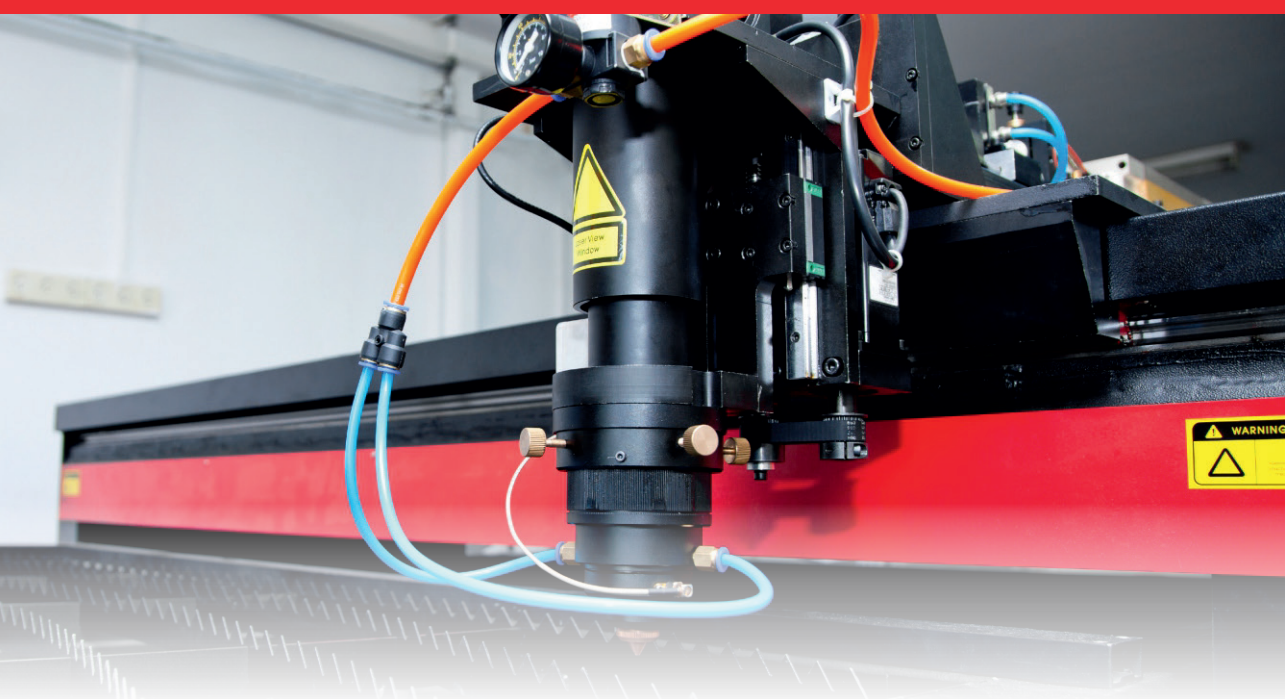
endo
endüstriyel donanım ve otomasyon sistemleri



Endüstriyel Donanım ve Lineer Hareket Sistemleri

2B

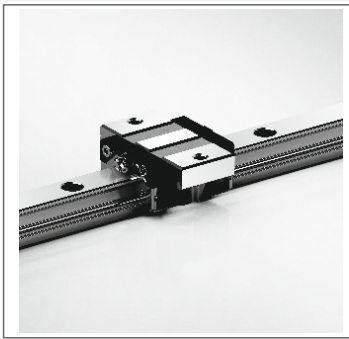
INDEX

1-172	CPC Linear Systems	CPC
173-202	Ground Type High Precision Ball Screws	GROUND SCREWS
203-258	Rack & Pinions	YYC
259-360	Thomson Linear Systems	THOMSON
361-446	Couplings, Joints & Locking Devices	SIT
447-474	Crossed Roller Bearings & Gonio Ways	SFT
475-546	Aluminum Sigma Profiles & Accessories	SIGMA PROFILE
547-558	Pneumatic Systems	PNEUMAX
559-604	Industrial Shock Absorbers	ENIDINE
605-628	Machinery Equipments & Accessories	ELESA
629-700	Protection Covers, Pneumatic Clamps & Lightnings	HEMA
701-806	Cable Carriers	CEA
807-820	Rotary Union & Joint Equipments	DEUBLIN

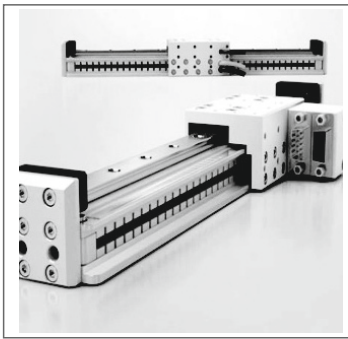
Linear Systems

cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO LTD

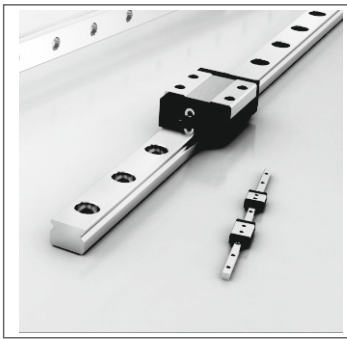
Linear Guide



Linear Motors



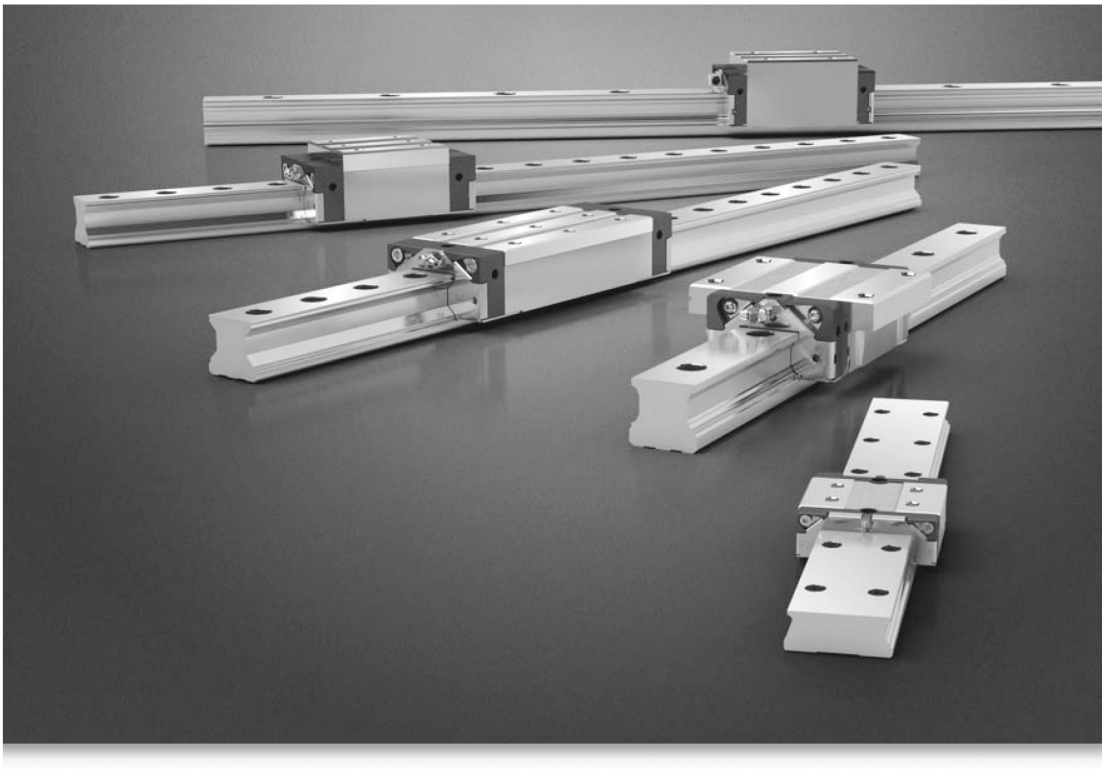
Miniatur Linear Guide



Linear Bearings

Ball Screws & Nuts

cpc 直得科技股份有限公司 CHIEFTEK PRECISION CO., LTD.



ARC/HRC/ERC Standard 4-Row Ball Bearing Linear Guide
WRC Wide 4-Row Ball Bearing Linear Guide
ARR/HRR/LRR Standard 4-Row Roller-type Linear Guide

cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.

ARC/HRC/ERC series

Linear motion technology

ARC/HRC/ERC Ball Type Linear Guide Series

4 Web: www.endo.com.tr Mail: satis@endo.com.tr Tel: +90 232 433 85 15

Product Overview

ARC/HRC/ERC Product Characteristics

The **cpc** ARC/HRC/ERC Linear Guide Series uses the O-type arrangement for the four row ball circulation design. The contact angle between the rail and ball is 45 degrees, and can realize the 4 directional load effects. **cpc** places special emphasis on strengthening the Arm length(Lo), so when sustaining external force F, will have even higher Mr value to increase the rigidity and static moment capability.
In addition, the runner block for the same size uses larger and more balls, so will outperform competitor's models by 10% to 30% regarding load capabilities. The products have characteristics of high load, high moment, and high stiffness.

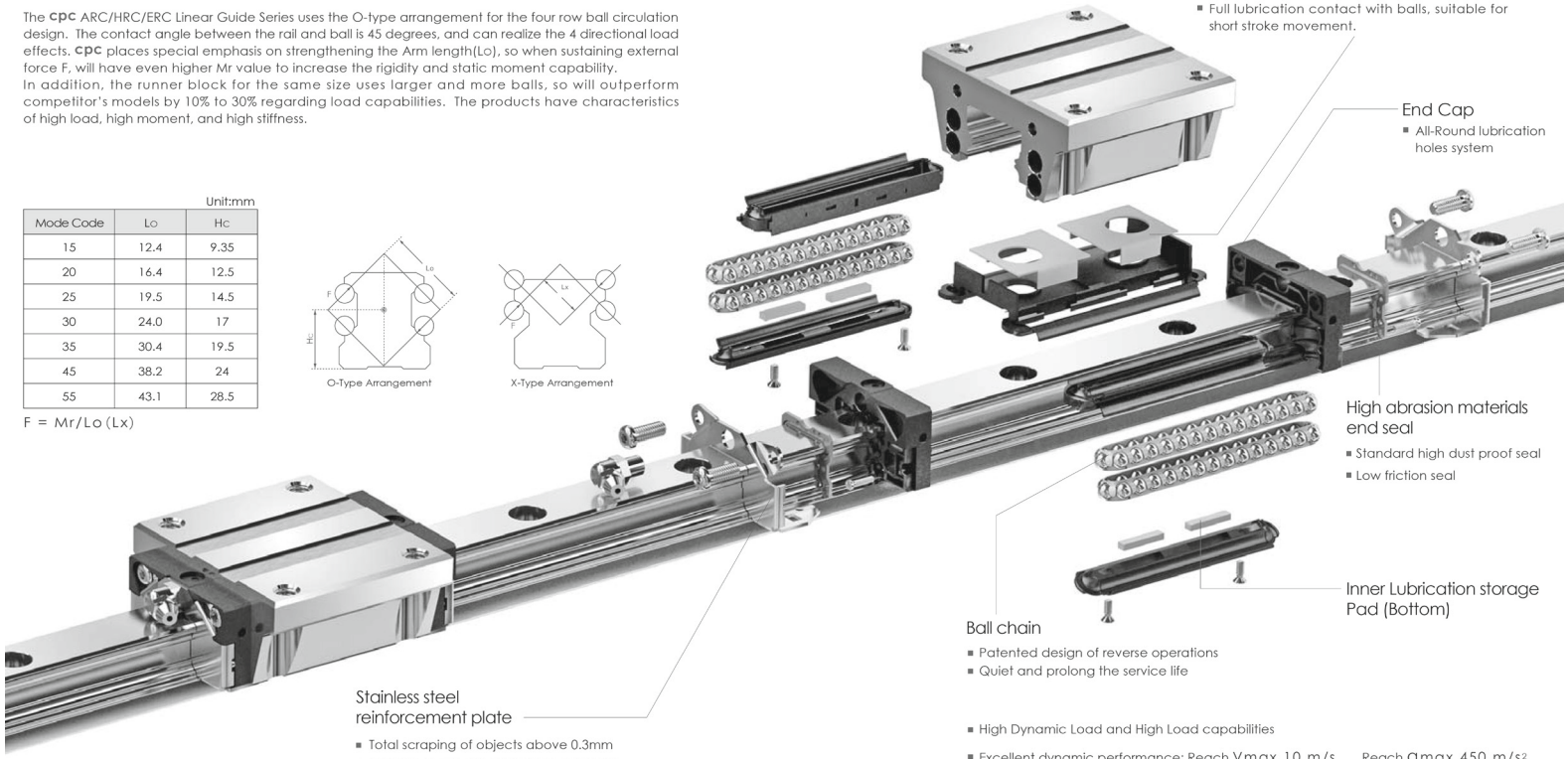
Unit:mm

Mode Code	Lo	Hc
15	12.4	9.35
20	16.4	12.5
25	19.5	14.5
30	24.0	17
35	30.4	19.5
45	38.2	24
55	43.1	28.5

F = Mr/Lo (Lx)

O-Type Arrangement

X-Type Arrangement



Inner Lubrication storage Pad (Upper)
- Length of the Runner Block will not be increased
- Full lubrication contact with balls, suitable for short stroke movement.

End Cap
- All-Round lubrication holes system

High abrasion materials end seal
- Standard high dust proof seal
- Low friction seal

Inner Lubrication storage Pad (Bottom)

Ball chain
- Patented design of reverse operations
- Quiet and prolong the service life

Stainless steel reinforcement plate
- Total scraping of objects above 0.3mm
- Increase X-axis direction force capacity

- High Dynamic Load and High Load capabilities
- Excellent dynamic performance: Reach Vmax 10 m/s Reach αmax 450 m/s²
- Can provide counterbored holes from the top and tapped mounting holes from the bottom rail
- Can provide special surface treatment

Product Design (Standard)

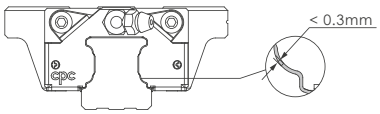
Dustproof design

Inner Seals

The newly designed inner seals both protect the rails from foreign particles and keep the lubrication inside the runner block, while maintaining a low friction profile.

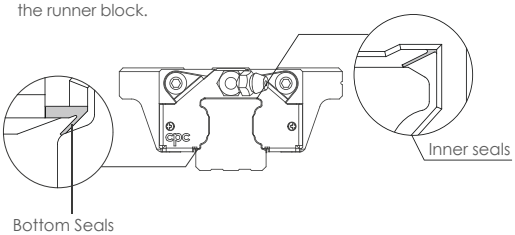
Stainless Steel Reinforcement Plate

The reinforcement plate also functions as a scraper for larger particulates like iron fillings, and has no more than 0.3mm clearance between the plate and the rail.



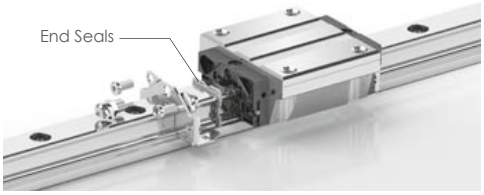
Bottom Seals

The bottom seals work in conjuction with the inner seals to keep foreign particles out and lubriation from leaking out. Our comprehensive sealing design significantly reduces re-lubrication needs and prolongs service life of the runner block.



End Seals

The end deals work in conjuction with the bottom and inner seals to block foreign particles out and prevent lubrication leakage. Our engineering plastic has a strong firction resistance and is less prone to cracking than typical NBR plastics.

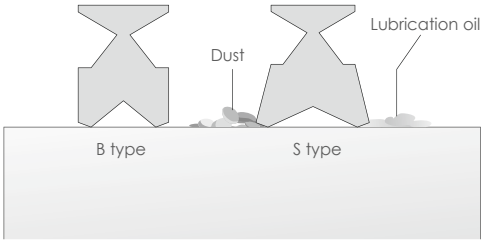


Standard Seals (S)

Our standard seals are in direct contact with the rail surface, giving them increased dustproof and lubcrication retenion capabilities. **cpc** recommends this class of seal for blocks that operate in environments high in foreign particles, such as sawdust, for long periods of time. S-type seals will have a compratively higher friction then B-Type seals.

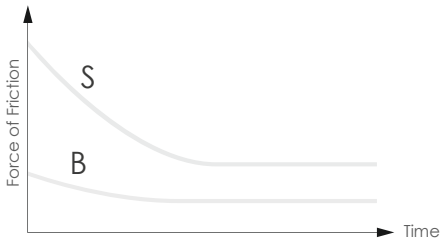
Low Friction Seals (B)

Our low-friction seals have slight contact with the rail and are suitable for most environments, with both low friction and a scraper function.



Seal type friction comparison

Friction levels will be the highest on new linear rails. But, after short periods of operation, such friction will be reduced to a constant level.



Average Friction of Block

Below are the tables for the block body and end seal friction levels under greaseless conditions.

Unit : N

ARC/HRC/ERC								
Block Type	Friction caused from ball bearing				Bottom Seals + Inner Seals	End Seals (2 sides)		External NBR seal with metal scraper
	Preload Class					S-Type Standard	B-Type Low friction	
	VC	V0	V1	V2				
15MN/FN	0.30	0.65	0.85	1.10	1.5	2.0	0.5	4
20MN/FN	0.40	0.75	1.40	1.60	2.0	2.5	1.0	5
25MN/FN	0.60	0.95	1.30	1.95	2.5	3.0	1.5	8
30MN/FN	0.55	1.10	2.00	3.10	3.0	5.0	2.0	10
35MN/FN	0.65	1.25	2.50	3.25	3.0	8.0	3.0	12
45MN/FN	0.85	2.10	2.80	4.00	4.0	11.0	4.0	20
55MN/FN	1.6	4.1	5.5	7.95	2.0	13.0	-	-

Unit : N

ARC/HRC/ERC								
Block Type	Friction caused from ball bearing				Bottom Seals + Inner Seals	End Seals (2 sides)		External NBR seal with metal scraper
	Preload Class					S-Type Standard	B-Type Low friction	
	VC	V0	V1	V2				
15MS/FS	0.30	0.60	0.80	1.00	1.5	2.0	0.5	4
20MS/FS	0.40	0.70	1.10	1.40	2.0	2.5	1.0	5
25MS/FS	0.50	0.90	1.20	1.80	2.5	3.0	1.5	8
30MS/FS	0.50	1.00	1.80	2.30	3.0	5.0	2.0	10

Unit : N

ARC/HRC/ERC								
Block Type	Friction caused from ball bearing				Bottom Seals + Inner Seals	End Seals (2 sides)		External NBR seal with metal scraper
	Preload Class					S-Type Standard	B-Type Low friction	
	VC	V0	V1	V2				
15ML/FL	0.40	0.70	0.90	1.40	1.5	2.0	0.5	4
20ML/FL	0.50	0.80	1.60	1.80	2.0	2.5	1.0	5
25ML/FL	0.70	1.20	1.80	2.00	2.5	3.0	1.5	8
30ML/FL	0.80	1.40	2.20	2.80	3.0	5.0	2.0	10
35ML/FL	0.90	1.60	2.70	3.50	3.0	8.0	3.0	12
45ML/FL	1.00	2.30	3.50	4.55	4.0	11.0	4.0	20
55ML/FL	1.9	4.3	6.6	8.6	2.0	13.0	-	-

Applied example

① . ARC25MN SZ V1N

Block friction = 1.3+2.5+3 = 6.8N

② . HRC30FL BZ V0P

Block friction= 1.4+3+2 = 6.4N

Friction caused from ball bearing
Bottom Seals + Inner Seals
+) End Seals (2 sides)
Block friction

Product Design (Standard)

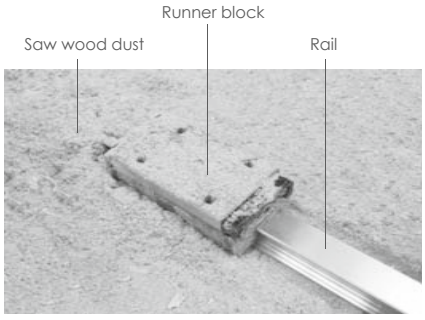
Saw wood dust Test

Test content

This test uses a total of 4 groups of products (2 rails matched with 2 lubrication methods) which are put on a saw wood dust surface on which a back and forth motion test is performed.

Rail
1. Tapped from top rail plus hole plugs (AR)
2. Tapped from bottom rail (ARU)

Runner Block
1. Installation of standard contact type seals (S), using grease
2. Installation of lubrication storage Pad and standard contact type seals(SZ), using grease



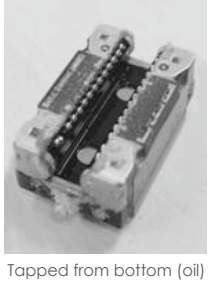
Testing conditions

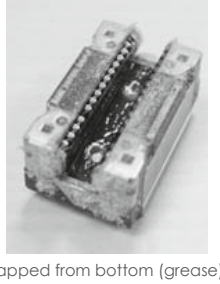
1. Stroke = 600mm
2. Total testing stroke = 30m

Test items

1. If saw wood dust enters the inner surface of the runner block
2. If saw wood dust enters the ball bearing runner area

Test results


Tapped from bottom (oil)


Tapped from bottom (grease)

Checked Item / Installation status	If saw wood dust enters inner block surface	If saw wood dust enters ball bearing runner area
ARU Rail SZ Type Runner Block (oil lubrication)	No	No
ARU Rail S Type Runner Block (grease lubrication)	No	No
AR Rail SZ Type Runner Block (oil lubrication)	Yes (belly area)	No
AR Rail S Type Runner Block (grease lubrication)	Yes (belly area)	No

Test result

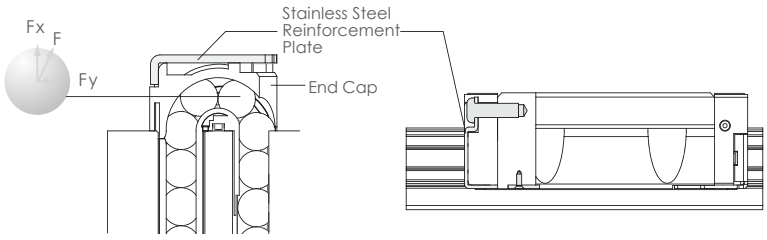
- The tapped from top rail has hole plugs, leading to rail unevenness, allowing some saw wood dust to enter the runner block belly area. The 2 sides of the runner block belly area are completely protected by stainless steel reinforcement plates and end seals, meaning that the ball bearing runner area is fully shielded from saw wood dust.
- The tapped from bottom rail has an even rail surface so that the ball bearing runner area is fully protected from saw wood dust.

Stainless steel reinforcement plate (Patent)

Scraping function on both sides

Using 2 stainless steel reinforcement plates, the L type design allows for screws to be fastened onto the top and bottom of the runner block, reinforcing the rigidity and cladding of its caps.

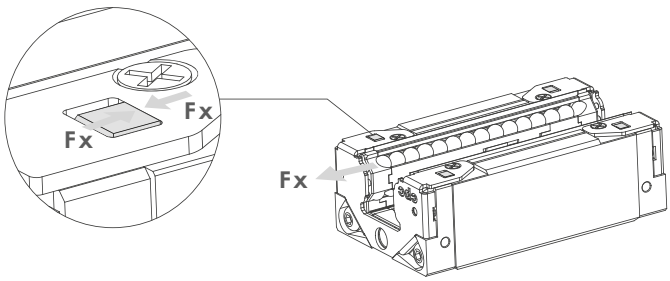
The clearance between the rail profile with the seal design is below 0.3mm, reinforcing the steel plates while enabling scraper functions.



Function of high speed operation

Our ARC/HRC/ERC type features stainless steel reinforcement plates and additional bottom latches, increasing its axial force and tolerance capacity to achieve faster operation speeds.

Vmax >10 m/s amax >450m/s²



Mutli-Directional Lubrication Nozzles (All-direction Lubrication Nozzles)

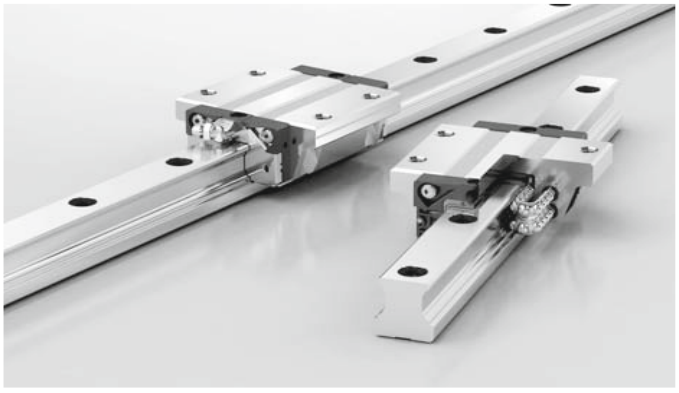
Our product features lubrication ports on the top, bottom, and sides, allowing installation of optional grease nipples for relubrication. The top port comes with a O-ring seal to allow easy re-lucrication from the top, and our diverse comphrensive lubrication injection design allows for lubrication in both axis.

Product Design (Option)

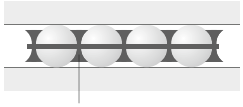
Low noise, superior quality high speed ball chain (Patent)

Ordering code: C

With traditional ball type linear guides, the spinning of balls in different directions leads to a two times faster contact speed. Such high friction greatly reduce the service life of such products. Additionally, the contact point between such balls also produces high pressure and noise levels while increasing the danger of oil film cladding damage.



Low noise ball chain



The contact point between the balls and ball chain leads to a low surface pressure level.

Traditional Ball type linear guide

Because the contact point of ball type linear guides is only between balls, the surface pressure is significantly higher.

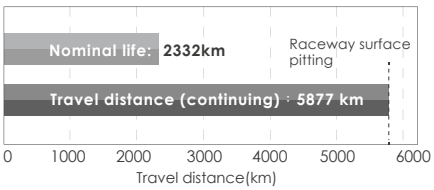
* The cpc ball chain provides a greater contact area between the balls and the ball chain. Because the film cladding will not be damaged easily and due to the lower noise volume, balls can move at a higher speed while product service life can also be extended significantly.
* The size of the ball chain design block is the same as that of linear guides without ball chains, allowing for same dimensions and use of identical guides.

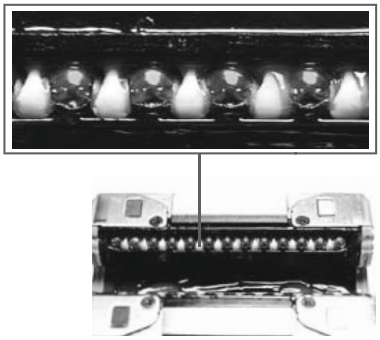
Heavy load test

Condition

Model : ARC25MN SZC V1H
Velocity : 1m/sec
Load capacities : 7.44kN(0.3C)
Dynamic load rating C_{100} : 24.8kN
Stroke : 960mm
Preload : 0.05C

Rating Life $\left(\frac{C}{P}\right)^3 \times 100km = \left(\frac{C}{0.05C+0.3C}\right)^3 \times 100km = 2332km$

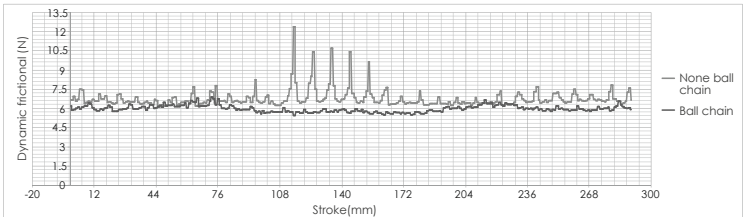




After testing, grease remains without anomalies.

Smoothness test

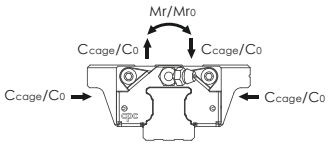
Model code : ARC25MNSV1N
Velocity : 10 mm/sec

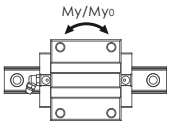


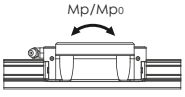
Load capacity of ball chain

There are three advantages of ARC/HRC/ERC ball chain series as compared with traditional, non-ball chain blocks :

1. The space block in the ball chain can prevent the oil film from rupturing by ball to ball contact and decrease friction induced wear.
2. The retainer block of the ball chain can maintain a reliable oil film layer by continuously applying grease on the moving part.
3. The ball chain provides the important function of leading steel ball motion. For traditional blocks without ball chains, its steel balls are pushed by the rotating back steel balls on the raceway, meaning that the contact angle between the balls and rail is less precise, causing vibration and an increased stress level between balls. In comparison, the balls in our ball chain product are led by the ball chain to ensure a correct fit and accurate contact angles. In this way, our product's ball chain design ensures that it can fit correctly when entering the raceway and that the contact angle will be accurate. This means that our Ball chain design provides for a smooth performance, lower vibration levels and less additional stress levels. Subsequently increase the dynamic load rating, C_{cage} value.







Dynamic rating load

The table on the right shows the Ccage and CISO values via different machine type testing. (According to ISO-14728 regulations)

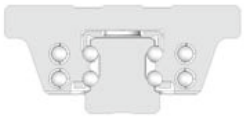
Model Code		C_{ISO} (kN)	C_{cage}(kN)
ARC-MN C ARC-FN C HRC-MN C HRC-FN C ERC-MN C	15	9.4	11.8
	20	15.4	22.3
	25	22.4	33.6
	30	31.0	46.5
	35	43.7	65.6
	45	67.6	101.4
ARC-ML C HRC-ML C HRC-FL C ERC-ML C	15	12.5	15.6
	20	18.9	27.4
	25	28.5	42.8
	30	38.0	57.0
	35	50.6	75.9
	45	86.2	129.3
ARC-MS C ARC-FS C ERC-MS C	15	7.1	8.9
	20	11.6	16.8
	25	16.8	25.2
	30	21.3	32.0

Static rating load & Static torque

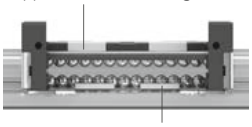
The C type block of ARC/HRC/ERC will increase the pitch between balls on the operating profile. Therefore, the static rating load C0 and the static rating torque Mr0, Mp0 and My0 values will be decreased.

Model Code		Static rating load(kN)	Static torque(Nm)		
		C_0	M_{r0}	M_{p0}	M_{y0}
ARC-MN C ARC-FN C HRC-MN C HRC-FN C ERC-MN C	15	16.2	130	95	95
	20	25.7	275	200	200
	25	36.4	465	340	340
	30	49.6	780	530	530
	35	70.2	1575	1010	1010
	45	102.8	2955	1775	1775
ARC-ML C HRC-ML C HRC-FL C ERC-ML C	15	24.3	195	215	215
	20	34.3	370	350	350
	25	51.6	655	640	640
	30	66.1	1040	900	900
	35	94.7	1940	1575	1575
	45	159.7	4185	3280	3280
ARC-MS C ARC-FS C ERC-MS C	15	10.8	85	45	45
	20	17.1	185	85	85
	25	24.3	310	145	145
	30	28.9	455	205	205

Product Design (option)



Upper Lubrication Storage Pad



Bottom Lubrication Storage Pad

Lubrication Design (Ordering Code: Z) (ARC/HRC/ERC)

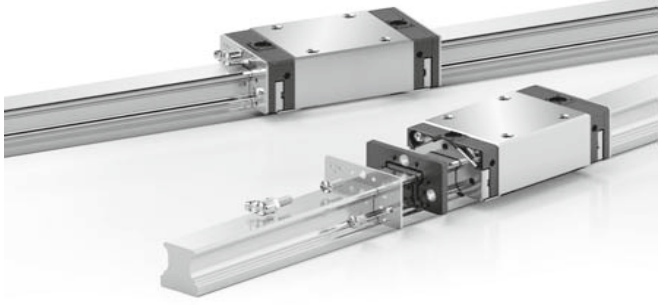
Inner oil storage and oil supply system design

Our Inner PU Lubrication Storage Pad design does not increase the length of the runner block and can effectively lubricate all balls. Customers can inject lubrication oil directly through its lubrication holes to ensure a sufficient storage in the PU Lubrication storage pad. This not only enables long term lubrication effects, but also a higher degree of ease at conforming to environment protection needs and lowering maintenance costs. For short stroke movements, this product allows for highly effective lubrication.

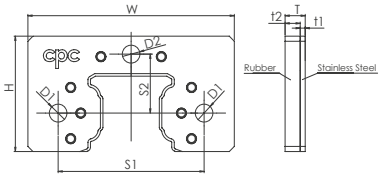
External NBR Seal with Metal Scraper (Ordering Code: SN / HN) (ARC/HRC/ERC/ARR/HRR/LRR)

Available for applications in harsh environments such as in grinding, glass processing, graphite processing and wood-working machinery, providing a highly effective dust and iron scrap proofing solution

SN: (made by BRB) For application in harsh environment.
HN: (made by HNBR) For application of resisting acidic / basic coolant.



Dimensions and Specifications

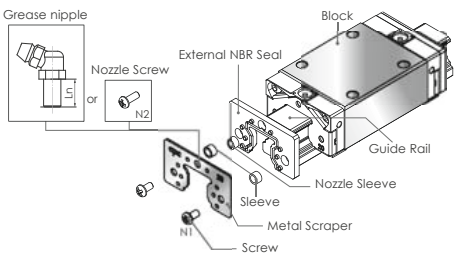


Unit: mm

Model Code		Exterior Dimension					Bore Specification				Screw Specification		
		T	t1	t2	W	H	S1	S2	D1	D2	N1	N2	Ln
Ball	15	4	1	3	33	20.3	25	10.2	3.5	3.5	M3x0.35	M3x0.5	9
	20	4	1	3	41	22.5	29	11.5	3.5	3.5	M3x0.35	M3x0.5	9
	25	5.2	1.2	4	47	26.5	36.5	13.5	3.5	6.5	M3x0.5	M6x0.75	12
	30	6	1.5	4.5	58	34.2	42.5	17.5	4.5	6.5	M4x0.5	M6x0.75	12
	35	6	1.5	4.5	68	39.3	50	20.5	4.5	6.5	M4x0.5	M6x0.75	12
	45	6	1.5	4.5	84	49.6	65	24.9	4.5	10	M4x0.5	PT1/8	15
	55	6	1.5	4.5	98	57	73	28	5.5	6.5	M5x0.5	M6x0.75	12
Roller	35	6	1.5	4.5	69	37.6	60	20	4.5	6.5	M4x0.5	M6x0.75	16
	45	6	1.5	4.5	84.9	43.5	70	22.9	4.5	6.5	M4x0.5	M6x0.75	16

Installation Manual

1. When installing the external NBR seal, please ensure that the block is on the rail
2. Ensure that the rubber part is fitted in the sleeve. If the rubber part has fallen off, set the sleeve to the corresponding bore.
3. Overlap the rubber part and metal scrapper with the corresponding salient point and bore. The cpc logo must be facing outward.
4. Slide the external NBR seal into the rail from two sides and closely connect with the block.
5. Fasten the screw into the correspondence bore and align the seal with the center of the rail and properly fastened. Do not allow the metal scraper to make contact with the guide rail.



LINEAR MOTION TECHNOLOGY

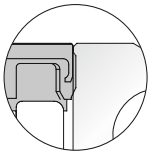
Metal-Plastic-Cap Patent Design for Standard Rail-Bolt-Hole (With patent)

(Ordering Code: MPC)

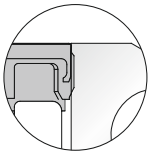
Metal Cap Features Introduction

The Most Convenient Metal Cap Used in Industry

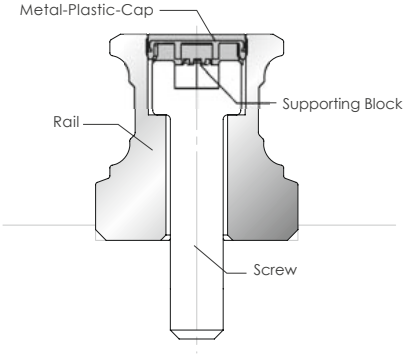
- The upper part of the cap is made of stainless steel which can prevent sharp foreign objects from piling up on the bolt-hole and affect the end seal function.
- The lower part of the cap is made of plastic, and can be installed directly on a standard rail without the need for additional bolt-hole slot milling.
- The bolt-hole chamfer for standard rails is C0.2mm. For further dustproof requests, the non-bolt-hole chamfer rail is optional upon ordering. (order code: TR)



Bolt-Hole with Chamfer (standard)

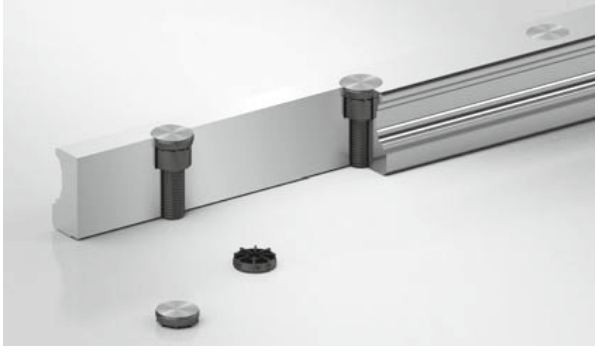


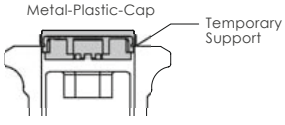
Bolt-Hole without Chamfer (optional: /TR)



Cap can be Smoothly Installed on Bolt-Hole

Bolt-hole cap of conventional linear guides, due to the difficulty of controlling hammering strength, often result in caps being hammered too deep or surface unevenness which leads to the accumulation of dirt or scrap iron. Our **cpc** cap is especially designed with a supporting block to prop up the cap and to fix the screw stably, thus preventing such unnecessary sinking.

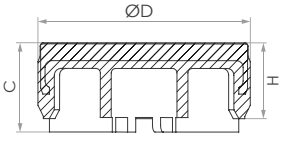




Cap before Hammering
(Plastic Support)

Plastic Support after Hammering
(The form of the 8 supporting blocks will become altered to fit with the screw)

Dimensions and Specifications



Model Code	Screw	External Diameter D	Cup Height H	Block Height C	Rail
A4	M4	7.7	1.7	2.0	AR15 , WRC21/15, WRC27/20
A5	M5	9.7	3.4	4.0	AR20
A6	M6	11.3	2.9	3.5	AR25
A8	M8	14.3	3.9	4.5	AR30 , AR35
A12	M12	20.4	5.0	5.6	AR45/ARR45
A8-R	M8	14.3	8.0	9.5	ARR35
A14	M14	24.4	6.0	6.5	AR55

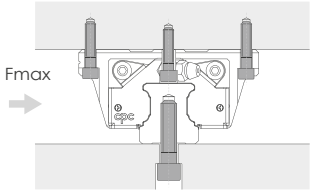
Technical Information

The maximum bearing capacity of linear guide is not only related to the static load capacity C_0, but also the screw mounting of coupling parts. Factors such as length of block, distance between rails, size of screws, and contact width of rail would impact the maximum bearing capacity of screw mounting.

Screw tightening torque (Nm)

Strength grade 12.9 Alloy steel screws	steel	cast iron	Non-ferrous metals
M3	2.0	1.3	1.0
M4	4.1	2.7	2.1
M5	8.8	5.9	4.4
M6	13.7	9.2	6.9
M8	30	20	15
M10	68	45	33
M12	118	78	59
M14	157	105	78

The lateral bearing capacity (without support from edge and lateral mounting)

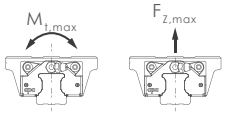


Linear guide often experience lateral load when used; in the case of mounting screw only, the lateral bearing capacity is suggested to be determined by the static friction force resulted from the screw tightening torque. If the maximum lateral load is exceeded, the support from the edge, lateral mounting and plugs are possible options to enhance the load capacity.

According to DIN637, DIN SIO 12090-1 and DIN EN ISO 898-1 regulation, when the tensile strength, torque and lateral force exert on class 8.8 alloy steel screw is larger than the values in table below, the screw mounting and design of edge support must be revised to avoid loose.

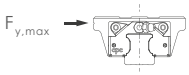
Screw maximum tensile strength and torque

size	ball type						roller type			
	short		standard		long		standard		long	
	$F_{z,max}$ N	$M_{t,max}$ Nm	$F_{z,max}$ N	$M_{t,max}$ Nm	$F_{z,max}$ N	$M_{t,max}$ Nm	$F_{z,max}$ N	$M_{t,max}$ Nm	$F_{z,max}$ N	$M_{t,max}$ Nm
15	3200	22	3700	26	4200	30	-	-	-	-
20	5500	51	6400	60	7300	68	-	-	-	-
25	8100	87	9400	100	10800	120	-	-	-	-
30	15900	210	18500	240	21100	280	-	-	-	-
35	-	-	18500	300	21100	340	36900	590	42200	680
45	-	-	45900	970	52400	1100	91700	1900	104800	2200
55	-	-	63700	1600	72800	1800	-	-	-	-



Screw lateral bearing capacity

size	ball type			roller type	
	short	standard	long	standard	long
	$F_{y,max}$ N	$F_{y,max}$ N	$F_{y,max}$ N	$F_{y,max}$ N	$F_{y,max}$ N
15	240	280	320	-	-
20	410	480	550	-	-
25	610	710	810	-	-
30	1200	1400	1600	-	-
35	-	1400	1600	2800	3200
45	-	3400	3900	6900	7900
55	-	4800	5500	-	-



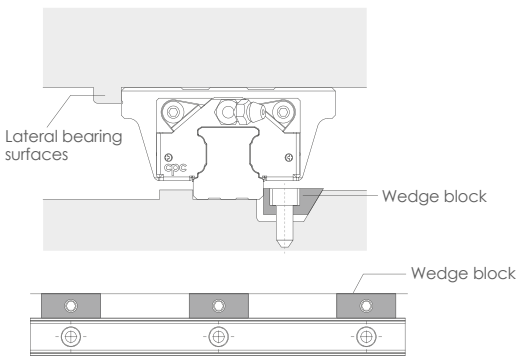
When class 10.9 class alloy steel screw is used, the value is about 1.4 times larger than the value in table above. When 12.9 class alloy steel screw is used, the value is about 1.68 times larger.

Lateral bearing surfaces and lateral fixing elements

When the lateral load is greater than the lateral load capacity, the lateral bearing surface is required to bear the lateral force. If the lateral force is bidirectional, Lateral fixing elements can be used to provide a bidirectional lateral load capability of the linear guide on the other side of the side bearing surface, and help close to the lateral bearing surface, the lateral straightness and side load capacity after installation will be greatly improved, and its allowable value will vary according to the type of fixed component.

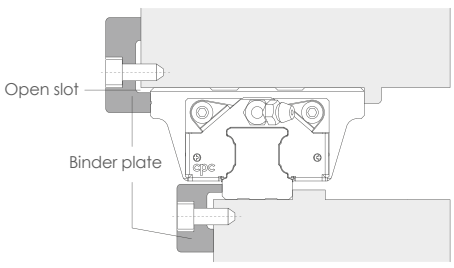
The following diagram shows several common elements.

Wedge block



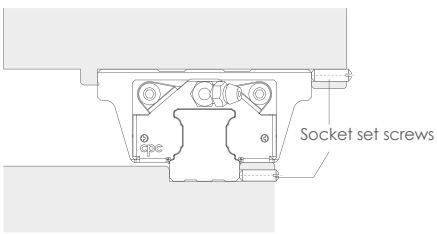
The linear guide rail is tightened by locking the bolts on the wedge block.

Binder plate



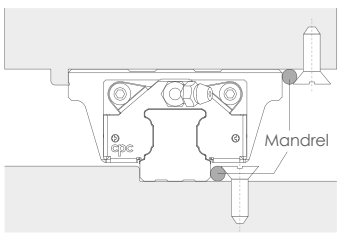
The open slot must be machined to prevent interference between the linear guide and carriage on the corners during installation.

Socket set screws



When the installation space is limited, the size of lateral mounting element must be considered.

Mandrel fixing



Use the slope of the nut to advance the roller to achieve the effect of tightening the linear LM guide

Technical information

Preload and clerance

The ARC/HRC/ERC linear guides provide 4 different preload classes VC, V0, V1, V2.

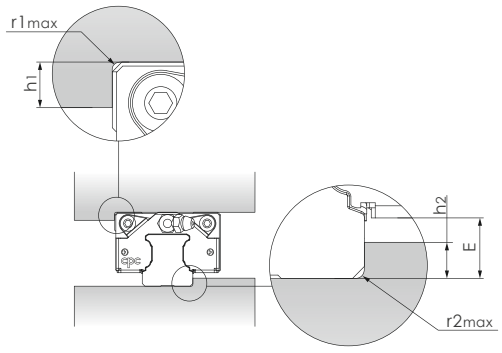
ARC/WRC										
Class	Description	Preload Value	Clearance (µm)							Application
			15	20	25	30	35	45	55	
			WRC21/15	WRC27/20						
VC	Clearance	0	+5~+0	+5~+0	+5~+0	+5~+0	+5~+0	+5~+0	+5~+0	Smooth motion, low friction
V0	Light Preload	0.02C	+0~-4	+0~-5	+0~-6	+0~-7	+0~-8	+0~-10	+0~-12	For precision situations, smooth motion
V1	Medium Preload	0.05C	-4~-10	-5~-12	-6~-15	-7~-18	-8~-20	-10~-24	-12~-28	High stiffness, precision, high load situations
V2	Heavy Preload	0.08C	-10~-16	-12~-18	-15~-23	-18~-27	-20~-31	-24~-36	-28~-45	Super high stiffness, precision and load capacity

HRC/ERC									
Class	Description	Preload Value	Clearance (µm)						Application
			15	20	25	30	35	45	55	
VC	Clearance	0	+5~+0	+5~+0	+5~+0	+5~+0	+5~+0	+5~+0	+5~+0	Smooth motion, low friction
V0	Light Preload	0.02C	+0~-4	+0~-5	+0~-6	+0~-7	+0~-8	+0~-10	+0~-12	For precision situations, smooth motion
V1	Medium Preload	0.08C	-4~-12	-5~-14	-6~-16	-7~-19	-8~-22	-10~-25	-12~-29	High stiffness, precision, high load situations
V2	Heavy Preload	0.13C	-11~-19	-14~-23	-16~-26	-19~-31	-22~-35	-25~-40	-29~-46	Super high stiffness, precision and load capacity

Installation Notice

Dimension of reference edge

To ensure that the linear guide is precisely assembled with the machine table, **cpc** devices have a recess installed in the reference edge corner. The corner of the machine table must be smaller than the chamfer of the linear guide to avoid interference. To consult on chamfer sizes and shoulder heights, please refer to the table below.



Unit : mm

ARC/HRC/ERC					
Type	r1max	r2max	h1	h2	E
15	0.5	0.5	4.0	2.5	3.3
20	0.5	0.5	5.0	4.0	5.0
25	1.0	1.0	5.0	5.0	6.0
30	1.0	1.0	6.0	5.5	6.6
35	1.0	1.0	6.0	6.5	7.6
45	1.0	1.0	8.0	8.0	9.3
55	1.5	1.5	10.0	10.0	12.0

WRC					
Type	r1max	r2max	h1	h2	E
21/15	0.4	0.4	5.0	2.0	2.7
27/20	0.4	0.4	5.0	3.0	3.5

ARR/HRR/LRR					
Type	r1max	r2max	h1	h2	E
35	1	1	8	5	6
45	1	0.5	10	7	8

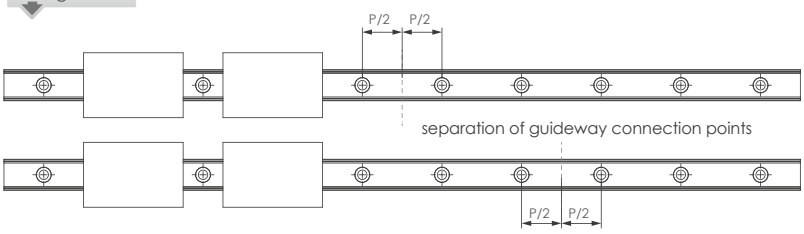
Rail Joint

The standard length of our large rails is 4 meters. If longer rails are required, **cpc** can provide a joint rail solution for which the joint number will be marked on the rail.

1. As shown in figure A, please follow the joint number to assemble.
2. For more than two units in each axis, to avoid accuracy effects from multiple blocks passing through the same connection point, we advise to use the connection points separately as shown on figure B.
3. Please use the slide as a connection point to tighten the slide before tightening the torques to fasten the screws from inside to outside.

Figure A

Figure B



Installation instructions

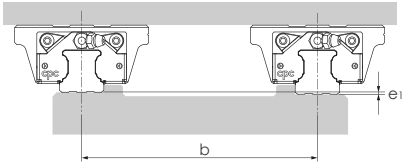
Installation surface geometry position accuracy

The rough finishing or milling on installation site will impact the working accuracy of linear guide, and reduce the service life of both standard, wide ball type linear guide and roller type linear guide. The accuracy of installation site and linear guides are critical factors to determine the accuracy of work bench. When the error of installation site is larger than the value calculated by following formula, the working resistance and service life will be impacted.

$e1\ (mm) = b\ (mm) \cdot f1 \cdot 10^{-4}$

$e2\ (mm) = d\ (mm) \cdot f2 \cdot 10^{-5}$

$e3\ (mm) = f3 \cdot 10^{-3}$



Installation datum plane

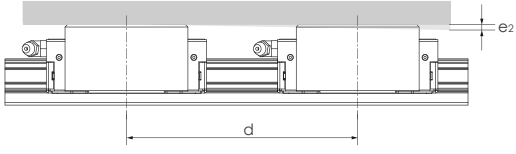
Rail: Both edges of rail can be reference edge, it shouldn't be marked separately.

Block: The side steel body of the block with
1. milled surface
2. Without groove mark can be the reference side.

Applicable to 15-55 all models

ARC/HRC/ERC (f1)				
Block length	VC	V0	V1	V2
MS / FS	5.2	3.5	2.2	1.1
MN / FN	4.5	3.1	1.8	0.8
ML / FL	4.2	2.8	1.7	0.7

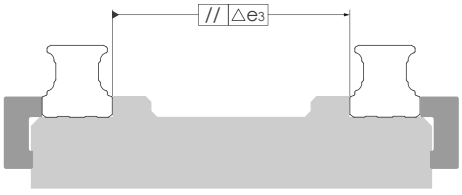
ARR/HRR/LRR (f1)				
Block length	VC	V0	V1	V2
MN / FN	1.3	1.1	1.0	0.8
ML / FL	1.2	1.1	0.9	0.7
MXL / FXL	1.2	1.0	0.9	0.7



ARC/HRC/ERC (f2)				
Block length	VC	V0	V1	V2
MS / FS	43.1	29.7	18.3	8.9
MN / FN	26.0	17.5	10.5	4.8
ML / FL	18.4	12.3	7.3	3.1

ARR/HRR/LRR (f2)				
Block length	VC	V0	V1	V2
MN / FN	7.1	6.2	5.2	4.3
ML / FL	5.3	4.7	3.9	3.2
MXL / FXL	4.2	3.6	3.0	2.5

LINEAR MOTION TECHNOLOGY



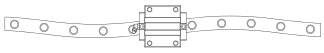
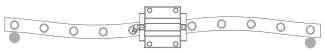
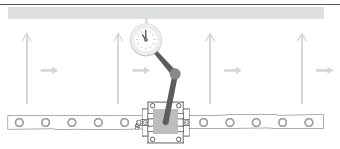
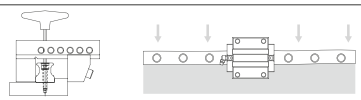
ARC (f3)				
Block length	VC	V0	V1	V2
15 MS / FS	20	14	9	5
15 MN / FN	18	13	8	4
15 ML	16	12	7	3
20 MS / FS	25	18	12	6
20 MN / FN	23	16	10	5
20 ML	21	14	9	4
25 MS / FS	31	22	15	8
25 MN / FN	27	20	13	6
30 MS / FS	38	28	18	10
30 MN / FN	33	24	15	8
30 ML	31	22	14	7
35 MN / FN	37	27	17	8
35 ML	35	25	16	8
45 MN	49	35	23	11
45 ML	45	32	21	10
55 MN	65	46	30	15
55 ML	62	44	28	13

HRC / ERC (f3)				
Block length	VC	V0	V1	V2
15 MN / FN / FN-R	18	13	8	4
15 ML / ML-R / FL / FL-R	16	12	7	3
20 MN / FN / FN-R	23	16	10	5
20 ML / ML-R / FL / FL-R	21	14	9	4
25 MS	31	22	15	8
25 MN / FN / FN-R	27	20	13	6
25 ML / ML-R / FL / FL-R	25	18	11	5
30 MN / FN / FN-R	33	24	15	8
30 ML / ML-R / FL / FL-R	31	22	14	7
35 MN / FN / FN-R	37	27	17	8
35 ML / ML-R / FL / FL-R	35	25	16	8
45 MN / FN / FN-R	49	35	23	11
45 ML / ML-R / FL / FL-R	45	32	21	10
55 MN / FN / FN-R	65	46	30	15
55 ML / ML-R / FL	62	44	28	13

ARR/HRR/LRR (f3)				
Block length	VC	V0	V1	V2
35 MN / FN	11	9	6	3
35 ML / FL	10	8	5	2
35 MXL / FXL	10	7	5	2
45 MN / FN	14	11	7	4
45 ML / FL	13	10	7	3
45 MXL / FXL	12	10	6	3

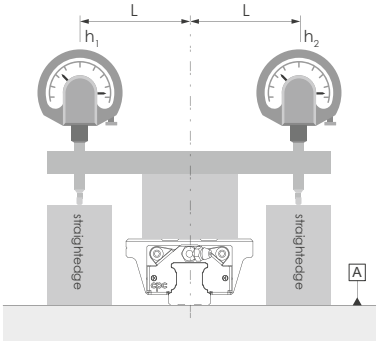
Installation instructions

Rail installation

Diagram	Description	Feature
	· No Straightening · Not allowed	No precision Low lateral bearing capacity
	· Straightening by pin · Not suggested	Low precision Low lateral bearing capacity
	· Straightening based on straight edge, calibrated by meter	Low to mid precision Low lateral bearing capacity
	· Place the rail on a supporting edge (Precision vise applied)	High precision One side with high lateral bearing capacity
	· With support edge and lateral mounting screw	Very high precision High lateral bearing capacity on both sides.

Recommended precision measurement method

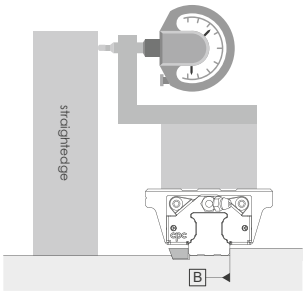
The working accuracy of linear guide is defined by the parallelism between block and rail(height, side). In practical application the linear accuracy is required, the measuring method is diverse, so we would suggest following measure to acquire the linear accuracy of linear guide.



H The horizontal working accuracy // P +
base plane flatness ▱ A = $|h_1-h_2|$ total length

(above mentioned method can be used to exclude the skew error of rail on roll direction)

* When the error of flatness of base plane is 0, the value is the linear working accuracy of rail at the certain height
(Please refer to table of working precision page 27)



W_2 The horizontal working accuracy // P +
the straightness of rail installation — B

*When the error of the straightness of the rail is 0, the value is the horizontal working accuracy on the side.
(Please refer to table of working precision page 27)

Lubrication

LINEAR MOTION TECHNOLOGY

Function

The loaded rolling elements and the raceway will be separated at the contact zone by a micron-thick layer of oil.
The lubrication will therefore

- reduce friction
- reduce wear
- reduce oxidation
- dissipate heat and increase service life

Lubrication caution

1. The blocks contain grease, can it can be directly installed on the machine, no need to be washed.
2. If the block is washed, please do not soak the block into lubrication oil until the cleaning detergent and the cleaning naphtha is totally dry. Soak the block into the lubrication oil until the oil-pad is full of lubricant, then the block is ready for installation.
3. The linear guide must be lubricated for protection purpose before first-use, this is to avoid the contact with pollutant.
4. The **cpc** block has grease inlet at front end, back end, left side, right side and top. The lubricant can be injected Through the grease inlet. Please see the table below for the amount of grease needed for different block model.
5. Please ensure the block is moving back and forth when the grease is injected into the block.
6. Frequent visual inspection is necessary to ensure the rail is constantly protected by a layer of oil.
7. The re-lubrication process must be done before the discoloration due to oil exhaustion
8. Please notify when the block is used in acidic, alkaline, or clean room applications.
9. Please contact our technical department for lubrication assistance if the rail mounting is different from horizontal direction.
10. The re-lubrication interval must be shortened if the travel stroke is <2 or >15 times the length of steel body of block.

The amount of oil needed to fulfill single block.

unit : cm^3

ARC/HRC/ERC			
Size	short (S)	standard (N)	long (L)
15	1.4	2	3.2
20	2.3	4	5.5
25	3.9	7	9.5
30	5.9	10	14
35	-	16	21
45	-	32	40
55	-	53	66.5

unit : cm^3

ARC/HRC/ERC (ball chain type)			
Size	short (S)	standard (N)	long (L)
15	1.2	1.5	2.5
20	2.3	3.5	5
25	3.9	7	9
30	5.4	9	12.5
35	-	15	19.5
45	-	30	37
55	-	-	-

unit : cm^3

WRC	
Size	standard (N)
21/15	2.7
27/20	5.3

unit : cm^3

WRC (ball chain type)	
Size	standard (N)
21/15	2.2
27/20	4.8

unit : cm^3

ARR/HRR/LRR			
Size	standard (N)	long (L)	extra long (XL)
35	9.4	11.0	14.1
45	22	26.4	30.8

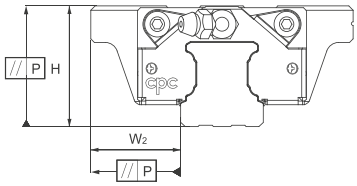
unit : cm^3

ARR/HRR/LRR (roller chain type)			
Size	standard (N)	long (L)	extra long (XL)
35	8.8	9.7	12.4
45	20.8	24.3	27.7

Technical information

Accuracy

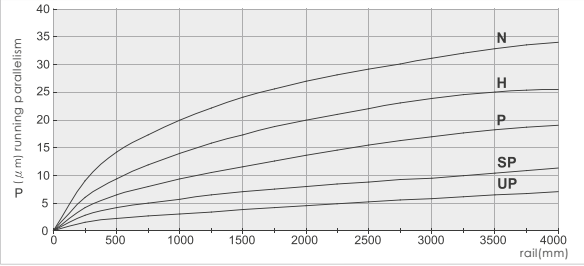
The ARC/HRC/ERC/WRC linear guides provide 5 different grades of precision : N, H, P, SP, and UP, Engineers can choose different grades depending on the machine applications.



Accuracy

Size	Accuracy grades (μm)		UP	SP	P	H	N
15 ~ 20	Tolerance of dimension height H	H	± 5	± 10	± 15	± 30	± 70
	Variation of height for different runner blocks on the same position of Rail	Δ H	3	5	6	10	20
	Tolerance of dimension width W_2	W_2	± 5	± 7	± 10	± 20	± 40
	Variation of width for different runner blocks on the same position of Rail	Δ W_2	3	5	7	15	30
25 ~35	Tolerance of dimension height H	H	± 5	± 10	± 20	± 40	± 80
	Variation of height for different runner blocks on the same position of Rail	Δ H	3	5	7	15	20
	Tolerance of dimension width W_2	W_2	± 5	± 7	± 10	± 20	± 40
	Variation of width for different runner blocks on the same position of Rail	Δ W_2	3	5	7	15	30
45 ~ 55	Tolerance of dimension height H	H	± 5	± 10	± 20	± 40	± 80
	Variation of height for different runner blocks on the same position of Rail	Δ H	3	5	7	15	25
	Tolerance of dimension width W_2	W_2	± 5	± 7	± 10	± 20	± 40
	Variation of width for different runner blocks on the same position of Rail	Δ W_2	3	5	7	15	30

Runner block relative to linear guide, datum plane parallel motion precision



Application

class	Movement, Conveyance	Manufacturing Equipment	High Precision Manufacturing Equipment	Measuring Equipment
N	●	●		
H	●	●	●	
P		●	●	●
SP			●	●
UP				●
Examples	1. Conveyance system 2. Industrial robots 3. Office Machinery	1. Woodworking machine 2. Punching press 3. Injection Molding machine	1. Lathe/milling machine/ grinding machine 2. Electrical discharge machining (EDM) 3. CNC machining center	1. Three dimensional measuring instrument 2. Detection mirror / head shaft 3. X-Y Table

Ordering information

ARC	U	15	M	N	-R	B	2	Z	C	V1	P	-1480L	-20	-20	II	/J

- /J: Customization code
- II: Number of rails on the same moving axis
- -20: End hole pitch (mm)*
- -20: Starting hole pitch (mm)*
- -1480L: Rail length (mm)
- P: Accuracy grade : UP, SP, P, H, N
- V1: Preload class : VC, V0, V1, V2
- C: with ball chain (Available for size 15,20,25,30,35 and 45)
- Z: with lubrication storage pad
- 2: Block quantity
- B: Seal type : B: Low friction S: Standard
- -R: R: six mounting holes Unlabeled: Standards
- N: Block length : L: long N: standard S: short
- M: Block width : M: standard F: flanged
- 15: Block type : 15, 20, 25, 30, 35, 45, 55
- U: U: rail (tapped from the botton)
- ARC: Product type : ARC: automation series HRC/ERC: heavy load series

Customization code(The meaning of suffix characters)

J : slide rail connection

G : customer designated lubricant

I : with Inspection report

S : special straightness requirements for rail

B : special processing for block

BL : with extension and contraction support layer.

SN : external NBR seal with metal scraper

R : special process for rail

VD : customized designated preload pressure value

OA : block install with grease nipple by cpc
(Please contact cpc for direction of grease nipple installation)

DE : reference edges of block and rail on opposite sides

HN : external HNBR seal with metal scraper

SG : installation of side grease holes and set screws

PC : with plastic caps for counter holes on the rail

MPC : with Metal-Plastic Caps for rail mounting holes.

TR : bolt-Hole without chamfer

BR : black chrome coating treatment on the rail

BB : black chrome coating treatment on the block

BRB : black chrome coating treatment on the block and rail

SB : with stainless steel ball bearings

NRB : nickel coating treatment on the block and rail

CR : clear chrome coating treatment on the rail

CB : clear chrome coating treatment on the block

CRB : clear chrome coating treatment on the block and rail

NR : nickel coating treatment on the rail

RR : raydent coating treatment on the rail

RB : raydent coating treatment on the block

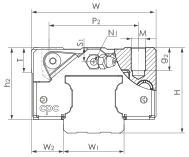
RRB : raydent coating treatment on the block and rail

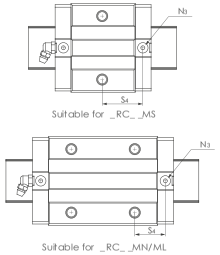
NB : nickel coating treatment on the block

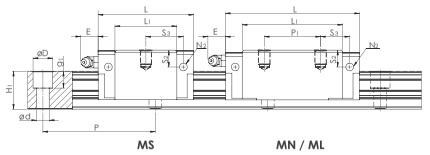
Note: For special process or customized requirement, please contact cpc for more information.

* The end pitch of the rail should not exceed the 1/2 of original pitch, this is to avoid the misfit of the rail to the workbench.

Dimensions Table







ARC MS Series

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)										Block Dimensions(mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	DxdxD1	W	L	L1	h2	P1	P2	P3	MxG2	M1	T	N1	N2	N3	E	S1	S2	S3	S4	C	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
ARC 15 MS	24	9.5	15	15	60	7.5x4.5x5.3	34	41.2	26	20.7	-	26	-	M4x7	-	6	M3x6.5	M3x6	P3	3.5	4.5	7.5	15.6	16.7	7.7	12.1	100	50	50	106	1290	ARC 15 MS
ARC 20 MS	28	11	20	20	60	9.5x6x8.5	42	49.2	32.2	23	-	32	-	M5x7	-	8	M3x7.5	M3x5.5	P4	10	4	7.4	19.1	19.8	12.5	19.3	205	100	100	170	2280	ARC 20 MS
ARC 25 MS	33	12.5	23	23	60	11x7x9	48	57.4	38.4	27	-	35	-	M6x9	-	8	M6x7.5	M3x6.5	P4	12	5	9.3	22.2	23.2	18.2	27.3	350	160	160	300	3020	ARC 25 MS
ARC 30 MS	42	16	28	27	80	14x9x12	60	68	44	35.2	-	40	-	M8x10	-	12	M6x8.5	M6x5	P5	12	7.5	12	27	26.7	23.3	33.1	520	230	230	560	4380	ARC 30 MS

ERC MS Series

ERC 25 MS	36	12.5	23	23	60	11x7x9	48	57.4	38.4	30	-	35	-	M6x9	-	8	M6x7.5	M3x6.5	P4	12	8	12.3	22.2	23.2	18.2	27.3	350	160	160	315	3020	ERC 25 MS

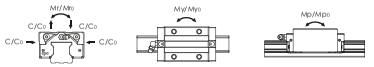
ARC MN Series

ARC 15 MN	24	9.5	15	15	60	7.5x4.5x5.3	34	55.5	40.3	20.7	26	26	-	M4x7	-	6	M3x6.5	M3x6	P3	3.5	4.5	7.5	9.8	10.9	9.9	17.5	140	105	105	158	1290	ARC 15 MN
ARC 20 MN	28	11	20	20	60	9.5x6x8.5	42	69	52	23	32	32	-	M5x7	-	8	M3x7.5	M3x5.5	P4	10	4	7.4	13	13.7	17.1	30.0	325	230	230	266	2280	ARC 20 MN
ARC 25 MN	33	12.5	23	23	60	11x7x9	48	81.2	62.2	27	35	35	-	M6x9	-	8	M6x7.5	M3x6.5	P4	12	5	9.3	16.6	17.6	24.8	42.5	540	385	385	420	3020	ARC 25 MN
ARC 30 MN	42	16	28	27	80	14x9x12	60	95.5	71.5	35.2	40	40	-	M8x10	-	12	M6x8.5	M6x5	P5	12	7.5	12	20.8	20.5	32.8	53.7	845	565	565	800	4380	ARC 30 MN
ARC 35 MN	48	18	34	32	80	14x9x12	70	111.2	86.2	40.4	50	50	-	M8x13	-	14	M6x10	M6x7	P5	12	8	15	23.4	24.1	45.9	82.9	1700	1080	1080	1120	6790	ARC 35 MN
ARC 45 MN	60	20.5	45	39	105	20x14x17	86	135.5	102.5	50.7	60	60	-	M10x17	-	14	PT1/8x12.5	M6x10.5	P5	14	11.1	18.1	27.3	27.3	71.3	122.1	3200	1910	1910	2120	10530	ARC 45 MN
ARC 55 MN	70	23.5	53	45.7	120	24x16x20	100	168.5	126.5	58	75	75	-	M12x20	-	16	M6x10	M6x13	P5	12	13.5	23.5	34.8	33.8	128	186	4949	3278	3278	4200	14000	ARC 55 MN

ARC ML Series

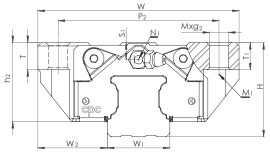
ARC 15 ML	24	9.5	15	15	60	7.5x4.5x5.3	34	76.2	61	20.7	34	26	-	M4x7	-	6	M3x6.5	M3x6	P3	3.5	4.5	7.5	16.1	17.2	13.4	26.9	215	235	235	240	1290	ARC 15 ML
ARC 20 ML	28	11	20	20	60	9.5x6x8.5	42	87.2	70.2	23	45	32	-	M5x7	-	8	M3x7.5	M3x5.5	P4	10	4	7.4	15.6	16.3	20.4	38.5	415	390	390	330	2280	ARC 20 ML
ARC 30 ML	42	16	28	27	80	14x9x12	60	118	94	35.2	60	40	-	M8x10	-	12	M6x8.5	M6x5	P5	12	8.7	12	21.7	21.7	39.6	70.2	1105	950	950	1138	4380	ARC 30 ML
ARC 35 ML	48	18	34	32	80	14x9x12	70	136.6	111.6	40.4	72	50	-	M8x13	-	14	M6x10	M6x7	P5	12	8	15	25.1	25.8	54.7	106.5	2185	1755	1755	1536	6790	ARC 35 ML
ARC 45 ML	60	20.5	45	39	105	20x14x17	86	171.5	138.5	50.7	80	60	-	M10x17	-	14	PT1/8x12.5	M6x10.5	P5	14	11.1	18.1	35.3	35.3	89.5	169.1	4430	3460	3460	3160	10530	ARC 45 ML
ARC 55 ML	70	23.5	53	45.7	120	24x16x20	100	202	160	58	95	75	-	M12x20	-	16	M6x10	M6x13	P5	12	13.5	23.5	41.5	40.5	147	226	6472	5284	5284	5083	14000	ARC 55 ML

1. The load capacities is for full-ball type (without ball chain)
2. N2 = Injecting holes
3. N3 = O-ring size for lubrication from above
4. N2 N3 will be sealed before shipmant, please open it when first using the product.

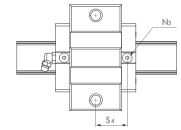


The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

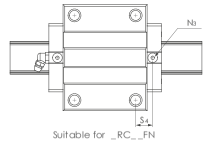
Dimensions Table



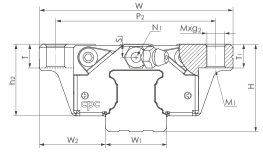
Suitable for ARC30 FS、FN
ARC35 FN



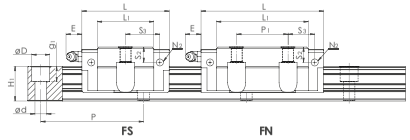
Suitable for _RC_ _FS



Suitable for _RC_ _FN



Suitable for ARC15 FS、FN
ARC20 FS、FN
ARC25 FS、FN



FS FN

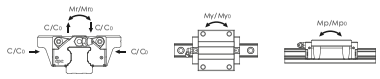
ARC FS Series

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)												Block Dimensions(mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	Dxdxg1	W	L	L1	h2	P1	P2	P3	Mxg2	M1	T	T1	N1	N2	N3	E	S1	S2	S3	S4	C	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
ARC 15 FS	24	18.5	15	15	60	7.5x4.5x5.3	52	41.2	26	20.7	-	41	-	M5x7	M4	7	7	M3x6.5	M3x6	P3	3.5	4.5	7.5	15.6	16.7	7.7	12.1	100	50	50	132	1290	ARC 15 FS
ARC 20 FS	28	19.5	20	20	60	9.5x6x8.5	59	49.2	32.2	23	-	49	-	M6x10	M5	10	10	M3x7.5	M3x5.5	P4	10	4	7.4	19.1	19.8	12.5	19.3	205	100	100	210	2280	ARC 20 FS
ARC 25 FS	33	25	23	23	60	11x7x9	73	57.4	38.4	27	-	60	-	M8x10	M6	12	10	M6x7.5	M3x6.5	P4	12	5	9.3	22.2	23.2	18.2	27.3	350	160	160	345	3020	ARC 25 FS
ARC 30 FS	42	31	28	27	80	14x9x12	90	68	44	35.2	-	72	-	M10x12	M8	12	12	M6x8.5	M6x5	P5	12	7.5	12	27	26.8	23.3	33.1	520	230	230	750	4380	ARC 30 FS

ARC FN Series

ARC 15 FN	24	18.5	15	15	60	7.5x4.5x5.3	52	55.5	40.3	20.7	26	41	-	M5x7	M4	7	7	M3x6.5	M3x6	P3	3.5	4.5	7.5	8.9	10.9	9.9	17.5	140	105	105	200	1290	ARC 15 FN
ARC 20 FN	28	19.5	20	20	60	9.5x6x8.5	59	69	52	23	32	49	-	M6x10	M5	10	10	M3x7.5	M3x5.5	P4	10	4	7.4	13	13.7	17.1	30.0	325	230	230	336	2280	ARC 20 FN
ARC 25 FN	33	25	23	23	60	11x7x9	73	81.2	62.2	27	35	60	-	M8x10	M6	12	10	M6x7.5	M3x6.5	P4	12	5	9.3	16.6	17.6	24.8	42.5	540	385	385	524	3020	ARC 25 FN
ARC 30 FN	42	31	28	27	80	14x9x12	90	95.5	71.5	35.2	40	72	-	M10x12	M8	12	12	M6x8.5	M6x5	P5	12	7.5	12	20.8	20.5	32.8	53.7	845	565	565	1200	4380	ARC 30 FN
ARC 35 FN	48	33	34	32	80	14x9x12	100	111.2	86.2	40.4	50	82	-	M10x13	M8	13	13	M6x10	M6x7	P5	12	8	15	23.4	24.1	45.9	82.9	1700	1080	1080	1580	6790	ARC 35 FN

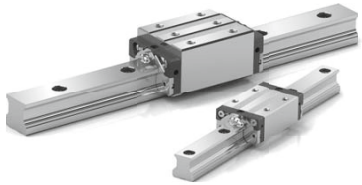
1. The load capacities is for full-ball type (without ball chain)
2. N2 = Injecting holes
3. N3 = O-ring size for lubrication from above
4. N2 N3 will be sealed before shipmant, please open it when first using the product.

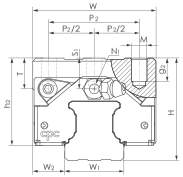


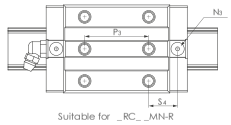
The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

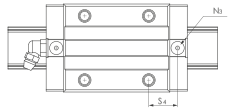
Dimensions Table



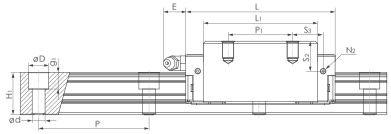




Suitable for _RC_ _MN-R



Suitable for _RC_ _MN



MN / MN-R

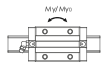
HRC MN Series

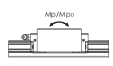
Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)											Block Dimensions(mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	D x d x g1	W	L	L1	h2	P1	P2	P2/2	P3	M x g2	M1	T	N1	N2	N3	E	S1	S2	S3	S4	C	C0	M10	Mp0	My0	Block(g)	Rail(g/m)	
HRC 15 MN	28	9.5	15	15	60	7.5x4.5x5.3	34	55.5	40.3	24.7	26	26	-	-	M4x7	-	6	M3x6.5	M3x6	P3	3.5	8.5	11.5	9.8	10.9	9.9	17.5	140	105	105	200	1290	HRC 15 MN
HRC 15 MN-R													13	26																	190		HRC 15 MN-R
HRC 20 MN	30	12	20	20	60	9.5x6x8.5	44	69	52	25	36	32	-	-	M5x8.5	-	8	M3x7.5	M3x5.5	P4	10	6	9.4	11	11.7	17.1	30.0	325	230	230	318	2280	HRC 20 MN
HRC 20 MN-R													16	36																	300		HRC 20 MN-R
HRC 25 MN	40	12.5	23	23	60	11x7x9	48	81.2	62.2	34	35	35	-	-	M6x9	-	12	M6x7.5	M3x6.5	P4	12	12	16.3	16.6	17.6	24.8	42.5	540	385	385	578	3020	HRC 25 MN
HRC 25 MN-R													17.5	35																	560		HRC 25 MN-R
HRC 30 MN	45	16	28	27	80	14x9x12	60	95.5	71.5	38.2	40	40	-	-	M8x12	-	12	M6x8.5	M6x5	P5	12	10.5	15	20.8	20.5	32.8	53.7	845	565	565	896	4380	HRC 30 MN
HRC 30 MN-R													20	40																	875		HRC 30 MN-R
HRC 35 MN	55	18	34	32	80	14x9x12	70	111.2	86.2	47.4	50	50	-	-	M8x13	-	14	M6x10	M6x7	P5	12	15	22	23.4	24.1	45.9	82.9	1700	1080	1080	1430	6790	HRC 35 MN
HRC 35 MN-R													25	50																	1370		HRC 35 MN-R
HRC 45 MN	70	20.5	45	39	105	20x14x17	86	135.5	102.5	60.7	60	60	-	-	M10x20	-	14	PT1/8x12.5	M6x10.5	P5	14	21.1	28.1	27.3	27.3	71.3	122.1	3200	1910	1910	2794	10530	HRC 45 MN
HRC 45 MN-R													30	60																	2650		HRC 45 MN-R
HRC 55 MN	80	23.5	53	45.7	120	24x16x20	100	168.5	126.5	68	75	75	-	-	M12x25	-	16	M6x10	M6x13	P5	12	23.5	33.5	34.8	33.8	128	186	4949	3278	3278	5110	14000	HRC 55 MN
HRC 55 MN-R													37.5	75																	4900		HRC 55 MN-R

ERC MN Series

ERC 25 MN	36	12.5	23	23	60	11x7x9	48	81.2	62.2	30	35	35	-	-	M6x9	-	8	M6x7.5	M3x6.5	P4	12	8	12.3	16.6	17.6	24.8	42.5	540	385	385	470	3020	ERC 25 MN
ERC 25 MN-R													17.5	35																	445		ERC 25 MN-R

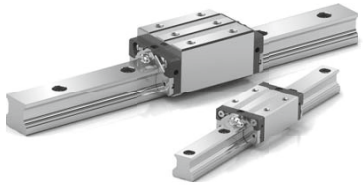
1. The load capacities is for full-ball type (without ball chain)
2. N2 = injecting holes
3. N3 = O-ring size for lubrication from above
4. N2 N3 will be sealed before shipmant, please open it when first using the product.

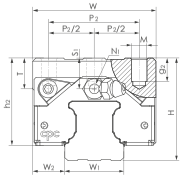


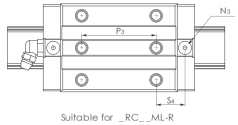


The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

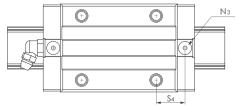
Dimensions Table



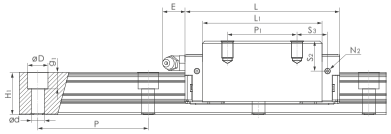




Suitable for _RC_ _ML-R



Suitable for _RC_ _ML



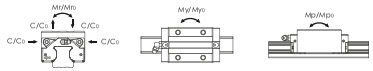
HRC ML Series

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)											Block Dimensions(mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	Dxdxg1	W	L	L1	h2	P1	P2	P2/2	P3	Mxg2	M1	T	N1	N2	N3	E	S1	S2	S3	S4	C	C0	Mt0	Mp0	My0	Block(g)	Rail(g/m)	
HRC 15 ML	28	9.5	15	15	60	7.5x4.5x5.3	34	76.2	61	24.7	26	26	-	-	M4x7	-	6	M3x6.5	M3x6	P3	3.5	8.5	11.5	20.1	21.2	13.4	26.9	215	235	235	300	1290	HRC 15 ML
HRC 15 ML-R													13	26																	280		HRC 15 ML-R
HRC 20 ML	30	12	20	20	60	9.5x6x8.5	44	87.2	70.2	25	50	32	-	-	M5x8.5	-	8	M3x7.5	M3x5.5	P4	10	6	9.4	13.1	13.8	20.4	38.5	415	390	390	400	2280	HRC 20 ML
HRC 20 ML-R													26	50																	370		HRC 20 ML-R
HRC 25 ML	40	12.5	23	23	60	11x7x9	48	105	86	34	50	35	-	-	M6x9	-	12	M6x7.5	M3x6.5	P4	12	12	16.3	21	22	30.7	57.7	735	710	710	685	3020	HRC 25 ML
HRC 25 ML-R													17.5	50																	645		HRC 25 ML-R
HRC 30 ML	45	16	28	27	80	14x9x12	60	118	94	38.2	60	40	-	-	M8x12	-	12	M6x8.5	M6x5	P5	12	10.5	15	21.7	21.8	39.6	70.2	1105	950	950	1150	4380	HRC 30 ML
HRC 30 ML-R													20	60																	1100		HRC 30 ML-R
HRC 35 ML	55	18	34	32	80	14x9x12	70	136.6	111.6	47.4	72	50	-	-	M8x13	-	14	M6x10	M6x7	P5	12	15	22	25.1	25.8	54.7	106.5	2185	1755	1755	1953	6790	HRC 35 ML
HRC 35 ML-R													25	72																	1800		HRC 35 ML-R
HRC 45 ML	70	20.5	45	39	105	20x14x17	86	171.5	138.5	60.7	80	60	-	-	M10x20	-	14	PT1/8x12.5	M6x10.5	P5	14	21.1	28.1	35.3	35.3	89.5	169.1	4430	3460	3460	4060	10530	HRC 45 ML
HRC 45 ML-R													30	80																	3950		HRC 45 ML-R
HRC 55 ML	80	23.5	53	45.7	120	24x16x20	100	202	160	68	95	75	-	-	M12x25	-	16	M6x10	M6x13	P5	12	23.5	33.5	41.5	40.5	147	226	6472	5284	5284	6243	14000	HRC 55 ML
HRC 55 ML-R													37.5	95																	6050		HRC 55 ML-R

ERC Series

ERC 25 ML	36	12.5	23	23	60	11x7x9	48	105	86	30	50	35	-	-	M6x9	-	8	M6x7.5	M3x6.5	P4	12	8	12.3	21	22	30.7	57.7	735	710	710	610	3020	ERC 25 ML
ERC 25 ML-R													17.5	50																	570		ERC 25 ML-R

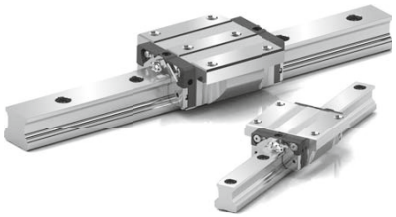
1. The load capacities is for full-ball type (without ball chain)
2. N2 = Injecting holes
3. N3 = O-ring size for lubrication from above
4. N2 N3 will be sealed before shipmant, please open it when first using the product.

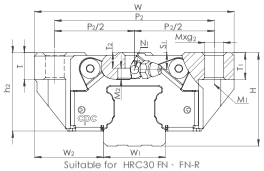


The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the fatal 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

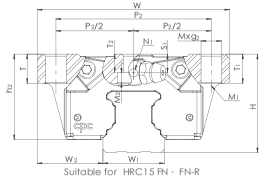
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

Dimensions Table

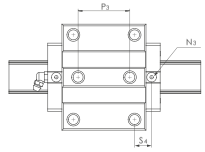




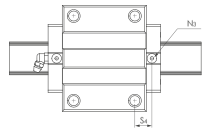
Suitable for HRC30 FN、FN-R
HRC35 FN、FN-R
HRC55 FN



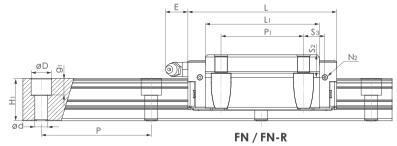
Suitable for HRC15 FN、FN-R
HRC20 FN、FN-R
HRC25 FN、FN-R
HRC45 FN、FN-R



Suitable for _RC_ _FN-R



Suitable for _RC_ _FN

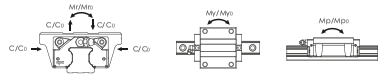


FN / FN-R

HRC FN Series

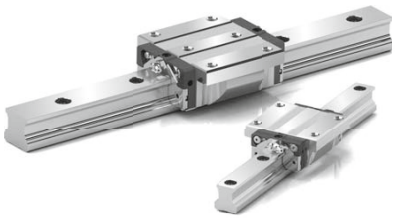
Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)												Block Dimensions(mm)								Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	Dxdxg1	W	L	L1	h2	P1	P2	P2/2	P3	Mxg2	M1	M2	T	T1	T2	N1	N2	N3	E	S1	S2	S3	S4	C	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
HRC 15 FN	24	16	15	15	60	7.5x4.5x5.3	47	55.5	40.3	20.7	30	38	-	-	M5x7	M4	-	7	7	-	M3x6.5	M3x6	P3	3.5	4.5	7.5	7.8	8.9	9.9	17.5	140	105	105	190	1290	HRC 15 FN
HRC 15 FN-R													19	26			2.8			4.4														175		HRC 15 FN-R
HRC 20 FN	30	21.5	20	20	60	9.5x6x8.5	63	69	52	25	40	53	-	-	M6x10	M5	-	10	10	-	M3x7.5	M3x5.5	P4	10	6	9.4	9	9.7	17.1	30.0	325	230	230	396	2280	HRC 20 FN
HRC 20 FN-R													26.5	35			3.5			4.5														375		HRC 20 FN-R
HRC 25 FN	36	23.5	23	23	60	11x7x9	70	81.2	62.2	30	45	57	-	-	M8x10	M6	-	12	10	-	M6x7.5	M3x6.5	P4	12	8	12.3	11.6	12.6	24.8	42.5	540	385	385	626	3020	HRC 25 FN
HRC 25 FN-R													28.5	40			4			6.4														550		HRC 25 FN-R
HRC 30 FN	42	31	28	27	80	14x9x12	90	95.5	71.5	35.2	52	72	-	-	M10x12	M8	-	12	12	-	M6x8.5	M6x5	P5	12	7.5	12	14.8	14.5	32.8	53.7	845	565	565	1110	4380	HRC 30 FN
HRC 30 FN-R													36	44			5			6.9														1000		HRC 30 FN-R
HRC 35 FN	48	33	34	32	80	14x9x12	100	111.2	86.2	40.4	62	82	-	-	M10x13	M8	-	13	13	-	M6x10	M6x7	P5	12	8	15	17.4	18.1	45.9	82.9	1700	1080	1080	1550	6790	HRC 35 FN
HRC 35 FN-R													41	52			5			7.4														1400		HRC 35 FN-R
HRC 45 FN	60	37.5	45	39	105	20x14x17	120	135.5	102.5	50.7	80	100	-	-	M12x15	M10	-	18	15	-	PT1/8x12.5	M6x10.5	P5	14	11.1	18.1	17.3	17.3	71.3	122.1	3200	1910	1910	2747	10530	HRC 45 FN
HRC 45 FN-R													50	60			6			9.9														2550		HRC 45 FN-R
HRC 55 FN	70	43.5	53	45.7	120	24x16x20	140	168.5	126.5	58	95	116	58	70	M14x18	M12	13	18	18	9.4	M6x10	M6x13	P5	12	13.5	23.5	24.8	23.8	128	186	4949	3278	3278	5440	14000	HRC 55 FN

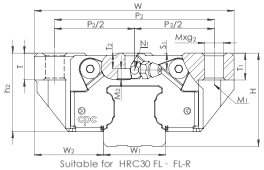
1. The load capacities is for full-ball type (without ball chain)
2. N_2 = injecting holes
3. N_3 = O-ring size for lubrication from above
4. N_2 N_3 will be sealed before shipmant, please open it when first using the product.
5. Mxg2, M1 : Screw size based on ISO 4762-12.9
6. M2 abdomen countersunk head screw size according to DIN 7984-8.8



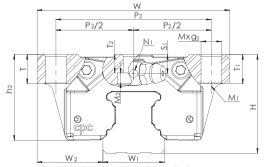
The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

Dimensions Table

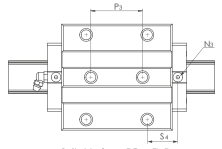




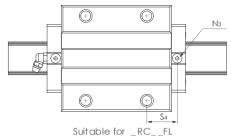
Suitable for HRC30 FL、FL-R
HRC55 FL



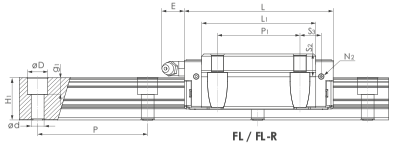
Suitable for HRC15 FL、FL-R
HRC20 FL、FL-R
HRC25 FL、FL-R
HRC35 FL、FL-R
HRC45 FL、FL-R



Suitable for _RC_ _FL-R



Suitable for _RC_ _FL

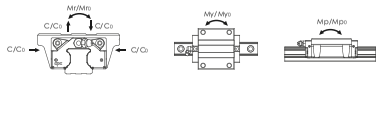


FL / FL-R

HRC FL Series

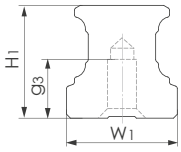
Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)													Block Dimensions(mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	D x d x g1	W	L	L1	h2	P1	P2	P2/2	P3	Mxg2	M1	M2	T	T1	T2	N1	N2	N3	E	S1	S2	S3	S4	C	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
HRC 15 FL	24	16	15	15	60	7.5x4.5x5.3	47	76.2	61	20.7	30	38	-	-	M5x7	M4	-	7	7	-	M3x6.5	M3x6	P3	3.5	4.5	7.5	18.1	19.2	13.4	26.9	215	235	235	290	1290	HRC 15 FL
HRC 15 FL-R													19	26			2.8			4.4														270		HRC 15 FL-R
HRC 20 FL	30	21.5	20	20	60	9.5x6x8.5	63	87.2	70.2	25	40	53	-	-	M6x10	M5	-	10	10	-	M3x7.5	M3x5.5	P4	10	6	9.4	18.1	18.8	20.4	38.5	415	390	390	504	2280	HRC 20 FL
HRC 20 FL-R													26.5	35			3.5			4.5														475		HRC 20 FL-R
HRC 25 FL	36	23.5	23	23	60	11x7x9	70	105	86	30	45	57	-	-	M8x10	M6	-	12	10	-	M6x7.5	M6x6.5	P4	12	8	12.3	23.5	24.5	30.7	57.5	735	710	710	870	3020	HRC 25 FL
HRC 25 FL-R													28.5	40			4			6.4														810		HRC 25 FL-R
HRC 30 FL	42	31	28	27	80	14x9x12	90	118	94	35.2	52	72	-	-	M10x12	M8	-	12	12	-	M6x8.5	M6x5	P5	12	7.5	12	25.7	25.8	39.6	70.2	1105	950	950	1385	4380	HRC 30 FL
HRC 30 FL-R													36	44			5			6.9														1290		HRC 30 FL-R
HRC 35 FL	48	33	34	32	80	14x9x12	100	136.6	111.6	40.4	62	82	-	-	M10x13	M8	-	13	13	-	M6x10	M6x7	P5	12	8	15	30.1	30.8	54.7	106.5	2185	1755	1755	2000	6790	HRC 35 FL
HRC 35 FL-R													41	52			5			7.4														1800		HRC 35 FL-R
HRC 45 FL	60	37.5	45	39	105	20x14x17	120	171.5	138.5	50.7	80	100	-	-	M12x15	M10	-	18	15	-	PT1/8x12.5	M6x10.5	P5	14	11.1	18.1	35.3	35.3	89.5	169.1	4430	3460	3460	4280	10530	HRC 45 FL
HRC 45 FL-R													50	60			6			9.9														4050		HRC 45 FL-R
HRC 55 FL	70	43.5	53	45.7	120	24x16x20	140	202	160	58	95	116	58	70	M14x18	M12	13	18	18	9.4	M6x10	M6x13	P5	12	13.5	23.5	41.5	40.5	147	226	6472	5284	5284	6963	14000	HRC 55 FL

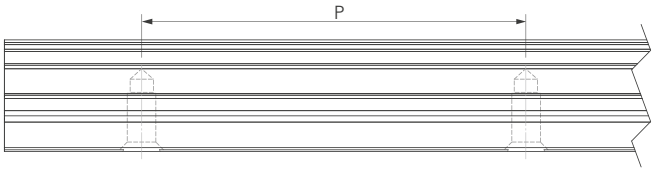
1. The load capacities is for full-ball type (without ball chain)
2. N2 = injecting holes
3. N3 = O-ring size for lubrication from above
4. N2 N3 will be sealed before shipmant, please open it when first using the product.
5. Mxg2, M1 : Screw size based on ISO 4762-12.9
6. M2 abdomen countersunk head screw size according to DIN 7984-8.8



The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

Dimensions Table





Rail (tapped from the bottom)

Model Code	W_1	H_1	P	Mxg3	Lmax	Rail(g/m)
ARU 15	15	15	60	M5x8	4000	1290
ARU 20	20	20	60	M6x10	4000	2280
ARU 25	23	23	60	M6x12	4000	3020
ARU 30	28	27	80	M8x15	4000	4380
ARU 35	34	32	80	M8x15	4000	6790
ARU 45	45	39	105	M12x19	4000	10530
ARU 55	53	45.7	120	M14x24	4000	14060

Nipple Option

Type				Nipple size		Grease nipple	Optional			
				Section	Side	Standard	Straight adapter	Tube diameter	L-Type adapter	Tube diameter
Ball	ARC15	HRC15	-	M3	M3	A-M3	OA-M3-D4	-	OB-M3-M6	-
	ARC20	HRC20	-	M3	M3	B-M3	OA-M3-D4	-	OB-M3-M6	-
	ARC25	HRC25	ERC25	M6	M3	A/B-M6	OA-M6-M8	Ø4	OB-M6-M8	Ø4
	ARC30	HRC30	-	M6	M6	A/B-M6	OA-M6-M8	Ø4	OB-M6-M8	Ø4
							OA-M6-PT1/8	-	OB-M6-PT1/8	-
							OA-M6-G1/8	Ø6		
	ARC35	HRC35	-	M6	M6	A/B-M6	OA-M6-M8	Ø4	OB-M6-M8	-
							OA-M6-PT1/8	-	OB-M6-PT1/8	-
							OA-M6-G1/8	Ø6		
	ARC45	HRC45	-	PT1/8	M6	B-PT1/8	OA-PT1/8-M8	Ø4	OB-PT1/8-M8	Ø4
							OA-PT1/8-PT1/8	-	OB-PT1/8-PT1/8	-
							OA-PT1/8-G1/8	Ø6		
	ARC55	HRC55	-	M6	M6	A/B-M6	OA-M6-M8	Ø4	OB-M6-M8	Ø4
							OA-M6-PT1/8	-	OB-M6-PT1/8	-
							OA-M6-G1/8	Ø6		
Roller	ARR35	HRR35	LRR35	M6	M6	A/B-M6-L	OA-M6-M8-L	Ø4	OB-M6-M8-L	Ø4
							OA-M6-PT1/8-L	-	OB-M6-PT1/8-L	-
							OA-M6-G1/8-L	Ø6		
	ARR45	HRR45	LRR45	M6	M6	A/B-M6-L	OA-M6-M8-L	Ø4	OB-M6-M8-L	Ø4
							OA-M6-PT1/8-L	-	OB-M6-PT1/8-L	-
							OA-M6-G1/8-L	Ø6		

* When external NRB seal is chosen (SN), please use long type grease nipple for ball type product, extra long type grease nipple for roller type product.

WRC series

Wide Rail Ball Type Linear Guide Series

Ordering information

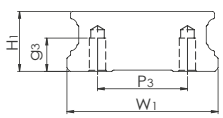
Model code

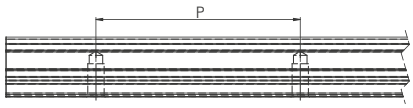
WRC	U	21/15	M	N	B	2	C	V1	P	-1480L	-20	-20	II	/J

- /J: Customization code (Please refer to page 30)
- II: Number of rails on the same moving axis
- -20: End hole pitch (mm)
- -20: Starting hole pitch (mm)
- -1480L: Rail length (mm)
- P: Accuracy grade : UP, SP, P, H, N (Please refer to page 29)
- V1: Preload class : VC, V0, V1, V2 (Please refer to page 23)
- C: with ball chain (Please refer to page 07)
- 2: Block quantity
- B: Seal type : B: Low friction
- N: Block length : N: standard
- M: Block width : M: standard F: flanged
- 21/15: Block type : 21/15 , 27/20
- U: rail (tapped from the bottom)
- WRC: Product type : WRC: Wide Rail Ball Type Linear Guide Series

Dimensions Table

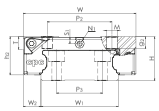
WRU Series Rail (tapped from the bottom)



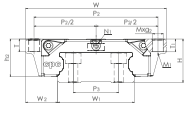


Model Code	W_1	H_1	P	P_3	Mxg3	Lmax	Rail(g/m)
WRU 21/15	37	14.4	50	22	M4x8	4000	3596
WRU 27/20	42	18.5	60	24	M5x7.5	4000	5259

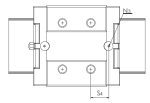
Dimensions Table



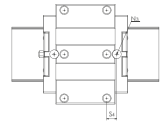
WRC MN

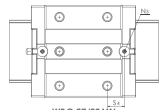


WRC FN

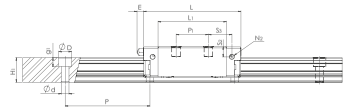


WRC 21/15MN





WRC 27/20MN



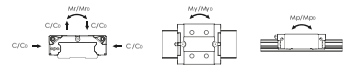
WRC Series

Model Code	Mounting Dimensions		Rail Dimensions (mm)					Block Dimensions (mm)											Block Dimensions (mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	P3	D x d x g1	W	L	L1	h2	P1	P2	P2/2	Mxg2	M1	T	T1	N1	N2	N3	E	S1	S2	S3	S4	C ISO 100km	C ISO 50km	Co	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
WRC 21/15 MN	21	8.5	37	14.4	50	22	7.5x4.5x5.3	54	57.5	40.3	18.3	19	31	-	M5x5	-	6	-	M3	M3x3	P3	3.5	3.3	6.1	13.9	11.9	9.9	12.5	17.5	315	105	105	160	3596	WRC 21/15 MN
WRC 21/15 FN	21	15.5	37	14.4	50	22	7.5x4.5x5.3	68	57.5	40.3	18.3	29	60	30	M5x7	M4	7	7	M3	M3x3	P3	3.5	3.3	6.1	8.9	6.9	9.9	12.5	17.5	315	105	105	198	3596	WRC 21/15 FN
WRC 27/20 MN	27	10	42	18.5	60	24	7.5x4.5x5.3	62	70	52	23.5	32	46	23	M6x6	-	10	-	M3	M3x4	P4	3.5	4.5	8	13.2	11.5	17.1	21.5	30	634	230	230	320	5259	WRC 27/20 MN
WRC 27/20 FN	27	19	42	18.5	60	24	7.5x4.5x5.3	80	70	52	23.5	40	70	35	M6x9	M5	9	9	M3	M3x4	P4	3.5	4.5	8	9.2	7.5	17.1	21.5	30	634	230	230	553	5259	WRC 27/20 FN

The above rating load capacities and static moments are calculated according to the ISO14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.26 for an accurate conversion.

WRC...C Series Ball chain type

Model Code	Mounting Dimensions		Rail Dimensions (mm)					Block Dimensions (mm)											Block Dimensions (mm)							Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	P3	D x d x g1	W	L	L1	h2	P1	P2	P2/2	Mxg2	M1	T	T1	N1	N2	N3	E	S1	S2	S3	S4	C cage 100km	C cage 50km	Co	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
WRC 21/15 MN...C	21	8.5	37	14.4	50	22	7.5x4.5x5.3	54	57.5	40.3	18.3	19	31	-	M5x5	-	6	-	M3	M3x3	P3	3.5	3.3	6.1	13.9	11.9	11.8	14.9	16.2	295	95	95	159	3596	WRC21/15MN...C
WRC 21/15 FN...C	21	15.5	37	14.4	50	22	7.5x4.5x5.3	68	57.5	40.3	18.3	29	60	30	M5x7	M4	7	7	M3	M3x3	P3	3.5	3.3	6.1	8.9	6.9	11.8	14.9	16.2	295	95	95	197.5	3596	WRC 21/15FN...C
WRC 27/20 MN...C	27	10	42	18.5	60	24	7.5x4.5x5.3	62	70	52	23.5	32	46	23	M6x6	-	10	-	M3	M3x4	P4	3.5	4.5	8	13.2	11.5	22.3	28.1	25.7	535	200	200	318	5259	WRC 27/20 MN...C
WRC 27/20 FN...C	27	19	42	18.5	60	24	7.5x4.5x5.3	80	70	52	23.5	40	70	35	M6x9	M5	9	9	M3	M3x4	P4	3.5	4.5	8	9.2	7.5	22.3	28.1	25.7	535	200	200	550	5259	WRC 27/20 FN...C



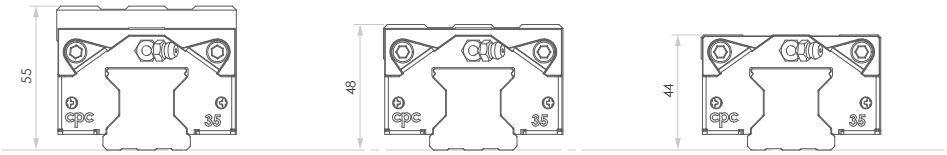
The dynamic load rating value with ball chain Ccage is the measured value (please refer to page 08). The above static load rating and the static moment are calculated according to the ISO 14728 standard.

ARR/HRR/LRR series
Roller-type Linear Guide

Product Overview

LRR Extremely Low Profile Type

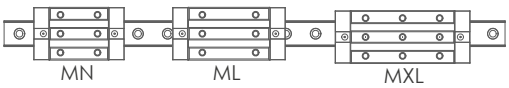
Suitable for conditions where a lower external torque and inertial force is required, this product combines a low height and center of gravity to provide a more compact product. ARR, HRR and LRRs blocks all share the same rail with a similar load capacity and service life.

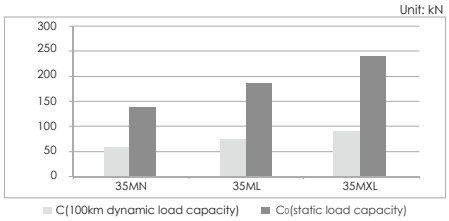


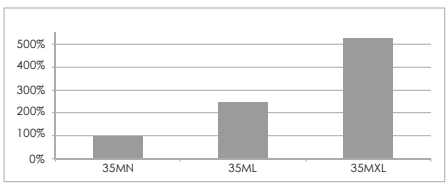
HRR 35MN ARR 35MN LRR 35MN

MXL Ultra Long Block Type

Compared to the industry's ML lengthened block, the MXL model's much lengthened block features a greater load, rigidity and shock reduction capability. This makes this model most suitable for machine tools that require super high rigidity and accuracy.



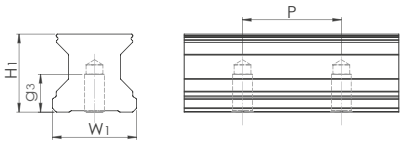




Service Life(under same load)

Dimensions Table

ARRU Series Rail (tapped from the bottom)



Model Code	W1	H1	P	Mxg3	Lmax	Rail(g/m)
ARRU 35	34	31	40	M8x15	4000	5740
ARRU 45	45	38	52.5	M12x19	4000	10000

Parts information

Low Noise Roller Chain (Optional)

Our Ball chain design effectively lowers high frequency noise volumes while sliding and enhancing smoothness. Additionally, the ball chain spacer between steel rollers continuously replenishes the oil film cladding to maintain a better lubrication effect.

(For more information please refer to page 07)

Full Cover Seal (Standard Feature)

All model type are equipped with an "end seal", "bottom seal", and "inner seal" to effectively prevent foreign objects from sliding into the block or lubrication from leaking out.

(For more information please refer to page 03)

High Rigidity Stainless Steel Reinforcement Plate (Standard Feature)

Our L-shaped design is locked with end and bottom screws on the block body. The bottom of the body is equipped with an integrated bolt, which allows for the tight fixing of the reinforcement plate to prevent unnecessary block damage from cracking the plastic mountings.

(For more information please refer to page 06)

Metal-Plastic-Cap (Standard Feature)

Stainless steel covers can demonstrate excellent friction resistance under harsh environments. Inside, the hole plug is equipped with fixed plastic support, enabling for easy installation and direct installation on a standard rail. Contact between the unit support part and stigma screws can prevent overly deep fastening during installation, while also preventing cap indentation and foreign objects from stacking while sliding.

(For more information please refer to page 10)

NBR Seal (Optional)

The seal demonstrates a high dustproof ability to be used in high dust particle working environments, being ideally placed in wood-working machines, glass processing machines, graphite processing machines and grinders. On the outer side of the seal is equipped a stainless steel scraper, with the clearance between the inner and rail contour measuring at only 0.2~0.3mm. This can prevent comparatively large foreign objects from damaging the rubber seal.

(For more information please refer to page 09)

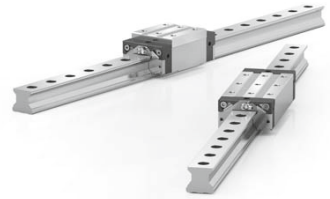
Ordering Information

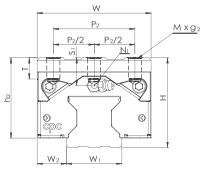
Model Code

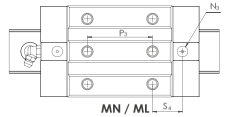
ARR	U	35	M	N	S	2	C	V1	P	-1480L	-20	-20	II	/J

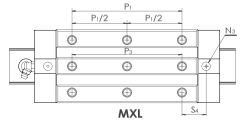
- /J: Customization code (please refer to page 30)
- II: Number of rails on the same moving axis
- -20: End hole pitch(mm)
- -20: Starting hole pitch(mm)
- -1480L: Rail length(mm)
- P: Accuracy grade: UP, SP, P, H (please refer to page 29)
- V1: Preload class: V0, V1, V2
- C: with ball chain (please refer to page 07)
- 2: Block quantity
- S: Seal type: S:standard
- N: Block length: N:standard L:long XL:extra long
- M: Block width: M:standard F:flanged
- 35: Block type: 35, 45
- U: U: Rail (tapped from the bottom)
- ARR: Product type: ARR: Low Profile Type HRR: High Profile Type LRR: Extremely Low Profile Type

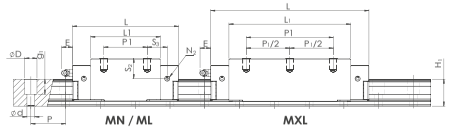
Dimensions Table











ARR MN/ML/MXL Series

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)											Block Dimensions(mm)								Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	DxdxG1	W	L	L1	h2	P1	P1/2	P2	P2/2	P3	MxG2	M1	T	N1	N2	N3	E	S1	S2	S3	S4	C50-100km	C0	M0	Mp0	My0	Block(g)	Rail(g/m)	
ARR 35MN	48	18	34	31	40	14x9x17	70	122	84	42	50	-	50	25	50	M8x13	-	13	M6x12	M6x8	P5	12	10	16.4	25	25	57	154	2742	1946	1946	1200	5740	ARR 35MN
ARR 35ML	48	18	34	31	40	14x9x17	70	147.5	109.5	42	72	-	50	25	72	M8x13	-	13	M6x12	M6x8	P5	12	10	16.4	26.7	26.7	68.9	196	3525	3226	3226	1750	5740	ARR 35ML
ARR 45MN	60	20.5	45	38	52.5	20x14x17	86	156	110	52	60	-	60	30	60	M10x17	-	13	M6x12	M6x8	P5	12	14.6	21.8	39.2	36	95.9	255	6350	4450	4450	2600	10000	ARR 45MN
ARR 45ML	60	20.5	45	38	52.5	20x14x17	86	191	145	52	80	-	60	30	80	M10x17	-	13	M6x12	M6x8	P5	12	14.6	21.8	46.7	43.5	118	333	8450	7700	7700	3350	10000	ARR 45ML

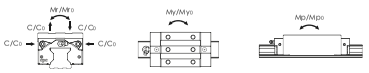
HRR MN/ML/MXL Series

HRR 35MN	55	18	34	31	40	14x9x17	70	122	84	49	50	-	50	25	50	M8x16	-	13	M6x12	M6x8	P5	12	17	23.4	25	25	57	154	2742	1946	1946	1720	5740	HRR 35MN
HRR 35ML	55	18	34	31	40	14x9x17	70	147.5	109.5	49	72	-	50	25	72	M8x16	-	13	M6x12	M6x8	P5	12	17	23.4	26.7	26.7	68.9	196	3525	3226	3226	2100	5740	HRR 35ML
HRR 35MXL	55	18	34	31	40	14x9x17	70	177.5	139.5	49	100	50	50	25	100	M8x16	-	13	M6x12	M6x8	P5	12	17	23.4	27.7	27.7	82	245	4439	5111	5111	2700	5740	HRR 35MXL
HRR 45MN	70	20.5	45	38	52.5	20x14x17	86	156	110	62	60	-	60	30	60	M10x20	-	13	M6x12	M6x8	P5	12	24.6	31.8	39.2	36	95.9	255	6350	4450	4450	3400	10000	HRR 45MN
HRR 45ML	70	20.5	45	38	52.5	20x14x17	86	191	145	62	80	-	60	30	80	M10x20	-	13	M6x12	M6x8	P5	12	24.6	31.8	46.7	43.5	118	333	8450	7700	7700	4300	10000	HRR 45ML
HRR 45MXL	70	20.5	45	38	52.5	20x14x17	86	226	180	62	120	60	60	30	120	M10x20	-	13	M6x12	M6x8	P5	12	24.6	31.8	44.2	41	138	410	10500	11800	11800	5200	10000	HRR 45MXL

LRR MN/ML/MXL Series

LRR 35MN	44	18	34	31	40	14x9x17	70	122	84	38	50	-	50	25	50	M8x9	-	9	M6x12	M6x8	P5	12	6	12.4	25	25	57	154	2742	1946	1946	1100	5740	LRR 35MN
LRR 35ML	44	18	34	31	40	14x9x17	70	147.5	109.5	38	72	-	50	25	72	M8x9	-	9	M6x12	M6x8	P5	12	6	12.4	26.7	26.7	68.9	196	3525	3226	3226	1500	5740	LRR 35ML
LRR 35MXL	44	18	34	31	40	14x9x17	70	177.5	139.5	38	100	50	50	25	100	M8x9	-	9	M6x12	M6x8	P5	12	6	12.4	27.7	27.7	82	245	4439	5111	5111	1900	5740	LRR 35MXL
LRR 45MN	52	20.5	45	38	52.5	20x14x17	86	156	110	44	60	-	60	30	60	M10x11	-	10	M6x12	M6x8	P5	12	6.6	13.8	39.2	36	95.9	255	6350	4450	4450	2100	10000	LRR 45MN
LRR 45ML	52	20.5	45	38	52.5	20x14x17	86	191	145	44	80	-	60	30	80	M10x11	-	10	M6x12	M6x8	P5	12	6.6	13.8	46.7	43.5	118	333	8450	7700	7700	2700	10000	LRR 45ML
LRR 45MXL	52	20.5	45	38	52.5	20x14x17	86	226	180	44	120	60	60	30	120	M10x11	-	10	M6x12	M6x8	P5	12	6.6	13.8	44.2	41	138	410	10500	11800	11800	3200	10000	LRR 45MXL

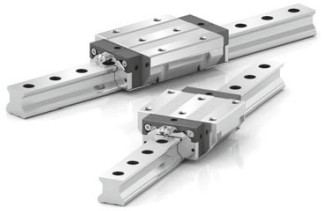
1. N2 = Injecting holes
2. N3 = O-ring size for lubrication from above
3. N2 N3 will be sealed before shipmant, please open it when first using the product.

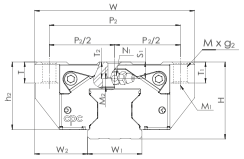


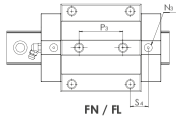
The above rating load capacities and static moments are calculated according to the ISO 14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.23 for an accurate conversion.

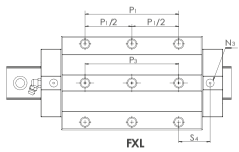
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

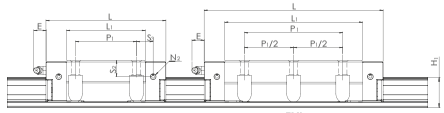
Dimensions Table











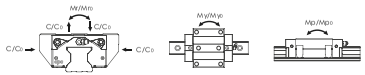
HRR FN/FL/FXL Series

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)													Block Dimensions(mm)									Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	Dxdxg1	W	L	L1	h2	P1	P1/2	P2	P2/2	P3	MxG2	M1	M2	T	T1	T2	N1	N2	N3	E	S1	S2	S3	S4	C50 100km	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
HRR 35FN	48	33	34	31	40	14x9x17	100	122	84	42	62	-	82	41	52	M10x13	M8	5	13	13	10.2	M6x12	M6x8	P5	12	10	16.4	19	19	57	154	2742	1946	1946	1700	5740	HRR 35FN
HRR 35FL	48	33	34	31	40	14x9x17	100	147.5	109.5	42	62	-	82	41	52	M10x13	M8	5	13	13	10.2	M6x12	M6x8	P5	12	10	16.4	31.7	31.7	68.9	196	3525	3226	3226	2400	5740	HRR 35FL
HRR 35FXL	48	33	34	31	40	14x9x17	100	177.5	139.5	42	100	50	82	41	100	M10x13	M8	5	13	13	10.2	M6x12	M6x8	P5	12	10	16.4	27.7	27.7	82	245	4439	5111	5111	3100	5740	HRR 35FXL
HRR 45FN	60	37.5	45	38	52.5	20x14x17	120	156	110	52	80	-	100	50	60	M12x15	M10	6	15	15	14.8	M6x12	M6x8	P5	12	14.6	21.8	29.2	26	95.9	255	6350	4450	4450	3600	10000	HRR 45FN
HRR 45FL	60	37.5	45	38	52.5	20x14x17	120	191	145	52	80	-	100	50	60	M12x15	M10	6	15	15	14.8	M6x12	M6x8	P5	12	14.6	21.8	46.7	43.5	118	333	8450	7700	7700	4700	10000	HRR 45FL
HRR 45FXL	60	37.5	45	38	52.5	20x14x17	120	226	180	52	120	60	100	50	120	M12x15	M10	6	15	15	14.8	M6x12	M6x8	P5	12	14.6	21.8	44.2	41	138	410	10500	11800	11800	5750	10000	HRR 45FXL

LRR FN/FL/FXL Series

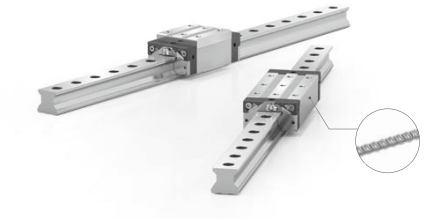
LRR 35FN	44	33	34	31	40	14x9x17	100	122	84	38	62	-	82	41	52	M10x13	M8	5	9	13	6.7	M6x12	M6x8	P5	12	6	12.4	19	19	57	154	2742	1946	1946	1550	5740	LRR 35FN
LRR 35FL	44	33	34	31	40	14x9x17	100	147.5	109.5	38	62	-	82	41	52	M10x13	M8	5	9	13	6.7	M6x12	M6x8	P5	12	6	12.4	31.7	31.7	68.9	196	3525	3226	3226	2200	5740	LRR 35FL
LRR 35FXL	44	33	34	31	40	14x9x17	100	177.5	139.5	38	100	50	82	41	100	M10x13	M8	5	9	13	6.7	M6x12	M6x8	P5	12	6	12.4	27.7	27.7	82	245	4439	5111	5111	2800	5740	LRR 35FXL
LRR 45FN	52	37.5	45	38	52.5	20x14x17	120	156	110	44	80	-	100	50	60	M12x15	M10	6	10	15	7.3	M6x12	M6x8	P5	12	6.6	13.8	29.2	26	95.9	255	6350	4450	4450	2900	10000	LRR 45FN
LRR 45FL	52	37.5	45	38	52.5	20x14x17	120	191	145	44	80	-	100	50	60	M12x15	M10	6	10	15	7.3	M6x12	M6x8	P5	12	6.6	13.8	46.7	43.5	118	333	8450	7700	7700	3800	10000	LRR 45FL
LRR 45FXL	52	37.5	45	38	52.5	20x14x17	120	226	180	44	120	60	100	50	120	M12x15	M10	6	10	15	7.3	M6x12	M6x8	P5	12	6.6	13.8	44.2	41	138	410	10500	11800	11800	4500	10000	LRR 45FXL

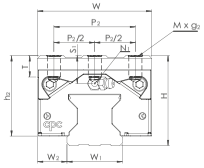
1. The load capacity is measured for the full-ball type (without ball chain)
2. N_2 = Injecting holes
3. N_3 = O-ring size for lubrication from above
4. N_2 N_3 will be sealed before shipment, please open it when first using the product.
5. $M \times g_2$, M1: Screw size based on ISO 4762-12.9
6. M_1: abdomen countersunk head screw size according to DIN 7984-8.8

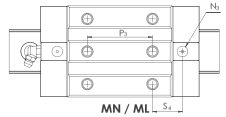


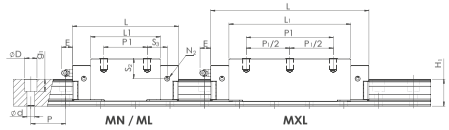
The above rating load capacities and static moments are calculated according to the ISO 14728 standard. The rating life for basic dynamic load ratings is defined as the total 100km travel distance for 90% of a group of identical linear guides, under the same conditions and free from any material damage caused by rolling fatigue. If a standard of 50km travel distance is applied to measure the average product lifespan, the above basic dynamic load rating C should be multiplied by 1.23 for an accurate conversion.

Dimensions Table









ARR MN/ML/MXL...C Series (Ball chain type)

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)											Block Dimensions(mm)								Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	DxdxD1	W	L	L1	h2	P1	P1/2	P2	P2/2	P3	MxG2	M1	T	N1	N2	N3	E	S1	S2	S3	S4	Ccage 100km	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
ARR 35MN	48	18	34	31	40	14x9x17	70	122	84	42	50	-	50	25	50	M8x13	-	13	M6x12	M6x8	P5	12	10	16.4	25	25	71.3	133	2350	1710	1710	1200	5740	ARR 35MN
ARR 35ML	48	18	34	31	40	14x9x17	70	147.5	109.5	42	72	-	50	25	72	M8x13	-	13	M6x12	M6x8	P5	12	10	16.4	26.7	26.7	86.1	175	3133	2881	2881	1750	5740	ARR 35ML
ARR 45MN	60	20.5	45	38	52.5	20x14x17	86	156	110	52	60	-	60	30	60	M10x17	-	13	M6x12	M6x8	P5	12	14.6	21.8	39.2	36	120	222	5750	4050	4050	2600	10000	ARR 45MN
ARR 45ML	60	20.5	45	38	52.5	20x14x17	86	191	145	52	80	-	60	30	80	M10x17	-	13	M6x12	M6x8	P5	12	14.6	21.8	46.7	43.5	147.5	288	7550	6900	6900	3350	10000	ARR 45ML

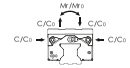
HRR MN/ML/MXL...C Series (Ball chain type)

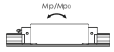
HRR 35MN	55	18	34	31	40	14x9x17	70	122	84	49	50	-	50	25	50	M8x16	-	13	M6x12	M6x8	P5	12	17	23.4	25	25	71.3	133	2350	1710	1710	1720	5740	HRR 35MN
HRR 35ML	55	18	34	31	40	14x9x17	70	147.5	109.5	49	72	-	50	25	72	M8x16	-	13	M6x12	M6x8	P5	12	17	23.4	26.7	26.7	86.1	175	3133	2881	2881	2100	5740	HRR 35ML
HRR 35MXL	55	18	34	31	40	14x9x17	70	177.5	139.5	49	100	50	50	25	100	M8x16	-	13	M6x12	M6x8	P5	12	17	23.4	27.7	27.7	102.5	224	4047	4695	4695	2700	5740	HRR 35MXL
HRR 45MN	70	20.5	45	38	52.5	20x14x17	86	156	110	62	60	-	60	30	60	M10x20	-	13	M6x12	M6x8	P5	12	24.6	31.8	39.2	36	120	222	5750	4050	4050	3400	10000	HRR 45MN
HRR 45ML	70	20.5	45	38	52.5	20x14x17	86	191	145	62	80	-	60	30	80	M10x20	-	13	M6x12	M6x8	P5	12	24.6	31.8	46.7	43.5	147.5	288	7550	6900	6900	4300	10000	HRR 45ML
HRR 45MXL	70	20.5	45	38	52.5	20x14x17	86	226	180	62	120	60	60	30	120	M10x20	-	13	M6x12	M6x8	P5	12	24.6	31.8	44.2	41	172.5	366	9650	10850	10850	5200	10000	HRR 45MXL

LRR MN/ML/MXL...C Series (Ball chain type)

LRR 35MN	44	18	34	31	40	14x9x17	70	122	84	38	50	-	50	25	50	M8x9	-	9	M6x12	M6x8	P5	12	6	12.4	25	25	71.3	133	2350	1710	1710	1100	5740	LRR 35MN
LRR 35ML	44	18	34	31	40	14x9x17	70	147.5	109.5	38	72	-	50	25	72	M8x9	-	9	M6x12	M6x8	P5	12	6	12.4	26.7	26.7	86.1	175	3133	2881	2881	1500	5740	LRR 35ML
LRR 35MXL	44	18	34	31	40	14x9x17	70	177.5	139.5	38	100	50	50	25	100	M8x9	-	9	M6x12	M6x8	P5	12	6	12.4	27.7	27.7	102.5	224	4047	4695	4695	1900	5740	LRR 35MXL
LRR 45MN	52	20.5	45	38	52.5	20x14x17	86	156	110	44	60	-	60	30	60	M10x11	-	10	M6x12	M6x8	P5	12	6.6	13.8	39.2	36	120	222	5750	4050	4050	2100	10000	LRR 45MN
LRR 45ML	52	20.5	45	38	52.5	20x14x17	86	191	145	44	80	-	60	30	80	M10x11	-	10	M6x12	M6x8	P5	12	6.6	13.8	46.7	43.5	147.5	288	7550	6900	6900	2700	10000	LRR 45ML
LRR 45MXL	52	20.5	45	38	52.5	20x14x17	86	226	180	44	120	60	60	30	120	M10x11	-	10	M6x12	M6x8	P5	12	6.6	13.8	44.2	41	172.5	366	9650	10850	10850	3200	10000	LRR 45MXL

1. N2 = Injecting holes
2. N3 = O-ring size for lubrication from above
3. N2, N3 will be sealed before shipment, please open it when first using the product.

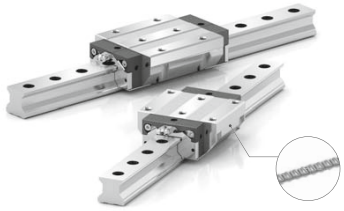


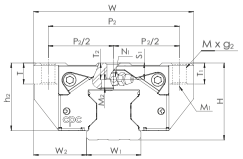


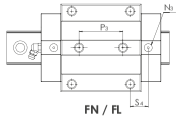
The measured value is the dynamic load rating value with ball chain Ccage. The above static load rating and the static moment are calculated according to the ISO 14728 standard.

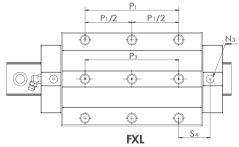
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

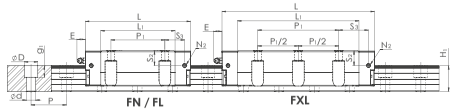
Dimensions Table











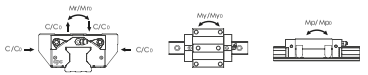
HRR FN/FL/FXL...C Series (Ball chain type)

Model Code	Mounting Dimensions		Rail Dimensions(mm)				Block Dimensions(mm)													Block Dimensions(mm)									Load Capacities (KN)		Static Moment (Nm)			Weight		Model Code
	H	W2	W1	H1	P	Dxdxg1	W	L	L1	h2	P1	P1/2	P2	P2/2	P3	MxPg2	M1	M2	T	T1	T2	N1	N2	N3	E	S1	S2	S3	S4	Ccage 100km	C0	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
HRR 35FN	48	33	34	31	40	14x9x17	100	122	84	42	62	-	82	41	52	M10x13	M8	5	13	13	10.2	M6x12	M6x8	P5	12	10	16.4	19	19	71.3	133	2350	1710	1710	1700	5740	HRR 35FN
HRR 35FL	48	33	34	31	40	14x9x17	100	147.5	109.5	42	62	-	82	41	52	M10x13	M8	5	13	13	10.2	M6x12	M6x8	P5	12	10	16.4	31.7	31.7	86.1	175	3133	2881	2881	2400	5740	HRR 35FL
HRR 35FXL	48	33	34	31	40	14x9x17	100	177.5	139.5	42	100	50	82	41	100	M10x13	M8	5	13	13	10.2	M6x12	M6x8	P5	12	10	16.4	27.7	27.7	102.5	224	4047	4695	4695	3100	5740	HRR 35FXL
HRR 45FN	60	37.5	45	38	52.5	20x14x17	120	156	110	52	80	-	100	50	60	M12x15	M10	6	15	15	14.8	M6x12	M6x8	P5	12	14.6	21.8	29.2	26	120	222	5750	4050	4050	3600	10000	HRR 45FN
HRR 45FL	60	37.5	45	38	52.5	20x14x17	120	191	145	52	80	-	100	50	60	M12x15	M10	6	15	15	14.8	M6x12	M6x8	P5	12	14.6	21.8	46.7	43.5	147.5	288	7550	6900	6900	4700	10000	HRR 45FL
HRR 45FXL	60	37.5	45	38	52.5	20x14x17	120	226	180	52	120	60	100	50	120	M12x15	M10	6	15	15	14.8	M6x12	M6x8	P5	12	14.6	21.8	44.2	41	172.5	366	9650	10850	10850	5750	10000	HRR 45FXL

LRR FN/FL/FXL...C Series (Ball chain type)

LRR 35FN	44	33	34	31	40	14x9x17	100	122	84	38	62	-	82	41	52	M10x9	M8	5	9	13	6.7	M6x12	M6x8	P5	12	6	12.4	19	19	71.3	133	2350	1710	1710	1550	5740	LRR 35FN
LRR 35FL	44	33	34	31	40	14x9x17	100	147.5	109.5	38	62	-	82	41	52	M10x9	M8	5	9	13	6.7	M6x12	M6x8	P5	12	6	12.4	31.7	31.7	86.1	175	3133	2881	2881	2200	5740	LRR 35FL
LRR 35FXL	44	33	34	31	40	14x9x17	100	177.5	139.5	38	100	50	82	41	100	M10x9	M8	5	9	13	6.7	M6x12	M6x8	P5	12	6	12.4	27.7	27.7	102.5	224	4047	4695	4695	2800	5740	LRR 35FXL
LRR 45FN	52	37.5	45	38	52.5	20x14x17	120	156	110	44	80	-	100	50	60	M12x15	M10	6	10	15	7.3	M6x12	M6x8	P5	12	6.6	13.8	29.2	26	120	222	5750	4050	4050	2900	10000	LRR 45FN
LRR 45FL	52	37.5	45	38	52.5	20x14x17	120	191	145	44	80	-	100	50	60	M12x15	M10	6	10	15	7.3	M6x12	M6x8	P5	12	6.6	13.8	46.7	43.5	147.5	288	7550	6900	6900	3800	10000	LRR 45FL
LRR 45FXL	52	37.5	45	38	52.5	20x14x17	120	226	180	44	120	60	100	50	120	M12x15	M10	6	10	15	7.3	M6x12	M6x8	P5	12	6.6	13.8	44.2	41	172.5	366	9650	10850	10850	4500	10000	LRR 45FXL

1. N2 = Injecting holes
2. N3 = O-ring size for lubrication from above
3. N2, N3 will be sealed before shipmant, please open it when first using the product.
4. MxgP, M1 : Screw size based on ISO 4762-12.9
5. M2 abdomen countersunk head screw size according to DIN 7984-8.8



The measured value is the dynamic load rating value with ball chain Ccage. The above static load rating and the static moment are calculated according to the ISO 14728 standard.

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

cpc AR/HR Z Series Lubrication Storage Pad Testing Report

A linear guide is a category of rolling guidance systems. By using unlimited recirculating stainless steel balls that operate between the raceways of the rail and the runner block, the carriage achieves high precision and low friction linear movement. If the linear guides do not have sufficient lubrication, rolling friction will increase, causing wear and shortened linear guide lifespan.

cpc has added and embedded PU lubricant storage pads to prolong the life of the linear guide; the pads directly contact and lubricate the rolling balls. This design supplies sufficient lubrication even in short stroke operations.

cpc's design, due to the embedded pads absorption and retention capabilities, results in a product that features a long operation life and long-term lubrication.

Following are the results of cpc's in-house testing.

AR15 Lubrication Storage Pad Testing Data

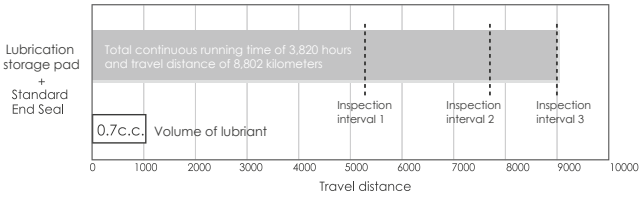
Tested products: AR15 blocks with lubrication storage pads, 8 pieces, and AR15 rails, N accuracy grade, 1500mm Length, 4 pieces

Testing condition	
Rating load capacities(each Block)	1.8KN(C=9KN、C0=17.5KN)
Stroke	0.96m
Max running speed	1m/s
Lubricant	DAPHNE SUPER MULTI 68 (Viscosity64.32 CST 40OC)
Lubrication period	No lubrication added during testing period

Testing equipment

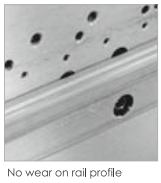
Testing result

Dried lubricant residue started appearing on rail profile, PU pads, and ball retainer of the tested blocks



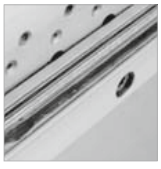
Test results at inspection intervals

Inspection intervals 1 and 2



No wear on rail profile

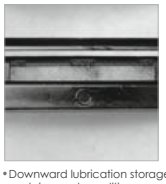
Inspection interval 3



Some rail profiles have dried lubricant present.

Inspection intervals 1 and 2: Lubrication Maintained

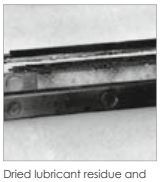
- Upward lubrication storage pads in good condition.
- Lubricant supply in good condition.
- No wear on the running profile of the rail.



- Downward lubrication storage pads in good condition.
- Lubricant supply in good condition.

Inspection interval 3: Lubricant residue

Dried lubricant residue and breakage on the upward lubrication storage pads



Dried lubricant residue and breakage on the downward lubrication storage pads.

Plastic parts and end seal in good condition

Plastic parts in good condition

End seal in good condition

Test Summary

Total continuous running time of 3820 hours and travel distance of 8802 kilometers.
Out of eight test blocks, dried lubricant residue appeared on 2 blocks and 1 rail.
Dried lubricant residue is indicative of a need for relubrication and thus lengthens the operational life of the linear guide.

NOTES:

cpc
CHIEFTEK PRECISION CO., LTD.

BALL SCREWS

SPECIFICATION NUMBER

Model Number Coding

EX. SFS R 025 05 C 1 D G C5 – 600 – P0

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1) Nut type codes

S | S : Single nut, D : Double nut

F | F : With flange, C : Without flange

S | S : DIN nut, U : DIN nut, I : I type nut, E : E type nut, K : K type nut, V : V type nut, T : T type nut, M : M type nut, Y : Y type nut, H : H type nut

(SFS, DFS, SFU, DFU, SFI, DFI, SFT, DFT, SFV, DFV, SFE, SFK, BSH, SCI, SFM, DFM, XSV)

(2) Direction of helix

R : Right L : Left

(3) Shaft dia. (mm)

(4) Lead(mm)

(5) No. of Turn (Circuits) or Turn x Row

Turn: T:1 A:1.5(or 1.7/1.8) B:2.5/2.8 C:3.8 D: 4.8 ex: (2.5x2 = B2)

(6) Flange type

N : Not cutting S : Single cutting D : Double cutting

(7) Produce code

G : Ground F : Rolled

(8) Accuracy grade code

C0、C1、C2、C3、C5、C7、C10

(9) Overall length of shaft(mm)

(10) Axial clearance and preload code

P0、P1、P2、P3、P4

SPECIFICATION NUMBER

Exchange Type

EX. F SFU R 025 05 T4 D

(1) Produce code
F : Rolled

S | S : Single nut, D : Double nut
F | F : With flange, C : Without flange

S | S : DIN nut, U : DIN nut, I : I type nut, E : E type nut, K : K type nut, V : V type nut, T : T type nut, M : M type nut, Y : Y type nut, H : H type nut

(2) Nut type codes

(3) Direction of helix
R : Right L : Left

(4) Shaft dia. (mm)

(5) Lead (mm)

(6) No. of Turn (Circuits) or Turn x Row
Turn: T:1 A:1.5(or 1.7/1.8) B:2.5 /2.8 C:3.8 D : 4.8 ex : (2.5x2 = B2)

(7) Flange type
N : Not cutting S : Single cutting D : Double cutting

EX. SC R 025 05 F C7 - 1000

(1) Type
SC : Standard SS : For SFS & DFS Only

(2) Direction of helix
R : Right L : Left

(3) Shaft dia. (mm)

(4) Lead (mm)

(5) Produce code
G : Ground F : Rolled

(6) Accuracy grade code
C0 、C1 、C2 、C3 、C5 、C7 、C10

(7) Overall length of shaft(mm)

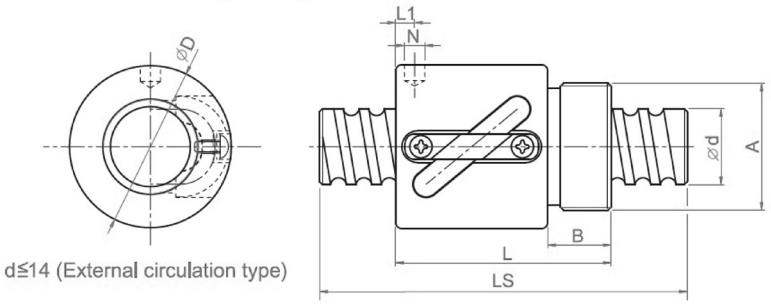
Code \ Produce	G-R	F-R	G-L	F-L
☆	✓	✓	✓	✓
○	✓	✓	✓	
△	✓	✓		
◎	✓		✓	
■	✓			
◇		✓		

Produce code :
G : Ground F : Rolled

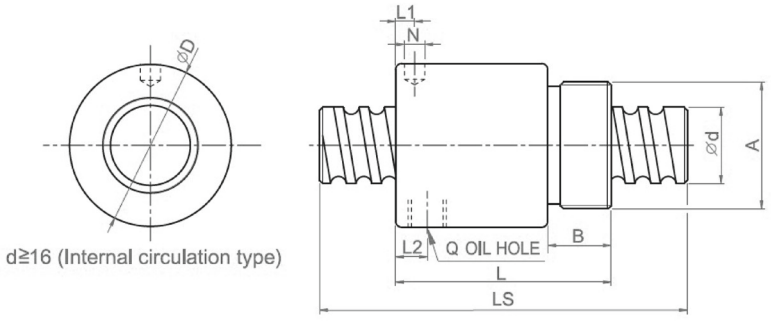
Direction of helix :
R-Right L-Left

BALL SCREW DIMENSION TABLE

TYPE : BSH



d≦14 (External circulation type)



d≧16 (Internal circulation type)

Unit : mm

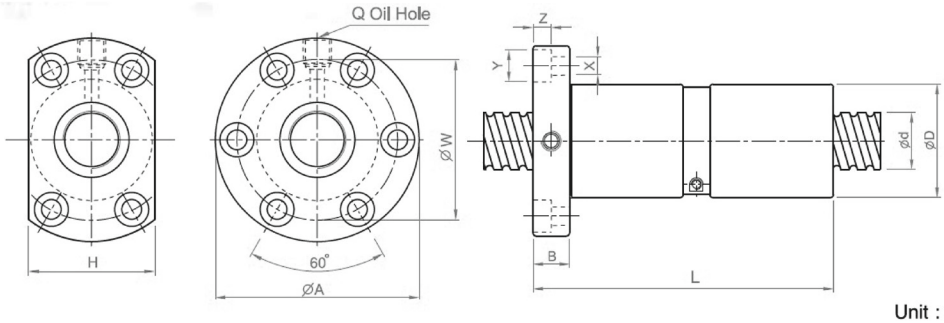
d:Screw O.D. l: Lead Da: Ball Dia. n: Number of Circuits Ls: Screw Length
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions														
		d	l	Da	D	A	B	L	L1	N	L2	Q	n	Ca	Coa	K
△	BSHR0082.5-2.5	8	2.5	1.2	17.5	M15x1P	7.5	23.5	10	3	-	-	2.5x1	189	381	11
△	BSHR01002-3.5	10	2	1.2	19.5	M17x1P	7.5	22	3	3.2	-	-	3.5x1	277	664	17
△	BSHR01004-2.5		4	2	25	M20x1P	10	34	3	3	-	-	2.5x1	400	754	14
△	BSHR01204-3.5	12	4	2.5	25.5	M20x1P	10	34	13	3	-	-	3.5x1	804	1649	23
△	BSHR01205-3.5		5	2.5	25.5	M20x1P	10	39	16.25	3	-	-	3.5x1	801	1644	24
■	BSHR01404-3.5	14	4	2.381	32.1	M25x1.5P	10	35	13	3	-	-	3.5x1	804	1803	26
△	BSHR01604-3	16	4	2.381	29	M22x1.5P	8	32	4	3.2	-	-	1x3	759	1804	24
△	BSHR01605-3		5	3.175	32.5	M26x1.5P	12	42	19.25	3	-	-	1x3	1077	2289	25
△	BSHR02005-3	20	5	3.175	38	M35x1.5P	15	45	20.3	3	-	-	1x3	1211	2906	30
△	BSHR02505-4	25	5	3.175	43	M40x1.5P	19	69	32.11	3	8	M6	1x4	1724	4904	37

Note : Nuts do not attach seals from ∅ 8 to ∅16.

BALL SCREW DIMENSION TABLE

TYPE : DFI



Unit : mm

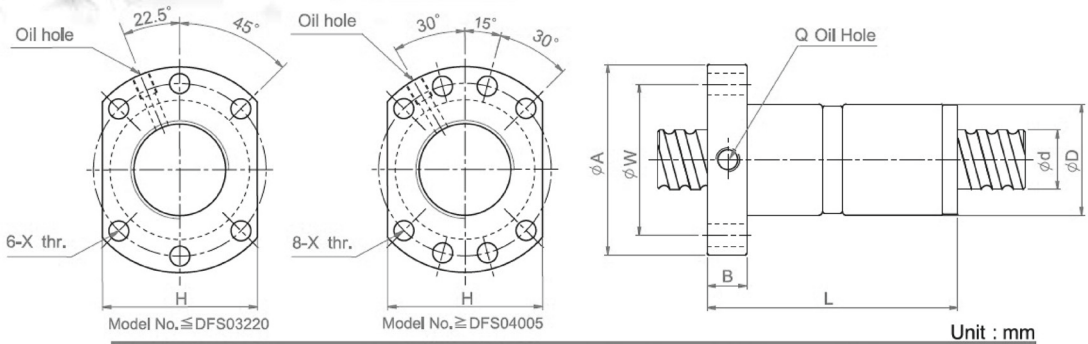
l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions																
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
△	DFI01604-4	16	4	2.381	30	49	10	80	39	34	4.5	8	4.5	M6	1x4	973	2406	44
△	DFI01605-4		5	3.175	30	49	10	100	39	34	4.5	8	4.5	M6	1x4	1380	3052	44
△	DFI02004-4	20	4	2.381	34	57	11	80	45	40	5.5	9.5	5.5	M6	1x4	1066	2987	51
☆	DFI02005-4		5	3.175	34	57	11	101	45	40	5.5	9.5	5.5	M6	1x4	1551	3875	52
△	DFI02504-4	25	4	2.381	40	63	11	80	51	46	5.5	9.5	5.5	M6	1x4	1180	3795	60
☆	DFI02505-4		5	3.175	40	63	11	101	51	46	5.5	9.5	5.5	M8	1x4	1724	4904	62
△	DFI02510-4		10	4.762	46	72	12	145	58	52	6.5	11	6.5	M6	1x4	2954	7295	68
△	DFI03204-4	32	4	2.381	46	72	12	80	58	52	6.5	11	6.5	M6	1x4	1296	4838	69
☆	DFI03205-4		5	3.175	46	72	12	102	58	52	6.5	11	6.5	M8	1x4	1922	6343	72
☆	DFI03210-4		10	6.35	54	88	15	162	70	62	9	14	8.5	M8	1x4	4805	12208	83
☆	DFI04005-4	40	5	3.175	56	90	15	105	72	64	9	14	8.5	M8	1x4	2110	7988	84
☆	DFI04010-4		10	6.35	62	104	18	165	82	70	11	17.5	11	M8	1x4	5399	15500	99
☆	DFI05010-4	50	10	6.35	72	114	18	171	92	82	11	17.5	11	M8	1x4	6004	19614	115
○	DFI06310-4	63	10	6.35	85	131	22	182	107	95	14	20	13	M8	1x4	6719	25358	135
△	DFI08010-4	80	10	6.35	105	150	22	182	127	115	14	20	13	M8	1x4	7346	31953	156

BALL SCREW DIMENSION TABLE

TYPE : DFS

High-Speed Ball Screw



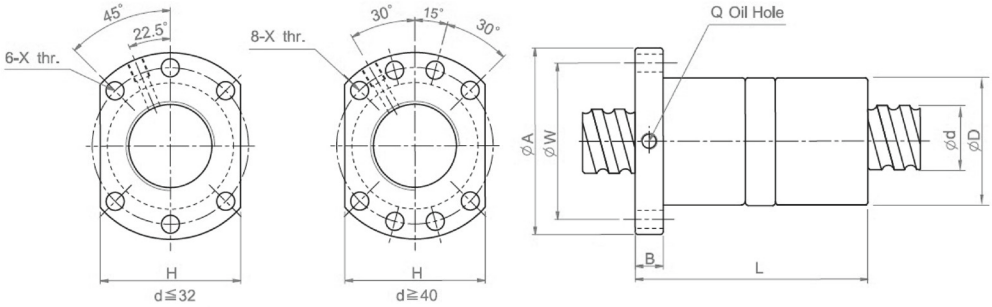
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions														
		d	l	Da	D	A	B	L	W	H	X	Q	n	Ca	Coa	K
△	DFS01605-3.8	15	5	2.778	28	48	10	73	38	40	5.5	M6	3.8x1	1112	2507	41
△	DFS01610-2.8		10	2.778	28	48	10	97	38	40	5.5	M6	2.8x1	839	1821	31
△	DFS02005-3.8	20	5	3.175	36	58	10	75	47	44	6.6	M6	3.8x1	1484	3681	50
■	DFS02006-4.8		6	3.175	36	58	10	98	47	44	6.6	M6	4.8x1	1811	4644	63
■	DFS02008-4.8		8	3.175	36	58	10	116	47	44	6.6	M6	4.8x1	1863	4861	66
△	DFS02010-3.8		10	3.175	36	58	10	120	47	44	6.6	M6	3.8x1	1516	3833	53
△	DFS02505-3.8	25	5	3.175	40	62	10	75	51	48	6.6	M6	3.8x1	1650	4658	59
■	DFS02506-4.8		6	3.175	40	62	10	98	51	48	6.6	M6	4.8x1	2015	5879	75
■	DFS02508-4.8		8	3.175	40	62	10	116	51	48	6.6	M6	4.8x1	2009	5867	76
△	DFS02510-3.8		10	3.175	40	62	12	122	51	48	6.6	M6	3.8x1	1638	4633	61
△	DFS03205-3.8	32	5	3.175	50	80	12	82	65	62	9	M6	3.8x1	1839	6026	71
■	DFS03206-4.8		6	3.175	50	80	12	99	65	62	9	M6	4.8x1	2247	7608	90
■	DFS03208-4.8		8	3.969	50	80	12	126	65	62	9	M6	4.8x1	3015	9181	92
△	DFS03210-3.8	31	10	3.969	50	80	13	122	65	62	9	M6	3.8x1	2460	7255	75
△	DFS03220-2.8		20	3.969	50	80	12	160	65	62	9	M6	2.8x1	1907	5482	58
△	DFS04005-3.8	40	5	3.175	63	93	15	85	78	70	9	M8	3.8x1	2018	7589	83
■	DFS04006-4.8		6	3.175	63	93	14	98	78	70	9	M6	4.8x1	2467	9583	106
■	DFS04008-4.8		8	3.969	63	93	14	125	78	70	9	M6	4.8x1	3327	11491	110
△	DFS04010-3.8	38	10	6.35	63	93	14	123	78	70	9	M8	3.8x1	5035	13943	91
△	DFS04020-2.8		20	6.35	63	93	14	162	78	70	9	M8	2.8x1	3959	10715	73
△	DFS05005-3.8	50	5	3.175	75	110	15	85	93	85	11	M8	3.8x1	2207	9542	96
△	DFS05010-3.8		10	6.35	75	110	18	138	93	85	11	M8	3.8x1	5638	17852	109
■	DFS05012-3.8	48	12	6.35	75	110	18	147	93	85	11	M8	3.8x1	5632	17836	110
△	DFS05020-3.8		20	6.35	75	110	18	218	93	85	11	M8	3.8x1	5749	18485	116

BALL SCREW DIMENSION TABLE

TYPE : DFU



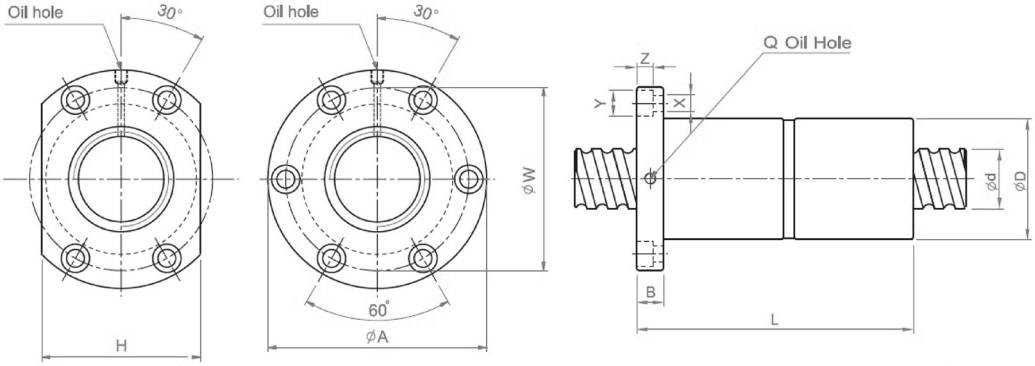
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions														
		d	l	Da	D	A	B	L	W	X	H	Q	n	Ca	Coa	K
△	DFU01604-4	16	4	2.381	28	48	10	80	38	5.5	40	M6	1x4	973	2406	43
☆	DFU01605-4		5	3.175	28	48	10	100	38	5.5	40	M6	1x4	1380	3052	44
☆	DFU01610-3		10	3.175	28	48	10	118	38	5.5	40	M6	1x3	1103	2401	35
△	DFU02004-4	20	4	2.381	36	58	10	80	47	6.6	44	M6	1x4	1066	2987	51
☆	DFU02005-4		5	3.175	36	58	10	101	47	6.6	44	M6	1x4	1551	3875	53
△	DFU02504-4	25	4	2.381	40	62	10	80	51	6.6	48	M6	1x4	1180	3795	60
☆	DFU02505-4		5	3.175	40	62	10	101	51	6.6	48	M6	1x4	1724	4904	62
■	DFU02506-4		6	3.969	40	62	10	105	51	6.6	48	M6	1x4	2318	6057	64
■	DFU02508-4		8	4.762	40	62	10	120	51	6.6	48	M6	1x4	2963	7313	67
○	DFU02510-4		10	4.762	40	62	12	145	51	6.6	48	M6	1x4	2954	7295	67
△	DFU03204-4	32	4	2.381	50	80	12	80	65	9	62	M6	1x4	1296	4838	71
☆	DFU03205-4		5	3.175	50	80	12	102	65	9	62	M6	1x4	1922	6343	74
■	DFU03206-4		6	3.969	50	80	12	105	65	9	62	M6	1x4	2632	7979	78
■	DFU03208-4		8	4.762	50	80	12	122	65	9	62	M6	1x4	3387	9622	82
☆	DFU03210-4		10	6.35	50	80	12	162	65	9	62	M6	1x4	4805	12208	82
☆	DFU04005-4	40	5	3.175	63	93	14	105	78	9	70	M8	1x4	2110	7988	87
■	DFU04006-4		6	3.969	63	93	14	108	78	9	70	M6	1x4	2873	9913	91
■	DFU04008-4		8	4.762	63	93	14	132	78	9	70	M6	1x4	3712	11947	96
☆	DFU04010-4		10	6.35	63	93	14	165	78	9	70	M8	1x4	5399	15500	99
☆	DFU05010-4	50	10	6.35	75	110	16	171	93	11	85	M8	1x4	6004	19614	117
△	DFU05020-4		20	7.144	75	110	16	280	93	11	85	M8	1x4	7142	22588	126
○	DFU06310-4	63	10	6.35	90	125	18	182	108	11	95	M8	1x4	6719	25358	139
△	DFU06320-4		20	9.525	95	135	20	290	115	13.5	100	M8	1x4	11444	36653	152
△	DFU08010-4	80	10	6.35	105	145	20	182	125	13.5	110	M8	1x4	7346	31953	156
△	DFU08020-4		20	9.525	125	165	25	295	145	13.5	130	M8	1x4	12911	47747	187
■	DFU10020-4	100	20	9.525	150	202	30	340	170	17.5	155	M8	1x4	14303	60698	222

BALL SCREW DIMENSION TABLE

TYPE : DFV



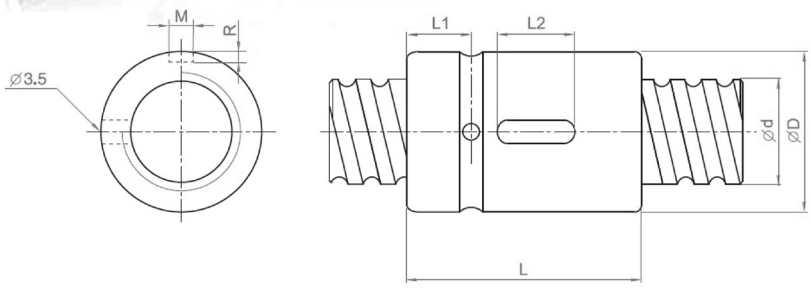
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions																
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
■	DFV01510-2.7	15	10	3.175	34	58	10	107	45	34	5.5	9.5	5.5	M6	2.7x1	972	2020	30
△	DFV01604-3.8	16	4	2.381	34	57	11	89	45	34	5.5	9.5	5.5	M6	3.8x1	931	2285	42
△	DFV01605-4.8		5	3.175	40	63	11	113	51	42	5.5	9.5	5.5	M6	4.8x1	1614	3662	53
△	DFV01610-2.7		10	3.175	40	63	11	106	51	42	5.5	9.5	5.5	M6	2.7x1	1008	2161	32
△	DFV02004-4.8	20	4	2.381	40	60	10	94	50	40	4.5	8	4	M6	4.8x1	1247	3584	61
△	DFV02005-4.8		5	3.175	44	67	11	112	55	52	5.5	9.5	5.5	M6	4.8x1	1814	4650	63
■	DFV02010-2.7		10	3.969	46	74	13	117	59	46	6.6	11	6.5	M6	2.7x1	1518	3398	40
△	DFV02505-4.8	25	5	3.175	50	73	11	105	61	52	5.5	9.5	5.5	M8	4.8x1	2017	5884	75
■	DFV02506-4.8		6	3.969	53	76	11	116	64	58	5.5	9.5	5.5	M6	4.8x1	2711	7268	78
■	DFV02508-4.8		8	4.762	56	85	13	134	71	64	6.5	11	6.5	M6	4.8x1	3466	8776	82
△	DFV02510-2.7		10	6.35	68	102	15	130	84	82	9	14	8.5	M8	2.7x1	3040	6547	49
△	DFV03204-4.8	32	4	2.381	54	81	12	94	67	64	6.6	11	6.5	M6	4.8x1	1517	5806	85
△	DFV03205-4.8		5	3.175	58	85	12	106	71	64	6.6	11	6.5	M8	4.8x1	2249	7612	90
■	DFV03206-4.8		6	3.969	62	89	12	114	75	68	6.6	11	6.5	M8	4.8x1	3079	9575	95
■	DFV03208-4.8		8	4.762	66	100	15	139	82	76	9	14	8.5	M8	4.8x1	3962	11547	100
△	DFV03210-4.8		10	6.35	74	108	15	186	90	82	9	14	9	M8	4.8x1	5620	14649	101
■	DFV03220-2.7		20	6.35	74	108	16	200	90	82	9	14	8.5	M8	2.7x1	3509	8644	61
△	DFV04005-4.8	40	5	3.175	67	101	15	109	83	72	9	14	8.5	M8	4.8x1	2468	9586	105
△	DFV04010-4.8		10	6.35	82	124	18	188	102	94	11	17.5	11	M8	4.8x1	6316	18600	121
△	DFV04020-2.7		20	6.35	82	124	18	200	102	90	11	17.5	11	M8	2.7x1	3935	10893	74
△	DFV05005-4.8	50	5	3.175	80	114	15	115	96	82	9	14	8.5	M8	4.8x1	2698	12053	122
△	DFV05010-4.8		10	6.35	93	135	16	173	113	98	11	17.5	11	M8	4.8x1	7023	23537	144
△	DFV05020-2.7		20	9.525	105	152	28	221	128	110	14	20	13	M8	2.7x1	7336	19700	90
△	DFV06310-4.8	63	10	6.35	108	154	22	195	130	110	14	20	13	M8	4.8x1	7860	30430	172
△	DFV06320-2.7		20	9.525	122	180	28	220	150	130	18	26	17.5	M8	2.7x1	8162	24741	107
△	DFV08010-4.8	80	10	6.35	130	176	22	195	152	132	14	20	13	M8	4.8x1	8593	38344	201
△	DFV08020-4.8		20	9.525	143	204	28	340	172	148	18	26	18	M8	4.8x1	15103	57296	226
△	DFV08020-7.6		20	9.525	143	204	28	460	172	148	18	26	18	M8	3.8x2	22423	90719	351

BALL SCREW DIMENSION TABLE

TYPE : SCI



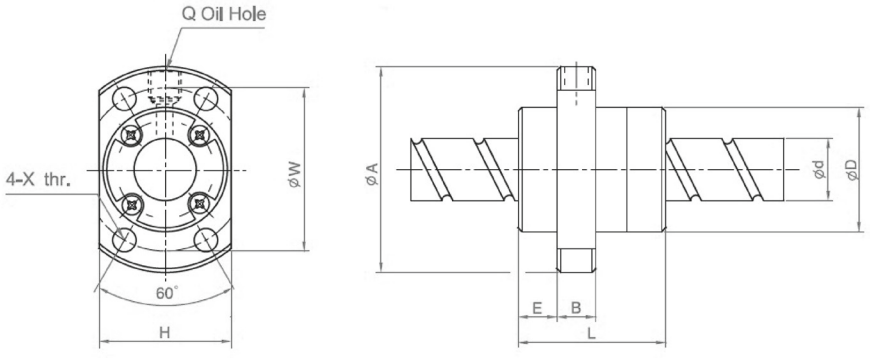
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions												
		d	l	Da	D	L	L1	L2	M	R	n	Ca	Coa	K
△	SCI01604-4	16	4	2.381	30	40	9	15	3	1.5	1x4	973	2406	32
☆	SCI01605-4		5	3.175	30	45	9	20	5	3	1x4	1380	3052	33
△	SCI02004-4	20	4	2.381	34	40	9	15	3	1.5	1x4	1066	2987	37
☆	SCI02005-4		5	3.175	34	45	9	20	5	3	1x4	1551	3875	39
△	SCI02504-4	25	4	2.381	40	40	9	15	3	1.5	1x4	1180	3795	43
☆	SCI02505-4		5	3.175	40	45	9	20	5	3	1x4	1724	4904	45
△	SCI02510-4		10	4.762	46	85	13	30	5	3	1x4	2954	7295	51
△	SCI03204-4	32	4	2.381	46	40	9	15	3	1.5	1x4	1296	4838	49
☆	SCI03205-4		5	3.175	46	45	9	20	5	3	1x4	1922	6343	52
☆	SCI03210-4		10	6.35	54	85	13	30	5	3	1x4	4805	12208	62
☆	SCI04005-4	40	5	3.175	56	45	9	20	5	3	1x4	2110	7988	59
☆	SCI04010-4		10	6.35	62	85	13	30	5	3	1x4	5399	15500	72
△	SCI05010-4	50	10	6.35	72	85	13	30	5	3	1x4	6004	19614	83
○	SCI06310-4	63	10	6.35	85	85	13	30	6	3.5	1x4	6719	25358	95
○	SCI08010-4	80	10	6.35	105	85	13	30	8	4.5	1x4	7346	31953	109

BALL SCREW DIMENSION TABLE

TYPE : SFE



Unit : mm

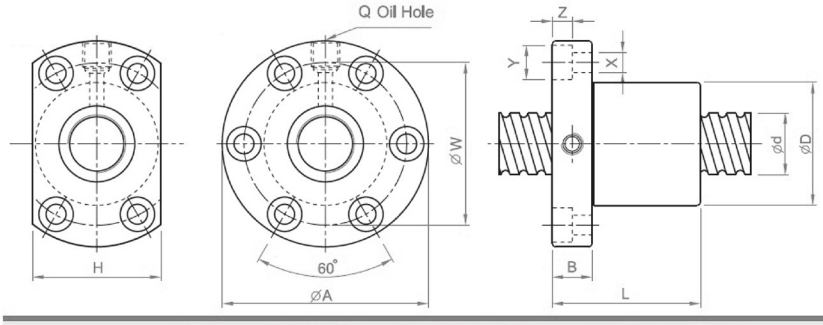
l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions															
		d	l	Da	D	A	E	B	L	X	W	H	Q	n	Ca	Coa	K
△	SFE01616-3	16	16	2.778	32	53	10.1	10	38	4.5	42	34	M6	1.7x2	1021	2409	29
△	SFE01632-3	16	32	2.778	34	55	10.5	10	34	5.5	45	36	M6	0.7x2	439	976	11
△	SFE02020-3	20	20	3.175	39	62	12	10	47	5.5	50	41	M6	1.7x2	1321	3320	35
△	SFE02040-3	20	40	3.175	38	58	11	10	41	5.5	48	40	M6	0.7x2	582	1397	13
△	SFE02525-3	25	25	3.969	47	74	14	12	57	6.6	60	49	M6	1.7x2	1974	5188	43
△	SFE02550-3	25	50	3.969	46	70	13	12	50	6.6	58	48	M6	0.7x2	870	2183	16
△	SFE03232-3	32	32	4.762	58	92	17	12	71	9	74	60	M6	1.7x2	2876	8207	54
△	SFE03264-3	32	64	4.762	58	92	15.5	12	62	9	74	60	M6	0.7x2	1225	3282	20
△	SFE04040-3	40	40	6.35	73	114	19.5	15	89	11	93	75	M6	1.7x2	4600	13281	66
△	SFE05050-3	50	50	7.938	90	135	21.5	20	107	14	112	92	M6	1.7x2	6512	19430	80

※ cpc Standard nuts are without seals, if required, please advise. ※
Recommended to use the new SFY type.

BALL SCREW DIMENSION TABLE

TYPE : SFI



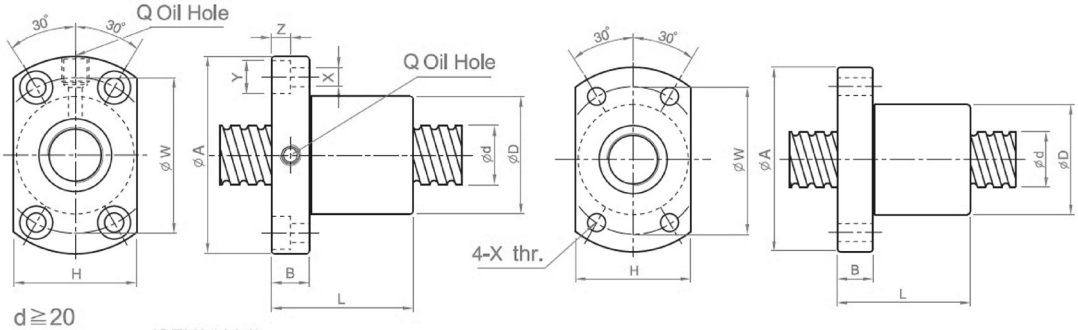
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/µm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions																
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
△	SFI01604-4	16	4	2.381	30	49	10	45	39	34	4.5	8	4.5	M6	1x4	973	2406	32
☆	SFI01605-4		5	3.175	30	49	10	50	39	34	4.5	8	4.5	M6	1x4	1380	3052	33
○	SFI01610-3		10	3.175	34	58	10	57	45	34	5.5	9.5	5.5	M6	1x3	1103	2401	27
△	SFI02004-4	20	4	2.381	34	57	11	46	45	40	5.5	9.5	5.5	M6	1x4	1066	2987	37
☆	SFI02005-4		5	3.175	34	57	11	51	45	40	5.5	9.5	5.5	M6	1x4	1551	3875	39
◎	SFI0205T-4		5.08	3.175	34	57	11	51	45	40	5.5	9.5	5.5	M6	1x4	1550	3875	39
○	SFI02504-4	25	4	2.381	40	63	11	46	51	46	5.5	9.5	5.5	M6	1x4	1180	3795	43
☆	SFI02505-4		5	3.175	40	63	11	51	51	46	5.5	9.5	5.5	M8	1x4	1724	4904	45
△	SFI02510-4		10	4.762	46	72	12	85	58	52	6.5	11	6.5	M6	1x4	2954	7295	51
△	SFI03204-4	32	4	2.381	46	72	12	47	58	52	6.5	11	6.5	M6	1x4	1296	4838	49
☆	SFI03205-4		5	3.175	46	72	12	52	58	52	6.5	11	6.5	M8	1x4	1922	6343	52
☆	SFI03210-4		10	6.35	54	88	15	90	70	62	9	14	8.5	M8	1x4	4805	12208	62
☆	SFI04005-4	40	5	3.175	56	90	15	55	72	64	9	14	8.5	M8	1x4	2110	7988	59
☆	SFI04010-4		10	6.35	62	104	18	93	82	70	11	17.5	11	M8	1x4	5399	15500	72
☆	SFI05010-4	50	10	6.35	72	114	18	93	92	82	11	17.5	11	M8	1x4	6004	19614	83
○	SFI06310-4	63	10	6.35	85	131	22	98	107	95	14	20	13	M8	1x4	6719	25358	95
△	SFI08010-4	80	10	6.35	105	150	22	98	127	115	14	20	13	M8	1x4	7346	31953	109

BALL SCREW DIMENSION TABLE

TYPE : SFK



Unit : mm

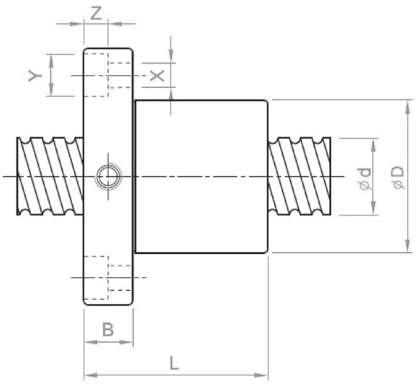
I: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

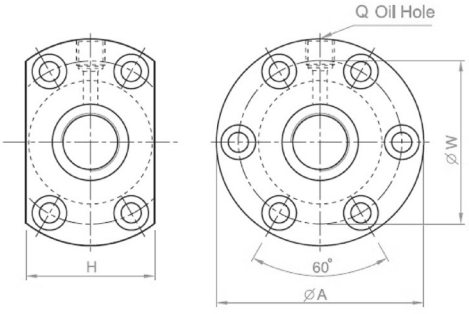
	Model No.	Dimensions															
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
■	SFK00401	4	1	0.8	10	20	3	12	15	14	2.9	–	–	–	1x2	64	97	5
△	SFK00601	6	1	0.8	12	24	3.5	15	18	16	3.4	–	–	–	1x3	111	224	9
○	SFK00801		1	0.8	14	27	4	16	21	18	3.4	–	–	–	1x4	161	403	14
○	SFK00802	8	2	1.2	14	27	4	16	21	18	3.4	–	–	–	1x3	222	458	13
△	SFK0082.5		2.5	1.2	16	29	4	26	23	20	3.4	–	–	–	1x3	221	457	13
○	SFK01002	10	2	1.2	18	35	5	28	27	22	4.5	–	–	–	1x3	243	569	15
△	SFK01004		4	2	26	46	10	34	36	28	4.5	8	4.5	M6	1x3	468	905	17
○	SFK01202	12	2	1.2	20	37	5	28	29	24	4.5	–	–	–	1x4	334	906	22
△	SFK01402	14	2	1.2	21	40	6	23	31	26	5.5	–	–	–	1x4	354	1053	24
■	SFK01602	16	2	1.2	25	43	10	40	35	29	5.5	–	–	M6	1x4	373	1200	26
■	SFK02002	20	2	1.2	50	80	6	23	31	26	5.5	–	–	M6	1x4	354	1053	24
■	SFK02502	25	2	1.2	50	80	10	40	35	29	5.5	–	–	M6	1x4	373	1200	26

	Model No.	Dimensions																
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
○	XSUR01204T3D-02	12	4	2.5	24	40	6	28	32	25	3.5	–	–	–	1x3	454	722	–
△	XSUR01205T3D-00		5	2 5	22	37	8	39	29	24	4 5	–	–	–	1x3	675	1316	17

BALL SCREW DIMENSION TABLE

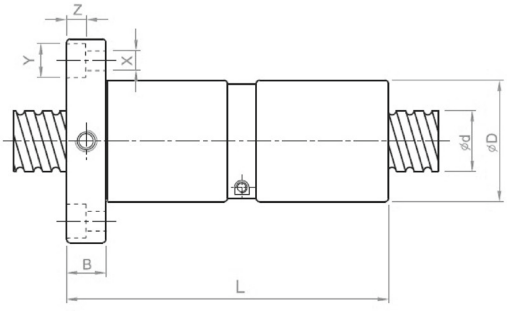
TYPE : SFM





Used for Milling Machine Only

TYPE : DFM



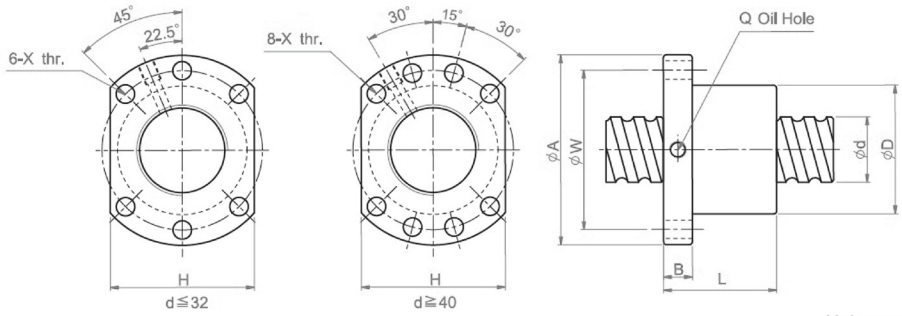
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/µm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions																
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
☆	SFM03205-4	32	5	3.175	48	74	12	52	60	60	6.5	11	6.5	M8	1x4	1922	6343	53
☆	SFM0325T-4		5.08	3.175	48	74	12	53	60	60	6.5	11	6.5	M8	1x4	1922	6343	53
☆	DFM03205-4	32	5	3.175	48	74	12	102	60	60	6.5	11	6.5	M8	1x4	1922	6343	73
☆	DFM0325T-4		5.08	3.175	48	74	12	104	60	60	6.5	11	6.5	M8	1x4	1922	6343	73

BALL SCREW DIMENSION TABLE

TYPE : SFU



Unit : mm

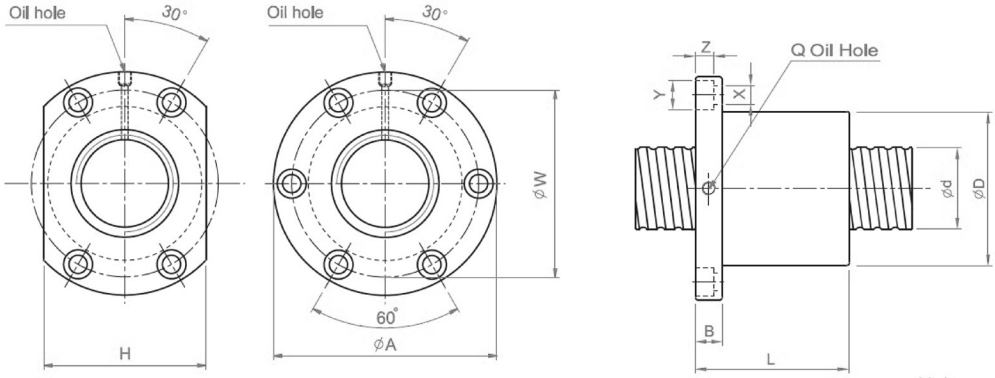
l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions														
		d	l	Da	D	A	B	L	W	X	H	Q	n	Ca	Coa	K
△	SFU01204-4	12	4	2.5	24	40	10	40	32	4.5	30		1x4	902	1884	26
☆	SFU01604-4	16	4	2.381	28	48	10	40	38	5.5	40	M6	1x4	973	2406	32
☆	SFU01605-4		5	3.175	28	48	10	50	38	5.5	40	M6	1x4	1380	3052	32
☆	SFU01610-3		10	3.175	28	48	10	57	38	5.5	40	M6	1x3	1103	2401	26
△	SFU02004-4	20	4	2.381	36	58	10	42	47	6.6	44	M6	1x4	1066	2987	38
☆	SFU02005-4		5	3.175	36	58	10	51	47	6.6	44	M6	1x4	1551	3875	39
△	SFU02504-4	25	4	2.381	40	62	10	42	51	6.6	48	M6	1x4	1180	3795	43
☆	SFU02505-4		5	3.175	40	62	10	51	51	6.6	48	M6	1x4	1724	4904	45
■	SFU02506-4		6	3.969	40	62	10	54	51	6.6	48	M6	1x4	2318	6057	47
■	SFU02508-4		8	4.762	40	62	10	63	51	6.6	48	M6	1x4	2963	7313	49
○	SFU02510-4		10	4.762	40	62	12	85	51	6.6	48	M6	1x4	2954	7295	50
△	SFU03204-4	32	4	2.381	50	80	12	44	65	9	62	M6	1x4	1296	4838	51
☆	SFU03205-4		5	3.175	50	80	12	52	65	9	62	M6	1x4	1922	6343	54
■	SFU03206-4		6	3.969	50	80	12	57	65	9	62	M6	1x4	2632	7979	57
■	SFU03208-4		8	4.762	50	80	12	65	65	9	62	M6	1x4	3387	9622	60
☆	SFU03210-4		10	6.35	50	80	12	90	65	9	62	M6	1x4	4805	12208	61
☆	SFU04005-4	40	5	3.175	63	93	14	55	78	9	70	M8	1x4	2110	7988	63
■	SFU04006-4		6	3.969	63	93	14	60	78	9	70	M6	1x4	2873	9913	66
■	SFU04008-4		8	4.762	63	93	14	67	78	9	70	M6	1x4	3712	11947	70
☆	SFU04010-4		10	6.35	63	93	14	93	78	9	70	M8	1x4	5399	15500	73
☆	SFU05010-4	50	10	6.35	75	110	16	93	93	11	85	M8	1x4	6004	19614	85
△	SFU05020-4		20	7.144	75	110	16	138	93	11	85	M8	1x4	7142	22588	94
○	SFU06310-4	63	10	6.35	90	125	18	98	108	11	95	M8	1x4	6719	25358	99
△	SFU06320-4		20	9.525	95	135	20	149	115	13.5	100	M8	1x4	11444	36653	112
△	SFU08010-4	80	10	6.35	105	145	20	98	125	13.5	110	M8	1x4	7346	31953	109
△	SFU08020-4		20	9.525	125	165	25	154	145	13.5	130	M8	1x4	12911	47747	138
■	SFU10020-4	100	20	9.525	150	202	30	180	170	17.5	155	M8	1x4	14303	60698	162

BALL SCREW DIMENSION TABLE

TYPE : SFV

High-Speed & Heavy Load Ball Screw



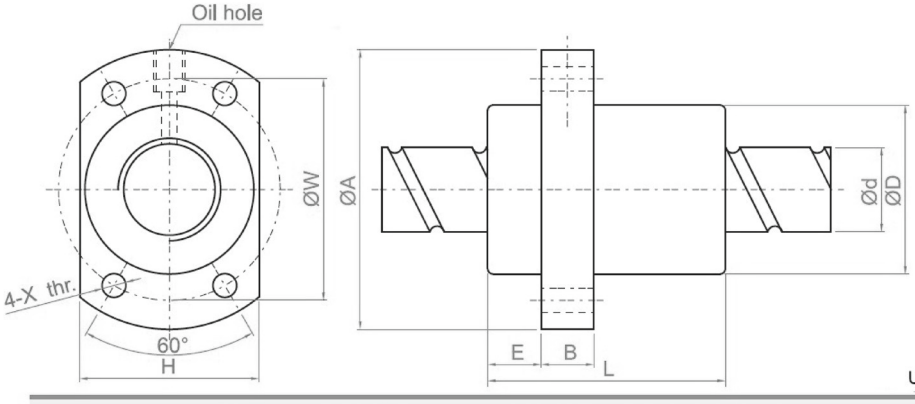
Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

	Model No.	Dimensions																
		d	l	Da	D	A	B	L	W	H	X	Y	Z	Q	n	Ca	Coa	K
△	SFV01205-2.8	12	5	2.5	30	50	10	42	40	32	4.5	8	4.5	M6	2.8x1	661	1316	19
△	SFV01210-2.7		10	2.5	30	50	10	53	40	32	4.5	8	4.5	M6	2.7x1	623	1241	18
■	SFV01510-2.7	15	10	3.175	34	58	10	57	45	34	5.5	9.5	5.5	M6	2.7x1	972	2020	23
△	SFV01604-3.8	16	4	2.381	34	57	11	45	45	34	5.5	9.5	5.5	M6	3.8x1	931	2285	31
△	SFV01605-4.8		5	3.175	40	63	11	58	51	42	5.5	9.5	5.5	M6	4.8x1	1614	3662	40
△	SFV01610-2.7		10	3.175	40	63	11	56	51	42	5.5	9.5	5.5	M6	2.7x1	1008	2161	24
△	SFV02004-4.8	20	4	2.381	40	60	10	50	50	40	4.5	8	4	M6	4.8x1	1247	3584	45
△	SFV02005-4.8		5	3.175	44	67	11	57	55	52	5.5	9.5	5.5	M6	4.8x1	1814	4650	47
■	SFV02010-2.7		10	3.969	46	74	13	57	59	46	6.6	11	6.5	M6	2.7x1	1518	3398	30
△	SFV02020-1.8		20	3.175	46	74	13	70	59	46	6.6	11	6.5	M6	1.8x1	764	1758	19
△	SFV02505-4.8	25	5	3.175	50	73	11	55	61	52	5.5	9.5	5.5	M8	4.8x1	2017	5884	56
■	SFV02506-4.8		6	3.969	53	76	11	62	64	58	5.5	9.5	5.5	M6	4.8x1	2711	7268	58
■	SFV02508-4.8		8	4.762	56	85	13	70	71	64	6.5	11	6.5	M6	4.8x1	3466	8776	61
△	SFV02510-2.7		10	6.35	68	102	15	70	84	82	9	14	8.5	M8	2.7x1	3040	6547	37
△	SFV02525-1.8		25	3.175	50	73	13	83	61	52	5.5	9.5	5.5	M8	1.8x1	843	2199	22
△	SFV03204-4.8	32	4	2.381	54	81	12	50	67	64	6.6	11	6.5	M6	4.8x1	1517	5806	62
△	SFV03205-4.8		5	3.175	58	85	12	56	71	64	6.6	11	6.5	M8	4.8x1	2249	7612	66
■	SFV03206-4.8		6	3.969	62	89	12	60	75	68	6.6	11	6.5	M8	4.8x1	3079	9575	70
■	SFV03208-4.8		8	4.762	66	100	15	75	82	76	9	14	8.5	M8	4.8x1	3962	11547	74
△	SFV03210-4.8		10	6.35	74	108	15	96	90	82	9	14	9	M8	4.8x1	5620	14649	76
■	SFV03220-2.7		20	6.35	74	108	16	100	90	82	9	14	8.5	M8	2.7x1	3509	8644	46
△	SFV04005-4.8	40	5	3.175	67	101	15	59	83	72	9	14	8.5	M8	4.8x1	2468	9586	76
△	SFV04010-4.8		10	6.35	82	124	18	100	102	94	11	17.5	11	M8	4.8x1	6316	18600	90
△	SFV04020-2.7		20	6.35	82	124	18	100	102	90	11	17.5	11	M8	2.7x1	3935	10893	56
△	SFV05005-4.8	50	5	3.175	80	114	15	60	96	82	9	14	8.5	M8	4.8x1	2698	12053	87
△	SFV05010-4.8		10	6.35	93	135	16	93	113	98	11	17.5	11	M8	4.8x1	7023	23537	106
△	SFV05020-2.7		20	9.525	105	152	28	121	128	110	14	20	13	M8	2.7x1	7336	19700	68
△	SFV06310-4.8	63	10	6.35	108	154	22	105	130	110	14	20	13	M8	4.8x1	7860	30430	126
△	SFV06320-2.7		20	9.525	122	180	28	120	150	130	18	26	17.5	M8	2.7x1	8162	24741	80
△	SFV08010-4.8	80	10	6.35	130	176	22	105	152	132	14	20	13	M8	4.8x1	8593	38344	145
△	SFV08020-4.8		20	9.525	143	204	28	180	172	148	18	26	18	M8	4.8x1	15103	57296	168
△	SFV08020-7.6		20	9.525	143	204	28	240	172	148	18	26	18	M8	3.8x2	22423	90719	260

BALL SCREW DIMENSION TABLE

TYPE : SFY



Unit : mm

l: Lead Da: Ball Dia. n: Number of Circuits K: Stiffness (Kgf/μm)
Ca: Basic Dynamic Rating Load (Kgf) Coa: Basic Static Rating Load(Kgf)

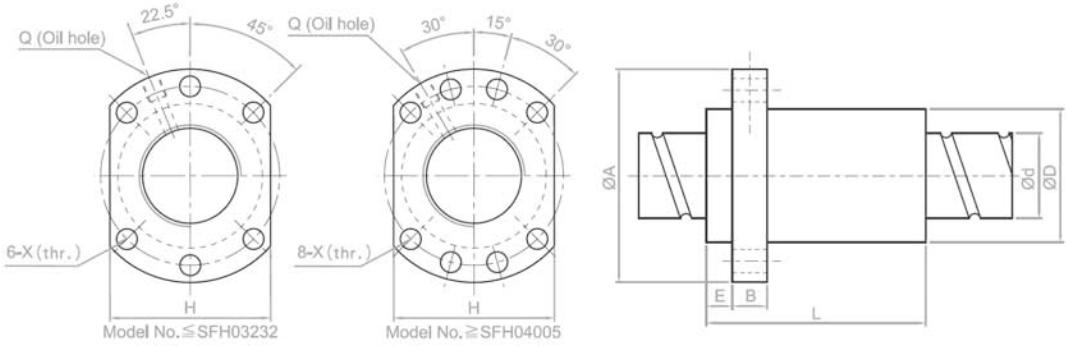
Model No.	Dimensions															
	d	l	Da	D	A	E	B	L	W	H	X	Q	n	Ca	Coa	K
△ SFY1616-3.6	16	16	2.778	32	53	10.1	10	45	42	34	4.5	M6	1.8x2	1073	2551	31
△ SFY1616-5.6		16	2.778	32	53	10.1	10	61	42	34	4.5	M6	2.8x2	1568	3968	47
△ SFY2020-3.6	20	20	3.175	39	62	13	10	52	50	41	5.5	M6	1.8x2	1387	3515	37
△ SFY2020-5.6		20	3.175	39	62	13	10	72	50	41	5.5	M6	2.8x2	2029	5468	56
△ SFY2525-3.6	25	25	3.969	47	74	15	12	64	60	49	6.6	M6	1.8x2	2074	5494	45
△ SFY2525-5.6		25	3.969	47	74	15	12	89	60	49	6.6	M6	2.8x2	3032	8546	69
△ SFY3232-3.6	32	32	4.762	58	92	17	12	78	74	60	9	M6	1.8x2	3021	8690	58
△ SFY3232-5.6		32	4.762	58	92	17	12	110	74	60	9	M6	2.8x2	4417	13517	88
△ SFY4040-3.6	40	40	6.35	73	114	19.5	15	99	93	75	11	M6	1.8x2	4831	14062	70
△ SFY4040-5.6		40	6.35	73	114	19.5	15	139	93	75	11	M6	2.8x2	7065	21874	106
△ SFY5050-3.6	50	50	7.938	90	135	21.5	20	117	112	92	14	M6	1.8x2	7220	21974	86
△ SFY5050-5.6		50	7.938	90	135	21.5	20	167	112	92	14	M6	2.8x2	10558	34182	131

Double Lead

Model No.	Dimensions															
	d	l	Da	D	A	E	B	L	W	H	X	Q	n	Ca	Coa	K
△ SFY1632-1.6	16	32	2.778	32	53	10.1	10	42.5	42	34	4.5	M6	0.8x2	493	1116	11
△ SFY1632-3.6		32	2.778	32	53	10.1	10	74.5	42	34	4.5	M6	1.8x2	989	2511	23
△ SFY2040-1.6	20	40	3.175	39	62	13	10	48	50	41	5.5	M6	0.8x2	653	1597	15
△ SFY2040-3.6		40	3.175	39	62	13	10	88	50	41	5.5	M6	1.8x2	1311	3592	30
△ SFY2550-1.6	25	50	3.969	47	74	15	12	58	60	49	6.6	M6	0.8x2	976	2495	19
△ SFY2550-3.6		50	3.969	47	74	15	12	108	60	49	6.6	M6	1.8x2	1960	5614	32
△ SFY3264-1.6	32	64	4.762	58	92	17	12	71	74	60	9	M6	0.8x2	1374	3571	22
△ SFY3264-3.6		64	4.762	58	92	17	12	135	74	60	9	M6	1.8x2	2759	8441	46
△ SFY4080-1.6	40	80	6.35	73	114	19.5	15	90	93	75	11	M6	0.8x2	2273	6387	29
△ SFY4080-3.6		80	6.35	73	114	19.5	15	170	93	75	11	M6	1.8x2	4566	14370	50
△ SFY50100-1.6	50	100	7.938	90	135	21.5	20	111	112	92	14	M6	0.8x2	3398	9980	35
△ SFY50100-3.6		100	7.938	90	135	21.5	20	211	112	92	14	M6	1.8x2	6824	22455	72

BALL SCREW DIMENSION TABLE

TYPE : SFH

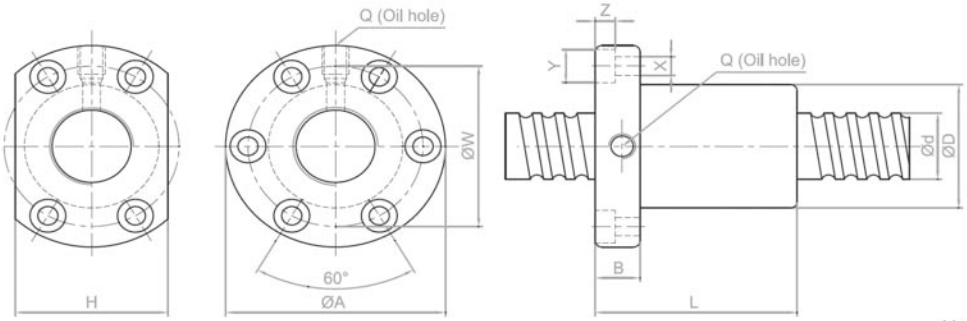


Unit : mm

Model No.	d	l	Da	Dimension										Load Rating		K kgf/μm
				D	A	E	B	L	W	H	X	Q	n	Ca (kgf)	Coa (kgf)	
SFH01205-2.8	12	5	2.5	24	40	5	10	30	32	30	4.5		2.8x1	661	1316	19
SFH01210-2.8		10	2.5	24	40	5	10	45	32	30	4.5		2.8x1	642	1287	19
SFH01605-3.8	15	5	2.778	28	48	5	10	37	38	40	5.5	M6	3.8x1	1112	2507	30
SFH01610-2.8		10	2.778	28	48	5	10	45	38	40	5.5	M6	2.8x1	839	1821	23
SFH01616-1.8		16	2.778	28	48	5	10	45	38	40	5.5	M6	1.8x1	552	1137	14
SFH01616-2.8		16	2.778	28	48	5	10	61	38	40	5.5	M6	2.8x1	808	1769	22
SFH01620-1.8		20	2.778	28	48	5	10	58	38	40	5.5	M6	1.8x1	554	1170	14
SFH02005-3.8	20	5	3.175	36	58	7	10	37	47	44	6.6	M6	3.8x1	1484	3681	37
SFH02010-3.8		10	3.175	36	58	7	10	55	47	44	6.6	M6	3.8x1	1516	3833	40
SFH02020-1.8		20	3.175	36	58	7	10	54	47	44	6.6	M6	1.8x1	764	1758	19
SFH02020-2.8		20	3.175	36	58	7	10	74	47	44	6.6	M6	2.8x1	1118	2734	29
SFH02505-3.8	25	5	3.175	40	62	7	10	37	51	48	6.6	M6	3.8x1	1650	4658	43
SFH02510-3.8		10	3.175	40	62	7	12	55	51	48	6.6	M6	3.8x1	1638	4633	45
SFH02525-1.8		25	3.175	40	62	7	12	64	51	48	6.6	M6	1.8x1	843	2199	22
SFH02525-2.8		25	3.175	40	62	7	12	89	51	48	6.6	M6	2.8x1	1232	3421	34
SFH03205-3.8	32	5	3.175	50	80	9	12	37	65	62	9	M6	3.8x1	1839	6026	51
SFH03210-3.8	31	10	3.969	50	80	9	12	57	65	62	9	M6	3.8x1	2460	7255	55
SFH03220-2.8		20	3.969	50	80	9	12	76	65	62	9	M6	2.8x1	1907	5482	43
SFH03232-1.8		32	3.969	50	80	9	12	80	65	62	9	M6	1.8x1	1257	3426	27
SFH03232-2.8		32	3.969	50	80	9	12	112	65	62	9	M6	2.8x1	1838	5329	42
SFH04005-3.8	40	5	3.175	63	93	9	15	42	78	70	9	M8	3.8x1	2018	7589	60
SFH04010-3.8	38	10	6.35	63	93	9	14	60	78	70	9	M8	3.8x1	5035	13943	67
SFH04020-2.8		20	6.35	63	93	9	14	80	78	70	9	M8	2.8x1	3959	10715	54
SFH04040-1.8		40	6.35	63	93	9	14	98	78	70	9	M8	1.8x1	2585	6648	34
SFH04040-2.8		40	6.35	63	93	9	14	138	78	70	9	M8	2.8x1	3780	10341	52
SFH05005-3.8	50	5	3.175	75	110	10.5	15	42	93	85	11	M8	3.8x1	2207	9542	68
SFH05010-3.8	48	10	6.35	75	110	10.5	18	60	93	85	11	M8	3.8x1	5638	17852	79
SFH05020-3.8		20	6.35	75	110	10.5	18	100	93	85	11	M8	3.8x1	5749	18485	87
SFH05050-1.8		50	6.35	75	110	10.5	18	120	93	85	11	M8	1.8x1	2946	8749	42
SFH05050-2.8		50	6.35	75	110	10.5	18	170	93	85	11	M8	2.8x1	4308	13610	65

BALL SCREW DIMENSION TABLE

TYPE : SFNI

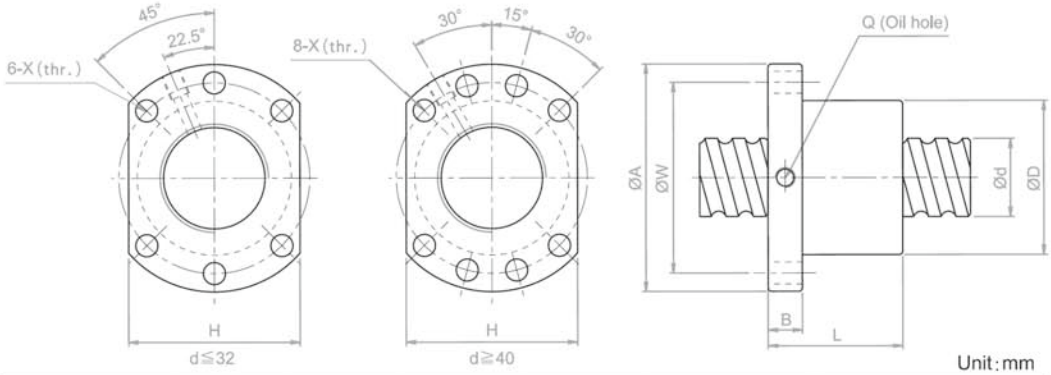


Unit : mm

Model No.	d	l	Da	Dimension											Load Rating		K kgf/μm
				D	A	B	L	W	H	X	Y	Z	Q	n	Ca (kgf)	Coa (kgf)	
SFNI01605-4	16	5	3.175	30	49	10	45	39	34	4.5	8	4.5	M6	1x4	1380	3052	33
SFNI01610-3		10	3.175	34	58	10	57	45	34	5.5	9.5	5.5	M6	1x3	1103	2401	27
SFNI02005-4	20	5	3.175	34	57	11	51	45	40	5.5	9.5	5.5	M6	1x4	1551	3875	39
SFNI02505-4	25	5	3.175	40	63	11	51	51	46	5.5	9.5	5.5	M8	1x4	1724	4904	45
SFNI02510-4		10	4.762	46	72	12	80	58	52	6.5	11	6.5	M6	1x4	2954	7295	51
SFNI03205-4	32	5	3.175	46	72	12	52	58	52	6.5	11	6.5	M8	1x4	1922	6343	52
SFNI03210-4		10	6.35	54	88	15	85	70	62	9	14	8.5	M8	1x4	4805	12208	62
SFNI04005-4	40	5	3.175	56	90	15	55	72	64	9	14	8.5	M8	1x4	2110	7988	59
SFNI04010-4		10	6.35	62	104	18	88	82	70	11	17.5	11	M8	1x4	5399	15500	72
SFNI05010-4	50	10	6.35	72	114	18	88	92	82	11	17.5	11	M8	1x4	6004	19614	83
SFNI06310-4	63	10	6.35	85	131	22	93	107	95	14	20	13	M8	1x4	6719	25358	95
SFNI08010-4	80	10	6.35	105	150	22	93	127	115	14	20	13	M8	1x4	7346	31953	109

BALL SCREW DIMENSION TABLE

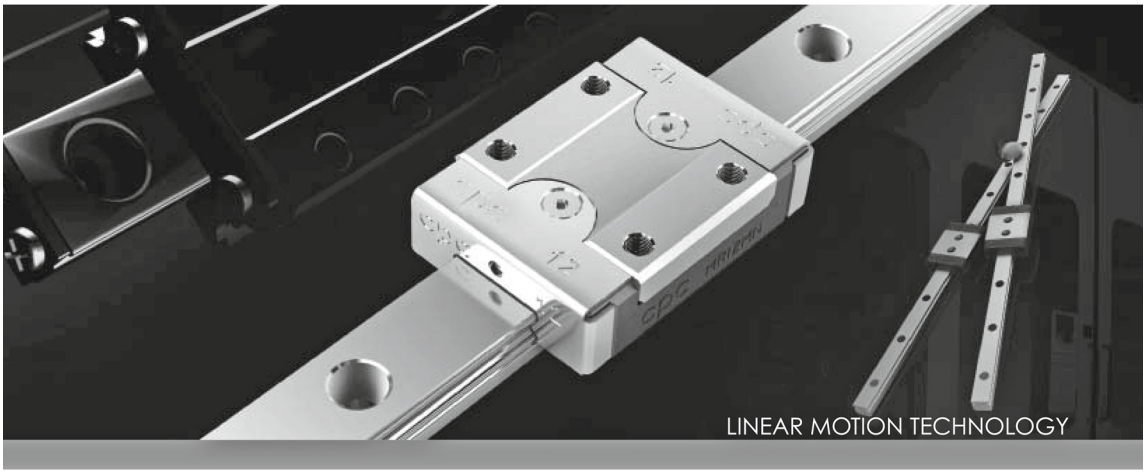
TYPE : **SFNU**



Unit : mm

Model No.	d	l	Da	Dimension									Load Rating		K kgf/μm
				D	A	B	L	W	H	X	Q	n	Ca (kgf)	Coa (kgf)	
SFNU01605-4	16	5	3.175	28	48	10	45	38	40	5.5	M6	1x4	1380	3052	32
SFNU01610-3		10	3.175	28	48	10	57	38	40	5.5	M6	1x3	1103	2401	26
SFNU02005-4	20	5	3.175	36	58	10	51	47	44	6.6	M6	1x4	1551	3875	39
SFNU02505-4	25	5	3.175	40	62	10	51	51	48	6.6	M6	1x4	1724	4904	45
SFNU02510-4		10	4.762	40	62	12	80	51	48	6.6	M6	1x4	2954	7295	50
SFNU03205-4	32	5	3.175	50	80	12	52	65	62	9	M6	1x4	1922	6343	54
SFNU03210-4		10	6.35	50	80	12	85	65	62	9	M6	1x4	4805	12208	61
SFNU04005-4	40	5	3.175	63	93	14	55	78	70	9	M8	1x4	2110	7988	63
SFNU04010-4		10	6.35	63	93	14	88	78	70	9	M8	1x4	5399	15500	73
SFNU05010-4	50	10	6.35	75	110	16	88	93	85	11	M8	1x4	6004	19614	85
SFNU06310-4	63	10	6.35	90	125	18	93	108	95	11	M8	1x4	6719	25358	99
SFNU08010-4	80	10	6.35	105	145	20	93	125	110	13.5	M8	1x4	7346	31953	109

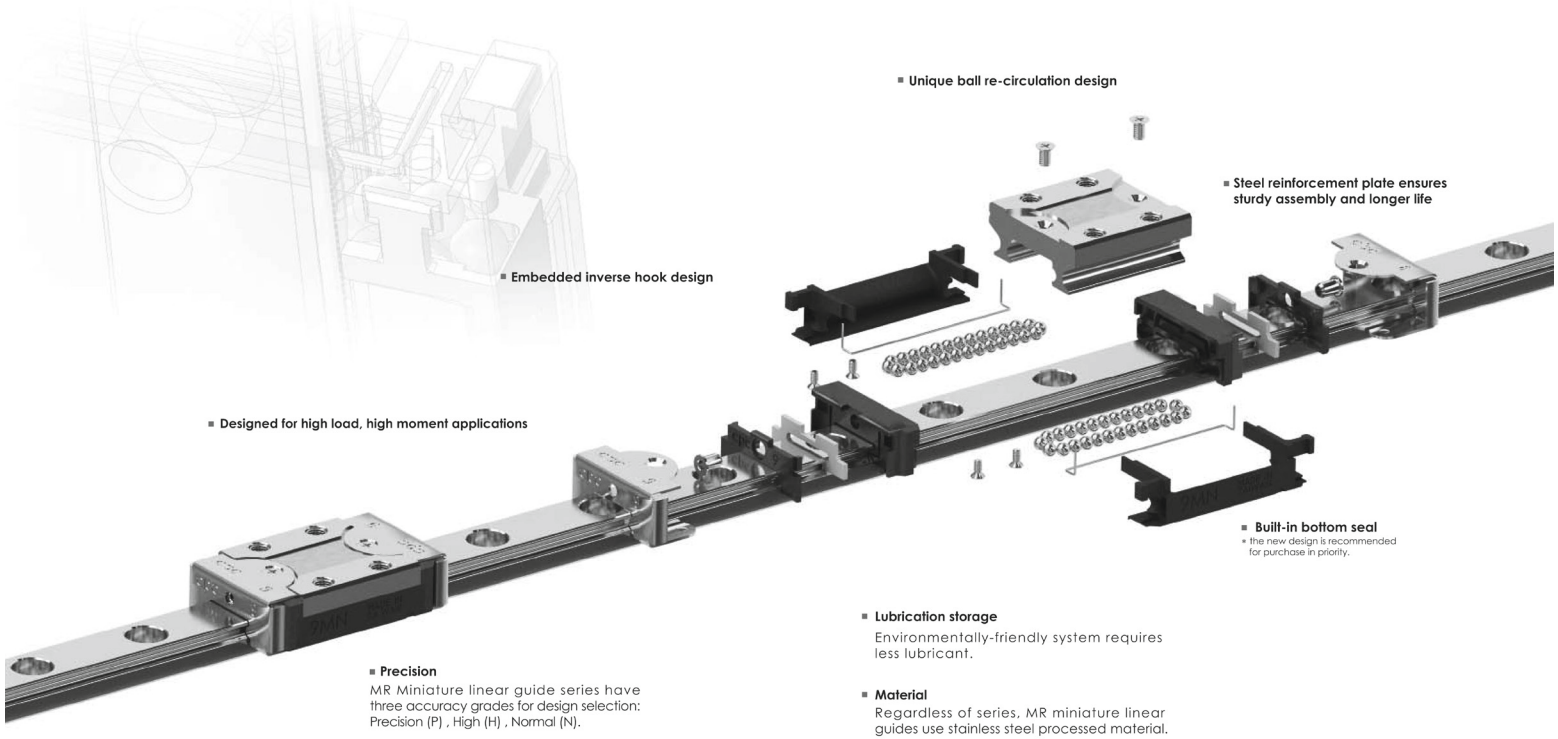
cpc



MR Miniature Linear Guide Series
ST Miniature Stroke Slide Series

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

1. Product Introduction



- **Unique ball re-circulation design**
- **Steel reinforcement plate ensures sturdy assembly and longer life**
- **Embedded inverse hook design**
- **Designed for high load, high moment applications**
- **Built-in bottom seal**
  - the new design is recommended for purchase in priority.

- **Precision**
  MR Miniature linear guide series have three accuracy grades for design selection: Precision (P) , High (H) , Normal (N).

- **Lubrication storage**
  Environmentally-friendly system requires less lubricant.

- **Material**
  Regardless of series, MR miniature linear guides use stainless steel processed material.

1. Product Introduction

Dustproof design

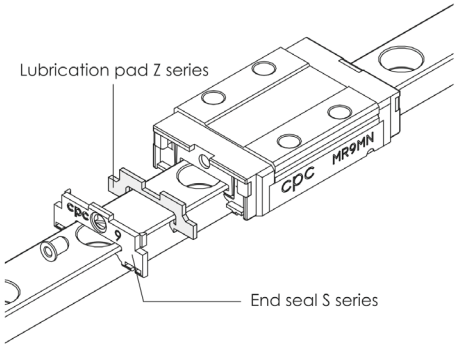
SS series-end seal

The standard end seal design can be hermetic and dustproof effectively; it can also maintain the product life, reduce lubrication grease consumption, and ensure a long-lasting lubrication effect. The special design of seal lip can generate few friction force without influencing its running smoothness.

Environmentally friendly lubrication design

ZZ series-end seal and lubrication pad

The two ends of the runner block are respectively provided with a hermetic lubrication grease injection design, capable of bringing the lubrication grease to the raceway by means of steel ball circulation, thereby achieving a lubrication effect. A built-in lubrication pad is optionally provided upon the design, further ensuring the lubrication effect of a long-term running, thereby reducing the maintenance cost, and further performing a very good lubrication capability during a short stroke running.



Brand new U series

Features: the built-in bottom seal does not affect the friction resistance if a clearance is smaller than 0.1mm.

SU series - end, bottom seals

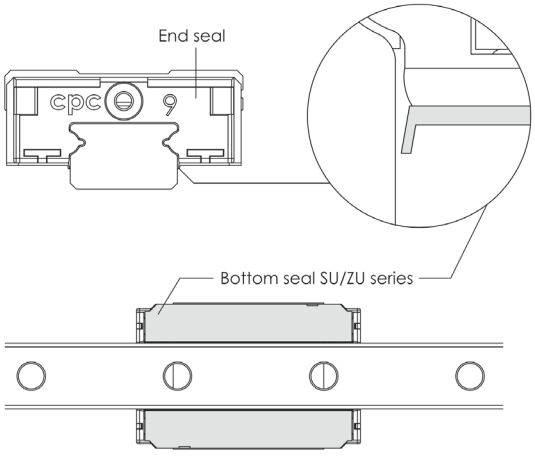
In addition to a normally equipped end seal, a newly designed runner block is equipped with a extra bottom seal, which can prevent foreign matters entering via the lower side of the runner block into the ball running rail, extending the working life of the runner block.

*the new design is recommended for purchase in priority.

ZU series - end, bottom seals and lubrication pad

A newly designed bottom seal can prevent lubrication grease from spilling below the runner block. In addition, a built-in lubrication pad is mounted, further strengthening the effects of saving grease, and exten ding a re-greasing interval.

*the new design is recommended for purchase in priority.



End reinforcing design

EE series-end seal and reinforcing plate

Adopting two pieces of stainless steel reinforcing plate to cover the two plastic ends of the slide block completely with an all cover design, and using stainless steel screws to respectively secure the upper and lower sides of the runner block steel body tightly strengthen the rigidity and coverage of the end cap so as to endure a faster running speed; a gap sealing design is adopted between the reinforcing plate and slide rail, allowing the stainless steel reinforcing plate to have a wiping blade function too.

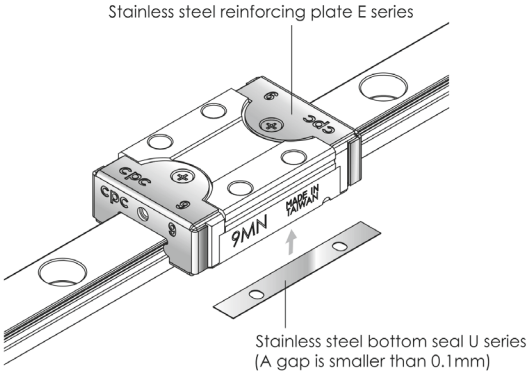
Running speed Vmax=5m/s ، amax=300m/s^2
(60m/s^2 can be reached without prepressing)

EZ series - end seal, reinforcing plate and lubrication pad

The built-in lubrication pads at the two ends of the runner block conform to environmental protection requirements and reduce maintenance cost.

EU series - end seal, stainless steel bottom seal and reinforcing plate

The stainless steel bottom seal protects the runner block of the EU series from the collision of foreign matters from the bottom and hence the damage of the runner block. Therefore, the runner block of this series has the best protection capability among all series; the product is recommended for using in the environment with enormous iron scraps around.



UZ series - end seal, stainless steel bottom seal, reinforcing plate and lubrication pad

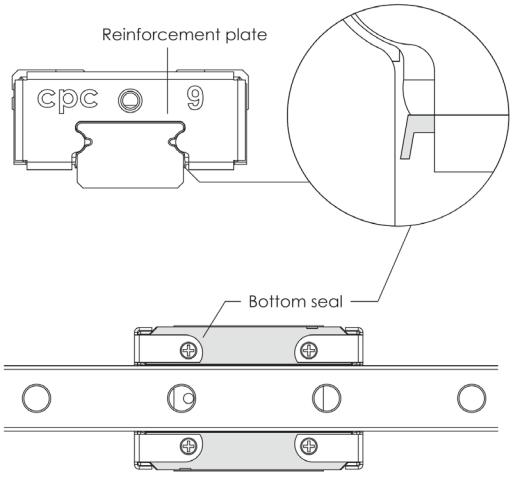
The lubrication pad can provide highly rigid runner block with better lubrication and grease storage capabilities, and reduce re-greasing time.

Brand new UE series

SUE series - end seal, bottom seal and reinforcing plate

Built-in type bottom seal strengthens the dustproof capability of the bottom of the runner block, and the stainless steel reinforcing plate can prevent hard and rigid objects from striking by the plastic cap out of the end; its dustproof effect is the best among all the product series.

*the new design is recommended for purchase in priority.



ZUE series - end seal, bottom seal, reinforcing plate and lubrication pad

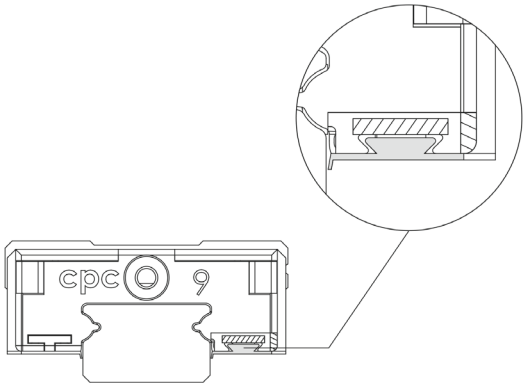
The bottom seal can prevent the lubrication grease from spilling below the runner block, and an built-in lubrication pad is further mounted, further strengthening a grease saving effect.

*the new design is recommended for purchase in priority.

1. Product Introduction

Embedded inverse hook design for reinforced mechanical integration

When the runner block is in motion and changing direction, the circulating stainless steel balls inside the raceway generate impact force against the plastic end cap. As the demand for rapid motion in the automation industry has increased, **cpc** has invented a new design to improve high speed running capability. Plastic inverse hooks for miniature linear blocks tightly secure block components to handle the impact force effectively by distributing the applied stress over a larger area.

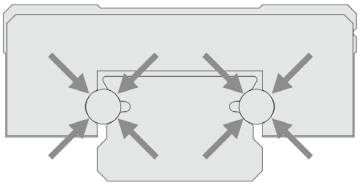


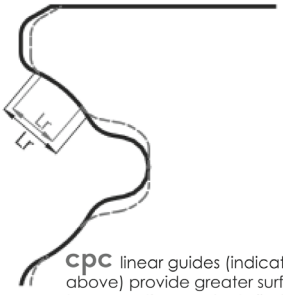
Brand new design

Suitable for :
High speed belt driven mechanism
High speed carrier design
Automation linkage between stations

High load and high moment capacity

The MR Miniature Linear Guide series is designed using two rows of recirculating balls. The design uses a Gothic profile with a 45° contact angle to achieve equal load capacity in all directions. Within the restriction of limited space, larger stainless steel balls are used to enhance the load and torsion resistance capacity.

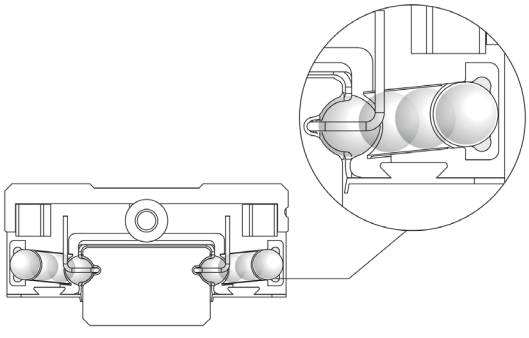




cpc linear guides (indicated with the thick black line above) provide greater surface contact as compared to competing products (indicated with the red-dotted line) when comparing same width rails.

Dust Proof Design

Our standard design comes equipped with an end seal that effectively restricts dust contamination and prolongs lubrication, ensuring longer product life. Specially-designed low friction seal lips do not affect running smoothness.



2. Technical Information

2.1 Precision

Accuracy

MR Miniature Linear Guide series have three accuracy grades (P,H,N) for your choice.

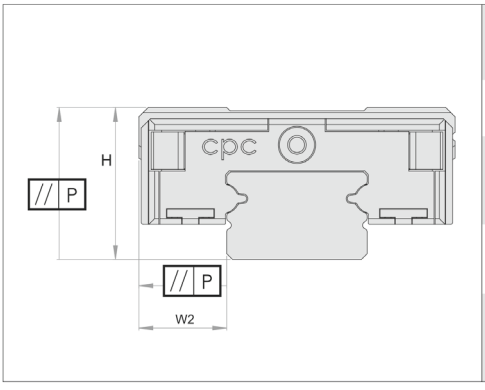


Table of accuracy

Accuracy grades (μm)		Precision P	High H	Normal N
Tolerance of dimension height H	H	±10	±20	±40
Variation of height for different runner Block on the same position of Rail	△H	7	15	25
Tolerance of dimension width W	W_2	±15	±25	±40
Variation of width for different runner Block on same position of Rail	△W_2	10	20	30

Speed

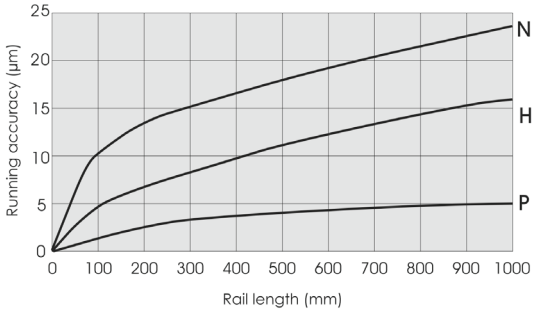
The maximum speed for the standard MR-SS/ZZ,SU/ZU type is:
Vmax = 3 m/s

Maximum acceleration
αmax = 250 m/s²
(If preload V0, capable of reaching 40m/s²)

The maximum speed for the standard MR-EE/EZ,EU/UZ,SUE/ZUE type is:
Vmax > 5 m/s

Maximum acceleration **αmax = 300 m/s²**
(If preload V0, capable of reaching 60m/s²)

Accuracy of the running parallelism



2. Technical Information

2.2 Preload

Preload

The MR Miniature Linear Guide series have three degrees of preload: V0, VS and V1 (as described in the table of preload below.) Preload can enhance stiffness, precision, and torsion resistance, but will negatively affect life and friction.

Table of Preload

Preload type	Model code	Clearance (um)						Application
		3	5	7	9	12	15	
Clearance	V0	+3 – 0	+3 – 0	+4 – 0	+4 – 0	+5 – 0	+6 – 0	Very smooth
Standard	VS	+1 – 0	+1 – 0	+2 – 0	+2 – 0	+2 – 0	+3 – 0	Smooth and precision
Light preload	V1	0 – - 0.5	0 – -1	0 – - 3	0 – - 4	0 – - 5	0 – - 6	High rigidity Minimize vibration High precision Load balance

Operating Temperature

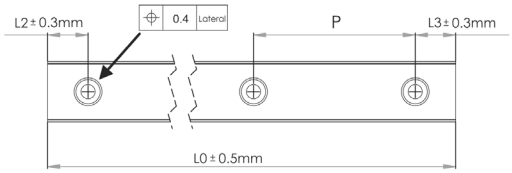
The MR Miniature Linear Guide can operate in a range of temperatures from -40°C~ + 80°C.
For short term operation, it can reach up to +100°C.

3. Ordering Information

3.1 Length of Rail

Length of Rail

Butt-jointing is required when lengths exceed Lmax.
(For detailed information, please contact cpc technical support.)



Model Code

MR	U	15	M	N	K	EE	2	V1	P	-310L	-15	-15	II	J

Customization code

Number of rails on the same moving axis

End hole pitch (mm)

Starting hole pitch(mm)

Rail length (mm)

Accuracy Grades: P(Precision) 、H(High) 、N(Normal)

Preload classes : V0 : Clearance VS : Standard V1 : Light Preload

Block quantity : Quantity of the runner block

SS: With End Seal
ZZ: End seal + Lubrication Storage
SU: End seal + Bottom Seal
ZU: End seal + Bottom Seal + Lubrication Storage
EE: End seal + Reinforcement Plate
EZ: End seal + Reinforcement Plate + Lubrication Storage
EU: End seal + Reinforcement Plate + Stainless Bottom Seal
UZ: End seal + Reinforcement Plate + Stainless Bottom Seal + Lubrication Storage
SUE: End seal + Bottom Seal + Reinforcement Plate
ZUE: End seal + Bottom Seal + Reinforcement Plate + Lubrication Storage

Rail material : No Mark : Standard Rail K : Carbon steel

Block type : L : Long N : Standard

Rail type : M : Standard W : Wide

Rail dimension : The width of rail ex. : 2、3、5、7、9、12、15

Special Rail U : Upward Screwing Rail No Mark : Standard Rail

Product Type: MR: Miniature Linear Guide

Standard type

size	3M	5M	7M	9M	12M	15M
Standard length of one rail (mm)	30	40	40	55	70	70
	40	55	55	75	95	110
	50	70	70	95	120	150
		85	85	115	145	190
		100	100	135	170	230
			130	155	195	270
				175	220	310
				195	245	350
				275	270	390
				375	320	430
					370	470
					470	550
					570	670
						870
Pitch (mm)	10	15	15	20	25	40
L2 , L3min	3	3	3	4	4	4
L2 , L3max	5	10	10	20	20	35
Lmax	300	1000	1000	1000	1000	1000

Wide type

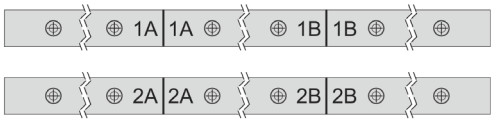
size	2W	3W	5W	7W	9W	12W	15W
Standard length of one rail (mm)	30	40	50	50	50	70	110
	40	55	70	80	80	110	150
	50	70	90	110	110	150	190
			110	140	140	190	230
			130	170	170	230	270
			150	200	200	270	310
			170	260	260	310	430
				290	290	390	550
					320	470	670
						550	790
Pitch (mm)	10	15	20	30	30	40	40
L2 , L3min	3	3	4	3	4	4	4
L2 , L3max	5	10	15	25	25	35	35
Lmax	300	1000	1000	1000	1000	1000	1000

Customization Requirement

The meaning of suffix characters:

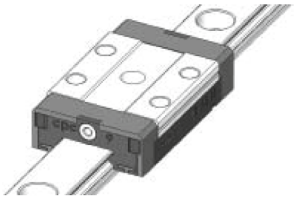
J : Butt-jointing track rail
G : Customer designated lubricant
I : Inspection report
C3 : Cap M3
C4 : Cap M4

R : Special process for rail
B : Special process for block
S : Special straightness for rail
MS : Metal Stopper on stainless steel Rail



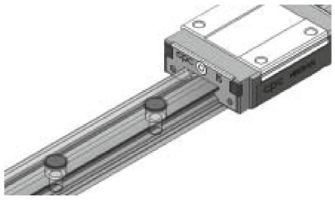
J : Butt-Jointing track rail

When the required length of the customer's rail exceeds the standard rail length, a butt-joint can be specified. The rail butt-joint indication is marked as illustrated above.



B : Special process for block

For special process requirements, please contact technical support.



C3 CapM3 :

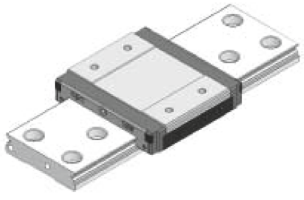
Applies to MR9M, MR12M, MR15M, MR7W & MR9W rails.

C4 CapM4 :

Applies to MR12W, MR15W rails.

R : Special process for rail

For special process requirements, please contact technical support.



S : Special straightness for rail

The straightness of the linear guide rail is specially calibrated by precision fine grinding.

G : Customer designated lubricant

According to application environment.

GN : No lubricant

GC : Low dust generation

Suitable for clean room environments.

I : Inspection report

Please contact technical support.

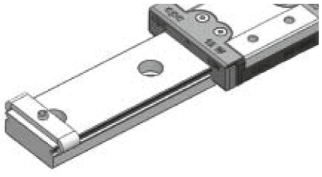
MS : Metal Stopper on stainless steel Rail

1. To prevent the block separates from the rail during the transportation or the installation which may cause the item damaged or even scattered.

2. Perfect plus for the rail installed on the vertical axis (Z axis) to prevent the block separates from the rail due to the gravity.

3. Stoppers and the screws are all made of stainless steel material with anti-corrosion function.

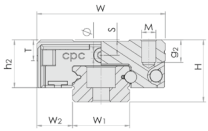
4. Strongly NOT recommended as the mechanical limited stopper being applied.

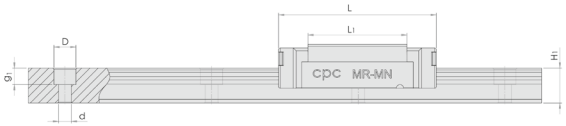


Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

5. Dimensions and Specifications

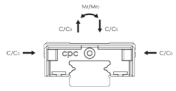
5.2 MR-M SS Series (End seal)
MR-M ZZ Series (End seal , Lubrication Storage)

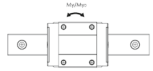


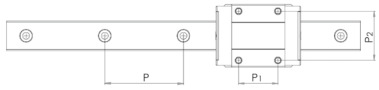


Model Code	Fabricate Dimensions		Rail Dimension(mm)				Block Dimension(mm)						Block Dimension(mm)				Load Capacities(N)		Static Moment(Nm)			Weight		Model Code
	H	W2	W1	H1	P	Dxdxg1	W	L	L1	h2	P1	P2	Mxg2	Ø	S	T	C100 (dyn)	C0 (stat)	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
MR 15ML SS/ZZ	16	8.5	15	9.5	40	6x3.5x4.5	32	60	44	12	25	25	M3x5.5	1.8	3.3	4.3	5350	9080	70	63.3	63.3	90	930	MR 15ML SS/ZZ
MR 15MN SS/ZZ	16	8.5	15	9.5	40	6x3.5x4.5	32	43	27	12	20	25	M3x5.5	1.8	3.3	4.3	3810	5590	43.6	27	27	61	930	MR 15MN SS/ZZ
MR 12ML SS/ZZ	13	7.5	12	7.5	25	6x3.5x4.5	27	47.6	34	10	20	20	M3x3.5	1.3	3.2	4.3	3240	5630	34.9	30.2	30.2	51	602	MR 12ML SS/ZZ
MR 12MN SS/ZZ	13	7.5	12	7.5	25	6x3.5x4.5	27	35.4	22	10	15	20	M3x3.5	1.3	3.2	4.3	2308	3465	21.5	12.9	12.9	34	602	MR 12MN SS/ZZ
MR 9ML SS/ZZ	10	5.5	9	5.5	20	6x3.5x3.5	20	40.9	30.8	7.8	16	15	M3x3.0	1.3	2.2	3.3	2135	3880	18.2	12.4	12.4	28	301	MR 9ML SS/ZZ
MR 9MN SS/ZZ	10	5.5	9	5.5	20	6x3.5x3.5	20	30.6	20.5	7.8	10	15	M3x3.0	1.3	2.2	3.3	1570	2495	11.7	6.4	6.4	18	301	MR 9MN SS/ZZ
MR 7ML SS/ZZ	8	5	7	4.7	15	4.2x2.4x2.3	17	31.2	21.8	6.5	13	12	M2x2.5	1.1	1.6	2.8	1310	2440	9	7.7	7.7	14	215	MR 7ML SS/ZZ
MR 7MN SS/ZZ	8	5	7	4.7	15	4.2x2.4x2.3	17	23.7	14.3	6.5	8	12	M2x2.5	1.1	1.6	2.8	890	1440	5.2	3.3	3.3	8	215	MR 7MN SS/ZZ
MR 5ML SS/ZZ	6	3.5	5	3.5	15	3.5x2.4x1	12	19.6	13.5	4.5	7	-	M2.6x2.0	0.7	1.3	2	470	900	2.4	2.1	2.1	4	116	MR 5ML SS/ZZ
MR 5MN SS/ZZ	6	3.5	5	3.5	15	3.5x2.4x1	12	16	10	4.5	-	8	M2x1.5	0.7	1.3	2	335	550	1.7	1	1	3.5	116	MR 5MN SS/ZZ
MRU 3ML SS	4	2.5	3	2.6	10	M1.6	8	16	11	3	5.5	-	M2x1.1	0.3	0.7	1.5	295	575	0.9	1.1	1.1	1.2	53	MRU 3ML SS
MRU 3MN SS	4	2.5	3	2.6	10	M1.6	8	11.7	6.7	3	3.5	-	M1.6x1.1	0.3	0.7	1.5	190	310	0.6	0.4	0.4	0.9	53	MRU 3MN SS

Load capacities are calculated according to ISO 14728. To compare the rating life definition and the load capacities: $C_{50}=1.26xC_{100}$

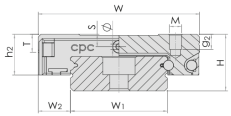




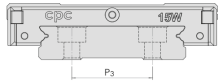


5. Dimensions and Specifications

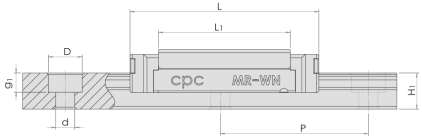
5.7 MR-W SS Series (End seal)
MR-W ZZ Series (End seal , Lubrication Storage)



MR 2W-MR 12W



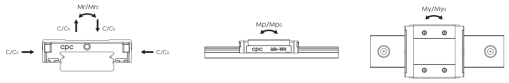
MR 15W

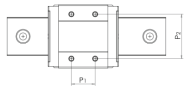


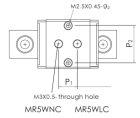
Model Code	Fabricate Dimensions		Rail Dimension(mm)					Block Dimension(mm)						Block Dimension(mm)				Load Capacities(N)		Static Moment(Nm)			Weight		Model Code
	H	W2	W1	H1	P	P3	D x d x g1	W	L	L1	h2	P1	P2	M x g2	Ø	S	T	C100 (dyn)	C0 (stat)	Mr0	Mp0	My0	Block(g)	Rail(g/m)	
MR 15WL SS/ZZ	16	9	42	9.5	40	23	8x4.5x4.5	60	74.4	57.6	12	35	45	M4x4.5	1.8	3.3	4.5	6725	12580	257.6	93.1	93.1	200	2818	MR 15WL SS/ZZ
MR 15WN SS/ZZ	16	9	42	9.5	40	23	8x4.5x4.5	60	55.3	38.5	12	20	45	M4x4.5	1.8	3.3	4.5	5065	8385	171.1	45.7	45.7	137	2818	MR 15WN SS/ZZ
MR 12WL SS/ZZ	14	8	24	8.5	40	-	8x4.5x4.5	40	59.4	46	10.1	28	28	M3x3.5	1.3	3.1	4.5	4070	7800	95.6	56.4	56.4	93	1472	MR 12WL SS/ZZ
MR 12WN SS/ZZ	14	8	24	8.5	40	-	8x4.5x4.5	40	44.4	31	10.1	15	28	M3x3.5	1.3	3.1	4.5	3065	5200	63.7	26.3	26.3	65	1472	MR 12WN SS/ZZ
MR 9WL SS/ZZ	12	6	18	7.3	30	-	6x3.5x4.5	30	50.7	39.5	8.6	24	23	M3x3	1.3	2.6	4	2550	4990	45.9	26.7	26.7	51	940	MR 9WL SS/ZZ
MR 9WN SS/ZZ	12	6	18	7.3	30	-	6x3.5x4.5	30	39.1	27.9	8.6	12	21	M3x3	1.3	2.6	4	2030	3605	33.2	13.7	13.7	37	940	MR 9WN SS/ZZ
MR 7WL SS/ZZ	9	5.5	14	5.2	30	-	6x3.5x3.5	25	40.5	30.1	7	19	19	M3x3	1.1	1.9	3.2	1570	3140	22.65	14.9	14.9	27	516	MR 7WL SS/ZZ
MR 7WN SS/ZZ	9	5.5	14	5.2	30	-	6x3.5x3.5	25	31.6	21.2	7	10	19	M3x3	1.1	1.9	3.2	1180	2095	15	7.3	7.3	19	516	MR 7WN SS/ZZ
MR 5WL SS	6.5	3.5	10	4	20	-	5.5x3x1.6	17	27.2	21.2	5	11	13	M2.5x1.5	0.9	1.2	2.3	615	1315	6.8	4.1	4.1	8	280	MR 5WL SS
MR 5WLC SS	6.5	3.5	10	4	20	-	5.5x3x1.6	17	27.2	21.2	5	11	13	M3/M2.5x1.5	0.9	1.2	2.3	615	1315	6.8	4.1	4.1	8	280	MR 5WLC SS
MR 5WN SS	6.5	3.5	10	4	20	-	5.5x3x1.6	17	21.1	15.1	5	6.5	13	M2.5x1.5	0.9	1.2	2.3	475	900	4.6	2.2	2.2	6	280	MR 5WN SS
MR 5WNC SS	6.5	3.5	10	4	20	-	5.5x3x1.6	17	21.1	15.1	5	6.5	13	M3/M2.5x1.5	0.9	1.2	2.3	475	900	4.6	2.2	2.2	6	280	MR 5WNC SS
* MR 3WL SS/ZZ	4.5	3	6	2.7	15	-	4x2.4x1.5	12	20.1	15.1	3.5	8	-	M2x1.4	0.3	0.8	1.8	370	800	2.5	1.9	1.9	3.4	105	MR 3WL SS/ZZ
* MR 3WN SS/ZZ	4.5	3	6	2.7	15	-	4x2.4x1.5	12	15	10	3.5	4.5	-	M2x1.4	0.3	0.8	1.8	280	530	1.6	0.9	0.9	3.4	105	MR 3WN SS/ZZ
* MR 2WL SS/ZZ	4	3	4	3	10	-	2.8x1.8x1.0	10	17	11.9	3	6.5	-	M2x1.3	-	-	1.3	310	625	1.6	1.2	1.2	3.0	69	MR 2WL SS/ZZ

* Anticipated

Load capacities are calculated according to ISO 14728. To compare the rating life definition and the load capacities: $C_{50}=1.26xC_{100}$

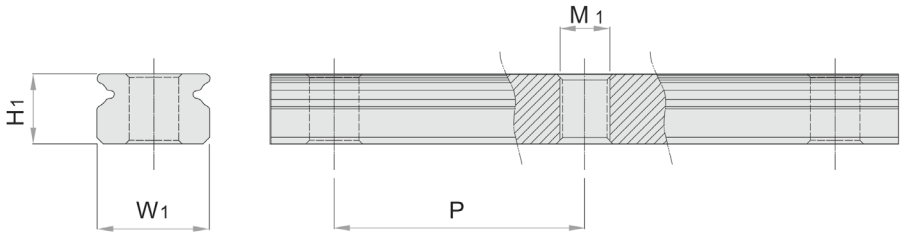






MR5WNC MR5WLC

5. Dimensions and Specifications



5.13 Standard MRU-M series - Tapped from bottom

Dimensions and Specifications

Model Code	Rail Dimensions (mm)			
	H_1	W_1	P	M_1
MRU 15M	9.5	15	40	M4x0.7
MRU 12M	7.5	12	25	M4x0.7
MRU 9M	5.5	9	20	M4x0.7
MRU 7M	4.7	7	15	M3x0.5
MRU 5M	3.5	5	15	M3x0.5
MRU 3M	2.6	3	10	M1.6 x0.35

5.14 Wide MRU-W series - Tapped from bottom

Dimensions and Specifications

Model Code	Rail Dimensions (mm)			
	H_1	W_1	P	M_1
MRU 15W	9.5	42	40	M5x0.8
MRU 12W	8.5	24	40	M5x0.8
MRU 9W	7.3	18	30	M4x0.7
MRU 7W	5.2	14	30	M4x0.7
MRU 5W	4	10	20	M3x0.5
MRU 3W	2.7	6	15	M3x0.5

ST Miniature Stroke Slide series

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

1. Product Introduction

High load and high moment capacity

The ST Miniature Stroke Slide series is designed with two rows of balls. The ball track has a Gothic profile design with a 45 degree contact angle to achieve equal load capacity in a mono block. This provides more space for the larger rolling elements while enhancing the load and moment capacity.

High running accuracy and smoothness

The steel balls of the ST Miniature Stroke Slide series roll on the rail without recirculation, resulting in excellent running behavior, smoothness, low friction, and high accuracy without vibration.

Dual plate design

The ST Miniature Stroke Slide series adopts a pair of end plates into the design. Both the center rail and bearing block sides have a plate installed that prevents the linear guide from over-stroking.

Easy mounting

The mounting of the ST Miniature Stroke Slide series is accomplished by fitting the fixing screw downward into the count bore of the rail by intersecting the bole pattern on the block and cage within a hole pitch. The one piece cage therefore does not influence the mounting of the rail. The preload is preset by ball sorting.

Temperature

The ST Miniature Stroke Slide series can withstand temperatures up to 150° C. There are two treatment options for higher temperature applications:

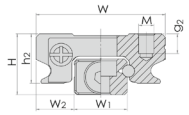
T1 : 200°C
T2 : 300°C

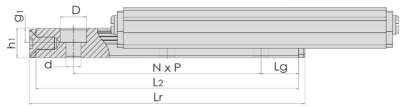
Applying treatments for higher temperature applications will reduce the load capacity.

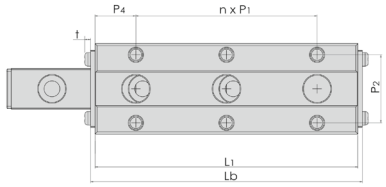
Anti-corrosion feature

The ST Miniature Stroke Slide series is composed of quenched hardened process stainless steel for the rail, block, and steel balls. The block plate and screw are made of stainless steel as well -- great for maintenance and inspection applications.

4. Dimensions and Specifications



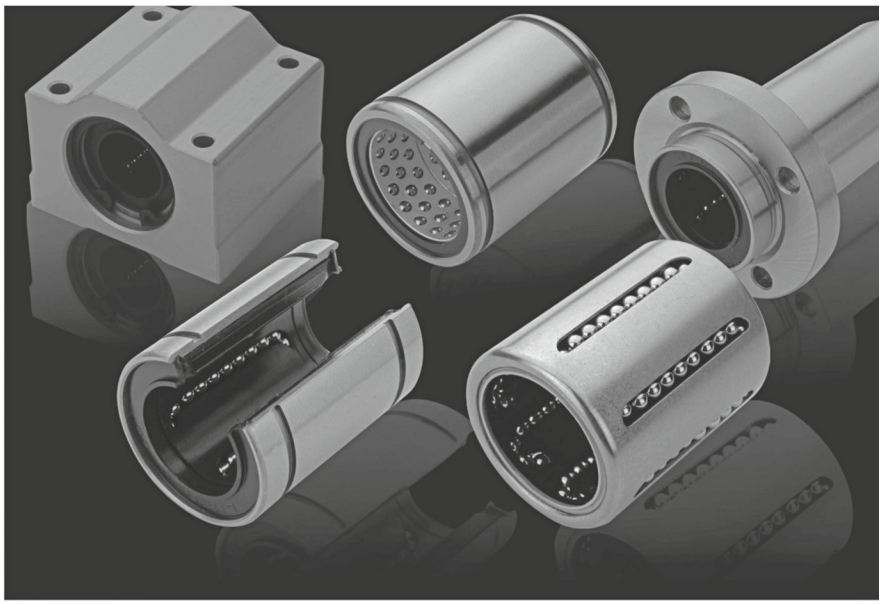




Model Code	Fabricate Dimensions (mm)		Rail Dimensions (mm)				Block Dimensions (mm)						Model Code
	H	W_2	P	W_1	h_1	D x d x g_1	P_1	P_2	W	h_2	Mxg_2	t	
ST7M	8	5	15	7	4.7	4.2x2.4x2.3	15	12	17	6.5	M2x2.5	1	ST7M
ST9M	10	5.5	20	9	5.5	6x3.5x3.5	20	15	20	7.8	M3x3.0	1.3	ST9M
ST12M	13	7.5	25	12	7.5	6x3.5x4.5	25	20	27	10	M3x3.5	1.3	ST12M

Model Code	Max Stroke	Rail Dimensions (mm)				Block Dimensions (mm)				Load Capacities		Static Moment		
	Ls	Lr	L_2	Lg	N	Lb	L_1	P_4	n	C_{100}(dyn)	C_0(stat)	Mr_0	Mp_0	My_0
ST7M	27	30	28	6.5	1	30	28	6.5	1	910	1580	5.9	3.4	3.4
ST7M	41	45	43	6.5	2	45	43	6.5	2	1220	2500	9.1	8	8
ST7M	55	60	58	6.5	3	60	58	6.5	3	1490	3330	12.4	14.6	14.6
ST9M	38	40	38	9	1	40	38	9	1	1590	2773	13.1	6.8	6.8
ST9M	58	60	58	9	2	60	58	9	2	2080	4170	19.7	16	16
ST9M	78	80	78	9	3	80	78	9	3	2520	5547	26.2	29.2	29.2
ST12M	44	50	47.4	11.2	1	50	47.4	11.2	1	2550	4340	27	16	16
ST12M	69	75	72.4	11.2	2	75	72.4	11.2	2	3350	6510	40.1	35.6	35.6
ST12M	94	100	97.4	11.2	3	100	97.4	11.2	3	4050	8670	54	62.8	62.8

cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.



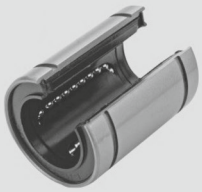
Linear Motion Technology

Linear Motion Ball Bearing

P.07 LM
P.09 LME

P.09 LME···AJ

P.09 LME-OP



P.12 LME···L

P.19 KH

Flanged Linear Motion Ball Bearing

P.43 LMEF

P.43 LMEK

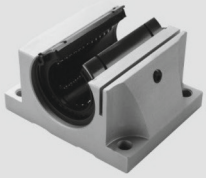
P.45 LMEF···L

P.45 LMEK

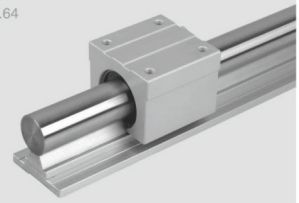
Support Rail Units

SBR系列
P.64

TBR系列
P.65

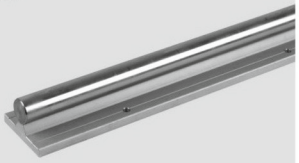


SBR···S系列
P.64

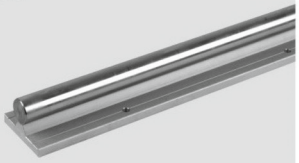


TBR···S系列
P.65

SBS系列
P.62



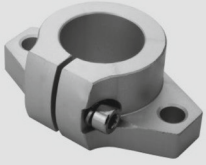
TBS系列
P.63



Shaft Support

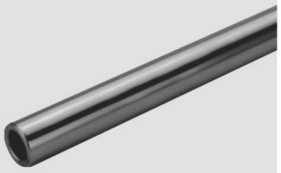
SH系列
P.66

SHF系列
P.67



Linear Shafts

SF系列
P.68

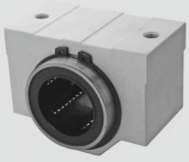


Linear Motion Ball Bearing Slide Units

P.59 SCE

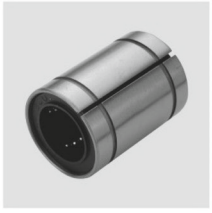
P.59 SCE···L

P.59 SCE···V



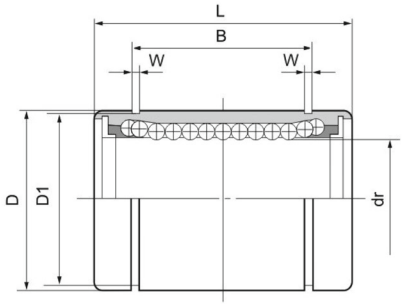
LM···UU (Resin retainer)
This type is a metric dimension series
widely used in Asia and other countries.

LM···UU



LM···UU–AJ

LM···UU–OP

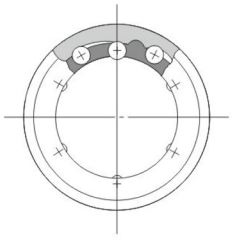


Nominal shaft diameter mm	Resin retainer									mm	dr Tolerance μ m	
	LM···UU	Ball circuit	Weight (gf)	LM···UU–AJ	Ball circuit	Weight (gf)	LM···UU–OP	Ball circuit	Weight (gf)		Precision	High
3	LM3	4	1.35	—	—	—	—	—	—	3	0 -5	0 -8
4	LM4	4	1.9	—	—	—	—	—	—	4		
5	LM5UU	4	4	—	—	—	—	—	—	5		
6	LM6UU	4	7.6	LM6UU-AJ	4	7.5	—	—	—	6	0 -6	0 -9
8	LM8SUU	4	10.4	LM8SUU-AJ	4	10	—	—	—	8		
8	LM8UU	4	15	LM8UU-AJ	4	14.7	—	—	—	8		
10	LM10UU	4	29.5	LM10UU-AJ	4	29	LM10UU-OP	3	23	10		
12	LM12UU	4	31.5	LM12UU-AJ	4	31	LM12UU-OP	3	25	12		
13	LM13UU	4	43	LM13UU-AJ	4	42	LM13UU-OP	3	34	13		
16	LM16UU	5	69	LM16UU-AJ	5	68	LM16UU-OP	4	52	16		
20	LM20UU	5	87	LM20UU-AJ	5	85	LM20UU-OP	4	69	20	0 -7	0 -10
25	LM25UU	6	220	LM25UU-AJ	6	216	LM25UU-OP	5	188	25		
30	LM30UU	6	250	LM30UU-AJ	6	245	LM30UU-OP	5	210	30		
35	LM35UU	6	390	LM35UU-AJ	6	384	LM35UU-OP	5	335	35	0 -8	0 -12
40	LM40UU	6	585	LM40UU-AJ	6	579	LM40UU-OP	5	500	40		
50	LM50UU	6	1,580	LM50UU-AJ	6	1,560	LM50UU-OP	5	1,340	50		
60	LM60UU	6	1,860	LM60UU-AJ	6	1,820	LM60UU-OP	5	1,610	60	0 -9	0 -15
80	LM80UU	6	4,420	LM80UU-AJ	6	4,300	LM80UU-OP	5	3,650	80		
100	LM100UU	6	8,600	LM100UU-AJ	6	8,540	LM100UU-OP	5	7,200	100	0 -10	0 -20
120	LM120UU	8	15,000	LM120UU-AJ	8	14,900	LM120UU-OP	6	11,600	120		
150	LM150UU	8	20,250	LM150UU-AJ	8	20,150	LM150UU-OP	6	15,700	150	0 -13	0 -25

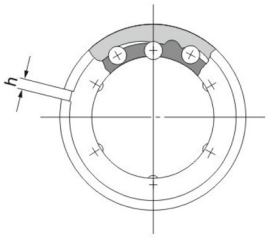
Seal type:
LM20UU

No entry	No seals
U	Seal on one side
UU	Seal on both sides

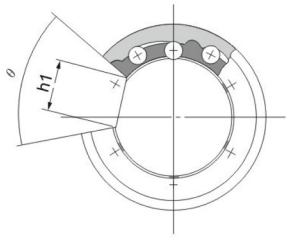
Note: Smaller sizes (3 and 4mm I.D.) are non–seal type only.



LM···UU



LM···UU–AJ



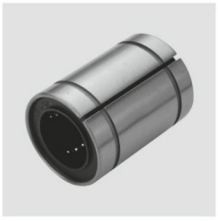
LM···UU–OP

Major dimensions and tolerance											Eccentricity μm		Radial clearance (Max) μm	Basic load rating	
	D		L		B	W	D_1	h	h_1	Θ					
mm	Tolerance μm	mm	Tolerance μm	mm	Tolerance μm	mm	mm	mm	mm		Precision	High		Dynamic Co N	Static Co N
7	0 −9	10	0 −120	—	—	—	—	—	—	—	4	8	−3	69	105
8		12		—	—	—	—	—	—	—				88	127
10		15		10.2	0 −200	1.1	9.6	—	—	—				167	206
12	0 −11	19	0 −200	13.5		1.1	11.5	1	—	—	8	12		206	265
15		17		11.5		1.1	14.3	1	—	—				176	216
15		24		17.5		1.1	14.3	1	—	—				274	392
19	0 −13	29		22		1.3	18	1	6.8	80°			−4	372	549
21		30		23		1.3	20	1.5	8	80°				510	784
23		32		23		1.3	22	1.5	9	80°				510	784
28		37		26.5		1.6	27	1.5	11	80°			−6	774	1,180
32	0 −16	42		30.5		1.6	30.5	1.5	11	60°	10	15		882	1,370
40		59	0 −300	41	0 −300	1.85	38	2	12	50°				980	1,570
45		64		44.5		1.85	43	2.5	15	50°			−8	1,570	2,740
52	0 −19	70		49.5		2.1	49	2.5	17	50°	12	20		1,670	3,140
60		80		60.5		2.1	57	3	20	50°			−10	2,160	4,020
80		100		74		2.6	76.5	3	25	50°			−13	3,820	7,940
90	0 −22	110		85		3.15	86.5	3	30	50°	17	25		4,700	10,000
120		140	0 −400	105.5	0 −400	4.15	116	3	40	50°			−20	7,350	16,000
150	0 −25	175		125.5		4.15	145	3	50	50°	20	30		14,100	34,800
180		200		158.6		4.15	175	3	85	80°			−25	16,400	40,000
180	0 −29	240		170.6		5.15	204	3	105	80°	25	40		21,100	54,300

SIUNIT: 1N≈0.102kgf

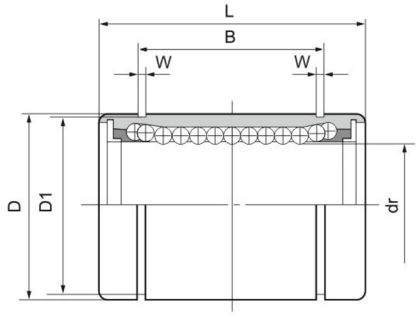
LME···UU (Resin retainer)
This type is a metric dimension series generally used in Europe.

LME···UU



LME···UU–AJ

LME···UU–OP

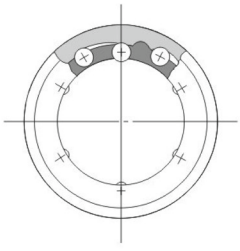


Nominal shaft diameter mm	Resin retainer									mm	dr Tolerance μm	
	LM···UU	Ball circuit	Weight (gf)	LM···UU–AJ	Ball circuit	Weight (gf)	LM···UU–OP	Ball circuit	Weight (gf)		Precision	High
3	LME3	4	1.35	—	—	—	—	—	—	3		
4	LME4	4	1.9	—	—	—	—	—	—	4		
5	LME5UU	4	11	LME5UU–AJ	4	10	—	—	—	5	—	+8 0
8	LME8UU	4	20	LME8UU–AJ	4	19.5	—	—	—	8		
10	LME10UU	4	29.5	LME10UU–AJ	4	29	LME10UU–OP	3	23	10		
12	LME12UU	4	41	LME12UU–AJ	4	40	LME12UU–OP	3	32	12		
16	LME16UU	5	57	LME16UU–AJ	5	56	LME16UU–OP	4	44	16	—	+9 −1
20	LME20UU	5	91	LME20UU–AJ	5	90	LME20UU–OP	4	75	20		
25	LME25UU	6	215	LME25UU–AJ	6	212	LME25UU–OP	5	181	25	—	+11 −1
30	LME30UU	6	325	LME30UU–AJ	6	320	LME30UU–OP	5	272	30		
40	LME40UU	6	705	LME40UU–AJ	6	694	LME40UU–OP	5	600	40	—	+13 −2
50	LME50UU	6	1,130	LME50UU–AJ	6	1,110	LME50UU–OP	5	970	50		
60	LME60UU	6	2,000	LME60UU–AJ	6	2,050	LME60UU–OP	5	1,580	60		

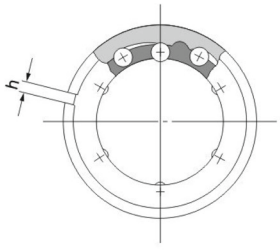
Seal type:
LME20UU

No entry	No seals
U	Seal on one side
UU	Seal on both sides

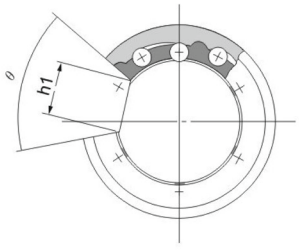
Note: Smaller sizes (3 and 4mm I.D.) are non–seal type only.



LME···UU



LME···UU–AJ

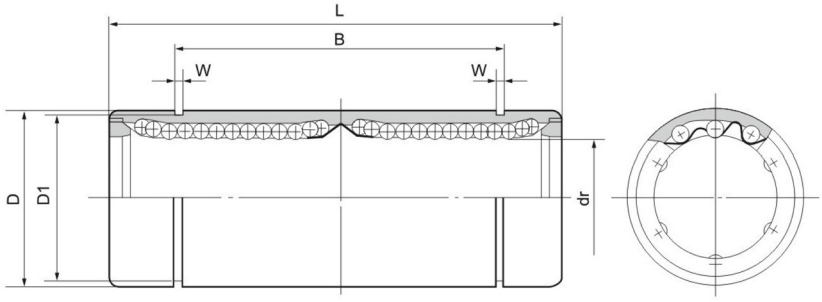


LME···UU–OP

Major dimensions and tolerance											Eccentricity μm	Radial clearance (Max) μm	Basic load rating	
mm	D Tolerance μm	mm	L Tolerance μm	mm	B Tolerance μm	W mm	D_1 mm	h mm	h_1 mm	Θ			Dynamic Co N	Static Co N
7	0 −8	10	0 −120	—	—	—	—	—	—	—	10	−3	69	105
8		12		—	—	—	—	—	—	—			88	127
12		22	0 −200	14.5	0 −200	1.1	11.5	1	—	—	12		206	265
16		25		16.5		1.1	15.2	1	—	—			265	402
19	0 −9	29		22		1.3	18	1	6.8	80°		−4	372	549
22		32		22.9		1.3	21	1.5	7.5	78°			510	784
26		36		24.9		1.3	24.9	1.5	10	78°			578	892
32	0 −11	45		31.5		1.6	30.3	2	10	60°	15	−6	862	1370
40		58	0 −300	44.1	0 −300	1.85	37.5	2	12.5	60°			980	1570
47		68		52.1		1.85	44.5	2	12.5	50°		−8	1570	2740
62	0 −13	80		60.6		2.15	59	3	16.8	50°	17		2160	4020
75		100		77.6		2.65	72	3	21	50°		−13	3820	7940
90	0 −15	125	0 −400	101.7	0 −400	3.15	86.5	3	27.2	54°	20		4700	9800

SIUNIT：1N≈0.102kgf

LME···LUU (Resin retainer)
This type is a metric dimension series generally used in Europe.



LME···LUU

Nominal shaft diameter mm	LME···LUU	Ball circuit	主要尺寸和公差 Major dimensions and tolerance										Eccentricity μm	Basic load arting		Weight (gf)
			dr		D		L		B		W	D_1		Dynamic Co N	Static Co N	
			mm	Tolerance μm	mm	Tolerance μm	mm	Tolerance μm	mm	Tolerance μm	mm	mm				
8	LME6LUU	4	8	+9 −1	16		46		33		1.1	15.2		421	804	40
12	LME12LUU	4	12		22	0 −11	61	0 −300	45.8	0 −300	1.3	21	15	813	1,570	80
16	LME16LUU	5	16	+11 −1	26		68		49.8		1.3	24.9		921	1,780	115
20	LME20LUU	5	20		32		80		61		1.6	30.5		1,370	2,740	180
25	LME25LUU	6	25	+13 −2	40	0 −13	112		82		1.85	38	17	1,570	3,140	430
30	LME30LUU	6	30		47		123		104.2		1.85	44.5		2,500	5,490	615
40	LME40LUU	6	40		62	0 −15	151	0 −400	121.2	0 −400	2.15	59	20	3,430	8,040	1,400
50	LME50LUU	6	50	+16 −4	75		192		155.2		2.65	72		6,080	15,900	2,320
60	LME60LUU	6	60		90	0 −20	209		170		3.15	86.5	25	7,550	20,000	3,920

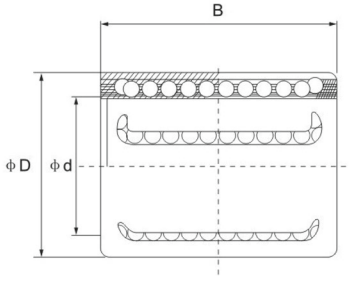
SIUNIT: 1N≈0.102kgf

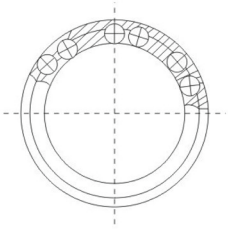
Seal type:

LME20LUU

No entry	No seals
UU	Seal on both sides

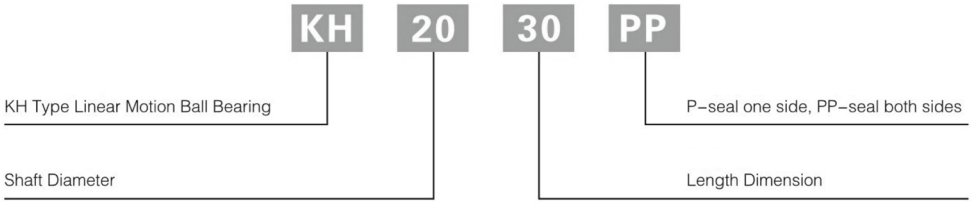
KH···



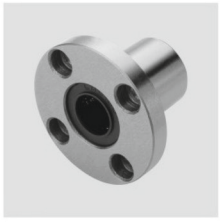


Designation	Major dimensions (mm)			Basic load rating		Weight (gf)
	Φd	ΦD	B	Dynamic Co N	Static Co N	
KH0622	6	12	22	400	239	7
KH0824	8	15	24	435	280	12
KH1026	10	17	26	500	370	14.5
KH1228	12	19	28	620	510	18.5
KH1428	14	21	28	620	520	20.5
KH1630	16	24	30	800	620	27.5
KH2030	20	28	30	950	790	32.5
KH2540	25	35	40	1,990	1,670	66
KH3050	30	40	50	2,800	2,700	95
KH4060	40	52	60	4,400	4,450	182
KH5070	50	62	70	5,500	6,300	252

Type number format

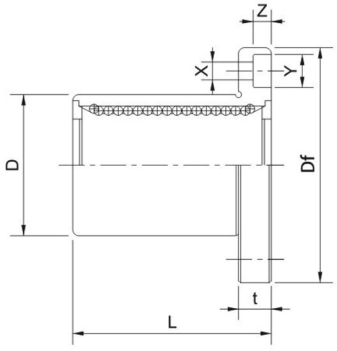


LMEF(K)···UU (Resin retainer)
This type is a metric dimension series generally used in Europe.



LMEF···UU

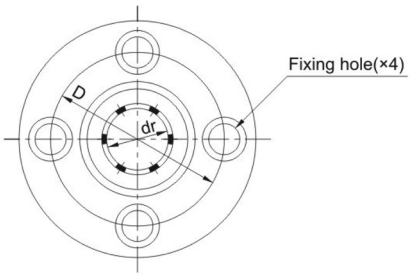
LMEK···UU



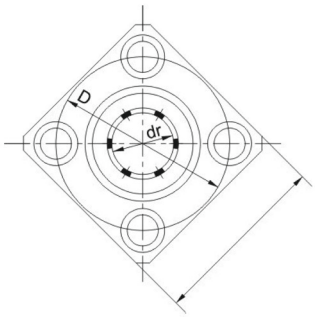
Nominal shaft diameter mm	LMEF···UU	Weight (gf)	LMEK···UU	Weight (gf)	Major dimensions and tolerance					
					dr		D		L	
					mm	Tolerance μm	mm	Tolerance μm	mm	Tolerance μm
5	LMEF5UU	26	LMEK5UU	20	5	+8 0	12	0 −8	22	±300
8	LMEF8UU	41	LMEK8UU	33	8		16		25	
12	LMEF12UU	80	LMEK12UU	64	12		22	0 −9	32	0 −200
16	LMEF16UU	103	LMEK16UU	90	16	+9 −1	26		36	
20	LMEF20UU	182	LMEK20UU	147	20		32	0 −11	45	
25	LMEF25UU	335	LMEK25UU	295	25	+11 −1	40		58	0 −300
30	LMEF30UU	560	LMEK30UU	465	30		47		68	
40	LMEF40UU	1,175	LMEK40UU	975	40	+13 −2	62	0 −13	80	
50	LMEF50UU	1,745	LMEK50UU	1,545	50		75		100	
60	LMEF60UU	3.220	LMEK60UU	2,780	60		90	0 −15	125	0 −400
80	LMEF80UU	6,420	LMEK80UU	5,920	80	+16 −4	120		165	

Seal type:
LMEF20UU

No entry	No seals
UU	Seal on both sides



LMEF···UU



LMEK···UU

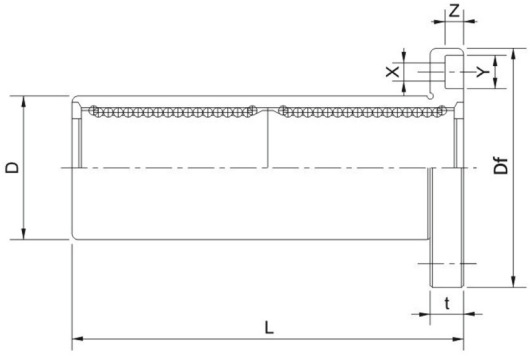
Major dimensions and tolerance							Eccentricity μ m	Squareness μ m	Basic load rating	
Flange										
Df mm	K mm	t mm	Dp mm	X mm	Y mm	Z mm			Dynamic C N	Static Co N
28	22	5	20	3.5	6	3.1	12	12	206	265
32	25	5	24	3.5	6	3.1			265	402
42	32	6	32	4,5	7.5	4.1			510	784
46	35	6	36	4,5	7.5	4.1			578	892
54	42	8	43	5.5	9	5.1	15	15	862	1,370
62	50	8	51	5.5	9	5.1			980	1,570
76	60	10	62	6.6	11	6.1			1,570	2,740
98	75	13	80	9	14	8.1	17	17	2,160	4,020
112	88	13	94	9	14	8.1			3,820	7,940
134	106	18	112	11	17	11.1	20	20	4,700	9,800
164	136	18	142	11	17	11.1			7,350	16,000

SIUNIT: 1N≈0.102kgf

/IEF(K)···LUU (Resin retainer)
iis type is a metric dimension series
enerally used in Europe.

LMEF···LUU

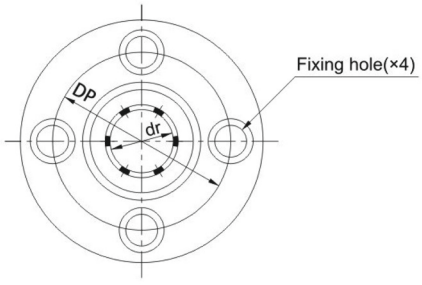
LMEK···LUU



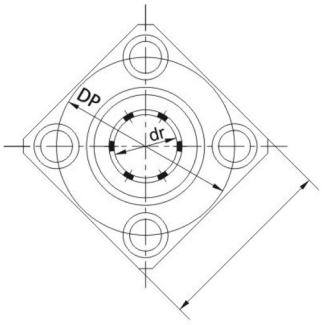
Nominal shaft diameter mm	LMEF···LUU	Weight (gf)	LMEK···LUU	Weight (gf)	Major dimensions and tolerance					
					dr		D		L	
					mm	Tolerance μm	mm	Tolerance μm	mm	Tolerance μm
8	LMEF8LUU	59	LMEK8LUU	51	8	+9	16	0 −9	46	± 300
12	LMEF12LUU	110	LMEK12LUU	90	12	−1	22	0	61	0 −300
16	LMEF16LUU	160	LMEK16LUU	135	16	+11	26	−11	68	
20	LMEF20LUU	260	LMEK20LUU	225	20	−1	32	0 −13	80	
25	LMEF25LUU	540	LMEK25LUU	500	25	+13	40		112	0 −400
30	LMEF30LUU	815	LMEK30LUU	720	30	−2	47		123	
40	LMEF40LUU	1,805	LMEK40LUU	1,600	40	+16 −4	62	0 −15	151	
50	LMEF50LUU	2,820	LMEK50LUU	2,620	50		75		192	
60	LMEF60LUU	4,920	LMEK60LUU	4,480	60		90	0 −20	209	

Seal type:
LMEF20LUU

No entry	No seals
UU	Seal on both sides



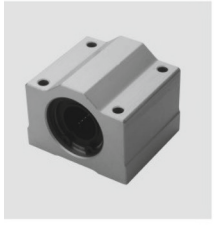
LMEF···LUU



LMEK···LUU

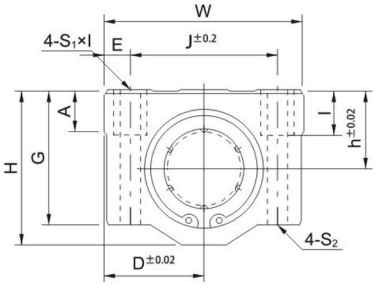
Major dimensions and tolerance							Eccentricity μm	Squareness μm	Basic load rating	
Flange										
Df mm	K mm	t mm	Dp mm	X mm	Y mm	Z mm			Dynamic C N	Static Co N
32	25	5	24	3.5	6	3.1	15	15	421	804
42	32	6	32	4,5	7.5	4.1			813	1,570
46	35	6	36	4,5	7.5	4.1			912	1,780
54	42	8	43	5.5	9	5.1	17	17	1,370	2,740
62	50	8	51	5.5	9	5.1			1,570	3,140
76	60	10	62	6.6	11	6.1			2,500	5,490
98	75	13	80	9	14	8.1	20	20	3,430	8,040
112	88	13	94	9	14	8.1			6,080	15,900
134	106	18	112	11	17	11.1	25	25	7,550	20,000

SIUNIT: 1N≈0.102k

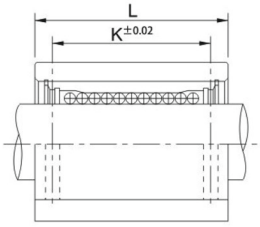


SCE···UU

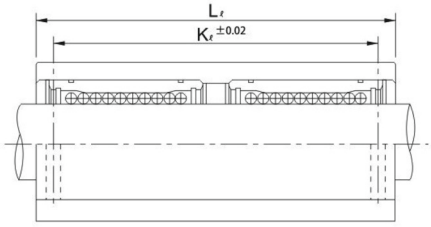
SCE···LUU



Standard		Basic load rating		Weight (gf)	Length Type		Basic load rating		Weight (gf)	Shorten Type	
Designation	Liner Bearing	Dynamic C N	Static Co N		Designation	Liner Bearing	Dynamic C N	Static Co N		Designation	Liner Bearing
SCE8UU	LME8UU	260	400	80	SCE8LUU	2×LME8UU	410	800	98	SCE8SUU	LME8UU
SCE12UU	LME12UU	410	590	118	SCE12LUU	2×LME12UU	650	1,180	232	SCE12SUU	LME12UU
SCE16UU	LME16UU	770	1,170	180	SCE16LUU	2×LME16UU	1,230	2,340	360	SCE16SUU	LME16UU
SCE20UU	LME20UU	860	1,370	245	SCE20LUU	2×LME20UU	1,370	2,740	490	SCE20SUU	LME20UU
SCE25UU	LME25UU	980	1,560	550	SCE25LUU	2×LME25UU	1,560	3,120	1,100	SCE25SUU	LME25UU
SCE30UU	LME30UU	1,560	2,740	760	SCE30LUU	2×LME30UU	2,490	5,480	1,525	SCE30SUU	LME30UU
SCE40UU	LME40UU	2,150	4,010	1,700	SCE40LUU	2×LME40UU	3,440	8,020	3,400	SCE40SUU	LME40UU
SCE50UU	LME50UU	3,820	7,930	2,950	SCE50LUU	2×LME50UU	6,110	15,860	5,920	SCE50SUU	LME50UU



SCE···UU



SCE···LUU

Basic load rating		Weight (gf)	Dimensions (mm)																
			Shaft Diameter	Nominal Dimensions (mm)										SC···UU		SC···LUU		SC···SU
Dynamic C N	Static Co N			h	D	W	H	G	A	J	E	S1 × l	S2	K	L	Kℓ	Lℓ	Ls
260	400	40	ϕ8	11	17	34	22	18	6	24	5	M4 × 8	ϕ3.4	18	30	42	58	14.4
410	590	82	ϕ12	15	22	44	30	24	8	33	5.5	M5 × 10	ϕ4.3	26	39	64	77	20.3
770	1,170	122	ϕ16	19	25	50	38.5	32.5	9	36	7	M5 × 12	ϕ4.3	34	44	79	89	22.3
860	1,370	176	ϕ20	21	27	54	41	35	11	40	7	M6 × 12	ϕ5.2	40	53	90	106	28.3
980	1,560	400	ϕ25	26	38	76	51.5	41	12	54	11	M8 × 18	ϕ7.0	50	67	119	136	40.4
1,560	2,740	570	ϕ30	30	39	78	59.5	49	15	58	10	M8 × 18	ϕ7.0	58	76	132	154	48.4
2,150	4,010	1,320	ϕ40	40	51	102	78	62	20	80	11	M10 × 25	ϕ8.7	60	90	150	180	56.5
3,820	7,930	1,900	ϕ50	52	61	122	102	80	25	100	11	M10 × 25	ϕ8.7	80	110	200	230	72.3

SB S ···A –1000L

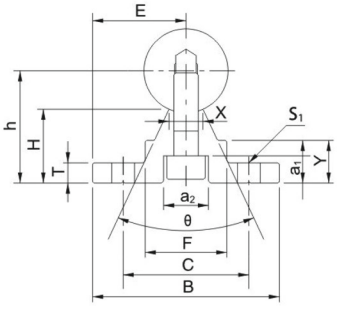
SB支撑导轨
SB Support Rail

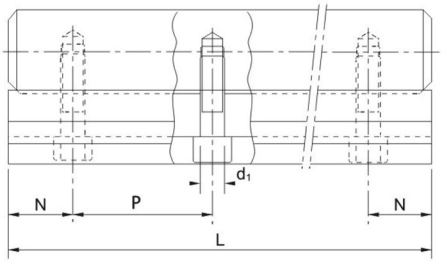
S: 带轴 With shaft
–: 不带轴 No shaft

支撑轨长度 Lenght of Rail

轴径 Shaft Diameter

★下表中的长度尺寸为推荐的标值用户订货时需要提供图纸。
We could manufacture according to customer's requirements.





型号 Designation	轴径 Shaft Diameter	尺寸 Nominal Dimensions (mm)														重量 Weight (kgf/m)
		E	h	B	H	T	F	X	Y	C	θ	S_1	a_1	a_2	d_1	
SBS16A	ϕ16	20	25	40	17.8	5	18.5	8	11.7	30	80°	ϕ5.5	6	9.5	5.5	2.56
SBS20A	ϕ20	22.5	27	45	17.7	5	19	8	10	30	50°	ϕ5.5	6.5	11	6.6	3.50
SBS25A	ϕ25	27.5	33	55	21	6	21.5	8	12	35	50°	ϕ6.6	6.5	11	6.6	5.30
SBS30A	ϕ30	30	37	60	22.8	7	26.5	10.3	13	40	50°	ϕ6.6	8.5	14	9	7.38
SBS35A	ϕ35	32.5	43	65	26.5	8	28	13	15.5	45	50°	ϕ9.0	8.5	14	9	9.68
SBS40A	ϕ40	37.5	48	75	29.4	9	38	16	17	55	50°	ϕ9.0	8.5	14	9	12.69
SBS50A	ϕ50	47.5	62	95	38.8	11	45	20	21	70	50°	ϕ11	12.5	19	11	20.46

支撑轨标准长度和主要尺寸
Support Rail Standard Length and Dimensions

型号 Designation	SBS16A	SBS20A	SBS25A	SBS30A	SBS35A	SBS40A	SBS50A
Standard Length L	190	340	250	450	460	460	470
	340	640	450	850	660	660	670
	640	940	850	1,250	860	860	870
	940	1,240	1,250	1,450	1,060	1,060	1,070
						1,260	1,270
N	20	20	25	25	30	30	35
P	150	150	200	200	200	200	200
Max.Length	1,390	1,390	1,850	1,850	1,860	1,860	2,070

Shaft Diameter

SBR···S **2A** + **1000L**

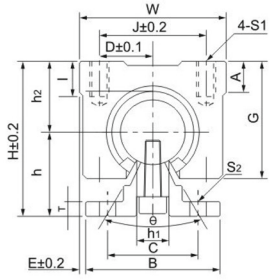
SBR Support Rail Units

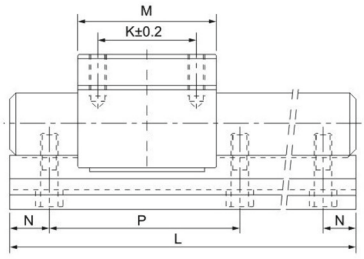
Number of the Units On One Support Rail

Rail Length

The main lengths of rails and slide units can be searched on the form of SBS series.

** Units Designation

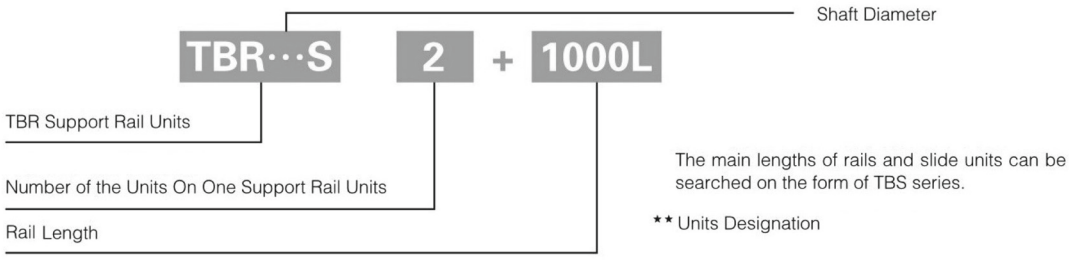


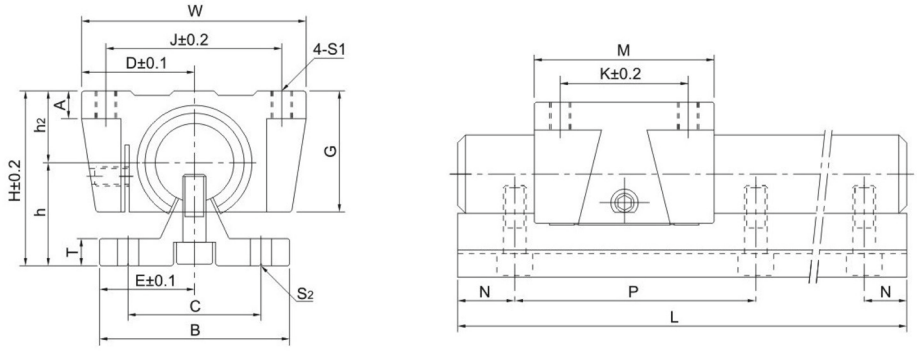


Designation		Shaft Diameter	Basic load rating		Weight (gf)		Dimensions (mm)				
Rail Units	Slide Units**		Dynamic C N	Static Co N	Slide Units (kgf)	Rails (kgf/m)	D	h	H	E	θ
SBR16SA	SBR16UUA	ϕ16	770	1,170	0.15	2.56	22.5	25	45	2.5	80°
SBR20SA	SBR20UUA	ϕ20	860	1,370	0.20	3.50	24	27	50	1.5	60°
SBR25SA	SBR25UUA	ϕ25	980	1,560	0.45	5.30	30	33	60	2.5	50°
SBR30SA	SBR30UUA	ϕ30	1,560	2,740	0.63	7.38	35	37	70	5	50°
SBR35SA	SBR35UUA	ϕ35	1,660	3,130	0.92	9.68	40	43	80	7.5	50°
SBR40SA	SBR40UUA	ϕ40	2,150	4,010	1.33	12.69	45	48	90	7.5	50°
SBR50SA	SBR50UUA	ϕ50	3,820	7,930	3.00	20.46	60	62	115	12.5	50°

Designation	Dimensions (mm)												
	W	G	A	B	T	M	$S_1 \times 1$	J	K	S_2	C	N	P
SBR16SA	45	33	9	40	5	45	M5 × 12	32	30	ϕ5.5	30	20	150
SBR20SA	48	39	11	45	5	50	M6 × 12	35	35	ϕ5.5	30	20	150
SBR25SA	60	47	14	55	6	65	M6 × 12	40	40	ϕ6.6	35	25	200
SBR30SA	70	56	15	60	7	70	M8 × 18	50	50	ϕ6.6	40	25	200
SBR35SA	80	63	18	65	8	80	M8 × 18	55	55	ϕ9.0	45	30	200
SBR40SA	90	72	20	75	9	90	M10 × 20	65	65	ϕ9.0	55	30	200
SBR50SA	120	91	25	95	11	110	M10 × 25	94	80	ϕ11	70	35	200

Designation	Dimensions (mm)											Designation	Basic load rating		Weight (gf)
	h_2	D	W	M	G	h_1	θ	K	S_1	I	A		Dynamic C N	Static Co N	
SBR16LUU	20	22.5	45	85	33	10	80°	60	M5	12	9	2 × LM16UUOP	1,548	2,360	300
SBR20LUU	23	24	48	96	39	10	60°	70	M6	12	11	2 × LM20UUOP	1,764	2,740	400
SBR25LUU	27	30	60	130	47	11.5	50°	100	M6	12	14	2 × LM25UUOP	1,960	3,140	900
SBR30LUU	33	35	70	140	56	14	50°	110	M8	18	15	2 × LM30UUOP	3,140	5,480	1,260
SBR40LUU	42	45	90	175	72	19	50°	140	M10	20	20	2 × LM40UUOP	4,320	8,040	2,660

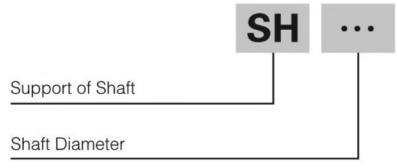


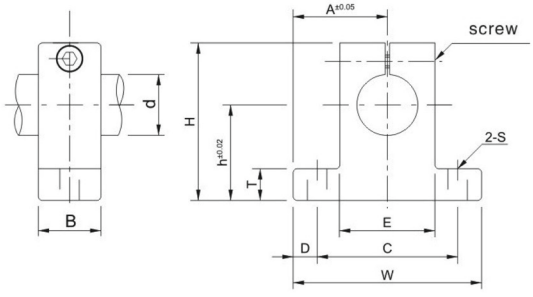


Designation		Shaft Diameter	Basic load rating		Weight (gf)		Dimensions (mm)			
Rail Units	Slide Units **		Dynamic C N	Static Co N	Slide Units (kgf)	Rails (kgf/m)	D	h	H	E
TBR16S	TBR16UU	16	392	490	0.18	2.45	31	22	40	25
TBR20S	TBR20UU	20	784	1176	0.30	3.60	34	29	50	27.5
TBR25S	TBR25UU	25	1568	2352	0.60	5.60	41	32	60	32.5
TBR30S	TBR30UU	30	1764	2940	0.90	8.00	45.5	36.5	70	37.5

Designation	尺寸 Dimensions (mm)												
	W	G	A	B	T	M	S_1	J	K	S_2	C	N	P
TBR16S	62	26	8	50	6	42	M5	50	30	ϕ5.5	37	20	150
TBR20S	68	31	10	55	8	51	M6	54	37	ϕ5.5	40	20	150
TBR25S	82	41	12	65	10	65	M8	65	50	ϕ6.6	45	25	200
TBR30S	91	48	12	75	12	75	M8	75	60	ϕ6.6	55	25	200

Slide Support

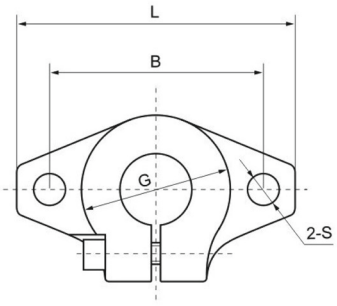


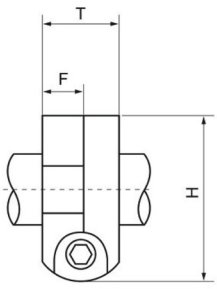


SH

Designation	Shaft Diameter	Dimensions (mm)											Weight (gf)
		h	A	W	H	T	E	D	C	B	S	J	
SH8	ϕ8	20	21	42	32.8	6	18	5	32	14	ϕ5.5	M4	24
SH10	ϕ10	20	21	42	32.8	6	18	5	32	14	ϕ5.5	M4	24
SH12	ϕ12	23	21	42	37.5	6	20	5	32	14	ϕ5.5	M4	30
SH13	ϕ13	23	21	42	37.5	6	20	5	32	14	ϕ5.5	M4	30
SH16	ϕ16	27	24	48	44	8	25	5	38	16	ϕ5.5	M4	40
SH20	ϕ20	31	30	60	51	10	30	7.5	45	20	ϕ6.6	M5	70
SH25	ϕ25	35	35	70	60	12	38	7	56	24	ϕ6.6	M6	130
SH30	ϕ30	42	42	84	70	12	44	10	64	28	ϕ9	M6	180
SH35	ϕ35	50	49	98	82	15	50	12	74	32	ϕ11	M8	270
SH40	ϕ40	60	57	114	96	15	60	12	90	36	ϕ11	M8	420
SH50	ϕ50	70	63	126	120	18	74	13	100	40	ϕ14	M12	750
SH60	ϕ60	80	74	148	136	18	90	14	120	45	ϕ14	M12	1100

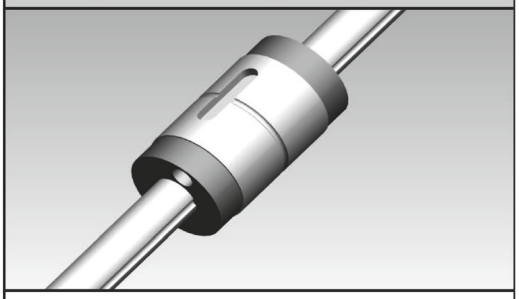
SHF





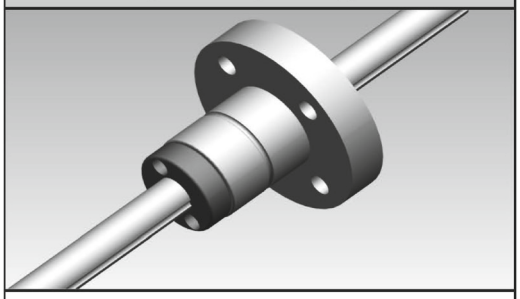
Designation	Shaft Diameter	Dimensions (mm)							Mounting bolt designation	Clamping bolt designation	Weight (gf)
		L	T	F	B	G	H	S			
SHF10	ϕ 10	43	10	5	32	20	24	5.5	M5	M4	13
SHF12	ϕ 12	47	13	7	36	25	28	5.5	M5	M4	20
SHF13	ϕ 13	47	13	7	36	25	28	5.5	M5	M4	20
SHF16	ϕ 16	50	16	8	40	28	31	5.5	M5	M4	27
SHF20	ϕ 20	60	20	8	48	34	37	7	M6	M5	40
SHF25	ϕ 25	70	25	10	56	40	42	7	M6	M5	60
SHF30	ϕ 30	80	30	12	64	46	50	9	M8	M6	110
SHF35	ϕ 35	92	35	14	72	50	58	12	M10	M8	380
SHF40	ϕ 40	102	40	16	80	56	67	12	M10	M10	510
SHF50	ϕ 50	122	50	19	96	70	83	14	M12	M12	890
SHF60	ϕ 60	140	60	23	112	82	95	14	M12	M12	1,500

Cylindrical Ball Spline Type SLT



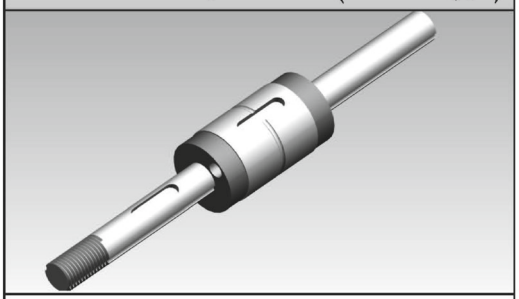
The spline nut is of a straight cylindrical shape. When it is necessary to apply a torque, insert a key into the keyway. Type SLT is the most compact of all Ball Spline types.

Flanged Ball Spline Type SLF



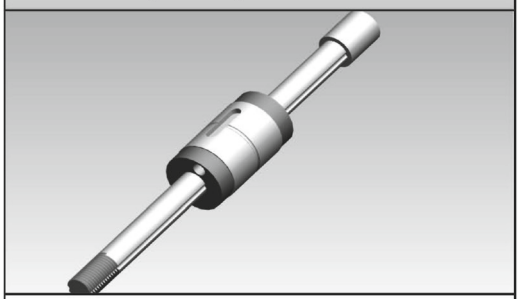
The spline nut can be attached to the housing via the flange, making assembly simple. It is most suitable where the housing may deform if a keyway is cut thereon, and where housing width is limited. Knock pins that can be driven into the flange completely eliminate the angular backlash that occurs in fitting part.

Precision Solid Spline Shaft (Stanard Type)



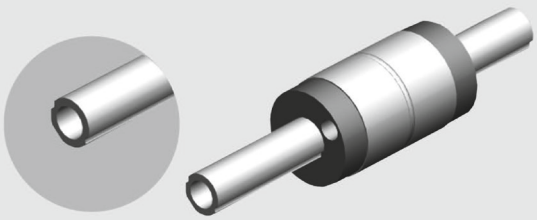
The spline shaft is formed by cold drawing, and the raceways are cut into the shaft to a high degree of precision. A spline nut is attached to the resulting spline shaft.

Special Spline Shaft



A shaft with a greater diameter at its ends or mid-point can be produced upon request, by machining it to the required spline shape.

Hollow Spline Shaft (Type H)



This type is made hollow through cold drawing. Enable it to accommodate pipes and vent air or to reduce its weight.

Table 8 presents guidelines for determining the appropriate clearance in the rotational direction for the given Ball Spline operating conditions. The rotational clearance of the Ball Spline significantly affects the accuracy and rigidity of the spline nut. Therefore it is critical to select the clearance best suited for the intended uses of the Ball Spline. Normally, the Ball Spline in use is preloaded. When it is subjected to repeated swiveling and reciprocal linear motion, a system receives heavy vibration and impact. In such an environment, preloading prolongs the service life and improves accuracy.

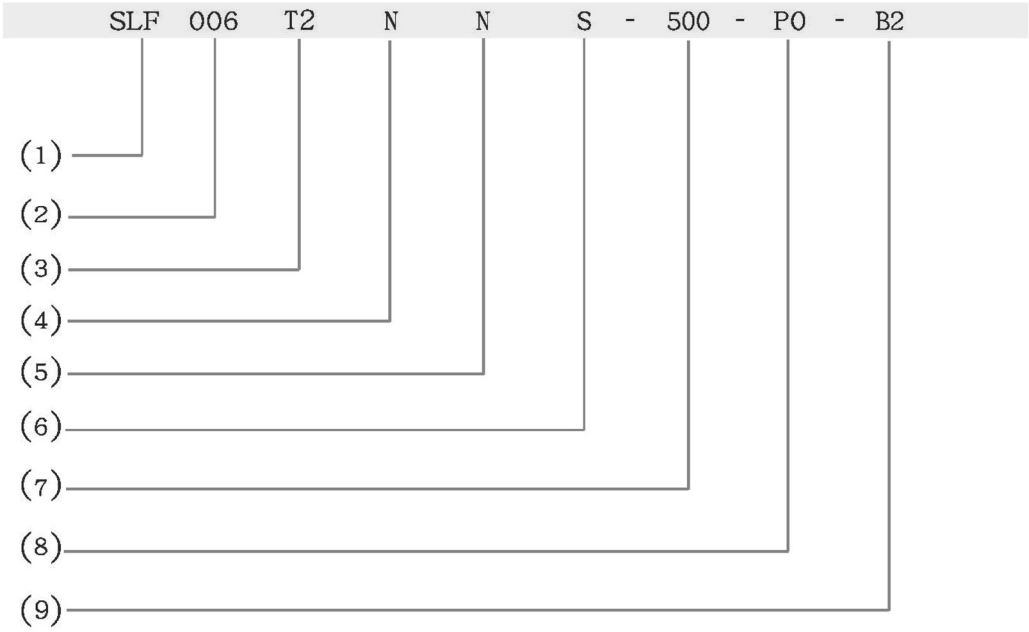
Table 8. Guidelines for Determining an Appropriate Ball-Spline Clearance in the Rotational Direction.

	Preload	Operating conditions	Sample conditions
Clearance in the Rotational Direction	Medium Preload P2	• High rigidity is required. Vibration and impact are severe. • The moment load must be borne by a single spline nut.	Construction-work-vehicle steering shaft; spot-welding-machine shaft; automatic-lathe-tool rest indexing shaft.
	Slight Preload P1	• Overhang loads and moments are applied. • Highly reproducible accuracy is required. • Alternate loads are applied.	Industrial robot arm; various automatic loaders; automatic-painting-machine guide shaft; electric-discharge-machine spindle; press die-set guide shaft; drilling-machine spindle.
	Normal P0	• Smooth movement should be achieved with only a low magnitude of force. • Torque is continually applied in a given direction	Various measuring instruments; automatic drafting machine; shape-measuring instrument; dynamometer; wire winder; automatic arc cutter; honing-machine spindle; automatic packing machine.

Table 9. SLT and SLF Clearance in the Rotational Direction

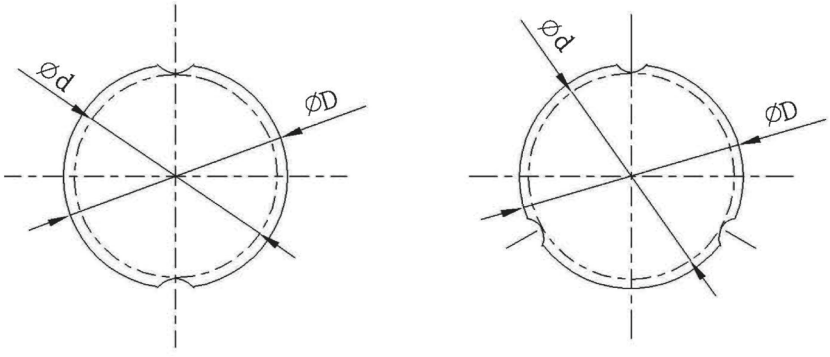
Unit: μm

Nominal Shaft Diameter \ Preload				Normal	Slight Preload	Medium Preload
				P0	P1	P2
6	8	10	13	−2 ~ + 1	−6 ~ −2	-
16		20		−2 ~ + 1	−6 ~ −2	−9 ~ −5
25		30		−3 ~ + 2	−10 ~ −4	−14 ~ −8
40		50		−4 ~ + 2	−16 ~ −8	−22 ~ −14



(1)	Spline Nut	SLF: Flange Type SLT: Cylindrical Type
(2)	Shaft Diameter	Unit: mm
(3)	No. of Trains	T2: Two Trains T4: Four Trains
(4)	Type of Flange	N: No Cutting (Round) S: Single Cutting D: Double Cutting (No Symbol When It is Without the Flange)
(5)	Accuracy Grade	N: Normal Grade H: High Grade P: Precision Grade
(6)	Type of Spline Shaft	S: Solid Spline Shaft H: Hollow Spline Shaft
(7)	Length of Spline Shaft	Unit: mm
(8)	Preload	P0: Zero Preload P1: Slight Preload P2: Medium Preload
(9)	Number of Nuts	(No Symbol When It is One) E.g. Two Nuts : B_2

Table (16) and (17) present Solid Spline Shaft cross-sectional shape and Hollow Spline-Shaft cross-sectional shape. If only, rework shaft ends to a cylindrical shaft, limit the diameter to minor diameter (∅d) or less.



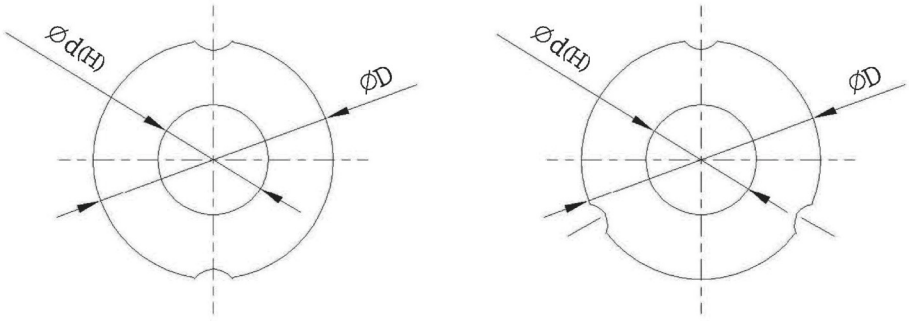
D ≤ 20　　D ≥ 25

Solid Spline Shaft

Table 16 Solid Spline Shaft Cross-Sectional Shape

Unit : mm

Nominal Shaft Diameter / Data	6	8	10	13	16	20	25	30	40	50
Minor Diameter ϕd	5.25	7.27	8.97	11.82	14.72	18.63	23.43	28.53	37.3	47.05
Outer Diameter ϕD h7	6	8	10	13	16	20	25	30	40	50
Mass (kg/m)	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25



$D \leq 20$ $D \geq 25$

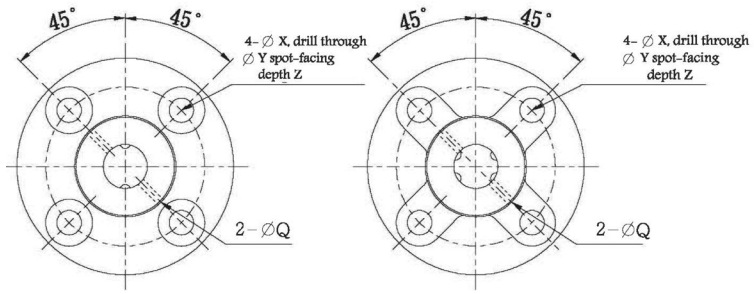
Hollow Spline Shaft

Table 17 Hollow Spline Shaft Cross-Sectional Shape

Unit: mm

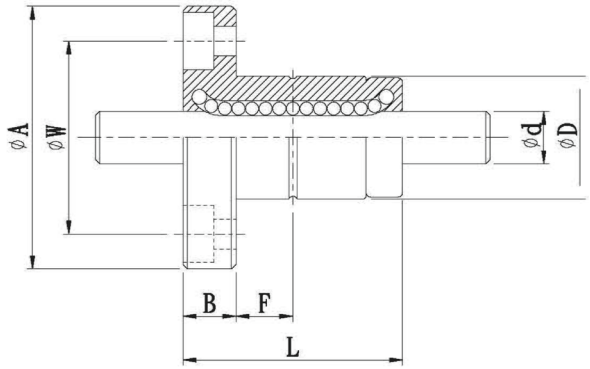
Nominal Shaft Diameter / Data	6	8	10	13	16	20	25	30	40	50
Hollow Diameter ϕd	2	3	4	7	8	10	15	16	20	26
Outer Diameter ϕD h7	6	8	10	13	16	20	25	30	40	50
Mass kg/m)	0.177	0.33	0.506	0.872	1.25	1.82	2.92	3.93	6.75	11.4

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

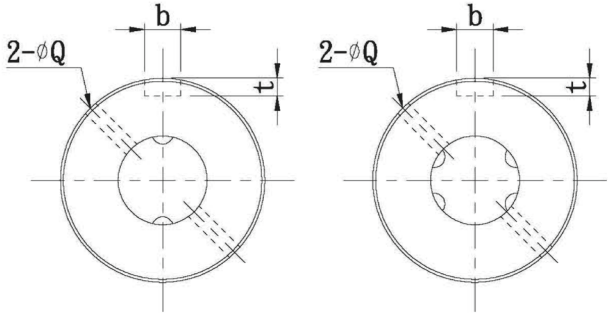


SLF 20 or Lower
(Two Trains of Balls)

SLF 25 or Higher
(Four Trains of Balls)

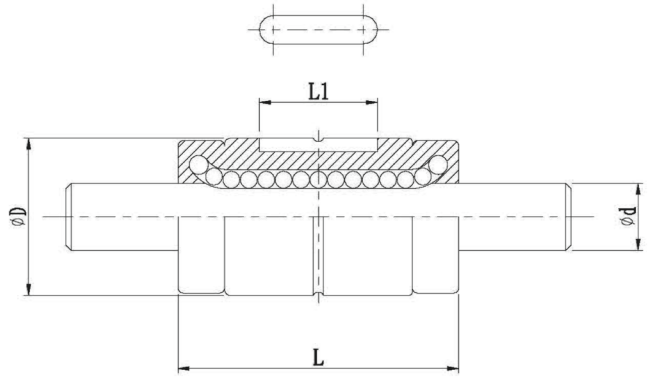


Model No	Spline-Nut Dimensions								Shaft Diameter	No. of Trains of Balls	Basic Load Rating		Basic Torque Rating		Static Permissible Moment		Mass	
	D	L	A	B	F	Oil Hole Q	W	Mounting Hole X x Y x Z	d h7		C kgf	C_0 kgf	C_T kgf · m	C_{0T} kgf · m	M_{A1} kgf · m	M_{A2} kgf · m	Spline Nut g	Spline Shaft kg/m
SLF 6	14	25	30	8	7.5	1	22	3.4x6.5x4.5	6	2	137	225	0.46	0.76	0.39	3.48	36.7	0.22
SLF 8	16	27	32	8	7.5	1.5	24	3.4x6.5x4.5	8	2	137	225	0.60	0.99	0.39	3.82	47	0.39
SLF 10	21	33	42	9	10.5	1.5	32	4.5x8x4	10	2	285	397	1.62	2.25	0.95	8.53	100	0.60
SLF 13	24	36	44	9	11	1.5	33	4.5x8x4.5	13	2	396	540	2.89	3.94	1.50	12.46	117	1.03
SLF 16	31	50	51	10	18	2	40	4.5x8x6	16	2	545	849	4.77	7.43	3.71	26.09	226	1.56
SLF 20	35	56	58	10	18	2	45	5.5x9.5x5.4	20	2	724	1109	7.90	12.09	5.53	38.00	303	2.44
SLF 25	42	71	65	13	26.5	3	52	5.5x9.5x8	25	4	1003	1593	21.99	43.01	10.35	68.59	458	3.80
SLF 30	47	80	75	13	30	3	60	6.6x11x8	30	4	1160	1980	30.26	62.93	15.68	93.27	633	5.49
SLF 40	64	100	100	18	36	4	82	9x14x12	40	4	2972	4033	105.37	176.05	36.59	246.34	1430	9.69
SLF 50	80	125	124	20	46.5	4	102	11x17.5x12	50	4	4086	5615	179.89	304.35	51.58	428.72	2756	15.19



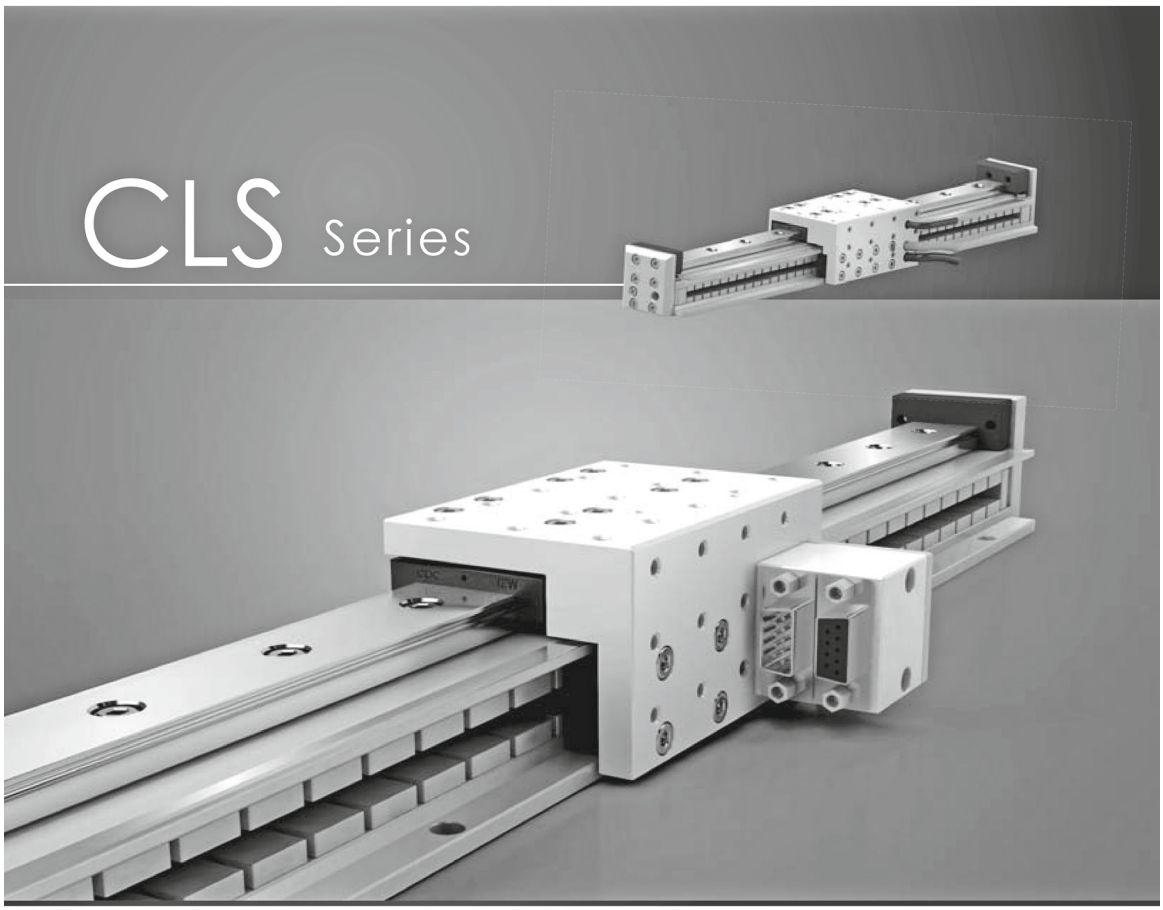
SLT 20 or Lower
(Two Trains of Balls)

SLT 25 or Higher
(Four Trains of Balls)



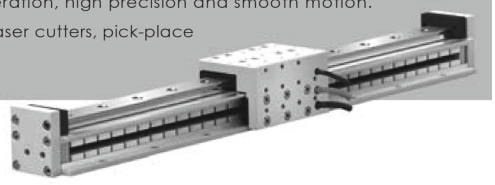
Model No	Spline-Nut Dimensions				Keyway Dimensions		Shaft Diameter		Basic Load Rating		Basic Torque Rating		Static Permissible Moment		Mass	
	D	L	L1	Oil Hole Q	b H8	t +0.05 0	d h7	No. of Trains of Balls	C kgf	C0 kgf	CT kgf · m	C0T kgf · m	MA1 kgf · m	MA2 kgf · m	Spline Nut g	Spline Shaft kg/m
SLT 6	14	25	10.5	1	2.5	1.2	6	2	137	225	0.46	0.76	0.39	3.48	14	0.22
SLT 8	16	27	10.5	1.5	2.5	1.2	8	2	137	225	0.60	0.99	0.39	3.82	16	0.39
SLT 10	21	33	13	1.5	3	1.5	10	2	285	397	1.62	2.25	0.95	8.53	37	0.60
SLT 13	24	36	15	1.5	3	1.5	13	2	396	540	2.89	3.94	1.50	12.46	52	1.03
SLT 16	31	50	17.5	2	3.5	2	16	2	545	849	4.77	7.43	3.71	26.09	130	1.56
SLT 20	35	56	29	2	4	2.5	20	2	724	1109	7.90	12.09	5.53	38.00	188	2.44
SLT 25	42	71	36	3	4	2.5	25	4	1003	1593	21.99	43.01	10.35	68.59	285	3.80
SLT 30	47	80	42	3	4	2.5	30	4	1160	1960	30.26	62.93	15.68	93.27	395	5.49
SLT 40	64	100	52	4	6	3.5	40	4	2972	4033	105.37	176.05	36.59	264.34	843	9.69
SLT 50	80	125	58	4	8	4	50	4	4086	5615	179.89	304.35	51.58	428.72	1758	15.19

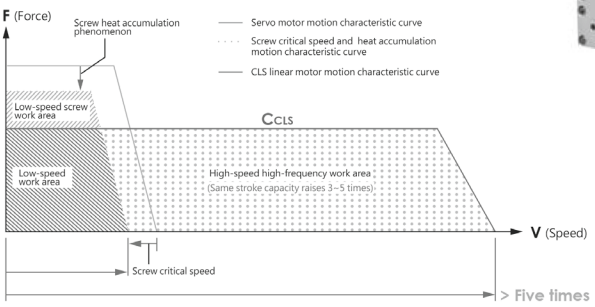
cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.



Compact Linear motor Stage

CLS is a series of structurally compact linear motor modules. It tightly integrates a ironless linear motor, linear guide, optical scale and base.With its zero cogging force, high acceleration, high precision and smooth motion.
It is high suitable for in applications such as AOI equipment, laser cutters, pick-place and scanning.



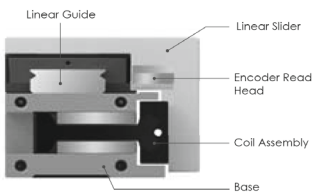


Compared to traditional ball screw modules, CLS series with direct drive coupling provides superior precision and velocity under many thrust output conditions.
At the same time providing the same highly integrated mechanical design. Enabling increased productivity and reliability as a direct replacement.

Features

1 High rigidity、Compact structure

CLS combines the base, Linear motor, wide type linear guide supporting a aluminum slider and optical scale for position feedback.
The entire module achieves high integration and rigidity, providing the user with an optimal choice under a given thrust requirement.



2 Lightweight 、High velocity and acceleration

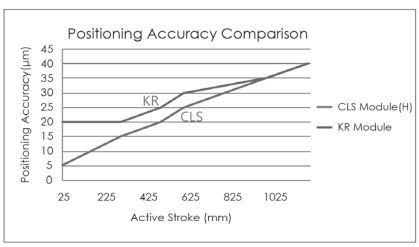
The linear motor in CLS is of the ironless type, combined with an aluminum slider it presents a low self load.
This forms a combination suitable for high acceleration and high velocity motion.

3 Smooth motion

CLS uses ironless linear motor as the actuator with no cogging force, achieving high stability under low and high velocity motion.

4 High precision

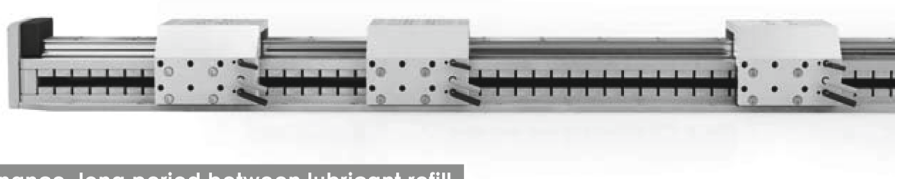
High precision positioning fully closed loop control with optical encoder based feedback. Optional precision grades of Normal (N), High (H) or custom (P) for even higher precision.



Customers can customize for higher accuracy P class CLS Module.

8 Multiple slider on same axis

CLS can contains multiple sliders on the same axis, each individually controllable.



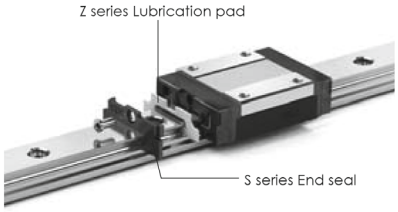
6 Easy maintenance, long period between lubricant refill

CLC uses linear motor and slider with built-in lubrication pad, increasing lubrication life and reapplication period.

Environmentally friendly lubrication design

Z series-end seal and lubrication pad

The two ends of the runner blocks are respectively provided with a hermetically sealed lubrication grease injection design, capable of bringing the lubrication grease to the raceway by means of steel ball circulation, thereby achieving a lubrication effect. A built-in lubrication pad is optionally provided upon the design, further preserving the lubrication effect during long-term running, thereby reducing the maintenance cost, and further provides enhanced lubrication capability during short stroke running.



7 High speed linear guide design

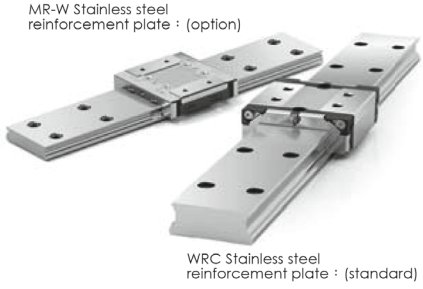
WRC-Series- Ball Type Linear Guide wide Model

CLS-PBX Series-This moduleequipped with WRC-linear guide, the block uses stainless steel reinforcement plate to enhance rigidity which can **Vmax=10m/s，αmax=450m/sec²**

MR-W Series-Miniature Linear Guide

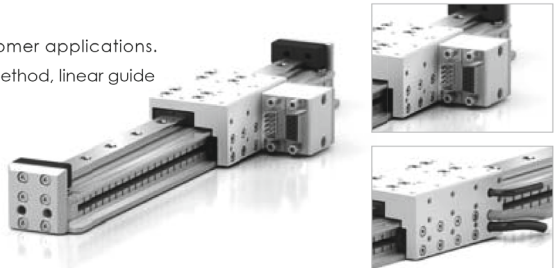
CLS-PM & CLS-PAX Series -This module equipped with miniature linear guide, which can endure **Vmax=3m/s，αmax=250m/sec²**

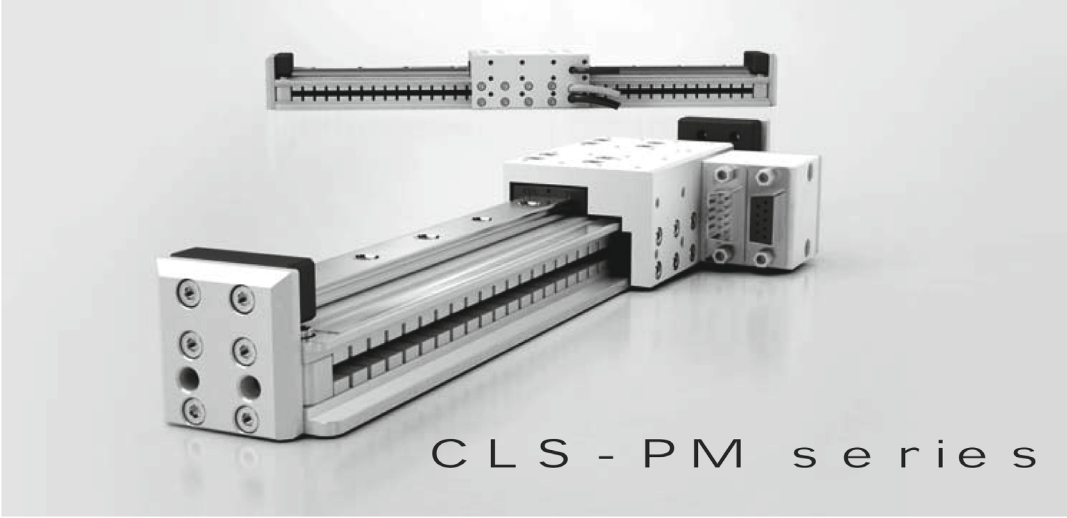
Under high speed application,(customized code:/V), the block equipped with stainless steel reinforcement plate, the capability increasing to **Vmax=9m/s，αmax=300m/sec²**



5 Customization

CLS modules can be customized for specific customer applications. Options include: Mounting hole position, cable exit method, linear guide model, weight reduction, specific travel range etc.





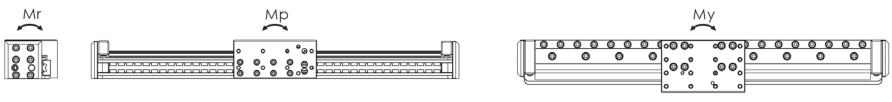
CLS-PM Module Parameters

CLS		PM-4			PM-6		
Motor parameters							
Continuous Force (N)		18.5			25.5		
Peak Force (N)		74			102.5		
Continuous Current (Apeak)		5			4.6		
Peak Current (Apeak)		20			18.4		
Force Constant (N/Apeak)		3.7			5.5		
Back EMF constant (VL-L/m/s)		4.3			6.5		
Resistance (Ohms)		1.2			1.7		
Inductance (mH)		0.04			0.07		
Magnetic Pole Pitch (mm)		15			15		
Stage parameters							
Total Length (mm)		152	332	512	152	332	512
Effective Travel (mm)		45	225	405	15	195	375
Slider Mass (kg)[1]		0.25			0.35		
Module Weight(kg)[1]		0.7	1.4	2.1	0.9	1.5	2.2
Accuracy[2]							
Straightness/Flatness(µm)		6	8	10	6	8	10
Repeatability(µm)[3]		±1	±1	±1	±1	±1	±1
		Linear Guide Rated Load and Static Moment					
Model Code		MR7WN			MR7WL		
Block quantity		2			2		
Load Capacity (KN)	C (dyn)	2.4			3.1		
	Co (stat)	4.2			6.3		
Static Moment (Nm)	Mro(Nm)	30			45.3		
	Mpo(Nm)	40.7			97.2		
	Myo(Nm)	40.7			97.2		

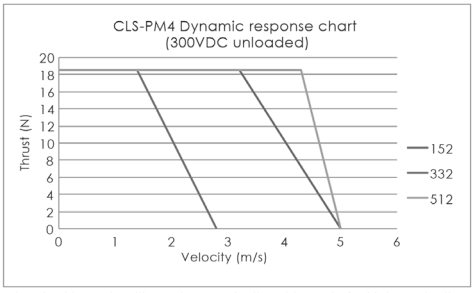
(1) Moving Load refers to mass before addition of payload mass. This includes the slider platform, motor forcer, linear guide, cabling, optical encoder read head etc. For the Connector type termination option it is 0.12kg.

(2) All listed precision figures are for the High Precision grade (H grade). There are no precision measurement specifications for the Normal grade.

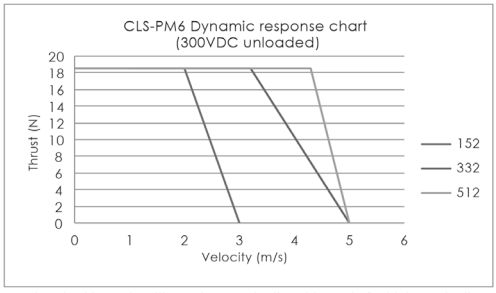
(3) System repeatability can be increase with the selection 0.5µm or 0.1µm grade optical encoders.



Dynamic Characteristics

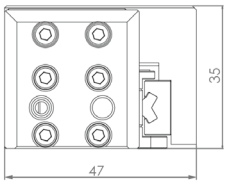


The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact cpc

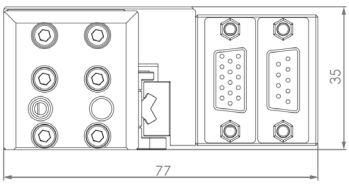


The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact cpc

Assembly Dimensions



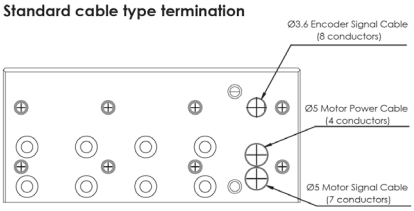
Standard cable type termination



Connector type termination

Wiring Definition

Standard cable type termination

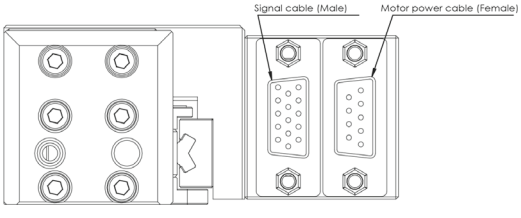


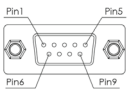
OUTPUT CABLE

Motor Wire Table		Hall Sensor Wire Table and Thermal Protection Wire Table			
Color	Function	Color	Function	Color	Function
White	phase U	Pink	Hall A U phase	Brown/Blue	Thermal sensor
Yellow	phase V	Yellow	Hall B V phase		
Brown	phase W	Green	Hall C W phase		
Green	PE	Grey	Hall IC + 5V		
		White	GND		

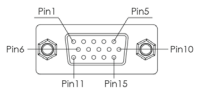
Encoder Signal connections	
Color	Function
Black	GND
Brown	Index-
Blue	B-
Yellow	A-
Red	5V
Orange	Index+
Purple	B+
Green	A+

Connector type termination





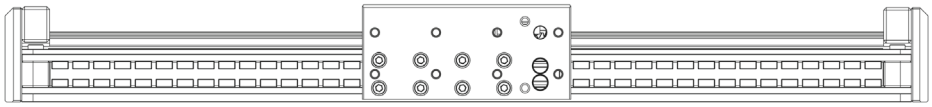
Power cable pin out	
Pin No.	Function
1	U
2	
6	
3	V
7	
8	
4	W
5	
9	
Frame	Isolation & GND

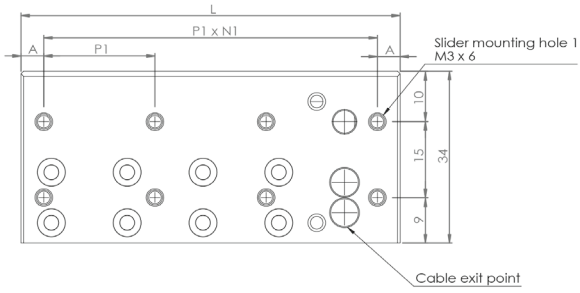


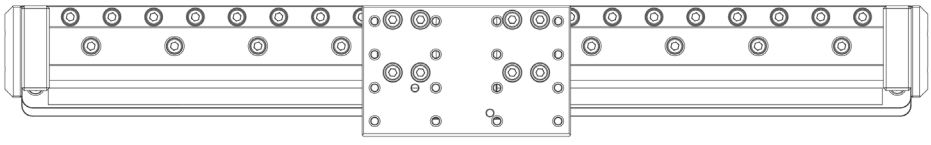
Signal cable pin out	
Pin No.	Function
1	GND
2	Index-
3	B-
4	A-
5	5V
6	Index+
7	B+
8	A+
9	Hall A U phase
10	Hall B V phase

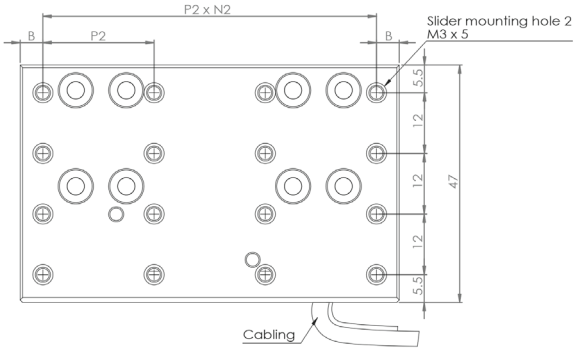
Signal cable pin out	
Pin No.	Function
11	Hall C W phase
12	Hall IC + 5V
13	Hall GND
14	Thermal sensor
15	Thermal sensor
Frame	Isolation

Slider Dimension





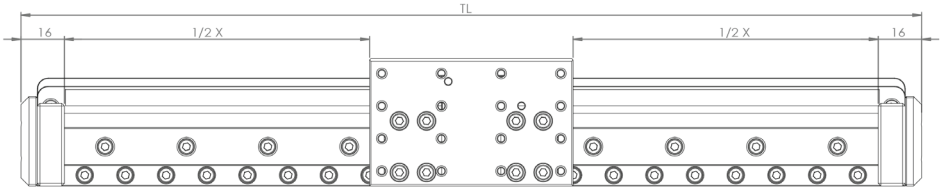


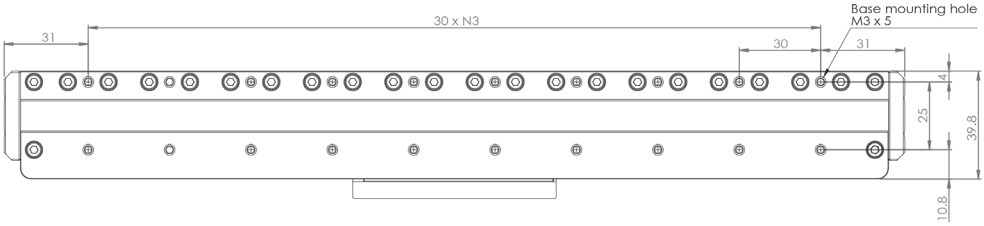


Unit: mm

Motor Model	Slider Length (L)	A	P1	N1	B	P2	N2
PM4	75	4.5	22	3	4.5	22	3
PM6	105	7.5	30	3	7.5	30	3

Mounting Dimension

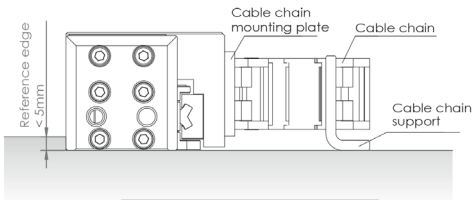




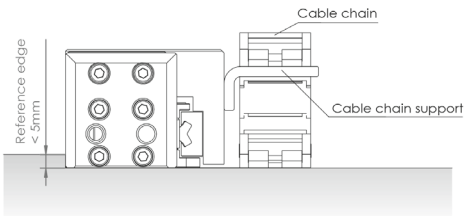
Unit: mm

Motor Model	Total Length (TL)	Effective Travel (X)	N3
PM4	152	45	3
	332	225	9
	512	405	15
PM6	152	15	3
	332	195	9
	512	375	15

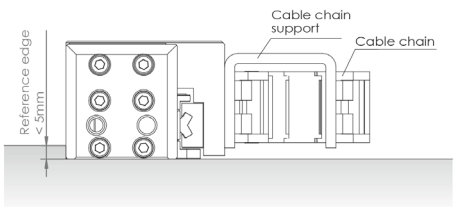
Usage Suggestion



Cable chain horizontal installation 1



Cable chain vertical installation



Cable chain horizontal installation 2

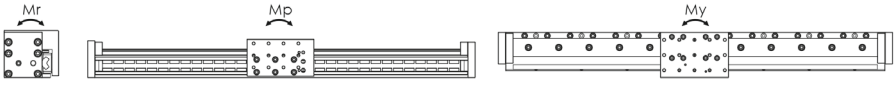
CLS-PAX Module Parameters

CLS		PA-X2						PA-X4					
Motor parameters													
Continuous Force (N)		31						55					
Peak Force (N)		123.8						220.2					
Continuous Current (Apeak)		3.6						3.2					
Peak Current (Apeak)		14.4						12.8					
Force Constant (N/Apeak)		8.6						17.2					
Back EMF constant (VL-L/m/s)		10						20					
Resistance (Ohms)		4.3						8.5					
Inductance (mH)		0.83						1.65					
Magnetic Pole Pitch (mm)		30						30					
Stage parameters													
Total Length (mm)		220	340	520	820	1000	1480	220	340	520	820	1000	1480
Effective Travel (mm)		90	210	390	690	870	1350	30	210	390	690	870	1350
Slider Mass (kg)[1]		0.5						0.8					
Module Weight(kg)[1]		2.1	2.9	3.9	5.7	7.5	16.2	2.4	3.2	4.2	6	7.8	16.5
Accuracy[2]													
Straightness/Flatness(µm)		6	8	10	20	20	25	6	8	10	20	20	25
Repeatability(µm)[3]		±1	±1	±1	±2	±2	±2	±1	±1	±1	±2	±2	±2
Linear Guide Rated Load and Static Moment													
Model Code		MR12WN						MR12WL					
Block quantity		2						2					
Load Capacity (KN)	C (dyn)	6.1						8.1					
	Co (stat)	10.4						15.6					
Static Moment (Nm)	Mro(Nm)	127						191					
	Mpo(Nm)	124						341					
	Myo(Nm)	124						341					

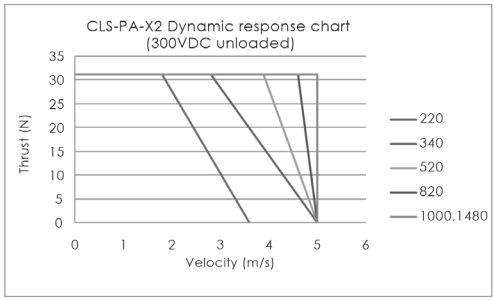
(1) Moving Load refers to mass before addition of payload mass. This includes the slider platform, motor forcer, linear guide, cabling, optical encoder read head etc. For the Connector type termination option it is 0.12kg.

(2) All listed precision figures are for the High Precision grade (H grade). There are no precision measurement specifications for the Normal grade.

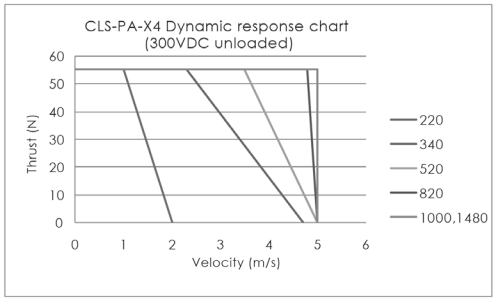
(3) System repeatability can be increase with the selection 0.5µm or 0.1µm grade optical encoders.



Dynamic Characteristics

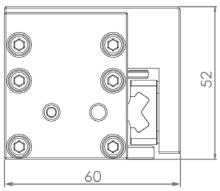


The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact cpc

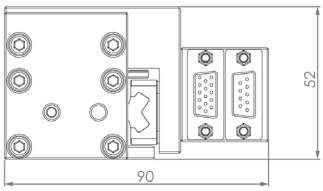


The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact cpc

Assembly Dimensions



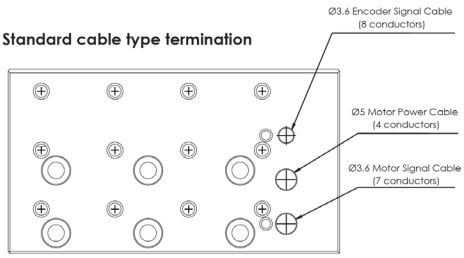
Standard cable type termination



Connector type termination

Wiring Definition

Standard cable type termination

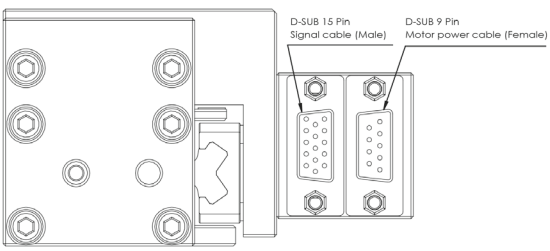


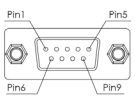
OUTPUT CABLE

Motor Wire Table		Hall Sensor Wire Table and Thermal Protection Wire Table			
Color	Function	Color	Function	Color	Function
White	phase U	Pink	Hall A U phase	Brown/Blue	Thermal sensor
Yellow	phase V	Yellow	Hall B V phase		
Brown	phase W	Green	Hall C W phase		
Green	PE	Grey	Hall IC + 5V		
		White	GND		

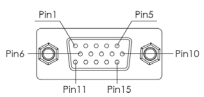
Encoder Signal connections	
Color	Function
Black	GND
Brown	Index-
Blue	B-
Yellow	A-
Red	5V
Orange	Index+
Purple	B+
Green	A+

Connector type termination





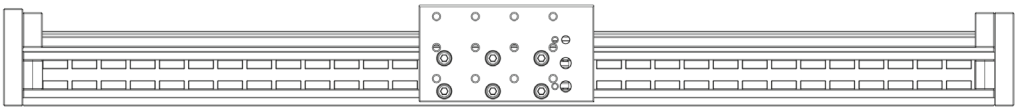
Power cable pin out	
Pin No.	Function
1	U
2	
6	
3	V
7	
8	
4	W
5	
9	
Frame	Isolation & GND

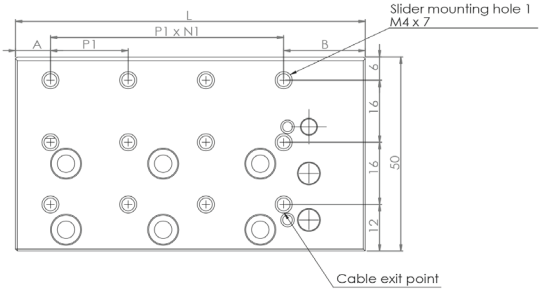


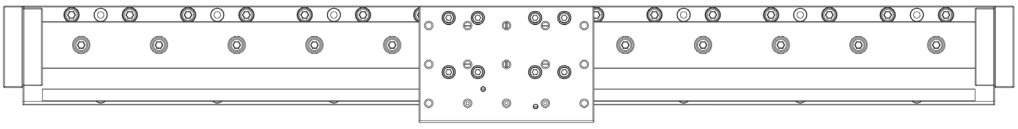
Signal cable pin out	
Pin No.	Function
1	GND
2	Index-
3	B-
4	A-
5	5V
6	Index+
7	B+
8	A+
9	Hall A U phase
10	Hall B V phase

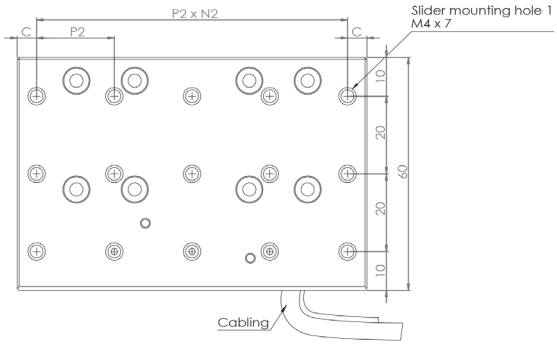
Signal cable pin out	
Pin No.	Function
11	Hall C W phase
12	Hall IC + 5V
13	Hall GND
14	Thermal sensor
15	Thermal sensor
Frame	Isolation

Slider Dimension





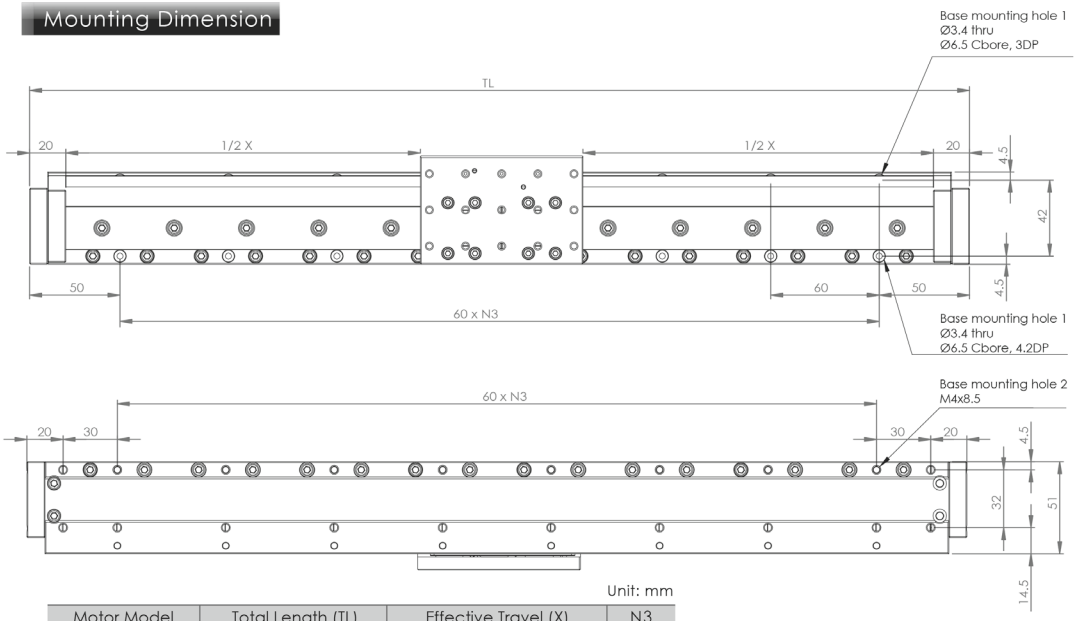




Unit: mm

Motor Model	Slider Length (L)	A	B	P1	N1	C	P2	N2
PA-X2	90	9	21	20	3	15	20	3
PA-X4	150	5	5	35	4	5	35	4

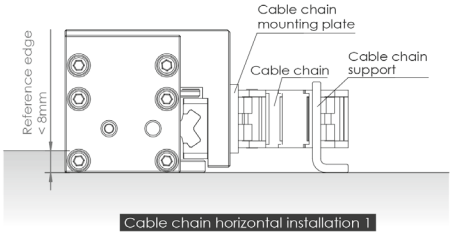
Mounting Dimension



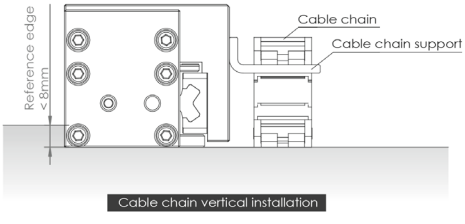
Unit: mm

Motor Model	Total Length (TL)	Effective Travel (X)	N3
PA-X2	220	90	2
	340	210	4
	520	390	7
	820	690	12
	1000	870	15
	1480	1350	23
PA-X4	220	30	2
	340	210	4
	520	390	7
	820	690	12
	1000	870	15
	1480	1350	23

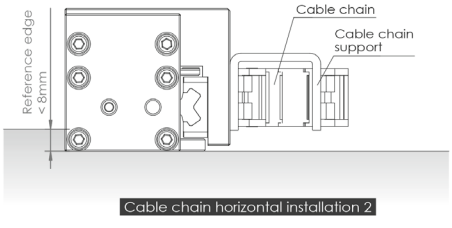
Usage Suggestion



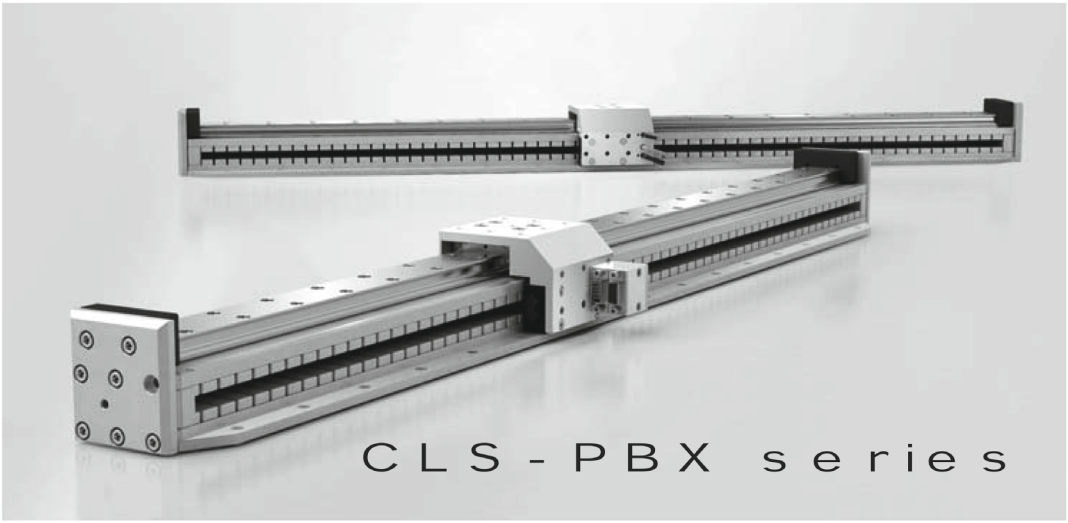
Cable chain horizontal installation 1



Cable chain vertical installation



Cable chain horizontal installation 2



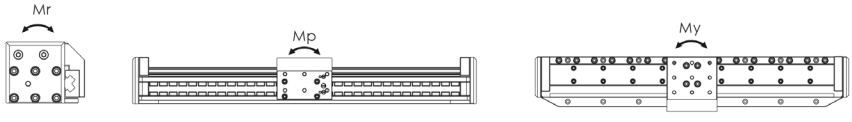
CLS-PBX Module Parameters

CLS		PB-X2						PB-X4						PB-X6					
Motor parameters																			
Continuous Force (N)		56.8						107.8						153.3					
Peak Force (N)		227						431.4						613					
Continuous Current (Apeak)		4						3.8						3.6					
Peak Current (Apeak)		16						2.6						14.4					
Force Constant (N/Apeak)		14.2						28.4						42.6					
Back EMF constant (VL-L/m/s)		16.5						33						49.5					
Resistance (Ohms)		4.1						8.3						12.4					
Inductance (mH)		1.44						2.87						4.31					
Magnetic Pole Pitch (mm)		30						30						30					
Stage parameters																			
Total Length (mm)		230	530	830	1010	1250	1490	230	530	830	1010	1250	1490	530	830	1010	1250	1490	
Effective Travel (mm)		95	395	695	875	1115	1355	35	335	635	815	1055	1295	275	575	755	995	1235	
Slider Mass (kg)[1]		0.7						1						1.3					
Module Weight(kg)[1]		3.7	8.5	13.3	16.2	20	23.9	4	8.8	13.6	16.5	20.3	24.2	9.4	14.2	17.1	20.9	24.8	
Accuracy[2]																			
Straightness/Flatness(μm)		6	10	20	20	25	30	6	10	20	20	25	30	10	20	20	25	30	
Repeatability(μm)[3]		±1	±1	±2	±2	±2	±2	±1	±1	±1	±2	±2	±2	±1	±1	±2	±2	±2	
Linear Guide Rated Load and Static Moment																			
Model Code		WRC21/15MN						WRC21/15MN						WRC21/15MN					
Block quantity		1						2						2					
Load Capacity (KN)	C (dyn)	9.9						19.8						19.8					
	Co (stat)	17.5						35.5						35.5					
Static Moment (Nm)	Mro(Nm)	315						630						630					
	Mpo(Nm)	105						670						1078					
	Myo(Nm)	105						670						1078					

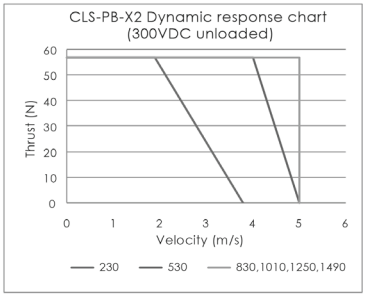
(1) Moving Load refers to mass before addition of payload mass. This includes the slider platform, motor forcer, linear guide, cabling, optical encoder read head etc. For the Connector type termination option it is 0.12kg.

(2) All listed precision figures are for the High Precision grade (H grade). There are no precision measurement specifications for the Normal grade.

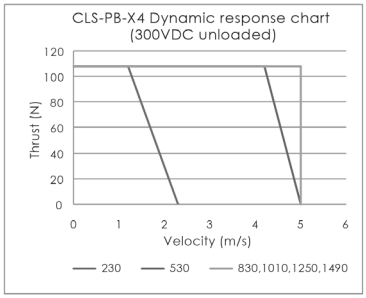
(3) System repeatability can be increase with the selection 0.5μm or 0.1μm grade optical encoders.



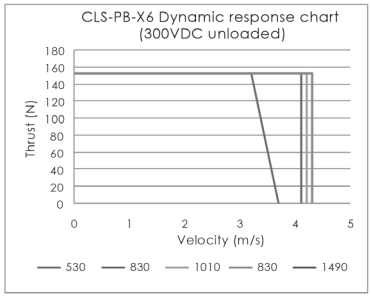
Dynamic Characteristics



The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact **cpc**

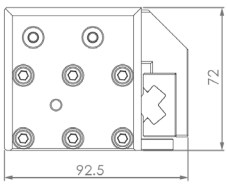


The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact **cpc**

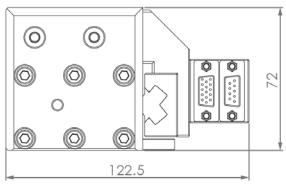


The chart is made with maximum velocity set to 5m/s, for higher velocity or special requirements, contact **cpc**

Assembly Dimensions



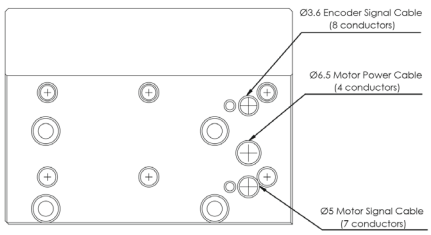
Standard cable type termination



Connector type termination

Wiring Definition

Standard cable type termination

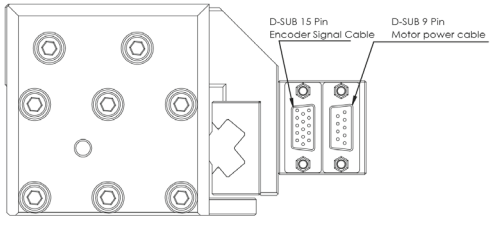


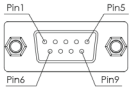
OUTPUT CABLE

Motor Wire Table		Hall Sensor Wire Table and Thermal Protection Wire Table			
Color	Function	Color	Function	Color	Function
White	phase U	Pink	Hall A U phase	Brown/Blue	Thermal sensor
Yellow	phase V	Yellow	Hall B V phase		
Brown	phase W	Green	Hall C W phase		
Green	P.E	Grey	Hall IC + 5V		
		White	GND		

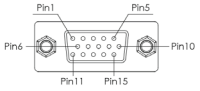
Encoder Signal connections	
Color	Function
Black	GND
Brown	Index-
Blue	B-
Yellow	A-
Red	5V
Orange	Index+
Purple	B+
Green	A+

Connector type termination





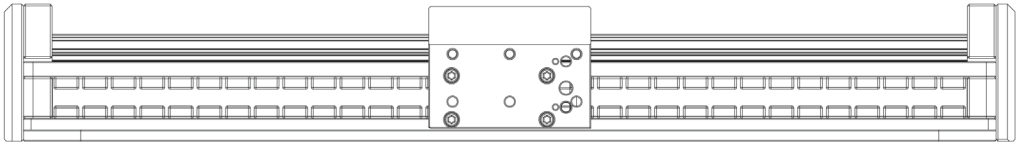
Power cable pin out	
Pin No.	Function
1	U
2	
6	
3	V
7	
8	
4	W
5	
9	
Frame	Isolation & GND

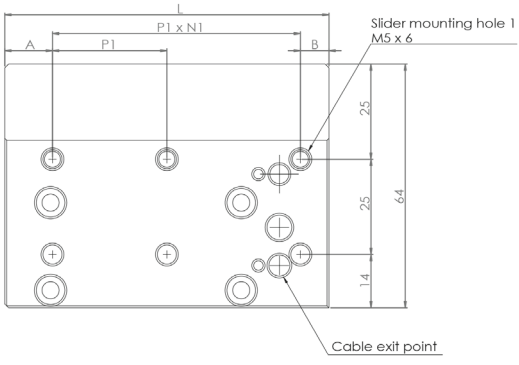


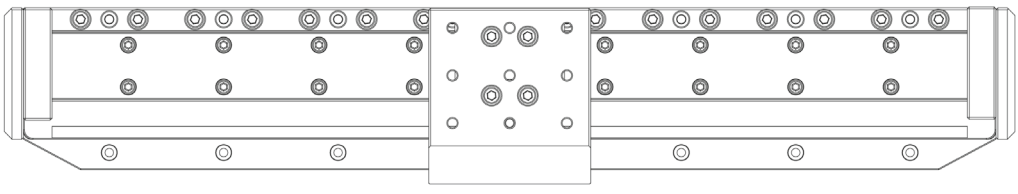
Signal cable pin out	
Pin No.	Function
1	GND
2	Index-
3	B-
4	A-
5	5V
6	Index+
7	B+
8	A+
9	Hall A U phase
10	Hall B V phase

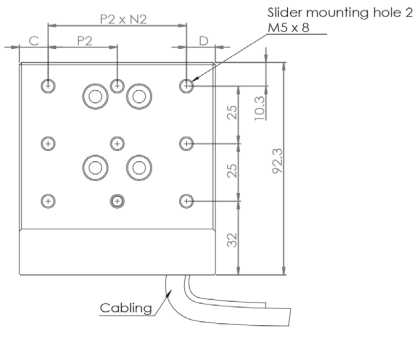
Signal cable pin out	
Pin No.	Function
11	Hall C W phase
12	Hall IC + 5V
13	Hall GND
14	Thermal sensor
15	Thermal sensor
Frame	Isolation

Slider Dimension





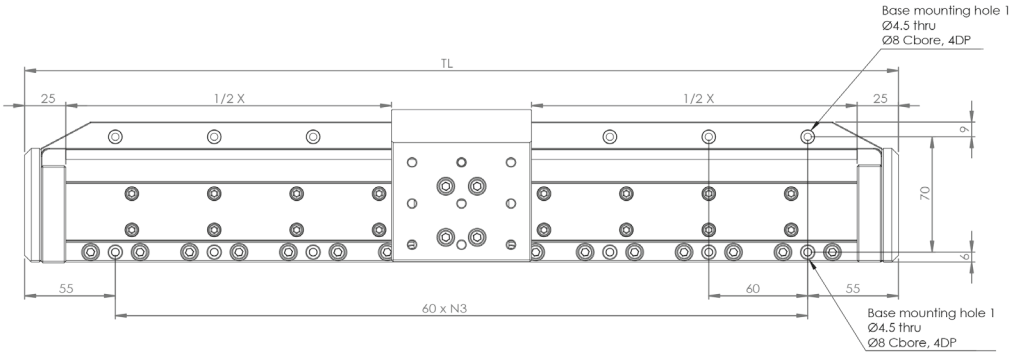


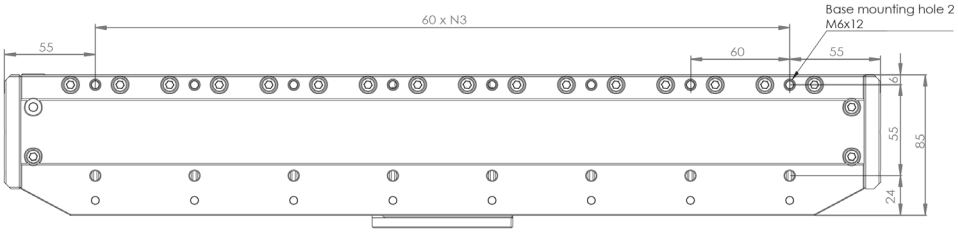


Unit: mm

Motor Model	Slider Length (L)	A	B	P1	N1	C	D	P2	N2
PB-X2	85	12.5	7.5	30	2	12.5	7.5	30	3
PB-X4	145	5	5	45	3	12.5	12.5	40	3
PB-X6	205	13	32	40	4	13	32	40	4

Mounting Dimension





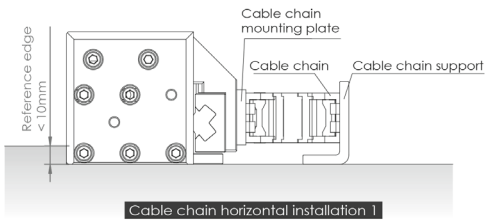
Unit: mm

Motor Model	Total Length (TL)	Effective Travel (X)	N3
PB-X2	230	95	2
	530	395	7
	830	695	12
	1010	875	15
	1250	1115	19
	1490	1355	23
PB-X4	230	35	3
	530	335	7
	830	635	12
	1010	815	15
	1250	1055	19
	1490	1295	23

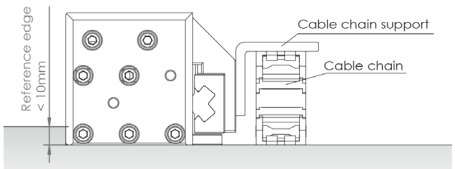
Unit: mm

Motor Model	Total Length (TL)	Effective Travel (X)	N3
PB-X6	530	275	7
	830	575	12
	1010	755	15
	1250	995	19
	1490	1235	23

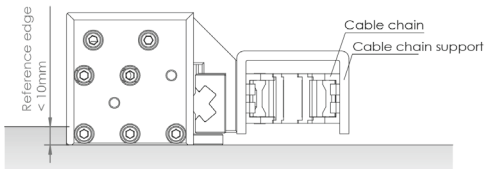
Usage Suggestion



Cable chain horizontal installation 1



Cable chain vertical installation



Cable chain horizontal installation 2

Ordering information

CLS	512	PM	4	395	CA	_	A	II	3	/J

/J — Customization code

3 — Exit Cable Length: 1,2,3,4,5,6,7,8,9(m)

II — Number of Sliders

A — Resolution: A : 1µm B : 0.5µm C : 0.1µm

_ — Slider Type: Standard CR: Dust Seal

CA — Cable interface: CA cable CN: Connector

395 — Effective Travel:
PM4 : 35,215,395,635,875mm
PM6 : 35,185,360,600,840mm
PAX2 : 90,210,390,690,990,1350mm
PAX4 : 150,330,630,930,1290mm
PBX2 : 95,395,695,875,1115,1355mm
PBX4 : 95,335,635,815,1055,1295mm
PBX6 : 95,275,575,755,995,1235mm

4 — Number of coil assembly : PM : 4,6 PAX : 2,4 PBX : 2,4,6

PM — Motor Model : PM,PAX,PBX

512 — Total Length :
PM4 : 152,332,512mm
PM6 : 152,332,512mm
PAX2 : 220,340,520,820,1000,1480mm
PAX4 : 220,340,520,820,1000,1480mm
PBX2 : 230,530,830,1010,1250,1490mm
PBX4 : 230,530,830,1010,1250,1490mm
PBX6 : 530,830,1010,1250,1490mm

CLS — Compact Linear Motor Module

Customized needs (The meaning of the suffix letter Description)

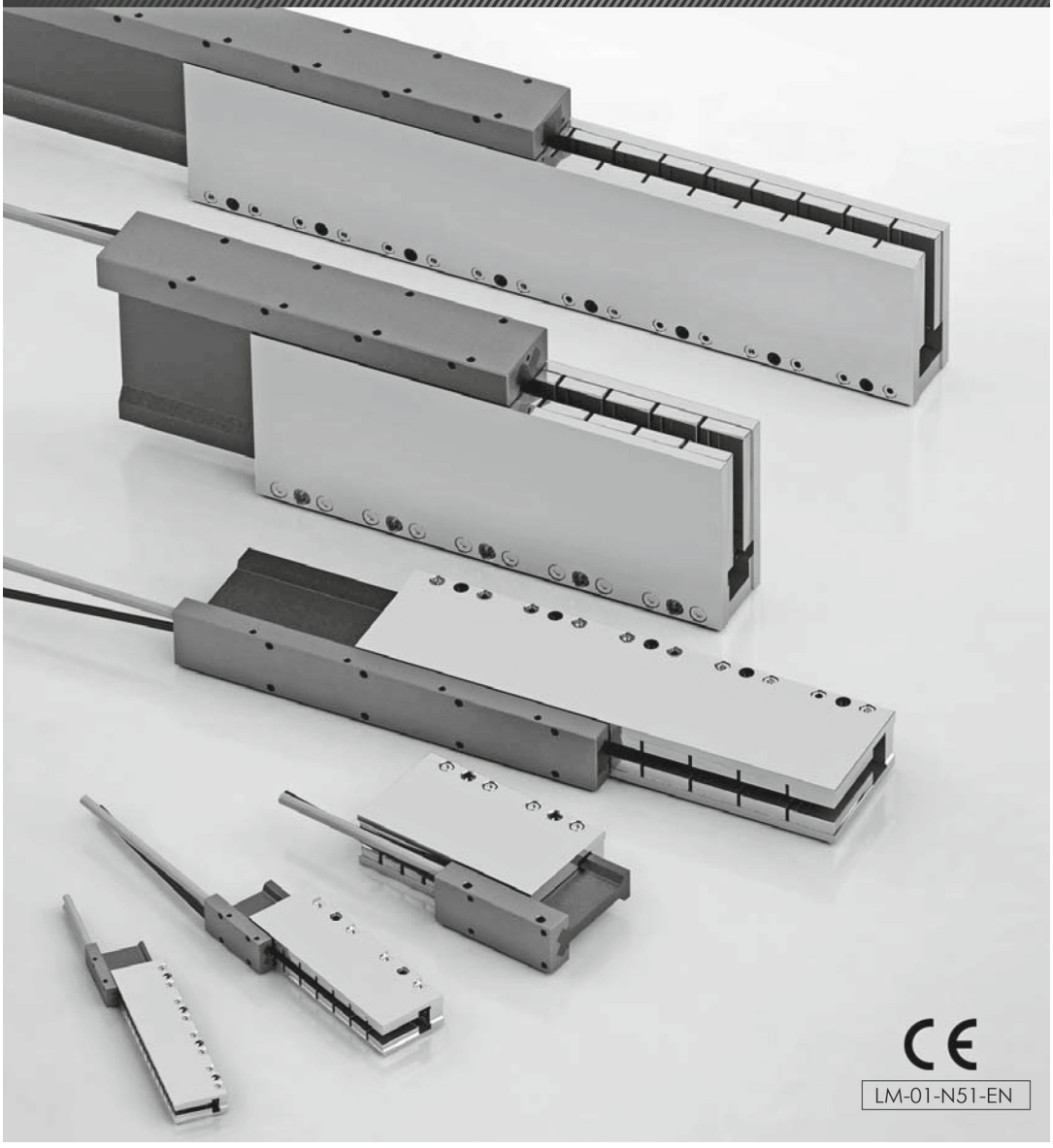
G : Customer designate lubricant
V : High speed requested : 3m/s < V < 9m/s or αmax = 300m/sec² (PM, PAX)
J : Other Customization

Accessory Options

CLS	AC	5	230	CN
Compact Linear Motor Module	220V AC Driver	Rated Current: 5A	Input Voltage 230V	Blank: None CN: Connector

cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.

LINEAR MOTORS



CE

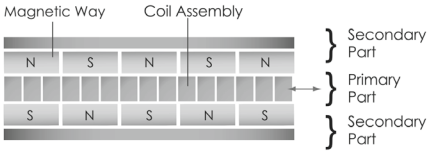
LM-01-N51-EN

Ironless Linear Motors

Construction & Features

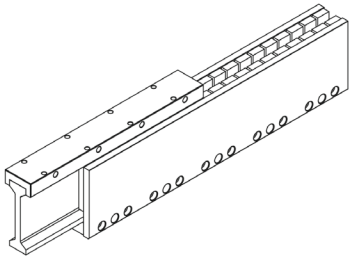
Provides fast acceleration with zero cogging for high velocities, super-smooth motion and superior position control.

Construction



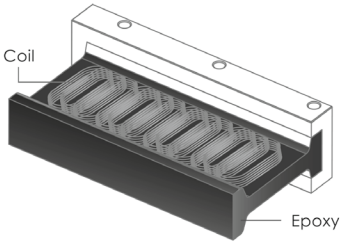
- **cpc** linear motors are composed of two pieces: a Coil Assembly (forcer) and a stationary Magnetic Way (Stator).
- The Coil Assembly is an ironless design, with the coils placed in a precisely molded resin shell.
- The Magnetic Way consists of two parallel steel plates with embedded rare-earth magnets facing each other. The two plates are joined at one end to create space for the Coil Assemblies to run.

Ironless advantages

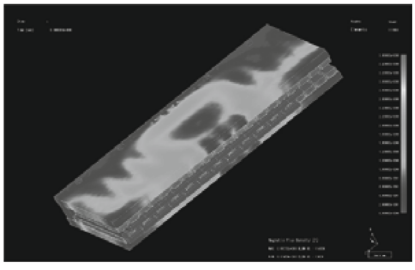


- **Magnetic Forces Contained**
  Magnetic Way consists of a balanced dual-magnet track, so there are no magnetic forces to deal with during assembly.
- **No Cogging**
  Ironless Coil Assembly results in zero cogging and super-smooth motion.
- **Low Weight Forcer**
  Absence of iron results in higher acceleration and deceleration rates as well as a higher mechanical bandwidth.
- **Wide Air Gap**
  Large air gap allows easy installation and alignment.

cpc Features

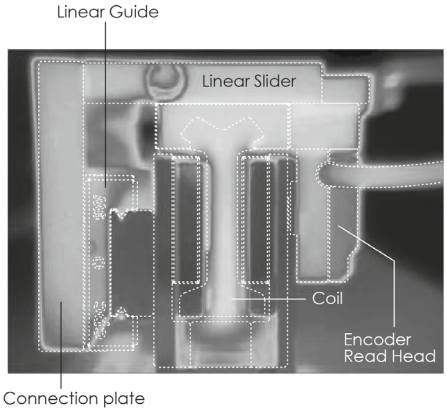


- **cpc** linear Motors are designed with overlapping coils to provide very high force density.
- **cpc** uses a vacuum-molding process to eliminate air bubbles from the finished epoxy mold. This results in a strengthened epoxy product with an enhanced lifetime.
- **cpc** linear motors are designed to have great dielectric strength, resulting in highly stable systems.
- **cpc** linear motors are very efficient at dissipating waste heat, allowing handling of larger currents for increased power.
- **cpc** For motor parameters, force constant refers to the amount of force produced per one ampere of current, while motor constant is the force produced per Watt and is representative of the motor's efficiency. As such the motor constant is a better metric at evaluating motor performance. cpc's linear motors have been designed with the aid of advanced simulation software. As a result, for a given dimension cpc's motor has a higher motor constant.



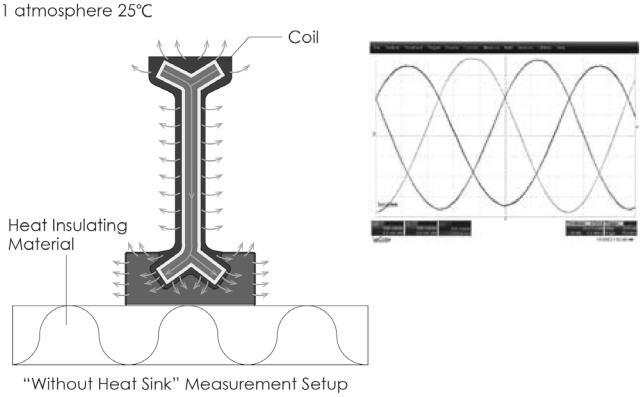
Linear Motor Thermal Analysis

In a linear motor system, the slider, linear guide and base are all paths of heat dissipation for the coil. This also includes the natural air flow over the motor while it is in motion. The thermograph image on the right shows the overall linear motor system temperature distribution after reaching thermal equilibrium. It is obvious that the heat from the coil is dissipated through everything it is in contact with. To ease estimation of required heat sinking capacity, the cpc catalog provides separate continuous current values. One value assumes the motor is without a heat sink and second is with a heat sink of nominal size. Both conditions assume even three phase current distribution.



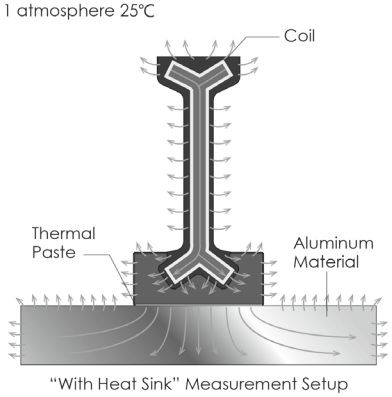
Stationary Measurements

The figure blow shows the method the test setup from which the "without heat sink"continuous current value is derived. The coil is placed on thermally insulating material with ambient air at 25°C and 1 atmosphere of air pressure . Evenly cycled three phase current is injected into the coils and the level of current is increased until the coil reach 110°C under thermal equilibrium.



"Without Heat Sink" Measurement Setup

The figure blow shows the method the test setup from which the "with heat sink"continuous current value is derived. The coil is placed on an aluminum plate with ambient air at 25°C and 1 atmosphere of air pressure . Thermal conductive paste is applied between the interface of the coil and aluminum plate. Evenly cycled three phase current is injected into the coil and the level of current is increased until the coils reach 110°C under thermal equilibrium.



"With Heat Sink" Measurement Setup

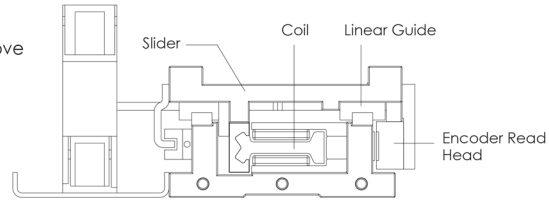
Dynamic System Measurement

Motion profile: Point to Point continuous move

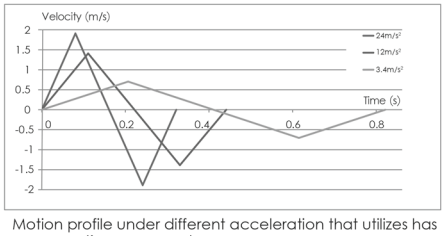
Travel: 150mm

Continuous Current : 3.4A

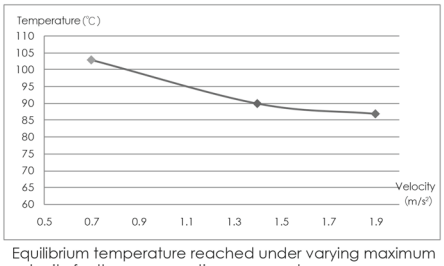
Slider Material: Aluminum (130x125x8mm)



The measurement result shows that, while the same amount of heat is produced. A fast moving motor coil is under a stronger air flow and reached a lower thermal equilibrium temperature.



Motion profile under different acceleration that utilizes has same continuous current.



Equilibrium temperature reached under varying maximum velocity for the same continuouscurrent.

Suggestion

Unlike conventional rotary motors, linear motors are mechanically open systems due to the way external components are connected. Hence the continuous force the motor can achieve is highly dependent on heat dissipation structure, air convection under motion and other external factors. For example, ambient air pressure has the following relation with elevation above sea level:

P_h= 760 - (h/12.5)

P_h : Atmospheric pressure(torr)

h : Elevation above sea level (m)

As atmospheric pressure and thus density decrease with elevation, the convection cooling effect is reduced. As a general guide, the achievable continuous force under vacuum is 50% of that under one atmosphere. cpc suggests that for most application purposes, the “with heat sink” value is used as the main metric in motor sizing selection. Should the “without heat sink”value be used instead it would easily lead to over design.

Parameter Glossary

Lp (mm) Coil Assembly Length

The length of the aluminum base of the coil assembly. The cable bending radius is not counted toward this length. A linear motor's effective stroke is usually the total Magnetic way length minus the coil length and cable bending radius.

Pm (Kg) Coil Assembly Weight

Includes main body weight and cable length of 400mm. This mass needs to be factored into the motor load.

Ic (Apk)Continuous Current

The peak line current level that will bring the motor coil to 110℃ given even cycling between the three phases. Assumes ambient air condition of one atmosphere at 25℃. Actual achievableIc is dependent on motor motion profile, component connection and surrounding environments. E.g.Ic capacity under vacuum is significantly less than under nominal air pressure, forcer under continuous motion versus stationary or large versus small forcer fixture contact surface area.

Unit conversion：

Apeak = $\sqrt{2}$ x Arms

Line current(Y) = $\sqrt{3}$ x Phase current(Y)

-------Y connection

Line current (Δ) = $\sqrt{3}$ x Phase current(Δ)

------Δconnection

Sm (Kg/m) Magnetic way Weight

Nominal weight of the Magnetic way per meter length

Ip (Apk) Peak Current

Instantaneous maximum current that can be passed into the motor coil. To prevent irreversible damage, duration should be less than1 second and a duty cycle of under 4%.

Fp (N) Peak Force

Instantaneous maximum force that can be produced by the motor. To prevent irreversible damage, duration should be less than1 second and a duty cycle of under 4%.

Fc (N) Continuous Force

The continuous force that will bring the motor coil to 110℃ given even cycling between the three phases

Ke (V_{LL}/m/s) Back EMF constant

The peak line-to-line Back EMF produced per one meter/second in velocity by the motor.

Maximum voltage required by a motor in motion is:

Volt = (Ke x Vmax) + (Imax x R)

It is recommended that the driver's maximum deliverable voltage is at least 1.3 times greater than the maximum voltage to ensure that there is enough control over the motor.

Unit conversion :

Vpeak = $\sqrt{2}$ x Vrms

Line voltage(Y) = $\sqrt{3}$ x Phase voltage(Y)

------- Y connection

Line voltage(Δ) = $\sqrt{3}$ x Phase voltage(Δ)

-------Δconnection

K_f (N/Apk) Force Constant

The thrust force produced by the motor per unit amp of current. The cpc catalog values are Peak values

Ipeak = $\sqrt{2}$ x Irms

τ_e (ms) Time Constant

Time needed to reach 63% of target current level. It is a function of inductance and resistance. Generally, Ironless linear motors have a smaller time constant than Ironed linear motors, thus have a faster response.

Kw (N/$\sqrt{W}$) Motor Constant

A measure of motor efficiency, a higher Motor constant indicates that for the same power input, greater force is produced.

τ_p (mm) Pole Pitch

The distance between identical magnetic poles within the Stator, i.e. S-S or N-N, This is equivalent to the commutation cycle length.

R (Ω) Resistance

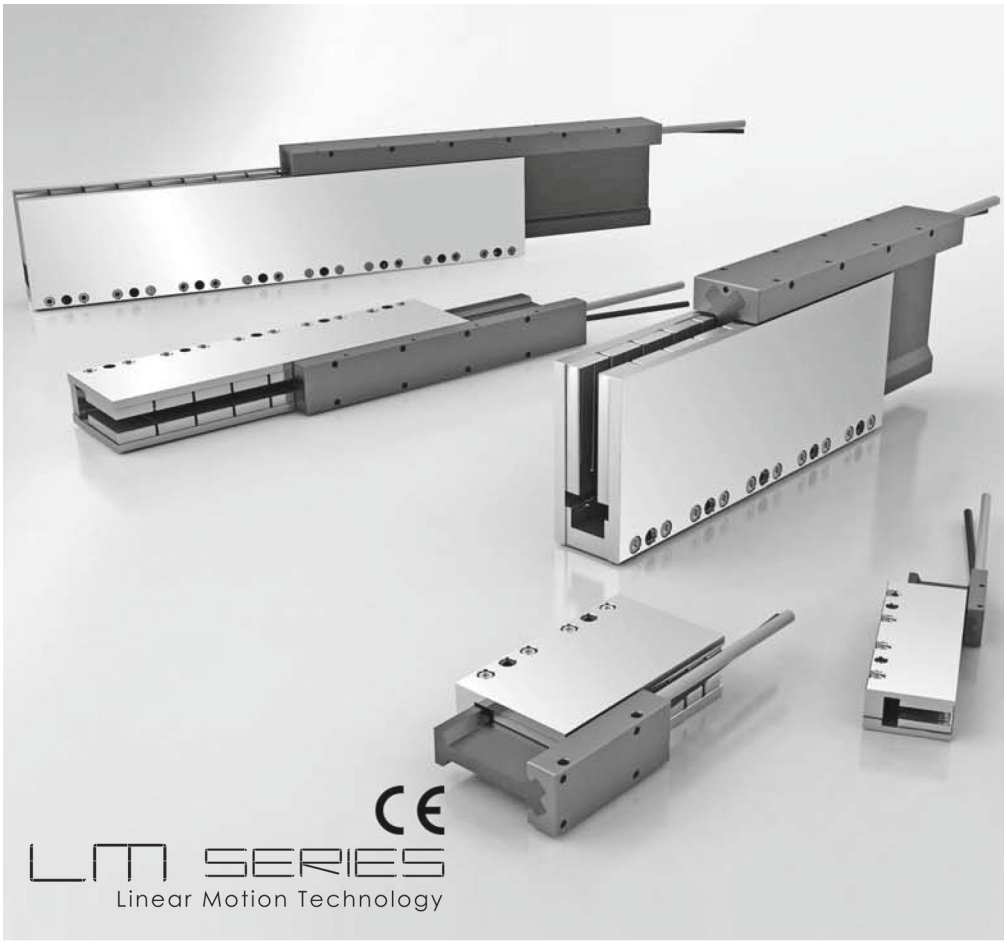
Motor coil three phase Line-to-Line resistance. Connecting the coils in parallel reduces the constant and Inductance but proportionally increases the amount of current required to achieve the same level of thrust. For copper coils there is a 0.393% increase in resistance for every 1°C rise in temperature.

L (mH) Inductance

Motor three phase Line-to-Line inductance. The lower inductance represent the motor's electrical loop response is faster.

Rth (°C/W) Thermal Resistance

Heat rise of the coil per unit watt of power input. Generally, the smaller the thermal resistance the better the heat dissipation structure.



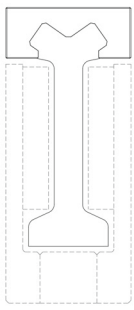
cpc Linear motor - overlapping windings for shorter overall length

Superior Insulation and high heat dissipation ability
Compact package with high output
Y-beam design for greater structural stiffness

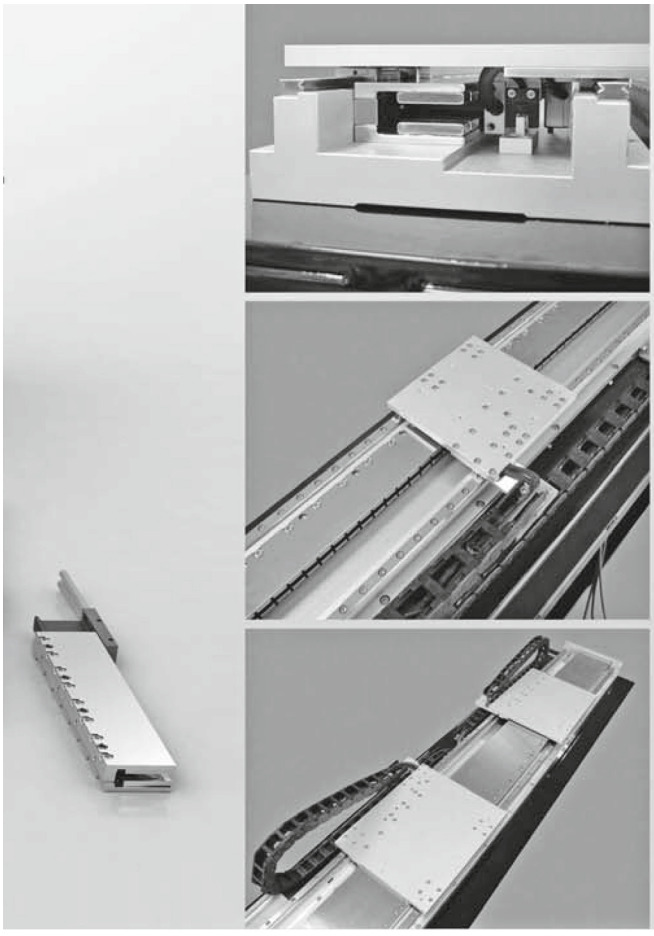
Instead of the conventional design in which the windings Are arranged side by side, overlapping windingdesign creates higher power density. The result is a compact size motor with no sacrifice in performance. The Y-beam design results in an enlarged contact surface for better heat transfer and outstanding thermal efficiency. Moreover, the special insulation material between coils achieves superior insulation. It enhances reliability and life for the motor.

Non-overlapped windings result in longer package length

Overlapping windings and Superior Insulation for shorter overall length



Y-beam design



High Speed, High Precision

- Highly rigid, direct driven and fully closed loop system with corresponding high precision, high efficiency, and excellent high speed performance.

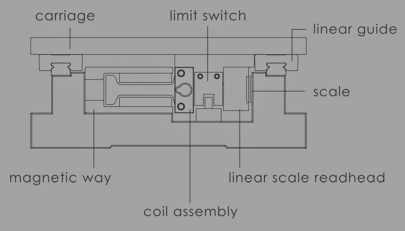
Suitable for Clean Environments

- No gear pitch error or backlash problems to cause noise. Very quiet even in high speed operation.
- No ball screw needed, no lubricant contamination issues. Suitable for clean room.

Simple Mechanism

- One Magnetic Way can operate with multiple Coil Assemblies, with each Coil Assembly driven independently.
- Multiple Magnetic Ways can be laid end to end to fit any length requirement.
- Simple and easy to use, even in applications with multiple Coil Assemblies or Magnetic Ways.

Typical linear motor application



Coil Assembly

Ordering Information:

LM	IL	PA	1	W1	N	NC	400

- **Cable Length** (in mm (400 mm Standard))
- **Cooling**: NC- no cooling; AC- air cooling
- **Halls**: N- no hall sensor; H- with hall sensor
- **Winding Type**: W1- winding 1; W2- winding 2; W3- winding 3; W4- winding 4
- **Coil assembly count**:
  - PM Type : 2.4.6
  - PA Type : 1.2.3.4.5
  - PA-X Type : 1.2.3.4.5
  - PB Type : 2.3.4.5.6.8
  - PB-X Type : 2.3.4.5.6.8
  - PD Type : 2.4.6.8.10
  - PD-X Type : 2.4.6.8.10
  - PDL Type : 2.4.6.8
  - PE-X Type : 2.4.6.8.10
- **Coil Assembly**: PM series; PA series; PA-X series; PB series; PE-X series; PB-X series; PD series; PD-X series; PDL series
- **Motor Type**: IL - ironless; IC - ironcore
- Linear Motor

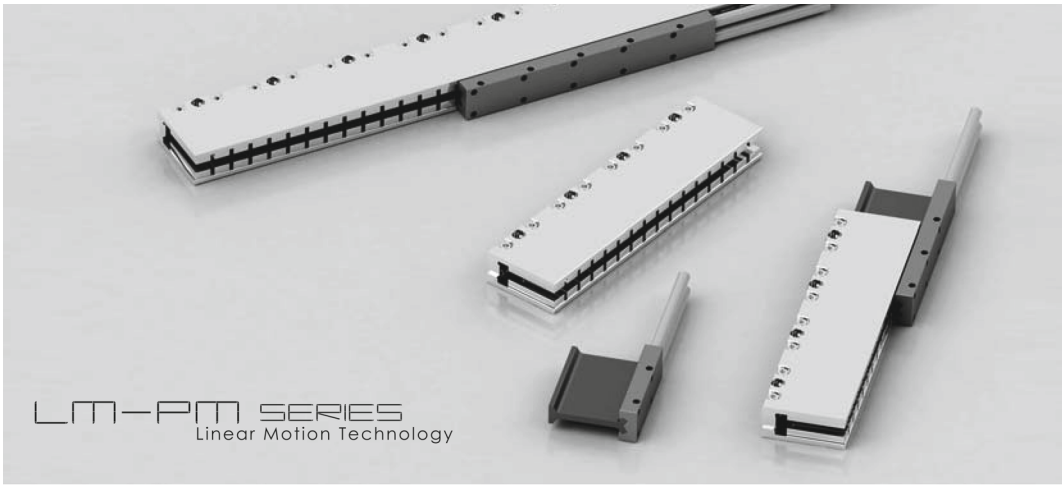
Magnetic Way

Ordering Information:

LM	IL	SA	0

- **Magnetic Way Length**: 0 - 120 mm; 1 - 300 mm; 2 - 480 mm
- **Magnetic Way**: SM series; SA series; SA-X series; SB series; SB-X series; SD series; SD-X series; SDL series; SE-X series
- **Motor Type**: IL- ironless; IC- ironcore
- Linear Motor

cpc also provides servo drives, optical linear scales and magnetic linear scale, for more details please contact cpc.



LM-PM Coil Assembly Model

Coil Assembly Model	LM-PM2			LM-PM4			LM-PM6		
Winding code	W1	W2	W3	W1	W2	W3	W1	W2	W3
Performance[4]									
Peak Force with heat sink(N)[1][2]	37.0			74.0			102.1		
Peak Force without heat sink(N)[2][3]	26.6			53.3			71.0		
Continuous Force with heat sink(N)[1][2]	9.2			18.5			25.5		
Continuous Force without heat sink(N)[2][3]	6.7			13.3			17.8		
Peak power(W)[1][2]	230.0			460.0			584.0		
Continuous power(W)[1][2]	14.4			28.8			36.5		
Mechanical									
Coil assembly length(mm)	40			70			100		
Coil assembly weight(kg)[2]	0.04			0.07			0.10		
Magnetic way weight(kg/m)[2]	2.0			2.0			2.0		
Pole pitch(mm)	15			15			15		
Electrical[4]									
Continuous Current with heat sink(A_{pk})[1][2]	2.5	5	10	2.5	5	10	2.3	4.6	9.2
Continuous Current without heat sink(A_{pk})[2][3]	1.8	3.6	7.2	1.8	3.6	7.2	1.6	3.2	6.4
Peak Current with heat sink(A_{pk})[1][2]	10	20	40	10	20	40	9.2	18.4	36.8
Peak Current without heat sink(A_{pk})[2][3]	7.2	14.4	28.8	7.2	14.4	28.8	6.4	12.8	25.6
Force Constant(N/A_{pk})[2]	3.7	1.8	0.9	7.4	3.7	1.8	11.1	5.5	2.8
Back EMF Constant(V/m/s)[2]	4.3	2.2	1.1	8.6	4.3	2.2	12.9	6.5	3.2
Resistant(Ohms)[2]	2.3	0.6	0.1	4.6	1.2	0.3	6.9	1.7	0.4
Inductance(mH)[2]	0.09	0.02	0.01	0.18	0.04	0.01	0.3	0.07	0.02
Time Constant(ms)[2]	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Thermal Resistant with heat sink(°C/W)[1][2]	4.6			2.3			1.8		
Thermal Resistant without heat sink(°C/W)[2][3]	8.8			4.4			3.8		
Heat Sink(mm)	300x200x12			300x200x12			300x200x12		
Motor Constant(N/√W)[2]	2.4			3.4			4.2		
Ph-PE dielectric strength[2]	≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)		
Ph-PE insulation resistance[2]	≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)		

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

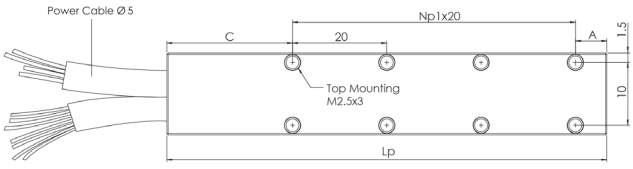
LM-PM Coil Assembly

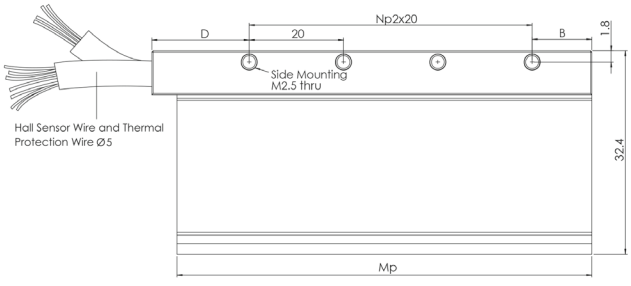
	Np1	Np2	Lp	Mp	A	B	C	D
LM-PM2	1	1	40	35	3	6.5	17	13.5
LM-PM4	2	2	70	65	13	16.5	17	13.5
LM-PM6	4	4	100	95	3	6.5	17	13.5

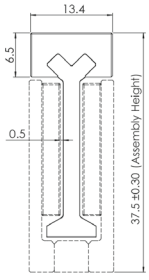
LM-SM Magnetic Way

	Ns	Ls
LM-SM0	3	120
LM-SM1	9	300
LM-SM2	15	480

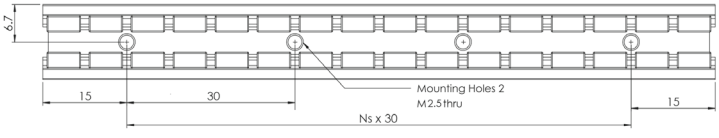
LM-PM Coil Assembly

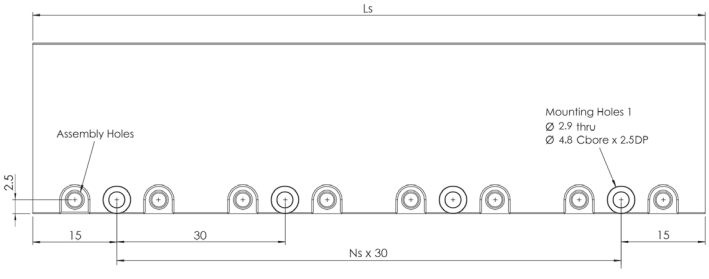


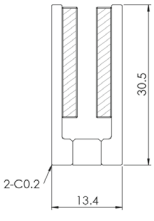




LM-SM Magnetic Way

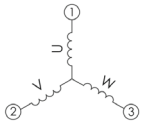


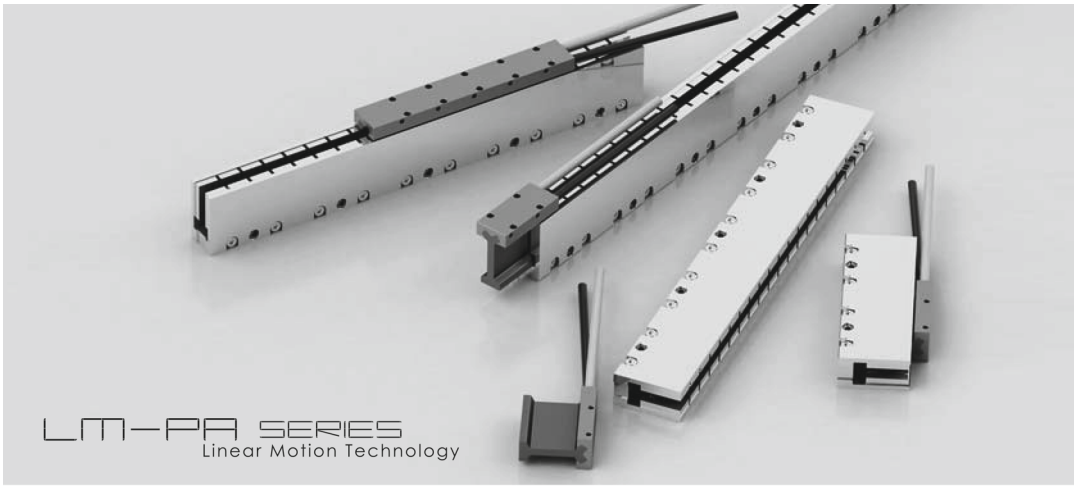




OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.25mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	0.25mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	0.25mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	0.25mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PA Coil Assembly Model

Coil Assembly Model	LM-PA1	LM-PA2		LM-PA3		LM-PA4			LM-PA5	
Winding code	W1	W1	W2	W1	W2	W1	W2	W3	W1	W2
Performance[4]										
Peak Force with heat sink(N)[1][2]	47.7	90.4		128.1		160.7			200.9	
Peak Force without heat sink(N)[2][3]	30.1	60.3		90.4		110.5			138.1	
Continuous Force with heat sink(N)[1][2]	11.9	22.6		32		40.2			50.2	
Continuous Force without heat sink(N)[2][3]	7.5	15.1		22.6		27.6			34.5	
Peak power(W)[1][2]	421.6	756.9		1012.7		1196			1495	
Continuous power(W)[1][2]	26.4	47.3		63.3		74.8			93.4	
Mechanical										
Coil assembly length(mm)	50	80		110		140			170	
Coil assembly weight(kg)[2]	0.08	0.12		0.16		0.20			0.24	
Magnetic way weight(kg/m)[2]	4.4	4.4		4.4		4.4			4.4	
Pole pitch(mm)	30	30		30		30			30	
Electrical[4]										
Continuous Current with heat sink(A_{pk})[1][2]	1.9	1.8	3.6	1.7	3.4	1.6	3.2	6.4	1.6	3.2
Continuous Current without heat sink(A_{pk})[2][3]	1.2	1.2	2.4	1.2	2.4	1.1	2.2	4.4	1.1	2.2
Peak Current with heat sink(A_{pk})[1][2]	7.6	7.2	14.4	6.8	13.6	6.4	12.8	25.6	6.4	12.8
Peak Current without heat sink(A_{pk})[2][3]	4.8	4.8	9.6	4.8	9.6	4.4	8.8	17.6	4.4	8.8
Force Constant(N/A_{pk})[2]	6.3	12.6	6.3	18.8	9.4	25.1	12.6	6.3	31.4	15.7
Back EMF Constant(V/m/s)[2]	7.3	14.6	7.3	21.9	11	29.2	14.6	7.3	36.5	18.3
Resistant(Ohms)[2]	7.3	14.6	3.7	21.9	5.5	29.2	7.3	1.8	36.5	9.1
Inductance(mH)[2]	1.25	2.5	0.63	3.75	0.94	5	1.25	0.13	6.25	1.56
Time Constant(ms)[2]	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Thermal Resistant with heat sink(°C/W)[1][2]	2.7	1.6		1.3		1			0.7	
Thermal Resistant without heat sink(°C/W)[2][3]	6.8	3.9		2.7		2.2			1.7	
Heat Sink(mm)	250x250x25	250x250x25		250x250x25		250x250x25			250x250x25	
Motor Constant(N/√W)[2]	2.3	3.3		4.0		4.6			5.2	
Ph-PE dielectric strength[2]	≥ 5KV(AC)	≥ 5KV(AC)		≥ 5KV(AC)		≥ 5KV(AC)			≥ 5KV(AC)	
Ph-PE insulation resistance[2]	≥ 1KV(DC)	≥ 1KV(DC)		≥ 1KV(DC)		≥ 1KV(DC)			≥ 1KV(DC)	

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

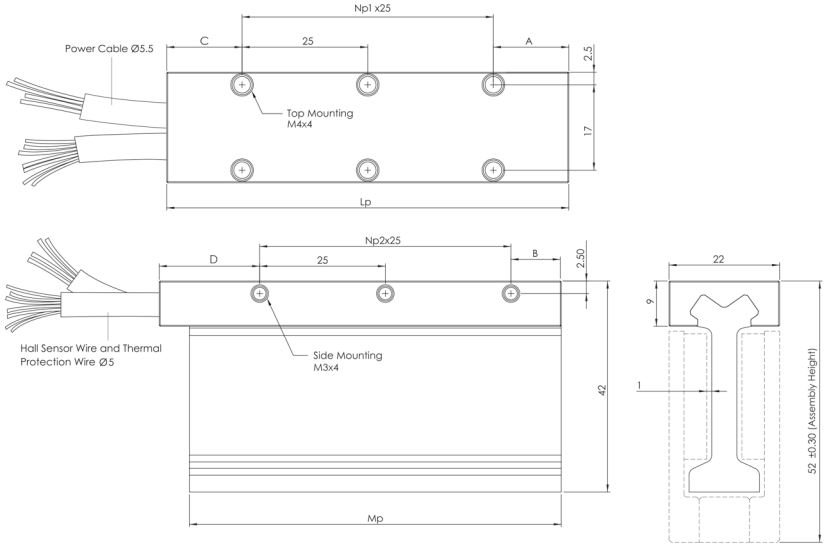
LM-PA Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PA1	1	1	50	44	10	5	15	20
LM-PA2	2	2	80	74	15	10	15	20
LM-PA3	3	3	110	104	20	15	15	20
LM-PA4	4	4	140	134	25	20	15	20
LM-PA5	6	5	170	164	5	25	15	20

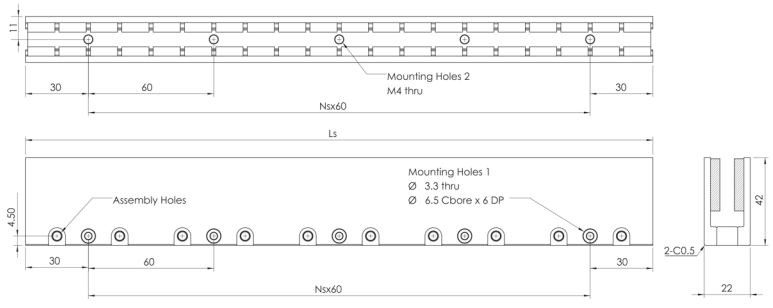
LM-SA Magnetic Way

	Ns	Ls
LM-SA0	1	120
LM-SA1	4	300
LM-SA2	7	480

LM-PA Coil Assembly

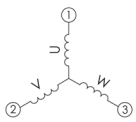


LM-SA Magnetic Way



OUTPUT CABLE (Cable standard length 400mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.25 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	0.25 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	0.25 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	0.25 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			



LM-PA-X Coil Assembly Model

Coil Assembly Model	LM-PA-X1	LM-PA-X2		LM-PA-X3		LM-PA-X4			LM-PA-X5	
Winding code	W1	W1	W2	W1	W2	W1	W2	W3	W1	W2
Performance[4]										
Peak Force with heat sink(N)[1][2]	65.4	123.8		175.4		220.2			258	
Peak Force without heat sink(N)[2][3]	44.7	82.6		113.5		151.4			189.2	
Continuous Force with heat sink(N)[1][2]	16.3	31		43.9		55			64.5	
Continuous Force without heat sink(N)[2][3]	11.2	20.6		28.4		37.8			47.3	
Peak power(W)[1][2]	491	881.3		1179.1		1392.6			1537.2	
Continuous power(W)[1][2]	30.7	55.1		73.7		87			96.1	
Mechanical										
Coil assembly length(mm)	50	80		110		140			170	
Coil assembly weight(kg)[2]	0.08	0.13		0.18		0.23			0.28	
Magnetic way weight(kg/m)[2]	4.4	4.4		4.4		4.4			4.4	
Pole pitch(mm)	30	30		30		30			30	
Electrical[4]										
Continuous Current with heat sink(A_{pk})[1][2]	1.9	1.8	3.6	1.7	3.4	1.6	3.2	6.4	1.5	3
Continuous Current without heat sink(A_{pk})[2][3]	1.3	1.2	2.4	1.1	2.2	1.1	2.2	4.4	1.1	2.2
Peak Current with heat sink(A_{pk})[1][2]	7.6	7.2	14.4	6.8	13.6	6.4	12.8	25.6	6	12
Peak Current without heat sink(A_{pk})[2][3]	5.2	4.8	9.6	4.4	8.8	4.4	8.8	17.6	4.4	8.8
Force Constant(N/A_{pk})[2]	8.6	17.2	8.6	25.8	12.9	34.4	17.2	8.6	43	21.5
Back EMF Constant(V/m/s)[2]	10	20	10	30	15	40	20	10	50	25
Resistant(Ohms)[2]	8.5	17	4.3	25.5	6.4	34	8.5	2.1	42.7	10.7
Inductance(mH)[2]	1.65	3.3	0.83	4.95	1.24	6.6	1.65	0.41	8.27	2.07
Time Constant(ms)[2]	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Thermal Resistant with heat sink(°C/W)[1][2]	2.5	1.5		1.1		0.9			0.7	
Thermal Resistant without heat sink(°C/W)[2][3]	4.9	3.5		2.7		2			1.6	
Heat Sink(mm)	250x250x25	250x250x25		250x250x25		250x250x25			250x250x25	
Motor Constant(N/√W)[2]	2.9	4.2		5.1		5.9			6.6	
Ph-PE dielectric strength[2]	≥ 5KV(AC)	≥ 5KV(AC)		≥ 5KV(AC)		≥ 5KV(AC)			≥ 5KV(AC)	
Ph-PE insulation resistance[2]	≥ 1KV(DC)	≥ 1KV(DC)		≥ 1KV(DC)		≥ 1KV(DC)			≥ 1KV(DC)	

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

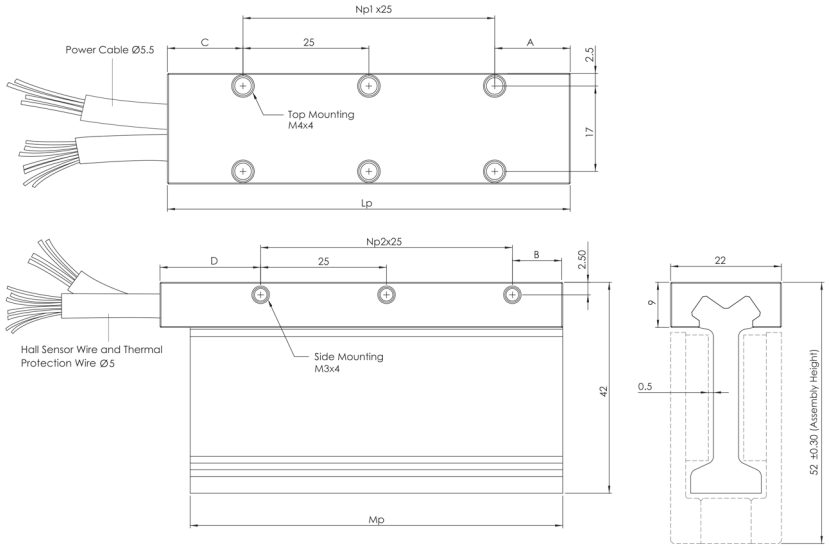
LM-PA-X Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PA-X1	1	1	50	44	10	5	15	20
LM-PA-X2	2	2	80	74	15	10	15	20
LM-PA-X3	3	3	110	104	20	15	15	20
LM-PA-X4	4	4	140	134	25	20	15	20
LM-PA-X5	6	5	170	164	5	25	15	20

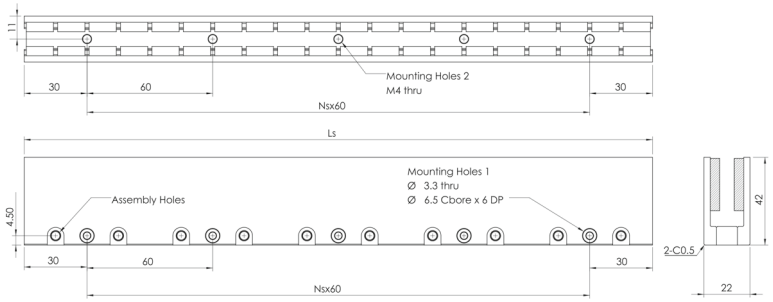
LM-SA-X Magnetic Way

	Ns	Ls
LM-SA-X0	1	120
LM-SA-X1	4	300
LM-SA-X2	7	480

LM-PA-X Coil Assembly

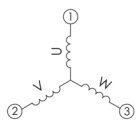


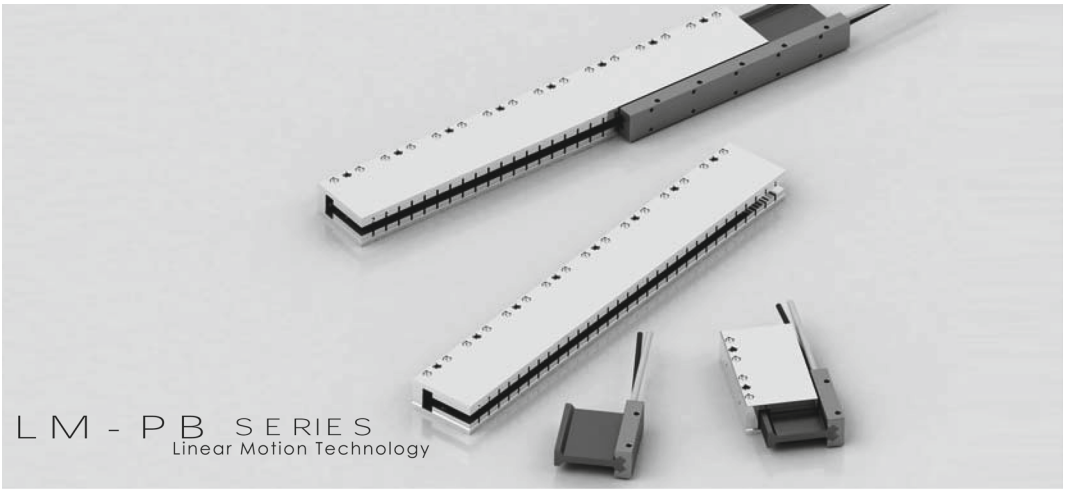
LM-SA-X Magnetic Way



OUTPUT CABLE (Cable standard length 400mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.25mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	0.25mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	0.25mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	0.25mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PB Coil Assembly Model

Coil Assembly Model	LM-PB2		LM-PB3		LM-PB4			LM-PB5		LM-PB6		LM-PB8			
Winding code	W1	W2	W1	W2	W1	W2	W3	W1	W2	W1	W2	W1	W2	W3	W4
Performance[4]															
Peak Force with heat sink(N)[1][2]	180.3		270.4		360.5			428.1		513.7		648.9			
Peak Force without heat sink(N)[2][3]	118.3		166.4		207.1			240.4		288.4		468.5			
Continuous Force with heat sink(N)[1][2]	45.1		67.6		90.1			107		128.4		162.2			
Continuous Force without heat sink(N)[2][3]	29.6		41.6		51.8			60.1		72.1		117.1			
Peak power(W)[1][2]	960		1440		1920			2166		2599.2		3110.4			
Continuous power(W)[1][2]	60		90		120			135.4		162.5		194.4			
Mechanical															
Coil assembly length(mm)	80		110		140			170		200		260			
Coil assembly weight(kg)[2]	0.31		0.43		0.54			0.66		0.78		0.9			
Magnetic way weight(kg/m)[2]	11.8		11.8		11.8			11.8		11.8		11.8			
Electrical cycle length(mm)	30		30		30			30		30		30			
Electrical[4]															
Continuous Current with heat sink(A_{pk})[1][2]	2	4	2	4	2	4	8	1.9	3.8	1.9	3.8	1.8	3.6	7.2	14.4
Continuous Current without heat sink(A_{pk})[2][3]	1.6	3.2	1.5	3	1.4	2.8	5.6	1.3	2.6	1.3	2.6	1.3	2.6	5.2	10.4
Peak Current with heat sink(A_{pk})[1][2]	8	16	8	16	8	16	32	7.6	15.2	7.6	15.2	7.2	14.4	28.8	57.6
Peak Current without heat sink(A_{pk})[2][3]	6.4	12.8	6	12	5.6	11.2	22.4	5.2	10.4	5.2	10.4	5.2	10.4	20.8	41.6
Force Constant(N/A_{pk})[2]	22.5	11.3	33.8	16.9	45.1	22.5	11.3	56.3	28.2	67.6	33.8	90.1	45.1	22.5	11.3
Back EMF Constant(V/m/s)[2]	26.2	13.1	39.3	19.7	52.4	26.2	13.1	65.5	32.8	78.6	39.3	104.8	52.4	26.2	13.1
Resistant(Ohms)[2]	15	3.8	22.5	5.6	30	7.5	1.9	37.5	9.4	45	11.3	60	15	3.8	0.9
Inductance(mH)[2]	3.5	0.88	5.25	1.31	7	1.75	0.44	8.75	2.19	10.5	2.63	14	3.5	0.88	0.22
Time Constant(ms)[2]	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Thermal Resistant with heat sink(°C/W)[1][2]	1.3		0.9		0.8			0.6		0.5		0.5			
Thermal Resistant without heat sink(°C/W)[2][3]	2.1		1.7		1.5			1.3		1.1		0.8			
Heat Sink(mm)	250x250x25		250x250x25		250x250x25			250x250x25		250x250x25		250x250x25			
Motor Constant(N/√W)[2]	5.8		7.1		8.2			9.2		10.1		11.6			
Ph-PE dielectric strength[2]	≥ 5KV(AC)		≥ 5KV(AC)		≥ 5KV(AC)			≥ 5KV(AC)		≥ 5KV(AC)		≥ 5KV(AC)			
Ph-PE insulation resistance[2]	≥ 1KV(DC)		≥ 1KV(DC)		≥ 1KV(DC)			≥ 1KV(DC)		≥ 1KV(DC)		≥ 1KV(DC)			

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

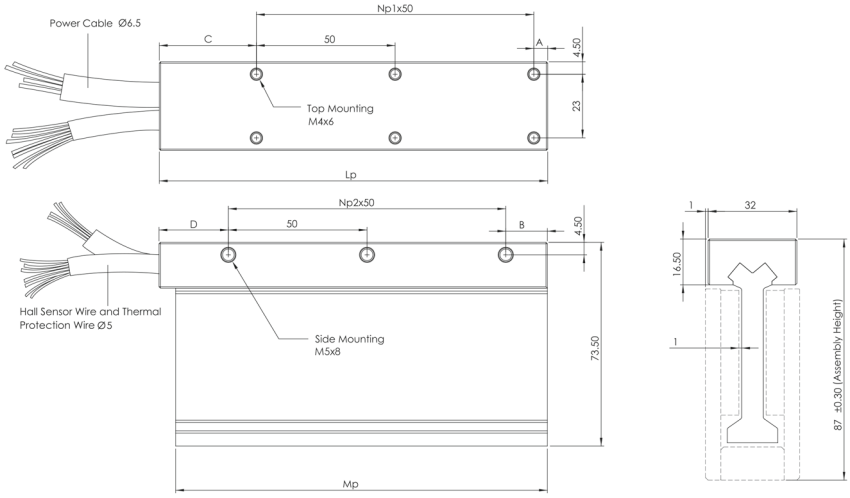
LM-PB Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PB2	1	1	80	74	5	10	25	20
LM-PB3	1	1	110	104	25	35	35	25
LM-PB4	2	2	140	134	5	15	35	25
LM-PB5	2	2	170	164	35	45	35	25
LM-PB6	3	3	200	194	15	25	35	25
LM-PB8	4	4	260	254	25	35	35	25

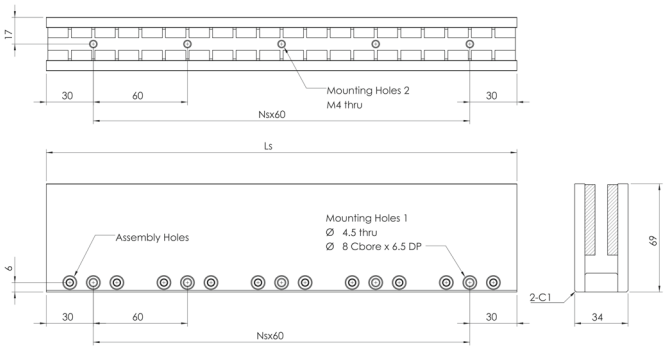
LM-SB Magnetic Way

	Ns	Ls
LM-SB0	1	120
LM-SB1	4	300
LM-SB2	7	480

LM-PB Coil Assembly

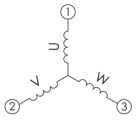


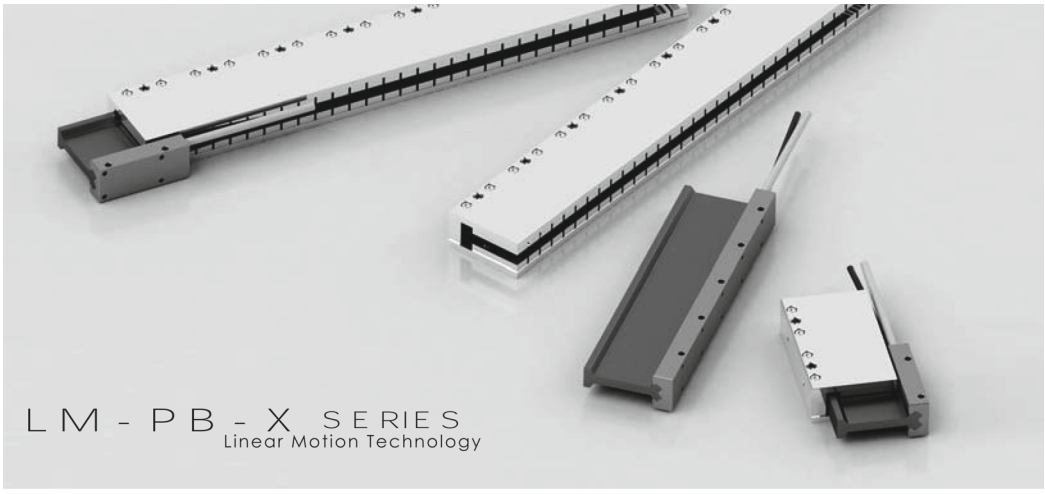
LM-SB Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	0.5 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	0.5 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	0.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PB-X Coil Assembly Model

Coil Assembly Model	LM-PB-X2		LM-PB-X3		LM-PB-X4			LM-PB-X5		LM-PB-X6		LM-PB-X8			
Winding code	W1	W2	W1	W2	W1	W2	W3	W1	W2	W1	W2	W1	W2	W3	W4
Performance[4]															
Peak Force with heat sink(N)[1][2]	227		340.6		431.4			539.2		613		771.9			
Peak Force without heat sink(N)[2][3]	170.3		238.4		295.2			368.9		442.7		590.3			
Continuous Force with heat sink(N)[1][2]	56.8		85.1		107.8			134.8		153.3		193			
Continuous Force without heat sink(N)[2][3]	42.6		59.6		73.8			92.2		110.7		147.6			
Peak power(W)[1][2]	1056		1584		1906.1			2382.6		2566.1		3051.8			
Continuous power(W)[1][2]	66		99		119.1			148.9		160.4		190.7			
Mechanical															
Coil assembly length(mm)	80		110		140			170		200		260			
Coil assembly weight(kg)[2]	0.33		0.44		0.55			0.72		0.9		1.09			
Magnetic way weight(kg/m)[2]	12.2		12.2		12.2			12.2		12.2		12.2			
Electrical cycle length(mm)	30		30		30			30		30		30			
Electrical[4]															
Continuous Current with heat sink(A_{pk})[1][2]	2	4	2	4	1.9	3.8	7.6	1.9	3.8	1.8	3.6	1.7	3.4	6.8	13.6
Continuous Current without heat sink(A_{pk})[2][3]	1.5	3	1.4	2.8	1.3	2.6	5.2	1.3	2.6	1.3	2.6	1.3	2.6	5.2	10.4
Peak Current with heat sink(A_{pk})[1][2]	8	16	8	16	7.6	15.2	30.4	7.6	15.2	7.2	14.4	6.8	13.6	27.7	54.4
Peak Current without heat sink(A_{pk})[2][3]	6	12	5.6	11.2	5.2	10.4	20.8	5.2	10.4	5.2	10.4	5.2	10.4	20.8	41.6
Force Constant(N/A_{pk})[2]	28.4	14.2	42.6	21.3	56.8	28.4	14.2	71	35.5	85.1	42.6	113.5	56.8	28.4	14.2
Back EMF Constant(V/m/s)[2]	33	16.5	49.5	24.8	66	33	16.5	82.5	41.3	99	49.5	132	66	33	16.5
Resistant(Ohms)[2]	16.5	4.1	24.8	6.2	33	8.3	2.1	41.3	10.3	49.5	12.4	66	16.5	4.1	1
Inductance(mH)[2]	5.74	1.44	8.61	2.15	11.48	2.87	0.72	14.35	3.59	17.22	4.31	22.96	5.74	1.44	0.36
Time Constant(ms)[2]	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Thermal Resistant with heat sink(°C/W)[1][2]	1.1		0.8		0.7			0.6		0.5		0.4			
Thermal Resistant without heat sink(°C/W)[2][3]	1.9		1.6		1.4			1.2		1		0.7			
Heat Sink(mm)	250x250x25		250x250x25		250x250x25			250x250x25		250x250x25		250x250x25			
Motor Constant(N/√W)[2]	7		8.6		9.9			11		12.1		14			
Ph-PE dielectric strength[2]	≥ 5KV(AC)		≥ 5KV(AC)		≥ 5KV(AC)			≥ 5KV(AC)		≥ 5KV(AC)		≥ 5KV(AC)			
Ph-PE insulation resistance[2]	≥ 1KV(DC)		≥ 1KV(DC)		≥ 1KV(DC)			≥ 1KV(DC)		≥ 1KV(DC)		≥ 1KV(DC)			

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

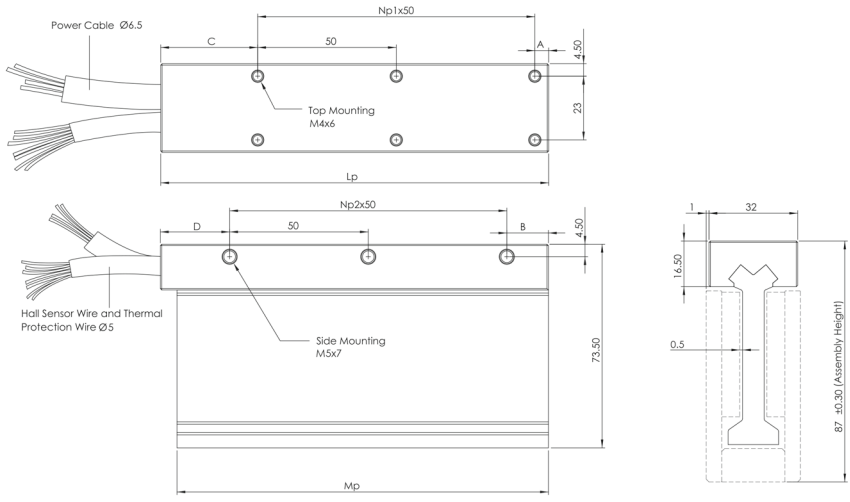
LM-PB-X Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PB-X2	1	1	80	74	5	10	25	20
LM-PB-X3	1	1	110	104	25	35	35	25
LM-PB-X4	2	2	140	134	5	15	35	25
LM-PB-X5	2	2	170	164	35	45	35	25
LM-PB-X6	3	3	200	194	15	25	35	25
LM-PB-X8	4	4	260	254	25	35	35	25

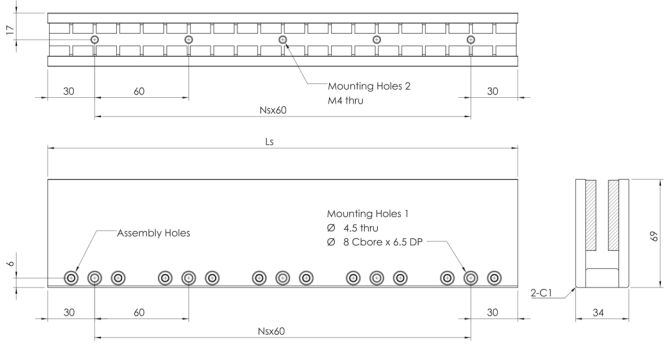
LM-SB-X Magnetic Way

	Ns	Ls
LM-SB-X0	1	120
LM-SB-X1	4	300
LM-SB-X2	7	480

LM-PB-X Coil Assembly

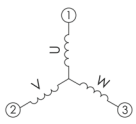


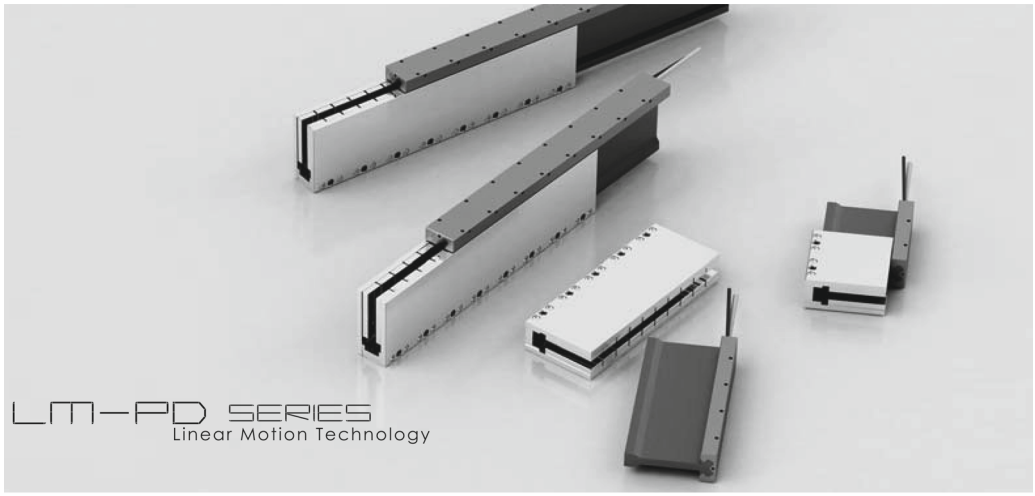
LM-SB-X Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	0.5 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	0.5 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	0.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PD Coil Assembly Model

Coil Assembly Model	LM-PD2		LM-PD4			LM-PD6			LM-PD8			LM-PD10		
Winding code	W1	W2	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3
Performance[4]														
Peak Force with heat sink(N)[1][2]	908.7		1642.7			2464			3075.6			3844.5		
Peak Force without heat sink(N)[2][3]	699		1258.2			1887.3			2376.6			2796		
Continuous Force with heat sink(N)[1][2]	227.2		410.7			616			768.9			961.1		
Continuous Force without heat sink(N)[2][3]	174.8		314.6			471.8			594.2			699		
Peak power(W)[1][2]	2812.2		4594.7			6892.1			8053.8			10067.2		
Continuous power(W)[1][2]	175.8		287.2			430.8			503.4			629.2		
Mechanical														
Coil assembly length(mm)	146		266			386			506			626		
Coil assembly weight(kg)[2]	1.3		2.5			3.7			4.9			6.1		
Magnetic way weight(kg/m)[2]	29.8		29.8			29.8			29.8			29.8		
Electrical cycle length(mm)	60		60			60			60			60		
Electrical[4]														
Continuous Current with heat sink(A_{pk})[1][2]	2.6	5.2	2.4	4.7	9.4	2.4	4.7	9.4	2.2	4.4	8.8	2.2	4.4	8.8
Continuous Current without heat sink(A_{pk})[2][3]	2	4	1.8	3.6	7.2	1.8	3.6	7.2	1.7	3.4	6.8	1.6	3.2	6.4
Peak Current with heat sink(A_{pk})[1][2]	10.4	20.8	9.4	18.8	37.6	9.4	18.8	37.6	8.8	17.6	35.2	8.8	17.6	35.2
Peak Current without heat sink(A_{pk})[2][3]	8	16	7.2	14.4	28.8	7.2	14.4	28.8	6.8	13.6	27.2	6.4	12.8	25.6
Force Constant(N/A_{pk})[2]	87.4	43.7	174.8	87.4	43.7	262.1	131.1	65.5	349.5	174.8	87.4	436.9	218.4	109.2
Back EMF Constant(V/m/s)[2]	101.6	50.8	203.2	101.6	50.8	304.8	152.4	76.2	406.4	203.2	101.6	508	254	127
Resistant(Ohms)[2]	26	6.5	52	13	3.3	78	19.5	4.9	104	26	6.5	130	32.5	8.1
Inductance(mH)[2]	26.4	6.6	52	13.2	3.3	79	19.8	4.95	105.6	26.4	6.6	132	33	8.25
Time Constant(ms)[2]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Thermal Resistant with heat sink(°C/W)[1][2]	0.4		0.3			0.2			0.2			0.1		
Thermal Resistant without heat sink(°C/W)[2][3]	0.7		0.5			0.3			0.3			0.2		
Heat Sink(mm)	800x900x12		800x900x12			800x900x12			800x900x12			800x900x12		
Motor Constant(N/√W)[2]	17.1		24.2			29.7			34.3			38.3		
Ph-PE dielectric strength[2]	≥ 5KV(AC)		≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)		
Ph-PE insulation resistance[2]	≥ 1KV(DC)		≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)		

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

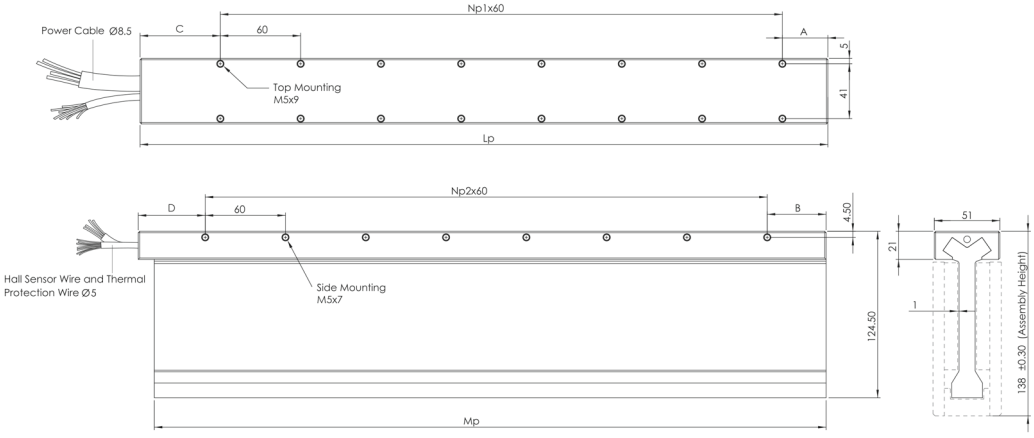
LM-PD Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PD2	1	1	146	143	26	36	60	50
LM-PD4	3	3	266	263	26	36	60	50
LM-PD6	5	5	386	383	26	36	60	50
LM-PD8	7	7	506	503	26	36	60	50
LM-PD10	9	9	626	623	26	36	60	50

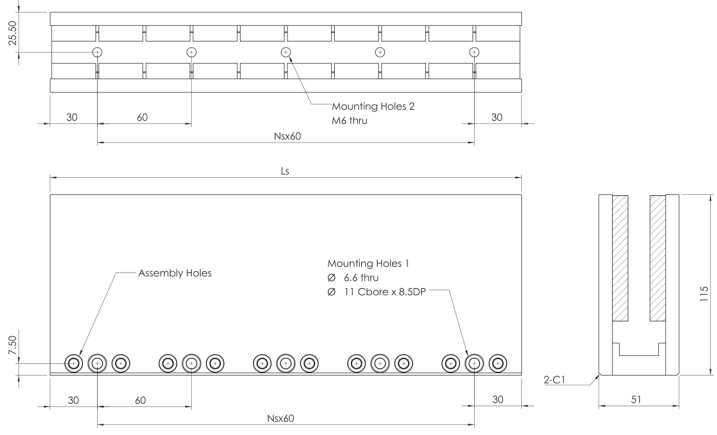
LM-SD Magnetic Way

	Ns	Ls
LM-SD0	1	120
LM-SD1	4	300
LM-SD2	7	480

LM-PD Coil Assembly

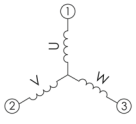


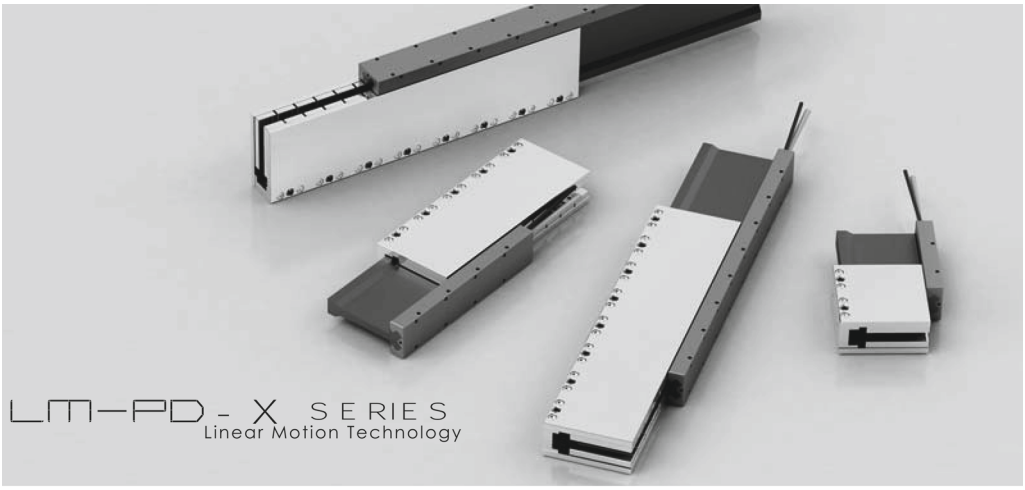
LM-SD Magnetic Way



OUTPUT CABLE (Cable standard length 400mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PD-X Coil Assembly Model

Coil Assembly Model	LM-PD-X2		LM-PD-X4			LM-PD-X6			LM-PD-X8			LM-PD-X10		
Winding code	W1	W2	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3
Performance[4]														
Peak Force with heat sink(N)[1][2]	1025		1892.3			2779.3			3469.2			4336.5		
Peak Force without heat sink(N)[2][3]	709.6		1419.2			2069.7			2680.7			3153.8		
Continuous Force with heat sink(N)[1][2]	256.2		473.1			694.8			867.3			1084.1		
Continuous Force without heat sink(N)[2][3]	177.4		354.8			517.4			670.2			788.4		
Peak power(W)[1][2]	3028.5		5161			7422.2			8673.3			10841.6		
Continuous power(W)[1][2]	189.3		322.6			463.9			542.1			677.6		
Mechanical														
Coil assembly length(mm)	146		266			386			506			626		
Coil assembly weight(kg)[2]	1.3		2.8			4.3			5.8			7.3		
Magnetic way weight(kg/m)[2]	29.8		29.8			29.8			29.8			29.8		
Electrical cycle length(mm)	60		60			60			60			60		
Electrical[4]														
Continuous Current with heat sink(A_{pk})[1][2]	2.6	5.2	2.4	4.7	9.6	2.4	4.7	9.4	2.2	4.4	8.8	2.2	4.4	8.8
Continuous Current without heat sink(A_{pk})[2][3]	1.8	3.6	1.8	3.6	7.2	1.8	3.5	7	1.7	3.4	6.8	1.6	3.2	6.4
Peak Current with heat sink(A_{pk})[1][2]	10.4	20.8	9.6	19.2	38.4	9.4	18.8	37.6	8.8	17.6	35.2	8.8	17.6	35.2
Peak Current without heat sink(A_{pk})[2][3]	7.2	14.4	7.2	14.4	28.8	7	14	28	6.8	13.6	27.2	6.4	12.8	25.6
Force Constant(N/A_{pk})[2]	98.6	49.3	197.1	98.6	49.3	295.7	147.8	73.9	394.2	197.1	98.6	492.8	246.4	123.2
Back EMF Constant(V/m/s)[2]	114.6	57.3	229.2	114.6	57.3	343.8	171.9	86	458.4	229.2	114.6	573	286.5	143.3
Resistant(Ohms)[2]	28	7	56	14	3.5	84	21	5.3	112	28	7	140	35	8.8
Inductance(mH)[2]	30.32	7.58	60.64	15.16	3.79	90.96	22.74	5.69	121.28	30.32	7.58	151.6	37.9	9.48
Time Constant(ms)[2]	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Thermal Resistant with heat sink(°C/W)[1][2]	0.4		0.3			0.2			0.2			0.1		
Thermal Resistant without heat sink(°C/W)[2][3]	0.8		0.4			0.3			0.2			0.2		
Heat Sink(mm)	800x900x12		800x900x12			800x900x12			800x900x12			800x900x12		
Motor Constant(N/√W)[2]	18.6		26.3			32.3			37.3			41.6		
Ph-PE dielectric strength[2]	≥ 5KV(AC)		≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)		
Ph-PE insulation resistance[2]	≥ 1KV(DC)		≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)		

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

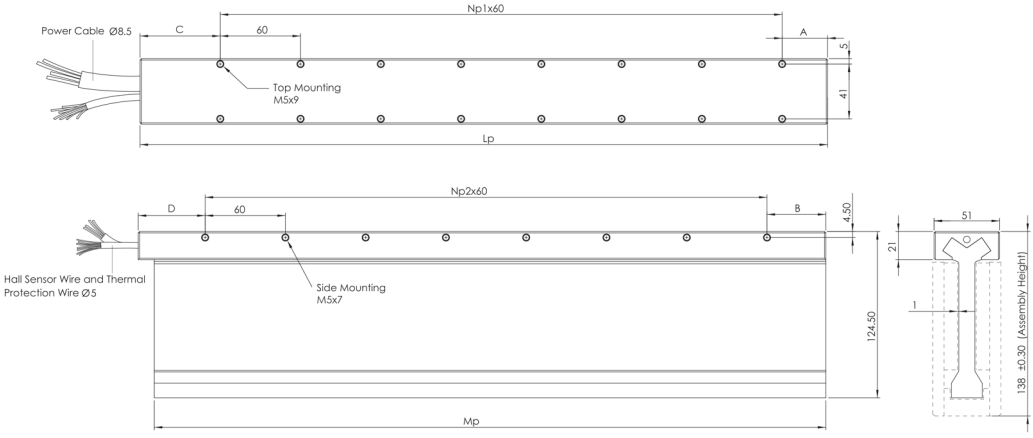
LM-PD-X Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PD-X2	1	1	146	143	26	36	60	50
LM-PD-X4	3	3	266	263	26	36	60	50
LM-PD-X6	5	5	386	383	26	36	60	50
LM-PD-X8	7	7	506	503	26	36	60	50
LM-PD-X10	9	9	626	623	26	36	60	50

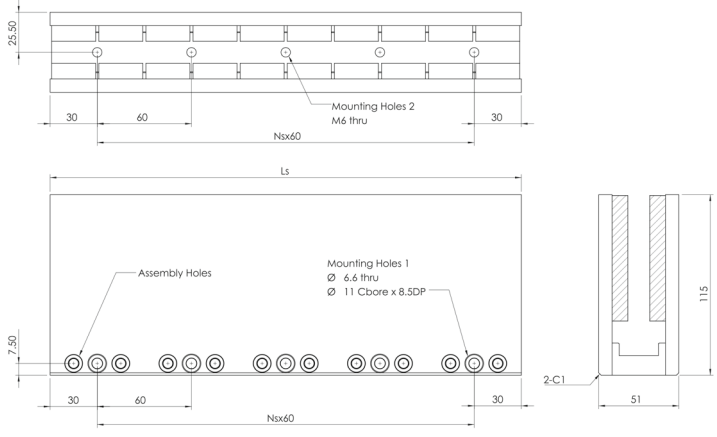
LM-SD-X Magnetic Way

	Ns	Ls
LM-SD-X0	1	120
LM-SD-X1	4	300
LM-SD-X2	7	480

LM-PD-X Coil Assembly

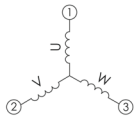


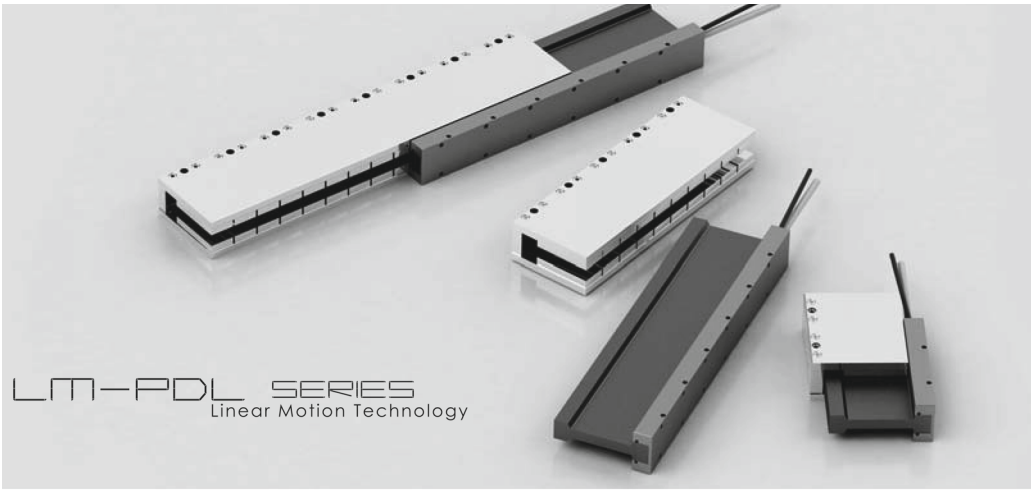
LM-SD-X Magnetic Way



OUTPUT CABLE (Cable standard length 400mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PDL Coil Assembly Model

Coil Assembly Model	LM-PDL2			LM-PDL4			LM-PDL6			LM-PDL8		
Winding code	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3
Performance[4]												
Peak Force with heat sink(N)[1][2]	657.2			1305.3			1900.3			2457.0		
Peak Force without heat sink(N)[2][3]	502.2			998.2			1382.1			1842.7		
Continuous Force with heat sink(N)[1][2]	164.4			326.3			475.1			614.2		
Continuous Force without heat sink(N)[2][3]	125.7			249.5			345.5			460.7		
Peak power(W)[1][2]	1294.7			2589.4			3659.0			4587.5		
Continuous power(W)[1][2]	80.9			161.8			228.7			286.7		
Mechanical												
Coil assembly length(mm)	148.0			268.0			388.0			508.0		
Coil assembly weight(kg)[2]	1.6			2.6			3.6			4.6		
Magnetic way weight(kg/m)[2]	25.1			25.1			25.1			25.1		
Electrical cycle length(mm)	60.0			60.0			60.0			60.0		
Electrical[4]												
Continuous Current with heat sink(A_{pk})[1][2]	1.7	3.4	6.8	1.7	3.4	6.8	1.7	3.3	6.6	1.6	3.3	6.6
Continuous Current without heat sink(A_{pk})[2][3]	1.3	2.6	5.2	1.3	2.6	5.2	1.2	2.4	4.8	1.2	2.4	4.8
Peak Current with heat sink(A_{pk})[1][2]	6.8	13.6	27.2	6.8	13.6	27.2	6.6	13.2	26.4	6.4	12.8	25.6
Peak Current without heat sink(A_{pk})[2][3]	5.2	10.4	20.8	5.2	10.4	20.8	4.8	9.6	19.2	4.8	9.6	19.2
Force Constant(N/A_{pk})[2]	96.7	48.4	24.2	192.0	96.0	48.0	287.9	144.0	72.0	383.9	192.0	96.0
Back EMF Constant(V/m/s)[2]	111.6	57.3	28.7	223.2	111.6	55.8	334.8	167.4	83.7	446.4	223.2	111.6
Resistant(Ohms)[2]	28	7.0	1.8	56.0	14.0	3.5	84.0	21.0	5.3	112.0	28.0	7.0
Inductance(mH)[2]	30.32	7.58	1.9	60.64	15.16	3.79	90.96	22.74	5.69	121.28	30.32	7.58
Time Constant(ms)[2]	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Thermal Resistant with heat sink(°C/W)[1][2]	1			0.5			0.4			0.3		
Thermal Resistant without heat sink(°C/W)[2][3]	1.6			0.8			0.7			0.5		
Heat Sink(mm)	800x900x12			800x900x12			800x900x12			800x900x12		
Motor Constant(N/√W)[2]	18.3			25.7			31.4			36.3		
Ph-PE dielectric strength[2]	≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)		
Ph-PE insulation resistance[2]	≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)		

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

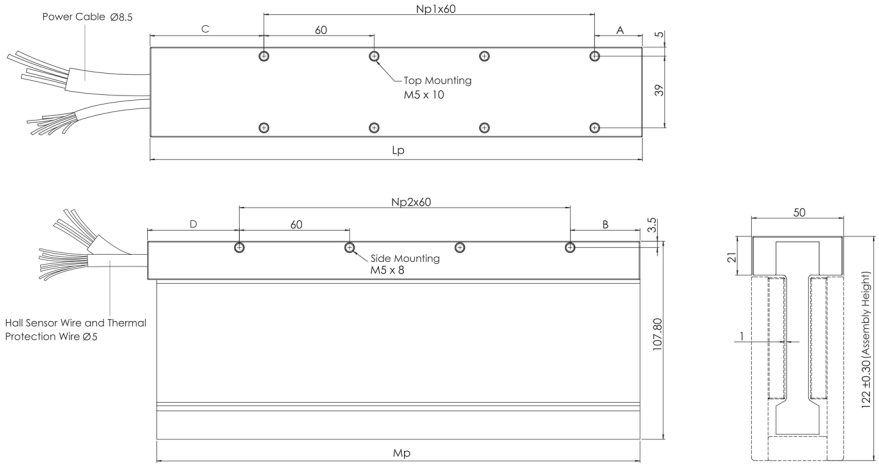
LM-PDL Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PDL2	1	1	148	143	26	38	62	50
LM-PDL4	3	3	268	263	26	38	62	50
LM-PDL6	5	5	388	383	26	38	62	50
LM-PDL8	7	7	508	503	26	38	62	50

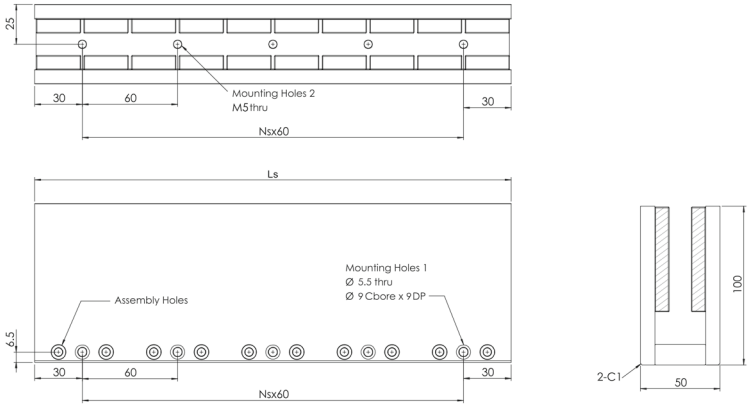
LM-SDL Magnetic Way

	Ns	Ls
LM-SDL0	1	120
LM-SDL1	4	300
LM-SDL2	7	480

LM-PDL Coil Assembly

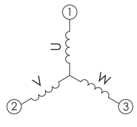


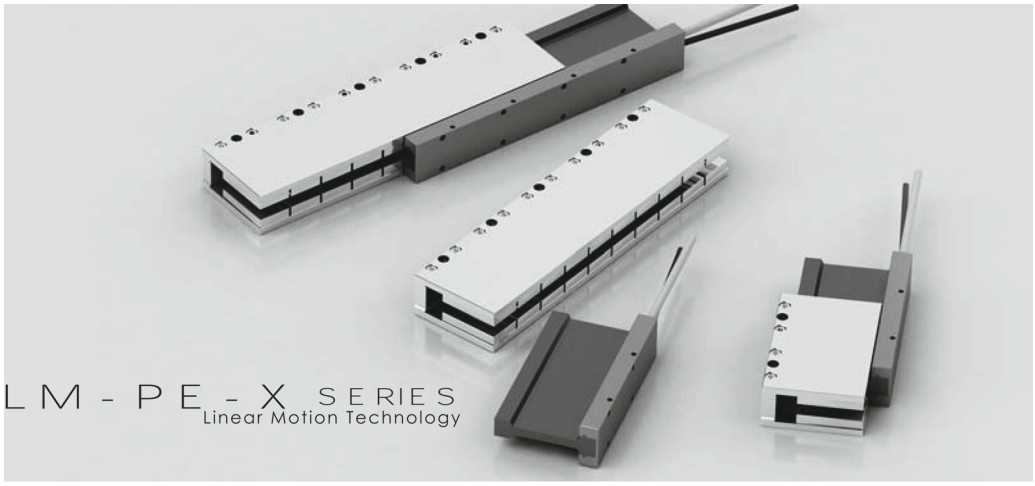
LM-SDL Magnetic Way



OUTPUT CABLE (Cable standard length 400mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-PE-X Coil Assembly Model

Coil Assembly Model	LM-PE-X2			LM-PE-X4			LM-PE-X6			LM-PE-X8		
Winding code	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3
Performance[4]												
Peak Force with heat sink(N)[1][2]	526.7			1053.4			1511.4			1923.6		
Peak Force without heat sink(N)[2][3]	389.3			778.6			1099.2			1465.6		
Continuous Force with heat sink(N)[1][2]	131.7			263.4			377.9			480.9		
Continuous Force without heat sink(N)[2][3]	97.3			194.7			274.8			366.4		
Peak power(W)[1][2]	1269.6			2539.2			3484.8			4233.6		
Continuous power(W)[1][2]	79.4			158.7			217.8			264.6		
Mechanical												
Coil assembly length(mm)	148.0			268.0			388.0			508.0		
Coil assembly weight(kg)[2]	0.9			1.5			2.1			2.7		
Magnetic way weight(kg/m)[2]	15.0			15.0			15.0			15		
Electrical cycle length(mm)	60.0			60.0			60.0			60.0		
Electrical[4]												
Continuous Current with heat sink(A_{pk})[1][2]	2.3	4.6	9.2	2.3	4.6	9.2	2.2	4.4	8.8	2.1	4.2	8.4
Continuous Current without heat sink(A_{pk})[2][3]	1.7	3.4	6.8	1.7	3.4	6.8	1.6	3.2	6.4	1.6	2.4	4.8
Peak Current with heat sink(A_{pk})[1][2]	9.2	18.4	36.8	9.2	18.4	36.8	8.8	17.6	35.2	8.4	16.8	33.6
Peak Current without heat sink(A_{pk})[2][3]	6.8	13.6	27.2	6.8	13.6	27.2	6.4	12.8	25.6	6.4	12.8	25.6
Force Constant(N/A_{pk})[2]	57.3	28.6	14.3	114.5	57.3	28.6	171.8	85.9	42.9	229.0	114.5	57.3
Back EMF Constant(V/m/s)[2]	66.1	33.1	16.5	132.2	66.1	33.1	198.3	99.2	49.6	264.4	132.2	66.1
Resistant(Ohms)[2]	15	3.8	0.9	30.0	7.5	1.9	45.0	11.3	2.8	60.0	15.0	3.8
Inductance(mH)[2]	12.89	3.22	0.81	25.78	6.45	1.61	38.67	9.67	2.42	51.56	12.89	3.22
Time Constant(ms)[2]	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Thermal Resistant with heat sink(°C/W)[1][2]	1			0.5			0.4			0.3		
Thermal Resistant without heat sink(°C/W)[2][3]	1.6			0.9			0.7			0.5		
Heat Sink(mm)	250x500x25			250x500x25			250x500x25			250x500x25		
Motor Constant(N/√W)[2]	14.8			20.9			25.6			29.6		
Ph-PE dielectric strength[2]	≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)			≥ 5KV(AC)		
Ph-PE insulation resistance[2]	≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)			≥ 1KV(DC)		

(1) The value applies to static sinusoidal drive, specific heat sink and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

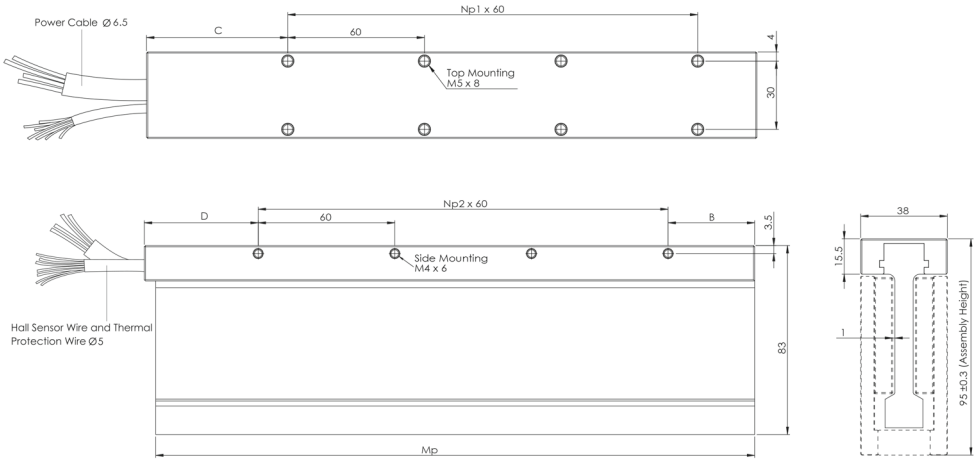
LM-PE-X Coil Assembly

	Np1	Np2	Lp	Mp	A	B	C	D
LM-PE-X2	1	1	148	143	26	38	62	50
LM-PE-X4	3	3	268	263	26	38	62	50
LM-PE-X6	5	5	388	383	26	38	62	50
LM-PE-X8	7	7	508	503	26	38	62	50

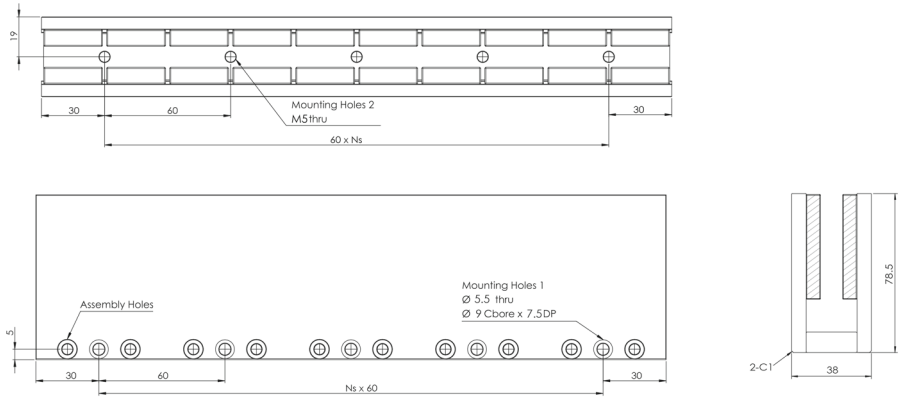
LM-SE-X Magnetic Way

	Ns	Ls
LM-SE-X0	1	120
LM-SE-X1	4	300
LM-SE-X2	7	480

LM-PE-X Coil Assembly

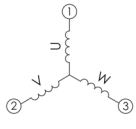


LM-SE-X Magnetic Way



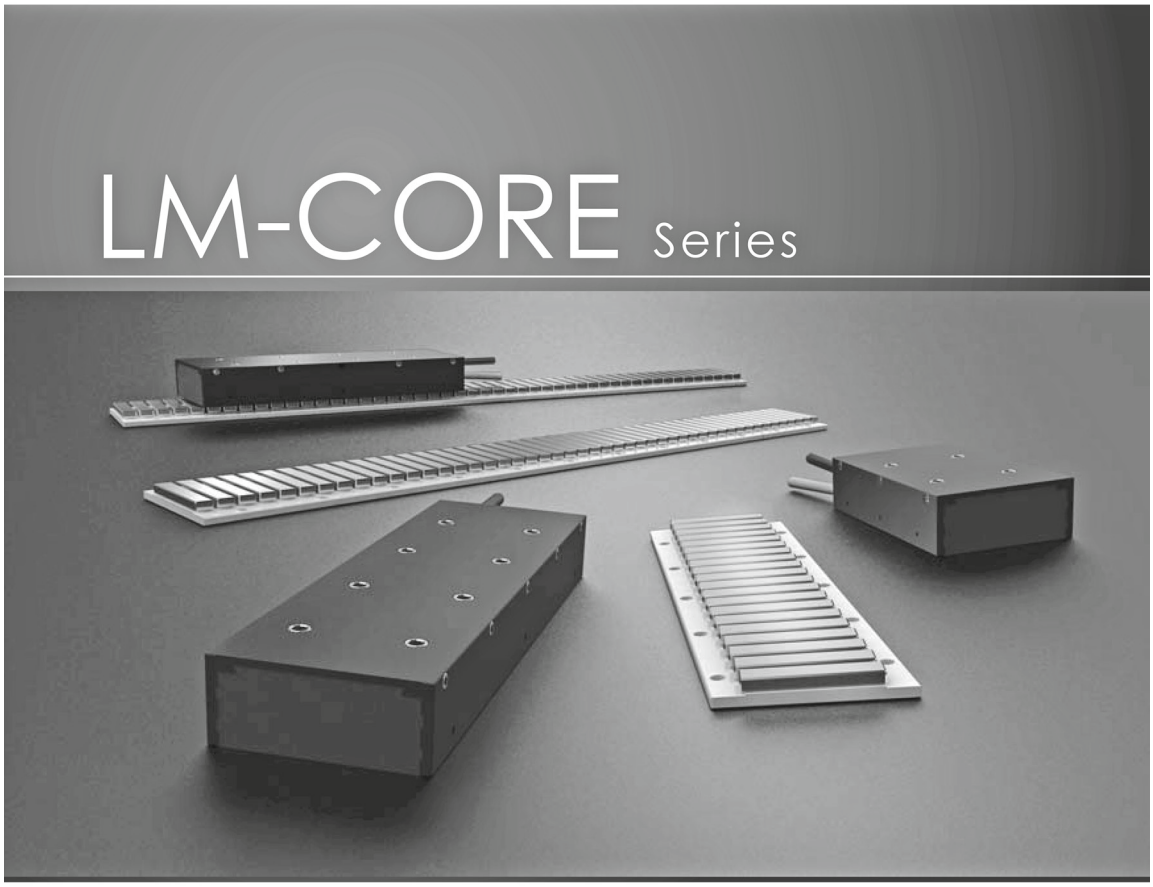
OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0,5 mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	0,5 mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	0,5 mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	0,5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			



cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.

LM-CORE Series



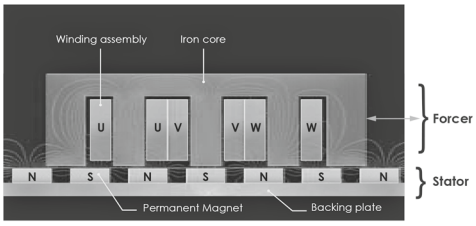
Ironcore Linear Motor

Ironcore Linear Motor

Construction & Features

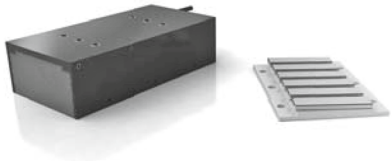
Iron core linear motors are suitable for use in high acceleration, high velocity and high load point to point linear motion applications.

Structure



- cpc linear motors are composed of two parts: The stator and the forcer.
- Forcer is made by combining coil windings with a iron core encapsulated by epoxy inside an aluminum outer shell.
- Stator is composed of arrays of permanent magnets on a ferromagnetic backing plate. The magnets are arranged in a N-S pole pattern, forming a closed magnetic field loop with the forcer iron core.

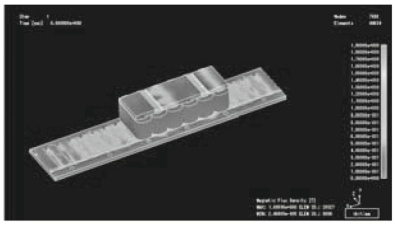
Advantages



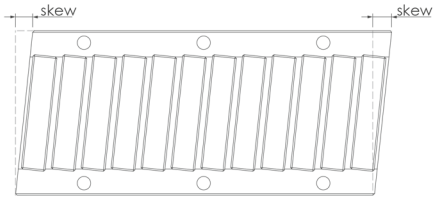
- **High Force Density**
  Due to stronger magnetic coupling between the iron core and the stator magnets. Iron core linear motors have relatively higher force output than ironless linear motors.
- **High Heat Dissipation**
  The iron core provides a dissipation path for the heat produced by the coils during operation, reducing the coil-to-ambient thermal resistance compared with ironless linear motors.
- **Easy assembly**
  For iron core linear motors the forcer and stator are directly facing and is easier to assemble.

cpc Features

- cpc For motor parameters, force constant refers to the amount of force produced per one ampere of current, while motor constant is the force produced per Watt and is representative of the motor's efficiency. As such the motor constant is a better metric at evaluating motor performance. cpc's linear motors have been designed with the aid of advanced simulation software. As a result, for a given dimension cpc's motor has a higher motor constant.



- **Low Cogging Force**
  Cogging force originates from the magnetic pull on the iron core during transitions across magnetic poles on the stator. By skewing the magnets the transition zone characteristics can be refined. Using advanced software analysis cpc arrived at a design with low cogging force

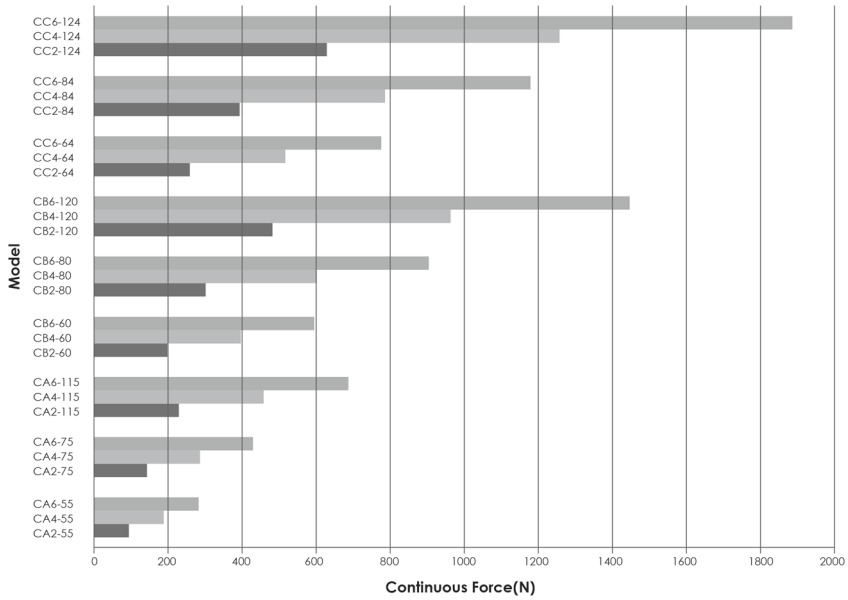


- **Heat Dissipative Case**
  In a cpc iron core motor the outer casing is made of aluminum, increasing heat dissipation area and lowering thermal resistance.
- **Integrated Hall Sensor and Temperature Switch**
  cpc's motor forcer fully utilizes its internal volume, integrating hall sensors and an over temperature detection switch for the user, without having to buy or install as optional extras.

Applications

1. Automated storage
2. Pick & Place
3. Industrial Automation
4. Semiconductors
5. Medical equipment
6. PCB industry
7. Printing industry

Continuous Force Overview



Ordering Information

Coil Assembly

LM	IC	CA	2	75	W1	H	NC	400

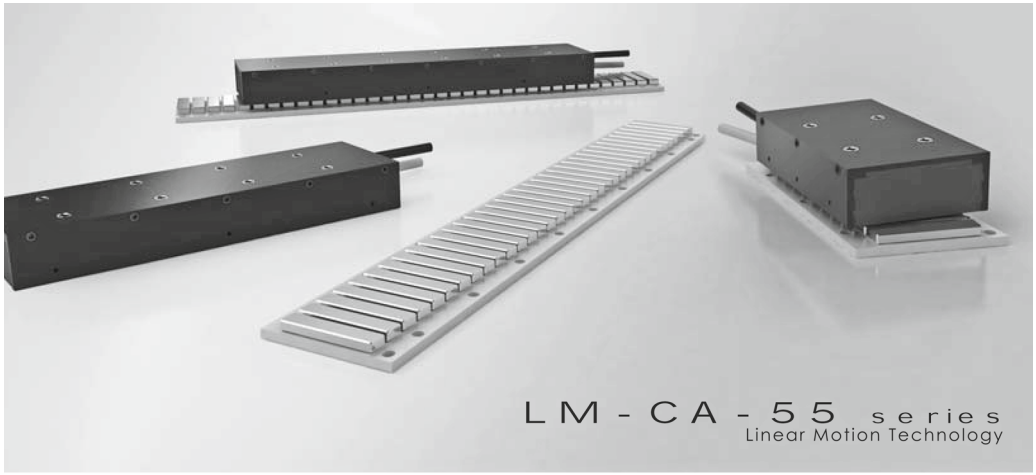
- 400 — Cable Length in mm (400mm Standard)
- NC — Cooling: NC - no cooling, WC - water cooling
- H — Halls: N - no hall sensor, H - with hall sensor
- W1 — Winding Type: S,SP,P,D
- 75 — Assembly width: CC-64,84,124 、 CA-55,75,115 、 CB-60,80,120
- 2 — Winding Quantity: 2 - 2 coils、4 - 4 coils、6 - 6 coils
- CA — Coil Assembly: CA series 、CB series 、CC series
- IC — Motor Type: IL - Ironless, IC - Ironcore
- LM — Linear Motor

Magnetic Way

LM	IC	MA	75	0	N

- N — Magnet Protection: 1. N - None, 2. S - Stainless Steel, 3. E - Epoxy
- 0 — Magnetic Way Length:
  - 0-MA : 120 MB : 120 MC : 114
  - 1-MA : 360 MB : 300 MC : 304
  - 2-MA : 480 MB : 480 MC : 456
- 75 — Assembly width: CC-64,84,124 CA-55,75,115 CB-60,80,120
- MA — Magnetic Way: MA series 、MB series 、MC series
- IC — Motor Type: IL - Ironless, IC - Ironcore
- LM — Linear Motor

cpc also provides servo drives, optical linear scales and magnetic linear scale, for more details please contact cpc.



LM-CA-55 Coil Assembly Model

Coil Assembly Model	LM-CA2-55			LM-CA4-55			LM-CA6-55		
Winding code	S	P	D	SP	P	D	SP	P	D
Performance[4]									
Peak Force with heat sink(N)[1][2]	242.1			484.2			726.3		
Peak Force without heat sink(N)[2][3]	138.8			277.6			416.4		
Continuous Force with heat sink(N)[1][2]	94.2			188.3			282.5		
Continuous Force without heat sink(N)[2][3]	53.8			107.6			161.4		
Peak Force in linear range(N)	174.9			349.7			524.6		
Attraction Force(N)	350.0			700.0			1050		
Peak power(W)[1][2]	1215			2430			3645		
Continuous power(W)[1][2]	66.2			132.3			198.5		
Mechanical									
Coil assembly length(mm)	97			177			257		
Coil assembly weight(kg)[2]	0.6			1.1			1.6		
Magnetic way weight(kg/m)[2]	2.6			2.6			2.6		
Pole pitch(mm)	20			20			20		
Electrical[4]									
Continuous Current with heat sink(A_{pk})[1][2]	1.8	3.5	7.0	3.5	7.0	14.4	3.5	10.5	21.0
Continuous Current without heat sink(A_{pk})[2][3]	1.0	2.0	4.0	2.0	4.0	8.0	2.0	6.0	12.0
Peak Current with heat sink(A_{pk})[1][2]	7.5	15.0	28.0	15.0	30.0	60.0	15.0	45.0	90.0
Peak Current without heat sink(A_{pk})[2][3]	4.4	8.7	13.1	8.7	17.4	34.8	8.7	26.1	52.2
Peak Current in linear range(N)	3.3	6.5	13.2	6.6	13.2	20.0	6.6	19.8	40.0
Force Constant(N/A_{pk})[2]	53.8	26.9	13.5	53.8	26.9	13.5	80.7	26.9	13.5
Back EMF Constant(V/m/s)[2]	67.4	33.7	16.9	67.4	33.7	16.9	101.1	33.7	16.9
Resistant(Ohms)[2]	21.6	5.4	1.4	10.8	2.7	0.7	16.2	1.8	0.5
Inductance(mH)[2]	100.00	25.00	6.25	50.00	12.50	3.13	75.00	8.30	2.10
Time Constant(ms)[2]	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Thermal Resistant with heat sink(°C/W)[1][2]	1.1			0.6			0.4		
Thermal Resistant without heat sink(°C/W)[2][3]	3.4			1.7			1.1		
Motor Constant(N/√W)[2]	11.6			16.4			20.1		

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 11x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

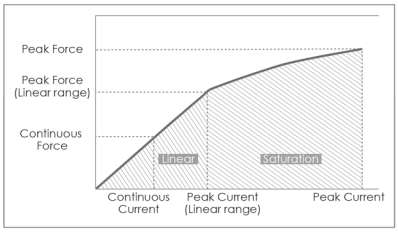
LM-CA-55 Coil Assembly

	Np1	Lp
LM-CA2-55	1	97
LM-CA4-55	3	177
LM-CA6-55	5	257

LM-MA-55 Magnetic Way

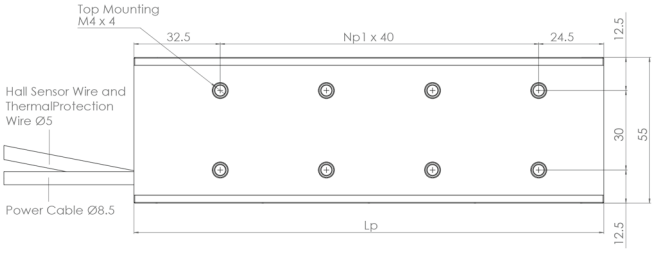
	Ns	Ls	Ls1
LM-MA2-55	2	120	110
LM-MA4-55	8	360	350
LM-MA6-55	11	480	470

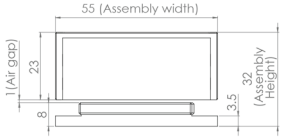
Current VS Force.



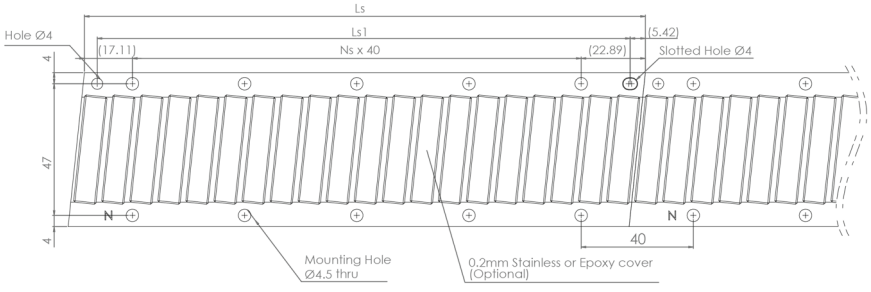
When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CA-55 Coil Assembly



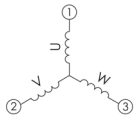


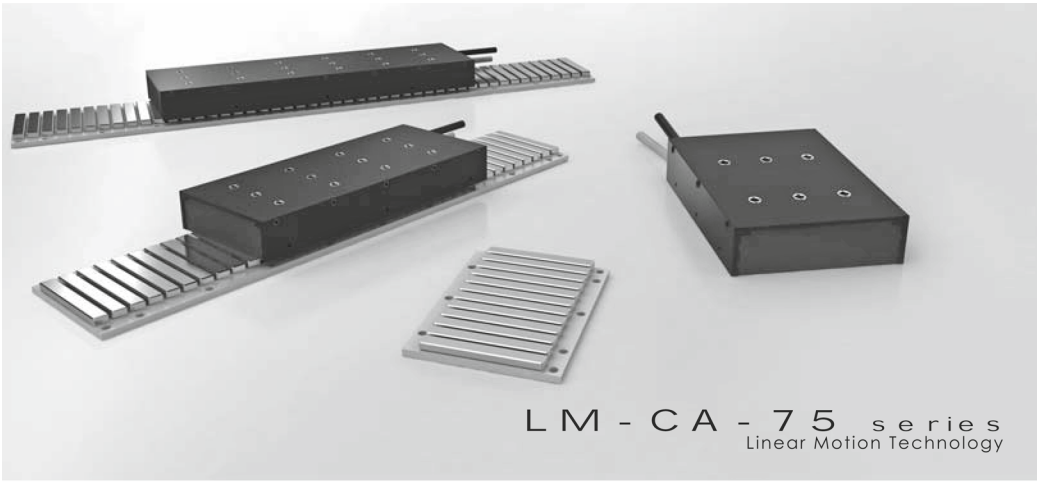
LM-MA-55 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CA-75 Coil Assembly Model

Coil Assembly Model	LM-CA2-75			LM-CA4-75			LM-CA6-75	
Winding code	S	P	D	SP	P	D	P	D
Performance[4]								
Peak Force with heat sink(N)[1][2]	368.0			736.0			1104.0	
Peak Force without heat sink(N)[2][3]	213.4			426.9			640.3	
Continuous Force with heat sink(N)[1][2]	143.1			286.2			429.3	
Continuous Force without heat sink(N)[2][3]	81.8			163.6			245.3	
Peak Force in linear range(N)	265.8			531.5			797.3	
Attraction Force(N)	505			1009			1514	
Peak power(W)[1][2]	1665			3330			4995	
Continuous power(W)[1][2]	90.7			181.3			272.0	
Mechanical								
Coil assembly length(mm)	97			177			257	
Coil assembly weight(kg)[2]	0.8			1.5			2.2	
Magnetic way weight(kg/m)[2]	3.5			3.5			3.5	
Pole pitch(mm)	20			20			20	
Electrical[4]								
Continuous Current with heat sink(A_{pk})[1][2]	1.8	3.5	7.0	3.5	7.0	14.0	10.5	21.0
Continuous Current without heat sink(A_{pk})[2][3]	1.0	2.0	4.0	2.0	4.0	8.0	6.0	12.0
Peak Current with heat sink(A_{pk})[1][2]	7.5	15.0	28.0	15.0	30.0	60.0	45.0	60.0
Peak Current without heat sink(A_{pk})[2][3]	4.4	8.7	13.1	8.7	17.4	34.8	26.1	52.2
Peak Current in linear range(N)	3.3	6.5	13.2	6.6	13.2	20.0	19.8	39.6
Force Constant(N/A_{pk})[2]	81.8	40.9	20.4	81.8	40.9	20.4	40.9	20.4
Back EMF Constant(V/m/s)[2]	102.4	51.2	25.6	102.4	51.2	25.6	51.2	25.6
Resistant(Ohms)[2]	29.6	7.4	1.9	14.8	3.7	0.9	2.5	0.6
Inductance(mH)[2]	137.03	34.26	8.57	68.52	17.13	4.28	11.4	2.9
Time Constant(ms)[2]	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Thermal Resistant with heat sink(°C/W)[1][2]	0.8			0.4			0.3	
Thermal Resistant without heat sink(°C/W)[2][3]	2.5			1.2			0.8	
Motor Constant(N/√W)[2]	15.0			21.3			26.0	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 11x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

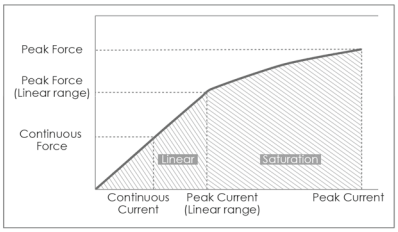
LM-CA-75 Coil Assembly

	Np1	Lp
LM-CA2-75	1	97
LM-CA4-75	3	177
LM-CA6-75	5	257

LM-MA-75 Magnetic Way

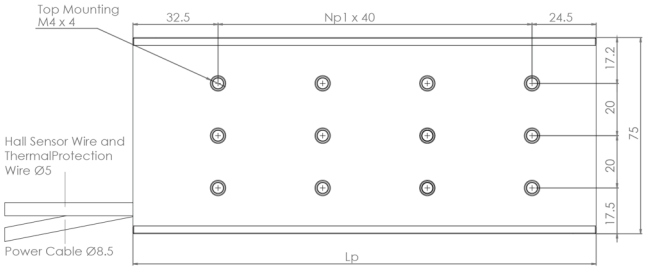
	Ns	Ls	Ls1
LM-MA2-75	2	120	110
LM-MA4-75	8	360	350
LM-MA6-75	11	480	470

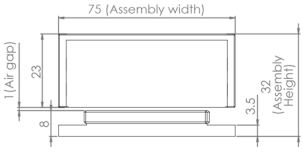
Current VS Force.



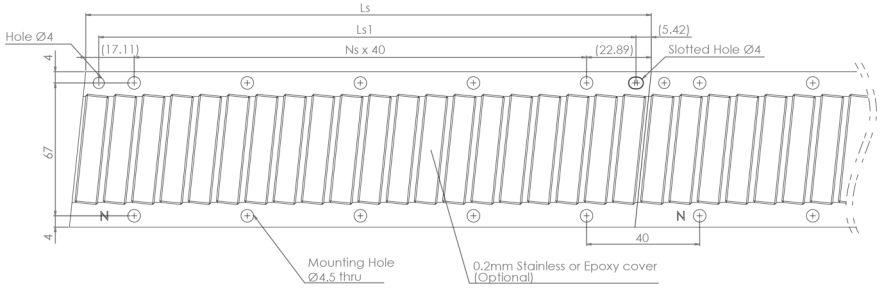
When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CA-75 Coil Assembly



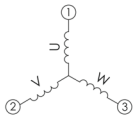


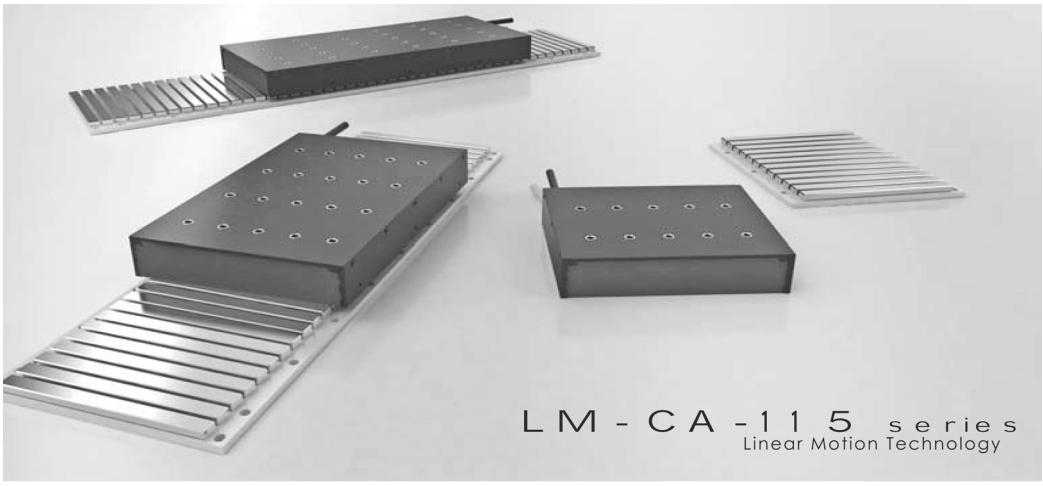
LM-MA-75 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CA-115 Coil Assembly Model

Coil Assembly Model	LM-CA2-115		LM-CA4-115		LM-CA6-115	
Winding code	P	D	P	D	P	D
Performance[4]						
Peak Force with heat sink(N)[1][2]	588.8		1177.6		1766.4	
Peak Force without heat sink(N)[2][3]	341.5		683.0		1024.5	
Continuous Force with heat sink(N)[1][2]	229.0		457.9		686.9	
Continuous Force without heat sink(N)[2][3]	130.8		261.7		392.5	
Peak Force in linear range(N)	454.5		909.0		1363.5	
Attraction Force(N)	896		1792		2688	
Peak power(W)[1][2]	2295		4589		6884	
Continuous power(W)[1][2]	124.9		249.9		374.8	
Mechanical						
Coil assembly length(mm)	97		177		257	
Coil assembly weight(kg)[2]	1.5		2.8		4.1	
Magnetic way weight(kg/m)[2]	6.7		6.7		6.7	
Pole pitch(mm)	20		20		20	
Electrical[4]						
Continuous Current with heat sink(A_{pk})[1][2]	3.3	6.7	6.7	13.3	10.0	20.0
Continuous Current without heat sink(A_{pk})[2][3]	1.9	3.8	3.8	7.6	5.7	11.4
Peak Current with heat sink(A_{pk})[1][2]	14.3	27.5	28.5	57.0	42.8	85.5
Peak Current without heat sink(A_{pk})[2][3]	8.3	13.1	13.1	33.1	24.8	49.6
Peak Current in linear range(N)	6.6	13.2	13.2	26.4	16.5	39.6
Force Constant(N/A_{pk})[2]	68.9	34.4	68.9	34.4	68.9	34.4
Back EMF Constant(V/m/s)[2]	86.3	43.1	86.3	43.1	86.3	43.1
Resistant(Ohms)[2]	11.3	2.8	5.65	1.41	3.8	0.9
Inductance(mH)[2]	52.31	13.08	26.16	6.54	17.4	4.4
Time Constant(ms)[2]	4.6	4.6	4.6	4.6	4.6	4.6
Thermal Resistant with heat sink(°C/W)[1][2]	0.6		0.3		0.2	
Thermal Resistant without heat sink(°C/W)[2][3]	1.8		0.9		0.6	
Motor Constant(N/√W)[2]	20.5		29.0		35.5	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 11x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

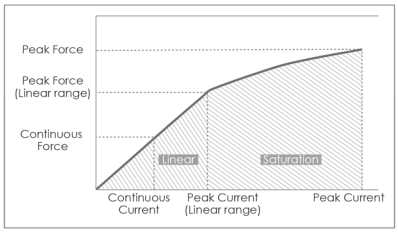
LM-CA-115 Coil Assembly

	Np1	Lp
LM-CA2-115	1	97
LM-CA4-115	3	177
LM-CA6-115	5	257

LM-MA-115 Magnetic Way

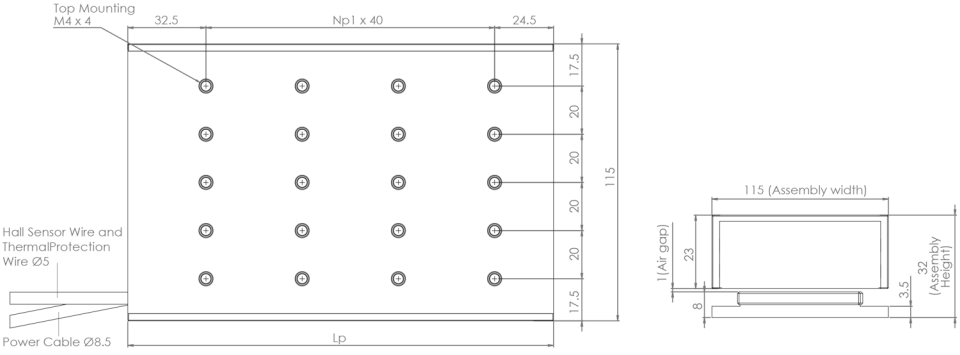
	Ns	Ls	Ls1
LM-MA2-115	2	120	110
LM-MA4-115	8	360	350
LM-MA6-115	11	480	470

Current VS Force.

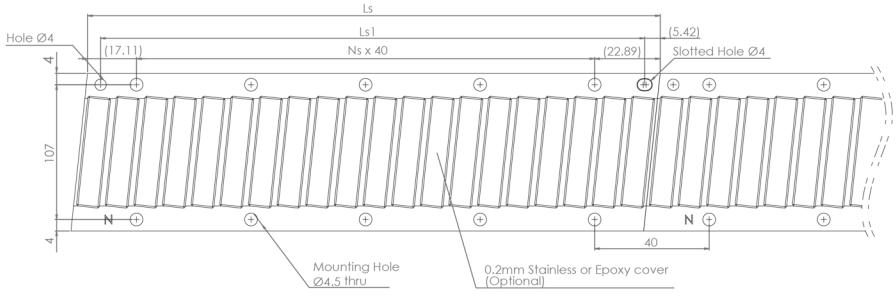


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CA-115 Coil Assembly

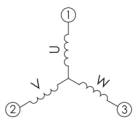


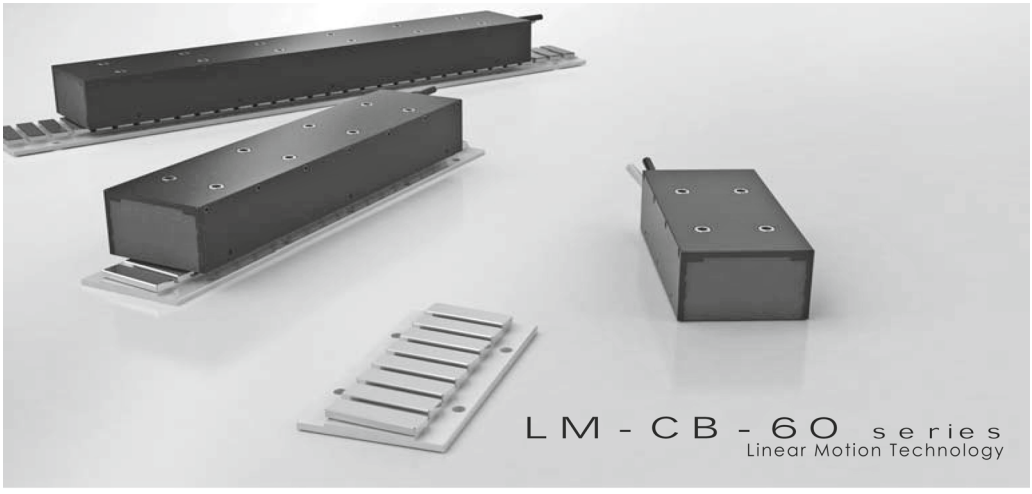
LM-MA-115 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CB-60 Coil Assembly Model

Coil Assembly Model	LM-CB2-60			LM-CB4-60			LM-CB6-60	
Winding code	S	P	D	SP	P	D	P	D
Performance[4]								
Peak Force with heat sink(N)[1][2]	386.3			772.6			1158.9	
Peak Force without heat sink(N)[2][3]	312.6			625.3			937.6	
Continuous Force with heat sink(N)[1][2]	198.2			396.5			594.7	
Continuous Force without heat sink(N)[2][3]	132.2			264.3			396.5	
Peak Force in linear range(N)	283.2			566.4			849.6	
Attraction Force(N)	630			1260			1890	
Peak power(W)[1][2]	1661			3321			4982	
Continuous power(W)[1][2]	84.7			169.3			254.0	
Mechanical								
Coil assembly length(mm)	130			250			370	
Coil assembly weight(kg)[2]	1.6			3.1			4.6	
Magnetic way weight(kg/m)[2]	3.0			3.0			3.0	
Pole pitch(mm)	30			30			30	
Electrical[4]								
Continuous Current with heat sink(A_{pk})[1][2]	2.1	4.2	8.4	4.2	8.4	16.8	12.6	25.2
Continuous Current without heat sink(A_{pk})[2][3]	1.4	2.8	5.6	2.8	5.6	11.2	8.4	16.8
Peak Current with heat sink(A_{pk})[1][2]	7.4	14.9	29.8	14.9	29.8	59.5	44.6	89.3
Peak Current without heat sink(A_{pk})[2][3]	4.8	9.6	19.2	9.6	19.2	38.4	28.8	57.6
Peak Current in linear range(N)	3.0	6.0	12.0	6.0	12.0	24.0	18.0	36.0
Force Constant(N/A_{pk})[2]	94.4	47.2	23.6	94.4	47.2	23.6	47.2	23.6
Back EMF Constant(V/m/s)[2]	104.0	52.0	26.0	104.0	52.0	26.0	52.0	26.0
Resistant(Ohms)[2]	19.2	4.8	1.2	9.6	2.4	0.6	1.6	0.4
Inductance(mH)[2]	200.00	50.00	12.5	100.00	25.00	6.25	16.7	4.2
Time Constant(ms)[2]	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Thermal Resistant with heat sink(°C/W)[1][2]	0.9			0.4			0.3	
Thermal Resistant without heat sink(°C/W)[2][3]	1.9			1.0			0.6	
Motor Constant(N/√W)[2]	21.5			30.5			37.3	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 8x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25℃ambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

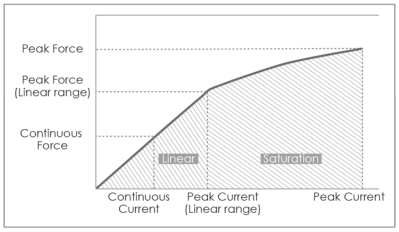
LM-CB-60 Coil Assembly

	Np1	Lp
LM-CB2-60	1	130
LM-CB4-60	3	250
LM-CB6-60	5	370

LM-MB-60 Magnetic Way

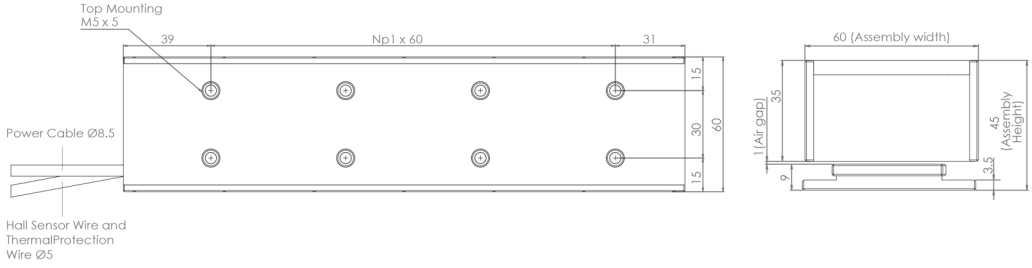
	Ns	Ls
LM-MB0-60	1	120
LM-MB1-60	4	300
LM-MB2-60	7	480

Current VS Force.

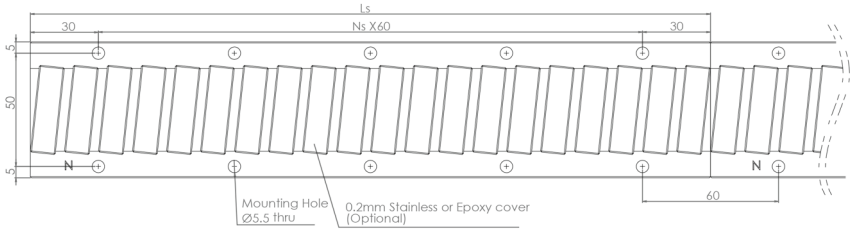


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CB-60 Coil Assembly

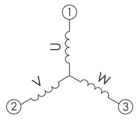


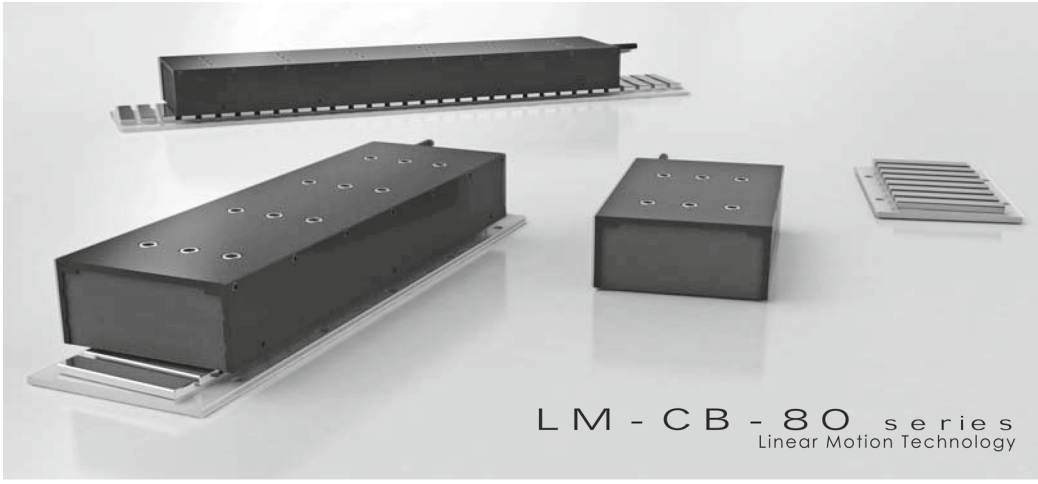
LM-MB-60 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CB-80 Coil Assembly Model

Coil Assembly Model	LM-CB2-80		LM-CB4-80		LM-CB6-80	
Winding code	P	D	P	D	P	D
Performance[4]						
Peak Force with heat sink(N)[1][2]	587.1		1174.3		1761.4	
Peak Force without heat sink(N)[2][3]	475.2		950.5		1425.6	
Continuous Force with heat sink(N)[1][2]	301.3		602.6		904.0	
Continuous Force without heat sink(N)[2][3]	200.9		401.8		602.6	
Peak Force in linear range(N)	430.5		860.9		1291.4	
Attraction Force(N)	958		1915		2873	
Peak power(W)[1][2]	2283		4567		6850	
Continuous power(W)[1][2]	116.4		232.8		349.3	
Mechanical						
Coil assembly length(mm)	130		250		370	
Coil assembly weight(kg)[2]	2.4		4.7		6.9	
Magnetic way weight(kg/m)[2]	4.6		4.6		4.6	
Pole pitch(mm)	30		30		30	
Electrical[4]						
Continuous Current with heat sink(A_{pk})[1][2]	4.2	8.4	8.4	16.8	12.6	25.2
Continuous Current without heat sink(A_{pk})[2][3]	2.8	5.6	5.6	11.2	8.4	16.8
Peak Current with heat sink(A_{pk})[1][2]	14.9	29.8	29.8	59.5	44.6	89.3
Peak Current without heat sink(A_{pk})[2][3]	9.6	19.2	19.2	38.4	28.8	57.6
Peak Current in linear range(N)	6.0	12.0	12.0	24.0	18.0	36.0
Force Constant(N/A_{pk})[2]	71.7	35.9	71.7	35.9	71.7	35.9
Back EMF Constant(V/m/s)[2]	79.0	39.5	79.0	39.5	79.0	39.5
Resistant(Ohms)[2]	6.6	1.7	3.3	0.8	2.2	0.6
Inductance(mH)[2]	68.75	17.19	34.38	8.59	22.92	5.70
Time Constant(ms)[2]	10.4	10.4	10.4	10.4	10.4	10.4
Thermal Resistant with heat sink(°C/W)[1][2]	0.6		0.3		0.2	
Thermal Resistant without heat sink(°C/W)[2][3]	1.4		0.7		0.5	
Motor Constant(N/√W)[2]	27.9		39.5		48.4	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 8x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

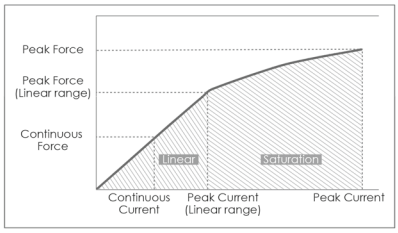
LM-CB-80 Coil Assembly

	Np1	Lp
LM-CB2-80	1	130
LM-CB4-80	3	250
LM-CB6-80	5	370

LM-MB-80 Magnetic Way

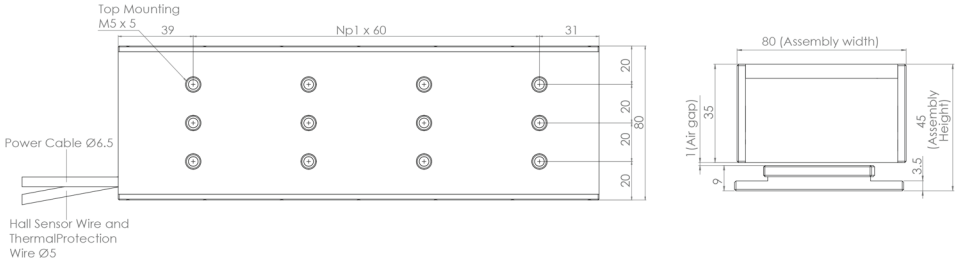
	Ns	Ls
LM-MB0-80	1	120
LM-MB1-80	4	300
LM-MB2-80	7	480

Current VS Force.

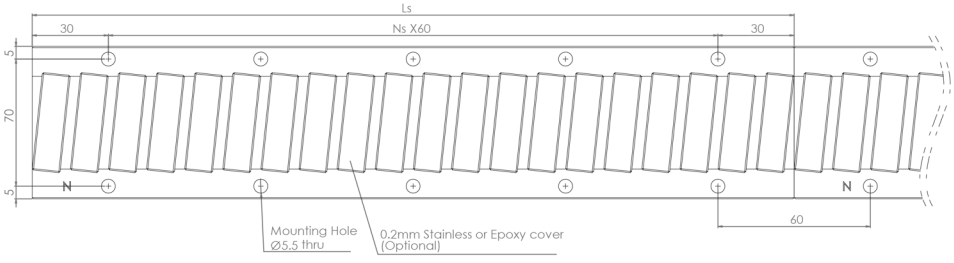


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CB-80 Coil Assembly

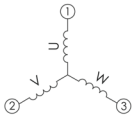


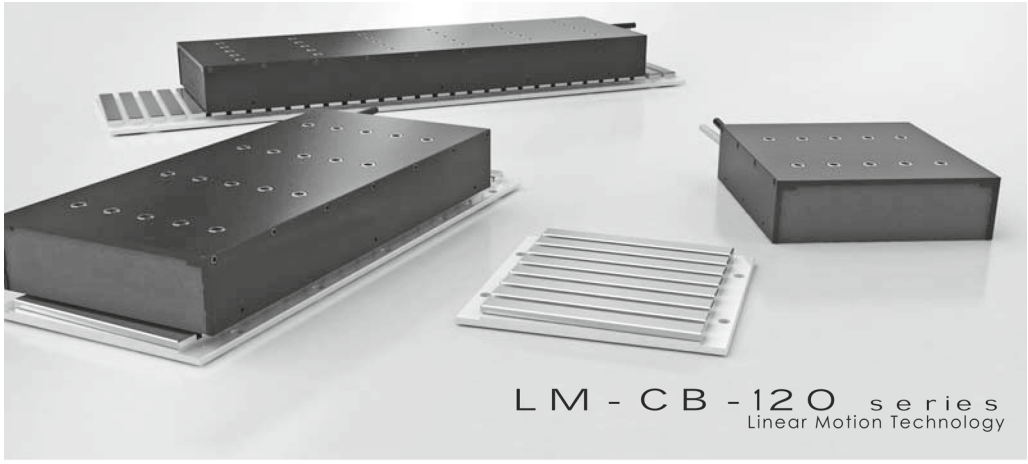
LM-MB-80 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CB-120 Coil Assembly Model

Coil Assembly Model	LM-CB2-120		LM-CB4-120		LM-CB6-120	
Winding code	P	D	P	D	P	D
Performance[4]						
Peak Force with heat sink(N)[1][2]	939.4		1878.9		2818.3	
Peak Force without heat sink(N)[2][3]	760.4		1520.7		2281.1	
Continuous Force with heat sink(N)[1][2]	482.1		964.2		1446.4	
Continuous Force without heat sink(N)[2][3]	321.4		642.8		964.2	
Peak Force in linear range(N)	725.0		1450.0		2175.0	
Attraction Force(N)	1613		3226		4839	
Peak power(W)[1][2]	3091		6182		9273	
Continuous power(W)[1][2]	157.6		315.2		472.8	
Mechanical						
Coil assembly length(mm)	130		250		370	
Coil assembly weight(kg)[2]	4.0		7.8		11.5	
Magnetic way weight(kg/m)[2]	7.7		7.7		7.7	
Pole pitch(mm)	30		30		30	
Electrical[4]						
Continuous Current with heat sink(A_{pk})[1][2]	4.0	8.0	8.0	16.0	12.0	23.9
Continuous Current without heat sink(A_{pk})[2][3]	2.7	5.3	5.3	10.6	8.0	16.0
Peak Current with heat sink(A_{pk})[1][2]	14.9	29.8	29.8	59.5	44.6	89.3
Peak Current without heat sink(A_{pk})[2][3]	9.6	19.2	19.2	38.4	28.8	57.6
Peak Current in linear range(N)	6.0	12.0	12.0	24.0	18.0	36.0
Force Constant(N/A_{pk})[2]	120.8	60.4	120.8	60.4	120.8	60.4
Back EMF Constant(V/m/s)[2]	133.1	66.6	133.1	66.6	133.1	66.6
Resistant(Ohms)[2]	9.90	2.50	4.95	1.24	3.3	0.8
Inductance(mH)[2]	103.13	25.78	51.56	12.89	34.40	8.60
Time Constant(ms)[2]	10.4	10.4	10.4	10.4	10.4	10.4
Thermal Resistant with heat sink(°C/W)[1][2]	0.5		0.2		0.2	
Thermal Resistant without heat sink(°C/W)[2][3]	1.0		0.5		0.3	
Motor Constant(N/√W)[2]	38.4		54.3		66.5	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 8x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

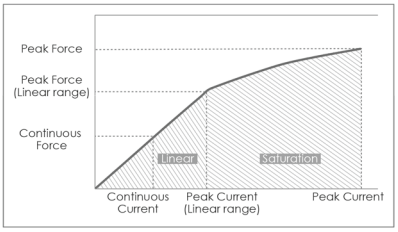
LM-CB-120 Coil Assembly

	Np1	Lp
LM-CB2-120	1	130
LM-CB4-120	3	250
LM-CB6-120	5	370

LM-MB-120 Magnetic Way

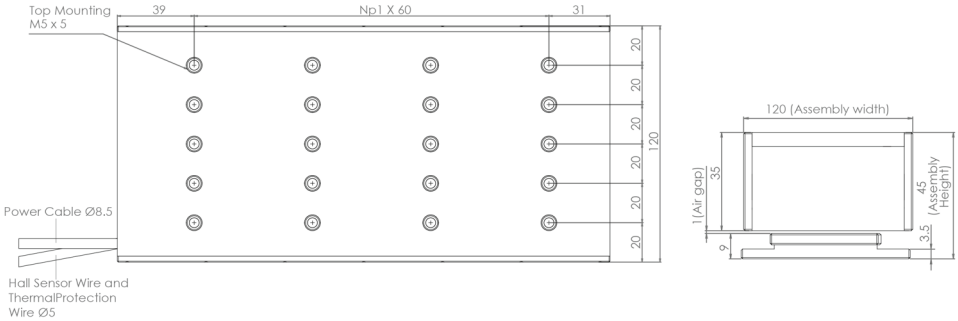
	Ns	Ls
LM-MB0-120	1	120
LM-MB1-120	4	300
LM-MB2-120	7	480

Current VS Force.

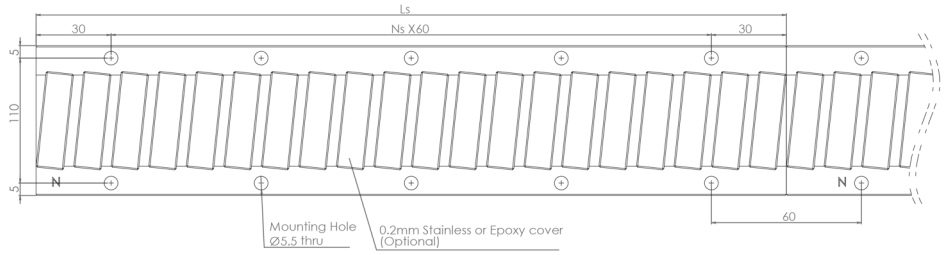


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CB-120 Coil Assembly

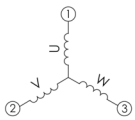


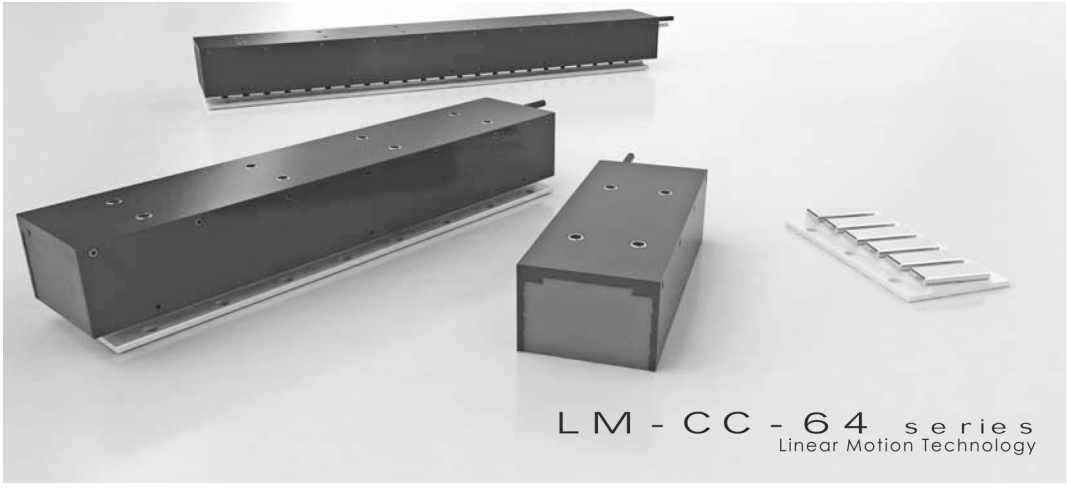
LM-MB-120 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CC-64 Coil Assembly Model

Coil Assembly Model	LM-CC2-64		LM-CC4-64		LM-CC6-64	
Winding code	P	D	P	D	P	D
Performance[4]						
Peak Force with heat sink(N)[1][2]	579.0		1158.0		1737.0	
Peak Force without heat sink(N)[2][3]	356.7		713.4		1070.1	
Continuous Force with heat sink(N)[1][2]	258.5		517.0		775.4	
Continuous Force without heat sink(N)[2][3]	100.8		201.6		302.4	
Peak Force in linear range(N)	287.2		574.4		861.6	
Attraction Force(N)	590		1180		1770	
Peak power(W)[1][2]	1617		3235		4852	
Continuous power(W)[1][2]	101.1		202.2		303.3	
Mechanical						
Coil assembly length(mm)	162		314		466	
Coil assembly weight(kg)[2]	2.3		4.5		6.6	
Magnetic way weight(kg/m)[2]	3.6		3.6		3.6	
Pole pitch(mm)	38		38		38	
Electrical[4]						
Continuous Current with heat sink(A_{pk})[1][2]	3.6	7.2	7.2	14.4	10.8	21.6
Continuous Current without heat sink(A_{pk})[2][3]	1.8	3.6	3.6	7.2	5.4	10.8
Peak Current with heat sink(A_{pk})[1][2]	14.4	28.8	21.6	28.8	43.2	86.4
Peak Current without heat sink(A_{pk})[2][3]	7.2	14.4	14.4	14.4	21.6	43.2
Peak Current in linear range(N)	4.0	8.0	8.0	16.0	12.0	24.0
Force Constant(N/A_{pk})[2]	71.8	35.9	71.8	35.9	71.8	35.9
Back EMF Constant(V/m/s)[2]	87.5	43.8	87.5	43.8	87.5	43.8
Resistant(Ohms)[2]	7.8	2.0	3.9	1.0	2.6	0.7
Inductance(mH)[2]	11.92	2.98	5.96	1.49	3.97	1.0
Time Constant(ms)[2]	1.5	1.5	1.5	1.5	1.5	1.5
Thermal Resistant with heat sink(°C/W)[1][2]	0.7		0.4		0.2	
Thermal Resistant without heat sink(°C/W)[2][3]	2.9		1.4		1.0	
Motor Constant(N/√W)[2]	25.7		36.4		44.5	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 9x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%.
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

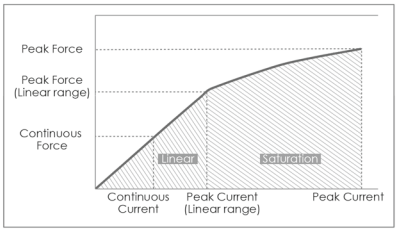
LM-CC-64 Coil Assembly

	Np1	Lp
LM-CC2-64	1	162
LM-CC4-64	3	314
LM-CC6-64	5	466

LM-MC-64 Magnetic Way

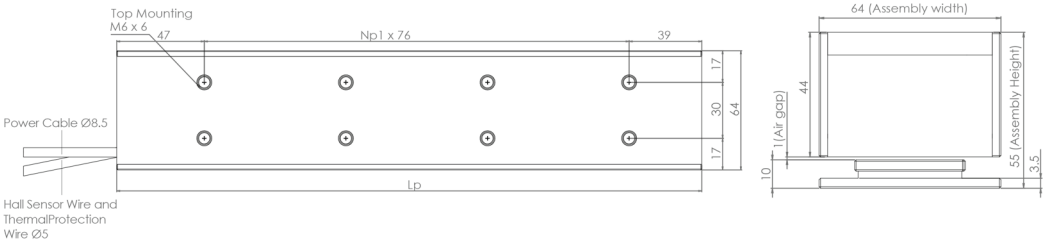
	Ns	Ls
LM-MC0-64	2	114
LM-MC1-64	7	304
LM-MC2-64	11	456

Current VS Force.

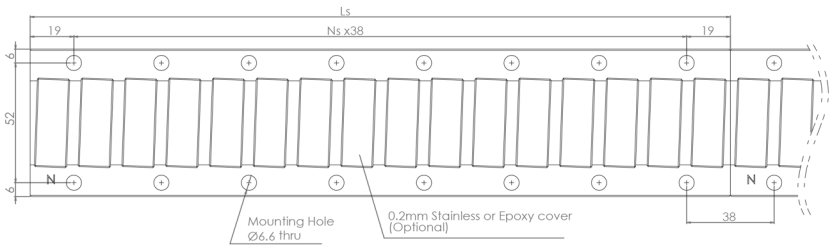


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CC-64 Coil Assembly

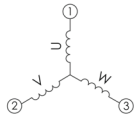


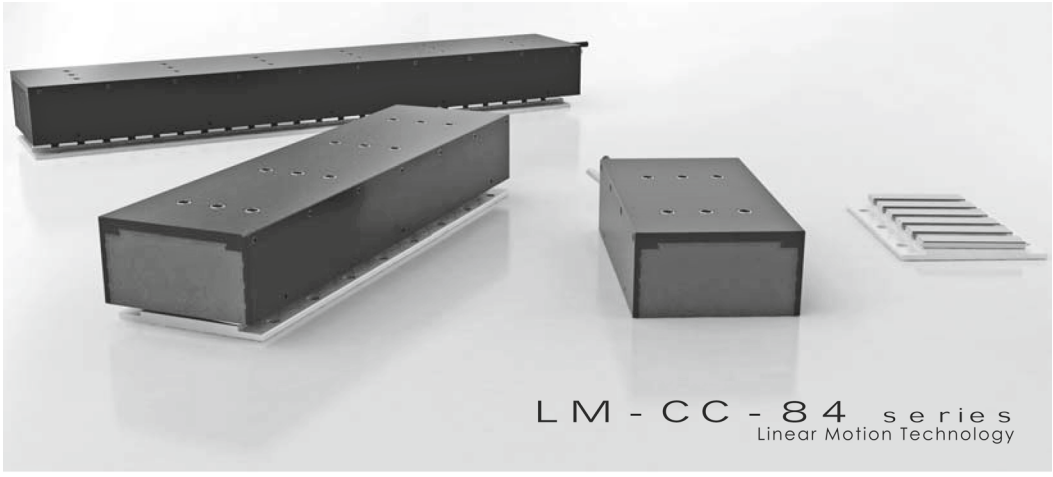
LM-MC-64 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CC-84 Coil Assembly Model

Coil Assembly Model	LM-CC2-84		LM-CC4-84		LM-CC6-84	
Winding code	P	D	P	D	P	D
Performance[4]						
Peak Force with heat sink(N)[1][2]	880.1		1760.1		2640.2	
Peak Force without heat sink(N)[2][3]	542.2		1084.4		1626.6	
Continuous Force with heat sink(N)[1][2]	392.9		785.8		1178.7	
Continuous Force without heat sink(N)[2][3]	153.2		306.5		459.7	
Peak Force in linear range(N)	436.5		873.1		1309.6	
Attraction Force(N)	897		1794		2690	
Peak power(W)[1][2]	2115		4230		6345	
Continuous power(W)[1][2]	132.2		264.4		396.6	
Mechanical						
Coil assembly length(mm)	162		314		466	
Coil assembly weight(kg)[2]	3.5		6.8		10.1	
Magnetic way weight(kg/m)[2]	5.5		5.5		5.5	
Pole pitch(mm)	38		38		38	
Electrical[4]						
Continuous Current with heat sink(A_{pk})[1][2]	3.6	7.2	7.2	14.4	10.8	20.5
Continuous Current without heat sink(A_{pk})[2][3]	1.8	3.6	3.6	7.2	5.4	10.8
Peak Current with heat sink(A_{pk})[1][2]	14.4	28.8	28.8	57.6	43.2	86.4
Peak Current without heat sink(A_{pk})[2][3]	7.2	14.4	14.4	28.8	21.6	43.2
Peak Current in linear range(N)	4.0	8.0	8.0	16.0	12.0	24.0
Force Constant(N/A_{pk})[2]	109.1	54.6	109.1	54.6	109.1	54.6
Back EMF Constant(V/m/s)[2]	133.0	66.5	133.0	66.5	133.0	66.5
Resistant(Ohms)[2]	10.2	2.6	5.1	1.3	3.4	0.9
Inductance(mH)[2]	15.59	3.90	7.79	1.95	5.20	1.30
Time Constant(ms)[2]	1.5	1.5	1.5	1.5	1.5	1.5
Thermal Resistant with heat sink(°C/W)[1][2]	0.6		0.3		0.2	
Thermal Resistant without heat sink(°C/W)[2][3]	2.2		1.1		0.7	
Motor Constant(N/√W)[2]	34.2		48.3		59.2	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 9x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

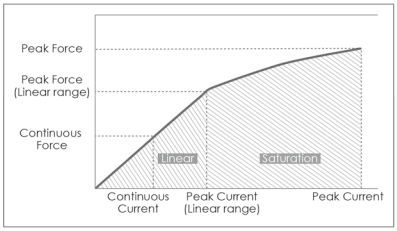
LM-CC-84 Coil Assembly

	Np1	Lp
LM-CC2-84	1	162
LM-CC4-84	3	314
LM-CC6-84	5	466

LM-MC-84 Magnetic Way

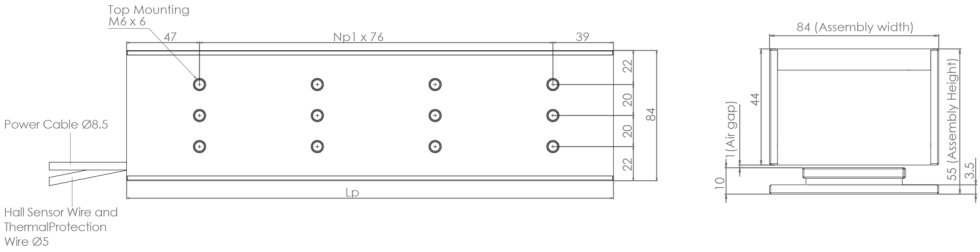
	Ns	Ls
LM-MC0-84	2	114
LM-MC1-84	7	304
LM-MC2-84	11	456

Current VS Force.

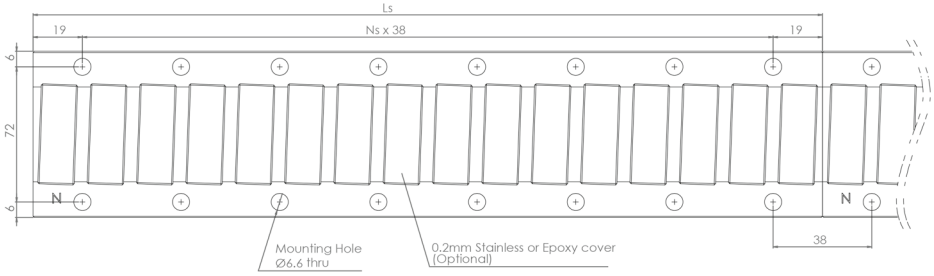


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CC-84 Coil Assembly

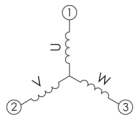


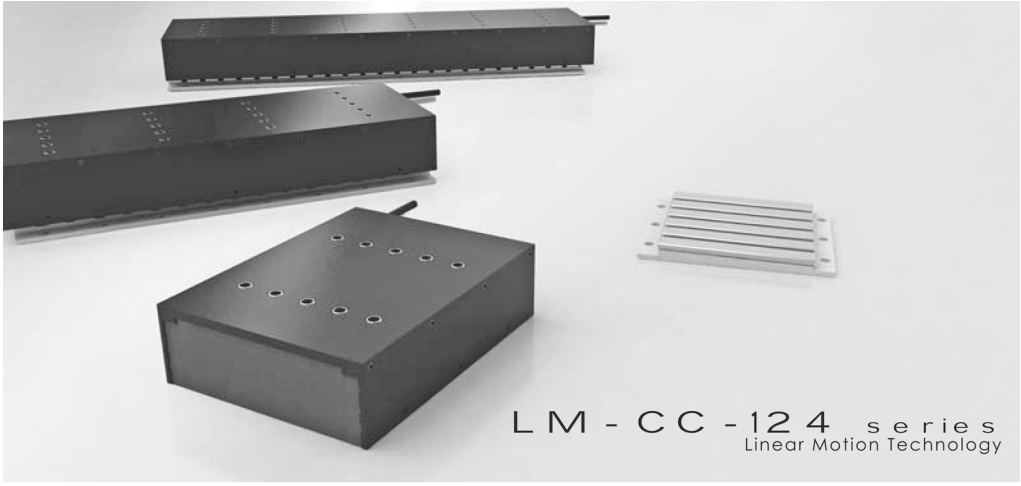
LM-MC-84 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown/Blue	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			





LM-CC-124 Coil Assembly Model

Coil Assembly Model	LM-CC2-124		LM-CC4-124		LM-CC6-124	
Winding code	P	D	P	D	P	D
Performance[4]						
Peak Force with heat sink(N)[1][2]	1408.1		2816.2		4224.3	
Peak Force without heat sink(N)[2][3]	867.5		1735.0		2602.5	
Continuous Force with heat sink(N)[1][2]	628.6		1257.2		1885.9	
Continuous Force without heat sink(N)[2][3]	245.2		490.3		735.5	
Peak Force in linear range(N)	735.2		1470.5		2205.7	
Attraction Force(N)	1510		3021		4531	
Peak power(W)[1][2]	1579		5614		8421	
Continuous power(W)[1][2]	175.4		350.9		526.3	
Mechanical						
Coil assembly length(mm)	162		314		466	
Coil assembly weight(kg)[2]	5.9		11.4		16.9	
Magnetic way weight(kg/m)[2]	9.2		9.2		9.2	
Pole pitch(mm)	38		38		38	
Electrical[4]						
Continuous Current with heat sink(A_{pk})[1][2]	3.4	6.8	6.8	13.7	10.3	20.5
Continuous Current without heat sink(A_{pk})[2][3]	1.7	3.4	3.4	6.8	5.1	10.3
Peak Current with heat sink(A_{pk})[1][2]	13.7	27.4	27.4	54.7	41.0	82.1
Peak Current without heat sink(A_{pk})[2][3]	6.8	13.7	13.7	27.4	20.5	41.0
Peak Current in linear range(N)	4.0	8.0	8.0	16.0	12.0	24.0
Force Constant(N/A_{pk})[2]	183.8	91.9	183.8	91.9	183.8	91.9
Back EMF Constant(V/m/s)[2]	224.0	112.0	224.0	112.0	224.0	112.0
Resistant(Ohms)[2]	15	3.8	7.5	1.9	5.0	1.3
Inductance(mH)[2]	22.92	5.73	11.46	2.87	7.64	1.91
Time Constant(ms)[2]	1.5	1.5	1.5	1.5	1.5	1.5
Thermal Resistant with heat sink(°C/W)[1][2]	0.4		0.2		0.1	
Thermal Resistant without heat sink(°C/W)[2][3]	1.7		0.8		0.6	
Motor Constant(N/√W)[2]	47.5		67.1		82.2	

(1) The value applies to static sinusoidal drive, specific heat sink (a 25mm aluminum heat sink whose area equals 9x the coil mounting area) and temperature from 25°C up to 110°C. The actual performance is dependent to heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance of all performance and electrical specification is ±10%
(3) The value applies to static sinusoidal drive and temperature from 25°C up to 110°C, without heat sink.
(4) Above "withoutheatsink" figure assumes a working condition of 1atm, 25°Cambient temperature, with the linear motor stationary and not in contact with any other objects, thus relying only on free air convection for cooling. As all heat conductive objects in direct contact with the linear motor, including slide plate, linear guide and base etc.can be considered as a kind of heat sink, the "with heat sink" figure should be taken as the primaryreference in actual application design.

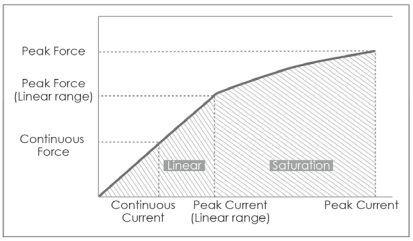
LM-CC-124 Coil Assembly

	Np1	Lp
LM-CC2-124	1	162
LM-CC4-124	3	314
LM-CC6-124	5	466

LM-MC-124 Magnetic Way

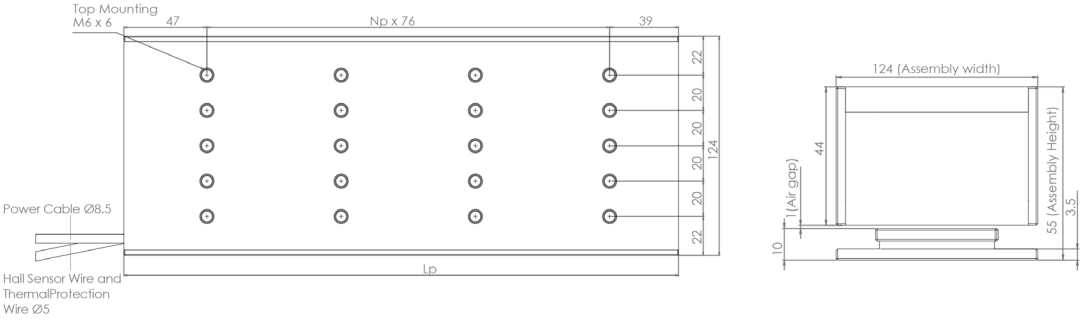
	Ns	Ls
LM-MC0-124	2	114
LM-MC1-124	7	304
LM-MC2-124	11	456

Current VS Force.

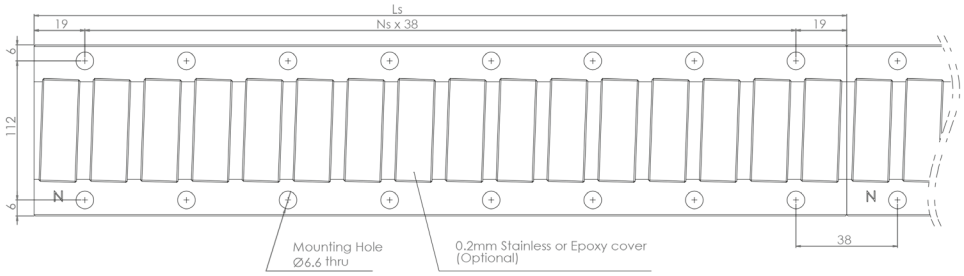


When the motor its operating in its linear regin, its thrust output is directly proportional to input current and the force constant is fixed.
When operating in the saturation regin,output thrust is not linearly proportional due to magnetic saturation,resulting in less thrust increase than expected.

LM-CC-124 Coil Assembly

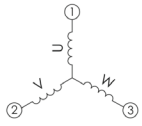


LM-MC-124 Magnetic Way



OUTPUT CABLE (All cable standard length 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0,14 mm²	Brown/Blue	Thermal sensor	0,14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0,14 mm²			
Brown	W phase	1.5mm²	Green	Hall C W phase	0,14 mm²			
Green	PE	1.5mm²	Grey	Hall IC + 5V	0,14 mm²			
			White	GND	0,14 mm²			



cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.

DR Series

DD Motor

DİRECT DRIVE TORQE MOTORS

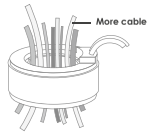
166
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

Features

Frameless type / DR series

❶ Highest torque density & motor constant.

❷ Large pass through



❸ High heat dissipation

❹ Cable output option

Ordering Information

DR	K	105	8	S	H	P	N	CS	0400

- 0400 → Cable length (mm) : 0400 : 400mm (Standard) Rotor : Blank
- CS → Cable exit direction : CS : Radial CU : Axial Rotor : Blank
- N → Cooling : N : No cooling W : Water cooling Rotor : Blank
- P → Temperature sensor: P : PTC-90°C K: KTY84-130 Rotor: Blank
- H → H : Hall sensor. NH : No hall sensor.
- S → Winding code : S : Standard F : Small current Rotor : Blank
- 8 → Height (mm) : 105 series 8, 16, 24, 32, 40, 48, 56, 80, 88 140 series 8, 16, 24, 30, 32, 38, 50, 58, 70, 78
- 105 → Outside diameter of the stator (mm) : 105, 140
- K → Part : K : Kit S : Stator R : Rotor
- DR → Torque motor

*To support hall function, the rotor height need to be higher.
*Configuring table of Hall type.

Unit: mm

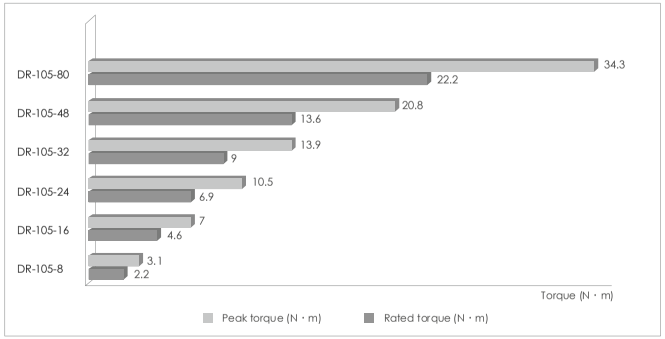
	Assembly height	Stator height	Rotor height
105 series	8	8	16
	16	16	24
	24	24	32
	32	32	40
	48	48	56
	80	80	88

Unit: mm

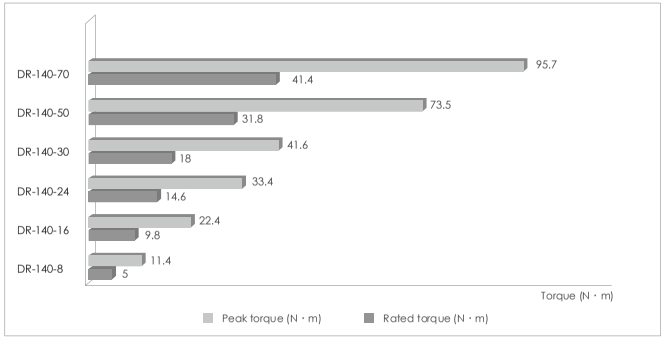
	Assembly height	Stator height	Rotor height
140 series	8	8	16
	16	16	24
	24	24	32
	30	30	38
	50	50	58
	70	70	78

Torque Overview

DR-105



DR-140



DR-105

	Unit	CPC											
		3-phase synchronous frameless Torque, 230$V_{AC\ RMS}$ (325V_{AC})											
Coil Assembly Model		DR-105-8		DR-105-16		DR-105-24		DR-105-32		DR-105-48		DR-105-80	
Winding code		S	F	S	F	S	F	S	F	S	F	S	F
Performance													
Peak Torque[2][3]	Nm	3.1		7.0		10.5		13.9		20.8		34.3	
Continuous Torque with heat sink[1][2]	Nm	2.2		4.6		6.9		9.0		13.6		22.2	
Continuous Torque without heat sink[2][3]	Nm	1.1		2.2		3.3		4.2		6.3		10.1	
Maximum Power with heat sink[1][2]	W	183.7		242.8		301.8		352.0		467.2		680.3	
Continuous Power with heat sink[1][2]	W	73.3		96.2		119.6		143.1		182.5		261.7	
Continuous Power without heat sink[2][3]	W	18.3		25.0		31.1		34.4		45.6		62.8	
Maximum speed AC 230V@DC 325V	rpm	5130	1710	2590	858	1721	571	1288	428	861	286	516	171
Maximum speed AC 420V@DC 600V	rpm	9470	3157	4783	1584	3178	1054	2380	791	1589	527	953	316
Mechanical													
Stator OD	mm	105											
Rotor ID	mm	56											
Lamination Stack Height	mm	8		16		24		32		48		80	
Rotor Inertia	$kg*m^2$	$5.8*10^{-5}$		$1.2*10^{-4}$		$1.7*10^{-4}$		$2.3*10^{-4}$		$3.5*10^{-4}$		$5.8*10^{-4}$	
Stator Mass	kg	0.51		0.92		1.42		1.93		2.95		4.98	
Rotor Mass	kg	0.06		0.12		0.19		0.25		0.37		0.62	
Total Mass	kg	0.57		1.04		1.61		2.18		3.32		5.6	
Electrical													
Peak Current[2][3]	A_{pk}	8.1	2.7	8.1	2.7	8.1	2.7	8.0	2.6	8.0	2.6	7.9	2.5
Continuous Current with heat sink[1][2]	A_{pk}	5.1	1.7	5.1	1.7	5.1	1.7	5.1	1.6	5.0	1.6	4.9	1.5
Continuous Current without heat sink[2][3]	A_{pk}	2.6	0.8	2.6	0.8	2.6	0.8	2.5	0.7	2.5	0.7	2.4	0.6
Max. current (Linear range)[2]	A_{pk}	5.5	1.9	5.5	1.9	5.5	1.9	5.5	1.9	5.4	1.8	5.4	1.8
Motor Torque constant	Nm/A_{pk}	0.43	1.30	0.86	2.60	1.29	3.90	1.72	5.20	2.58	7.81	4.30	13.01
Back EMF constant[3]	V/rad/s	0.50	1.50	0.99	2.99	1.49	4.49	1.99	5.99	2.98	8.98	4.97	14.97
Resistance	Ω	2.8	24.8	3.7	32.2	4.6	39.6	5.5	47	7.3	61.8	10.9	91.4
Inductance	mH	16.50	132.50	29.20	229.30	41.90	326.10	54.60	422.90	80.00	616.50	130.80	1003.7
Time constant[2]	ms	5.9	5.3	7.9	7.1	9.1	8.2	9.9	9.0	11.0	10.0	12.0	11.0
Thermal Resistance without heat sink[2][3]	°C/W	1.19		0.83		0.67		0.59		0.44		0.31	
Thermal Resistance with heat sink[1][2]	°C/W	4.80		3.66		2.96		2.72		2.07		1.50	
Motor Constant[2]	N/√W	0.26		0.45		0.60		0.73		0.95		1.30	
Magnet poles	(N 2τ)	20											
Ph-PE dielectric strength		≧1.5KV(AC)											
Ph-PE insulation Resistance		≧ 600V(DC)											

(1) This value applies to the static sinusoidal drive under specific heat sink and temperature ranges from 25°C up to 110°C. The actual performance is dependent on the heat sink configuration, system cooling condition and ambient temperature.

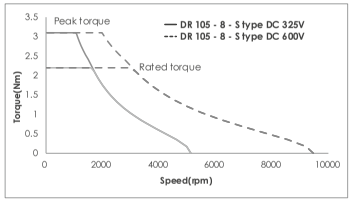
(2) The tolerance levels for the total performance and electrical specification is ±10%

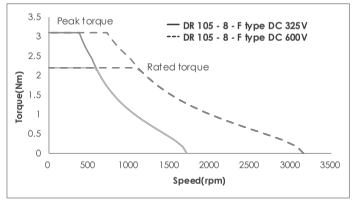
(3) This value applies to static sinusoidal drive operating under temperatures from 25°C up to 110°C, without a heat sink.

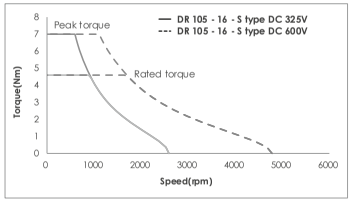
(4) The above "without heat sink" figure assumes a working condition of 1 atm, 25°C ambient temperature, in which the linear motor is stationary and not in contact with any other objects, relying only on free air convection for cooling. As all heat conductive objects in direct contact with the motor, including the plate, bearing and housing, can be considered a kind of heat sink, the "with heat sink" figure should be taken as the primary reference in actual application design.

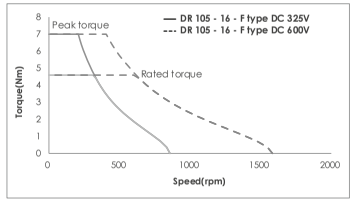
Torque / Speed Curve

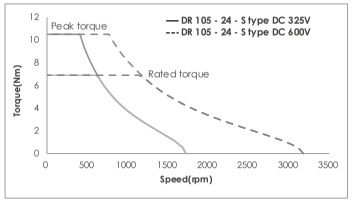
(AC 230V@DC 325V)
(AC 420V@DC 600V)

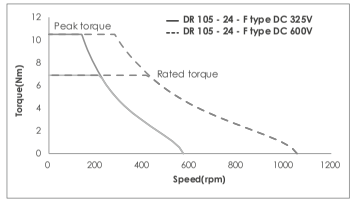


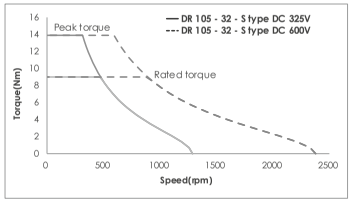


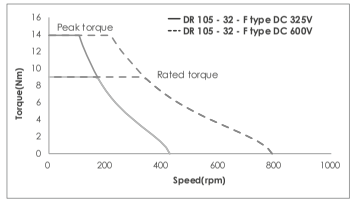








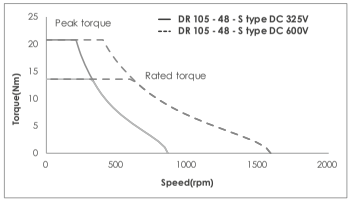


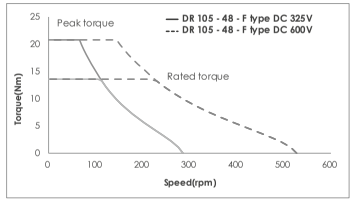


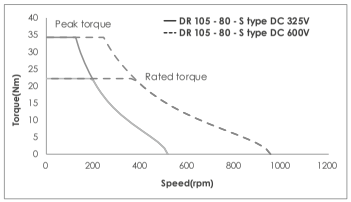
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15
167

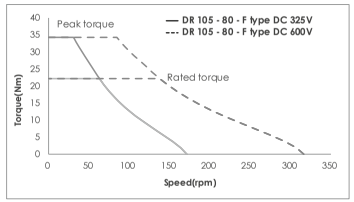
Torque / Speed Curve

(AC 230V@DC 325V)
(AC 420V@DC 600V)



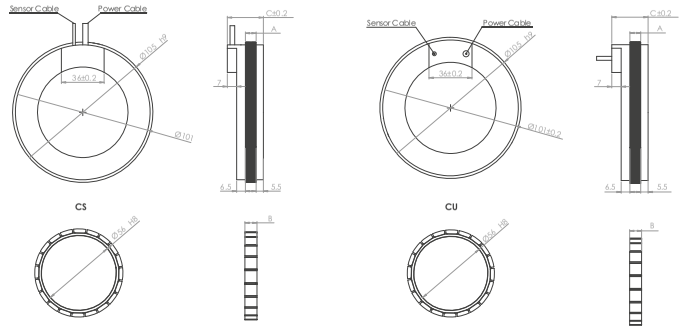






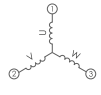
Dimension

Unit: mm



OUTPUT CABLE (All cable standard length is 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown	Thermal sensor	0.14 mm²
Yellow	V phase	0.5 mm²	Yellow	Hall B V phase	0.14 mm²	Blue		
Brown	W phase	0.5 mm²	Green	Hall C W phase	0.14 mm²	Shielding		
Green	PE +shielding	0.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			



DIMENSIONS

Type	A	B	C
DR-105-8	8	9	27
DR-105-16	16	17	35
DR-105-24	24	25	43
DR-105-34	32	33	51
DR-105-48	48	49	67
DR-105-80	80	81	99

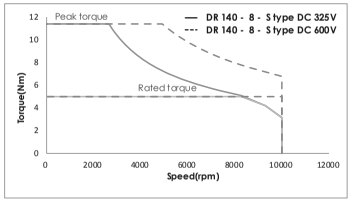
DR-140

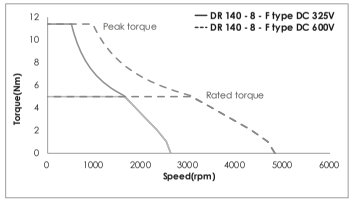
	Unit	CPC											
		3-phase synchronous frameless Torque, 230V$_{DC\ link}$ (325V$_{DC}$)											
Coil Assembly Model		DR-140-8		DR-140-16		DR-140-24		DR-140-30		DR-140-50		DR-140-70	
Winding code		S	F	S	F	S	F	S	F	S	F	S	F
Performance													
Peak Torque[2][3]	Nm	11.4		22.4		33.4		41.6		73.5		95.7	
Contionuous Torque with heat sink[1][3]	Nm	5.0		9.8		14.6		18.0		31.8		41.1	
Contionuous Torque without heat sink[2][3]	Nm	3.0		6.0		8.9		10.8		19.1		24.4	
Maximum Power with heat sink[1][3]	W	1555.4		1952.3		2342.7		2616.4		3588.0		4487.5	
Contionuous Power with heat sink[1][3]	W	90.4		113.5		136.2		148.3		203.4		249.9	
Contionuous Power without heat sink[2][3]	W	33.3		41.8		50.1		53.4		73.2		88.0	
Maximum speed AC 230V@DC 325V	rpm	10000	2617	6576	1329	4422	890	3562	712	2019	402	1535	306
Maximum speed AC 420V@DC 600V	rpm	10000	4831	10000	2453	8164	1644	6576	1315	3728	743	2835	566
Mechanical													
Stator OD	mm	140											
Rotor ID	mm	60											
Lamination Stack Height	mm	8		16		24		30		50		70	
Rotor Inertia	kg*m²	3.99*10^{-4}		7.55*10^{-4}		1.11*10^{-3}		1.38*10^{-3}		2.27*10^{-3}		3.2*10^{-3}	
Stator Mass	kg	0.56		1.11		1.67		2.09		3.48		4.87	
Rotor Mass	kg	0.26		0.5		0.69		0.89		1.46		2.04	
Total Mass	kg	0.82		1.61		2.36		2.98		4.94		6.91	
Electrical													
Peak Current[2][3]	A_{pk}	126.0	25.3	126.0	25.3	126.0	25.3	126.0	25.2	126.0	25.2	125.0	25.0
Contionuous Current with heat sink[1][3]	A_{pk}	30.0	6.1	30.0	6.1	30.0	6.1	30.0	6.0	30.0	6.0	29.8	5.9
Contionuous Current without heat sink[2][3]	A_{pk}	18.0	3.7	18.0	3.7	18.0	3.7	18.0	3.6	18.0	3.6	17.8	3.5
Max. current (Linear range)[2]	A_{pk}	30.0	6.1	30.0	6.1	30.0	6.1	30.0	6.0	30.0	6.0	29.8	5.9
Motor Torque constant	Nm/A_{pk}	0.16	0.82	0.32	1.61	0.48	2.40	0.60	3.00	1.06	5.30	1.39	6.96
Back EMF constant[3]	V/rad/s	0.20	0.98	0.39	1.93	0.58	2.88	0.72	3.60	1.27	6.37	1.67	8.36
Resistance	Ω	0.10	2.43	0.12	3.05	0.15	3.66	0.16	4.12	0.23	5.65	0.29	7.18
Inductance	mH	0.43	10.75	0.86	21.50	1.29	32.20	1.62	40.40	2.70	67.50	3.74	93.50
Time constant[2]	ms	4.4		7.0		8.8		9.8		11.9		13.0	
Thermal Resistance without heat sink[2][3]	°C/W	0.94		0.75		0.62		0.57		0.42		0.34	
Thermal Resistance with heat sink[1][3]	°C/W	2.56		2.04		1.70		1.59		1.16		0.97	
Motor Constant[2]	N/√W	0.52		0.92		1.25		1.48		2.23		2.60	
Magnet poles	N(2π)	20											
Ph-PE dielectric strength		≥ 1.5KV (AC)											
Ph-PE insulation Resistance		≥ 600V (DC)											

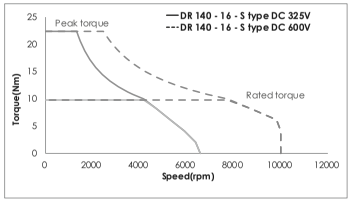
(1) This value applies to the static sinusoidal drive under specific heat sink and temperature ranges from 25°C up to 110°C. The actual performance is dependent on the heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance levels for the total performance and electrical specification is ±10%
(3) This value applies to static sinusoidal drive operating under temperatures from 25°C up to 110°C, without a heat sink.
(4) The above "without heat sink" figure assumes a working condition of 1 atm, 25°C ambient temperature, in which the linear motor is stationary and not in contact with any other objects, relying only on free air convection for cooling. As all heat conductive objects in direct contact with the motor, including the plate, bearing and housing, can be considered a kind of heat sink, the "with heat sink" figure should be taken as the primary reference in actual application design.

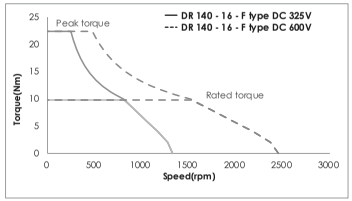
Torque / Speed Curve

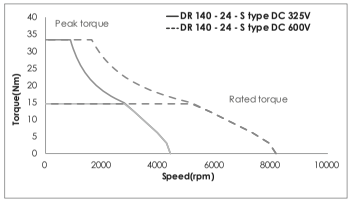
(AC 230V@DC 325V)
(AC 420V@DC 600V)

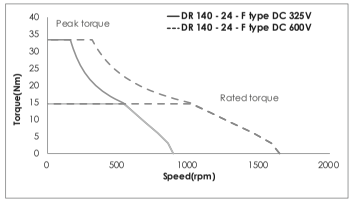


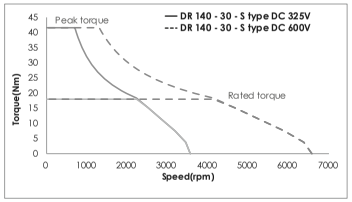


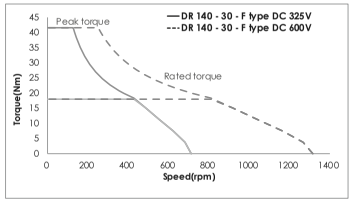


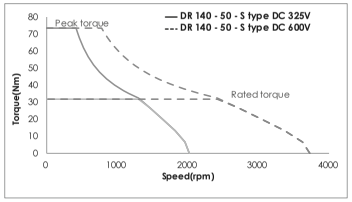


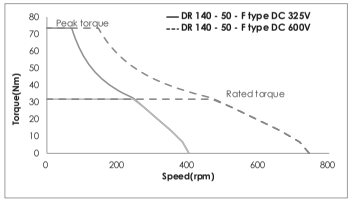


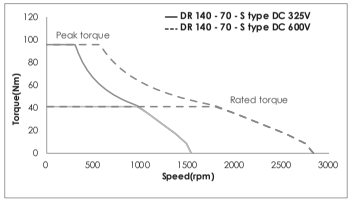


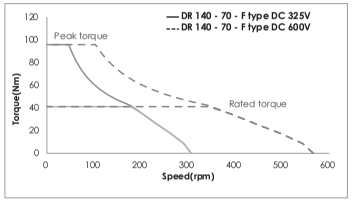






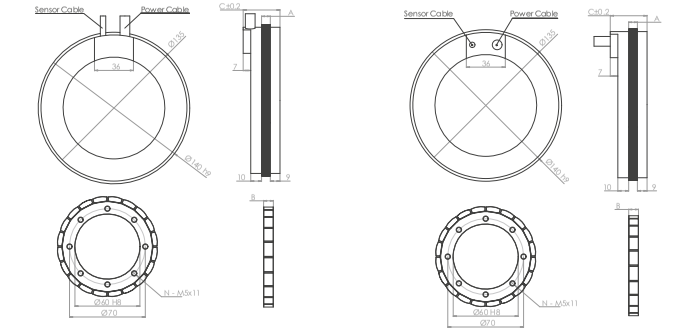






Dimension

Unit: mm



OUTPUT CABLE (All cable standard length is 400 mm)

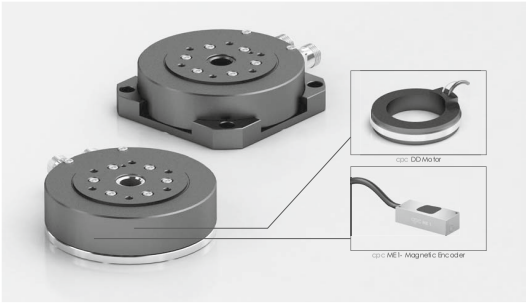
Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	1.5mm²	Pink	Hall A U phase	0.14 mm²	Brown	Thermal sensor	0.14 mm²
Yellow	V phase	1.5mm²	Yellow	Hall B V phase	0.14 mm²	Blue		
Brown	W phase	1.5mm²	Green	Hall C W phase	0.14 mm²	Shielding		
Green	PE + shielding	1.5mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			

DIMENSIONS

Type	N	A	B	C
DR-140-08	8	8.05	9	34
DR-140-16		16.1	17	42
DR-140-24		24.15	25	50
DR-140-30		30.1	31	56
DR-140-50		50.05	51	76
DR-140-70		70	71	96

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

cpc Rotary Positioner RP-120 series



Features

- Less rotor Inertia
- Highest torque density
- Highest motor constant
- Low profile
- Direct drive
- High heat dissipation
- Large hollow diameter
- Cylindrical or flange type

Ordering Information

RP	120	37	F	O	A	S	S	S	D	R	01

- 01: N/A : N; Cable length: 01,02,03,04,05,06, 07,08,09(m)
- R: Cable exit direction: R : Radial A : Axial
- D: Cable interface: D: Direct C: Joint
- S: Winding type: S: High speed type F: Low current type
- S: Brake: S: Standard B: With brake
- S: Cooling: S: Standard WC: Water cooling
- A: Encoder specifications: A: Analog B: 720000 C: 1440000 D: 3600000 E: 7200000 F: 200000 G: 417792 H: 835584 I: 1671168
- O: Encoder type: O: Optical M: Magnetic
- F: Frame type: F: Flange type
- 37: Height (mm) 37,42,45,50,53,58,61,66,77,82
- 120: Outer diameter (mm) 120
- RP: Rotary Positioner

For more details please contact cpc.

cpc CHIEFTEK PRECISION CO., LTD.

HEADQUARTERS
CHIEFTEK PRECISION CO., LTD.
No.3, Dali 1st Rd., Sinshih Township, Tainan Science Park, 741-45 Tainan, Taiwan, R.O.C
TEL:+886-6-505 5858 Http://www.chieftek.com
E-mail:service@mail.chieftek.com

CHIEFTEK PRECISION USA
4881 Muretta Street, Chino, CA. 91710
Tel: +1-909-628-9300
Fax: +1-909-628-7171

cpc Europa GmbH
Industriepark 314, D-78244 Gottmadingen, Germany
TEL:+49-7731-59130-38
FAX:+49-7731-59130-28

CHIEFTEK MACHINERY KUNSHAN CO., LTD.
No.1188, Hongqiao Rd. Kunshan, Jiangsu, P.R. China
TEL:+86-512-5525 2831
FAX:+86-512-5525 2851

* cpc reserves the right to revise any information (technical details) any time without notice, for printing mistakes or any other incidental mistakes. We take no responsibility.

2017.03.03 Printed in Taiwan

RP-120 series

	Unit	RP-120-37	RP-120-45	RP-120-53	RP-120-61	RP-120-77	RP-120-42	RP-120-50	RP-120-58	RP-120-66	RP-120-82
Encoder type		Optical					Magnetic				
External	mm	120									
Height	mm	37	45	53	61	77	42	50	58	66	82
Max. Torque	N-m	2.9	5.9	8.8	11.6	17.5	2.9	5.9	8.8	11.6	17.5
Rated torque	N-m	2	3.9	5.9	7.7	11.6	1.3*	2.6*	3.9*	5.1*	7.7*
Radial run out (No load)	μm	<20									
Axial run out (No load)	μm	<20									

* The operating temperature of the sensor: 60°C Max.

Encoder specifications

	Cycle / rev. (sin/cos, 1 Vpp)	Counts / rev. (5 V, RS422)	Resolution (arc.sec)	Repeatability (arc.sec)
Incremental optical	3600	720,000	1.8	±2.5
		1,440,000	0.9	±1.5
		3,600,000	0.36	±1
		7,200,000	0.18	±1
Incremental magnetic	102	200,000	6.48	±8
		417,792	3.102	±5
		835,584	1.551	±3
		1,671,168	0.776	±2

* For digital A/B output, cpc can provide the external interpolator.

Speed table

Type	Winding type	Resolution (arc.sec)	Max. speed (rpm)
RP-120-42 RP-120-50 RP-120-58	S	6.48	1100
		3.102	1100
		1.551	1100
		0.776	700
RP-120-66	S	6.48	900
		3.102	900
		1.551	900
		0.776	700
RP-120-82	S	6.48	600
		3.102	600
		1.551	600
		0.776	600

* Max speed depends on limit of motor type, encoder and bearing.

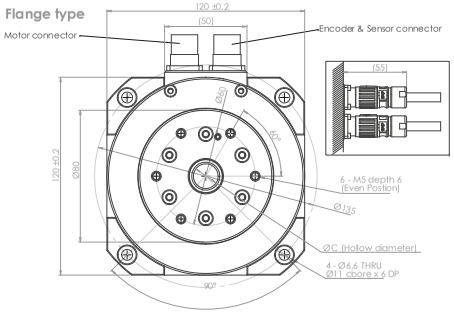
Speed table

Type	Winding type	Resolution (arc.sec)	Max. speed (rpm)
RP-120-37 RP-120-45 RP-120-53 RP-120-61 RP-120-77	S (F)	1.8	600
		0.9	300
		0.36	120
		0.18	60

Type	Winding type	Resolution (arc.sec)	Max. speed (rpm)
RP-120-42	F	6.48	1100
		3.102	1100
		1.551	1100
		0.776	700
RP-120-50	F	6.48	600
		3.102	600
		1.551	600
		0.776	600
RP-120-58	F	6.48	400
		3.102	400
		1.551	400
		0.776	400
RP-120-66	F	6.48	300
		3.102	300
		1.551	300
		0.776	300
RP-120-82	F	6.48	200
		3.102	200
		1.551	200
		0.776	200

cpc Rotary Positioner RP-120 series

Dimension of joint connector

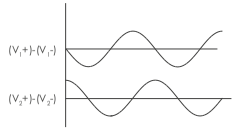


Unit: mm

Magnetic encoder					
Type	42	50	58	66	82
H	42	50	58	66	82
A	14	22	30	38	54
C	25	25	25	25	25

Optical encoder					
Type	37	45	53	61	77
H	37	45	53	61	77
A	9	17	25	33	49
C	15	15	15	15	15

Encoder output signals



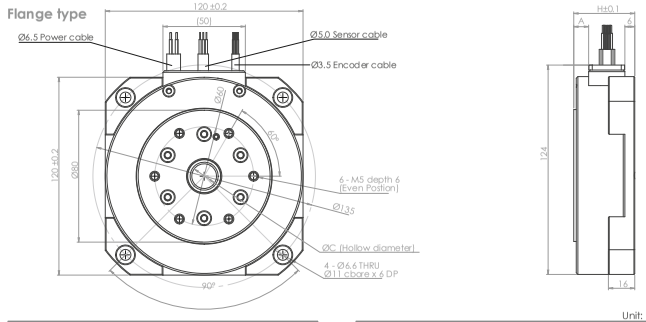
Incremental 2 channels V_1 and V_2 differential sinusoids in quadrature, centred ~ 1.65 V (90° phase shifted)

Wiring information

Power wiring diagram	
Function	Pin
U	8
V	1
W	2
GND	5

Encoder wiring diagram (Analog)		
Function	Signal	Pin
Power	5V	5
	0V	1
Incremental signal	V_1^+	8
	V_1^-	4
	V_2^+	7
	V_2^-	3
Reference mark	Z^+	6
	Z^-	2
	Shield	9
Temperature Switch	PTC Temp.	14
		15

Dimension of direct cable



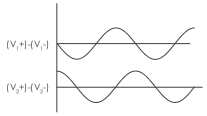
Unit: mm

Magnetic encoder					
Type	42	50	58	66	82
H	42	50	58	66	82
A	14	22	30	38	54
C	25	25	25	25	25

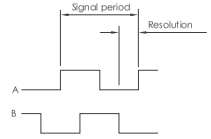
Optical encoder					
Type	37	45	53	61	77
H	37	45	53	61	77
A	9	17	25	33	49
C	15	15	15	15	15

Encoder output signals

Incremental 2 channels V_1 and V_2 differential sinusoids in quadrature, centred ~ 1.65 V (90° phase shifted)



Incremental 2 channels A and B in quadrature (90° phase shifted)



Wiring information

Power wiring diagram	
Function	Color
U	White
V	Yellow
W	Brown
GND	Green

Encoder wiring diagram		
Function	Signal	Color
Power	5V	Red
	0V	Blue
Incremental signal	A^+	Brown
	A^-	Green
	B^+	Grey
	B^-	Yellow
Reference mark	Z^+	Pink
	Z^-	White
	Shield	
Temperature Switch	PTC Temp.	Brown
		Blue

NOTES:

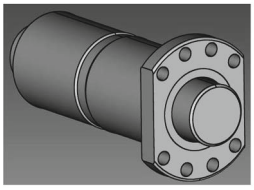
Grounded Ball Screws & Nuts

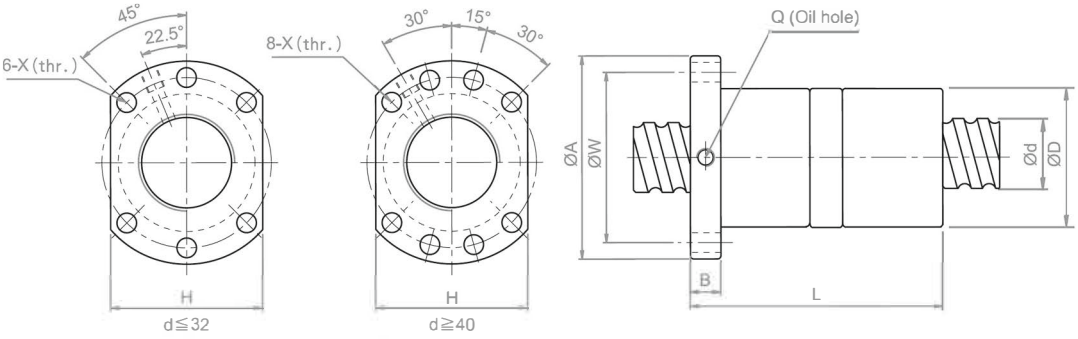
KSK KUŘIM

Steinmeyer

cpc

HIGH PRECISION GRINDED BALL SCREWS





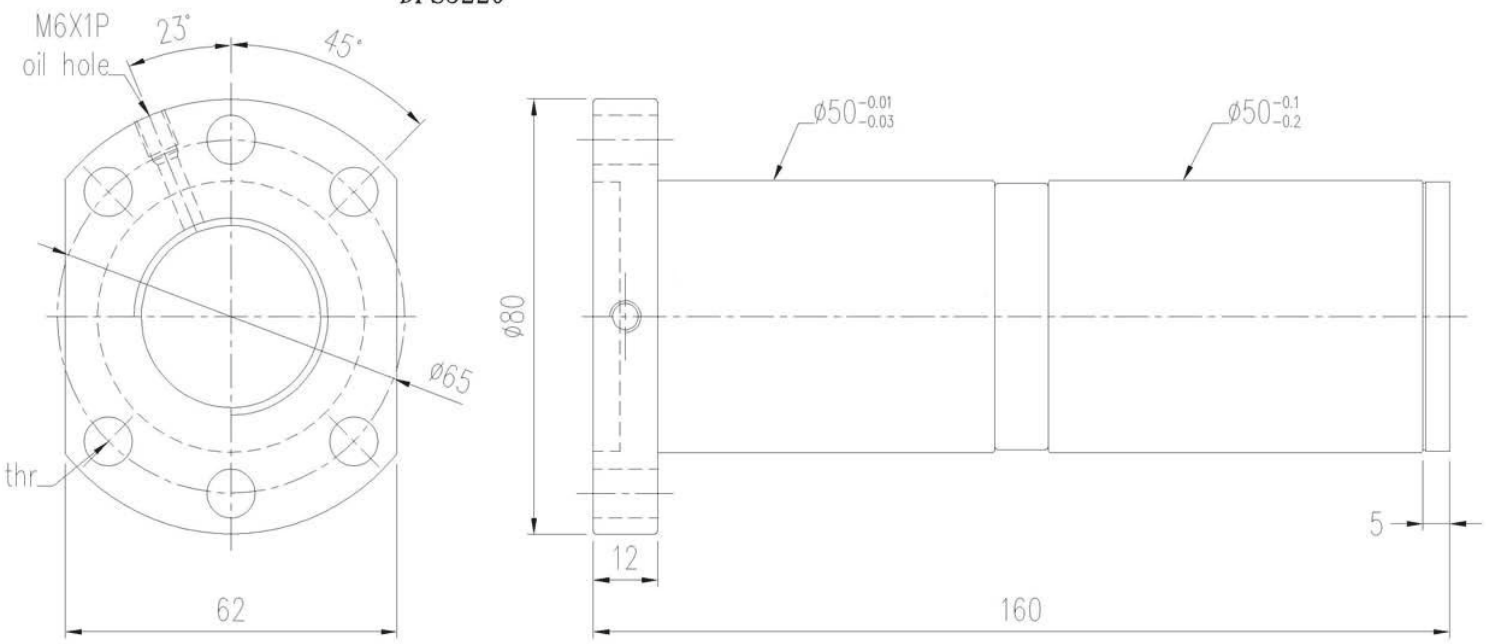
ALL STOCK ITEM IS INDICATED INSIDE DARK LINE ZONE

Unit : mm

Model No.	d	l	Da	Dimension									Ca (kgf)	Coa (kgf)	K kgf/μm
				D	A	B	L	W	H	X	Q	n			
DFU01604-4	16	4	2.381	28	48	10	80	38	40	5.5	M6	1x4	973	2406	43
DFU01605-4		5	3.175	28	48	10	100	38	40	5.5	M6	1x4	1380	3052	44
DFU01610-3		10	3.175	28	48	10	118	38	40	5.5	M6	1x3	1103	2401	35
DFU02004-4	20	4	2.381	36	58	10	80	47	44	6.6	M6	1x4	1066	2987	51
DFU02005-4		5	3.175	36	58	10	101	47	44	6.6	M6	1x4	1551	3875	53
DFU02504-4	25	4	2.381	40	62	10	80	51	48	6.6	M6	1x4	1180	3795	60
DFU02505-4		5	3.175	40	62	10	101	51	48	6.6	M6	1x4	1724	4904	62
DFU02506-4		6	3.969	40	62	10	105	51	48	6.6	M6	1x4	2318	6057	64
DFU02508-4		8	4.762	40	62	10	120	51	48	6.6	M6	1x4	2963	7313	67
DFU02510-4		10	4.762	40	62	12	145	51	48	6.6	M6	1x4	2954	7295	67
DFU03204-4	32	4	2.381	50	80	12	80	65	62	9	M6	1x4	1296	4838	71
DFU03205-4		5	3.175	50	80	12	102	65	62	9	M6	1x4	1922	6343	74
DFU03206-4		6	3.969	50	80	12	105	65	62	9	M6	1x4	2632	7979	78
DFU03208-4		8	4.762	50	80	12	122	65	62	9	M6	1x4	3387	9622	82
DFU03210-4		10	6.35	50	80	12	162	65	62	9	M6	1x4	4805	12208	82
DFU04005-4	40	5	3.175	63	93	14	105	78	70	9	M8	1x4	2110	7988	87
DFU04006-4		6	3.969	63	93	14	108	78	70	9	M6	1x4	2873	9913	91
DFU04008-4		8	4.762	63	93	14	132	78	70	9	M6	1x4	3712	11947	96
DFU04010-4		10	6.35	63	93	14	165	78	70	9	M8	1x4	5399	15500	99
DFU05010-4	50	10	6.35	75	110	16	171	93	85	11	M8	1x4	6004	19614	117
DFU05020-4		20	7.144	75	110	16	280	93	85	11	M8	1x4	7142	22588	126
DFU06310-4	63	10	6.35	90	125	18	182	108	95	11	M8	1x4	6719	25358	139
DFU06320-4		20	9.525	95	135	20	290	115	100	13.5	M8	1x4	11444	36653	152
DFU08010-4	80	10	6.35	105	145	20	182	125	110	13.5	M8	1x4	7346	31953	156
DFU08020-4		20	9.525	125	165	25	295	145	130	13.5	M8	1x4	12911	47747	187
DFU10020-4	100	20	9.525	150	202	30	340	170	155	17.5	M8	1x4	14303	60698	222

CHIEFTEK PRECISION CO., LTD.

DFS3220



Helix Dir.	螺旋方向	R
Ball Dia.	鋼珠直徑	3.969
Number of Turns	珠捲數	2.8*1
Basic Dynamic (Ca)	動負荷	1907 kgf
Basic static (COa)	靜負荷	5482 kgf
Lead	導 程	20

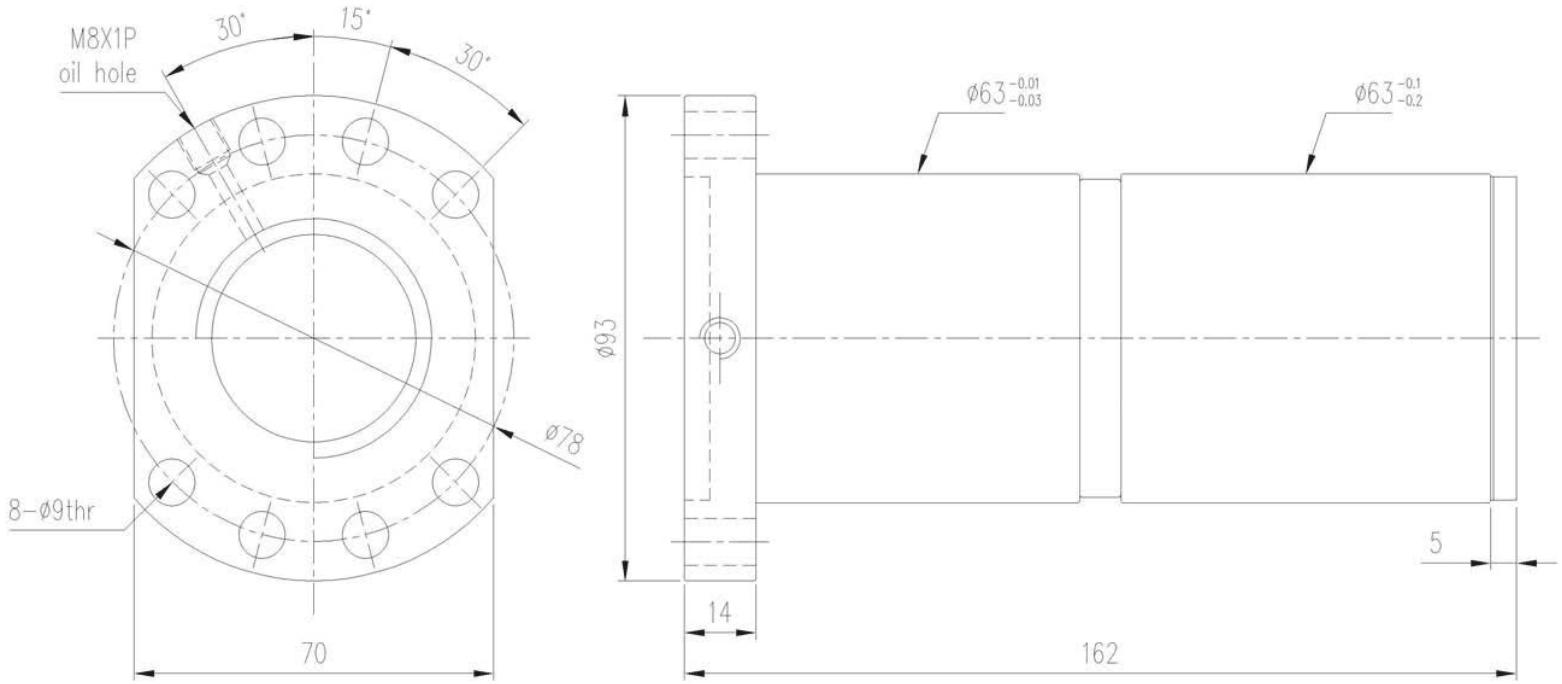
STOCK ITEM

endo

cpc CHIEFTEK PRECISION CO., LTD.

endo

DFS04020



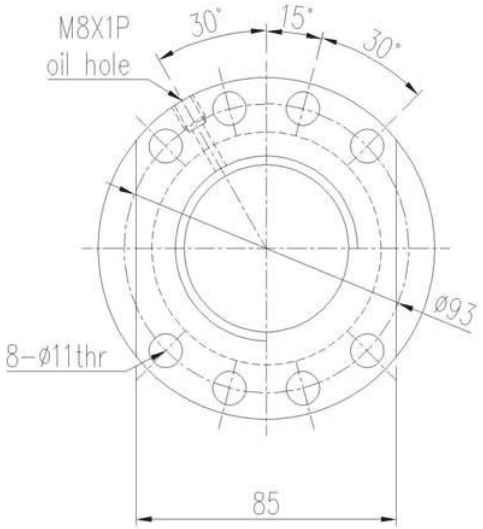
Helix Dir.	螺旋方向	R
Ball Dia.	鋼珠直徑	6.35
Number of Turns	珠捲數	2.8*1
Basic Dynamic (Ca)	動負荷	3959 kgf
Basic static (C0a)	靜負荷	10715 kgf
Lead	導 程	20

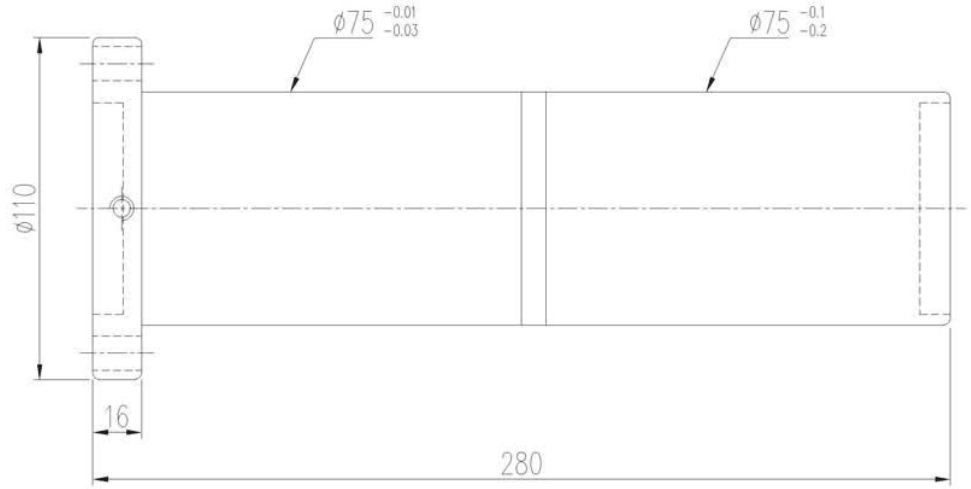
STOCK ITEM

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

cpc
CHIEFTEK PRECISION CO., LTD.

DFU05020





Helix Dir.	螺旋方向	R
Ball Dia.	鋼珠直徑	7.144
Number of Turns	珠捲數	1*4
Basic Dynamic (Ca)	動負荷	7142 kgf
Basic static (Coa)	靜負荷	22588 kgf
Lead	導 程	20

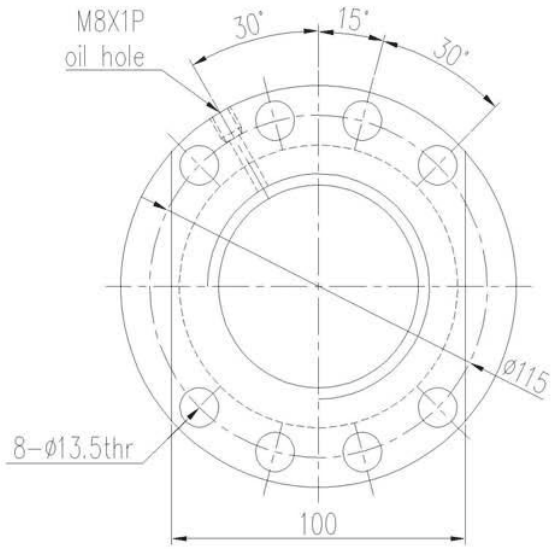
STOCK ITEM

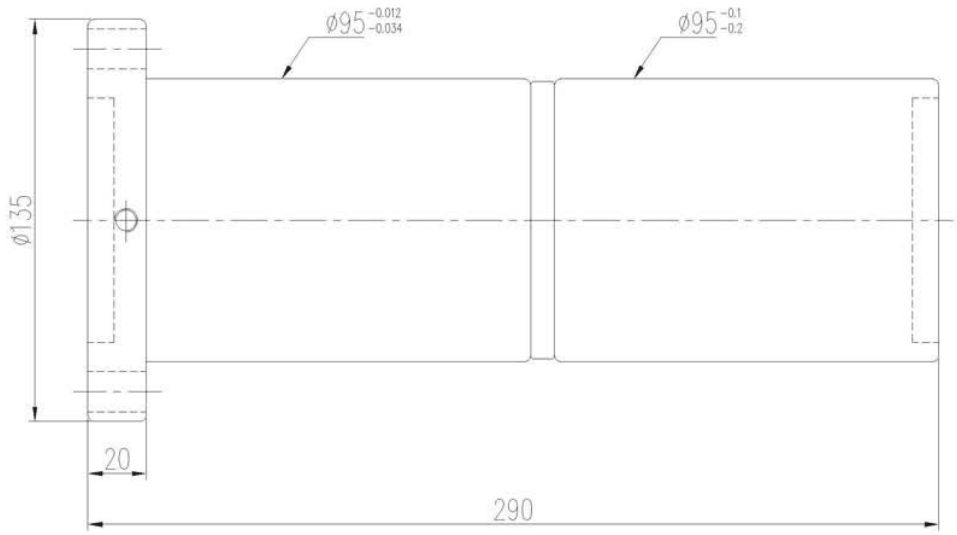
endo

cpc CHIEFTEK PRECISION CO., LTD.

endo

DFU06320





Helix Dir.	螺旋方向	R
Ball Dia.	鋼珠直徑	9.525
Number of Turns	珠捲數	1*4
Basic Dynamic (Ca)	動負荷	11444 kgf
Basic static (C0a)	靜負荷	36653 kgf
Lead	導 程	20

STOCK ITEM

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

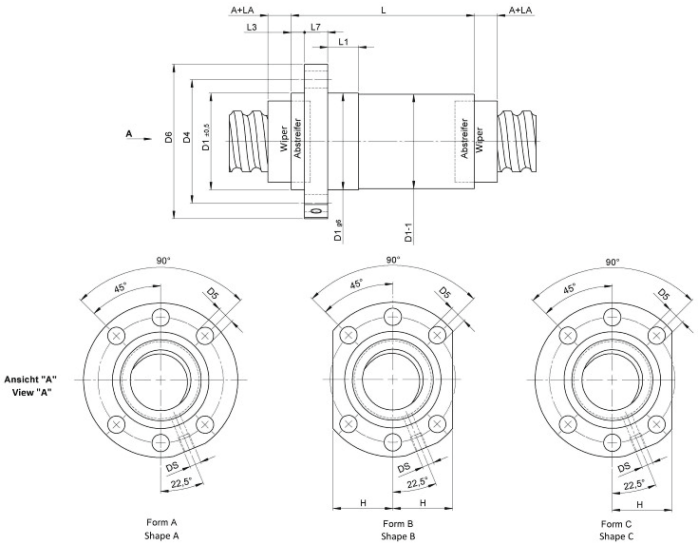
STOCK ITEM

1516/5.25.3,5.3

Description

- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions



Series			1516	Wiper extension	[mm]	L3	6
Nominal diameter	[mm]	dN	25	Flange thickness	[mm]	L7	10
Lead	[mm]	P	5	Dynamic load capacity	[kN]	Ca	13.7
Ball circles		i	1x3	Static load capacity	[kN]	COa	21.5
Ball diameter	[mm]	dW	3.5	Additional wiper extensions for combination wipers	[mm]	LA	9
DN-value			120000	Pilot length	[mm]	L1	10
No. of starts			1	Pilot diameter	[mm]	D1	40
Stiffness	[N/µm]	Rnu,ar	420	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		6.8	Bolt circle diameter	[mm]	D4	51
Friction torque TO	[Ncm]		20.5	Flange hole diameter	[mm]	D5	6.6
Max. preload	[N]		1370	Lube hole	[mm]	DS	M6x1
Accuracy			P	Flange diameter	[mm]	D6	62
Nut length	[mm]	L	85	Flange flat dimension	[mm]	H	24

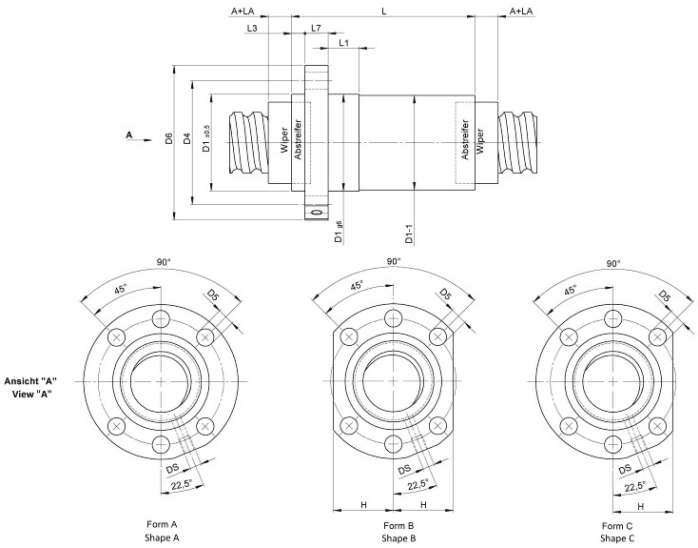
STOCK ITEM

1516/5.32.3,5.4

Description

- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions



Series			1516	Wiper extension	[mm]	L3	6
Nominal diameter	[mm]	dN	32	Flange thickness	[mm]	L7	12
Lead	[mm]	P	5	Dynamic load capacity	[kN]	Ca	20.4
Ball circles		i	2x4	Static load capacity	[kN]	C0a	39.8
Ball diameter	[mm]	dW	3.5	Additional wiper extensions for combination wipers	[mm]	LA	9
DN-value			120000	Pilot length	[mm]	L1	10
No. of starts			1	Pilot diameter	[mm]	D1	50
Stiffness	[N/µm]	Rnu,ar	730	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		13.1	Bolt circle diameter	[mm]	D4	65
Friction torque TO	[Ncm]		39.2	Flange hole diameter	[mm]	D5	9
Max. preload	[N]		2040	Lube hole	[mm]	DS	M6x1
Accuracy			P	Flange diameter	[mm]	D6	80
Nut length	[mm]	L	97	Flange flat dimension	[mm]	H	31

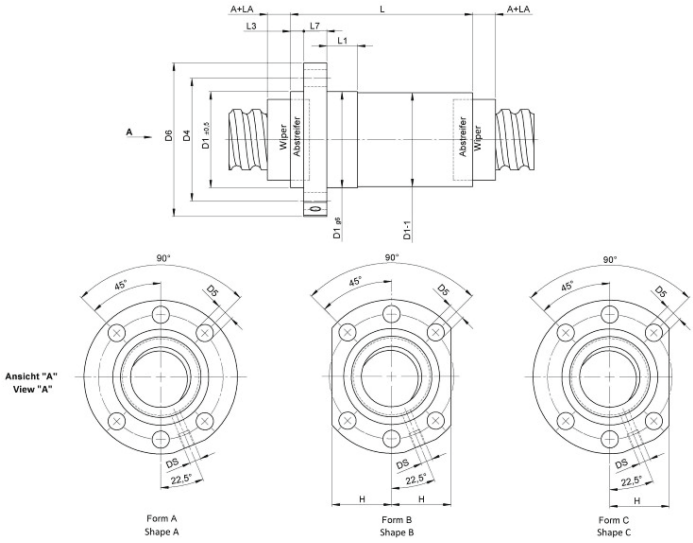
STOCK ITEM

1516/10.32.6.4

Description

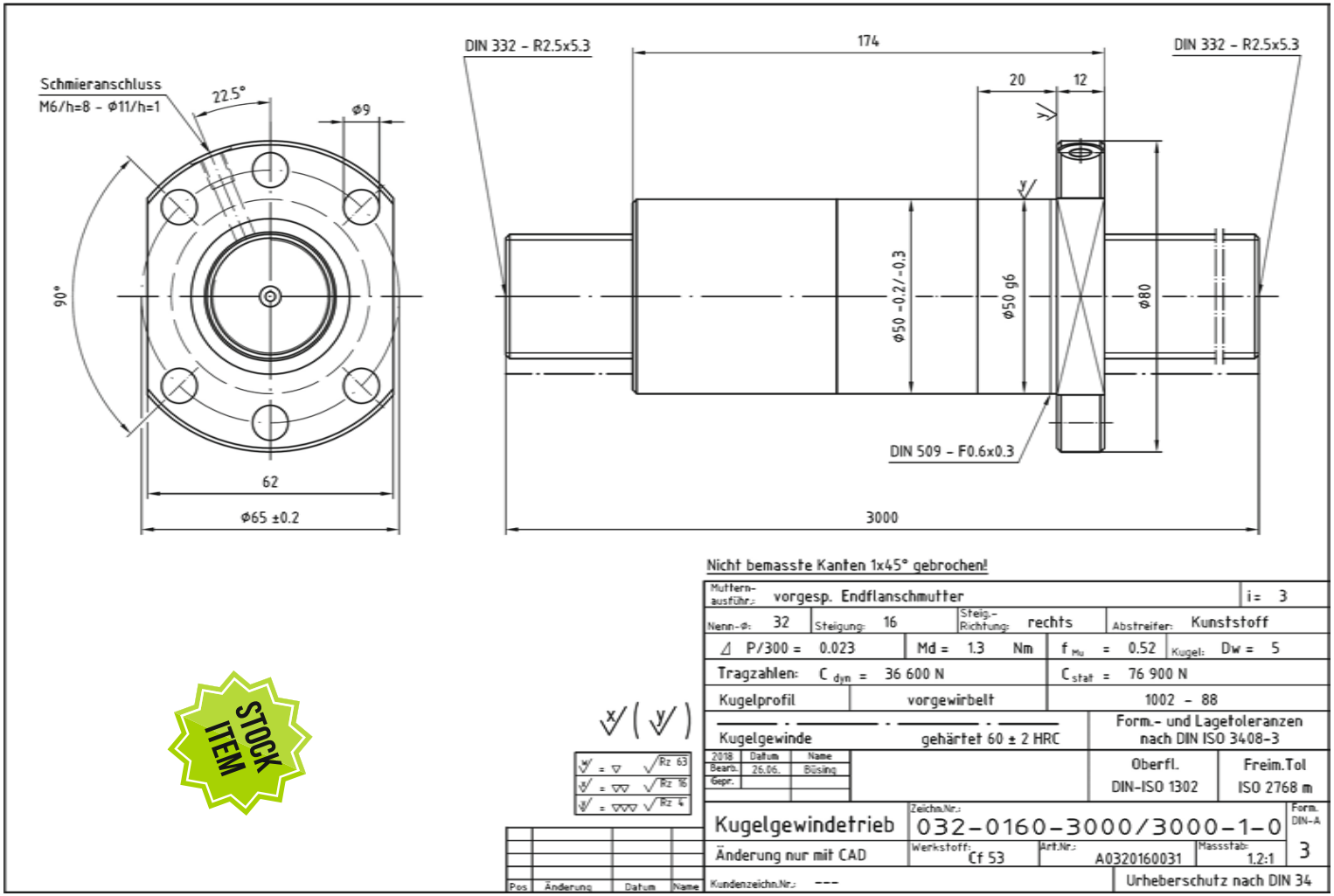
- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions

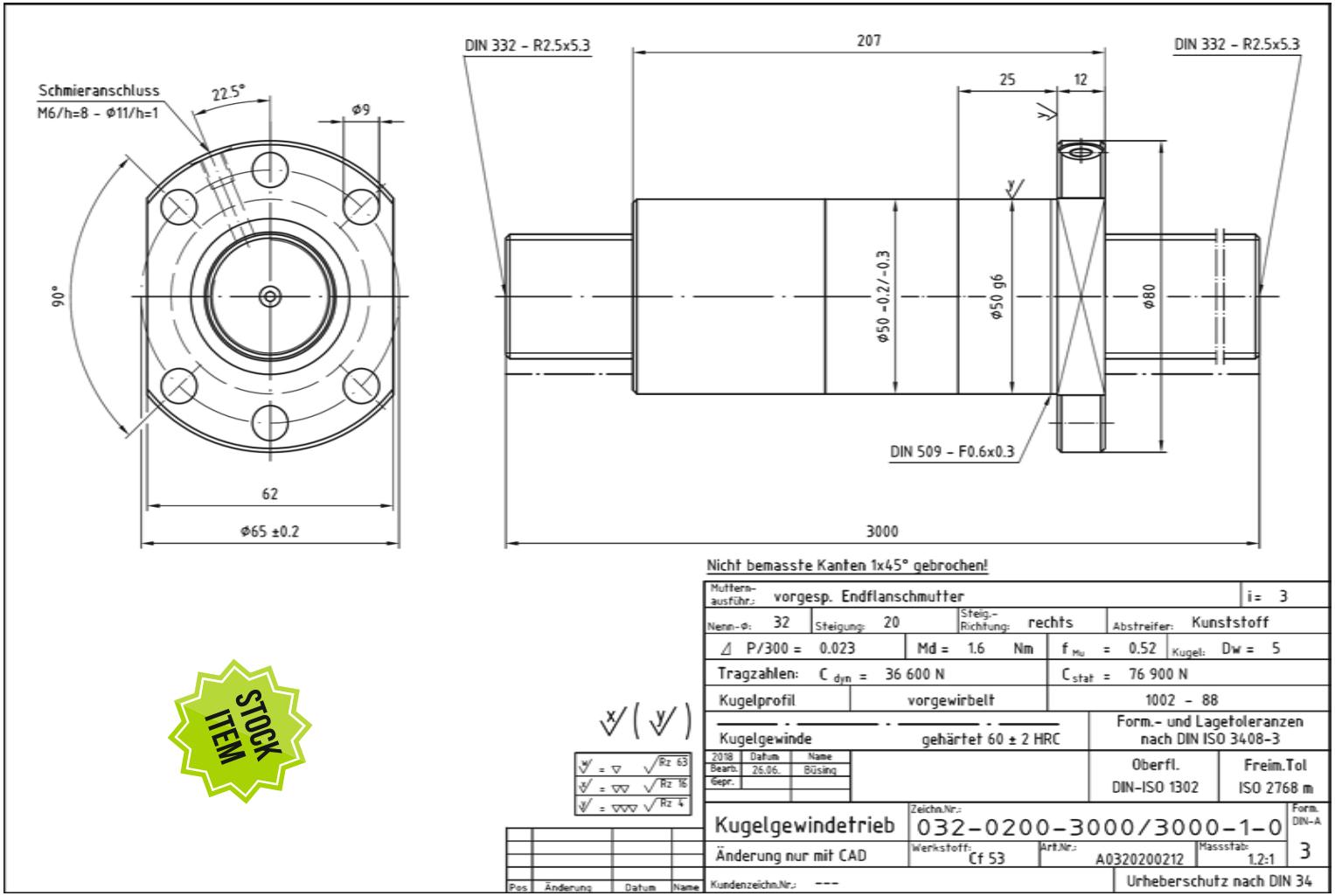


Series			1516	Wiper extension	[mm]	L3	7
Nominal diameter	[mm]	dN	32	Flange thickness	[mm]	L7	12
Lead	[mm]	P	10	Dynamic load capacity	[kN]	Ca	39.4
Ball circles		i	2x4	Static load capacity	[kN]	COa	60.8
Ball diameter	[mm]	dW	6	Additional wiper extensions for combination wipers	[mm]	LA	12
DN-value			120000	Pilot length	[mm]	L1	16
No. of starts			1	Pilot diameter	[mm]	D1	50
Stiffness	[N/µm]	Rnu,ar	650	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		30.3	Bolt circle diameter	[mm]	D4	65
Friction torque TO	[Ncm]		70.6	Flange hole diameter	[mm]	D5	9
Max. preload	[N]		3940	Lube hole	[mm]	DS	M6x1
Accuracy			P	Flange diameter	[mm]	D6	80
Nut length	[mm]	L	165	Flange flat dimension	[mm]	H	31

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15



STOCK ITEM


Schmieranschluss
M6/h=8 – ⌀11/h=1
22.5°
⌀9
90°
62
⌀65 ±0.2
DIN 332 – R2.5x5.3
207
25
12
DIN 332 – R2.5x5.3
⌀50 -0.2/-0.3
⌀50 g6
⌀80
DIN 509 – F0.6x0.3
3000
Nicht bemasste Kanten 1x45° gebrochen!
Muttern-ausführ.: vorgesp. Endflanschmutter
i= 3
Nenn-⌀: 32
Steigung: 20
Steig.-Richtung: rechts
Abstreifer: Kunststoff
P/300 = 0.023
Md = 1.6 Nm
f Mu = 0.52
Kugel: Dw = 5
Tragzahlen: C dyn = 36 600 N
C stat = 76 900 N
Kugelprofil
vorgewirbelt
1002 – 88
Kugelgewinde
gehärtet 60 ± 2 HRC
Form.- und Lagetoleranzen nach DIN ISO 3408-3
2018 Datum Name
Bearb. 26.06. Büsing
Gepr.
Oberfl. DIN-ISO 1302
Freim.Tol ISO 2768 m
Kugelgewindetrieb
Zeichn.Nr.: 032-0200-3000/3000-1-0
Form. DIN-A 3
Änderung nur mit CAD
Werkstoff: Cf 53
Art.Nr.: A0320200212
Massstab: 1:2:1
Kundenzeichn.Nr.: ---
Urheberschutz nach DIN 34
Pos Änderung Datum Name

STOCK ITEM

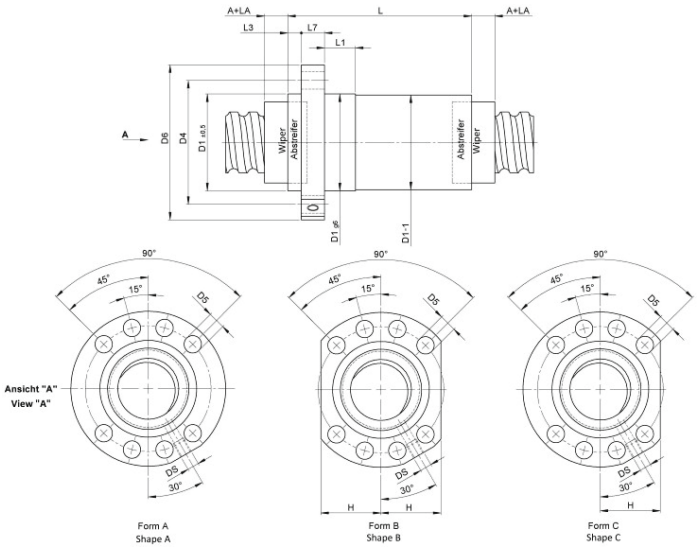
STOCK ITEM

1516/5.40.3,5.4

Description

- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions



Series			1516	Wiper extension	[mm]	L3	6
Nominal diameter	[mm]	dN	40	Flange thickness	[mm]	L7	14
Lead	[mm]	P	5	Dynamic load capacity	[kN]	Ca	22.7
Ball circles		i	2x4	Static load capacity	[kN]	C0a	50.9
Ball diameter	[mm]	dW	3.5	Additional wiper extensions for combination wipers	[mm]	LA	9
DN-value			120000	Pilot length	[mm]	L1	10
No. of starts			1	Pilot diameter	[mm]	D1	63
Stiffness	[N/µm]	Rnu,ar	890	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		18.2	Bolt circle diameter	[mm]	D4	78
Friction torque TO	[Ncm]		54.5	Flange hole diameter	[mm]	D5	9
Max. preload	[N]		2270	Lube hole	[mm]	DS	M8x1
Accuracy			P	Flange diameter	[mm]	D6	93
Nut length	[mm]	L	99	Flange flat dimension	[mm]	H	35

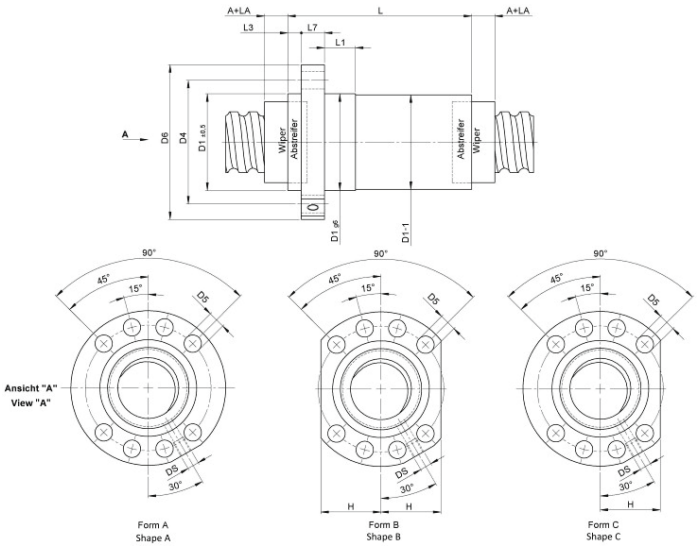
STOCK ITEM

1516/10.40.7,5.4

Description

- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions



Series			1516	Wiper extension	[mm]	L3	7
Nominal diameter	[mm]	dN	40	Flange thickness	[mm]	L7	14
Lead	[mm]	P	10	Dynamic load capacity	[kN]	Ca	59
Ball circles		i	2x4	Static load capacity	[kN]	C0a	95.1
Ball diameter	[mm]	dW	7.5	Additional wiper extensions for combination wipers	[mm]	LA	12
DN-value			120000	Pilot length	[mm]	L1	16
No. of starts			1	Pilot diameter	[mm]	D1	63
Stiffness	[N/µm]	Rnu,ar	830	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		61.4	Bolt circle diameter	[mm]	D4	78
Friction torque TO	[Ncm]		127.4	Flange hole diameter	[mm]	D5	9
Max. preload	[N]		5900	Lube hole	[mm]	DS	M8x1
Accuracy			P	Flange diameter	[mm]	D6	93
Nut length	[mm]	L	167	Flange flat dimension	[mm]	H	35

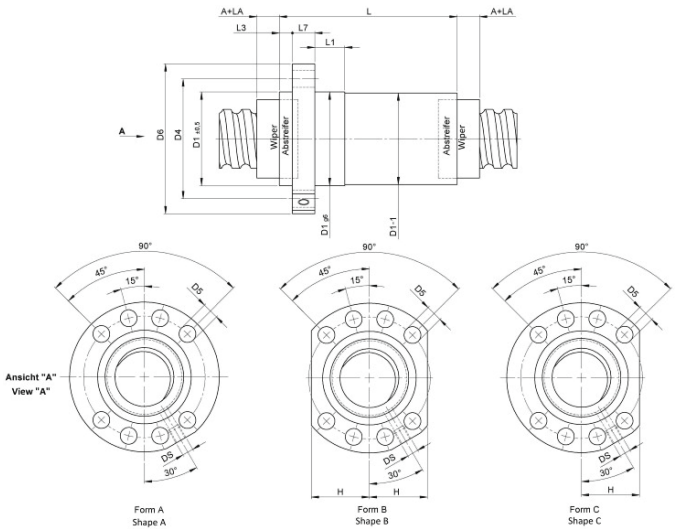
STOCK ITEM

1516/12.40.7,5.4

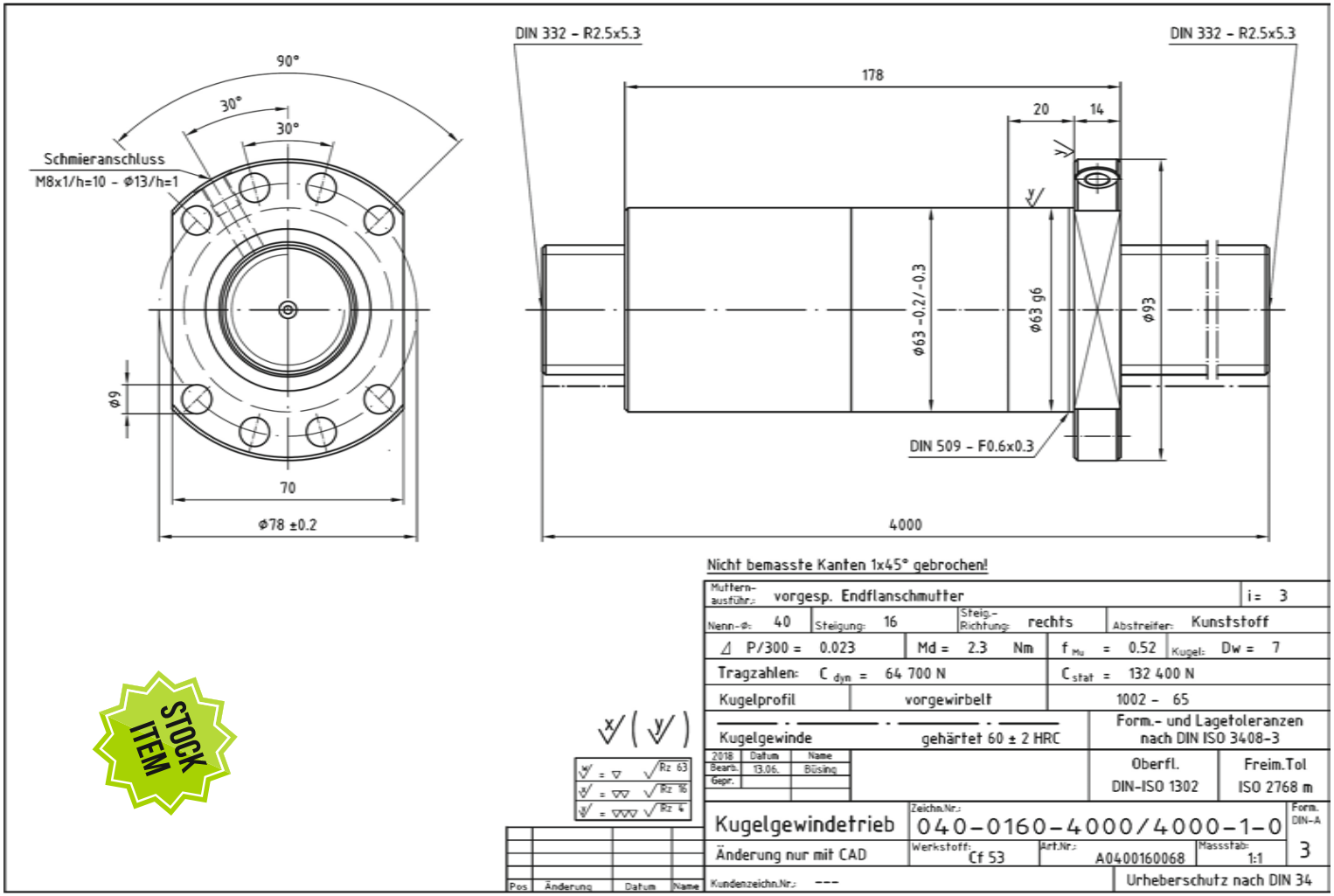
Description

- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions

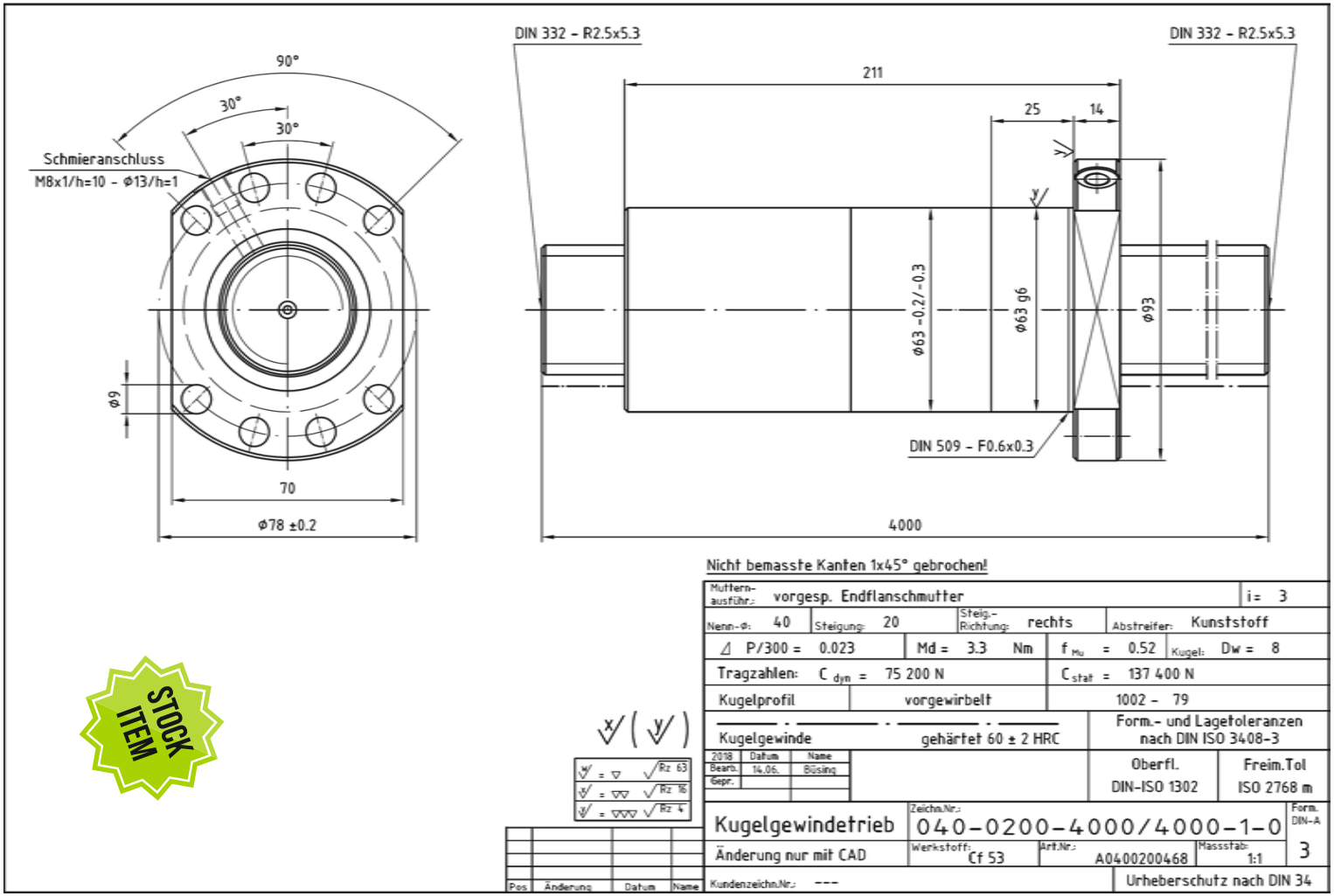


Series			1516	Wiper extension	[mm]	L3	7
Nominal diameter	[mm]	dN	40	Flange thickness	[mm]	L7	14
Lead	[mm]	P	12	Dynamic load capacity	[kN]	Ca	58.9
Ball circles		i	2x4	Static load capacity	[kN]	C0a	95
Ball diameter	[mm]	dW	7.5	Additional wiper extensions for combination wipers	[mm]	LA	12
DN-value			120000	Pilot length	[mm]	L1	16
No. of starts			1	Pilot diameter	[mm]	D1	63
Stiffness	[N/µm]	Rnu,ar	810	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		61.3	Bolt circle diameter	[mm]	D4	78
Friction torque TO	[Ncm]		127.2	Flange hole diameter	[mm]	D5	9
Max. preload	[N]		5890	Lube hole	[mm]	DS	M8x1
Accuracy			P	Flange diameter	[mm]	D6	93
Nut length	[mm]	L	177	Flange flat dimension	[mm]	H	35

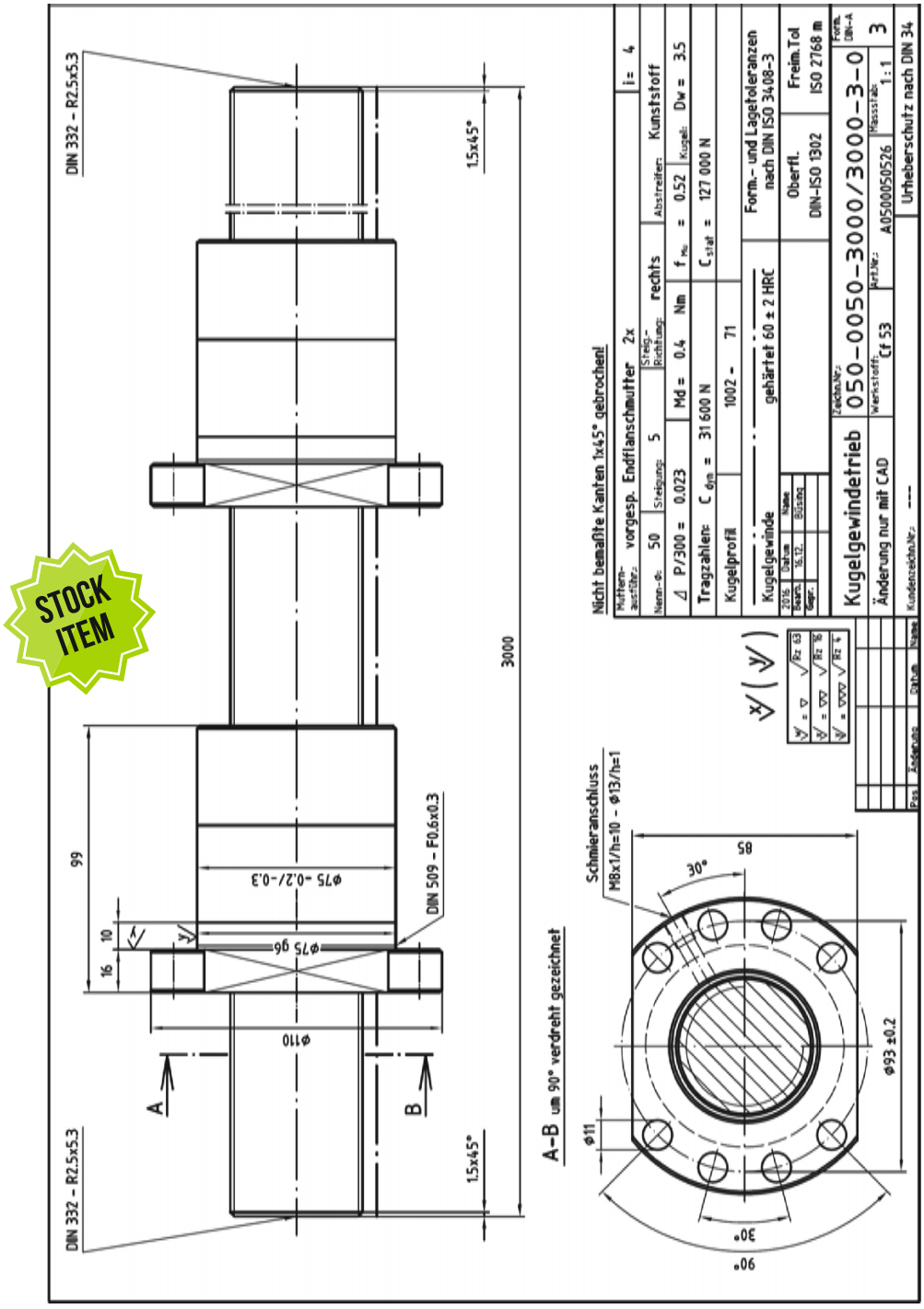

90°
30°
30°
Schmieranschluss
M8x1/h=10 - ø13/h=1
ø9
70
ø78 ±0.2
DIN 332 - R2.5x5.3
DIN 332 - R2.5x5.3
178
20
14
ø63 -0.2/-0.3
ø63 g6
ø93
DIN 509 - F0.6x0.3
4000
Nicht bemasste Kanten 1x45° gebrochen!
Muttern-ausführ.: vorgesp. Endflanschmutter
i = 3
Nenn-ø: 40
Steigung: 16
Steig.-Richtung: rechts
Abstreifer: Kunststoff
P/300 = 0.023
Md = 2.3 Nm
f Mu = 0.52
Kugel: Dw = 7
Tragzahlen: C dyn = 64 700 N
C stat = 132 400 N
Kugelprofil
vorgewirbelt
1002 - 65
Kugelgewinde
gehärtet 60 ± 2 HRC
Form.- und Lagetoleranzen nach DIN ISO 3408-3
2018 Datum Name
Bearb. 13.06. Büsing
Gepr.
Oberfl. DIN-ISO 1302
Freim.Tol ISO 2768 m
Kugelgewindetrieb
Zeichn.Nr.: 040-0160-4000/4000-1-0
Form. DIN-A 3
Änderung nur mit CAD
Werkstoff: Cf 53
Art.Nr.: A0400160068
Massstab: 1:1
Pos Änderung Datum Name
Kundenzeichn.Nr.: ---
Urheberschutz nach DIN 34

STOCK ITEM

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15



STOCK ITEM


STOCK ITEM
DIN 332 - R2.5x5.3
1.5x45°
3000
99
10
16
ø75 -0.2/-0.3
ø75 g6
DIN 509 - F0.6x0.3
ø110
A
B
Schmieranschluss
M8x1/h=10 - ø13/h=1
A-B um 90° verdreht gezeichnet
ø11
85
30°
ø93 ±0.2
30°
90°
Nicht bemaßte Kanten 1x45° gebrochen!
Kugelgewindefrieb
050-0050-3000/3000-3-0
Änderung nur mit CAD
Cf 53
A0500050526
Urheberschutz nach DIN 34

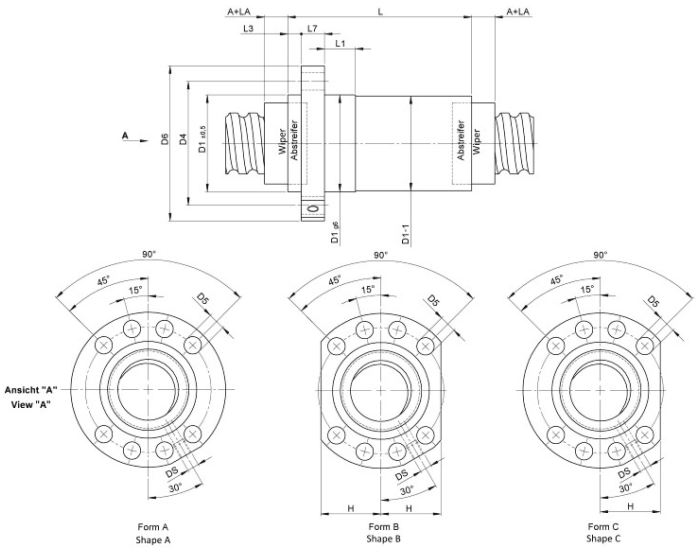
STOCK ITEM

1516/10.50.7,5.4

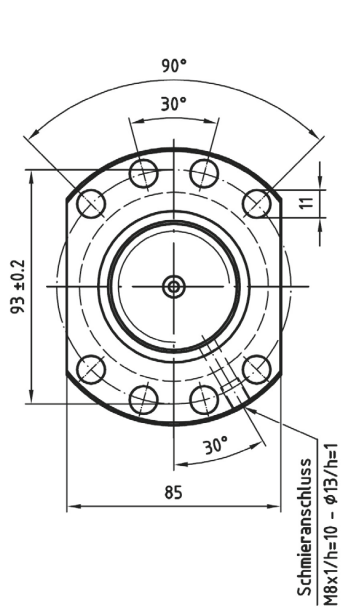
Description

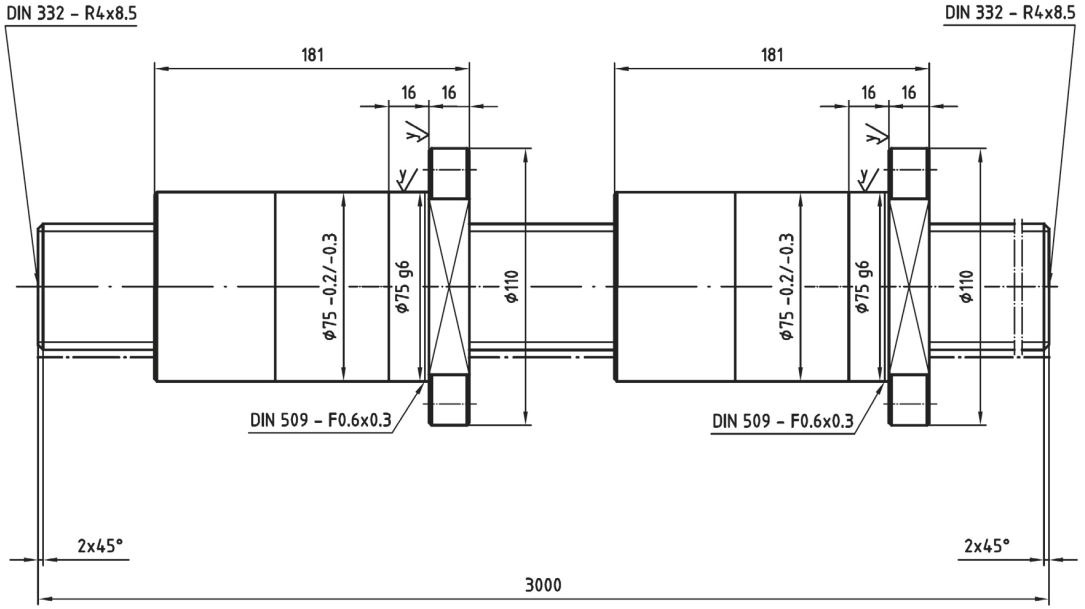
- Nut Series 1516 with internal ball return, Flange double nut with 2-point-contact, with standard wipers on both ends
- Nut shape according to DIN for assembly by flange
- Single start ball thread, ground execution according to accuracy class P1 - P5

Technical Data and Dimensions



Series			1516	Wiper extension	[mm]	L3	7
Nominal diameter	[mm]	dN	50	Flange thickness	[mm]	L7	16
Lead	[mm]	P	10	Dynamic load capacity	[kN]	Ca	67.4
Ball circles		i	2x4	Static load capacity	[kN]	COa	124.3
Ball diameter	[mm]	dW	7.5	Additional wiper extensions for combination wipers	[mm]	LA	12
DN-value			120000	Pilot length	[mm]	L1	16
No. of starts			1	Pilot diameter	[mm]	D1	75
Stiffness	[N/µm]	Rnu,ar	1060	Pilot diameter tolerance	[mm]		g6
Friction torque FROM	[Ncm]		94.4	Bolt circle diameter	[mm]	D4	93
Friction torque TO	[Ncm]		175.2	Flange hole diameter	[mm]	D5	11
Max. preload	[N]		6740	Lube hole	[mm]	DS	M8x1
Accuracy			P	Flange diameter	[mm]	D6	110
Nut length	[mm]	L	169	Flange flat dimension	[mm]	H	42.5





Nicht bemasste Kanten 1x45° gebrochen!

STOCK ITEM

Muttern-ausführ.:	vorgesp. Endflanschmutter (2x)				i = 4
Nenn-ø: 50	Steigung: 12	Steig.-Richtung: rechts		Abstreifer: Kunststoff	
⊿ P/300 = 0.023	Md = 2.3 Nm	f_{Mu} = 0.52	Kugel:	Dw = 7	
Tragzahlen:	C_{dyn} = 84 400 N		C_{stat} = 225 700 N		
Kugelprofil	vorgewirbelt		1002 – 65		
Kugelgewinde	gehärtet 60 ± 2 HRC		Form.- und Lagetoleranzen nach DIN ISO 3408-3		

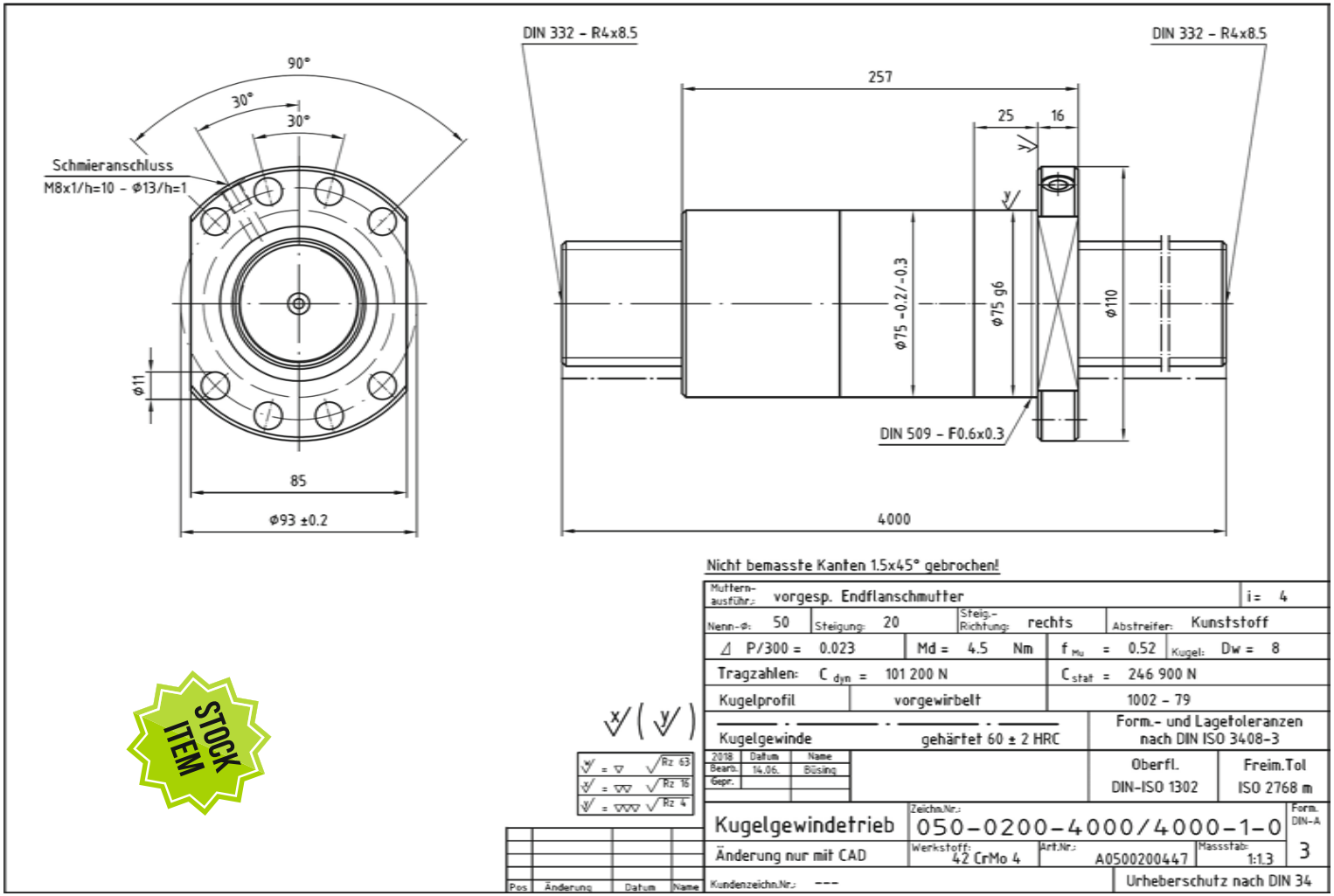
2016	Datum	Name		
Bearb.	28.01.	Cakar		
Gepr.			Oberfl. DIN-ISO 1302	Freim.Tol ISO 2768 m

Kugelgewindetrieb	Zeichn.Nr.: 050-0120-3000/3000-1-0			Form. DIN-A 3
Änderung nur mit CAD	Werkstoff: Cf 53	Art.Nr.: A0500120081	Massstab: 1 : 1.5	
Kundenzeichn.Nr.: ---			Urheberschutz nach DIN 34	

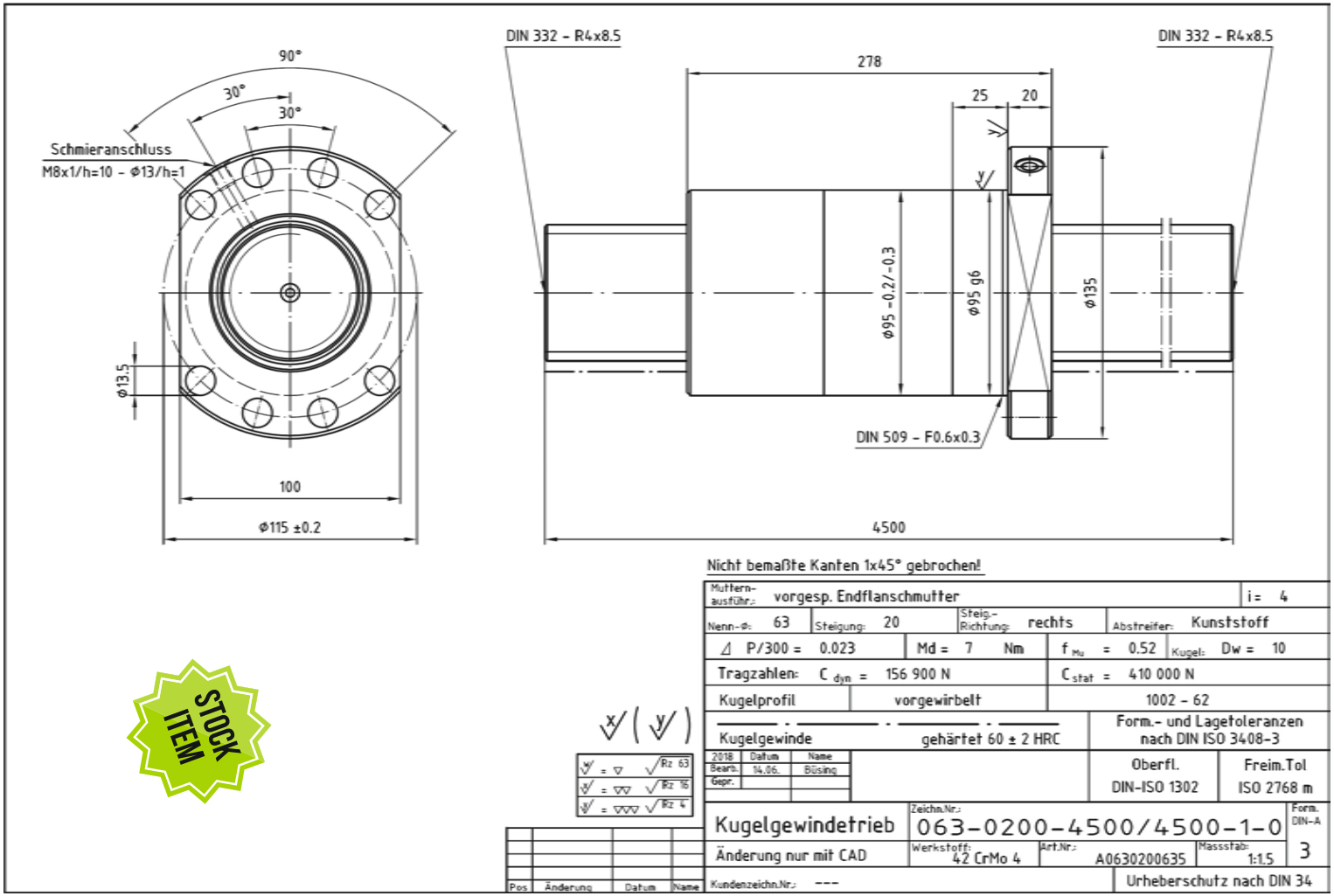
Pos	Änderung	Datum	Name

GROUND SCREWS

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

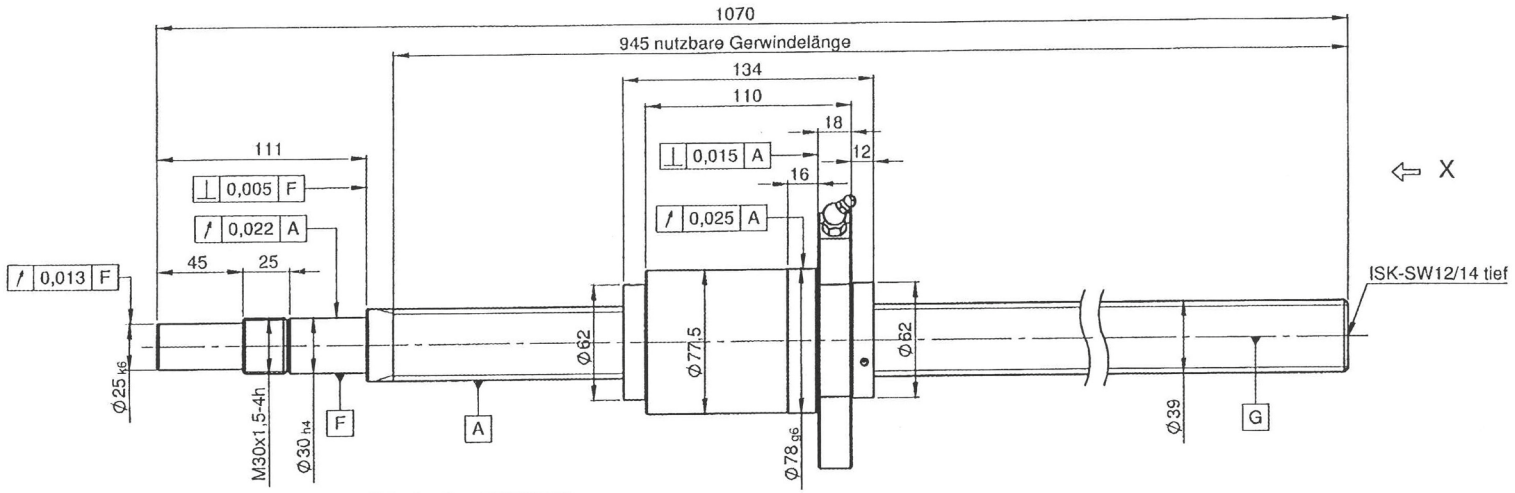


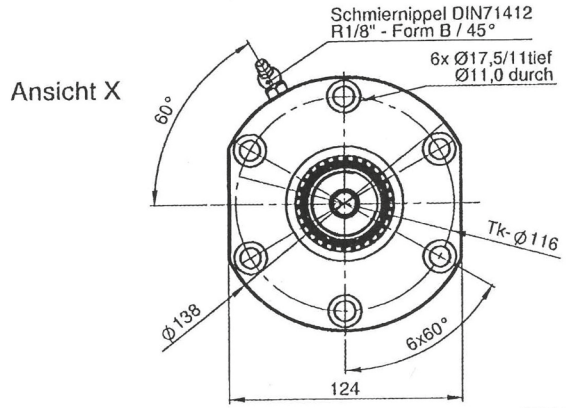
STOCK ITEM


90°
30°
30°
Schmieranschluss
M8x1/h=10 - Ø13/h=1
Ø13.5
100
Ø115 ±0.2
DIN 332 - R4x8.5
DIN 332 - R4x8.5
278
25
20
Ø95 -0.2/-0.3
Ø95 g6
Ø135
DIN 509 - F0.6x0.3
4500
Nicht bemaßte Kanten 1x45° gebrochen!
Muttern-ausführ.: vorgesp. Endflanschmutter
i = 4
Nenn-Ø: 63
Steigung: 20
Steig.-Richtung: rechts
Abstreifer: Kunststoff
P/300 = 0.023
Md = 7 Nm
f Mu = 0.52
Kugel: Dw = 10
Tragzahlen: C dyn = 156 900 N
C stat = 410 000 N
Kugelprofil
vorgewirbelt
1002 - 62
Kugelgewinde
gehärtet 60 ± 2 HRC
Form.- und Lagetoleranzen nach DIN ISO 3408-3
2018 Datum Name
Bearb. 14.06. Büsing
Gepr.
Oberfl. DIN-ISO 1302
Freim.Tol ISO 2768 m
Kugelgewindetrieb
Zeichn.Nr.: 063-0200-4500/4500-1-0
Form. DIN-A 3
Änderung nur mit CAD
Werkstoff: 42 CrMo 4
Art.Nr.: A0630200635
Maßstab: 1:1.5
Pos Änderung Datum Name
Kundenzeichn.Nr.: ---
Urheberschutz nach DIN 34

STOCK ITEM

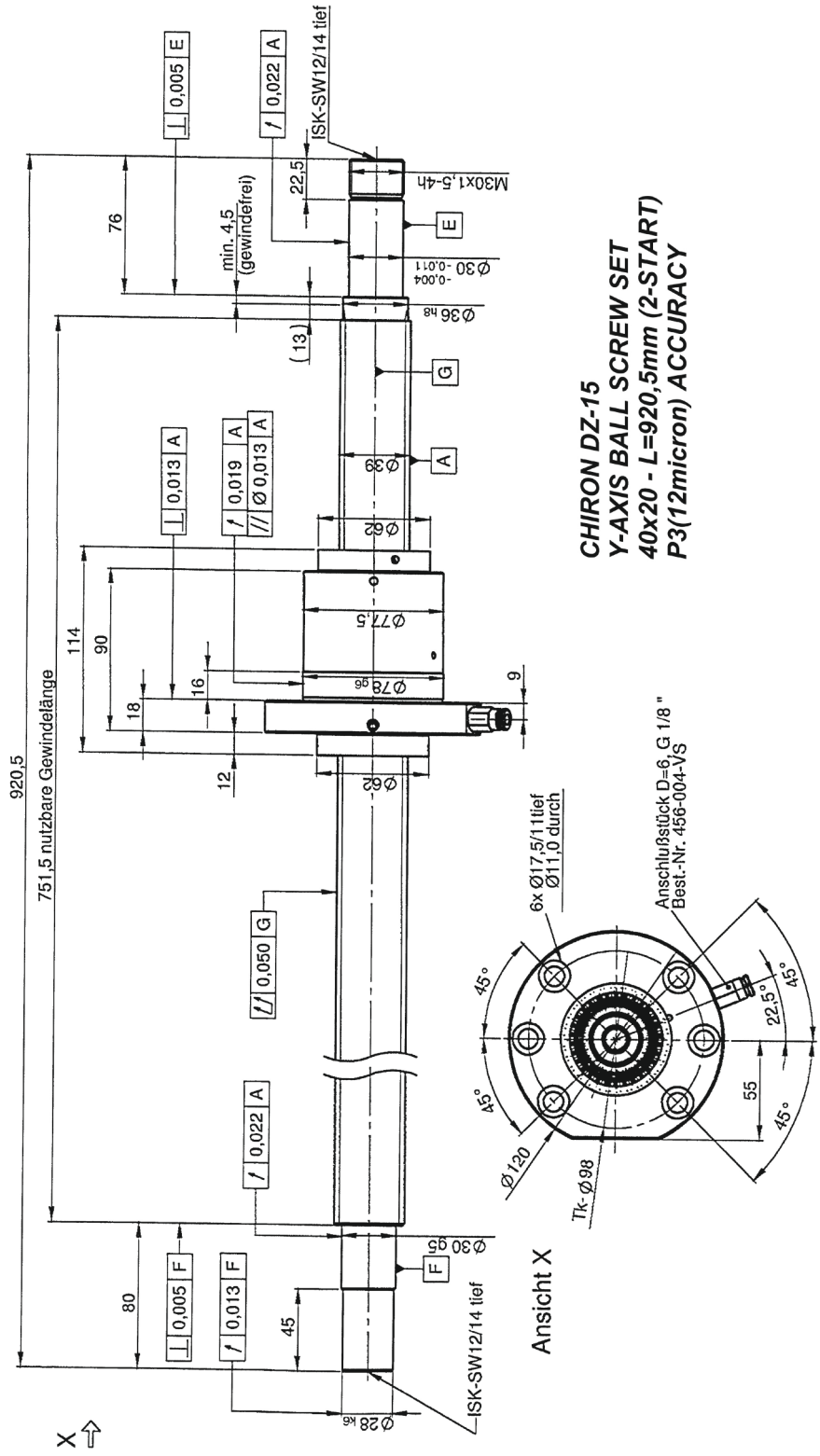
194
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

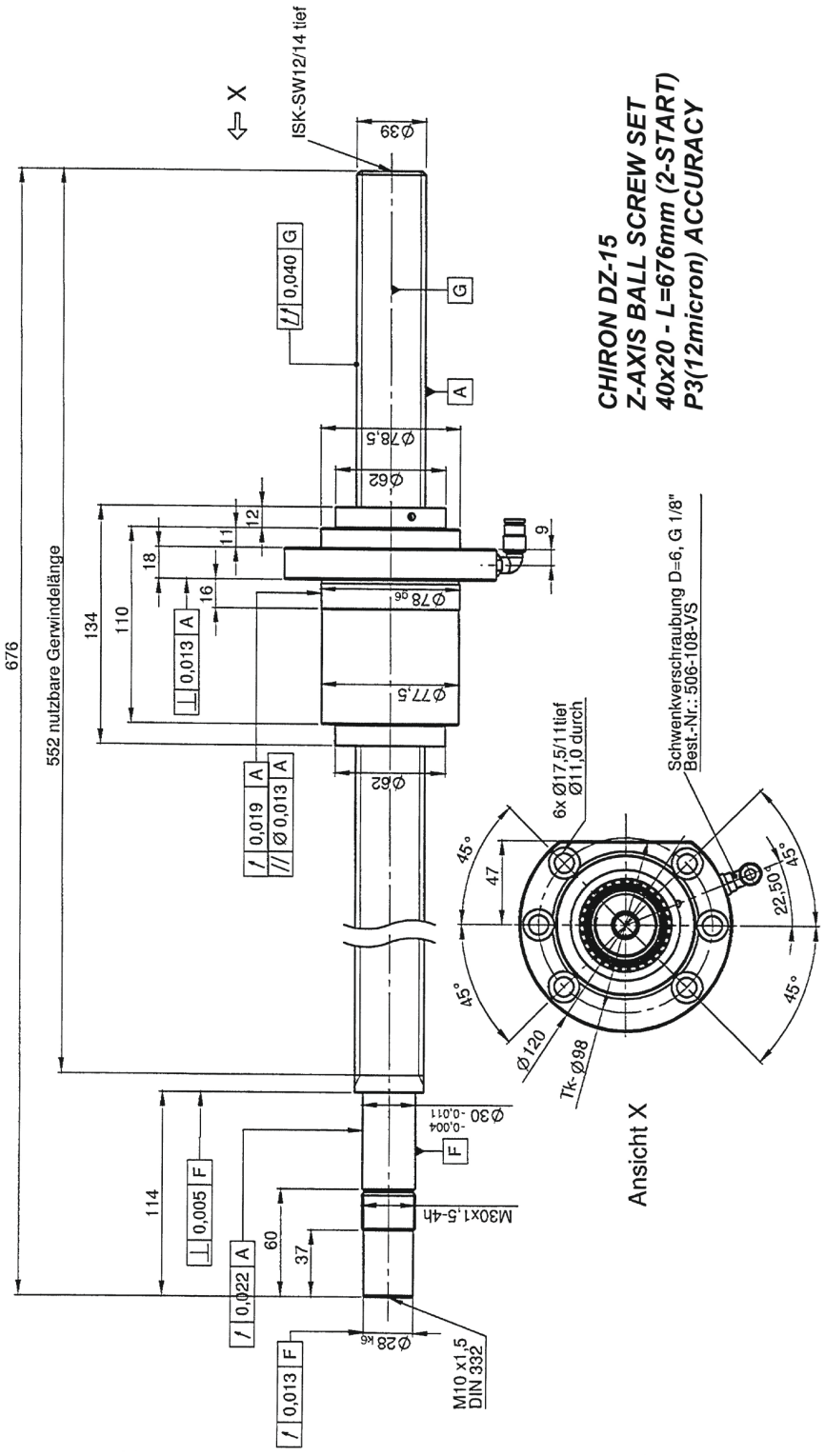


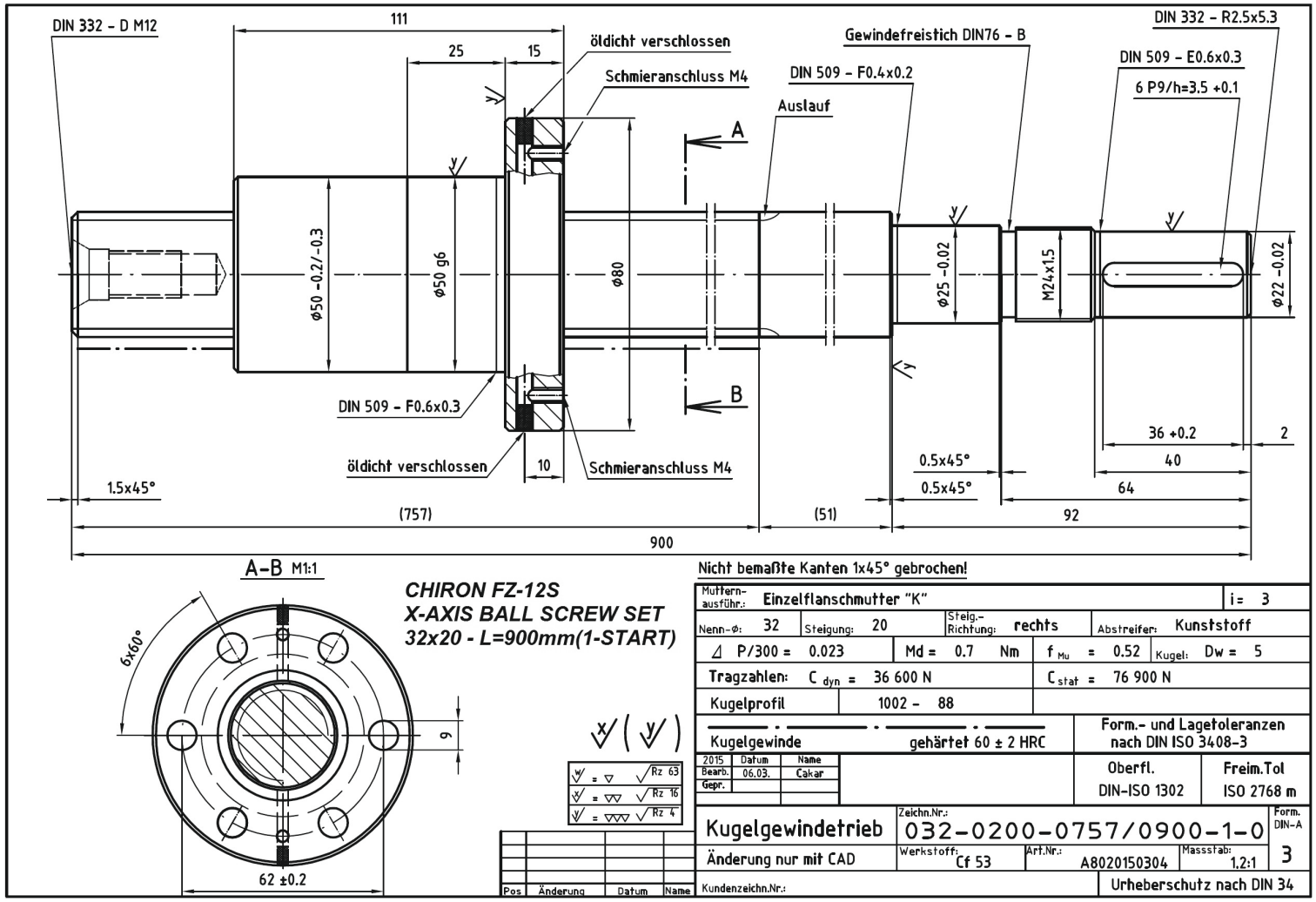


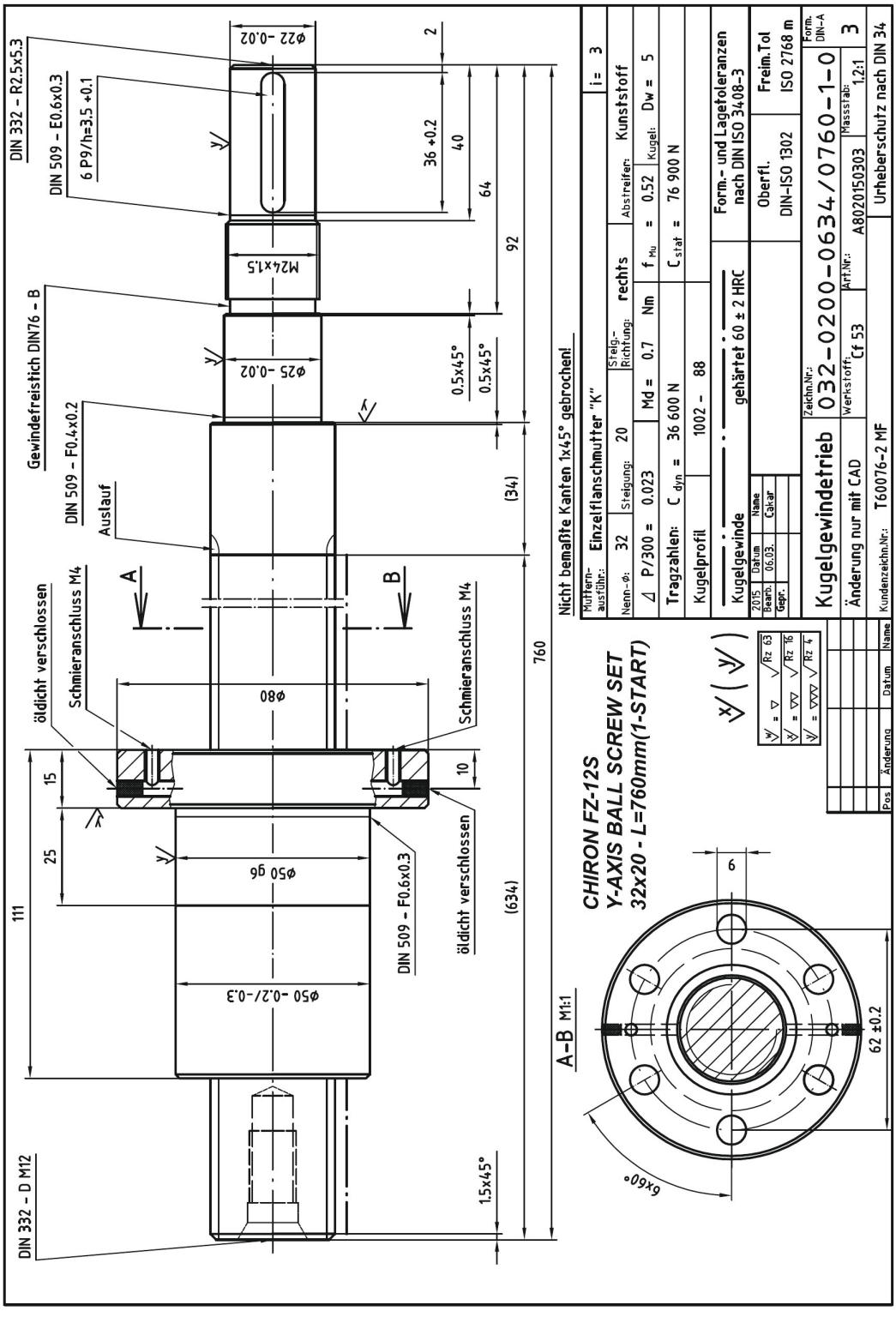
Spindel-nenn-Ø [mm]	40	Mutternart	Doppelmutter
Steigung [mm]	20	dyn. Tragzahl [KN]	74,4
Steigungsrichtung	RH	stat. Tragzahl [KN]	102,8
Kugel-Ø [mm]	7,5	Anzahl der Umläufe	2 x 4
Anzahl der Gänge	2	Axialspiel [mm]	0
Steigungsgenauigkeit nach DIN 69051	T3	Vorspannung [N]	7450
Abstreifer	Doppelabstreifer beidseitig	Art der Vorspannung	EtaPlus-Ausführung
Schmierung	Fett Shell Alvania EP (LF) 2		

CHIRON DZ-15
X-AXIS BALL SCREW SET
40x20 - L=1070mm (2-START)
P3(12micron) ACCURACY


CHIRON DZ-15
Y-AXIS BALL SCREW SET
40x20 - L=920,5mm (2-START)
P3(12micron) ACCURACY
920,5
751,5 nutzbare Gewindelänge
M30x1,5-4h
ISK-SW12/14 tief
min. 4,5 (gewindefrei)
22,5
76
114
90
80
45
18
16
12
9
(13)
0,005 E
0,022 A
0,013 A
0,019 A
Ø 0,013 A
0,050 G
0,005 F
0,013 F
Ø30 -0,004 -0,011
Ø36 h8
Ø39
Ø62
Ø77,5
Ø78 g6
Ø30 g5
Ø28 k6
6x Ø17,5/11 tief Ø11,0 durch
Anschlußstück D=6, G 1/8 " Best.-Nr. 456-004-VS
Ø120
Tk- Ø98
55
22,5°
45°
Ansicht X
X


CHIRON DZ-15
Z-AXIS BALL SCREW SET
40x20 - L=676mm (2-START)
P3(12micron) ACCURACY
ISK-SW12/14 tief
X
Ø39
0,040 G
G
A
Ø78,5
Ø62
12
11
18
16
9
Ø78 g6
Ø77,5
0,013 A
0,019 A
Ø 0,013 A
676
552 nutzbare Gerwindelänge
134
110
Ø62
6x Ø17,5/11tief
Ø11,0 durch
Schwenkverschraubung D=6, G 1/8"
Best.-Nr.: 506-108-VS
45°
47
22,50
Ø120
Tk-Ø98
Ansicht X
Ø30 -0,004 -0,011
F
M30x1,5-4h
114
0,005 F
60
37
0,022 A
Ø28 k6
0,013 F
M10 x1,5
DIN 332


DIN 332 – D M12
111
25
15
öldicht verschlossen
Schmieranschluss M4
DIN 509 – F0.4x0.2
Auslauf
Gewindefreistich DIN76 – B
DIN 332 – R2.5x5.3
DIN 509 – E0.6x0.3
6 P9/h=3.5 +0.1
A
B
ø50 -0.2/-0.3
ø50 g6
ø80
ø25 -0.02
M24x1.5
ø22 -0.02
DIN 509 – F0.6x0.3
öldicht verschlossen
10
Schmieranschluss M4
36 +0.2
2
40
64
92
0.5x45°
0.5x45°
1.5x45°
(757)
(51)
900
A–B M1:1
6x60°
9
62 ±0.2
CHIRON FZ-12S
X-AXIS BALL SCREW SET
32x20 - L=900mm(1-START)
Nicht bemaßte Kanten 1x45° gebrochen!
Muttern-ausführ.: Einzelflanschmutter "K"
i = 3
Nenn-ø: 32
Steigung: 20
Steig.-Richtung: rechts
Abstreifer: Kunststoff
P/300 = 0.023
Md = 0.7 Nm
f Mu = 0.52
Kugel: Dw = 5
Tragzahlen: C dyn = 36 600 N
C stat = 76 900 N
Kugelprofil
1002 – 88
Kugelgewinde
gehärtet 60 ± 2 HRC
Form.- und Lagetoleranzen nach DIN ISO 3408-3
2015 Datum Name
Bearb. 06.03. Cakar
Gepr.
Oberfl. DIN-ISO 1302
Freim.Tol ISO 2768 m
Kugelgewindetrieb
Zeichn.Nr.: 032-0200-0757/0900-1-0
Form. DIN-A 3
Änderung nur mit CAD
Werkstoff: Cf 53
Art.Nr.: A8020150304
Massstab: 1.2:1
Pos Änderung Datum Name
Kundenzeichn.Nr.:
Urheberschutz nach DIN 34


DIN 332 – R2.5x5.3
DIN 509 – E0.6x0.3
6 P9/h=3.5 +0.1
Gewindefreistich DIN76 – B
DIN 509 – F0.4x0.2
Auslauf
öldicht verschlossen
Schmieranschluss M4
DIN 332 – D M12
DIN 509 – F0.6x0.3
1.5x45°
0.5x45°
M24x1.5
Ø22 -0.02
Ø25 -0.02
Ø50 g6
Ø50 -0.2/-0.3
Ø80
36 +0.2
40
64
92
(34)
(634)
760
111
25
15
10
2
6
62 ±0.2
6x60°
A–B M1:1
Nicht bemaßte Kanten 1x45° gebrochen!
CHIRON FZ-12S
Y-AXIS BALL SCREW SET
32x20 - L=760mm(1-START)
Kugelgewindetrieb
032-0200-0634/0760-1-0
Einzelflanschmutter "K"
Kugelgewinde gehärtet 60 ± 2 HRC
Form.- und Lagetoleranzen nach DIN ISO 3408-3
Oberfl. DIN-ISO 1302
Freim.Tol ISO 2768 m
Änderung nur mit CAD
Werkstoff: Cf 53
Art.Nr.: A8020150303
Maßstab: 1:2:1
Urheberschutz nach DIN 34

"CPC" TAŞLANMIŞ VİDALI MİL LİSTESİ

S. NO	MARKA	MENŞEİ	STOK KODLARIMIZ	STOK AÇIKLAMASI	ÖLÇÜSÜ	STOKLARIMIZA GELİŞ BİLGİSİ	SATIŞ MANTIĞI	STOK DURUMU
1	CPC	TAYVAN	CPC SCR-02505-GC7-1500	25X05 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	25x05	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-02505-T4D-GC7	DFUR 25X05 ÇİFTLİ SOMUN - TAŞLANMIŞ				
2	CPC	TAYVAN	CPC SCR-02506-GC7-1500	25X06 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	25x06	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-02506-T4D-GC7	DFUR 25X06 ÇİFTLİ SOMUN - TAŞLANMIŞ				
3	CPC	TAYVAN	CPC SCR-02508-GC7-1500	25X08 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	25x08	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-02508-T4D-GC7	DFUR 25X08 ÇİFTLİ SOMUN - TAŞLANMIŞ				
4	CPC	TAYVAN	CPC SCR-02510-GC7-1500	25X10 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	25x10 - SAĞ PASO	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOKLARA GİRDİ
			CPC DFUR-02510-T4D-GC7	DFUR 25X10 ÇİFTLİ SOMUN - TAŞLANMIŞ				
5	CPC	TAYVAN	CPC SCL-02510-GC7-2000	25X10 G7 VİDALI MİL - TAŞLANMIŞ SOL PASO 2000MM	25x10 - SOL PASO	1 ADET L=2000mm MİL + 1 ADET TEKLİ SOMUN	1000mm + 1 SOMUN=1 SET	STOKLARA GİRDİ
			CPC FSFUL-02510-T4D-GC7	FSFUL 25X10 FLANŞLI TAŞLANMIŞ SOMUN - SOL PASO				
6	CPC	TAYVAN	CPC SCR-03205-GC7-1500	32X05 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	32x05	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-03205-T4D-GC7	DFUR 32X05 ÇİFTLİ SOMUN - TAŞLANMIŞ				
7	CPC	TAYVAN	CPC SCR-03206-GC7-1500	32X06 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	32x06	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-03206-T4D-GC7	DFUR 32X06 ÇİFTLİ SOMUN - TAŞLANMIŞ				
8	CPC	TAYVAN	CPC SCR-03208-GC7-1500	32X08 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	32x08	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-03208-T4D-GC7	DFUR 32X08 ÇİFTLİ SOMUN - TAŞLANMIŞ				
9	CPC	TAYVAN	CPC SCR-03210-GC7-1500	32X10 G7 - VİDALI MİL - TAŞLANMIŞ 1500MM	32x10	1 ADET L=1500mm MİL + 1 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-03210-T4D-GC7	DFUR 32X10 ÇİFTLİ SOMUN - TAŞLANMIŞ				
10	CPC	TAYVAN	CPC SCR-03220-GC7-2560	32X20 G7 - VİDALI MİL - TAŞLANMIŞ 2560MM	32x20	1 ADET L=2560mm MİL + 2 ADET ÇİFTLİ SOMUN	1280mm + 1 SOMUN=1 SET	STOKLARA GİRDİ
			CPC DFSR-03220-T4D-GC7	DFSR 32X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				
11	CPC	TAYVAN	CPC SCR-04005-GC7-3000	40X05 G7 - VİDALI MİL - TAŞLANMIŞ 3000MM	40x05	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-04005-T4D-GC7	DFUR 40X05 ÇİFTLİ SOMUN - TAŞLANMIŞ				
12	CPC	TAYVAN	CPC SCR-04006-GC7-3000	40X06 G7 - VİDALI MİL - TAŞLANMIŞ 3000MM	40x06	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-04006-T4D-GC7	DFUR 40X06 ÇİFTLİ SOMUN - TAŞLANMIŞ				
13	CPC	TAYVAN	CPC SCR-04008-GC7-3000	40X08 G7 - VİDALI MİL - TAŞLANMIŞ 3000MM	40x08	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-04008-T4D-GC7	DFUR 40X08 ÇİFTLİ SOMUN - TAŞLANMIŞ				
14	CPC	TAYVAN	CPC SCR-04010-GC7-3000	40X10 G7 VİDALI MİL - TAŞLANMIŞ 3000MM	40x10	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	1500mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-04010-T4D-GC7	DFUR 40X10 ÇİFTLİ SOMUN - TAŞLANMIŞ				
15	CPC	TAYVAN	CPC SCR-04020-GC7-4000	40X20 G7 - VİDALI MİL - TAŞLANMIŞ 4000MM	40x20	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	2000mm + 1 SOMUN=1 SET	2019 - YAZIN GELECEK
			CPC DFSR-04020-T4D-GC7	DFSR 40X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				
16	CPC	TAYVAN	CPC SCR-05010-GC7-4000	50X10 G7 - VİDALI MİL - TAŞLANMIŞ 4000MM	50x10	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	2000mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-05010-T4D-GC7	DFUR 50X10 ÇİFTLİ SOMUN - TAŞLANMIŞ				
17	CPC	TAYVAN	CPC SCR-05020-GC7-4000	50X20 G7 - VİDALI MİL - TAŞLANMIŞ 4000MM	50x20	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	2000mm + 1 SOMUN=1 SET	2019 - YAZIN GELECEK
			CPC DFUR-05020-T4D-GC7	DFUR 50X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				
18	CPC	TAYVAN	CPC SCR-06310-GC7-4000	63X10 G7 - VİDALI MİL - TAŞLANMIŞ 4000MM	63x10	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	2000mm + 1 SOMUN=1 SET	STOK VAR
			CPC DFUR-06310-T4D-GC7	DFUR 63X10 ÇİFTLİ SOMUN - TAŞLANMIŞ				
19	CPC	TAYVAN	CPC SCR-06320-GC7-4500	63X20 G7 - VİDALI MİL - TAŞLANMIŞ 4500MM	63x20	1 ADET L=4500mm MİL + 2 ADET ÇİFTLİ SOMUN	2250mm + 1 SOMUN=1 SET	2019 - YAZIN GELECEK
			CPC DFUR-06320-T4D-GC7	DFUR 63X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

"STEINMEYER" TAŞLANMIŞ VİDALI MİL LİSTESİ

S. NO	MARKA	MENŞEİ	STOK KODLARIMIZ	STOK AÇIKLAMASI	ÖLÇÜSÜ	STOKLARIMIZA GELİŞ BİLGİSİ	MİL+ SOMUN SET İÇERİĞİ	STOK DURUMU
1	STEINMEYER	ALMANYA	STEIN 1516.632	1516.632/05.25.2200.2200 P5 25X05 2200MM TAŞLANMIŞ MİL	25x05	1 ADET L=2200mm MİL + 2 ADET ÇİFTLİ SOMUN	**1100mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.25X05	1516/05.25.3,5.3 25X05 ÇİFTLİ SOMUN-TAŞLANMIŞ				
2	STEINMEYER	ALMANYA	STEIN 1516.688	1516.688/5.32.2500.2500.P5 32X05 2500MM TAŞLANMIŞ MİL	32x05	1 ADET L=2500mm MİL + 2 ADET ÇİFTLİ SOMUN	**1250mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.32X05	1516/5.32.3,5.4 32X05 ÇİFTLİ SOMUN-TAŞLANMIŞ				
3	STEINMEYER	ALMANYA	STEIN 1516.682	1516.682/10.32.2500.2500.P5 32X10 2500MM TAŞLANMIŞ MİL	32x10	1 ADET L=2500mm MİL + 2 ADET ÇİFTLİ SOMUN	**1250mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.32X10	1516/10.32.6.4 32X10 ÇİFTLİ SOMUN-TAŞLANMIŞ				
4	STEINMEYER	ALMANYA	STEIN 1516.684	1516.684/16.32.3000.3000.P5 32X16 3000MM TAŞLANMIŞ MİL	32x16	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1 SET**	STOKLARA GİRDİ
			STEIN 1516.32X16	1516/16.32.5.3 32X16 ÇİFTLİ SOMUN - TAŞLANMIŞ				
5	STEINMEYER	ALMANYA	STEIN 1516.683	1516.683/20.32.3000.3000.P5 32X20 3000MM TAŞLANMIŞ MİL	32x20	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1 SET**	STOKLARA GİRDİ
			STEIN 1516.32X20	1516/20.32.5.3 32X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				
6	STEINMEYER	ALMANYA	STEIN 1516.658	1516.658/05.40.3000.3000.P5 40X05 3000MM TAŞLANMIŞ MİL	40x05	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.40X05	1516/05.40.3,5.4 40X05 ÇİFTLİ SOMUN-TAŞLANMIŞ				
7	STEINMEYER	ALMANYA	STEIN 1516.740	1516.740/10.40.3000.3000.P5 40X10 3000MM TAŞLANMIŞ MİL	40x10	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.40X10	1516/10.40.7,5.4 40X10 ÇİFTLİ SOMUN-TAŞLANMIŞ				
8	STEINMEYER	ALMANYA	STEIN 1516.502	1516.502/12.40.3000.3000.P5 40X12 3000MM TAŞLANMIŞ MİL	40x12	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.40X12	1516/12.40.7,5.4 40X12 ÇİFTLİ SOMUN-TAŞLANMIŞ				
9	STEINMEYER	ALMANYA	STEIN 1516.741	1516.741/16.40.4000.4000.P5 40X16 4000MM TAŞLANMIŞ MİL	40x16	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	**2000mm + 1 SOMUN=1 SET**	STOKLARA GİRDİ
			STEIN 1516.40X16	1516/16.40.7.3 40X16 ÇİFTLİ SOMUN - TAŞLANMIŞ				
10	STEINMEYER	ALMANYA	STEIN 1516.742	1516.742/20.40.4000.4000.P5 40X20 4000MM TAŞLANMIŞ MİL	40x20	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	**2000mm + 1 SOMUN=1 SET**	STOKLARA GİRDİ
			STEIN 1516.40X20	1516/20.40.8.3 40X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				
11	STEINMEYER	ALMANYA	STEIN 1516.508	1516.508/5.50.3000.3000 P5 50X05 3000MM TAŞLANMIŞ MİL	50x05	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.50X05	1516/5.50.3,5.4 50X05 ÇİFTLİ SOMUN-TAŞLANMIŞ				
12	STEINMEYER	ALMANYA	STEIN 1516.747	1516.747/10.50.3000.3000.P5 50X10 3000MM TAŞLANMIŞ MİL	50x10	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.50X10	1516/10.50.7,5.4 50X10 ÇİFTLİ SOMUN-TAŞLANMIŞ				
13	STEINMEYER	ALMANYA	STEIN 1516.602	1516.602/12.50.3000.3000 P5 50X12 3000MM TAŞLANMIŞ MİL	50x12	1 ADET L=3000mm MİL + 2 ADET ÇİFTLİ SOMUN	**1500mm + 1 SOMUN=1SET**	STOK VAR
			STEIN 1516.50X12	1516/12.50.7.4 50X12 ÇİFTLİ SOMUN-TAŞLANMIŞ				
14	STEINMEYER	ALMANYA	STEIN 1516.748	1516.748/20.50.4000.4000.P5 50X20 4000MM TAŞLANMIŞ MİL	50x20	1 ADET L=4000mm MİL + 2 ADET ÇİFTLİ SOMUN	**2000mm + 1 SOMUN=1 SET**	STOKLARA GİRDİ
			STEIN 1516.50X20	1516/20.50.8.4 50X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				
15	STEINMEYER	ALMANYA	STEIN 1516.750	1516.750/20.63.4500.4500.P5 63X20 4500MM TAŞLANMIŞ MİL	63x20	1 ADET L=4500mm MİL + 2 ADET ÇİFTLİ SOMUN	**2250mm + 1 SOMUN=1 SET**	STOKLARA GİRDİ
			STEIN 1516.63X20	1516/20.63.10.4 63X20 ÇİFTLİ SOMUN - TAŞLANMIŞ				

TELESCOPIC BALL SCREWS

Telescopic Ball Screw

- Very high stiffness, high dynamics
- Very good positioning (Accuracy in microns)
- Set of several mutually screwed ball screws
- Each nut has an additional function as bearing
- Innovative simultaneous movement and rotation of all ball screws at the same time
- Low installation dimensions

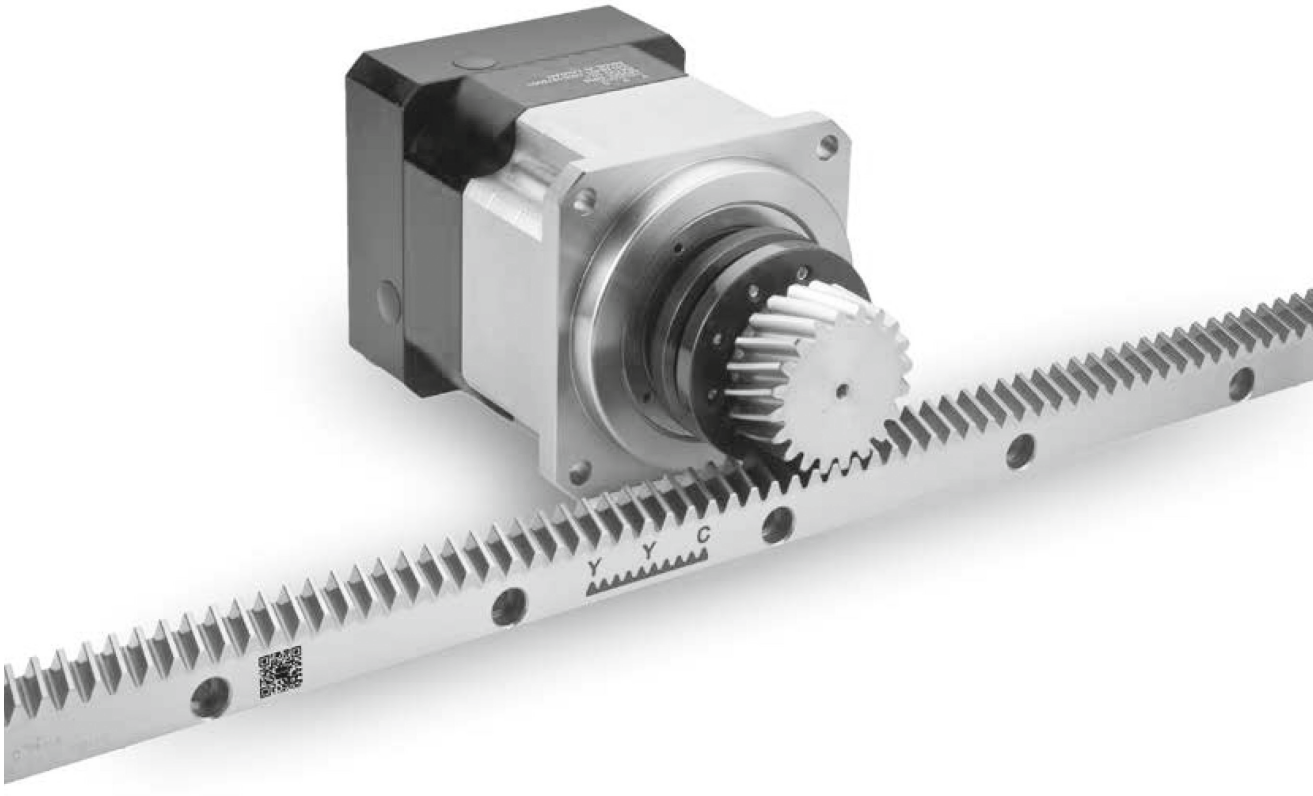
Application:

- Machine tools with unconventional kinematic structure
- Military application (see pictures below)
- Replacement of hydraulic cylinders (easy control and positioning, ecology)
- Maximum loads up to 125 tons
- Length up to 20 metres (in extended position)

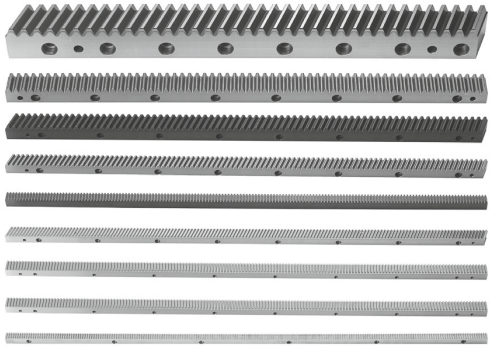
NOTES:

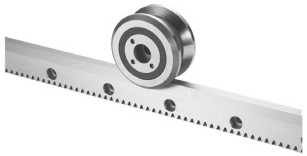
Y Y C

Racks and Pinions

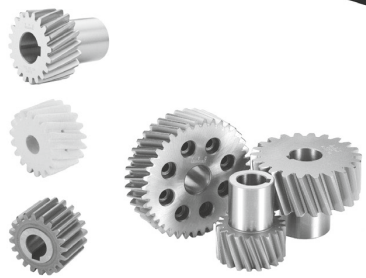


YYC No. 1 in Market Share of Precision Racks for Machine Centers in Asia





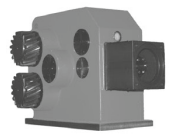
New Launch! Guideway Rack and Roller Bearing
The linear guideway rack can reduce parts space, deduct backlash, save assembling time and cost.



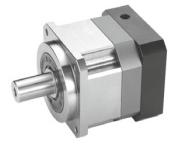
Content	Rack	Pinion
Quality Level	DIN 5~DIN 10	
Material	S45C, SCR415, SCM440, SCM415, SUS, Nylon, Copper, Aluminum etc.	
Tooth Type	Straight, Helical, Round, Hexgen	Straight, Helical
Treatment	Milled, Teeth Ground, 4 Surface Ground	Milled, Teeth Ground
Module	M1.5~12	M0.5-M20
Length/Teeth No.	500 / 1000 / 2000 mm	16-95T
Heat Treatment	Hardened, Quenched, High Frequency, Carburized, Layered.	Hardened, Quenched, High Frequency, Carburized.
Surface Treatment	4 Surface Ground, Black-Coated. Sand-blasted, Phosphated, Galvanized, Nickel plated.	Surface Ground, Black-Coated. Sand-blasted, Phosphated, Galvanized, Nickel plated.

Level	Applications	Market	YYC Rack Advantages
DIN 5	Ultra High Precision Machines. 5 Axis machines. CNC Machine Centers.	Ultra High Precision Rack	■ Leading Manufacturer to launch DIN 5 Rack in Taiwan. ■ Top Ten Product of Golden Torque Awards in 2016. ■ Best Product of National Brand Yu-Shan Award in 2016.
DIN 6	Wood / Plasma / Lazar Cutting Machines, Pipe Bending Machines. CNC Routers Robotic Arm System	High Precision Rack	■ No. 1 in market share of in Asia. ■ YYC has been exporting 12 years. ■ Smart Manufacturing. ■ Quality Stable, Long Product Life. ■ Advanced Heat Treatment Technology.
DIN 7	CNC Curving Machine Multiple Working Machine	Precision Rack	■ Optimized Production works efficiently. ■ High Cost/Price Value. ■ Price Concern Preferred.
DIN 8	Economy Machine Center Automatic Door, Warehouse System. Linear Transmission System.	Economy Rack	■ 39-Year-Experiences. ■ Equipment, Cutters very sufficient. ■ Optimized Production works efficiently.
DIN 9-10	Gantry Milling Machine. Heavy Load but low precision application.	Wear Resistance Rack	■ Mature Heat Treatment Technology. ■ Multiple Surface Treatment Options. ■ Fair Price and Long Product Life

2018 Patent Certificate



Backlash Free Reducer:
Modules: M3-M8
Ratio: 27, 47



Planetary Reducers:
Code: 42、60、90、115、142、180
Ratio: 3-100
Arc/min: 1-12 arc/min
Backlash Levels: Ps, P0, P1 and P2

齒條目錄 Contents of Racks

型號 Code	精度等級 DIN 3962	材 料 Material	齒型 Type	齒面處理 Teeth Treatment	硬度處理 Hardness	鑽 孔 Mounted Holes	模 數 Module	頁碼 Page
CHTGH	DIN 5	S45C	斜齒齒輪右斜 Helical19°31'42"	齒面研磨 Teeth Ground	熱處理 Hardened HRC 50°-55°	鑽孔 Holes	1.5, 2, 2.5, 3, 4, 5, 6, 8	P.6
CHTGH	DIN 6	S45C					1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	P.7
MHTG	DIN 7	SCM440			*		1.5, 2, 2.5, 3, 4, 5, 6, 8	P.8
CHTM	DIN 8	S45C		精銑 Milled	*		1.5, 2, 3, 4, 5, 6, 8, 10	P.9
CHTMQ	DIN 8	S45C			調質 HRC18°-22° Quenched & Tempered		1.5, 2, 3, 4, 5, 6, 8, 10	P.10
CHTMH	DIN 9	S45C			熱處理 Hardened HRC 50°-55°		1.5, 2, 3, 4, 5, 6, 8, 10	P.11
CSTGH	DIN 5	S45C	直齒 Straight	齒面研磨 Teeth Ground	熱處理 /Hardened HRC 50°-55		2, 3, 4, 5	P.12
CSTGH	DIN 6	S45C					1.5, 2, 2.5, 3, 4, 5, 6, 8	P.13
CSTM	DIN 8	S45C		精銑 Milled	*		1.5, 2, 3, 4, 5, 6, 8, 10	P.14
CSTMQ	DIN 8	S45C			調質 Quenched&Tempered HRC 18°-20°		1.5, 2, 3, 4, 5, 6, 8, 10	P.15
CSTMH	DIN 9	S45C			熱處理 Hardened HRC 50°-55°		1.5, 2, 3, 4, 5, 6, 8, 10	P.16

型號 Code	精度等級 JIS	材 料 Material	齒型 Type	齒面處理 Teeth Treatment	硬度處理 Hardness	鑽 孔 Mounted Holes	模 數 Module	頁碼 Page
MHTGQ	JIS 1	SCM440	斜齒齒輪右斜 Helical 20°30'	齒面研磨 Teeth Ground	調質 HRC18°-20° Quenched & Tempered	鑽孔 Holes	1, 1.5, 2, 2.5, 3	P.17
CHTM	JIS 4	S45C	斜齒齒輪右斜 Helical 15°	精銑 Milled	*	有 / 無鑽孔 with/out Holes	2, 3	P.18
CSTGH	JIS 2	S45C	直齒 Straight	齒面研磨 Teeth Ground	熱處理 Hardened HRC 50°-55°	有 / 無鑽孔 with/out Holes	1, 1.5, 2, 2.5, 3, 4, 5, 6	P.19
MSTMQ	JIS 4	SCM440		精銑 Milled	調質 HRC18°-22° Quenched & Tempered	有 / 無鑽孔 with/out Holes	1.5, 2, 2.5, 3, 4, 5, 6	P.20
CSTM	JIS 4	S45C			*	有 / 無鑽孔 with/out Holes	1, 1.5, 2, 2.5, 3, 4, 5, 6	P.21
CSTMH	JIS 5	S45C			熱處理 Hardened HRC 50°-55°	有 / 無鑽孔 with/out Holes	1.5, 2, 2.5, 3, 4, 5, 6	P.22

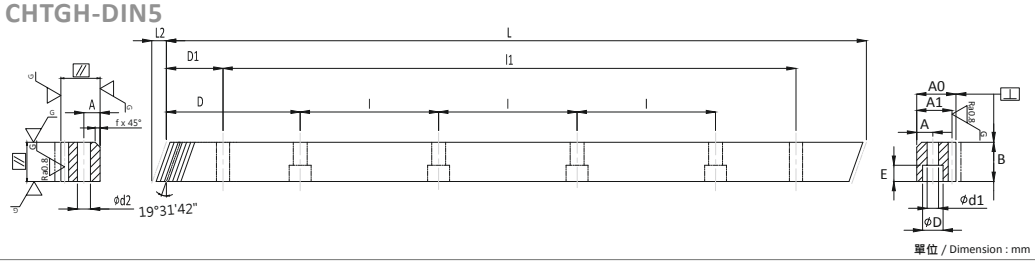
型號 Code	精度等級 JIS	材 料 Material	齒型 Type	齒面處理 Teeth Treatment	硬度處理 Hardness	鑽 孔 Mounted Holes	周節 CP	頁碼 Page
MSTGQ-CP	JIS 1	SCM440	直齒 Straight	齒面研磨 Teeth Ground	調質 HRC18°-22° Quenched & Tempered	有 / 無鑽孔 with/out Holes	5, 10	P.23
MSTGH-CP	JIS 1	SCM440			熱處理 Hardened HRC 55°-58°	有 / 無鑽孔 with/out Holes	5, 10	P.24
CSTM-CP	JIS 4	S45C		精銑 Milled	*	有 / 無鑽孔 with/out Holes	5, 10, 15, 20	P.25

齒條型號說明 Rack Code Instruction

1st	2nd	3th	4th	5th	6th	7th	8th
材料 Material	齒型 Type	棒型 Shape	齒面處理 Teeth Treatment	硬度處理 Hardness	模數 Module	長度 Length	等級 Grade
C	S	T	G	H	020	10	DIN JIS
C= 中碳鋼 M= 合金鋼	S= 直齒 H= 斜齒	T= 四角棒	M= 精铣 G= 齒研	Q= 調質 H= 硬化處理	M1.5~M10	05=500mm 10=1000mm 15=1500mm 20=2000mm	DIN 5-9 JIS 1-5
C= Carbon Steel =S45C M=Alloy Steel =SCM440	S=Straight H=Helical	T=Tetragon	M=Milled G=Ground	H=Hardened Q=Quenched & Tempered			

備註：長度、鑽孔、材質、表面處理 (噴砂、磷酸鹽、研磨) 等特殊需求，皆可客製。
Remarks: Lengths, holes,materials,surface treaments (sandblasted, phosphated, sides ground) and other requirements all could be customized.

CHTGH-DIN5



單位 / Dimension : mm

系列 CHTGH-DIN5 斜齒齒研齒條
品質等級 DIN 5

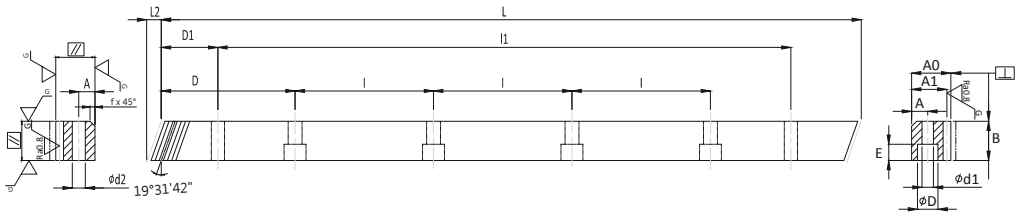
材料 S45C
右旋角 19°31'42"
硬度 HRC 50~55°
硬化處理後四面研磨與齒研
總齒距誤差 :Fp /1000 ≦ 0.026 mm
室溫在攝氏 25° 為準

Series CHTGH-DIN5 Helical Teeth Ground Racks
Quality Grade DIN 5

Material S45C
Right Hand Angle 19°31'42"
Hardness HRC 50~55°
Ground on all sides after hardening.
Total Pitch Error: Fp /1000 ≦ 0.026 mm
Room Temperature is 25°C

型號 Code	模數 Module	L	L2	齒數 No. of Teeth	B	A0	A1	D	l	孔數 No of Holes	A	ød1	øD	E	D1	l1	ød2	f	F_{ta} kN	KG
CHTGH01505-DIN5	1.5	500.00	6.70	100	19	19	17.5	62.5	125	4	8	7	11	7	31.7	436.60	5.7	1.5	6.87	1.3
CHTGH01510-DIN5	1.5	1000.00	6.70	200	19	19	17.5	62.5	125	8	8	7	11	7	31.7	936.60	5.7	1.5	6.97	2.6
CHTGH02005-DIN5	2	500.00	8.50	75	24	24	22.0	62.5	125	4	8	7	11	7	31.7	436.60	5.7	2	11.46	2.1
CHTGH02010-DIN5	2	1000.00	8.50	150	24	24	22.0	62.5	125	8	8	7	11	7	31.7	936.60	5.7	2	11.68	4.1
CHTGH02505-DIN5	2.5	500.00	8.50	60	24	24	21.5	62.5	125	4	9	7	11	7	31.7	436.60	5.7	2	14.20	2.1
CHTGH02510-DIN5	2.5	1000.00	8.50	120	24	24	21.5	62.5	125	8	9	7	11	7	31.7	936.60	5.7	2	14.52	4.1
CHTGH03005-DIN5	3	500.00	10.30	50	29	29	26.0	62.5	125	4	9	10	15	9	35	430.00	7.7	2	20.41	3.0
CHTGH03010-DIN5	3	1000.00	10.30	100	29	29	26.0	62.5	125	8	9	10	15	9	35	930.00	7.7	2	20.96	6.0
CHRGH04005-DIN5	4	506.67	13.80	38	39	39	35.0	62.5	125	4	12	10	15	9	33.3	433.00	7.7	2	36.11	5.5
CHTGH04010-DIN5	4	1000.00	13.80	75	39	39	35.0	62.5	125	8	12	10	15	9	33.3	933.40	7.7	2	37.24	10.8
CHTGH05005-DIN5	5	500.00	17.40	30	49	39	34.0	62.5	125	4	12	14	20	13	37.5	425.00	11.7	3	55.95	6.8
CHTGH05010-DIN5	5	1000.00	17.40	60	49	39	34.0	62.5	125	8	12	14	20	13	37.5	925.00	11.7	3	57.97	13.6
CHTGH06005-DIN5	6	500.00	20.90	25	59	49	43.0	62.5	125	4	16	18	26	17	37.5	425.00	15.7	3	79.91	10.3
CHTGH06010-DIN5	6	1000.00	20.90	50	59	49	43.0	62.5	125	8	16	18	26	17	37.5	925.00	15.7	3	83.07	20.5
CHTGH08005-DIN5	8	480.00	28.00	18	79	79	71.0	60.0	120	4	25	22	33	21	120	240.00	19.7	4	139.40	21.3
CHTGH08010-DIN5	8	960.00	28.00	36	79	79	71.0	60.0	120	8	25	22	33	21	120	720.00	19.7	4	145.83	42.6

CHTGH-DIN6



系列 CHTGH-DIN6 斜齒齒研齒條
品質等級 DIN 6

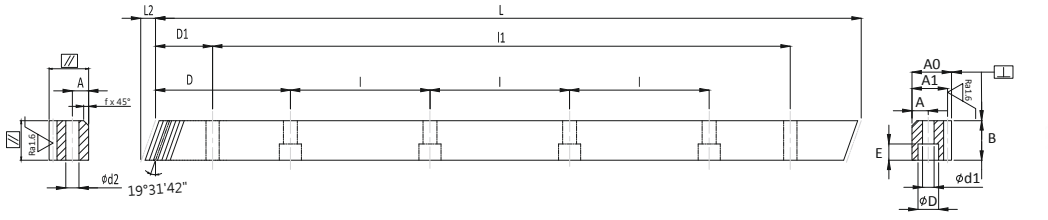
材料 S45C
右旋角 19°31'42"
硬度 HRC 50~55°
硬化處理後四面研磨與齒研
總齒距誤差 : Fp /1000 ≦ 0.036 mm
Fp /2000 ≦ 0.047 mm (≦ 0.024/1000 mm)

Series CHTGH-DIN6 Helical Teeth Ground Racks
Quality Grade DIN 6

Material S45C
Right Hand Angle 19°31'42"
Hardness HRC 50~55°
Ground on all sides after hardening.
Total Pitch Error: Fp /1000 ≦ 0.036 mm
Fp /2000 ≦ 0.047 mm (≦ 0.024/1000 mm)

型號 Code	模數 Module	L	L2	齒數 No. of Teeth	B	A0	A1	D	l	孔數 No of Holes	A	ød1	øD	E	D1	l1	ød2	f	F_{ta} kN	KG
CHTGH01505-DIN6	1.5	500.00	6.70	100	19	19	17.5	62.5	125	4	8	7	11	7	31.7	436.60	5.7	1.5	6.87	1.3
CHTGH01510-DIN6	1.5	1000.00	6.70	200	19	19	17.5	62.5	125	8	8	7	11	7	31.7	936.60	5.7	1.5	6.97	2.6
CHTGH02005-DIN6	2	500.00	8.50	75	24	24	22.0	62.5	125	4	8	7	11	7	31.7	436.60	5.7	2	11.46	2.1
CHTGH02010-DIN6	2	1000.00	8.50	150	24	24	22.0	62.5	125	8	8	7	11	7	31.7	936.60	5.7	2	11.68	4.1
CHTGH02020-DIN6	2	2000.00	8.50	300	24	24	22.0	62.5	125	16	8	7	11	7	31.7	1936.60	5.7	2	11.80	8.2
CHTGH02505-DIN6	2.5	500.00	8.50	60	24	24	21.5	62.5	125	4	9	7	11	7	31.7	436.60	5.7	2	14.20	2.1
CHTGH02510-DIN6	2.5	1000.00	8.50	120	24	24	21.5	62.5	125	8	9	7	11	7	31.7	936.60	5.7	2	14.52	4.1
CHTGH02520-DIN6	2.5	2000.00	8.50	240	24	24	21.5	62.5	125	16	9	7	11	7	31.7	1936.60	5.7	2	14.71	8.2
CHTGH03005-DIN6	3	500.00	10.30	50	29	29	26.0	62.5	125	4	9	10	15	9	35.0	430.00	7.7	2	20.41	3.0
CHTGH03010-DIN6	3	1000.00	10.30	100	29	29	26.0	62.5	125	8	9	10	15	9	35.0	930.00	7.7	2	20.96	6.0
CHTGH03020-DIN6	3	2000.00	10.30	200	29	29	26.0	62.5	125	16	9	10	15	9	35.0	1930.00	7.7	2	21.28	12.0
CHTGH04005-DIN6	4	506.67	13.80	38	39	39	35.0	62.5	125	4	12	10	15	9	33.3	433.00	7.7	2	36.11	5.5
CHTGH04010-DIN6	4	1000.00	13.80	75	39	39	35.0	62.5	125	8	12	10	15	9	33.3	933.40	7.7	2	37.24	10.8
CHTGH04020-DIN6	4	2000.00	13.80	150	39	39	35.0	62.5	125	16	12	10	15	9	33.3	1933.40	7.7	2	37.95	21.6
CHTGH05005-DIN6	5	500.00	17.40	30	49	39	34.0	62.5	125	4	12	14	20	13	37.5	425.00	11.7	3	55.95	6.8
CHTGH05010-DIN6	5	1000.00	17.40	60	49	39	34.0	62.5	125	8	12	14	20	13	37.5	925.00	11.7	3	57.97	13.6
CHTGH05020-DIN6	5	2000.00	17.40	120	49	39	34.0	62.5	125	16	12	14	20	13	37.5	1925.00	11.7	3	59.30	27.2
CHTGH06005-DIN6	6	500.00	20.90	25	59	49	43.0	62.5	125	4	16	18	26	17	37.5	425.00	15.7	3	79.91	10.3
CHTGH06010-DIN6	6	1000.00	20.90	50	59	49	43.0	62.5	125	8	16	18	26	17	37.5	925.00	15.7	3	83.07	20.5
CHTGH06020-DIN6	6	2000.00	20.90	100	59	49	43.0	62.5	125	16	16	18	26	17	37.5	1925.00	15.7	3	85.29	41.1
CHTGH08005-DIN6	8	480.00	28.00	18	79	79	71.0	60.0	120	4	25	22	33	21	120.0	240.00	19.7	4	139.40	21.3
CHTGH08010-DIN6	8	960.00	28.00	36	79	79	71.0	60.0	120	8	25	22	33	21	120.0	720.00	19.7	4	145.83	42.6
CHTGH08020-DIN6	8	1920.00	28.00	72	79	79	71.0	60.0	120	16	25	22	33	21	120.0	1680.00	19.7	4	150.59	85.1
CHTGH10005-DIN6	10	500.00	35.11	15	99	99	89.0	62.5	125	4	32	33	48	32	125.0	250.00	19.7	5	215.33	34.8
CHTGH10010-DIN6	10	1000.00	35.11	30	99	99	89.0	62.5	125	8	32	33	48	32	125.0	750.00	19.7	5	226.09	69.6

CHTM-DIN8



單位 / Dimension : mm

系列 CHTM-DIN8 斜齒精銑齒條
品質等級 DIN 8

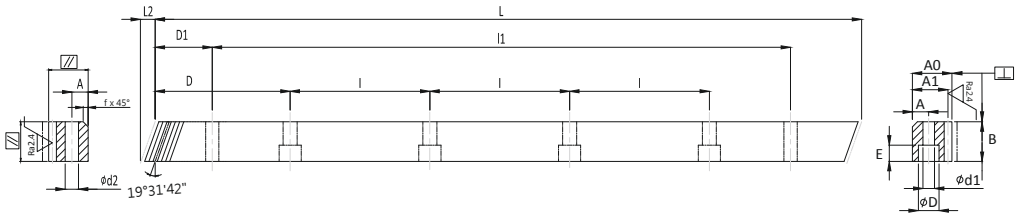
材料 S45C
右旋角 19°31'42"
硬度 HRC 10~12°
總齒距誤差：Fp /1000 ≦ 0.060 mm
Fp /2000 ≦ 0.080 mm

Series CHTM-DIN8 Helical Milled Racks
Quality Grade DIN 8

Material S45C
Right Hand Angle 19°31'42"
Hardness: Soft HRC 10~12°
Total Pitch Error: Fp /1000 ≦ 0.060 mm
Fp /2000 ≦ 0.080 mm

型號 Code	模數 Module	L	L2	齒數 No. of Teeth	B	A0	A1	D	l	孔數 No of Holes	A	ød1	øD	E	D1	l1	ød2	f	F_{ta} kN	KG
CHTM01510-DIN8	1.5	1000	6.00	200	17	17	15.5	62.5	125	8	7	6	9.5	6	31.7	936.6	5.70	1.5	4.35	2.1
CHTM02010-DIN8	2	1000	8.90	150	25	24	22	62.5	125	8	8	7	11	7	31.7	936.6	5.70	2	8.49	4.3
CHTM02020-DIN8	2	2000	8.90	300	25	24	22	62.5	125	16	8	7	11	7	31.7	1936.6	5.70	2	8.58	8.5
CHTM03010-DIN8	3	1000	10.60	100	30	29	26	62.5	125	8	9	10	15	9	35.0	930.0	7.70	2	15.13	6.2
CHTM03020-DIN8	3	2000	10.60	200	30	29	26	62.5	125	16	9	10	15	9	35.0	1930.0	7.70	2	15.36	12.4
CHTM04010-DIN8	4	1000	14.20	75	40	39	35	62.5	125	8	12	10	15	9	33.3	933.4	7.70	2	26.65	11.1
CHTM04020-DIN8	4	2000	14.20	150	40	39	35	62.5	125	16	12	10	15	9	33.3	1933.4	7.70	2	27.16	22.2
CHTM05010-DIN8	5	1000	17.40	60	49	39	34	62.5	125	8	12	14	20	13	37.5	925.0	11.70	3	40.44	13.6
CHTM05020-DIN8	5	2000	17.40	120	49	39	34	62.5	125	16	12	14	20	13	37.5	1925.0	11.70	3	41.37	27.2
CHTM06010-DIN8	6	1000	20.90	50	59	49	43	62.5	125	8	16	18	26	17	37.5	925.0	15.70	3	57.96	20.5
CHTM06020-DIN8	6	2000	20.90	100	59	49	43	62.5	125	16	16	18	26	17	37.5	1925.0	15.70	3	59.51	41.1
CHTM08010-DIN8	8	960	28.00	36	79	79	71	60	120	8	25	22	33	21	120.0	720.0	19.70	4	101.75	42.6
CHTM08020-DIN8	8	1920	28.00	72	79	79	71	60	120	16	25	22	33	21	120.0	1680.0	19.70	4	105.07	85.1
CHTM10010-DIN8	10	1000	35.11	30	99	99	89	62.5	125	8	32	33	48	32	125.0	750.0	19.70	5	157.75	69.6

CHTMH-DIN9



單位 / Dimension : mm

系列 CHTMH-DIN9 斜齒熱處理齒條
品質等級 DIN 9

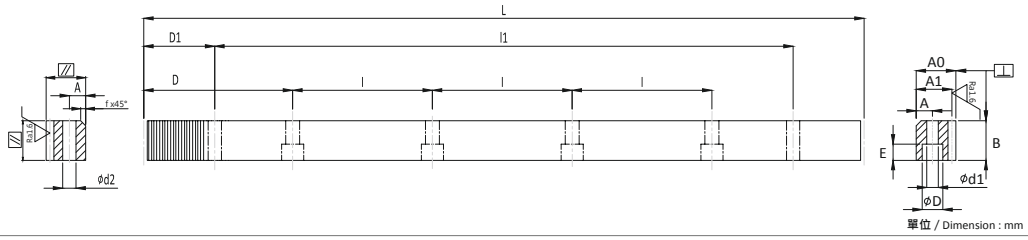
材料 S45C
右旋角 19°31'42"
硬度 HRC 50~55°
表面經噴砂處理
總齒距誤差 : Fp /1000 ≦ 0.10 mm

Series CHTMH-DIN 9 Helical Hardened Racks
Quality Grade DIN 9

Material S45C
Right Hand Angle 19°31'42"
Hardness: Soft HRC 50~55°
Surfaces are sandblasted.
Total Pitch Error: Fp /1000 ≦ 0.10 mm

型號 Code	模數 Module	L	L2	齒數 No. of Teeth	B	A0	A1	D	l	孔數 No of Holes	A	ød1	øD	E	D1	l1	ød2	f	F_{ta} kN	KG
CHTMH01510-DIN9	1.5	1000	6.00	200	17	17	15.5	62.5	125	8	7	6	9.5	7	31.7	936.6	5.7	1.5	4.90	2.1
CHTMH02010-DIN9	2	1000	8.50	150	24	24	22	62.5	125	8	8	7	11	7	31.7	936.6	5.7	2	9.18	4.1
CHTMH02020-DIN9	2	2000	8.50	300	24	24	22	62.5	125	16	8	7	11	7	31.7	1936.6	5.7	2	9.28	8.2
CHTMH03010-DIN9	3	1000	10.30	100	29	29	26	62.5	125	8	9	10	15	9	35.0	930.0	7.7	2	16.47	6.0
CHTMH03020-DIN9	3	2000	10.30	200	29	29	26	62.5	125	16	9	10	15	9	35.0	1930.0	7.7	2	16.72	12.0
CHTMH04010-DIN9	4	1000	13.80	75	39	39	35	62.5	125	8	12	10	15	9	33.3	933.4	7.7	2	29.26	10.8
CHTMH04020-DIN9	4	2000	13.80	150	39	39	35	62.5	125	16	12	10	15	9	33.3	1933.4	7.7	2	29.82	21.6
CHTMH05010-DIN9	5	1000	17.40	60	49	39	34	62.5	125	8	12	14	20	13	37.5	925.0	11.7	3	45.55	13.6
CHTMH05020-DIN9	5	2000	17.40	120	49	39	34	62.5	125	16	12	14	20	13	37.5	1925.0	11.7	3	46.59	27.2
CHTMH06010-DIN9	6	1000	20.90	50	59	49	43	62.5	125	8	16	18	26	17	37.5	925.0	15.7	3	54.20	20.5
CHTMH06020-DIN9	6	2000	20.90	100	59	49	43	62.5	125	16	16	18	26	17	37.5	1925.0	15.7	3	55.65	41.1
CHTMH08010-DIN9	8	960	28.00	36	79	79	71	60	120	8	25	22	33	21	120.0	720.0	19.7	4	114.58	42.6
CHTMH08020-DIN9	8	1920	28.00	72	79	79	71	60	120	16	25	22	33	21	120.0	1680.0	19.7	4	118.32	85.1
CHTMH10010-DIN9	10	1000	35.11	30	99	99	89	62.5	125	8	32	33	48	32	125.0	750.0	19.7	5	177.65	69.6

CSTM-DIN8



系列 CSTM-DIN8　直齒精銑齒條
品質等級 DIN 8

材料 S45C
硬度 HRC 10~12°
總齒距誤差 : Fp /1000 ≦ 0.060 mm
Fp /2000 ≦ 0.080 mm

Series CSTM-DIN8　Straight Milled Racks
Quality Grade DIN 8

Material S45C
Hardness HRC 10~12°
Total Pitch Error: Fp /1000 ≦ 0.060 mm
Fp /2000 ≦ 0.080 mm

型號 Code	模數 Module	L	齒數 No. of Teeth	B	A0	A1	D	l	孔數 No of Holes	A	ød1	øD	E	D1	l1	ød2	f	F_{ta} kN	KG
CSTM01510-DIN8	1.5	999.03	212	17	17	15.5	62.44	124.88	8	7	6	9.5	7	29	941.00	5.7	1.5	3.62	1.9
CSTM02010-DIN8	2	1005.31	160	25	24	22	62.83	125.66	8	8	7	11	7	31.3	942.70	5.7	2	7.07	4.1
CSTM02020-DIN8	2	2010.62	320	25	24	22	62.83	125.66	16	8	7	11	7	31.3	1948.00	5.7	2	7.15	8.1
CSTM03010-DIN8	3	1017.88	108	30	29	26	63.62	127.23	8	9	10	15	9	34.4	949.10	7.7	2	12.61	5.9
CSTM03020-DIN8	3	2035.75	216	30	29	26	63.62	127.23	16	9	10	15	9	34.4	1967.00	7.7	2	12.80	11.9
CSTM04010-DIN8	4	1005.31	80	40	39	35	62.83	125.66	8	12	10	15	9	37.5	930.30	7.7	2	22.21	10.5
CSTM04020-DIN8	4	2010.62	160	40	39	35	62.83	125.66	16	12	10	15	9	37.5	1935.60	7.7	2	22.63	21.0
CSTM05010-DIN8	5	1005.31	64	49	39	34	62.83	125.66	8	12	14	20	13	30.1	945.00	11.7	3	33.75	12.9
CSTM05020-DIN8	5	2010.62	128	49	39	34	62.83	125.66	16	12	14	20	13	30.1	1950.40	11.7	3	34.48	25.8
CSTM06010-DIN8	6	1017.88	54	59	49	43	63.62	127.23	8	16	18	26	17	31.4	955.00	15.7	3	48.40	19.7
CSTM06020-DIN8	6	2035.75	108	59	49	43	63.62	127.23	16	16	18	26	17	31.4	1973.00	15.7	3	49.61	39.5
CSTM08010-DIN8	8	1005.31	40	79	79	71	62.83	125.66	8	25	22	33	21	26.6	952.00	19.7	4	85.17	42.1
CSTM08020-DIN8	8	2010.61	80	79	79	71	62.83	125.66	16	25	22	33	21	26.6	1957.40	19.7	4	87.75	84.2
CSTM10010-DIN8	10	1005.31	32	99	99	89	62.83	125.66	8	32	33	48	32	125.67	754.00	19.7	5	131.75	66.1

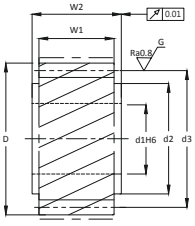


圖1 /Fig . 1

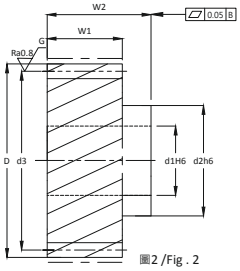
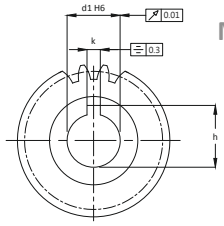


圖2 /Fig . 2



單位 / Dimension : mm

系列 MHGH-DIN6 斜齒齒研齒輪
品質等級 DIN 6

材料 SCM415/SCM440
左旋角 19°31'42"
硬度 HRC 55~60°
硬化處理後齒面研磨

Series MHGH-DIN6 Helical Teeth Ground Pinions
Quality Grade DIN 6

Material SCM415/SCM440
Left Hand Angle 19°31'42"
Hardness: HRC 55~60°
Teeth Ground after Hardening

型號 Code	圖 Fig.	DIN	齒數 No. of Teeth	d1	d2	d3	D	w1	w2	k	h	F_{ta} kN	KG
模數 1.5 / Module 1.5													
MHGH0150201	1	-DIN6	20	11	25	31.83	34.83	20	22	4	12.8	7.16	0.1
MHGH0150202	1	-DIN6	20	13	25	31.83	34.83	20	22	5	15.3	7.16	0.1
MHGH0150203	1	-DIN6	20	14	25	31.83	34.83	20	22	5	16.3	7.16	0.1
MHGH0150204	1	-DIN6	20	16	25	31.83	34.83	20	22	5	18.3	7.16	0.1
MHGH0150211	2	-DIN6	21	16	30	33.42	36.42	20	46	5	18.3	7.23	0.3

MHGH-DIN6

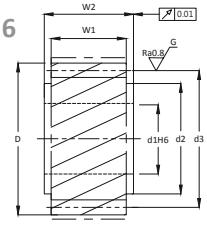


圖1 /Fig . 1

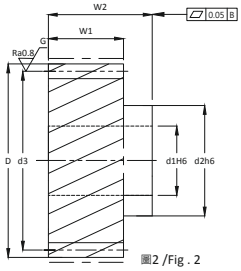
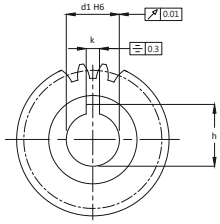


圖2 /Fig . 2



單位 / Dimension : mm

系列 MHGH-DIN6 斜齒齒研齒輪
品質等級 DIN 6

材料 SCM415/SCM440
左旋角 19°31'42"
硬度 HRC 55~60°
硬化處理後齒面研磨

Series MHGH-DIN6 Helical Teeth Ground Pinions
Quality Grade DIN 6

Material SCM415/SCM440
Left Hand Angle 19°31'42"
Hardness: HRC 55~60°
Teeth Ground after Hardening

型號 Code	圖 Fig.	DIN	齒數 No. of Teeth	d1	d2	d3	D	w1	w2	k	h	F_{ta} kN	KG
模數 2 / Module 2													
MHGH0200181	1	-DIN6	18	16	25	38.197	42.2	28	30	5	18.3	12.88	0.2
MHGH0200201	1	-DIN6	20	19	30	42.44	46.4	28	30	6	21.8	13.37	0.2
MHGH0200202	2	-DIN6	20	19	30	42.44	46.4	28	56	6	21.8	13.37	0.2
MHGH0200203	1	-DIN6	20	20	30	42.44	46.4	28	30	6	22.8	13.37	0.2
MHGH0200204	2	-DIN6	20	22	36	42.44	46.4	28	56	6	24.8	13.37	0.2
MHGH0200205	1	-DIN6	20	22	30	42.44	46.4	28	30	6	24.8	13.37	0.2
MHGH0200211	1	-DIN6	21	16	25	44.56	48.6	28	30	5	18.3	13.51	0.3
MHGH0200212	2	-DIN6	21	22	36	44.56	48.6	28	30	6	24.8	13.51	0.3
MHGH0200221	1	-DIN6	22	19	30	46.69	50.7	28	30	6	21.8	13.78	0.3
MHGH0200222	2	-DIN6	22	19	30	46.69	50.7	28	56	6	21.8	13.78	0.3
MHGH0200223	1	-DIN6	22	22	30	46.69	50.7	28	30	6	24.8	13.78	0.3
MHGH0200224	2	-DIN6	22	22	36	46.69	50.7	28	56	6	24.8	13.78	0.3
MHGH0200251	1	-DIN6	25	19	30	53.05	57.1	28	30	6	21.8	14.31	0.4
MHGH0200252	2	-DIN6	25	19	30	53.05	57.1	28	56	6	21.8	14.31	0.4
MHGH0200253	1	-DIN6	25	20	30	53.05	57.1	28	30	6	22.8	14.31	0.4
MHGH0200254	1	-DIN6	25	22	30	53.05	57.1	28	30	6	24.8	14.31	0.4
MHGH0200255	2	-DIN6	25	22	36	53.05	57.1	28	56	6	24.8	14.31	0.4
MHGH0200256	1	-DIN6	25	25	36	53.05	57.1	28	30	6	27.8	14.31	0.4
MHGH0200281	1	-DIN6	28	19	30	59.42	63.4	28	30	6	21.8	14.75	0.4
MHGH0200282	2	-DIN6	28	19	30	59.42	63.4	28	56	6	21.8	14.75	0.4
MHGH0200283	1	-DIN6	28	22	30	59.42	63.4	28	30	6	24.8	14.78	0.4
MHGH0200284	2	-DIN6	28	22	36	59.42	63.4	28	56	6	24.8	14.75	0.4
MHGH0200285	1	-DIN6	28	35	48	59.42	63.4	28	30	10	38.3	14.78	0.4
MHGH0200301	1	-DIN6	30	16	25	63.66	67.7	28	30	5	18.3	15.02	0.7
MHGH0200302	1	-DIN6	30	20	30	63.66	67.7	28	30	6	22.8	15.02	0.7
MHGH0200303	2	-DIN6	30	22	36	63.66	67.7	28	56	6	24.8	15.02	0.7
MHGH0200304	1	-DIN6	30	25	36	63.66	67.7	28	30	8	28.3	15.02	0.7
MHGH0200305	1	-DIN6	30	30	45	63.66	67.7	28	30	8	33.3	15.02	0.7
MHGH0200306	2	-DIN6	30	30	50	63.66	67.7	28	60	8	33.3	15.02	0.7
MHGH0200307	2	-DIN6	30	32	55	63.66	67.7	28	65	10	35.3	15.02	0.7
MHGH0200321	1	-DIN6	32	20	30	67.91	71.9	28	30	6	22.8	15.24	0.7
MHGH0200322	1	-DIN6	32	22	30	67.91	71.9	28	30	6	24.8	15.24	0.7
MHGH0200323	2	-DIN6	32	22	36	67.91	71.9	28	56	6	27.8	15.24	0.7
MHGH0200324	1	-DIN6	32	25	36	67.91	71.9	28	30	8	28.3	15.24	0.7
MHGH0200325	1	-DIN6	32	35	48	67.91	71.9	28	30	10	38.3	15.24	0.7
MHGH0200361	1	-DIN6	36	35	48	76.39	80.4	28	30	10	38.3	15.63	0.8
MHGH0200391	2	-DIN6	39	32	55	82.76	86.8	28	65	10	35.3	15.88	1.4
MHGH0200401	1	-DIN6	40	35	48	84.88	88.9	28	30	10	38.3	15.95	1.2

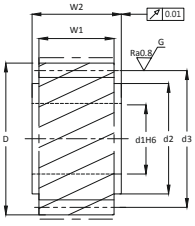


圖1 /Fig . 1

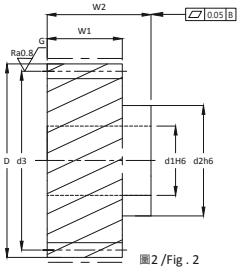
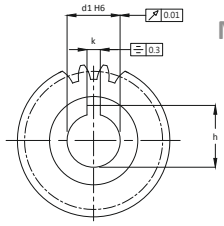


圖2 /Fig . 2



單位 / Dimension : mm

系列 MHGH-DIN6 斜齒齒研齒輪
品質等級 DIN 6

材料 SCM415/SCM440
左旋角 19°31'42"
硬度 HRC 55~60°
硬化處理後齒面研磨

Series MHGH-DIN6 Helical Teeth Ground Pinions
Quality Grade DIN 6

Material SCM415/SCM440
Left Hand Angle 19°31'42"
Hardness: HRC 55~60°
Teeth Ground after Hardening

型號 Code	圖 Fig.	DIN	齒數 No. of Teeth	d1	d2	d3	D	w1	w2	k	h	F_{ta} kN	KG
模數 3 / Module 3													
MHGH0300181	1	-DIN6	18	25	36	54	60	28	30	8	28.3	15.21	0.4
MHGH0300201	1	-DIN6	20	25	36	60	66	28	30	8	28.3	15.21	0.5
MHGH0300202	2	-DIN6	20	25	44	63.66	69.7	28	60	8	28.3	20.05	1.1
MHGH0300203	1	-DIN6	20	30	45	63.66	69.7	28	30	8	33.3	20.05	0.5
MHGH0300204	2	-DIN6	20	30	50	63.66	69.7	28	60	8	33.3	20.05	1.1
MHGH0300205	2	-DIN6	20	32	55	63.66	69.7	28	65	10	35.3	20.05	1.2
MHGH0300206	1	-DIN6	20	35	48	63.66	69.7	28	30	10	38.3	20.05	0.5
MHGH0300221	1	-DIN6	22	25	36	70.03	76	28	30	8	28.3	20.67	0.6
MHGH0300222	1	-DIN6	22	30	45	70.03	76	28	30	8	33.3	20.67	0.6
MHGH0300223	2	-DIN6	22	32	55	70.03	76	28	65	10	35.3	20.67	1.4
MHGH0300224	1	-DIN6	22	35	48	70.03	76	28	30	10	38.3	20.67	0.6
MHGH0300225	2	-DIN6	22	40	62	70.03	76	28	65	12	43.3	20.67	1.4
MHGH0300251	2	-DIN6	25	22	36	79.58	85.6	28	56	6	24.8	21.47	1.5
MHGH0300252	1	-DIN6	25	25	36	79.58	85.6	28	30	8	28.3	21.47	0.8
MHGH0300253	2	-DIN6	25	25	44	79.58	85.6	28	60	8	28.3	21.47	1.6
MHGH0300254	1	-DIN6	25	30	45	79.58	85.6	28	30	8	33.3	21.47	0.8
MHGH0300255	2	-DIN6	25	30	50	79.58	85.6	28	60	8	33.3	21.47	1.6
MHGH0300256	2	-DIN6	25	32	55	79.58	85.6	28	65	10	35.3	21.47	1.8
MHGH0300257	1	-DIN6	25	35	48	79.58	85.6	28	30	10	38.3	21.47	0.8
MHGH0300258	2	-DIN6	25	35	55	79.58	85.6	28	65	10	38.3	21.47	1.8
MHGH0300259	1	-DIN6	25	40	70	79.58	85.6	28	50	12	43.3	21.47	1.4
MHGH03002510	2	-DIN6	25	40	62	79.58	85.6	28	65	12	43.3	21.47	1.8
MHGH0300281	2	-DIN6	28	32	55	89.13	95.1	28	65	10	35.3	22.13	2.2
MHGH0300282	2	-DIN6	28	40	62	89.13	95.1	28	65	12	43.3	22.13	2.2
MHGH0300321	2	-DIN6	32	32	55	101.86	107.85	28	65	10	35.3	22.86	2.8
MHGH0300322	2	-DIN6	32	40	62	101.86	107.85	28	65	12	43.3	22.86	2.8
MHGH0300322	2	-DIN6	32	40	62	101.86	107.85	28	65	12	43.3	22.86	2.0

MHGH-DIN6

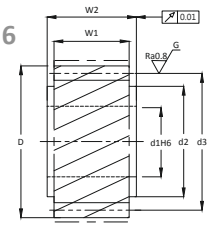


圖1 /Fig . 1

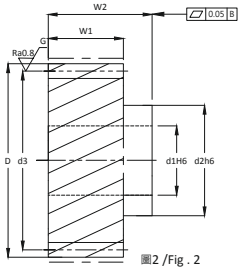
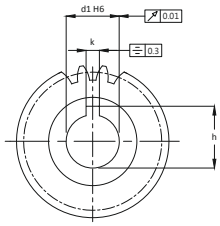


圖2 /Fig . 2



單位 / Dimension : mm

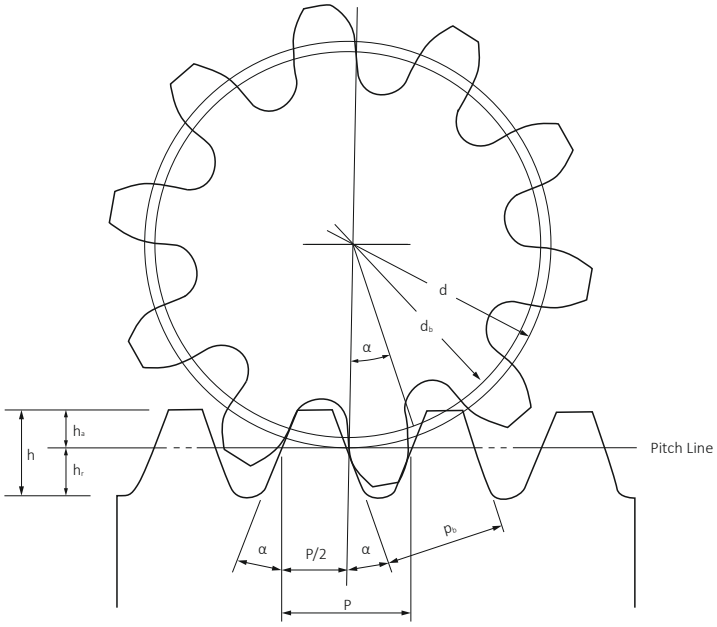
系列 MHGH-DIN6 斜齒齒研齒輪
品質等級 DIN 6

材料 SCM415/SCM440
左旋角 19°31'42"
硬度 HRC 55~60°
硬化處理後齒面研磨

Series MHGH-DIN6 Helical Teeth Ground Pinions
Quality Grade DIN 6

Material SCM415/SCM440
Left Hand Angle 19°31'42"
Hardness: HRC 55~60°
Teeth Ground after Hardening

型號 Code	圖 Fig.	DIN	齒數 No. of Teeth	d1	d2	d3	D	w1	w2	k	h	F_{ta} kN	KG
模數 4 / Module 4													
MHGH0400151	1	-DIN6	15	35	52	63.66	71.7	40	50	10	38.3	34.29	0.8
MHGH0400181	2	-DIN6	18	32	55	76.39	84.4	40	75	10	35.3	36.8	1.6
MHGH0400201	1	-DIN6	20	35	52	84.88	92.9	40	50	10	38.3	38.20	1.3
MHGH0400202	1	-DIN6	20	45	65	84.88	92.9	40	50	14	48.8	38.20	1.3
MHGH0400211	2	-DIN6	21	32	55	89.13	97.1	40	75	10	35.3	38.60	2.2
MHGH0400212	2	-DIN6	21	35	55	89.13	97.1	40	75	10	38.3	38.60	2.2
MHGH0400213	2	-DIN6	21	40	62	89.13	97.1	40	75	12	43.3	38.60	2.2
MHGH0400214	2	-DIN6	21	45	68	89.13	97.1	40	75	14	48.8	38.60	2.2
MHGH0400221	1	-DIN6	22	35	52	93.37	101.4	40	50	10	38.3	39.37	1.6
MHGH0400222	1	-DIN6	22	45	65	93.37	101.4	40	50	14	48.8	39.37	1.6
MHGH0400241	2	-DIN6	24	32	55	101.86	109.9	40	75	10	35.3	40.43	2.8
MHGH0400242	2	-DIN6	24	35	55	101.86	109.9	40	75	10	38.3	40.43	2.8
MHGH0400243	2	-DIN6	24	40	62	101.86	109.9	40	75	12	43.3	40.43	2.8
MHGH0400244	2	-DIN6	24	45	68	101.86	109.9	40	75	14	48.8	40.43	2.8
MHGH0400245	2	-DIN6	24	55	80	101.86	109.9	40	80	16	59.3	40.43	3.0
MHGH0400251	1	-DIN6	25	35	52	106.1	114.1	40	50	10	38.3	40.91	2.0
MHGH0400252	1	-DIN6	25	45	65	106.1	114.1	40	50	14	48.8	40.91	2.0
MHGH0400253	2	-DIN6	25	55	80	106.1	114.1	40	80	16	59.3	40.91	3.2
模數 5 / Module 5													
MHGH0500181	2	-DIN6	18	45	68	95.49	105.5	50	85	14	48.8	57.50	2.9
MHGH0500241	2	-DIN6	24	45	68	127.32	137.3	50	85	14	48.8	63.17	4.9
MHGH0500242	2	-DIN6	24	55	80	127.32	137.3	50	90	16	59.3	63.17	5.2
MHGH0500243	2	-DIN6	24	75	110	127.32	137.3	50	110	20	79.9	63.17	6.4
模數 6 / Module 6													
MHGH0600201	2	-DIN6	20	55	80	127	139.3	60	100	16	59.3	85.95	6.0
MHGH0600202	2	-DIN6	20	75	110	127	139.3	60	120	20	79.9	85.95	7.2
MHGH0600251	2	-DIN6	25	55	80	159	171.2	60	100	16	59.3	92.04	9.0
MHGH0600252	2	-DIN6	25	75	110	159	171.2	60	120	20	79.9	92.04	10.8
模數 8 / Module 8													
MHGH0800181	2	-DIN6	18	75	110	152.79	168.8	80	140	20	79.9	147.20	12.3
MHGH0800201	2	-DIN6	20	85	125	169.8	185.8	80	145	22	90.4	152.80	15.4
模數 10 / Module 10													
MHGH1000201	2	-DIN6	20	85	125	212.21	232.2	100	165	22	90.4	238.75	27.4



標準直齒輪

模數	m	Module	m
壓力角	$\alpha = 20°$	Pressure Angle	$\alpha = 20°$
齒冠高	$h_a = m$	Addendum	$h_a = m$
齒根高	$h_f \geqq 1.25m$	Dedendum	$h_f \geqq 1.25m$
齒全深	$h \geqq 2.25m$	Whole Depth	$h \geqq 2.25m$
有效齒深	$h_w = 2.00m$	Working Tooth Depth	$h_w = 2.00m$
齒頂隙	$c = 0.25m$	Clearance	$c = 0.25m$
標準節距	$p = \pi m$	Circular Pitch	$p = \pi m$
基圓節距	$p_b = p \cos \alpha$	Base Circle Pitch	$p_b = p \cos \alpha$
標準圓直徑	$d = mz$	Standard Circle Dia	$d = mz$
基圓直徑	$d_b = d \cos \alpha$	Base Circle Diameter	$d_b = d \cos \alpha$
R 角		r_f = Root Radius	
齒厚		S= Circular Tooth Thickness	

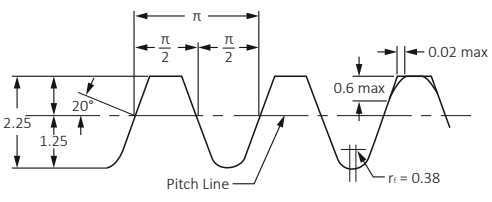


圖 1-1 ISO 53 針對基本公制齒條的模數 1 進行標準化
Fig. 1-1 The Basic Metric Rack From ISO 53 Normalized for Module 1

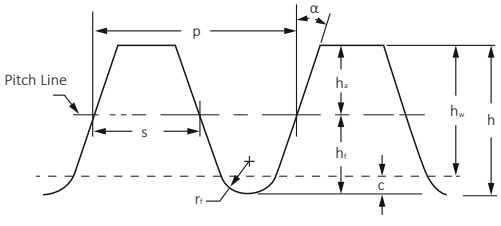
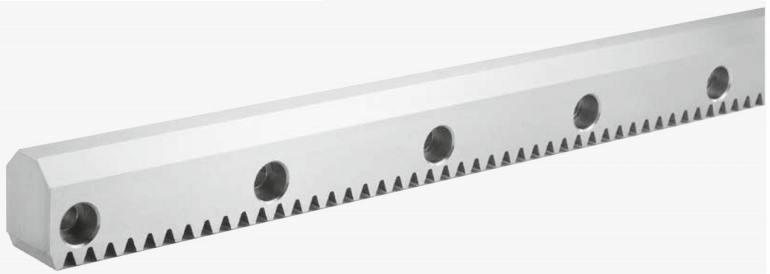


圖 1-2 基本英制徑節齒條的 DP1 進行標準化
Fig. 1-2 The Basic Inch Diametral Pitch Rack Normalized for 1 Diametral Pitch

Guideway Racks

You Drive, You Control!

你驅動，你掌控！



Guideway Rack Content

1st	2nd	3rd	4th	5th	6th	7th	8th
材料 Material	齒型 Type	棒型 Shape	齒面處理 Teeth Treatment	硬度處理 Hardness	周節 Circular Pitch	長度 Length	等級 Grade
M	S/H	V/T	G	H	CP	10	Q6
M=SCM440	S=直齒 H=斜齒	V=V型棒 T=四角棒(平面)	G=齒研/研磨	H=硬化處理	CP=周節	CP5=1030 CP7.5=1230 CP10=1230	Q=DIN
	S=Straight H=Helical	V=V Type Bar T=Tetragon Bar	G=Teeth Ground /Ground	H=Hardened	CP=Circular Pitch		

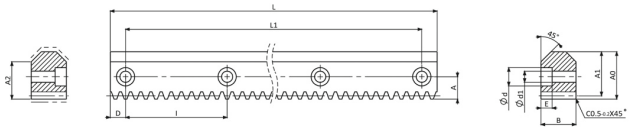
Guideway Rack Range

型號 Code	材料 Material	齒條齒型 Type	齒條齒型 Type	棒型 Shape	齒面處理 Teeth Treatment	硬度處理 Hardness	周節 CP	精度等級 Grade DIN
MSVGH-CP	SCM440	直齒 Straight	V型導軌齒條 V Type Guideway Rack	六角棒 Hexgan	齒研 Teeth Ground	熱處理 Hardened HRC 53°-58°	5, 7.5, 10	DIN 6
MNVGH-00	SCM440	N/A	V型導軌 V Type Guideway	六角棒 Hexgan	研磨 Ground	熱處理 Hardened HRC 53°-58°	N/A	DIN 6
MSTGH-CP	SCM440	直齒 Straight	平軌齒條 Guideway Rack	四角棒 Tetragon	齒研 Teeth Ground	熱處理 Hardened HRC 53°-58°	5, 7.5, 10	DIN 6
MNTGH-00	SCM440	N/A	平面導軌 Guideway	四角棒 Tetragon	研磨 Ground	熱處理 Hardened HRC 53°-58°	N/A	DIN 6

YYC

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

MSVGH-CP-Q6
直齒V型齒研導軌齒條
Straight V Type Ground Guideway Racks



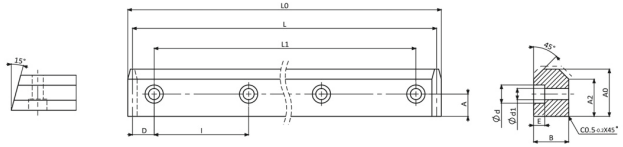
單位 / Dimension : mm

型號 Code	序號 No	Q	周節 CP	L	L1	模數 Module	B	A0	A1	D	I	A	ød	ød1	E	A2	KG
MSVGH-CP 050 10	1	-Q6	5	1030	1000	1.5915	14.5	24.5	22.91	15	100	11.5	11	7	6.8	20.0	2.2
MSVGH-CP 050 10	2	-Q6	5	1030	1000	1.5915	19.5	29.5	27.91	15	100	14.0	15	9	9	23.5	3.5
MSVGH-CP 075 12	1	-Q6	7.5	1230	1200	2.3873	24.7	33.0	30.61	15	100	14.5	15	9	9	25.2	5.8
MSVGH-CP 100 12	1	-Q6	10	1230	1200	3.1831	34.6	46.6	43.42	15	100	18	18	11	11	36.7	11.7

系列MSVGH-CP-Q6 直齒V型齒研導軌齒條
材料 SCM440 (鉻鉬合金鋼)
硬度 HRC 53~58°
硬化處理後六面研磨與齒研

Series MSVGH-CP-Q6 Straight V Type Ground Guideway Racks
Material SCM440 (Chromium Molybdenum Alloy Steel)
Hardness HRC 53~58°
6 Sides Ground and Teeth Ground after hardening.

MNVGH-00-Q6
V型研磨導軌
V Type Ground Guideway

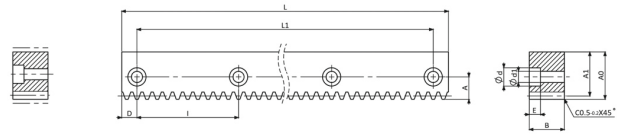


單位 / Dimension : mm

型號 Code	序號 No	Q	L0	L	L1	B	A0	D	I	ød	ød1	E	A2	KG
MNVGH-00	1	-Q6	1033.89	1030	1000	14.5	24.5	15	100	11	7	6.8	20.0	2.3
MNVGH-00	2	-Q6	1035.23	1030	1000	19.5	29.5	15	100	15	9	9	23.5	3.6
MNVGH-00	3	-Q6	1236.62	1230	1200	24.7	33.0	15	100	15	9	9	25.2	6.3
MNVGH-00	4	-Q6	1239.27	1230	1200	34.6	46.6	15	100	18	11	11	36.7	12.5

系列MNVGH-00-Q6 V型研磨導軌
材料 SCM440 (鉻鉬合金鋼)
硬度 HRC 53~58°
硬化處理後六面研磨

Series MNVGH-00-Q6 V Type Ground Guideway
Material SCM440 (Chromium Molybdenum Alloy Steel)
Hardness HRC 53~58°
6 Sides Ground after hardening.

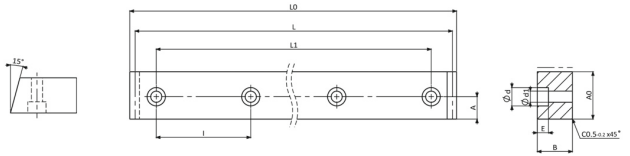


單位 / Dimension : mm

型號 Code	序號 No	Q	周節 CP	L	L1	模數 Module	B	A0	A1	D	I	A	ød	ød1	E	KG
MSTGH-CP 050 10	1	-Q6	5	1030	1000	1.5915	14.5	24.5	22.91	15	100	11.5	11	7	6.8	2.2
MSTGH-CP 050 10	2	-Q6	5	1030	1000	1.5915	19.5	29.5	27.91	15	100	14.0	15	9	9	3.5
MSTGH-CP 075 12	1	-Q6	7.5	1230	1200	2.3873	24.7	33.0	30.61	15	100	14.5	15	9	9	5.8
MSTGH-CP 100 12	1	-Q6	10	1230	1200	3.1831	34.6	46.6	43.42	15	100	18	18	11	11	11.7

系列MSTGH-CP-Q6 齒研平軌齒條
材料 SCM440 (鉻鉬合金鋼)
硬度 HRC 53~58°
硬化處理後四面研磨與齒研

Series MSTGH-CP-Q6 Ground Guideway Racks
Material SCM440 (Chromium Molybdenum Alloy Steel)
Hardness HRC 53~58°
4 Sides Ground and Teeth Ground after hardening.

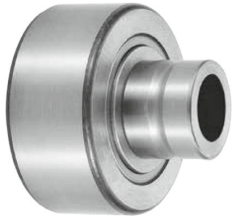


單位 / Dimension : mm

型號 Code	序號 No	Q	L0	L	L1	B	A0	D	I	ød	ød1	E	KG
MNTGH-00	1	-Q6	1033.89	1030	1000	14.5	24.5	15	100	11	7	6.8	2.5
MNTGH-00	2	-Q6	1035.23	1030	1000	19.5	29.5	15	100	15	9	9	4.0
MNTGH-00	3	-Q6	1236.62	1230	1200	24.7	33.0	15	100	15	9	9	6.8
MNTGH-00	4	-Q6	1239.27	1230	1200	34.6	46.6	15	100	18	11	11	13.4

系列MNTGH-00-Q6 研磨平面導軌
材料 SCM440 (鉻鉬合金鋼)
硬度 HRC 53~58°
硬化處理後四面研磨

Series MNTGH-00-Q6 Ground Guideway
Material SCM440 (Chromium Molybdenum Alloy Steel)
Hardness HRC 53~58°
4 Sides Ground after hardening.



滾輪目錄
Content of Rollers

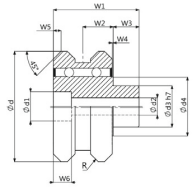
型號 Code	材料 Material	滾輪型狀 Type	心軸外徑 Shaft Dia.	頁碼 Page
UV	SUJ2 (100Cr6)	導軌滾輪 V Type Roller	15 20 25 35	77
UR	SUJ2 (100Cr6)	平軌滾輪 Round Roller	15 20 25 35	77

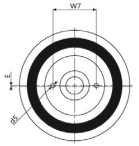
滾輪型號說明
Roller Code Instruction

1st	2nd	3rd	4th
材料 Material	型狀 Type	心軸外徑 Shaft Diameter	偏心量 Excenter
U=軸承鋼	V= V型 R=圓型	15 20 25 35	Y=1mm N=0mm
U=SUJ2 (100Cr6)	V= V Type R=Round		Y=1mm N=0mm

ROLLERS FOR GUIDEWAY RACKS

導軌滾輪
V Type Roller



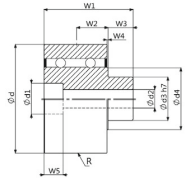


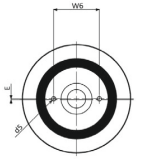
單位 / Dimension : mm

型號 Code	心軸外徑 Shaft Dia.	偏心量 Excenter	ød	ød1	W1	W5	W2	W3	W4	W6	R	ød2	ød3	ød4	W7	d5	Ga (μm)	KG
UV15Y	15	1 mm	53	13.5	35	2	12	12	1	9	R250	8.4	15h7	23.8	18.5	2.6x3	-3/+5	0.23
UV15N	15	0 mm	53	13.5	35	2	12	12	1	9	R250	8.4	15h7	23.8	18.5	2.6x3	-3/+5	0.23
UV20Y	20	1 mm	63	16.5	46	3	16	15	1	11	R300	10.5	20h7	27.7	22.5	2.6x3	-3/+5	0.45
UV20N	20	0 mm	63	16.5	46	3	16	15	1	11	R300	10.5	20h7	27.7	22.5	2.6x3	-3/+5	0.45
UV25Y	25	1 mm	77	20.5	60	3.5	20.5	20	1	13	R360	13	25h7	35.6	27.5	4.1x4.5	-3/+5	1.00
UV25N	25	0 mm	77	20.5	60	3.5	20.5	20	1	13	R360	13	25h7	35.6	27.5	4.1x4.5	-3/+5	1.00
UV35Y	35	1 mm	107	28.5	84	7.5	30	25	1	17.5	R500	17	40h7	56.9	42	4.1x4.5	-3/+5	2.50
UV35N	35	0 mm	107	28.5	84	7.5	30	25	1	17.5	R500	17	40h7	56.9	42	4.1x4.5	-3/+5	2.50

Ga (μm)內部軸向間隙/Internal Axial Tolerance

平軌滾輪
Round Roller

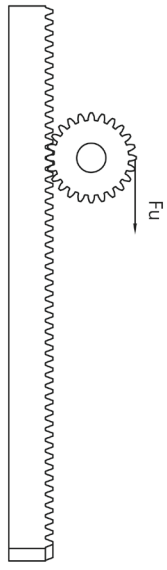


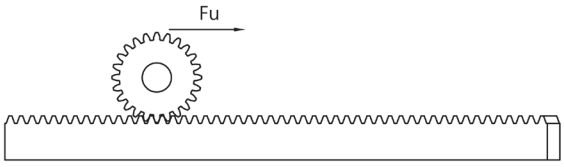


單位 / Dimension : mm

型號 Code	心軸外徑 Shaft Dia.	偏心量 Excenter	ød	ød1	W1	W2	W3	W4	W5	R	ød2	ød3	ød4	W6	d5	Ga (μm)	KG
UR15Y	15	1 mm	47	13.5	35	12	12	1	9	R500	8.4	15h7	23.8	18.5	2.6x3	-3/+5	0.16
UR20Y	20	1 mm	72	16.5	46	16	15	1	11	R500	10.5	20h7	27.7	22.5	2.6x3	-3/+5	0.63
UR25Y	25	1 mm	85	20.5	60	20.5	20	1	13	R500	13	25h7	35.6	27.5	4.1x4.5	-3/+5	1.00
UR35Y	35	1 mm	100	28.5	84	30	25	1	17.5	R500	17	40h7	56.9	42	4.1x4.5	-3/+5	2.70

齿条传动形式（selection rack and pinion drive）





上升/下降(lift/lower)

$F_u = m \cdot g + m \cdot a$

水平(drive)

$F_u = m \cdot g \cdot \mu + m \cdot a$

名称（description）	公式（formula）	单位（dimension）
加速度（acceleration）	$a = \frac{v}{t} = \frac{2 \cdot s}{t^2}$	m/s^2
速度(speed)	$v = \frac{s}{t} = \sqrt{2 \cdot a \cdot s}$	m/s
距离(distance)	s	m
时间(time)	t	s
转速(rpm)	$n = \frac{v \cdot 60}{\Pi \cdot d_0}$	1/min
分度圆直径(pitch diameter)	d_0	mm
扭矩(torque)	$M = \frac{F_u \cdot d_0}{2000}$	Nm
功率（power）	$P = \frac{M \cdot n}{9550} = \frac{F_u \cdot n \cdot d_0}{19100}$	kw

設計參數

使用係數	1.0
齒間連接安全係數	1.0
防齒裂安全係數	1.4
使用壽命	20,000h

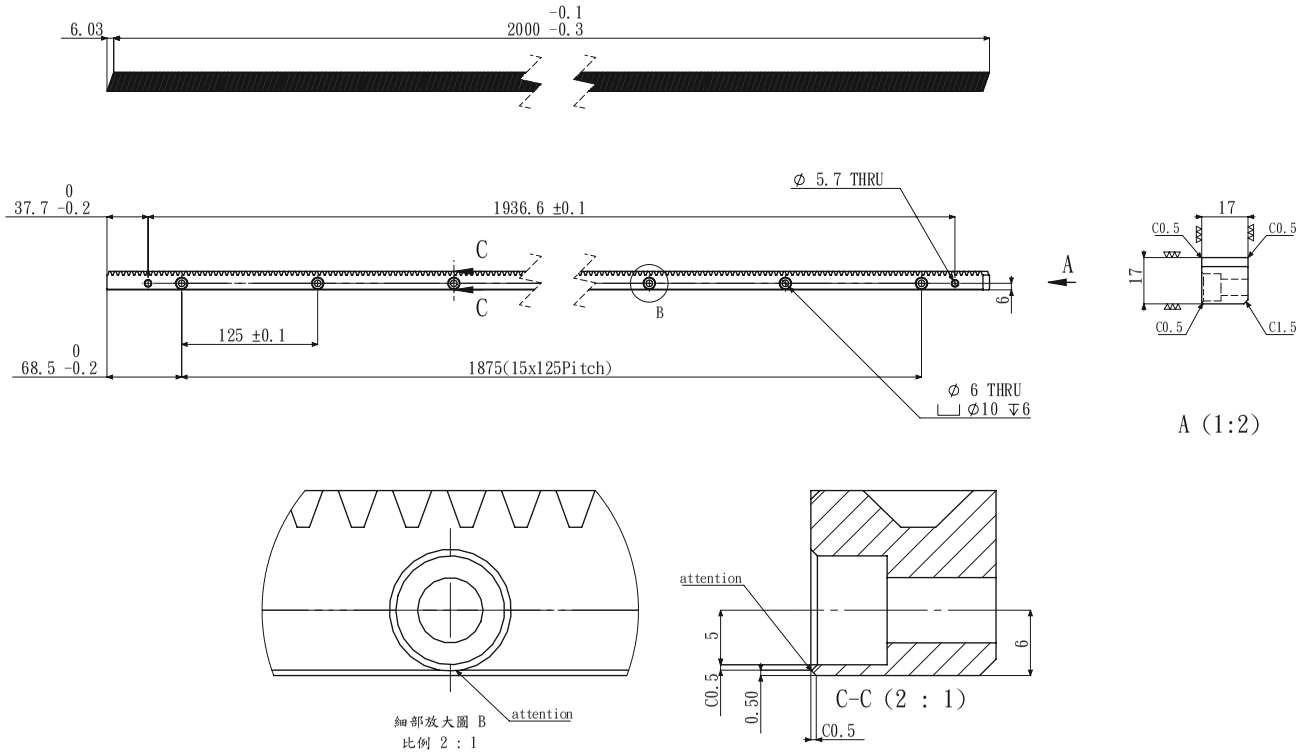
The dimensioning happened with

application factor:	1.0
safety for stress at single tooth contact:	1.0
safety for Tooth root stress:	1.4
service life in hours:	20,000h

此樣本中的所有產品型號及參數如有變更恕不另行通告，訂貨前請與本公司聯絡確認

NOTES:

DIN 8 & HELICAL RACK - M:1.5



*注意: 沉頭孔倒角C0.5以下 勿過大造成破孔

訂單編號I161028-0002 99044 專用圖

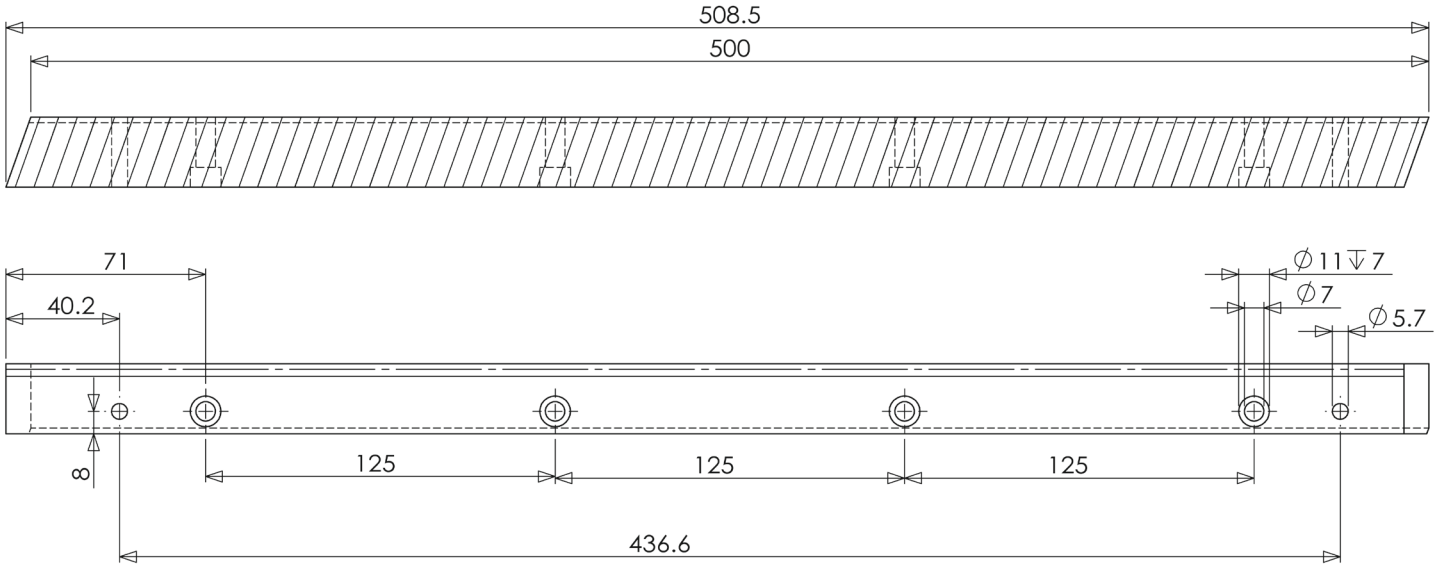
Pitch Error 總齒距累積誤差	GT f/2000≦0.12mm

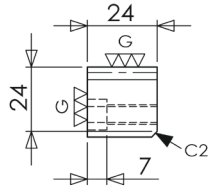
除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	1.5	繪製 DRAWN BY	MING	日期 DATE : 2016.10.28	版 次 : B
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	400T	檢查 CHK'D		Y Y C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.	
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D			
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO: CHTM01520 -99044	
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C			比例 SCALE 1:5 / 重量WEIGHT: / 圖頁 SHEET 1 OF 1	

YYC

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

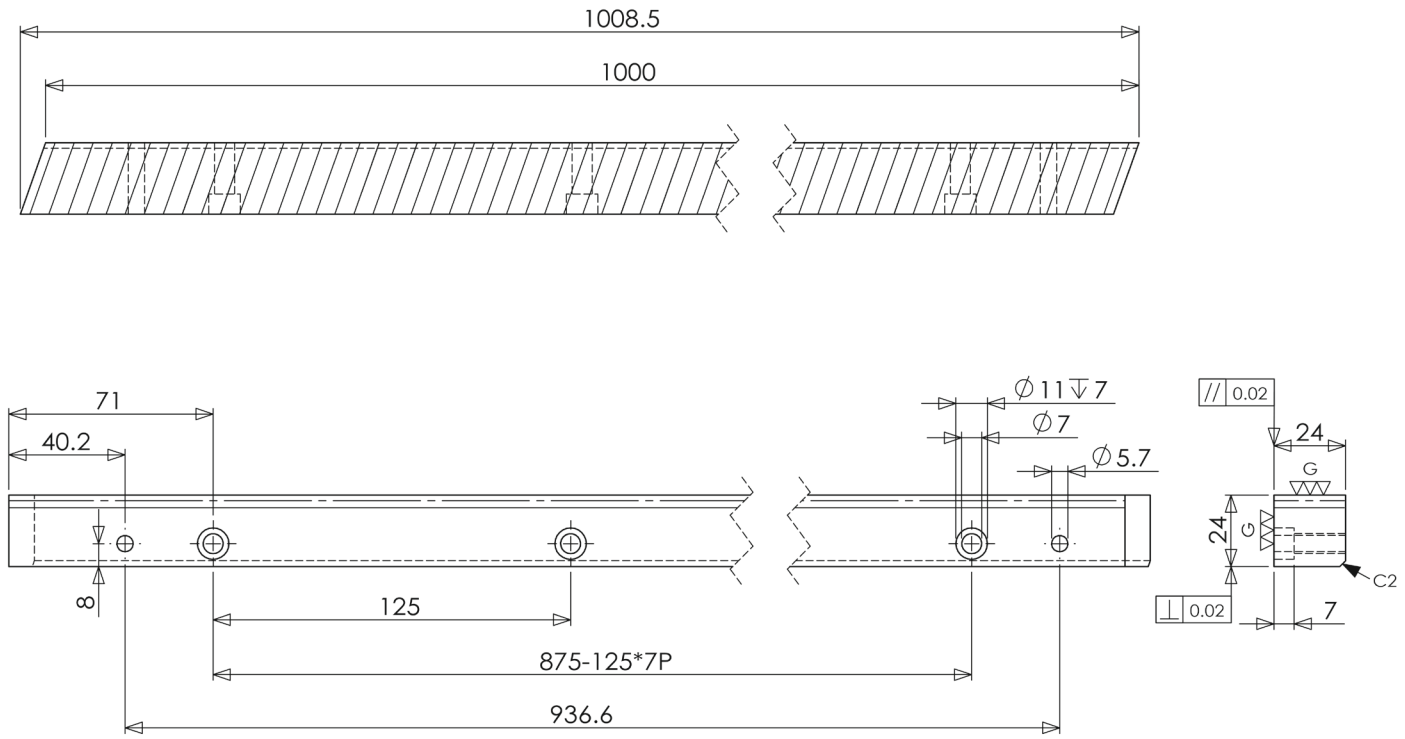
DIN 6 & HELICAL RACK - M: 2





除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	75T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGH-24-24-500L-M2 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 6 & HELICAL RACK - M: 2

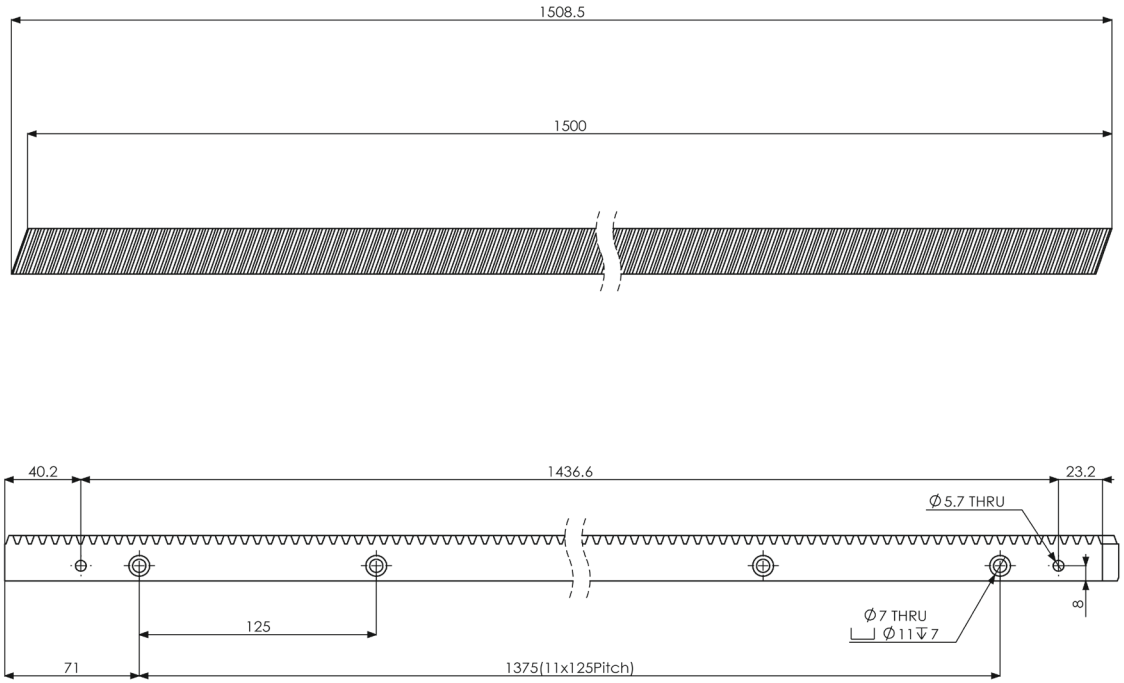


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	150T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGH-24-24-1000L-M2 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

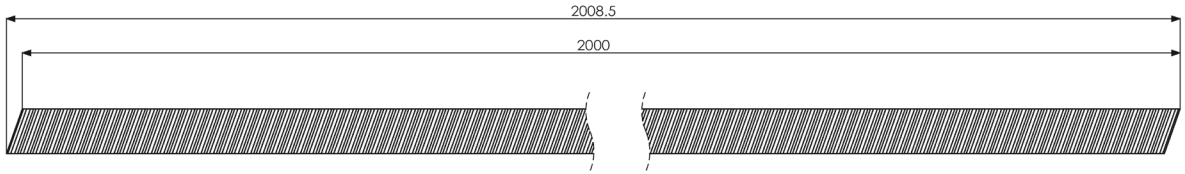
DIN 6 & HELICAL RACK - M: 2

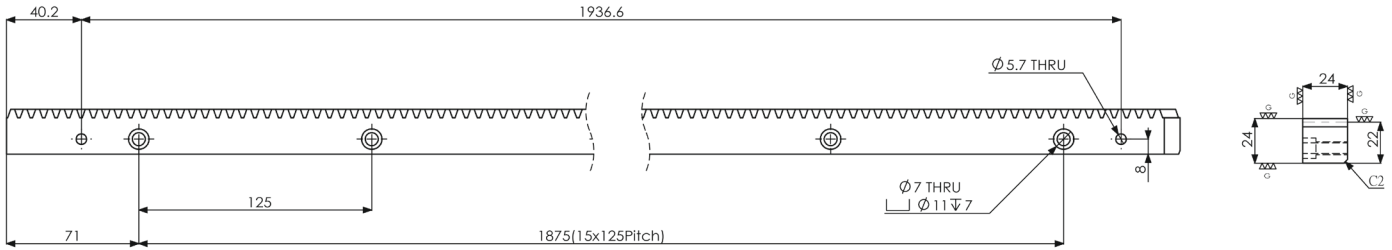


高週波硬度 Hardness :HRC50°-55°

除非另有指定,否則毫米為單位 Unless specify, unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	MING	日期 DATE : 2014.12.11
	四面研磨Sides Ground	有 Included	齒數Teeth No.	225T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTGH-020-15 / 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C			比例 SCALE 1:3 / 重量WEIGHT: / 頁 SHEET 1 OF 1

DIN 6 & HELICAL RACK - M: 2





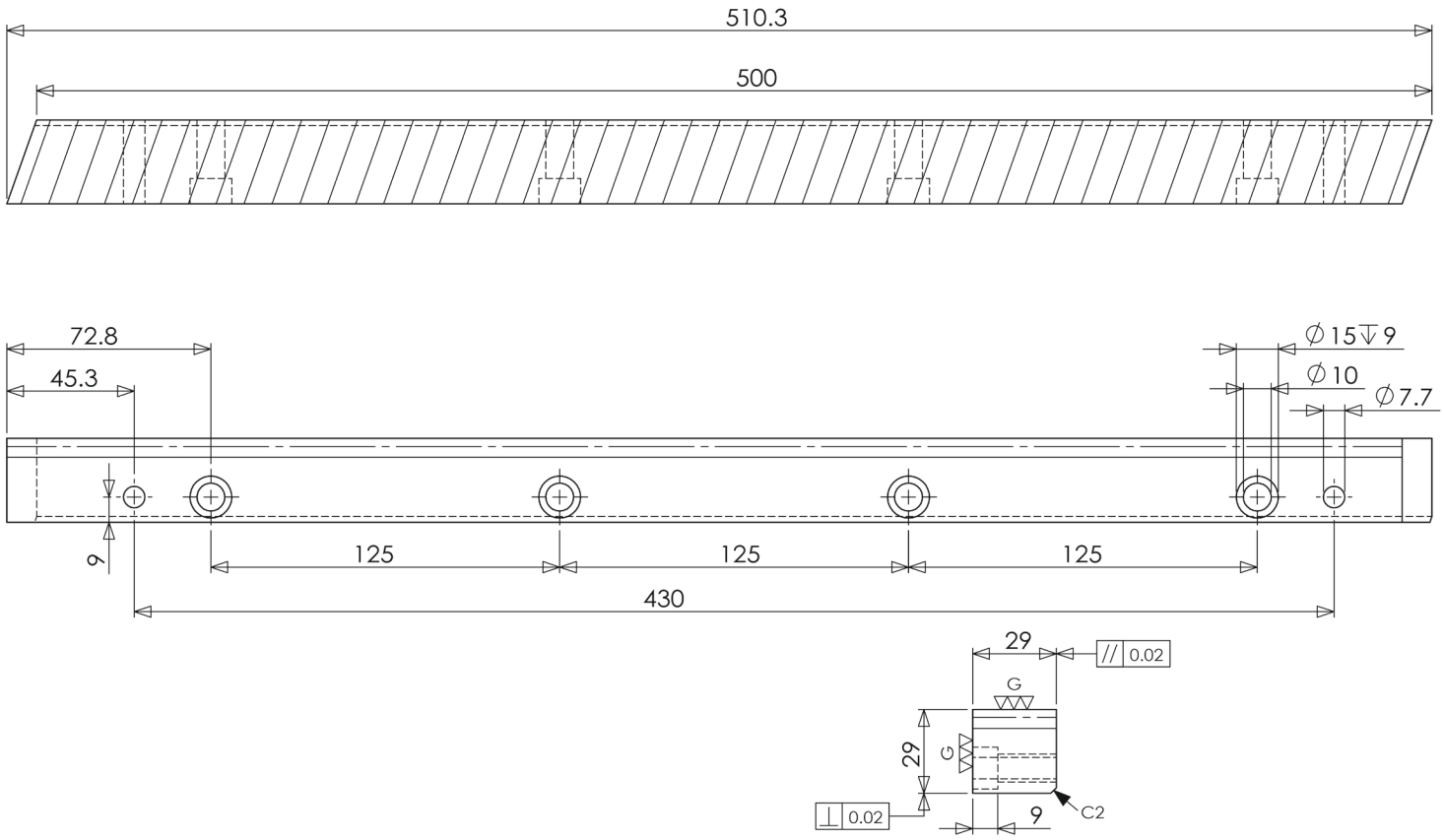
高週波硬度 Hardness :HRC50°-55°

除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	MING	日期 DATE : 2014.12.11
	四面研磨Sides Ground	有 Included	齒數Teeth No.	300T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTGH-020-20 / 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C			比例 SCALE 1:3 / 重量WEIGHT: / 圖頁 SHEET 1 OF 1

YYC

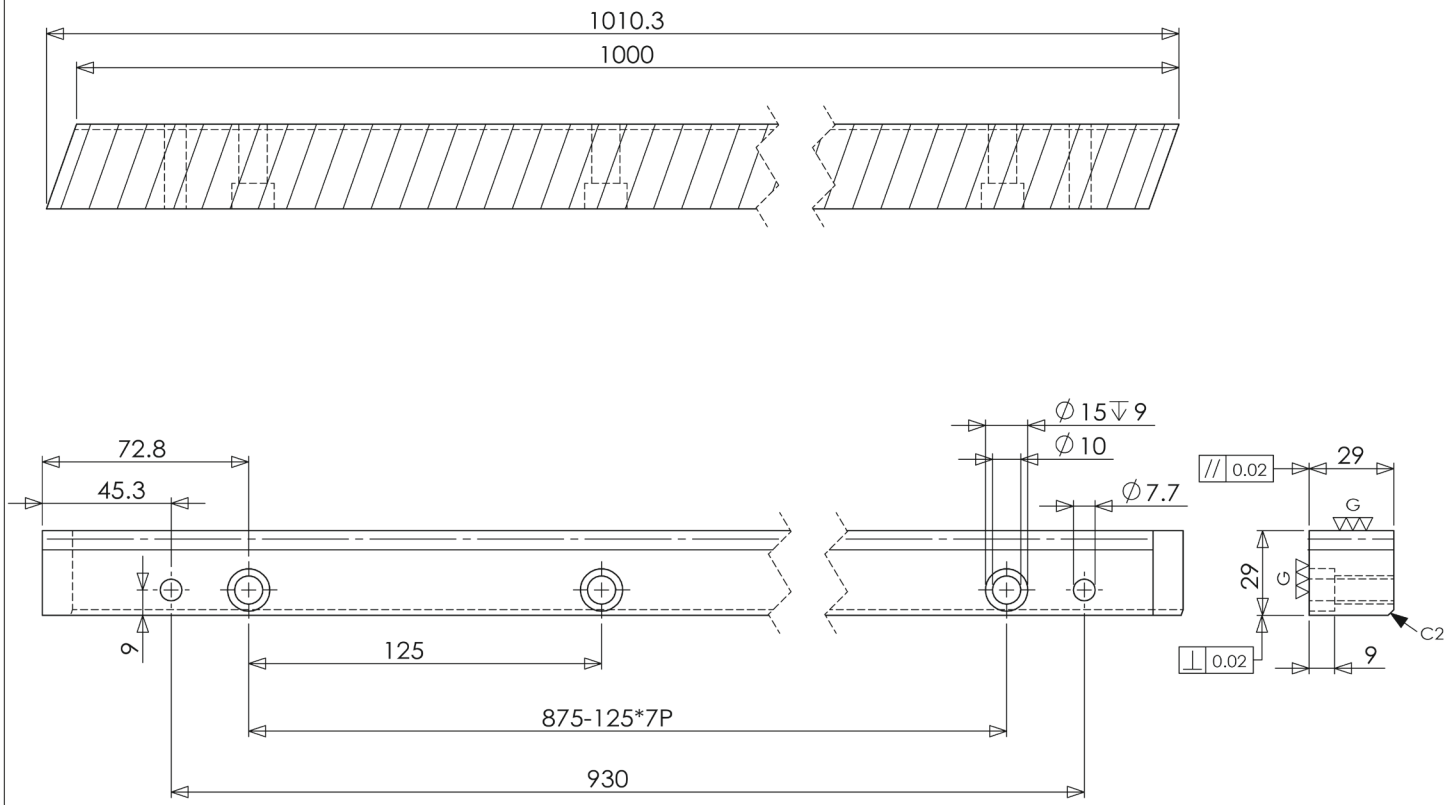
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 6 & HELICAL RACK - M: 3



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	3	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	50T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGH-29-29-500L-M3 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 6 & HELICAL RACK - M: 3

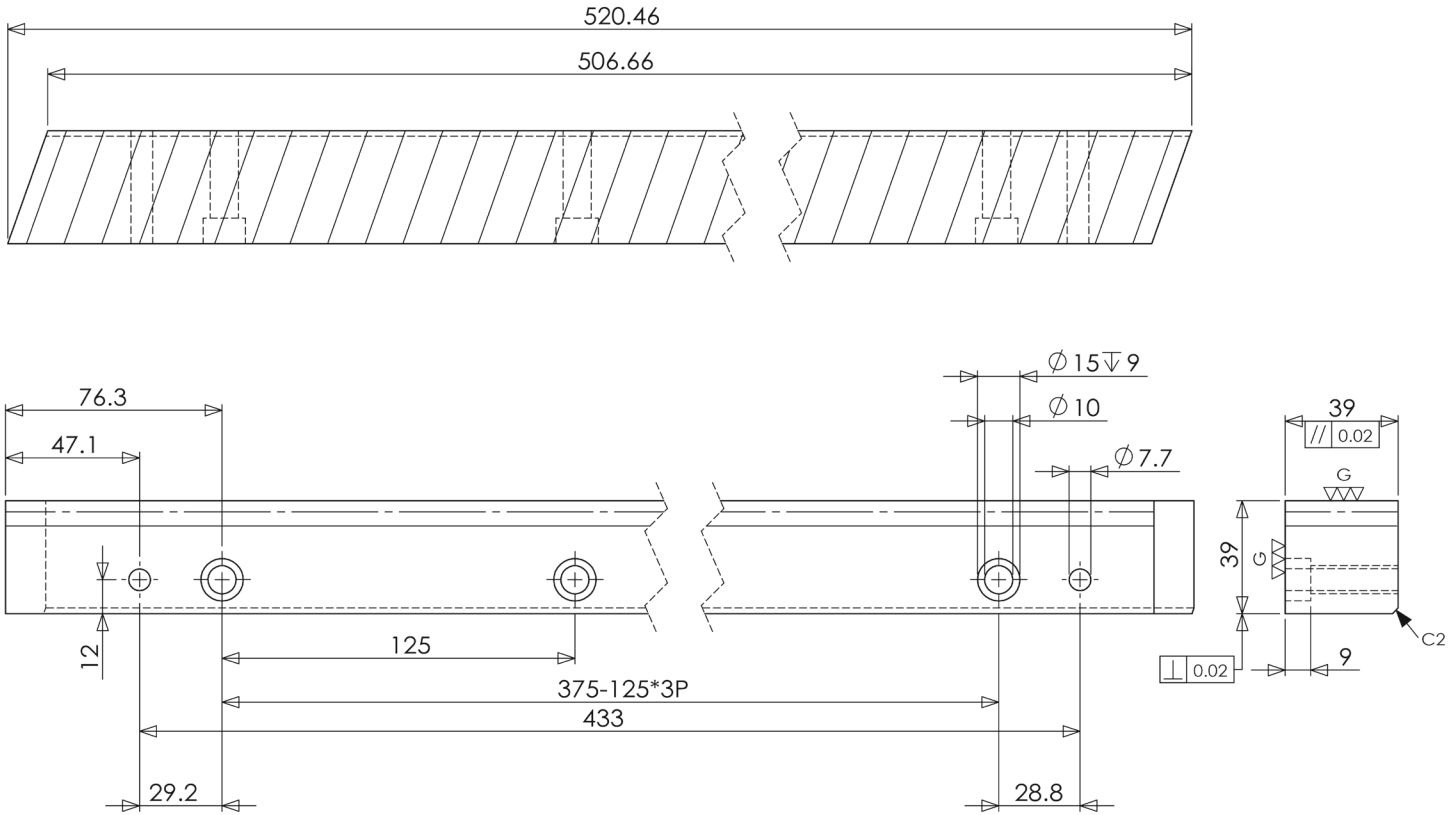


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	3	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	100T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGM-29-29-1000L-M3 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

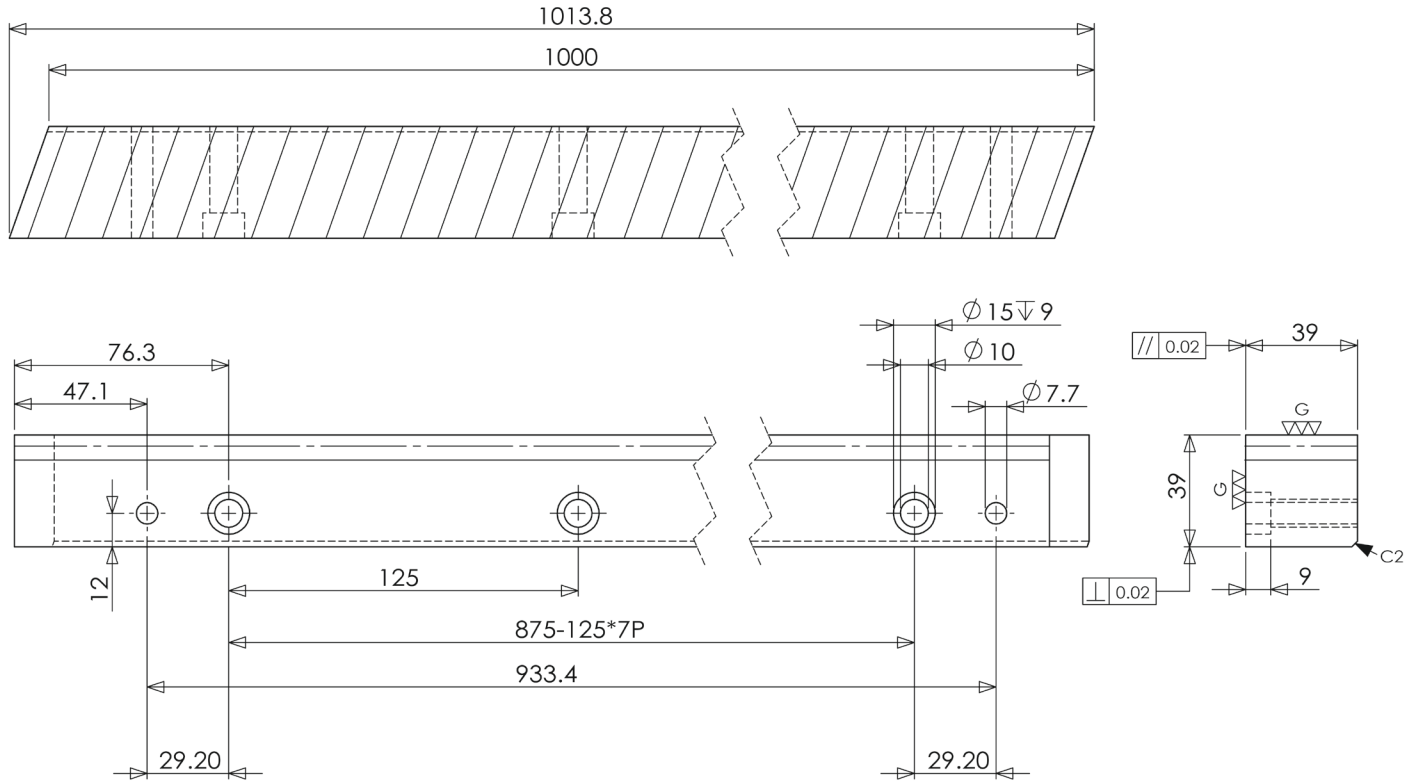
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 6 & HELICAL RACK - M: 4



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	4	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	38T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGH-39-39-506.67L-M4 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 6 & HELICAL RACK - M: 4

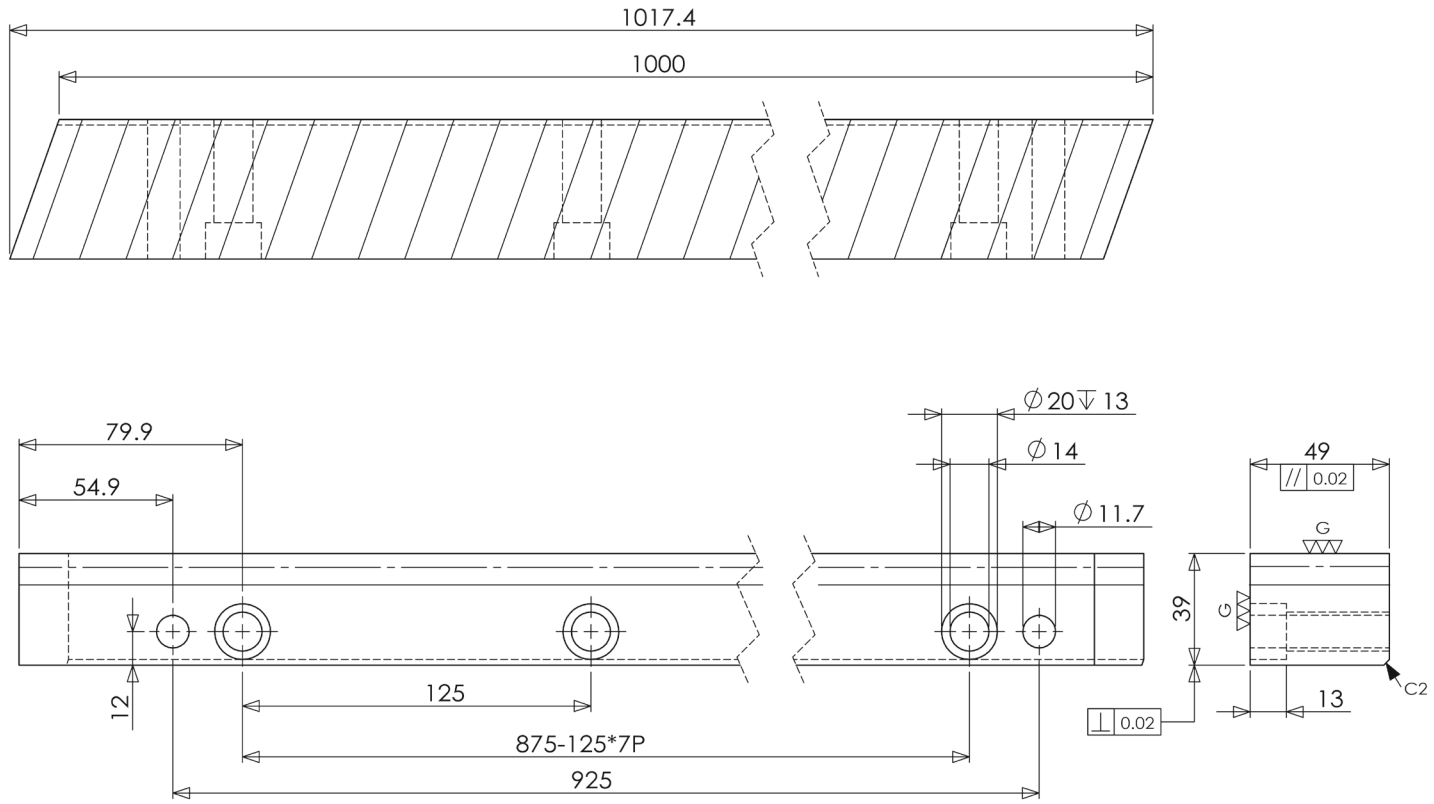


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	4	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	75T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGH-39-39-1000L-M4 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

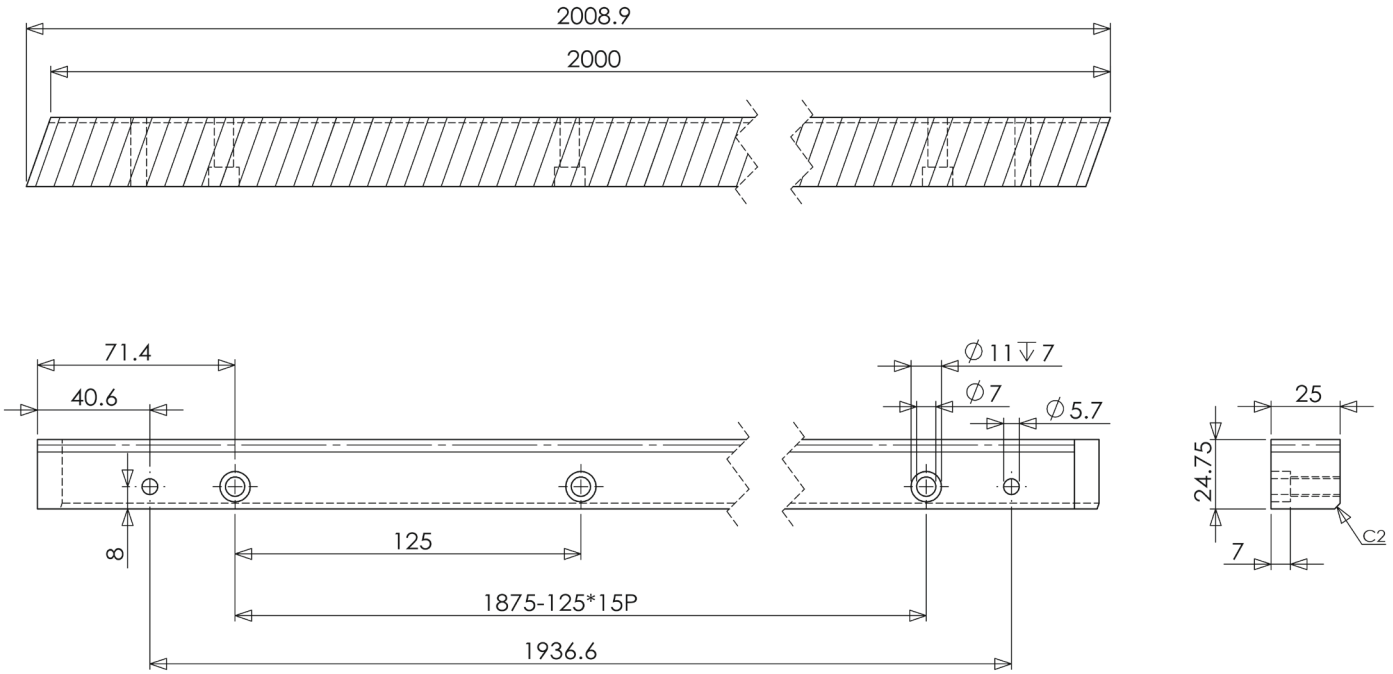
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 6 & HELICAL RACK - M: 5



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	5	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	有 Included	齒數Teeth No.	60T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTGH-49-39-1000L-M5 版次 A
	精度等級 Precision Grade	DIN 6級 DIN Grade 6	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 8 & HELICAL RACK - M: 2

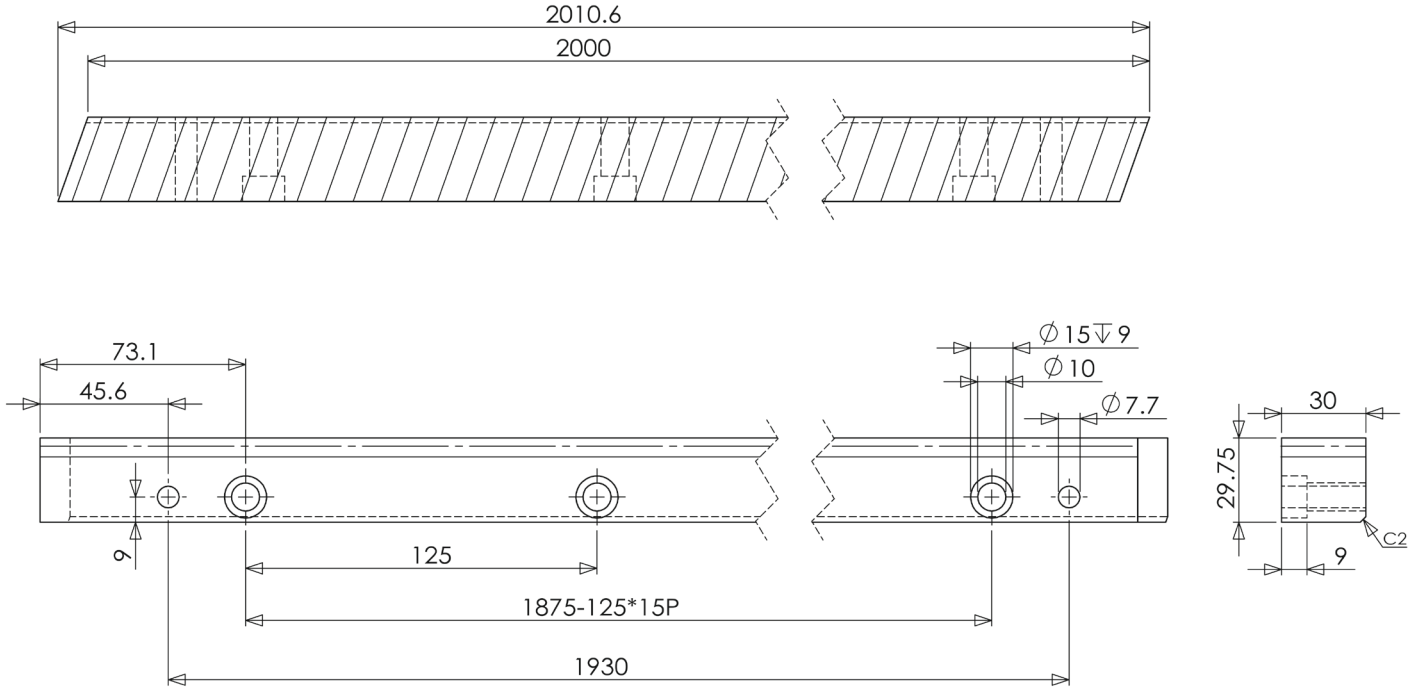


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	2	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	300T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTM-25-24.75-2000L-M2 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

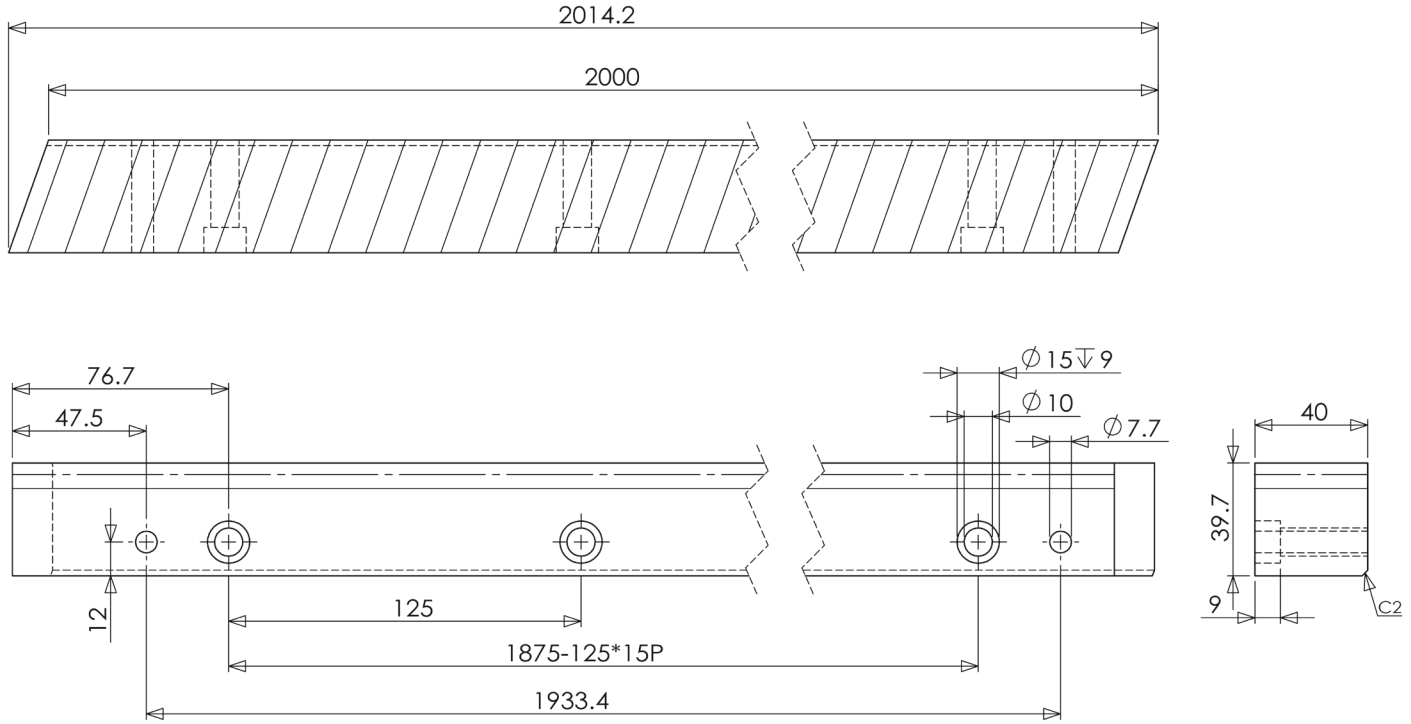
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 8 & HELICAL RACK - M: 3



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	3	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	200T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTM-30-29.75-2000L-M3 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 8 & HELICAL RACK - M: 4

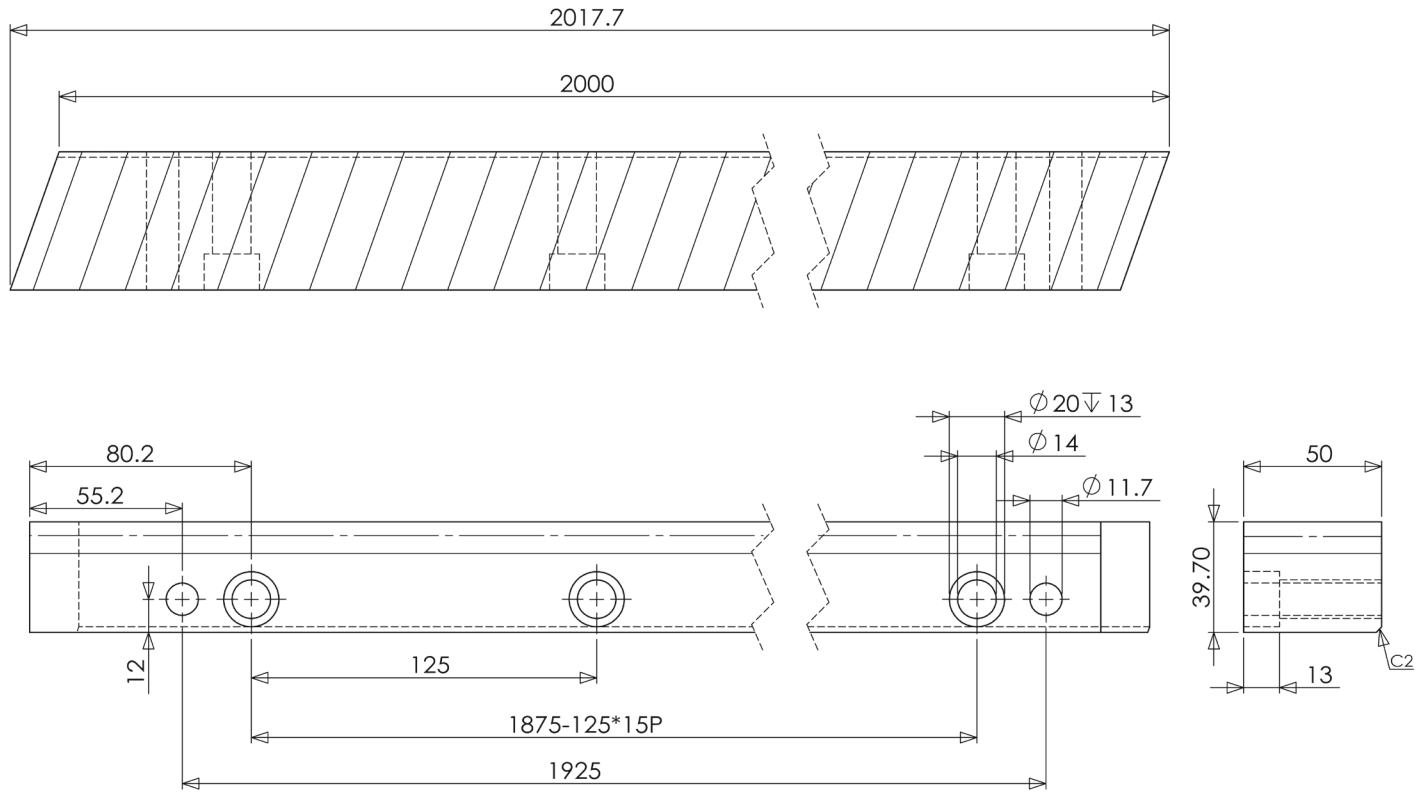


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	4	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	150T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTM-40-39.7-2000L-M4 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

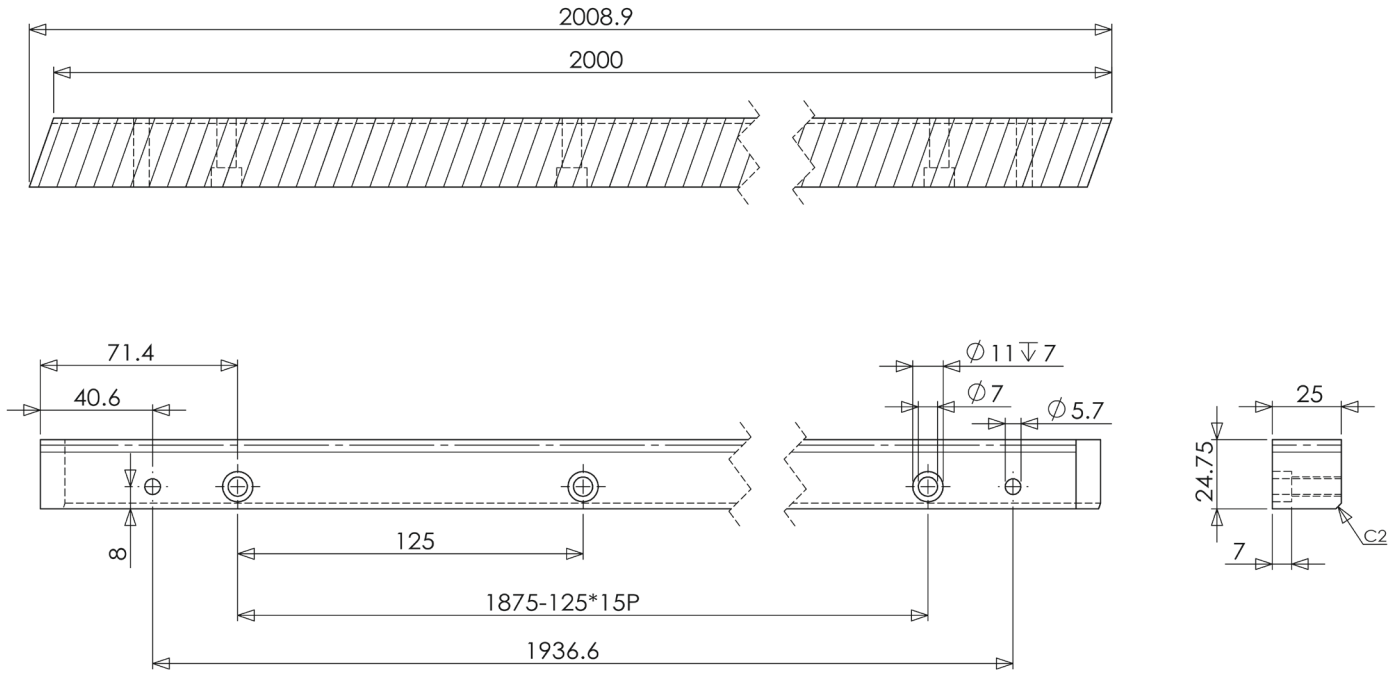
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 8 & HELICAL RACK - M: 5



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	5	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	120T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTM-50-39.7-2000L-M5 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 10 & HELICAL RACK - M: 2

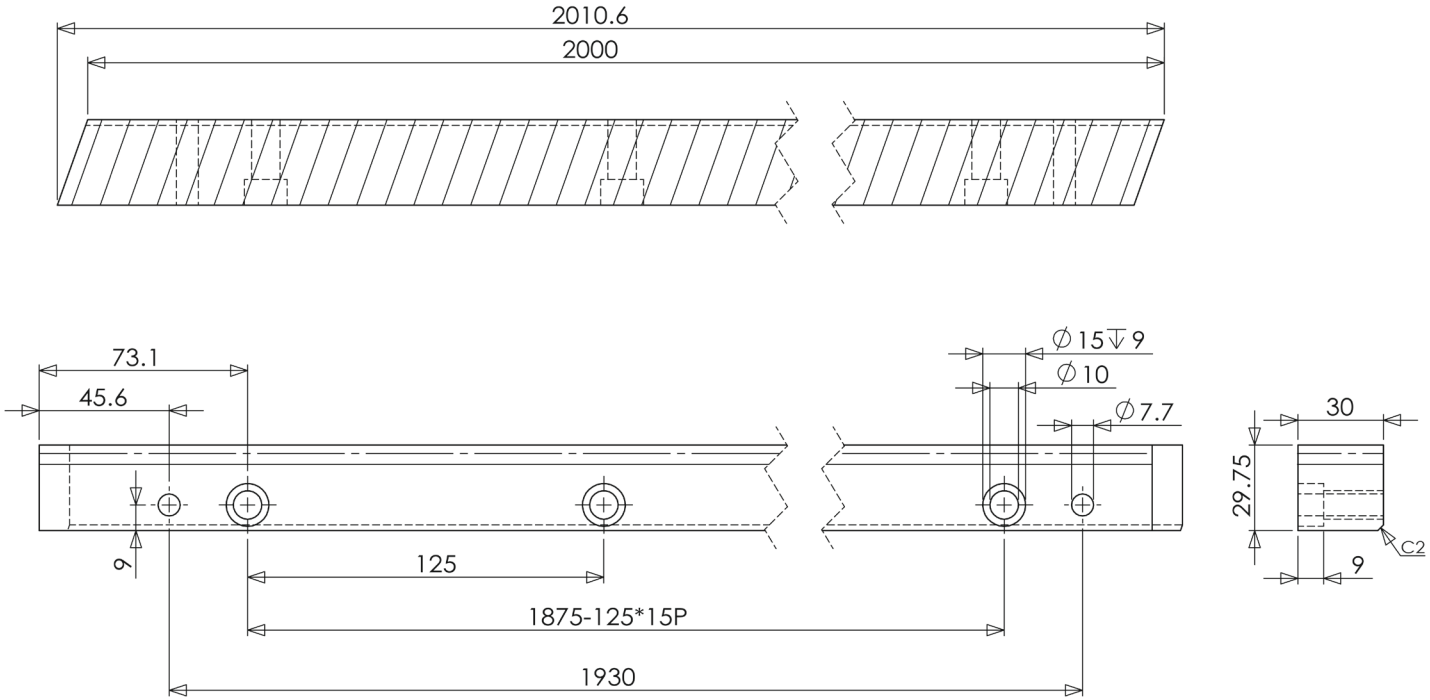


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	300T	檢查 CHK'D		Y.Y.C 原德昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTMH-25-24.75-2000L-M2 版次 A
	精度等級 Precision Grade	DIN 10級 DIN Grade 10	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

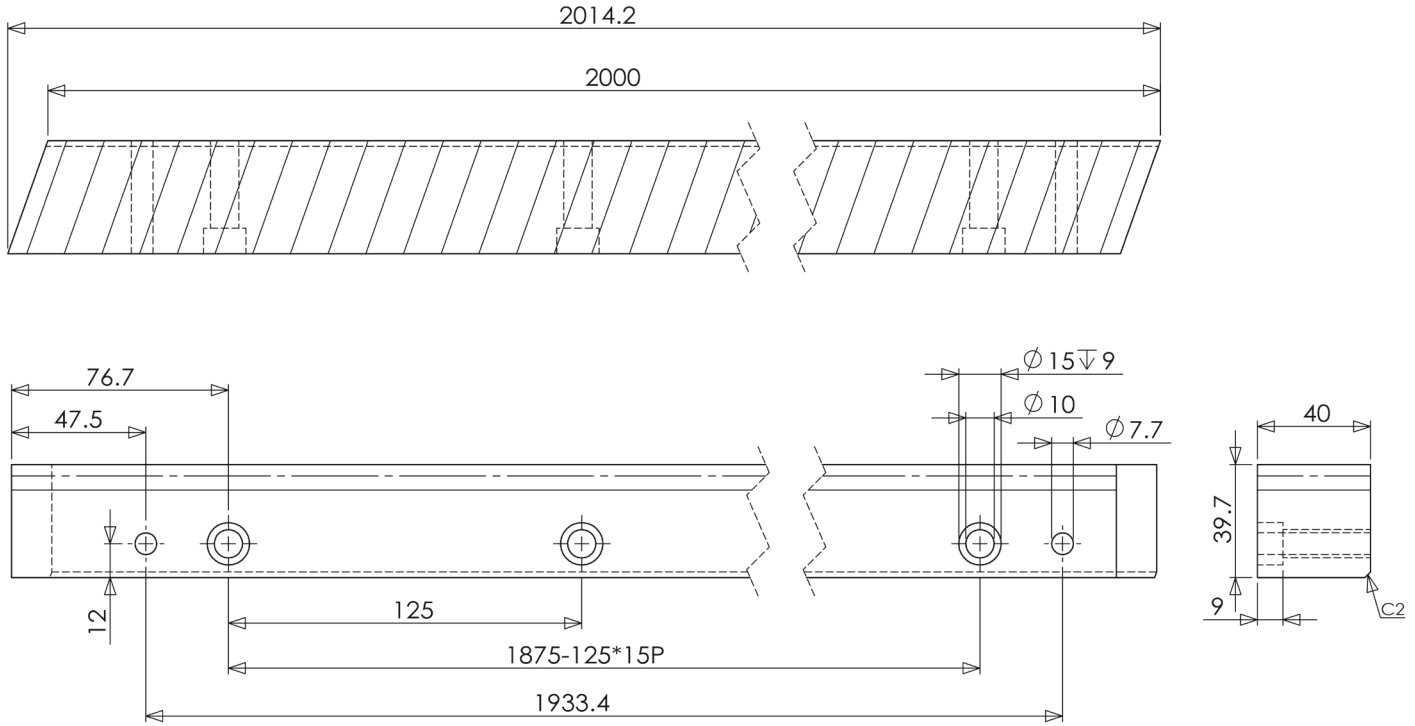
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 10 & HELICAL RACK - M: 3



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	3	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	200T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTMH-30-29.75-2000L-M3 版次 A
	精度等級 Precision Grade	DIN 10級 DIN Grade 10	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 10 & HELICAL RACK - M: 4

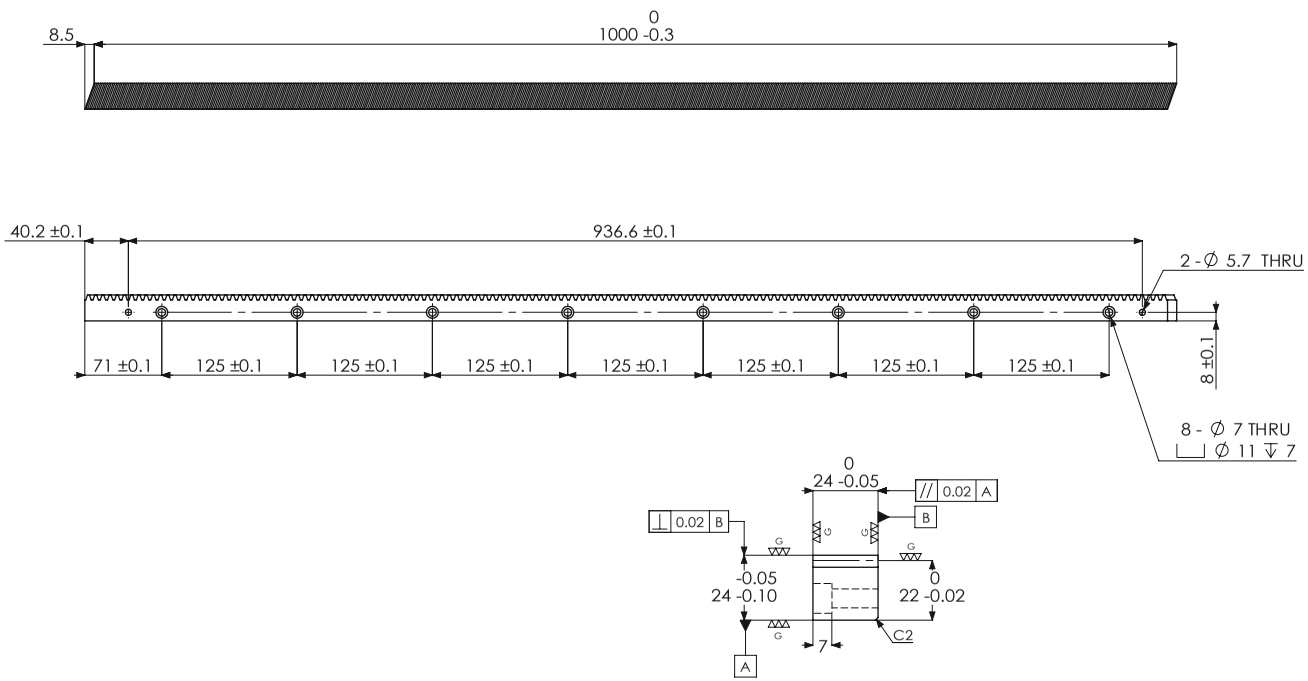


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	4	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	150T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"	製程 MFG		圖號 DWG NO:CHTMH-40-39.7-2000L-M4 版次 A
	精度等級 Precision Grade	DIN 10級 DIN Grade 10	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

註: 未標示之銳角 倒C1

DIN 5 & HELICAL RACK - M:2

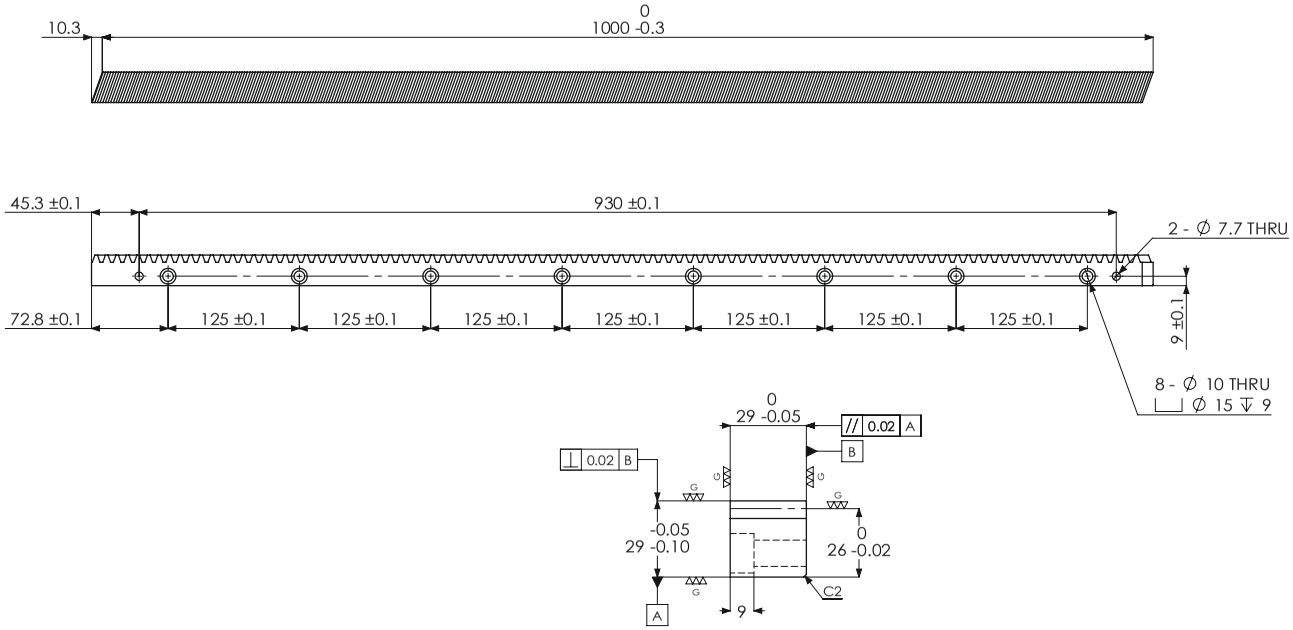


HRC50°- 55°

Pitch Error 總齒距累積誤差	GT f/1000≦0.026mm						
除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	MING	日期 DATE : 2015.12.10
	四面研磨Sides Ground	有 Included	齒數Teeth No.	150T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTGH-02010-DIN5 / 版次 A
	精度等級 Precision Grade	DIN 5級 DIN Grade 5	材質Material	S45C			比例 SCALE 1:5 / 重量WEIGHT: / 圖頁 SHEET 1 OF 1

註: 未標示之銳角 倒C1

DIN 5 & HELICAL RACK - M:3



HRC50°- 55°

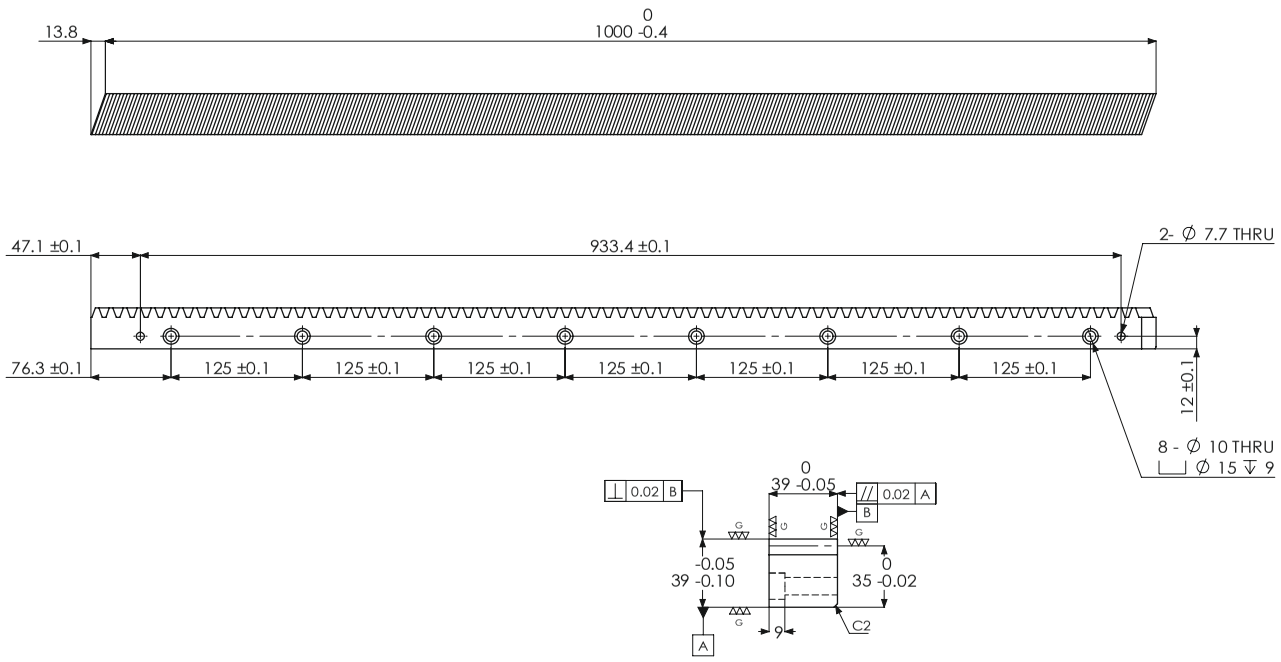
Pitch Error 總齒距累積誤差	GT f/1000≦0.026mm

除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	3	繪製 DRAWN BY	MING	日期 DATE : 2015.12.10
	四面研磨Sides Ground	有 Included	齒數Teeth No.	100T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTGH-03010-DIN5 / 版次 A
	精度等級 Precision Grade	DIN 5級 DIN Grade 5	材質Material	S45C			比例 SCALE 1:5 / 重量 WEIGHT: / 圖頁 SHEET 1 OF 1

YYC

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 5 & HELICAL RACK - M:4

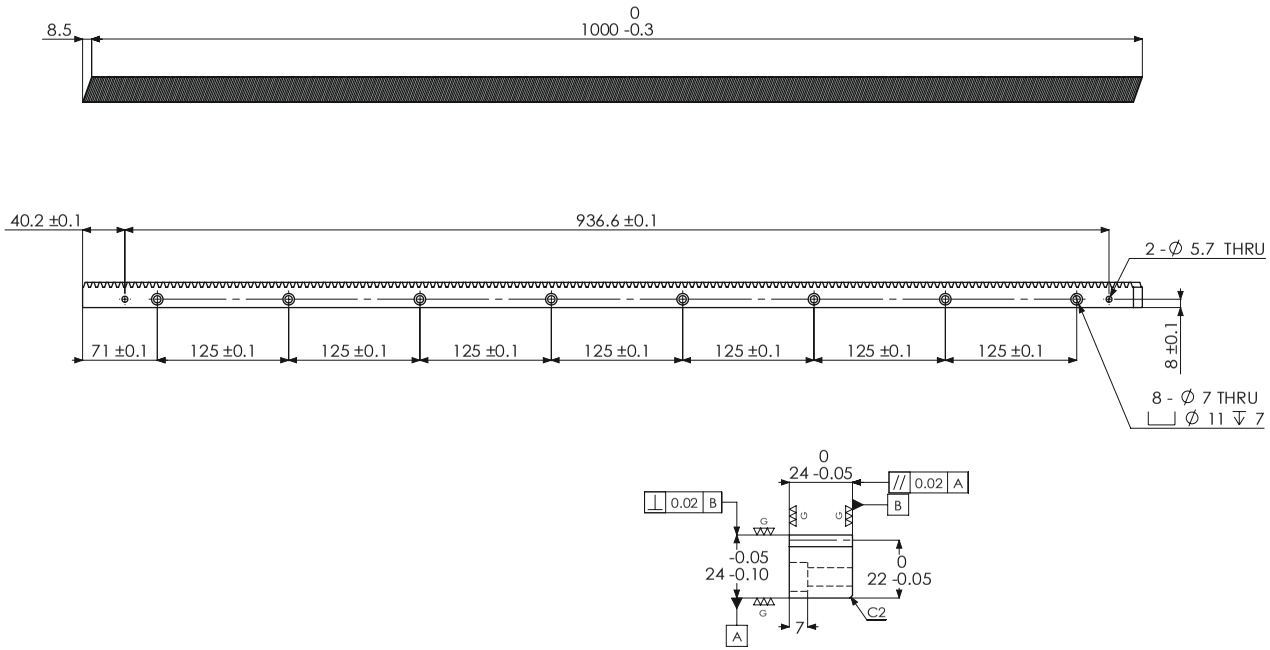


HRC50°- 55°

Pitch Error 總齒距累積誤差	GT f/1000≦0.026mm						
除非另有指定,否則毫米為單位 Unless specify,unit is mm	高週波Hardness	有 Included	模數Module	4	繪製 DRAWN BY	MING	日期 DATE : 2015.12.10
去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES	四面研磨Sides Ground	有 Included	齒數Teeth No.	75T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	齒研 Teeth Ground	有 Included	壓力角Pressure Angle	20°	核准 APPV'D		
	噴砂 Sandblast	無 Not included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTGH-04010-DIN5 / 版次 A
	精度等級 Precision Grade	DIN 5級 DIN Grade 5	材質Material	S45C			比例 SCALE 1:5 / 重量WEIGHT: / 圖頁 SHEET 1 OF 1

註: 未標示之銳角 倒C1

DIN 7 & HELICAL RACK - M:2



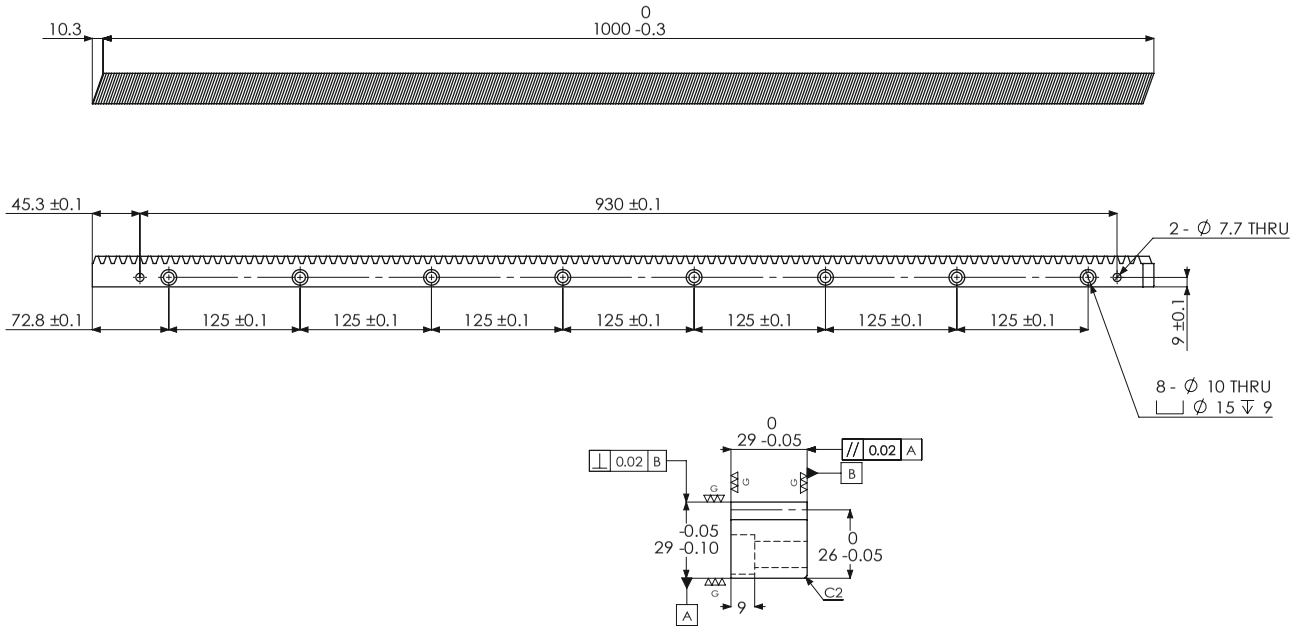
HRC50°- 55°

Pitch Error 總齒距累積誤差	GT f/1000≦0.052mm						
除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	2	繪製 DRAWN BY	MING	日期 DATE : 2015.12.10
	四面研磨Sides Ground	有 Included	齒數Teeth No.	150T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	噴砂 Sandblast	有 Included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTMH-G02010-DIN7 版次 A
	精度等級 Precision Grade	DIN 7級 DIN Grade 7	材質Material	S45C			比例 SCALE 1:5 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

註: 未標示之銳角 倒C1

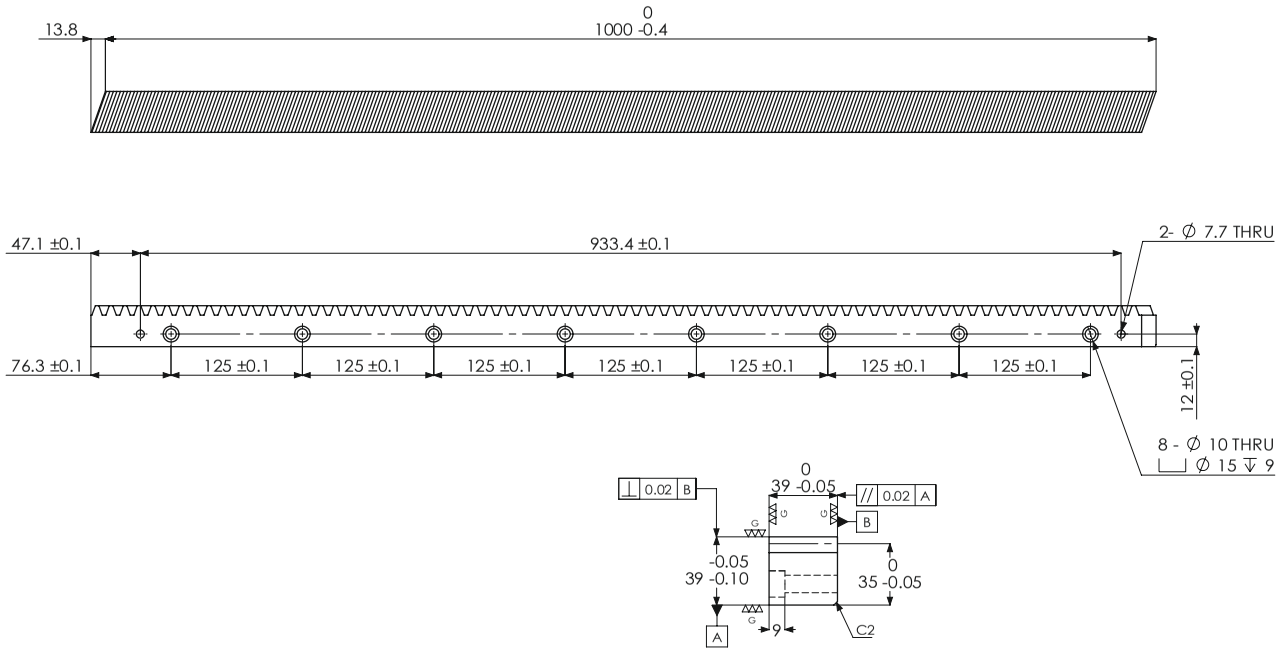
DIN 7 & HELICAL RACK - M:3



HRC50°- 55°

Pitch Error 總齒距累積誤差	GT f/1000≦0.052mm						
除非另有指定,否則毫米為單位 Unless specify,unit is mm	高週波Hardness	有 Included	模數Module	3	繪製 DRAWN BY	MING	日期 DATE : 2015.12.10
去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES	四面研磨Sides Ground	有 Included	齒數Teeth No.	100T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	噴砂 Sandblast	有 Included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTMH-G03010-DIN7 / 版次 A
	精度等級 Precision Grade	DIN 7級 DIN Grade 7	材質Material	S45C			比例 SCALE 1:5 / 重量WEIGHT: / 圖頁 SHEET 1 OF 1

DIN 7 & HELICAL RACK - M:4



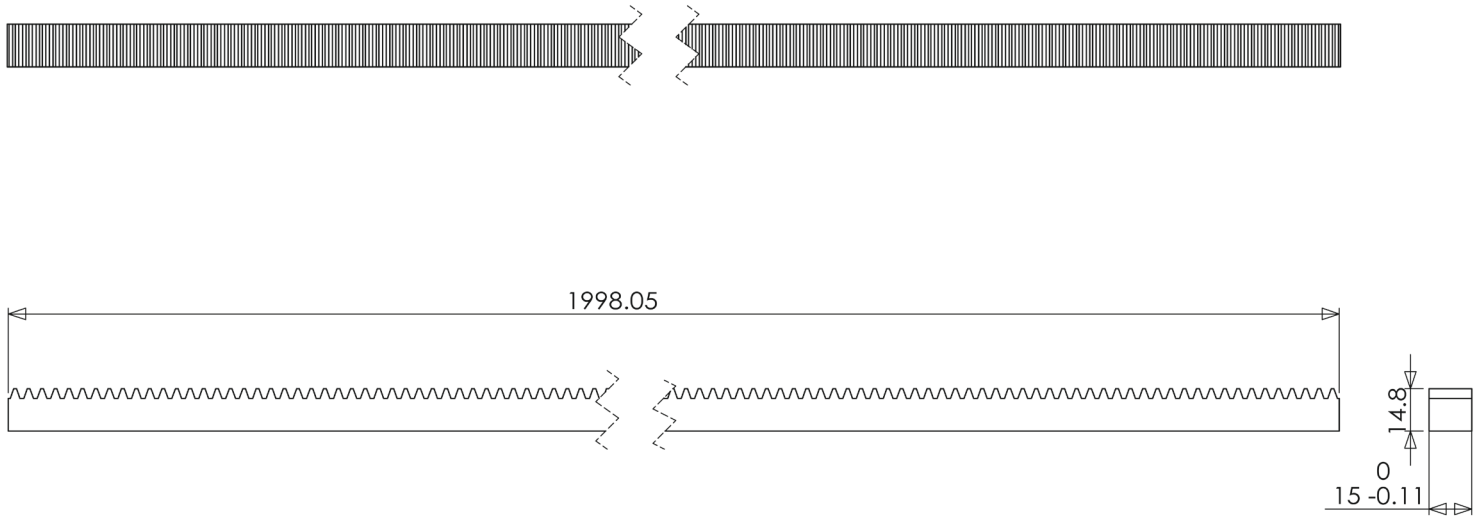
HRC50°- 55°

Pitch Error 總齒距累積誤差	GT f/1000≦0.052mm						
除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	有 Included	模數Module	4	繪製 DRAWN BY	MING	日期 DATE : 2015.12.10
	四面研磨Sides Ground	有 Included	齒數Teeth No.	75T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	噴砂 Sandblast	有 Included	右旋角Right Hand Angle	19°31'42"			圖號 DWG NO:CHTMH-G04010-DIN7 版次 A
	精度等級 Precision Grade	DIN 7級 DIN Grade 7	材質Material	S45C			比例 SCALE 1:5 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

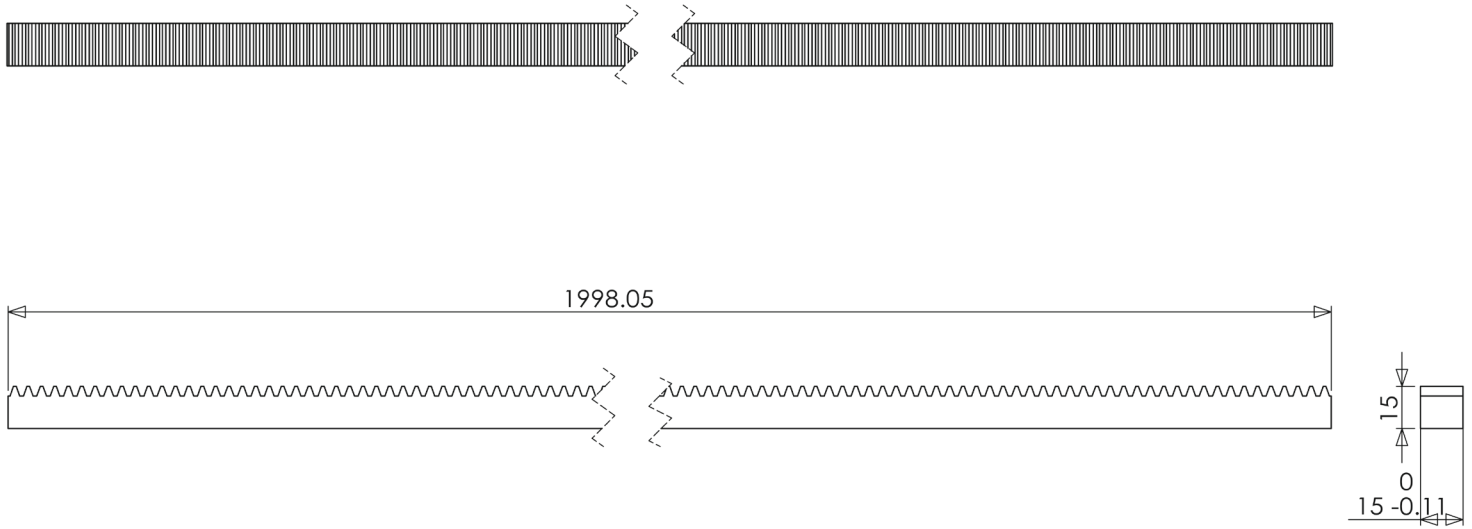
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 8 & STRAIGHT RACK - M:1.5



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	1.5	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	424T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-15-14.8-1998.05L-M1.5 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 8 & STRAIGHT RACK - M:1

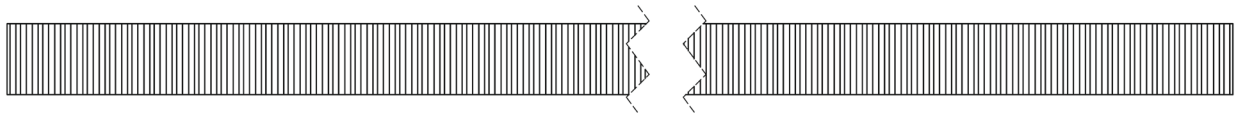


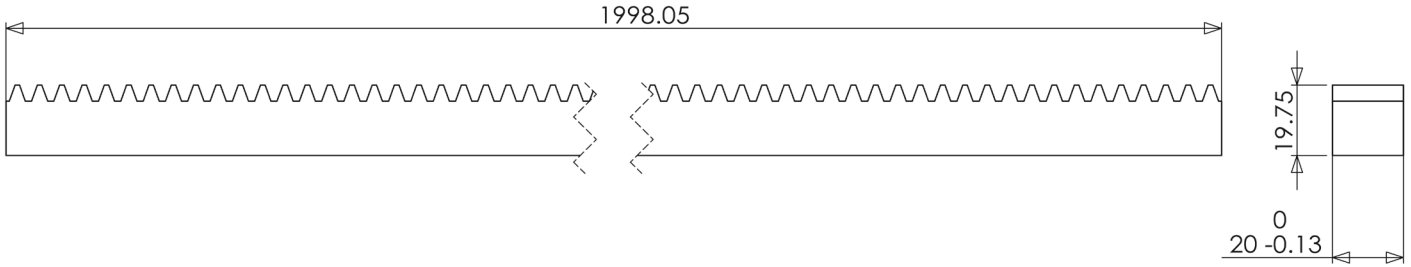
除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	1	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	636T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-15-15-1998.05L-M1 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

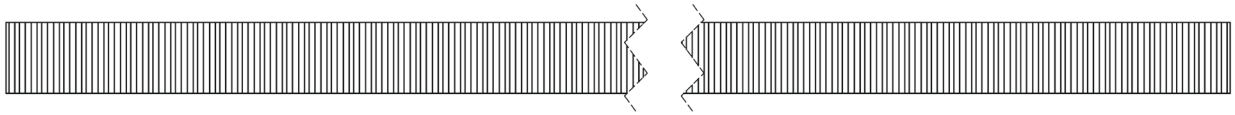
DIN 8 & STRAIGHT RACK - M:2

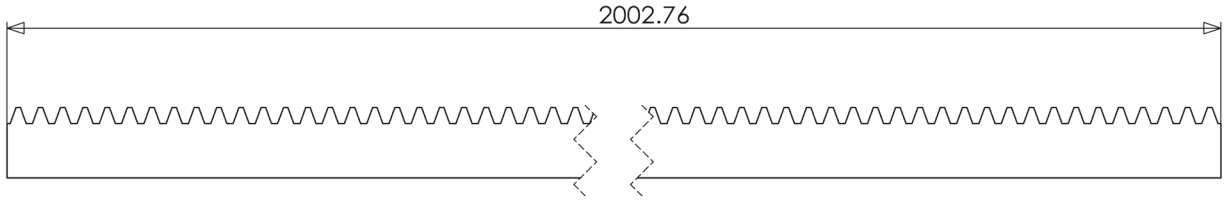


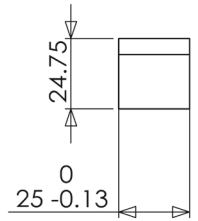


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	2	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	318T	檢查 CHK'D		Y.Y.C 原憶昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-20-19.75-1998.05L-M2 / 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 / 重量WEIGHT: / 圖頁 SHEET 1 OF 1

DIN 8 & STRAIGHT RACK - M:2.5





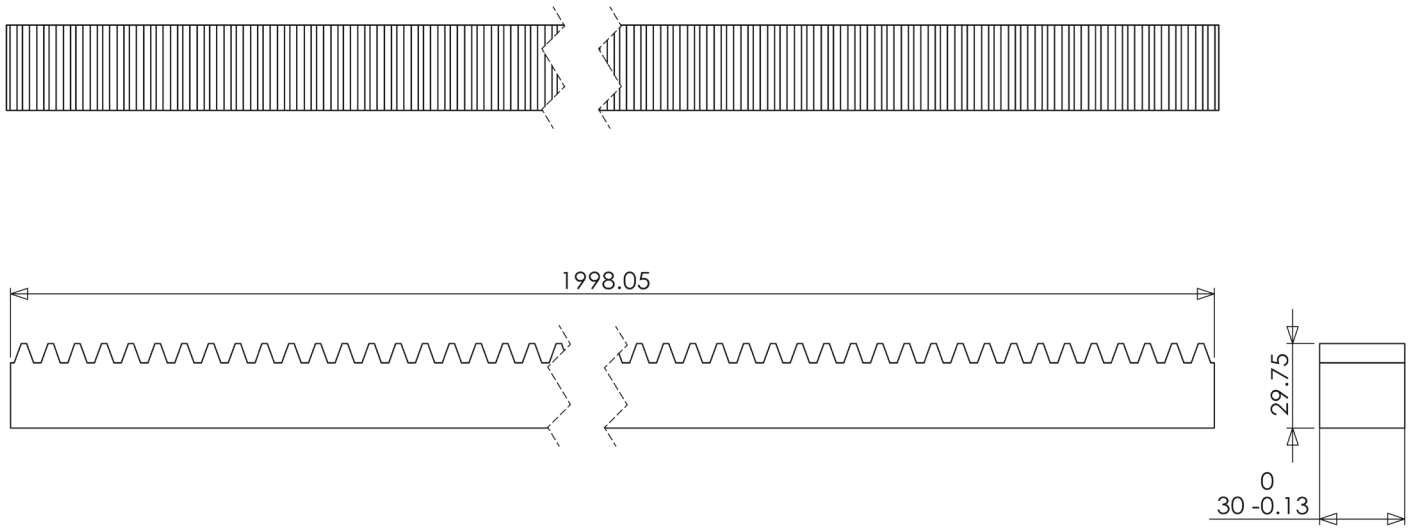


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	2.5	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	255T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-25-24.75-2002.76L-M2.5 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

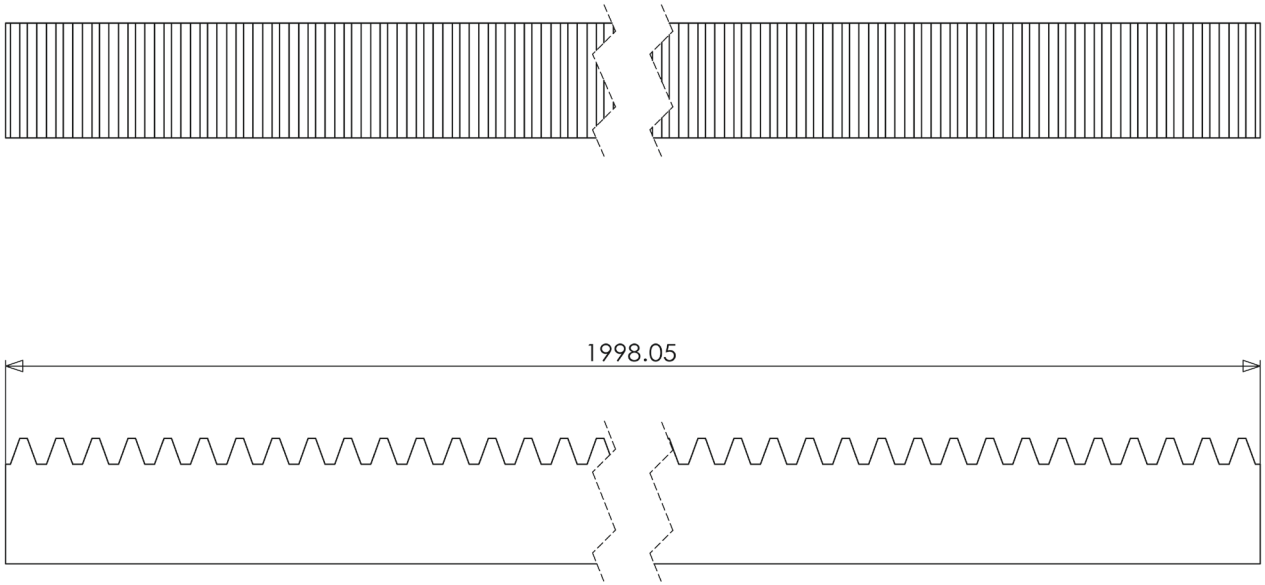
Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

DIN 8 & STRAIGHT RACK - M:3



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	3	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	212T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-30-29.75-1998.05L-M3 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

DIN 8 & STRAIGHT RACK - M:4

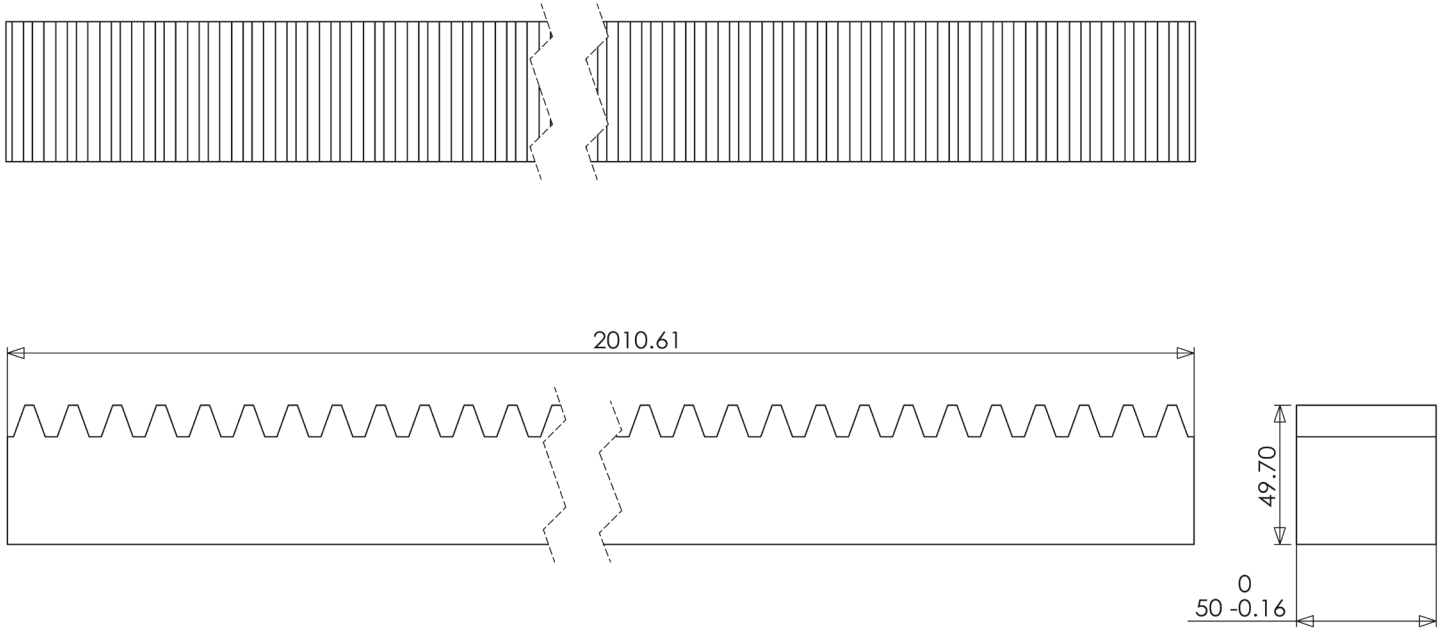


除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	4	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	159T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-40-39.7-1998.05L-M4 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

YYC

Web: www.endo.com.tr
Mail: satis@endo.com.tr
Tel: +90 232 433 85 15

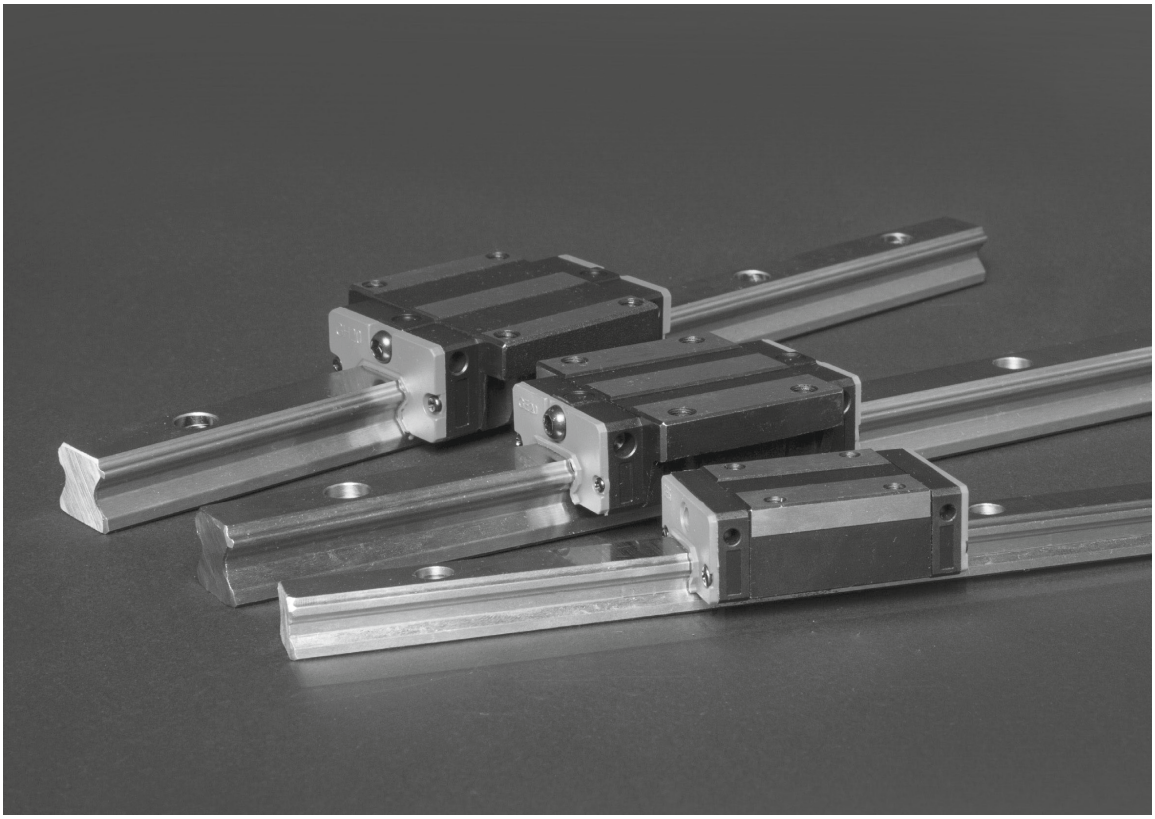
DIN 8 & STRAIGHT RACK - M:5



除非另有指定,否則毫米為單位 Unless specify,unit is mm 去除毛邊與銳角 DEBUR AND SHARP CUTTING EDGES 表面加工 SURFACE FINISH: 公差 TOLERANCES: 線性 LINEAR: 角度 ANGLE:	高週波Hardness	無 Not included	模數Module	5	繪製 DRAWN BY	YU MING 游銘	日期 DATE : 2013.11.05
	四面研磨Sides Ground	無 Not included	齒數Teeth No.	128T	檢查 CHK'D		Y.Y.C 原億昌機械股份有限公司 YUAN YI CHANG Machinery co.,Ltd.
	齒研 Teeth Ground	無 Not included	壓力角Pressure Angle	20°	核准 APPV'D		
	染黑Blackening	無 Not included	齒型Rack Type	Straight	製程 MFG		圖號DWGNO:CHTM-N-50-49.7-2010.61L-M5 版次 A
	精度等級 Precision Grade	DIN 8級 DIN Grade 8	材質Material	S45C	品管 Q.A		比例 SCALE 1:2 重量WEIGHT: 圖頁 SHEET 1 OF 1

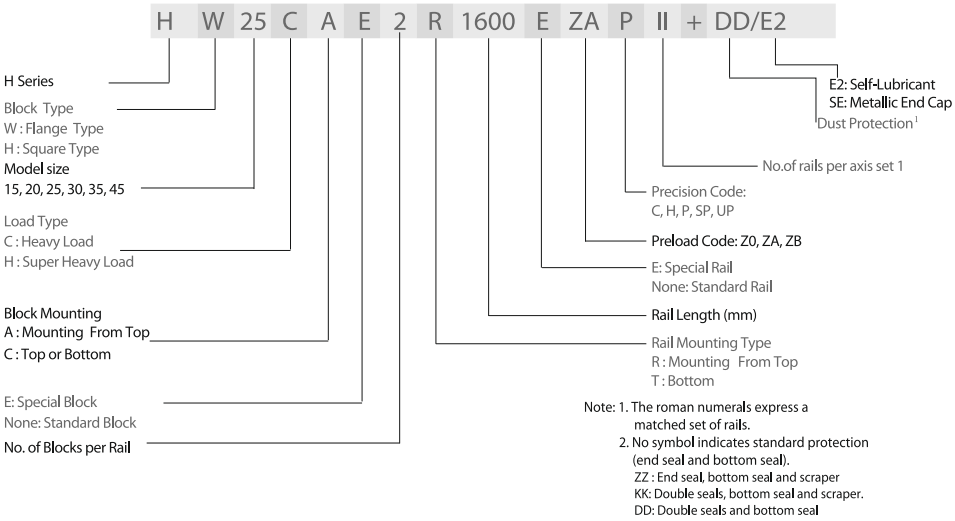
YYC

Linear Guideways



Linear Guideways - H Series

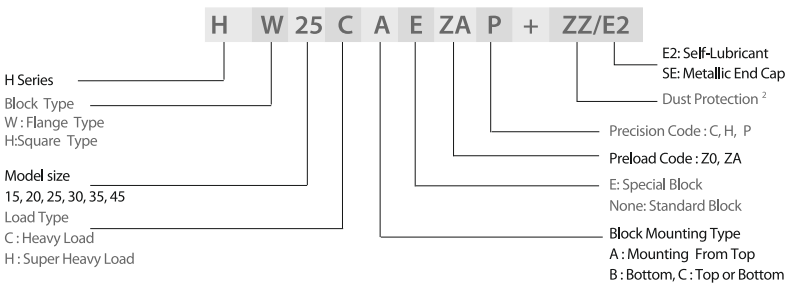
(1) Non-interchangeable type



Note: 1. The roman numerals express a matched set of rails.
2. No symbol indicates standard protection (end seal and bottom seal).
ZZ : End seal, bottom seal and scraper
KK: Double seals, bottom seal and scraper.
DD: Double seals and bottom seal

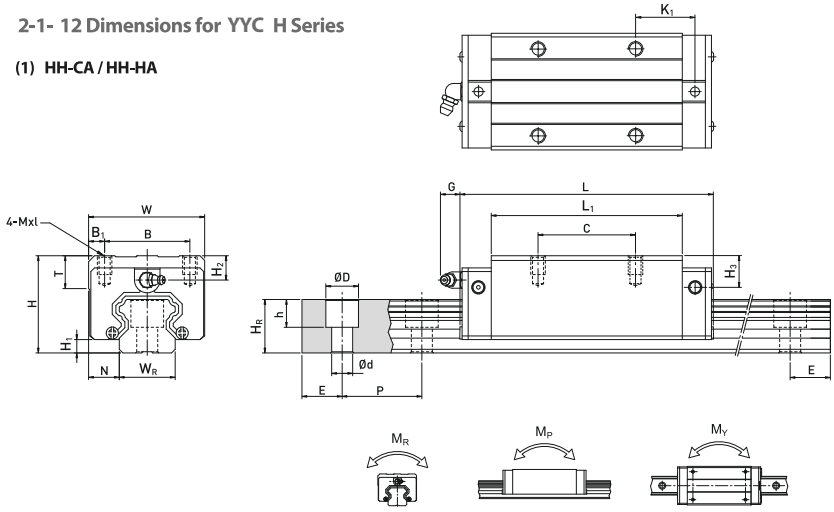
(2) Interchangeable type

- Model Number of H Block



2-1- 12 Dimensions for YYC H Series

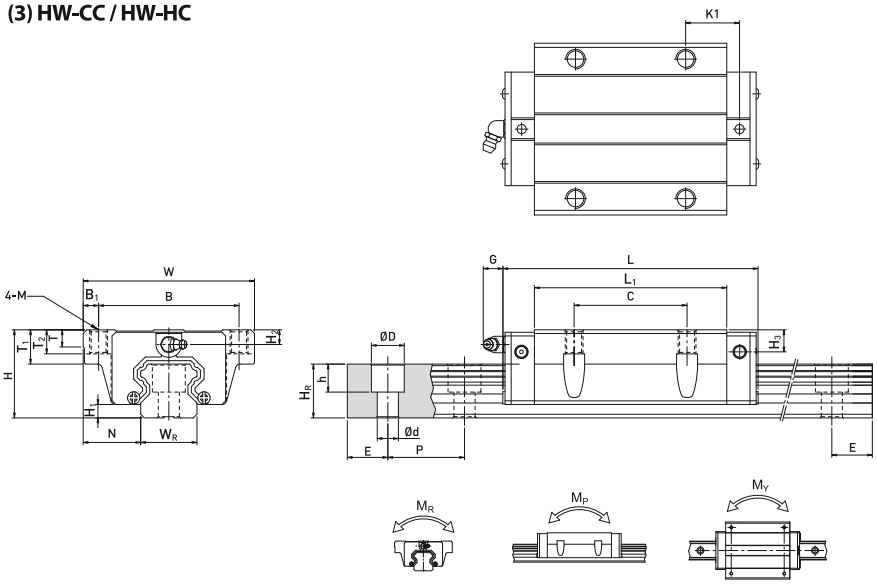
(1) HH-CA / HH-HA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)											Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	G	MxI	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C_0(kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
HH15CA	28	4.3	9.5	34	26	4	26	39.4	61.4	10	5.3	M4x5	6	7.95	7.7	15	15	7.5	5.3	4.5	60	20	M4x16	11.38	16.97	0.12	0.10	0.10	0.18	1.45
HH20CA	30	4.6	12	44	32	6	36	50.5	77.5	12.25	12	M5x6	8	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	17.75	27.76	0.27	0.20	0.20	0.30	2.21
HH20HA							50	65.2	92.2	12.6														21.18	35.9	0.35	0.35	0.35	0.39	
HH25CA	40	5.5	12.5	48	35	6.5	35	58	84	15.7	12	M6x8	8	10	9	23	22	11	9	7	60	20	M6x20	26.48	36.49	0.42	0.33	0.33	0.51	3.21
HH25HA							50	78.6	104.6	18.5														32.75	49.44	0.56	0.57	0.57	0.69	
HH30CA	45	6	16	60	40	10	40	70	97.4	20.25	12	M8x10	8.5	9.5	13.8	28	26	14	12	9	80	20	M8x25	38.74	52.19	0.66	0.53	0.53	0.88	4.47
HH30HA							60	93	120.4	21.75														47.27	69.16	0.88	0.92	0.92	1.16	
HH35CA	55	7.5	18	70	50	10	50	80	112.4	20.6	12	M8x12	10.2	16	19.6	34	29	14	12	9	80	20	M8x25	49.52	69.16	1.16	0.81	0.81	1.45	6.30
HH45CA	70	9.5	20.5	86	60	13	60	97	139.4	23	12.9	M10x17	16	18.5	30.5	45	38	20	17	14	105	22.5	M12x35	77.57	102.71	1.98	1.55	1.55	2.73	10.41

Note : 1 kgf = 9.81 N

(3) HW-CC / HW-HC



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)														Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	G	M	T	T_1	T_2	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(kN)	C_0 (kN)	M_R kN-m	M_P kN-m	M_Y kN-m	Block kg	Rail kg/m
HW15CC	24	4.3	16	47	38	4.5	30	39.4	61.4	8	5.3	M5	6	8.9	6.95	3.95	3.7	15	15	7.5	5.3	4.5	60	20	M4x16	11.38	16.97	0.12	0.10	0.10	0.17	1.45
HW20CC	30	4.6	21.5	63	53	5	40	50.5	77.5	10.25	12	M6	8	10	9.5	6	6	20	17.5	9.5	8.5	6	60	20	M5x16	17.75	27.76	0.27	0.20	0.20	0.40	2.21
HW20HC								65.2	92.2	17.6																21.18	35.9	0.35	0.35	0.35	0.52	
HW25CC	36	5.5	23.5	70	57	6.5	45	58	84	10.7	12	M8	8	14	10	6	5	23	22	11	9	7	60	20	M6x20	26.48	36.49	0.42	0.33	0.33	0.59	3.21
HW25HC								78.6	104.6	21																32.75	49.44	0.56	0.57	0.57	0.80	
HW30CC	42	6	31	90	72	9	52	70	97.4	14.25	12	M10	8.5	16	10	6.5	10.8	28	26	14	12	9	80	20	M8x25	38.74	52.19	0.66	0.53	0.53	1.09	4.47
HW30HC								93	120.4	25.75																47.27	69.16	0.88	0.92	0.92	1.44	
HW35CC	48	7.5	33	100	82	9	62	80	112.4	14.6	12	M10	10.1	18	13	9	12.6	34	29	14	12	9	80	20	M8x25	49.52	69.16	1.16	0.81	0.81	1.56	6.30
HW45CC	60	9.5	37.5	120	100	10	80	97	139.4	13	12.9	M12	15.1	22	15	8.5	20.5	45	38	20	17	14	105	22.5	M12x35	77.57	102.71	1.98	1.55	1.55	2.79	10.41

Note : 1 kgf = 9.81 N

Type Comparison Table For The Linear Guide

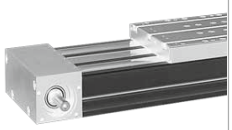
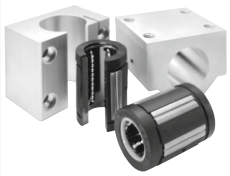
Type	YYC	HIWIN	THK	PMI	TBI	ABBA	STAF	CPC
HH Series	HH15CA	HGH15CA	HSR15R	MSA15S	TRH15VL	BRC15R0	BGXH15BN	HRC15MN
	HH20CA	HGH20CA	HSR20R	MSA20S	TRH20VL	BRC20R0	BGXH20BN	HRC20MN
	HH20HA	HGH20HA	HSR20LR	MSA20LS	TRH20VE	BRC20LR	BGXH20BL	HRC20ML
	HH25CA	HGH25CA	HSR25R	MSA25S	TRH25VN	BRC25R0	BGXH25BN	HRC25MN
	HH25HA	HGH25HA	HSR25LR	MSA25LS	TEH25VE	BRC25LR	BGXH25BL	HRC25ML
	HH30CA	HGH30CA	HSR30R	MSA30S	TRH30VN	BRC30R0	BGXH30BN	HRC30MN
	HH30HA	HGH30HA	HSR30LR	MSA30LS	TRH30VE	BRC30LR	BGXH30BL	HRC30ML
	HH35CA	HGH35CA	HSR35R	MSA35S	TRH35VN	BRC35R0	BGXH35BN	HRC35MN
	HH45CA	HGH45CA	HSR45R	MSA45S	TRH45VN	BRC45R0	BGXH45BN	HRC45MN
HW Series	HW15CA/C	HGW15CA/B/C	/	MSA15E/A	TRH15FN	BRC15A0	BGXH15FN	HRC15FN
	HW20CA/C	HGW20CA/B/C	HSR20CA/B	MSA20E/A	TRH20FN	BRC20A0	BGXH20FN	HRC20FN
	HW20HA/C	HGW20HA/B/C	HSR20HA/HB	MSA20LE/LA	TRH20FE	BRC20LA	BGXH20FL	HRC20FL
	HW25CA/C	HGW25CA/B/C	HSR25CA/B	MSA25E/A	TRH25FN	BRC25A0	BGXH25FN	HRC25FN
	HW25HA/C	HGW25HA/B/C	HSR25HA/HB	MSA25LE/LA	TRH25FE	BRC25LA	BGXH25FL	HRC25FL
	HW30CA/C	HGW30CA/B/C	HSR30CA/B	MSA30E/A	TRH30FN	BRC30A0	BGXH30FN	HRC30FN
	HW30HA/C	HGW30HA/B/C	HSR30HA/HB	MSA30LE/LA	TRH30FE	BRC30LA	BGXH30FL	HRC30FL
	HW35CA/C	HGW35CA/B/C	HSR35CA/B	MSA35E/A	TRH35FN	BRC35A0	BGXH35FN	HRC35FN
	HW45CA/C	HGW45CA/B/C	HSR45CA/B	MSA45E/A	TRH45FN	BRC45A0	BGXH45FN	HRC45FN
EH series	EH15CA	EGH15CA	SSR15WY/WMYSR15W/WM	MSB15S	TRS15VN	BRC15UO	BGXS15BN	ARC15MN
	EH20CA	EGH20CA	SSR20WY/WMY,SR20W/WM	MSB20S	TRS20VN	BRC20UO	BGXS20BN	ARC20MN
	EH25CA	EGH25CA	SSR25WY/WMY,SR25W/WM	MSB25S	TRS25VN	BRC25UO	BGXS25BN	ARC25MN
	EH30CA	EGH30CA	SSR30XWYWMY,SR30W/WM	MSB30S	TRS30VN	BRC30UO	BGXS30BN	ARC30MN
EW series	EW15CA/C	EGW15CA/B	SR15TB/TBM	MSB15E	TRS15FN	/	BGXS15FN	ARC15FN
	EW20CA/C	EGW20CA/B	SR20TB/TBM	MSB20E	TRS20FN	/	BGXS20FN	ARC20FN
	EW25CA/C	EGW25CA/B	SR25TB/TBM	MSB25E	TRS25FN	/	BGXS25FN	ARC25FN
	EW30CA/C	EGW30CA/B	SR30TB/TBM	MSB30E	TRS30FN	/	BGXS30FN	ARC30FN

NOTES:

Linear Systems

THOMSON®

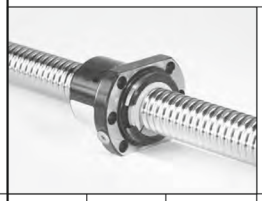
Linear Motion. ***Optimized.***™

Ball Screws	Ball Splines	Lead Screws	Linear Guides
Support Units	**Linear Bearings**	**Linear Motion Systems**	**Linear Ball Bushings**
			
Roundrail Linear Guides	**Clutches & Brakes**	**Linear Actuators**	**Lifting Systems**

Nuts for rolled ball screw shafts

See fold-out cover page for dimensions, form and drilling pattern

KGF-D (FK) style single nut



Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	D_1	D_4	D_5	D_6	L	L_m	L_1	L_3	L_7
d_0	P_h		D_w	g6			h13					h13
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
16	5	1	3.500	28	38	5.5	48	48.5	33	10	5.5	10
20	5	1	3.500	36	47	6.6	58	48.5	33	10	5.5	10
25	5	1	3.500	40	51	6.6	62	49	33	10	6	10
32	5	1	3.500	50	65	9	80	57	39	10	6	12
32	10	1	5.556	50	65	9	80	73	55	16	6	12
40	5	1	3.500	63	78	9	93	66	45	10	7	14
40	10	1	7.144	63	78	9	93	88.5	67.5	16	7	14
50	10	1	7.144	75	93	11	110	92	69	13	7	16
63	10	1	7.144	90	108	11	125	103.5	78.5	16	7	18
80	10	1	7.144	105	125	13.5	145	121	92	16	9	20

KGF-D (FH) style single nut

Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	D_1	D_4	D_5	D_6	L	L_m	L_1	L_3	L_7
d_0	P_h		D_w	g6			h13					h13
[mm]	[mm]		[mm]	[mm]	[MM]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
20	20	4	3.500	36	47	6.6	58	36	15	4	11	10
25	10	2	3.500	40	51	6.6	62	51	30.85	20.7	10.15	10
25	25	4	3.500	40	51	6.6	62	39	19	9	10	10
32	20	2	5.556	56	71	9	86	83	56	25	15	12
32	32	4	3.969	56	71	9	86	42	21	12	9	12
40	20	2	5.556	63	78	9	93	83	49.5	25	19.5	14
40	40	4	7.144	70	85	9	100	104	72,5	25	17,5	14
50	20	2	6.350	75	93	11	110	85	47	16	22	16
63	20	2	7.144	95	115	13.5	135	86	42	18	24	20

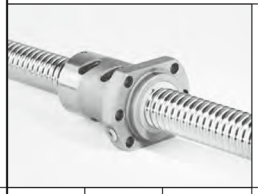
[1] Dimension does not comply with DIN 69051; [2] Lubrication bore located anywhere on the circumference; [3] No wiper; [4] Round flange

					Nut form	Drilling pattern	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
	L_8	D_B	L_B	L_{10}						C_{am}	C_{0am}
	h13										
	[mm]	[mm]	[mm]	[mm]				[mm]		[kN]	[kN]
	40	M6x1	5	8	S	1	EUS	0.041	3	9.5	10.9
	44	M6x1	5	8	S	1	EUS	0.041	3	11.5	15.5
	48	M6x1	5	8	S	1	EUS	0.041	3	13.1	20.2
	62	M6x1	6	8	S	1	EUS	0.041	4	19.3	36.3
	62	M6x1	6	8	S	1	EUS	0.065	3	26.4	39
	70	M8x1	7	10	S	2	EUS	0.041	5	26.3	59.2
	70	M8x1	7	10	S	2	EUS	0.084	4	64.9	109
	85	M8x1	8	9	S	2	EUS	0.084	4	66.4	134.3
	95	M8x1	9	10	S	2	EUS	0.084	5	93.8	229.7
	110	M8x1	10	10	S	2	EUS	0.084	6	121.9	374.9

					Nut form	Drilling pattern	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
	L_8	D_B	L_B	L_{10}						C_{am}	C_{0am}
	h13										
	[mm]	[mm]	[mm]	[mm]				[mm]		[kN]	[kN]
	44	M6x1	5	8	S	1	End cap	0.041	2.8	10.8	17.5
	48	M6x1	5	8	S	1	End cap	0.041	6.1	24.7	53.4
	48	M6x1	5	8	S	1	End cap	0.041	3.6	13.1	26.0
	65	M6x1	6	9	S	1	End cap	0.065	5.6	47.2	83.2
	68	M6x1	6	8	S	1	End cap	0.047	4	19.7	39
	70	M8x1	7	10	S	2	End cap	0.065	5.6	52.2	103.6
	75	M8x1	7	10	S	2	End cap	0.084	6.4	80.0	178.6
	85	M8x1	8	10	S	2	End cap	0.084	5.6	78.8	188.7
	100	M8x1	10	10	S	2	End cap	0.084	5.6	103.1	270.8

Nuts for rolled ball screw shafts

See fold-out cover page for dimensions, form and drilling pattern

Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	KGF-L(FL) style preloaded single nut								
												
d_0	P_h		D_w	D_1	D_4	D_5	D_6	L	L_m	L_1	L_3	L_7
				g6			h13					h13
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
16	5	1	3.500	28	38	5.5	48	55	39.5	10	5.5	10
20	5	1	3.500	36	47	6.6	58	68.5	53	10	5.5	10
25	5	1	3.500	40	51	6.6	62	69.5	53.5	10	6	10
32	5	1	3.500	50	65	9	80	83	65	10	6	12
32	10	1	5.556	50	65	9	80	105.5	87.5	16	6	12
40	5	1	3.500	63	78	9	93	97	76	10	7	14
40	10	1	7.144	63	78	9	93	142	121	16	7	14
50	10	1	7.144	75	93	11	110	144	121	16	7	16
63	10	1	7.144	90	108	11	125	166	141	16	7	18

Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	KGF-G(ZG) style single nut								
d_0	P_h		D_w	D_1	D_{11}	L	L_{11}	D_B	L_B	L_{10}	D_{13}	L_{13}
				h12								
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
12	4	1	2.000	25	M20x1	34	10	M6x1	5	through	-	-
16	5	1	3.500	32	M30x1.5	57.5	16.5	M6x1	10.5	through	4	22
20	5	1	3.500	38	M35x1.5	57.5	16.5	M6x1	10.5	through	4	22
25	5	1	3.500	42	M40x1.5	63.5	17	M6x1	10.5	through	4	23
25	10	2	3.500	42	M40x1.5	61	17	M6x1	10	through	4	21
32	5	1	3.500	52	M48x1.5	65.5	19	M6x1	10.5	through	5	23
32	10	1	5.556	52	M48x1.5	85	19	M6x1	12	through	5	43
40	5	1	3.500	58	M56x1.5	67.5	19	M8x1	12	through	5	22.5
40	10	1	7.144	65	M60x2	105.5	27	M8x1	13	through	6	43
40	20	2	5.556	65	M60x2	83	27	M6x1	10	through	6	33
50	10	1	7.144	78	M72x2	118	29	M8x1	13	through	6	53
63	10	1	7.144	92	M85x2	118	29	M8x1	13	through	6	53
80	10	1	7.144	120	M110x2	126	34	M8x1	15.5	through	8	53

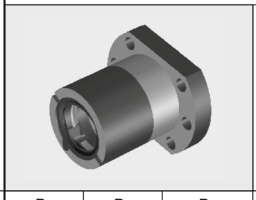
					Nut form	Drilling pattern	Return system	Preload force+	Number of loaded turns	Modified dynamic rated load	Modified static rated load
	L_8	D_B	L_B	L_{10}						C_{am}	C_{0am}
	h13										
	[mm]	[mm]	[mm]	[mm]				[kN]		[kN]	[kN]
	40	M6x1	5	8	S	1	EUS	0.67	2+2	6.7	7.2
	44	M6x1	5	8	S	1	EUS	1.15	3+3	11.5	15.5
	48	M6x1	5	8	S	1	EUS	1.26	3+3	12.6	19.1
	62	M6x1	6	9	S	1	EUS	1.93	4+4	19.3	36.4
	62	M6x1	6	8	S	1	EUS	2.64	3+3	26.4	39
	70	M8X1	7	10	S	2	EUS	2.63	5+5	26.3	59.2
	70	M8X1	7	10	S	2	EUS	6.49	4+4	64.9	109
	85	M8X1	8	10	S	2	EUS	6.64	4+4	66.4	134.3
	95	M8X1	9	10	S	2	EUS	9.38	5+5	93.8	229.7

	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
				C_{am}	C_{0am}
		[mm]		[kN]	[kN]
	EUS	0.024	3	3.8	4.3
	EUS	0.041	4	12.1	14.5
	EUS	0.041	4	14.8	20.7
	EUS	0.041	5	20.4	33.7
	MUS	0.041	6	19.9	31.8
	EUS	0.041	5	23.3	45.5
	EUS	0.065	4	33.8	52
	EUS	0.041	5	26.3	59.2
	EUS	0.084	5	78.6	136.2
	MUS	0.065	4	34.2	57.2
	EUS	0.084	6	97.8	213.2
	EUS	0.084	6	109.7	275.6
	EUS	0.084	6	121.9	375

[1] Dimension does not comply with DIN 69051
[2] Lubrication bore located anywhere on the circumference
[3] No wiper
[4] Round flange

Nuts for rolled ball screw shafts

See fold-out cover page for dimensions, form and drilling pattern

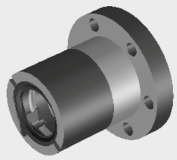
Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	KGF-D style single nut								
												
d_0	P_h		D_w	D_1	D_4	D_5	D_6	L	L_m	L_1	L_3	L_7
				g6			h13					h13
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
12	10	2	2.000	24	32	4.5	40	27.5	14.5	9.5	5	8
16	5	1	3.500	28	38	5.5	48	42	32	10	0	10
16	10	2	3.000	28	38	5.5	48	55	45	10	0	10
20	5	1	3.500	36	47	6.6	58	42	32	10	0	10
25	5	1	3.500	40	51	6.6	62	42	32	10	0	10
25	10	2	3.500	40	51	6.6	62	55	45	16	0	10
25	20	4	3.500	40	51	6.6	62	35	14.5	4	10.5	10
25	25	5	3.500	40	51	6.6	62	35	17	9	8	10
25	50	5	3.500	40	51	6.6	62	58	38	10	10	10
32	5	1	3.500	50	65	9	80	55	43	10	0	12
32	10	1	7.144	53 [1]	65	9	80	69	57	16	0	12
32	20	2	5.000	53 [1]	65	9	80	80	68	16	0	12
32	32	4	3.969	50	65	9	80	42	21	12	9	12
40	5	1	3.500	63	78	9	93	57	43	10	0	14
40	10	1	7.144	63	78	9	93	71	57	16	0	14
40	20	2	5.000	63	78	9	93	80	66	16	0	14
40	40	4	3.500	63	78	9	93	85	63.5	16	7.5	14
50	10	1	7.144	75	93	11	110	95	79	16	0	16
50	20	2	7.144	85 [1]	103 [1]	11	125	95	77	22	0	18
63	10	1	7.144	90	108	11	125	97	79	16	0	18
63	20	2	7.144	95	115	13.5	135	99	79	25	0	20

[1] Dimension does not comply with DIN 69051; [2] Lubrication bore located anywhere on the circumference; [3] No wiper; [4] Round flange

					Nut form	Drilling pattern	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
	L_8	D_B	L_B	L_{10}						C_{am}	C_{0am}
	h13										
	[mm]	[mm]	[mm]	[mm]				[mm]		[kN]	[kN]
	26	M5x0.8	4	6	S	3	End cap	0.024	4	4.9	8
	40	M6x1	5	10	E	1	EUS	0.041	3	9.3	13.1
	40	M6x1	5	10	E	1	Channel	0.041	6	15.4	26.5
	44	M6x1	5	10	E	1	Channel	0.035	3	10.5	16.6
	48	M6x1	5	10	E	1	EUS	0.041	3	12.3	22.5
	48	M6x1	5	10	E	1	Channel	0.041	3	13.2	25.3
	48	M6x1	5	8	S	1	End cap	0.041	4	13	23.3
	- [4]	M6x1	5	8	S	1	End cap	0.041	5	16.7	32.2
	48	M6x1	5	8	S	1	End cap	0.041	5	15.4	31.7
	62	M6x1	6	10	E	1	EUS	0.041	5	21.5	49.3
	62	M8x1	6	10	E	1	EUS	0.084	3	33.4	54.5
	62	M6x1	6	10	E	1	Channel	0.059	4	29.7	59.8
	62	M6x1	6	8	S	1	End cap	0.047	4	19.7	37.4
	70	M6x1	7	10	E	2	EUS	0.041	5	23.8	63.1
	70	M8x1	7	10	E	2	EUS	0.084	3	38	69.1
	70	M8x1	7	10	E	2	Channel	0.059	4	33.3	76.1
	- [4]	M8x1	7	10	S	2	End cap	0.041	8	35	101.9
	85	M8x1	8	10	E	2	EUS	0.084	5	68.7	155.8
	95	M8x1	9	10	E	2	Channel	0.084	4	60	136.3
	95	M8x1	9	10	E	2	EUS	0.084	5	76	197
	100	M8x1	10	10	E	2	Channel	0.084	4	78.4	171.3

Nuts for rolled ball screw shafts

See fold-out cover page for dimensions, form and drilling pattern

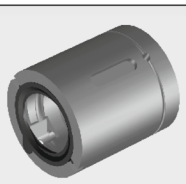
Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	KGF-N style single nut								
												
d_0	P_h		D_w	D_1	D_4	D_5	D_6	L	L_m	L_1	L_3	L_7
				g6			h13					h13
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
16	5	1	3.500	28	38	5.5	48	44	32	8	0	12
20	5	1	3.500	32	45	7	55	44	32	8	0	12
20	20	4	3.500	35	50	7	62	30	12	4	8	10
20	50	5	3.500	35	50	7	62	56	37	10	9	10
25	5	1	3.500	38	50	7	62	46	32	8	0	14
32	5	1	3.500	45	58	7	70	49	43	10	0	16
32	10	1	7.144	53	68	7	80	73	57	10	0	16
32	40	4	3.500	53	68	7	80	45	21.5	14	7.5	16
40	5	1	3.500	53	68	7	80	59	43	10	0	16
40	10	1	7.144	63	78	9	95	73	57	10	0	16
50	10	1	7.144	72	90	11	110	97	79	10	0	18
63	10	1	7.144	85	105	11	125	99	79	10	0	20
80	10	1	7.144	105	125	14	145	101	79	10	0	22

[1] Dimension does not comply with DIN 69051; [2] Lubrication bore located anywhere on the circumference; [3] No wiper; [4] Round flange

	L_8	D_B	L_B	L_{10}	Nut form	Drilling pattern	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
	h13									C_{am}	C_{0am}
	[mm]	[mm]	[mm]	[mm]				[mm]		[kN]	[kN]
	- [4]	M6x1	6	8	E	4	EUS	0.041	3	9.3	13.1
	- [4]	M6x1	6	8	E	4	EUS	0.041	3	10.5	16.6
	- [4]	M6x1	5	8	S	4	End cap	0.041	4	11.6	18.4
	- [4]	M6x1	5	8	S	4	End cap	0.041	5	13	24.6
	- [4]	M6x1	7	8	E	4	EUS	0.041	3	12.3	22.5
	- [4]	M6x1	8	8	E	4	EUS	0.041	5	21.5	49.3
	- [4]	M8x1	8	8	E	4	EUS	0.084	3	33.4	54.5
	- [4]	M6x1	8	10	S	4	End cap	0.041	4	14.9	32.4
	- [4]	M6x1	8	8	E	4	EUS	0.041	5	23.8	63.1
	- [4]	M8x1	8	8	E	4	EUS	0.084	3	38	69.1
	- [4]	M8x1	9	8	E	4	EUS	0.084	5	68.7	155.8
	- [4]	M8x1	10	8	E	4	EUS	0.084	5	76	197
	- [4]	M8x1	11	8	E	4	EUS	0.084	5	86.25	262.41

Nuts for rolled ball screw shafts

See fold-out cover page for dimensions, form and drilling pattern

Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	KGM-D style single nut														
													Nut form	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
d_0	P_h		D_w	D_1	L	L_3	D_B	L_B	L_9	L_{12}	B	T					C_{am}	C_{0am}
				g6							P9							
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			[mm]		[kN]	[kN]
12	10	2	2.000	24	27.5	5	2	7	8.75	10	3	1.8	S	End cap	0.024	4	4.9	8
16	5	1	3.500	28	34	-	3	7	7	20	5	2	E	EUS	0.041	3	9.3	13.1
16	10	2	3.000	28	50	-	3	7	15	20	5	2	E	Channel	0.035	6	15.4	26.5
20	5	1	3.500	36	34	-	3	7	7	20	5	2	E [2]	Channel	0.041	3	10.5	16.6
25	5	1	3.500	40	34	-	3	7	7	20	5	2	E	EUS	0.041	3	12.3	22.5
25	10	2	3.500	40	45	-	3	7.5	12.5	20	5	2	E	Channel	0.041	3	13.2	25.3
25	20	4	3.500	40	35	10.5	1.5	14	11.5	12	5	3	S	End cap	0.041	4	13	23.3
25	25	5	3.500	40	35	8	1.5	11.5	11	13	5	3	S	End cap	0.041	5	16.7	32.2
25	50	5	3.500	40	58	10	1.5	17	19	20	5	3	S	End cap	0.041	5	15.4	31.7
32	5	1	3.500	50	45	-	3	7.5	8	30	6	2.5	E	EUS	0.041	5	21.5	49.3
40	5	1	3.500	63	45	-	3	7.5	8	30	6	2.5	E	EUS	0.041	5	23.8	63.1
40	10	1	7.144	63	60	-	4	10	15	30	6	2.5	E	EUS	0.084	3	38	69.1
40	20	2	5.000	63	70	-	3	7.5	20	30	6	2.5	E	Channel	0.059	4	33.3	76.1
40	40	4	3.500	63	85	7.5	1.5	15	27.5	30	6	3.5	S	End cap	0.041	8	35	101.9
50	10	1	7.144	75	82	-	4	11	23	36	6	2.5	E	EUS	0.084	5	68.7	155.8
63	10	1	7.144	90	82	-	4	11	23	36	6	2.5	E	EUS	0.084	5	76	197
63	20	2	7.144	95	82	-	4	10	23	36	6	2.5	E	Channel	0.084	4	78.4	171.3

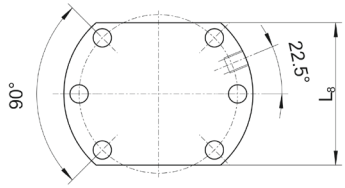
[1] Dimension does not comply with DIN 69051; [2] Lubrication bore located anywhere on the circumference; [3] No wiper; [4] Round flange

Nominal diameter	Lead	Number of threads on the shaft	Ball diameter	KGM-N style single nut									Nut form	Return system	Nominal axial backlash	Number of loaded turns	Modified dynamic rated load	Modified static rated load
d_0	P_h		D_w	D_1	L	L_3	D_B	L_B	L_9	L_{12}	B	T					C_{am}	C_{0am}
				g6							P9							
[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			[mm]		[kN]	[kN]
12	4	1	2.000	20	24	-	0	0	5	14	3	1.8	E [3]	Channel	0.024	3	4.9	6.6
12	5	1	2.000	20	24	-	0	0	5	14	3	1.8	E [3]	Channel	0.024	3	4.4	6.8
20	5	1	3.500	32	34	-	3	7	7	20	5	2	E	EUS	0.041	3	10.5	16.6
20	20	4	3.500	35	30	8	1.5	11.5	9	12	5	3	S	End cap	0.041	4	11.6	18.4
20	50	5	3.500	35	56	9	1.5	16	18	20	5	3	S	End cap	0.041	5	13	24.6
25	5	1	3.500	38	34	-	3	7	7	20	5	2	E	EUS	0.041	3	12.3	22.5
32	5	1	3.500	45	45	-	3	7.5	8	30	6	2.5	E	EUS	0.041	5	21.5	49.3
32	10	1	7.144	53	60	-	4	10	15	30	6	2.5	E	EUS	0.084	3	33.4	54.5
32	20	2	5.000	53	70	-	3	7.5	20	30	6	2.5	E	Channel	0.059	4	29.7	59.8
32	40	4	3.500	53	45	7.5	1.5	13	10	25	6	4	S	End cap	0.041	4	14.9	32.4
40	5	1	3.500	53	45	-	3	7.5	8	30	6	2.5	E	EUS	0.041	5	23.8	63.1
50	10	1	7.144	72	82	-	4	11	23	36	6	2.5	E	EUS	0.084	5	68.7	155.8
50	20	2	7.144	85	82	-	4	10	23	36	6	2.5	E	Channel	0.084	4	60	136.3
63	10	1	7.144	85	82	-	4	11	23	36	6	2.5	E	EUS	0.084	5	76	197
80	10	1	7.144	105	82	-	4	11	23	36	8	3	E	EUS	0.084	5	86.3	262.4

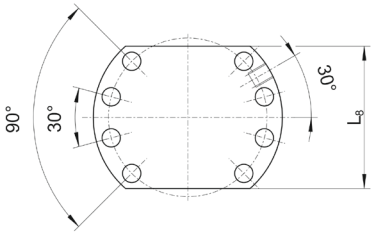
[1] Dimension does not comply with DIN 69051; [2] Lubrication bore located anywhere on the circumference; [3] No wiper; [4] Round flange

Dimensions, drilling patterns and forms of ball screw nuts

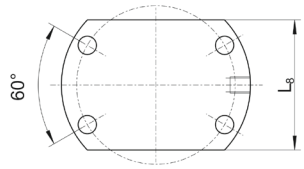
KGF-D, KGF-L nut styles: Drilling pattern 1



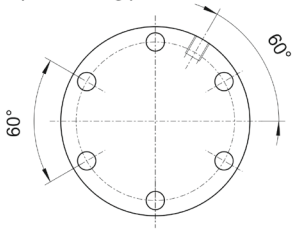
KGF-D, KGF-L nut styles: Drilling pattern 2



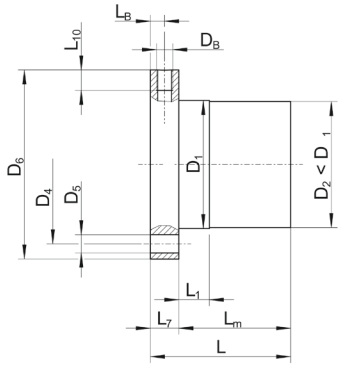
KGF-D nut styles: Drilling pattern 3



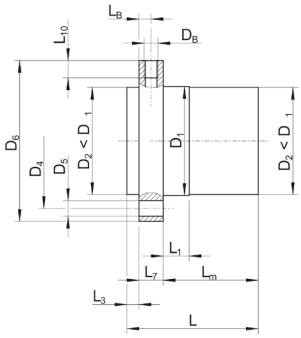
KGF-N nut styles: Drilling pattern 4



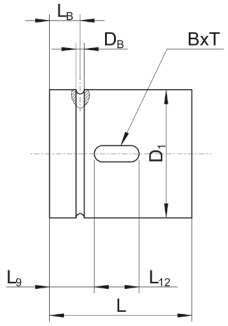
KGF-D, KGF-N nut styles: Form E



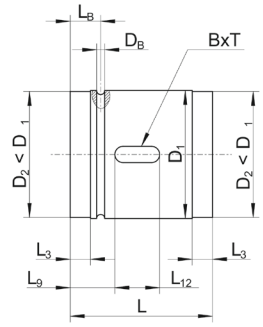
KGF-D, KGF-L, KGF-N nut styles: Form S



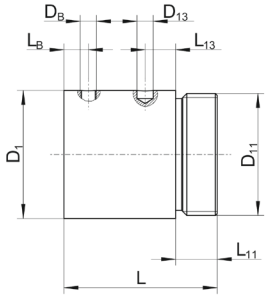
KGM-D, KGM-N nut styles: Form E



KGM-D, KGM-N nut styles: Form S



KGM-G (ZG) nut style



Sizing and selection

Critical speed of ball screws

With thin, fast-rotating screws, there is a danger of "whipping". The method described below allows the resonant frequency to be estimated assuming a sufficiently rigid assembly. Furthermore, speeds in the vicinity of the critical speed considerably increase the risk of lateral buckling. The critical speed is therefore included in the calculation of the critical buckling force.

Maximum permissible speed

(V) $n_{zul} = 0.8 \cdot n_{kr} \cdot f_{kr}$

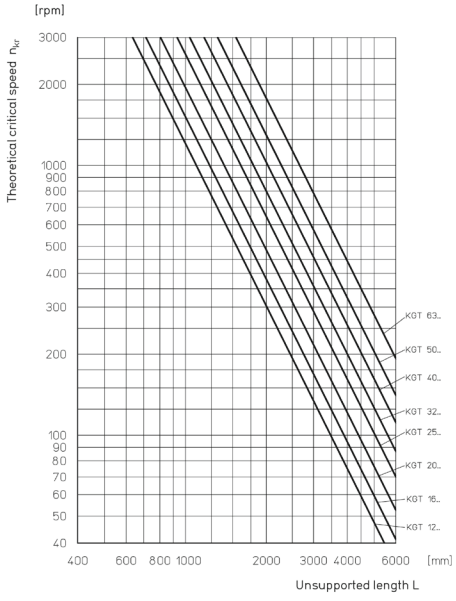
n_{zul} Maximum permissible speed [rpm]

n_{kr} Theoretical critical speed [rpm], that can lead to resonance effects ➔ see table

f_{kr} Correction factor, considering the bearing support of the screw. ➔ see table

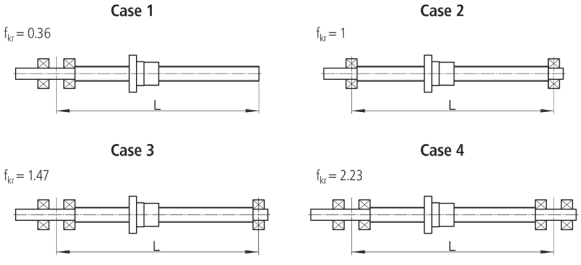
! The operating speed must not exceed 80 % of the maximum speed

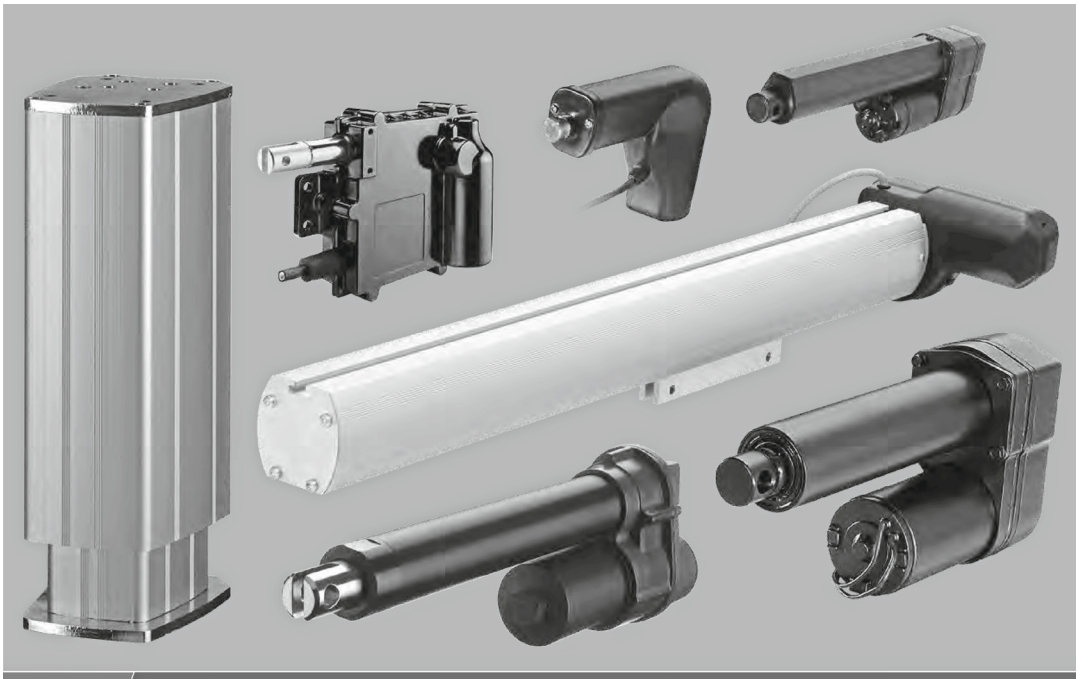
Theoretical critical speed n_{kr}



Bearing support

Typical values of correction factor f_{kr} corresponding to the usual cases of installation for standard screw bearings.





Linear Actuators

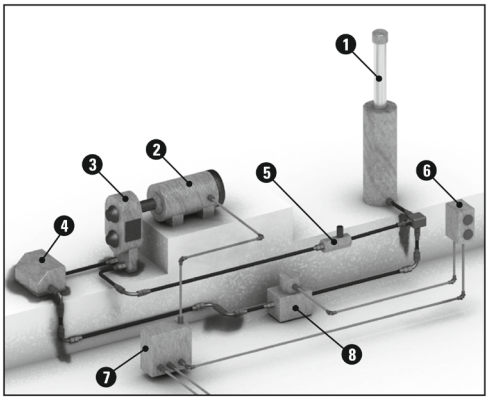
Linear actuators for industrial, mobile, medical, office and domestic applications.

THOMSON
Linear Motion. **Optimized.**

Introduction

The Benefits of Electrification

Replacing hydraulic or pneumatic cylinders with electrical linear actuators means a simpler and smaller installation, easier control, lower energy costs, higher accuracy, less maintenance, less noise and a cleaner, healthier environment.

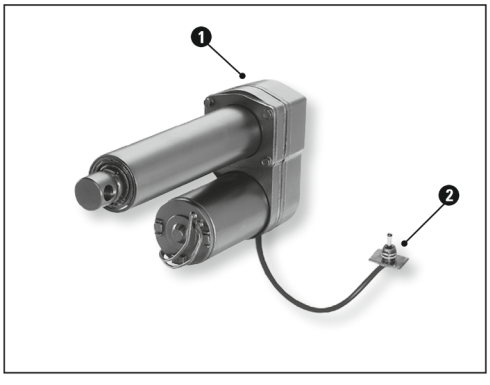


You can design, purchase and install all these components or you can select and install an actuator and control.

Single acting, uni-directional hydraulic cylinder system

1. Hydraulic cylinder
2. Electric pump motor
3. Hydraulic pump
4. Hydraulic oil resevoir
5. Check valve
6. Operator push button box
7. Relay cabinet
8. Unloading valve

This single acting, uni-directional hydraulic cylinder system is one of the simplest hydraulic solutions. This system only allows consistent performance in one direction. In order to get consistent performance in both directions a bi-directional system would be required which is even more complex and costly.



Plug and play type of connections, simple installation and no need for any set up or adjustments ensures accurate, clean and trouble free operation within the hour.

Electric linear actuator system

1. Linear actuator
2. DPDT switch

This simple electrical actuator system will ensure consistent operation in both directions. It will also give you added features such as electronic load monitoring, end of stroke limit switches, mid stroke protection and manual override operation in case of power failure. Optional features such as analog or digital position feedback, adjustable end of stroke limit switches, end of stroke indication outputs and signal following capability are also available. Another advantage is that a system like this is easy to integrate with other control systems normally found in industrial systems or vehicles such as PLC's, micro-controllers, computers or simple relay based systems.

Introduction

Actuator Applications

Thomson Electrak actuators can be found in the most diverse applications, ranging from agricultural to industrial, ventilation and medical equipment. Anywhere you want to lift, lower, push, pull, rotate or position a load - only your imagination will set the limit.

Mobile-off-highway
Actuators are widely used in agricultural, construction, mining, forestry, road work and railway equipment for the control of seats, hoods, doors, covers, balers, pantographs, sprayer booms, throttles and much more.

Turf and garden
Actuators can be found on riding lawn mowers, golf carts, garden tractors, cleaning machines, sky lifts and other utility vehicles.

Industrial equipment
Actuators are used on conveyor belts, for adjustable work tables/platforms and in the opening and closing of hatches, doors and locks. They are also common in machines for dispensing, cutting, packaging, labeling, scanning or printing.

Health and fitness
Actuators are commonly used in patient lifts/beds, handicap adapted vehicles and wheel chairs to position patients or equipment. Other applications include hospital devices, examination chairs/tables and work out/gym apparatus.

Office, domestic and entertainment equipment
At home, in the office and in the entertainment business actuators are used in automatic doors, lifts, garage doors, gates, satellite dishes, beds, reclining chairs, adjustable office desks, arcade games, vending machines, theatre/TV/movie props and theme park attractions.

Marine
On boats, ships and oil rigs actuators are used in seats, hatches, fire doors, rescue equipment, valves and throttles.

Ventilation and process control
Actuators are used for valve control in ventilation and process equipment.

Performance Overview

Standard Rod Actuator Range

	ROD ACTUATORS					
	E 1	E 1SP	E 050	E PPA-DC	E 10	E LA14
Product availability						
North America / Europe / Asia [1]	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	/•/•
General performance						
Product group rating	good	good	better	good	better	best
Input voltage - Vdc / Vac [V]	12, 24, 36[2] /	12, 24, 36[2] /	12, 24, 36/	12, 24, 36, 90[3] /	12, 24, 36/	12, 24, 36 /
Maximum dynamic load [N]	340	340	500	6670	6800	6800
Maximum speed [mm/s]	75	75	48	33	60	60
Maximum stroke length [mm]	150	150	200	914	610	600
Restraining torque [Nm]	2,3	0	0	23	12	0
Protection class	IP65	IP65	IP56	IP52	IP65	IP65
Features						
Mounting configuration	clevis	clevis	clevis	trunnion	clevis	clevis/ trunnion
Screw type - acme / worm / ball	•/ /	•/ /	/•/	/ /•	•[2] / /•	•/ /•
Overload clutch			•	•	•	•
Motor overload protection	•	•	•	•	•	•
End of stroke limit switches	•		•			
Potentiometer feedback		•				
Dynamic braking			•[6]			
Optional features						
End of stroke limit switches				•	•[3]	
Potentiometer feedback			•	•	•	•
Encoder feedback				•		
External adjustable magnetic sensors						•
Manual override				•[3]	•	•
More information						
See page[1]	16	18	20	22	24	26
Actuator Controls						
Recommended control	AC-247 ELS	AC-247 ELS	DCG-150	AC-063	AC-063	AC-063

[1] Products not available in this region are not further described in this catalog. Contact customer support for more information.
[2] Not available in North America. [3] Not available in Europe. [4] For horizontal operation only.
[5] For vertical operation only. [6] At end of stroke only. [7] Trapezoidal screw.

Can't find what you are looking for?
Thomson is the industry leader in custom actuator design. If you do not find the right product for your application within our standard range, please contact customer service at Phone +46 (0)44 24 67 90 for a customized solution.

Performance Overview

Standard Rod Actuator Range

ROD ACTUATORS				
	E 5	E LA24	E THROTTLE	MAX JAC
Product availability				
North America / Europe / Asia [1]	•/•/•	/•/•	•/•/•	•/•/•
General performance				
Product group rating	better	best	best	best
Input voltage - Vdc / Vac [V]	/ 115[3], 230, 400[2]	/ 230, 400	12, 24	12, 24
Maximum dynamic load [N]	6800	6800	130	800
Maximum speed [mm/s]	60	60	96	60
Maximum stroke length [mm]	610	600	50.8	300
Restraining torque [Nm]	12	0	0	2
Protection class	IP45	IP45	IP67/IP69K	IP66/IP69K
Features				
Mounting configuration	clevis	clevis/trunnion	integrated	clevis
Screw type - acme / worm / ball	•[2] / /•	•/ /•	/•/	/•/•
Overload clutch	•	•	•	
Motor overload protection	•	•	•	
End of stroke limit switches				
Potentiometer feedback				•
Dynamic braking				
Optional features				
End of stroke limit switches	•[3]		•	
Potentiometer feedback	•	•	•	•
Encoder feedback				•
External adjustable magnetic sensors		•		
Manual override	•	•		
More information				
See page[1]	28	30	32	34
Actuator Controls				
Recommended control	DPDT Switch	DPDT Switch	DPDT, CanBus	upon request

Can't find what you are looking for?
Thomson is the industry leader in custom actuator design. If you do not find the right product for your application within our standard range, please contact customer service at Phone +46 (0)44 24 67 90 for a customized solution.

Performance Overview

Lifting Columns

		LIFTING COLUMNS				
		LC1600	LC2000	LC3000	DMD	DMA
Product availability						
North America / Europe / Asia [1]		•/•/•	•/•/•	•/•/•	•/•/•	•/•/•
General performance						
Product group rating		best	best	best	better	better
Input voltage - Vdc / Vac	[V]	24	24	24	12, 24, 36 /	/ 115[3], 230, 400[2]
Maximum dynamic load	[N]	1600	2000	3000	6800	6800
Maximum speed	[mm/s]	11	19	8	60	60
Maximum stroke length	[mm]	400	600	400	610	610
Restraining torque	[Nm]	0	0	0	0	0
Protection class		IP44	IP44	IP44	IP65	IP45
Features						
Mounting configuration		base mount	base mount	base mount	base mount	base mount
Screw type - acme / worm / ball		•/ /	telescopic	/ /•	•/ /•	•/ /•
Overload clutch					•	•
Motor overload protection					•	•
End of stroke limit switches		•	•	•		
Potentiometer feedback						
Dynamic braking		•				
Optional features						
End of stroke limit switches						
Potentiometer feedback					•[2]	•[2]
Encoder feedback		•	•	•		
External adjustable magnetic sensors						
Manual override						
More information						
See page[1]		36	38	40	42	44
Actuator Controls						
Recommended control		DCG-154	DCG-180	DCG-180	AC-063	DPDT Switch

[1] Products not available in this region are not further described in this catalog. Contact customer support for more information.
[2] Not available in North America. [3] Not available in Europe. [4] For horizontal operation only.
[5] For vertical operation only. [6] At end of stroke only. [7] Trapezoidal screw.

Can't find what you are looking for?
Thomson is the industry leader in custom actuator design. If you do not find the right product for your application within our standard range, please contact customer service at Phone +46 (0)44 24 67 90 for a customized solution.

Performance Overview

Rodless Actuators

RODLESS ACTUATORS			
	LM80-H	**LM80-V**	**LM80-I**
Product availability			
North America / Europe / Asia [1]	• / • / •	• / • / •	• / • / •
General performance			
Product group rating	better	better	better
Input voltage - Vdc / Vac [V]	12, 24 /	12, 24 /	12, 24 /
Maximum dynamic load [N]	2000[4]	2000[5]	2000[5]
Maximum speed [mm/s]	110	110	110
Maximum stroke length [mm]	1500	1500	1500
Restraining torque [Nm]	0	0	0
Protection class	IP44	IP44	IP44
Features			
Mounting configuration	T-slot	T-slot	T-slot
Screw type - acme / worm / ball	•[7] / / •	•[7] / / •	•[7] / / •
Overload clutch			
Motor overload protection			
End of stroke limit switches			
Potentiometer feedback			
Dynamic braking			
Optional features			
End of stroke limit switches			
Potentiometer feedback			
Encoder feedback			
External adjustable magnetic sensors			
Manual override	•	•	•
More information			
See page[1]	46	48	50
Actuator Controls			
Recommended control	DCG-170	DCG-160	DCG-160

Can't find what you are looking for?
Thomson is the industry leader in custom actuator design. If you do not find the right product for your application within our standard range, please contact customer service at Phone +46 (0)44 24 67 90 for a customized solution.

Performance Overview

Legacy Actuators

	LEGACY ACTUATORS			
	E 1SL	**E 150**	**E100**	**E Pro**
Product availability				
North America / Europe / Asia	•/ /	•/•/•	•/ /	•/•/•
General performance				
Input voltage - Vdc / Vac [V]	12, 24 /	12, 24, 36 / 115[1]	24 /	12, 24 /
Maximum dynamic load [N]	340	2000	6800	4500
Maximum speed [mm/s]	76	71	48	51
Maximum stroke length [mm]	152	406	609	300
Restraining torque [Nm]	0	0	12	17 / 0[2]
Protection class	IP65	IP56	IP65	IP66 (67)
Standard features				
Mounting configuration	clevis	clevis	tube	clevis
Screw type - acme / worm / ball	•/ /	/•/	/ /•	•/ /•
Motor overload protection		•	•	•
Potentiometer feedback			•	•
Fixed end of stroke limit switches	•			
Adjustable end of stroke limit switches			•	•
Internally restrained	•	•		
Electronic load monitoring				•
Dynamic braking				•
Manual override				•
Optional features				
Adjustable end of stroke limit switches		•		
Potentiometer feedback		•		•
Encoder feedback				•
Programmable limit switches				•
End of stroke indication outputs				•
Low voltage power switching				•
Signal follower input				•

[1] Not available in Europe. [2] Without/with anti-rotation option.

About Legacy Actuators

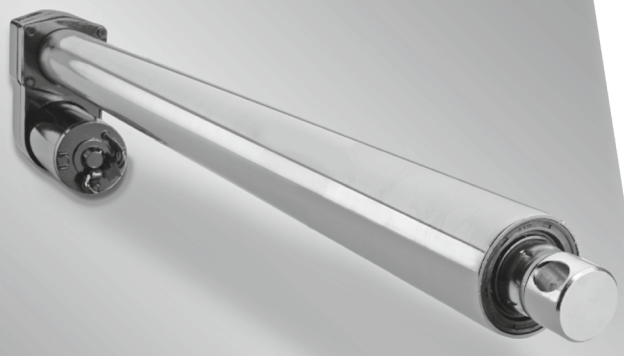
The legacy products will not be further described in this catalog. We recommend you choose one of the products on the preceding pages, especially when designing new equipment. However, the legacy actuators can still be purchased and we fully support them. Please contact customer support if you need more information.

About Custom Actuators

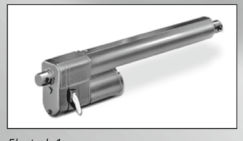
The actuators you see on these pages are some of the building blocks we use to create cost effective custom actuators for OEMs. If you can't find the actuator that meets your needs, call customer service for a custom solution. Thomson is the industry leader in custom actuator design.

ELECTRAK® MARINE ACTUATORS

www.DanaherMotion.com

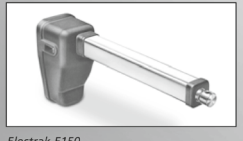


Electrak E050



Electrak 1

Electrak 10



Electrak E150

Features & Benefits

- Compact size
- Operates off 12 or 24 VDC boat battery for versatility
- Draws power only when load is being moved for high efficiency
- Holds load with power off for safety
- Stroke lengths from 2 to 24 inches
- Load ratings from 25 to 1500 lbs.
- Ball or acme screw drives for high or moderate load ratings
- Built-in brakes on ball bearing screw models to prevent back driving
- Weather protection seals & gaskets
- Ignition protected motors per Coast Guard requirements on selected designs
- Overload protection
- Lifetime lubrication gearbox - no maintenance

Danaher Motion offers a complete line of Electrak linear actuators and controls to provide the boat and marine manufacturer with an ideal source for push-pull power on watercraft. Our Electrak linear actuators are well suited for the marine industry due to their compact size, 12 or 24 VDC operation, high efficiency and broad load capabilities.

The full range of Electrak actuators offer users complete control of every aspect of a boat's operation electrically, without the complication, high cost, and maintenance associated with hydraulic systems. Electrak actuators are easy to install with clevis mounting and eliminate the need for hoses, pumps, filters, regulators, and periodic maintenance.

THOMSON™

Solutions by DANAHER MOTION

Ideal for Power Boats and Sailcraft: Electrak linear actuators find extensive use on power boats and sailcraft – all with the push of a button.

Typical Applications:

- Raising, lowering, holding hatch covers
- Boom control when raising or lowering the mainsail
- Opening, closing, holding windows
- Downhaul control
- Raising and lowering trailer hitches
- Seat positioning

	Electrak 050	Electrak 1	Electrak 2		Electrak 10		Electrak 150
Load Capacity	25, 50, 112	25, 75	250	250	500, 1000, 1500	500, 1000, 1500	110, 225, 450
Stroke Length	2, 4, 6, 8	2, 4, 6	4,8,12,18,24	12, 18, 24	4,8,12,18,24	12, 18, 24	1, 2, 4, 6, 8, 10, 12, 14, 16
Type of Screw	Acme	Acme	Acme	Acme	Ball	Ball	Acme
Load Limiting Clutch	Yes	No	Yes	Yes	Yes	Yes	No
Limit Switches Stroke Standard	Fixed End of Stroke Standard	Fixed	No MCS-2007 Control	No	No	No	Optional Adjustable End of Stroke
Motor Overload Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restraining Torque (max)	None - Internally Restrained	20 lb. in	100 lb. in	100 lb. in	100 lb. in	100 lb. in	None - Internally Restrained
Optional Controls	DPDT switch	DPDT switch	DPDT switch	DPDT switch	DPDT switch	DPDT switch	DPDT switch
Ignition Protected Motor	No	No	Optional	Yes	Optional	Yes	No
Cover Tube	Plastic	Painted Aluminum	Painted Steel	Stainless Steel	Painted Steel	Stainless Steel	Anodized Aluminum
Environment	IP56	Washdown w/ 96 hour salt spray test rating	Washdown w/ 96 hour salt spray test rating	Washdown w/ 96 hour salt spray test rating	Washdown w/ 96 hour salt spray test rating	Washdown w/ 96 hour salt spray test rating	IP56

THOMSON™

Solutions by DANAHER MOTION

DANAHER MOTION is a trademark.

Danaher Motion makes every attempt to ensure accuracy and reliability of the specifications in this publication. Specifications are subject to change without notice. Danaher Motion provides this information "AS IS" and disclaims all warranties, express or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose. It is the responsibility of the product user to determine the suitability of this product for a specific application.

©2004 Danaher Motion. Supplier XK KP 8-18-04 200407-05.qxd AIEI-02.140-081104-X

FOR IMMEDIATE ASSISTANCE:

Internet: www.DanaherMotion.com

In USA, Canada or Mexico:
Phone: 1-540-633-3400
Fax: 1-540-639-4162
E-mail: DMAC@danahermotion.com
Literature: litrequest@danahermotion.com
or write: Danaher Motion, 203A West Rock Road, Radford, VA 24141 USA

In UK:
Phone: 0800 975 1000
Sales Fax: 0800 975 1001
E-mail: LMSEurope@danahermotion.com
or write: Danaher Linear Motion Systems, Fishleigh Road, Roundswell Business Park, Barnstaple, EX31 3UD UK

Catalogue request: catalogues@danahermotion.com

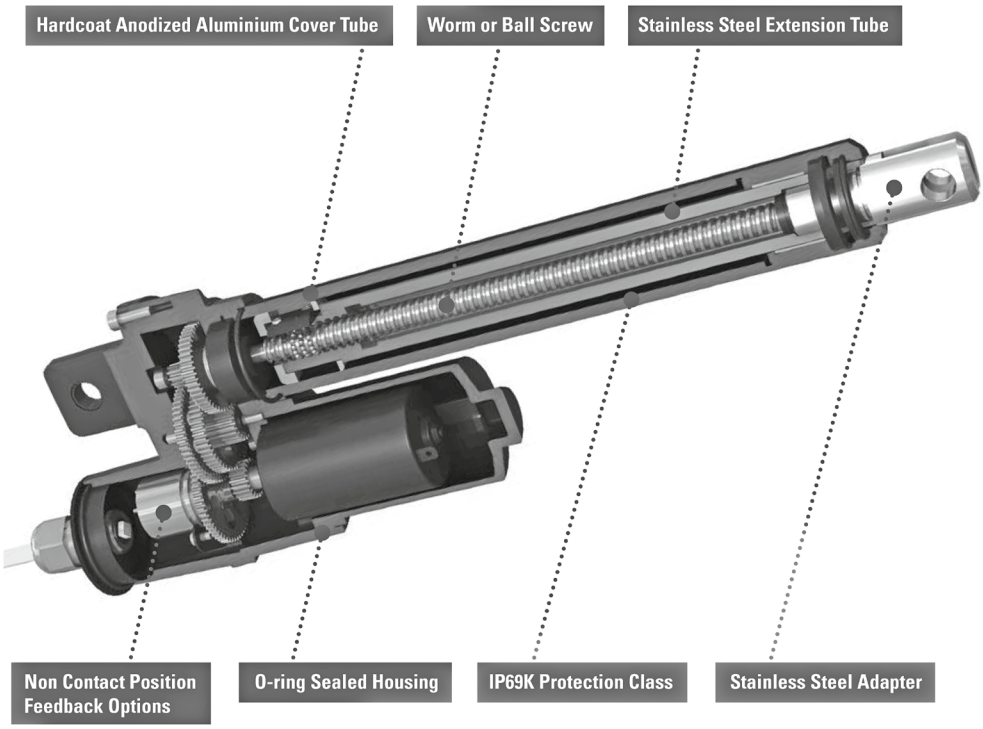
In Europe:
Phone: +46 (0) 44 24 67 00
Fax: +46 (0) 44 24 40 85
E-mail: helpdesk@tollo.com
or write: Danaher Motion, Tollo Linear AB, Box 9053, SE-291 09 Kristianstad Sweden

or
Phone: +49 (0) 70 22 504-0
Fax: +49 (0) 70 22 541-68
or write: Danaher Linear GmbH, Nürtinger Strasse 70, D-72649 Wolfschlugen Germany

Elsewhere:
Phone: 1 (516) 883-8937
Fax: 1 (516) 883-7109

Tough, Tougher, Max Jac® ...

State of the art technology and the best materials available make the Max Jac strong and reliable within a lightweight package. The Max Jac has undegone rigorous testing throughout the entire development process to ensure that it will deliver trouble free operation, long life, and outstanding performance in demanding environments.



Max Jac Main Features

- Long life
- Reliability
- High speed
- High efficiency
- Small envelope
- Minimal backlash
- Vibration resistant
- Duty cycle up to 100%
- Short total length versus stroke
- High degree corrosion protection
- High accuracy position feedback options

Specifications

Standard Features and Benefits

- Designed for industrial applications
- Rugged aluminum housing with IP69K
- High efficiency
- Long life
- Hard coat anodizing for high corrosion resistance
- Virtually maintenance free
- Worm or ball screw models
- Non contact analog position feedback signal

General Specifications

Parameter	Max Jac
Screw type	worm or ball
Internally restrained	no
Manual override	no
Dynamic braking	no
Self locking worm screw models ball screw models	 yes no
End of stroke protection	no
Mid stroke protection	no
Motor protection	no
Motor connection	flying leads or cable with connector
Motor connector	AMP Superseal Series 1,5
Certificates	CE
Options	Encoder position feedback

Performance Specifications

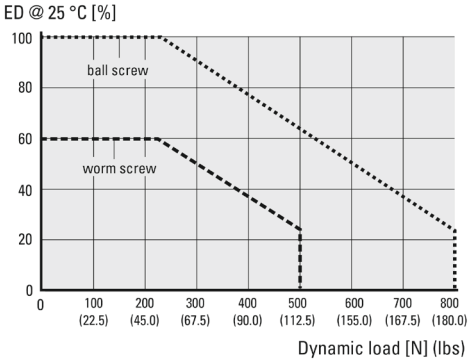
Parameter		Max Jac
Maximum load, dynamic / static MX • • W (worm screw) MX • • B (ball screw)	[N]	 500 / 2000 800 / 100 - 350 [1]
Speed, at no load / at maximum load MX • • W (worm screw) MX • • B (ball screw)	[mm/s]	 33 / 19 60 / 30
Available input voltages	[VDC]	12, 24
Standard stroke lengths	[mm]	50,100,150 200, 250 [2], 300 [2]
Operating temperature limits	[°C]	-40 to +85
Full load duty cycle @ 25 °C	[%]	25
End play, maximum	[mm]	0,3
Restraining torque	[Nm]	2
Lead cross section	[mm²]	1
Standard cable lengths	[mm]	300, 1600
Protection class		IP66/IP69K
Salt spray resistance	[h]	500
Life	[cycles]	500000 [3]
Analog position feedback signal	[VDC]	0,5 - 4,5
Encoder position feedback option Supply voltage Pulses per mm, worm / ball screw Channels	 [VDC]	 5 9,86 / 5,84 A, B

[1] The static force (i.e. the backdriving force) for a ball screw unit varies and is dependant on the number of cycles it have been running and at wich loads.

[2] Strokes possible for ball screw models only.

[3] For ball screw actuator with 100 mm stroke, average load of 500 N and changing load direction.

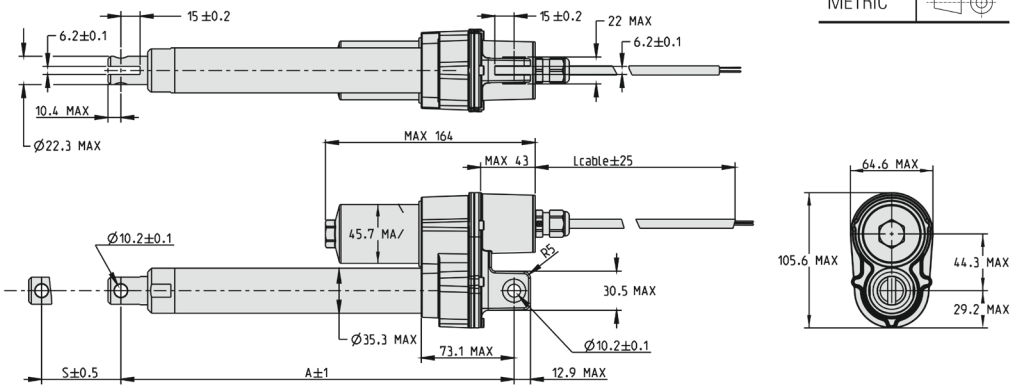
Duty Cycle vs. Load



THOMSON

Dimensions, Performance and Ordering Key

Dimensions	Projection
METRIC	

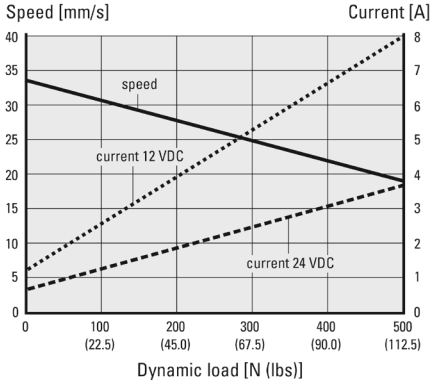


Stroke (S)	[mm (inch)]	50 (1.97)	100 (3.94)	150 (5.91)	200 (7.87)	250 (9.84) *	300 (11.81) *
Retracted length (A)	[mm (inch)]	206 (8.11)	256 (10.08)	306 (12.05)	356 (14.02)	406 (15.98)	456 (17.95)
Weight	[kg]	1,5	1,7	1,9	2,1	2,2	2,4

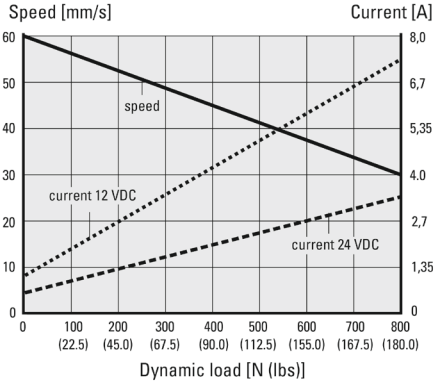
* Strokes possible for ball screw models only.

Performance Diagrams

Worm Screw Models (MX • • W)



Ball Screw Models (MX • • B)



Ordering Key

Position	1	2	3	4	5
Example	MX12-	B8	M15	P	1

1. Actuator type and supply voltage
MX12- = Max Jac 12 VDC
MX24- = Max Jac 24 VDC

2. Max. dynamic load, screw type and max. speed
B8 = 800 N, ball screw, 55 mm/s
W1 = 500 N, worm screw, 35 mm/s

3. Stroke (S)
M05 = 50 mm
M10 = 100 mm
M15 = 150 mm
M20 = 200 mm
M25 = 250 mm*
M30 = 300 mm*

4. Position feedback option
P = analog signal (standard)
E = encoder signal

5. Cable and connectors
0 = 300 mm long flying leads
1 = 300 mm long cable and connector **
2 = 1600 mm long cable and connector **
** AMP Super seal series 1,5 connector

* Strokes possible for ball screw models only.

Features and Benefits

Thomson WhisperTrak™ linear actuators were designed to incorporate features that enable machine builders the greatest flexibility in their design. A sleek and compact design, washdown protection, electronic limit switches and a global sales and service organization are just some of the features offered. The result is the optimum actuator for the applications it is built to serve.

Exceptionally quiet
Thomson WhisperTrak linear actuators boast a low sound level of less than 45 dBa, about the same as an average library. This quiet, consistent low sound level is conducive to personal mobility applications and provides unobtrusive linear motion in an elegant package.

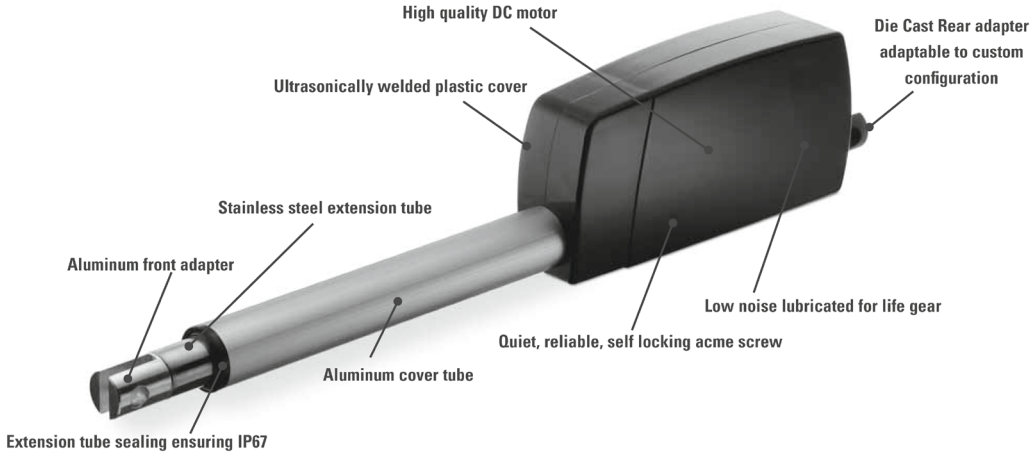
Permanent sealing for environmental protection
The actuator is able to operate in harsh conditions where it is exposed to washdown, rain, dust, or other particulate without the use of any additional cover. The Thomson WhisperTrak linear actuator is rated for protection class IP67.

Compact and compatible
The Thomson WhisperTrak linear actuator is one of the most compact actuators on the market and pin to pin compatible with virtually all competitor actuators in this segment. This allows you to easily replace an existing actuator with the Thomson WhisperTrak linear actuator and gain the space saving benefits while reducing weight.

Maintenance free
Our new actuator is unique in that it requires zero maintenance throughout the entire life of the actuator. The average life is 10,000 cycles (one full stroke back and forth) at the maximum load. Once properly installed, the Thomson WhisperTrak linear actuator will provide trouble-free operation with zero maintenance, thereby reducing the total cost of ownership.

Unique options
The Thomson WhisperTrak linear actuator is unique in that it offers a compact machine footprint and robust features that are unavailable anywhere else. The electronic limit switches (ELS) and anti-rotation options are available off the shelf and fit within the compact envelope of the standard model. Mounting options include standard as pictured or rotated 90 degrees.

World wide representation
For over 40 years Thomson has provided simple, innovative, and dependable linear actuator solutions. With global sales and manufacturing facilities, Thomson is able to respond quickly to all customer needs. The Thomson WhisperTrak linear actuator is designed to meet all relevant certificates and is built in accordance with ISO 9000.



Applications

The Thomson WhisperTrak electric linear actuator offers incredible flexibility. Any application which requires a small footprint or quiet operation would benefit from it. Specifically, personal mobility, rehab, medical equipment, office and domestic machines, are well suited as a result of its compact envelope and unique operating features such as quiet operation and one piece housing.

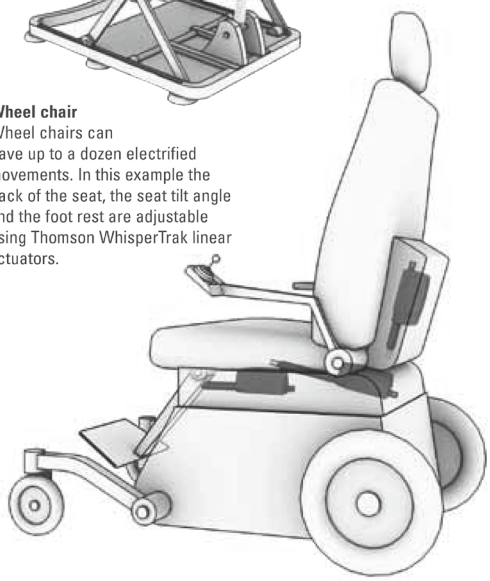
Rehab and handicap equipment
Personal mobility is a growing area for linear actuators. Equipment designed to offer mobility or rehabilitation to disabled, elderly, or injured people can include wheel chairs, patient lifts, handicapped accessible cars/trucks, and other rehabilitation equipment.

Medical/hospital equipment
Patient beds, x-ray machines and examination chairs are just a few examples where linear actuators are used. In fact, every place where a simple, reliable and electrified movement is needed a linear actuator is likely the answer.

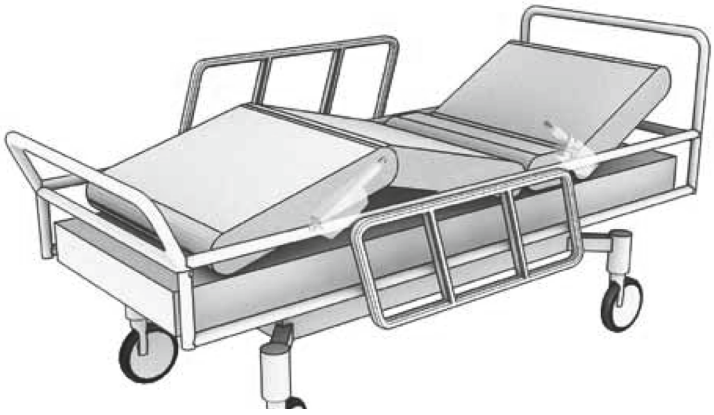
Furniture
The quiet operation and small footprint of the Thomson WhisperTrak linear actuator make it ideal for home or office furniture requirements where silent operation is an issue. Adjustable desks, beds, reclining chairs, and the positioning of heavy TV screens benefit from the quiet, precise actuation of the WhisperTrak linear actuator.

Limitless possibilities
Whether the standard product meets your specifications or you require a more customized solution, Thomson engineers are available to discuss any of your application needs.

Bath chair lift
For simple and safe handling the lift movement is electrically actuated. The Thomson WhisperTrak linear actuator is light-weight and quiet and makes cleaning easy without worry of water ingression or exposure to detergents.



Wheel chair
Wheel chairs can have up to a dozen electrified movements. In this example the back of the seat, the seat tilt angle and the foot rest are adjustable using Thomson WhisperTrak linear actuators.



Beds
Beds in hospitals or at home are commonly equipped with actuators to adjust different functions. In this image the back and the leg angles are adjustable but actuators are also used to tilt, turn, and position beds in almost any way imaginable to make life easier for the patient, nurse and the cleaning staff.

Specifications

Specifications are subject to change without notice. It is the responsibility of the product user to determine the suitability of this product for a specific application.

Technical Specification		2000N	
Voltage			
Input voltage	[VDC]	12	24
Load			
Static load (Fx), maximum	[N]	2000 (450 lbs)	
Dynamic load (Fx), maximum	[N]	2000 (450 lbs)	
Stroke			
Stroke lengths, standard	[cm]	10, 20, 30, 40, 50	
Current			
Current consumption, rated load	[A]	4.5	2.2
Current consumption, stall/in-rush	[A]	14	8.0
General data			
Speed, no load	[mm/s]	5.8 (.23"/s)	
Speed, rated load	[mm/s]	4.0 (.16"/s)	
Operating temperature limits	[°C]	-25 to +40 (-13F to 104F)	
Duty cycle, maximum	[%]	10	
Life, average	[cycles]	10 000	
Sound level	[dBa]	< 45	
Lead screw type		acme	
Protection class		IP67	
Certificates		CE (EN60601-1) UL (UL60601-1)	

Features

- Maintenance free
- Very high sealing degree due to ultrasonic welding of enclosure
- Washdown proof during operation
- Can be submerged when not operating
- Compact and light weight

Options

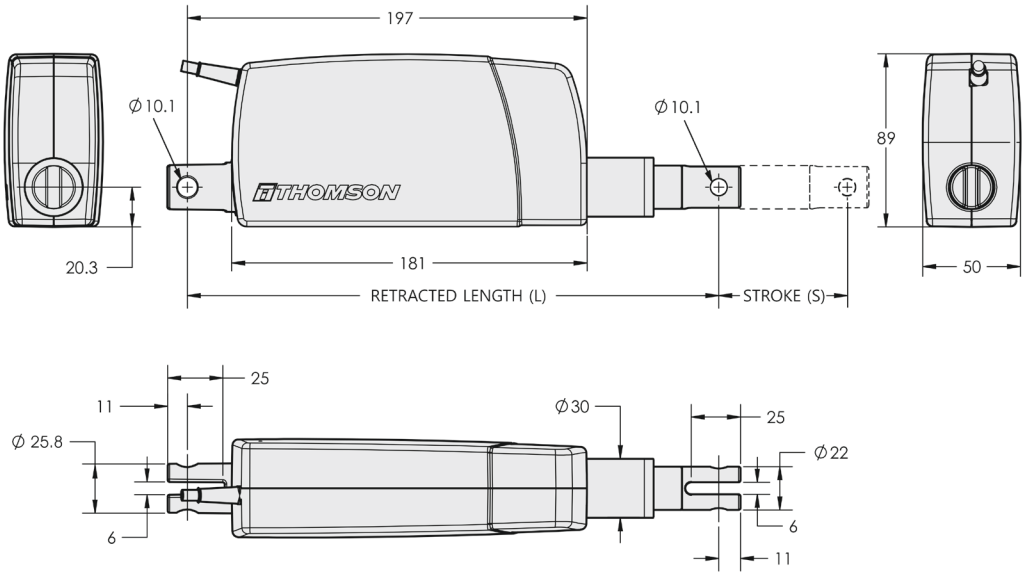
- Electronic limit switches (ELS)[1]
- Anti rotation mechanism [2]
- Mounting adapters turned 90°

[1] Shuts off power at the end of stroke and all along the stroke at overload conditions.
ELS is normally set for 120% of the rated dynamic maximum load.
[2] Prevents the extension tube from rotating if it is not fixed in the end.

Dimensions

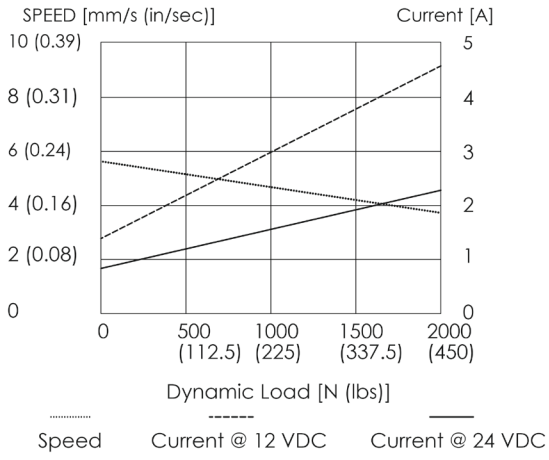
Cable length, see ordering key page 10

W • • 02 (max. load 2000 N (450 lbs)

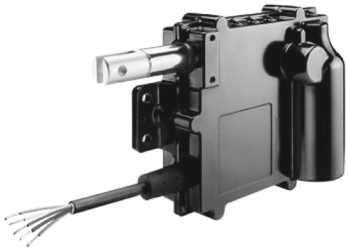


Stroke "S" mm (inch)	100 (3.94)	200 (7.87)	300 (11.81)	400 (15.75)	500 (19.69)
Retracted Length "L" mm (inch)	238 (9.37)	338 (12.31)	438 (17.24)	589 (23.19)	689 (27.13)
Weight kg (lbs)	1.20 (2.65)	1.35 (2.98)	1.5 (3.31)	1.65 (3.64)	1.80 (3.97)

Performance Diagram



Specifications



Standard Features and Benefits

- Designed for industrial applications
- Rugged aluminum housing with IP69K/IP67 sealing
- E-coated housing for corrosion resistance
- Minimal maintenance
- Integrated electronic options
- High end features at a low cost
- Integrated mounting holes

General Specifications

Parameter	Electrak Throttle
Screw type	worm
Internally restrained	yes
Manual override	no
Dynamic braking with option CN with option NP, FN, FP	 yes no
Holding brake	no (self locking)
End of stroke protection	yes
Mid stroke protection	yes
Motor protection with temperature rating S with temperature rating E	 auto reset thermal switch no
Motor connection	flying leads or Deutsch connector
Certificates	CE, RoHS
Options	• extended temperature range • adapter orientation • right angle cable exit • analog position feedback sensor • internal end of stroke limit switches • CANBUS SAE J1939

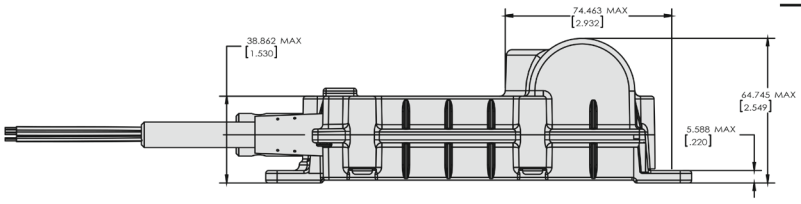
Performance Specifications

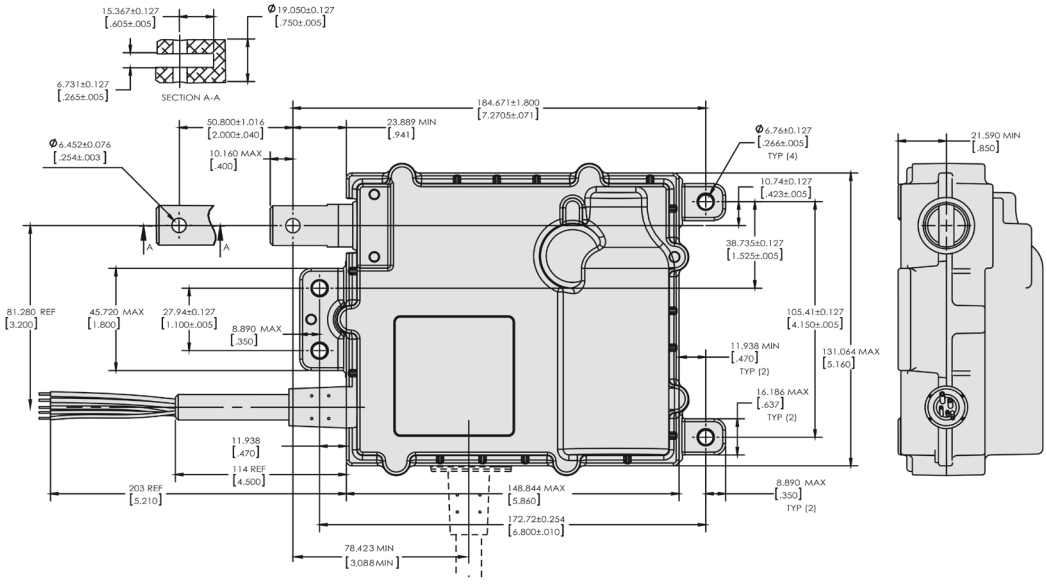
Parameter		Electrak Throttle
Maximum load, dynamic / static ET••-084 [1] ET••-174	[N (lbf)]	 45 (10) / 90 (20) 130 (30) / 260 (60)
Speed, no load / at max. load ET••-084 [1] ET••-174	[mm/s (in/s)]	 96 (3.7) / 83 (3.3) 48 (1.9) / 37 (1.45)
Available input voltages	[VDC]	12, 24
Current draw, max. [2] 12 VDC models 24 VDC models	[A]	 4 2
Operating temperature, min	[°C (F)]	- 40 (-40)
Operating temperature, max ET••-•••-•S ET••-•••-•E	[°C (F)]	 85 (185) 125 (257)
Full load duty cycle @ 25 °C [3]	[%]	50
End play, maximum	[mm (in)]	1.5 (0.06)
Restraining torque	[Nm (lbf-in)]	0
Motor cable lead cross section	[mm²(AWG)]	0.8 (18)
Motor cable length	[mm (in)]	165 (6.5)
Protection class		IP69K, IP67
Operational life	[cycles]	500000
Retracted length	[mm (in)]	184.7 (7.27)
Stroke length	[mm (in)]	50.8 (2)
Weight	[kg (lbs)]	1.11 (2.5)
Analog feedback sensor linearity	[± %]	1

[1] The ET•• -084 (high speed version) can only be ordered in combination with operating temperature rating E.
[2] Max. current draw ratings do not include motor inrush current. Typical inrush current values are 12 A at 12 VDC and 6 A at 24 VDC.
[3] For all models and load ranges.

Dimensions and Performance Diagrams

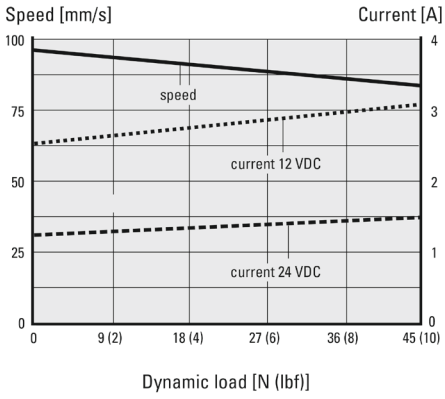
Dimensions	Projection
METRIC [INCH]	



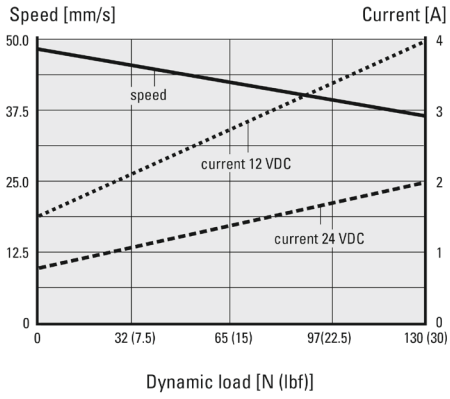


Performance Diagrams

ET••-084



ET••-174



Ordering Key

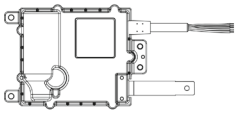
Ordering Key							
Position	1	2	3	4	5	6	7
Example	ET12-	174-	S	S	NP	1	S

1. Actuator type and supply voltage
ET12- = Electrak® Throttle, 12 VDC
ET24- = Electrak® Throttle, 24 VDC

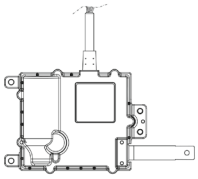
2. Max. dynamic load and speed version
084- = 45 N (10 lbf), high speed *
174- = 130 N (30 lbf), standard speed

3. Harness orientation
S = parallel to adapter
R = rotated 90° in housing

S



R



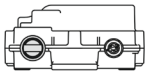
4. Temperature rating
S = standard: -40 (-40) to +85 (+185) °C (F)
E = high temperature: -40 (-40) to +125 (+257) °C (F) *

5. Control option
NP = analog position feedback sensor
FN = end of stroke limit switches
FP = analog position feedback sensor and end of stroke limit switches
CN = CANBUS SAE J1939

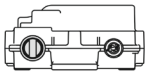
6. Connection options
1 = flying leads
2 = Deutsch DTM04-6P connector

7. Adapter options
S = standard adapter orientation
M = adapter rotated 90°

S



M



* The high speed (084-) version can only be ordered with the high temperature (E) rating and vice versa. Note that there is no thermal switch to protect the motor on the high temperature rated models.

THOMSON

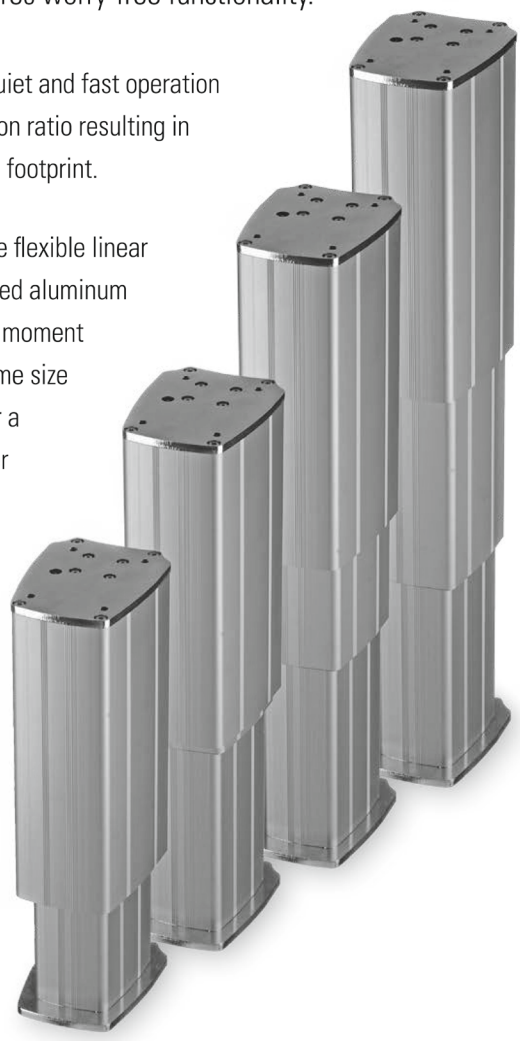
Introducing the Thomson Lifting Column Product Family

Thomson Lifting Columns are self-supporting and height adjustable lifting solutions in a compact, pre-aligned package, perfect for medical and ergonomic applications requiring telescopic motion. Simple, one-step installation requires minimal downtime and maintenance-free operation ensures worry-free functionality.

These columns are designed for smooth, quiet and fast operation and offer an excellent extension to retraction ratio resulting in the maximum range of motion in a minimal footprint.

Thomson lifting columns are designed to be flexible linear motion solutions based on anodized extruded aluminum profiles which slide into each other. A high moment load capacity, large holding capacity to frame size ratio, and the ability to use a single unit for a center load or multiple units linked together allow for numerous design configurations.

Thomson lifting columns can also be customized for more specific requirements. The result is a self-supporting, compact, and versatile lifting solution.



Features and Benefits

Three different lifting column modules are now available from Thomson, all sharing the same basic design and functionality. All models feature easy installation, maintenance-free operation, and a high moment load capacity. Though each model has its own unique advantages, the basic features and benefits are the same.

Common Thomson Lifting Columns Features

Modern, Functional and Aesthetic Design

Aesthetic design.
Anodized aluminum profiles with 20 µ anodization and surface tolerance class 3.

Benefits: Column can be visible in the end product. No need to shroud or cover.
Results: Saves cost on overall machine design.

High Load and Speed Capability

Models for loads up to 3000 N, moment loads up to 400 Nm and speeds up to 19 mm/s.

Benefits: Ability to push and hold higher loads while still providing appropriate speed levels.
Results: Improves device functionality with higher and offset loads while still providing throughput requirements.

Easy to Install and Maintenance Free

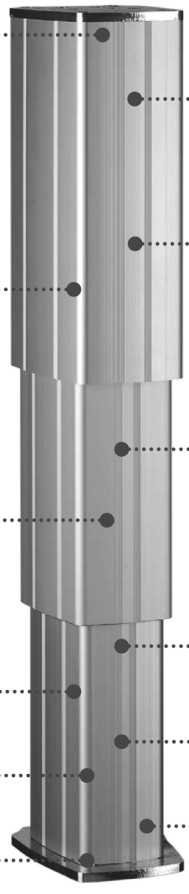
Maintenance free.
Pre-drilled mounting holes.

Benefits: Simple to install and integrate into overall machine.
Results: Saves costs on install and device maintenance.

Built In End of Stroke Stop

Dynamic Braking

Holds Load at Stand Still



Favorable Extension/Retraction Ratio

Compact design provides favorable ratio between stroke and retracted length.

Benefits: Provides more device flexibility with low retracted height while still providing necessary stroke length.
Results: Improves patient, doctor, operator or other end-user ergonomics.

Quiet and Smooth Operation

Quiet operation suitable for domestic use.

Benefits: Noise levels are appropriate for medical and office use.
Results: No attenuation of the sound needed.

CE approved

Rigourous testing ensure a safe and reliable product.

Benefits: The device is documented safe.
Results: Save on testing and integration costs into end device.

Compact Low Weight Design

Self Supporting Aluminum Cover

IP 44 Protection Class

Model Comparison

The Thomson Lifting Column product family has three different models that are all made of self-supporting extruded aluminum profiles that are easy to install and require no additional cover for protection. The type of model that is most appropriate depends on the balance that is needed among extension-to-retraction ratio, load capacity, speed and cost.

Model Comparison			
	LC1600	LC2000	LC3000
Model			
Description	Two-piece extrusion with 1600 N loading capacity ideal for cost-sensitive applications where extension-to-retraction ratio is not as critical.	Three-piece extrusion with 2000 N loading capacity and a telescoping leadscrew mechanism to provide an ideal extension-to-retraction ratio.	Three-piece extrusion with ballscrew drive mechanism to allow for 3000 N loading capacity and high moment loading.
Screw type	Trapezoidal screw	Telescopic lead screw	Ball screw
Weight	Best	Good	Good
Quiet operation	Best	Good	Good
Extension/retraction ratio	Good	Best	Better
Minimum retracted length	Good	Best	Better
Load capacity	Good	Better	Best
Load torque capacity	Good	Good	Best
Duty cycle	Good	Best	Good
Speed	Better	Best	Good
Mid stroke overload protection	Yes	No *	No *

* Mid-stroke overload protection available with use of DCG Control.

Electrak® HD

Linear Actuator with Flexible Onboard Controls, Superior Performance and Unmatched Environmental Protection

NEW PRODUCT

www.thomsonlinear.com

THOMSON®
*Linear Motion. **Optimized.***™

Electrak® HD – Superior Performance Linear Actuator

Higher Power, Longer Stroke, On-board Controls with optional J1939 CAN bus and Unmatched Environmental Protection

The Electrak HD is a new electric linear actuator platform with onboard electronics which can eliminate the need for standalone controls. Higher power opens a new, wider range of hydraulic applications to electric conversion. And, it meets the most extreme OEM component environmental acceptance tests, including IP69K.

Industry-Leading, Onboard Electronics

The new Electrak Modular Control System (EMCS) is the foundation for the best onboard controls currently available in electric linear actuators and includes optional, built-in J1939 CAN bus support.

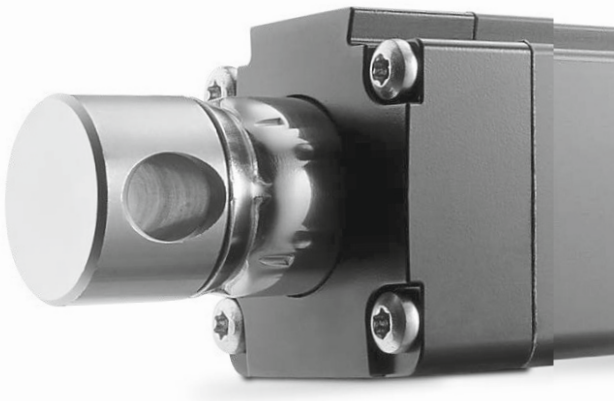
The feature-rich modular design for all control and feedback options is simple to use and built within one compact housing. It improves controllability, saves space and reduces installation time and total cost.

- Built-in J1939 CAN bus option enhances controllability, can eliminate individual controls and simplifies OEM machine design.
- Electronic trip point calibration ensures consistent overload protection.
- Constant monitoring of critical parameters such as end-of-stroke, voltage, current and temperature is standard on all HD actuators.
- Built-in dynamic braking reduces coast at the end of stroke, improving repeatability.
- Optional low-level switching with automatic sleep mode reduces footprint, lowers costs and boosts circuit isolation.
- Optional end-of-stroke indication output for customer use, such as interlocks.

Superior Performance

Higher power and longer stroke lengths enable Electrak HD to tackle applications outside the range of other electric linear actuators.

- Higher load ranges up to 10 kN (2250 lbs) are ideal for hydraulic to electric conversion applications.
- Stroke lengths up to 1000 mm (39 in).
- Efficient actuator design, including a high quality ball screw, reduces current draw by up to 20%.



Unrivaled Environmental Protection

Electrak HD is tested to meet and exceed the toughest OEM mechanical and electronic component acceptance tests in the market today.

- IP69K (static), IP67 (static) and IP66 (dynamic) ratings prove Electrak HD can withstand the harshest environments.
- Capable of operating in a wide temperature range from - 40 °C to + 85 °C (- 40 °F to + 185 °F).
- Salt spray tested for 200 hours.
- CE, RoHS and REACH (EU) certified.

Additional Standard Features

- Integrated manual override.
- Standard anti-rotation actuation.
- Integrated thermal overload protection.
- Load lock in case of ball nut overload failure.
- Flexible front and rear clevis options.

How Thomson Built a World-Class Linear Actuator

1. Start with the proven, rugged Electrak® electric linear actuator.
2. Add state-of-the-art onboard controls, feedback, CAN bus J1939 and eliminate the need for standalone controls.
3. Boost the power, increase stroke lengths, reduce current draw.
4. Design it all into a more compact envelope with the best environmental protections on the market today.

INDUSTRY-LEADING ONBOARD CONTROLS

The new, Electrak Modular Control System is the foundation of the best onboard controls available today for electric linear actuators and includes optional, built-in J1939 CAN bus support.

1 Electrak Modular Control System (EMCS)

- Electrak Monitoring Package (standard)
- End-of-Stroke Indication Output Option
- Analog Position Output Option
- Digital Position Output Option
- Low-Level Signal Motor Switching Option
- J1939 CAN Bus Control Option

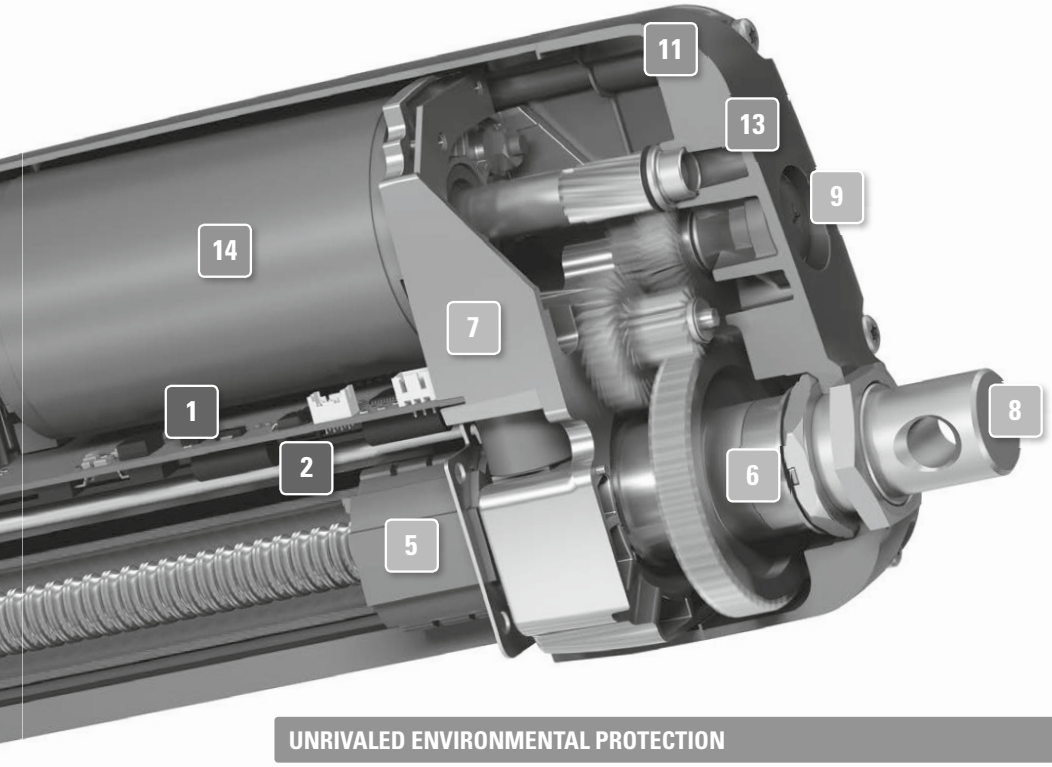
2 Built-in End-of-Stroke Limit Switches

3 Mounting Slots for External Limit Switches

SUPERIOR PERFORMANCE

Higher power and longer stroke lengths enable Electrak HD to tackle applications outside the range of other electric linear actuators.

4 Modular Cabling
5 Standard Anti-Rotation Feature
6 Static Load Holding Brake
7 Robust Zinc Housing
8 Large Variety of Adapters
9 Integrated Manual Override
10 High Efficiency Ball Screw Assembly



UNRIVALED ENVIRONMENTAL PROTECTION

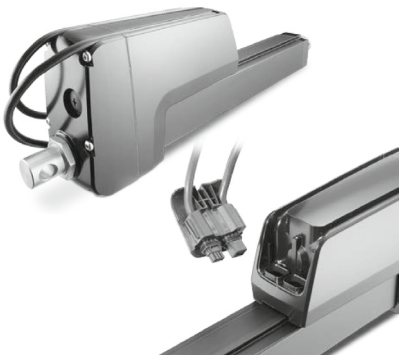
Electrak HD is tested to meet and exceed the toughest OEM mechanical and electronic component acceptance tests in the market today.

11 IP67/IP69K Protection Class
12 Stainless Steel Extension Tube
13 Salt Spray Tested for 200 Hours
14 Large Operating Temperature Range
15 Hard-coat Anodized Aluminum Cover Tube

THOMSON Linear Motion. Optimized.

Electrak® HD – Smarter, Stronger, Longer

In addition to advanced control features, the Electrak HD offers 50% higher load capacity, 60% longer stroke lengths than previous designs and is faster than the competition at comparable loads. This new, extended envelope of operation also opens a larger range of hydraulic applications to electric conversion.



Electrak HD offers smart design solutions, like built-in cable management, an integrated connector, and a manual override feature on every actuator.

Building on the capabilities of the Electrak 10, the workhorse of electric actuators for decades, the Electrak HD offers onboard controls, higher load capacity (up to 10 kN, 2250 lbs.), longer strokes (up to 1 meter, 39 in.) and higher speeds.

Ready to Work in Extreme Environments

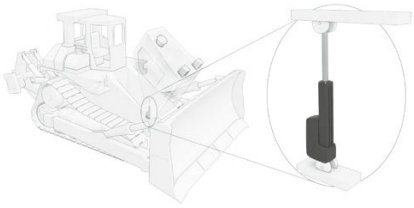
The Electrak HD is well-suited for heavy-duty, industrial, applications including conversion of hydraulic to electric actuation. It shows its mettle when used under the harshest conditions. Each HD actuator is designed to meet and exceed the toughest OEM mechanical and electrical components tests, including IP69K.

THOMSON Linear Motion. Optimized.

Improving Machine Design with Electric Actuation

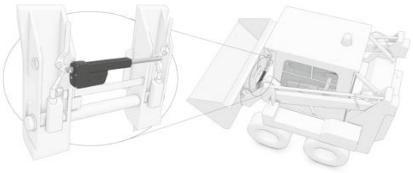
These applications illustrate how the Electrak® HD can deliver huge benefits over pneumatic and hydraulic mechanisms, including reduced design, installation and operation costs while improving controllability, safety and productivity.

Single-User Maintenance and Repair



Electric linear actuators enable a single maintenance or repair technician to access the engine compartment quickly and safely.

Quick-Attach

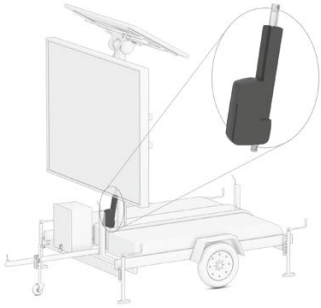


Quick-attach actuators allow the operator to change implements on the loader or skid steer without leaving the seat for improved productivity and safety.

Utility Vehicles

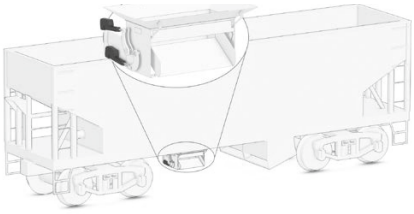
Garden, construction and service vehicles require rugged, efficiently controlled performance. The environmental protection (IP69K), high load capabilities, and J1939 CAN bus communication provide that performance.

Roadwork and Construction Site Equipment



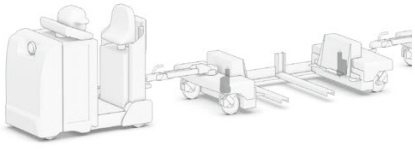
Long stroke, protection against harsh environments and high load rating (including high shock loading for wind shear) make the Electrak HD a great fit for this roadside construction sign.

Railroad Equipment



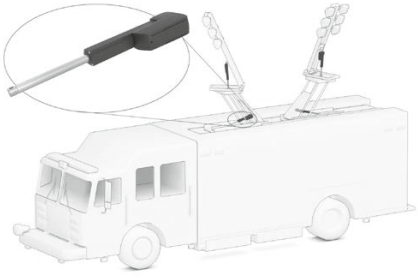
Railroad equipment experiences the toughest conditions. Whether it is to open and close a gravity bin or to control a pantograph, the Electrak HD actuator will perform effectively despite harsh weather, heavy vibrations and high pressure washing.

Logistic Systems



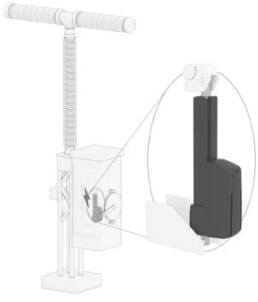
The Electrak HD, with its built-in J1939 CAN bus capabilities, makes it easy to build intelligent logistic systems such as the material handling train shown here.

Emergency and Rescue Vehicles



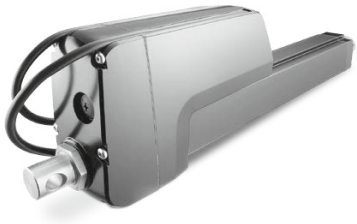
The deployment of lighting on emergency vehicles demands the most reliable operation. Electrak HD is easily controlled, has a built-in manual override and operates reliably in all weather to help emergency responders do their jobs safely.

Switch Gears



Electrical switch gears are often placed in remote locations. It is critical that power switching is executed and confirmed without fail. Electrak HD is ideal for this task in arctic to high-temperature conditions.

Electrak® HD Technical Features



The Electrak HD is a New Electric Linear Actuator Platform

Onboard electronics eliminate the need for standalone controls. Higher power opens a new, wider range of hydraulic applications to electric conversion. And, the Thomson Electrak HD meets the most extreme OEM component environmental acceptance tests, including IP69K.

General Specifications

Parameter	Electrak HD
Screw type	ball
Nut type	load lock ball nut
Manual override	yes
Anti-rotation	yes
Dynamic braking	yes (1)
Static load holding brake	yes
End-of-stroke protection	internal end-of-stroke limit switches
Overload protection	yes
Temperature monitoring	yes
Temperature compensation	yes
Voltage monitoring	yes
Electrical connections (2)	cable(s) with flying leads
Certificates	CE

(1) Dynamic braking is included at the ends of stroke for all Electrak HD actuators. Dynamic braking offered throughout the entire stroke length only on low-level switching and J1939 options.
(2) There are one or two cables depending on the control option used. The cable(s) enters the actuator via a connector. The replacement of an actuator can be completed by unplugging the old actuator and plugging in the new one.

Optional Features

Parameter	Electrak HD
Mechanical options	Variety of front and rear adapters
	Alternative adapter orientation
Control options (see page 22)	End-of-stroke output
	Analog position feedback
	Digital position feedback
	Low-level signal motor switching
	CAN bus J1939

Accessories

Parameter	Electrak HD
Mechanical	Rod end front adapter
Electrical	External slot mounted limit switches

Electrak HD Technical Specifications

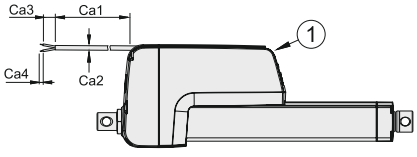
Mechanical Specifications

Parameter		Electrak HD
Max. static load [1]	[kN (lbs)]	18 (4050)
Max. dynamic load (Fx) HDxx-B017 HDxx-B026 HDxx-B045 HDxx-B068 HDxx-B100	[kN (lbs)]	 1.7 (382) 2.6 (585) 4.5 (1012) 6.8 (1529) 10 (2248)
Speed @ no load/max. load HDxx-B017 HDxx-B026 HDxx-B045 HDxx-B068 HDxx-B100	[mm/s (in/s)]	 71/58 (2.8/2.28) 40/32 (1.6/1.3) 24/19 (0.94/0.75) 18/14 (0.71/0.55) 11/9 (0.43/0.35)
Min. ordering stroke (S) length	[mm]	100
Max. ordering stroke (S) length	[mm]	1000
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (F)]	- 40 – 85 (- 40 – 185)
Full load duty cycle @ 25 °C (77 °F)	[%]	25 [2]
End play, maximum	[mm (in)]	1.2 (0.047)
Restraining torque	[Nm (lbs)]	0
Protection class - static		IP67 / IP69K
Protection class - dynamic		IP66
Salt spray resistance	[h]	200

[1] Max. static load at fully retracted stroke.
[2] For a HDxx-B1000 actuator, unidirectional load, the duty cycle is 15%.

Electrical Specifications

Parameter		Electrak HD
Available input voltages	[Vdc]	12, 24
Input voltage tolerance HD12 (12 Vdc input voltage) HD24 (24 Vdc input voltage)	[Vdc]	 9 - 16 18 - 32
Current draw @ no load/max. load HD12-B017 HD24-B017 HD12-B026 HD24-B026 HD12-B045 HD24-B045 HD12-B068 HD24-B068 HD12-B100 HD24-B100	[A]	 3/18 1.5/9 3/18 1.5/9 3/18 1.5/9 3/20 1.5/10 3/18 1.5/9
Motor leads cross section	[mm² (AWG)]	2 (14)
Signal leads cross section	[mm² (AWG)]	0.5 (20)
Standard cable lengths (Ca1)	[m (in)]	0.3, 1.5, 5 (11.8, 59, 197)
Cable diameter (Ca2)	[mm (in)]	7.5 (.295)
Flying lead length (Ca3)	[mm (in)]	76.2 (3)
Stripped lead length (Ca4)	[mm (in)]	6.35 (0.25)



The drawing shows the cables exiting the cable slots at the end of the actuator housing which is the shipping position. The user can adjust the exit point to be anywhere between the connector (1) in the front of the housing and the end of the cable slots.

Actuator Weight [kg]

Maximum Dynamic Load (Fx) [kN (lbs)]	Ordering Stroke (S) [mm]																		
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
1.7 (382)	6,5	6,7	7,0	7,2	7,5	7,7	8,0	8,2	8,5	8,7	9,0	9,2	9,5	9,7	10,0	10,2	10,5	10,7	11,0
2.6 (585)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0	10.2	11.6	11.9	12.2
4.5 (1012)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	10.4	10.7	11.0	11.3	11.6	11.9	12.2
6.8 (1592)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	9.5	9.8	10.1	10.4	10.7	11.0	11.3	11.6	11.9	12.2
10 (2248)	6.7	7.0	7.2	7.5	7.7	8.0	8.2	9.1	9.4	9.7	10.0	10.3	10.6	10.9	11.2	11.5	11.8	12.1	12.4

Conversion Factors: Millimeter to inch: 1 mm = 0.03937 in, kilogram to pound: 1 kg = 2.204623 lbs

THOMSON
Linear Motion. Optimized.

How to Order the Electrak® HD

This ordering key provides a quick overview of the product versions available. It is important to consider many application details when selecting a product, including the loads, speeds and control options required, as well as the product environment and necessary accessories. To explore additional technical resources and options, contact Thomson customer support at www.thomsonlinear.com/hd.

Ordering Key

1	2	3	4	5	6	7	8
HD12	**B026-**	**0300**	**LXX**	**2**	**M**	**M**	**S**

1. Model and input voltage
HD12 = Electrak HD, 12 Vdc
HD24 = Electrak HD, 24 Vdc

2. Screw type, dynamic load capacity
B017- = ball screw, 1.7 kN (382 lbs)
B026- = ball screw, 2.6 kN (585 lbs)
B045- = ball screw, 4.5 kN (1012 lbs)
B068- = ball screw, 6.8 kN (1529 lbs)
B100- = ball screw, 10 kN (2248 lbs)

3. Ordering stroke length (1)
0100 = 100 mm
0150 = 150 mm
0200 = 200 mm
0250 = 250 mm
0300 = 300 mm
0350 = 350 mm
0400 = 400 mm
0450 = 450 mm
0500 = 500 mm
0550 = 550 mm
0600 = 600 mm
0650 = 650 mm
0700 = 700 mm
0750 = 750 mm
0800 = 800 mm
0850 = 850 mm
0900 = 900 mm
0950 = 950 mm
1000 = 1000 mm

4. Electrak® Modular Control System options
EXX = Electronic Monitoring Package only
ELX = EXX + end-of-stroke indication output
EXP = EXX + analog (potentiometer) position output
EXD = EXX + digital position output
ELP = ELX + analog (potentiometer) position output
ELD = ELX + digital position output
LXX = EXX + low-level signal motor switching
LLX = EXX + LXX + end-of-stroke indication output
LXP = EXX + LXX +analog (potentiometer) position output
CNO = Can bus J1939 + open loop speed control

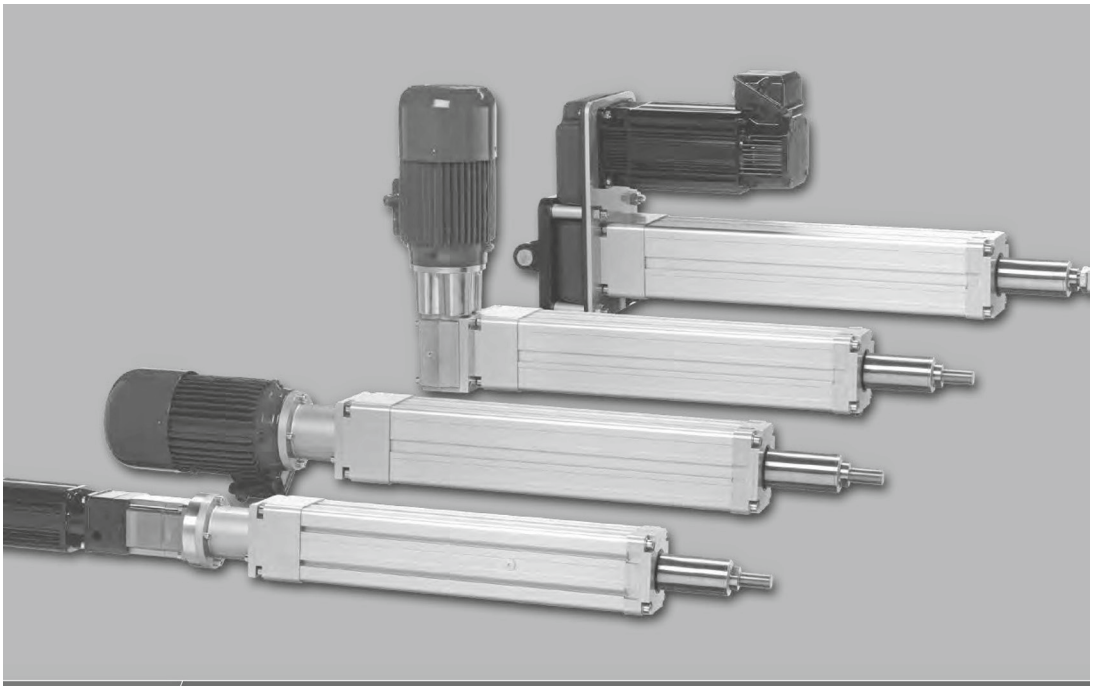
5. Harness option
1 = 0.3 m long cables with flying leads
2 = 1.5 m long cables with flying leads
3 = 5.0 m long cables with flying leads

6. Rear adapter option
M = cross hole for 12 mm pin
E = cross hole for ½ inch pin
N = forked cross hole for 12 mm pin
F = forked cross hole for ½ inch pin

7. Front adapter option
M = cross hole for 12 mm pin
E = cross hole for ½ inch pin
N = forked cross hole for 12 mm pin
F = forked cross hole for ½ inch pin
P = metric female thread
G = inch female thread

8. Adapter orientation
S = standard
M = 90 ° turned

(1) Other stroke lengths available on request, please contact customer support.

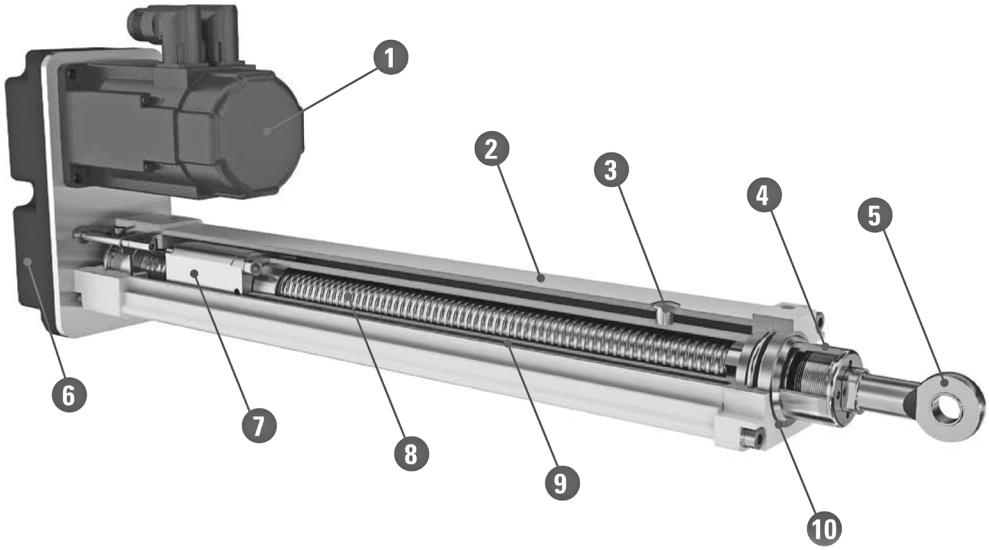


Precision Linear Actuators

THOMSON
Linear Motion. **Optimized.**™

Technical Overview

The design of an precision linear actuator is quite basic. An electric motor – through either a belt gear, a worm gear, a planetary gear or via a coupling directly – rotates a ball screw which translates the torque into axial force through the extension tube. While the concept is straight forward, as illustrated by the cutaway on this page, significant expertise and development have been invested in the specification and design of each component. Each actuator is also built to meet the highest quality standards and are thoroughly tested before shipment.

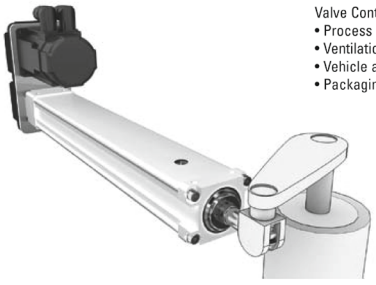


1. Choose between a high performance AC servo motor or the robust, cheaper and simpler three phase AC motor.
2. High quality extension tube in extruded aluminium with grooves for sensors and T-slot bolts.
3. One point lubrication for easy and fast service.
4. Robust hard chromed steel extension tube.
5. Choose between extension tube with inside or outside thread, clevis or spherical joint ends.
6. Choose between direct drive, belt gear, worm gear or planetary gear for optimum performance.
7. High precision safety ball nut that will hold the load even if the balls break.
8. High quality ball screw drive.
9. Internally guided extension tube with anti-rotation mechanism which also acts as a screw support.
10. IP65 sealing of the actuator allows it to operate in harsh environments.

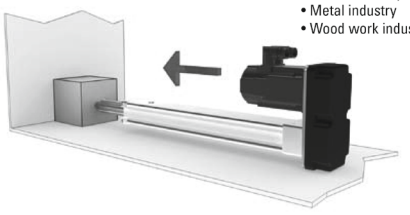
Applications

The precision linear actuator range is used for many tasks in industry. Combining the actuators with controls and drives from Kollmorgen makes it easy to design linear motion equipment in a fast and simple way. Some of the most common applications are described below.

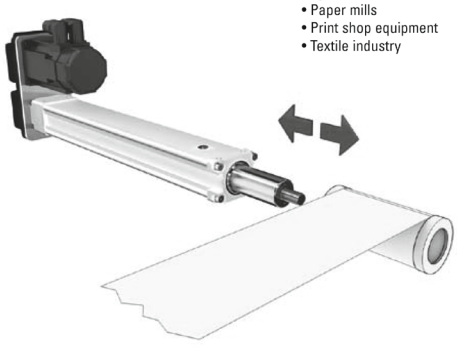
Our application engineers have a broad knowledge base built on decades of linear motion experience and they can help you find the ultimate solution for your application. They can also assist you with sizing and selection as well as with the design and commissioning of your equipment.



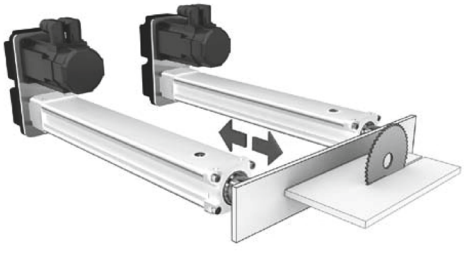
Valve Control
- Process industry
- Ventilation equipment
- Vehicle applications
- Packaging industry



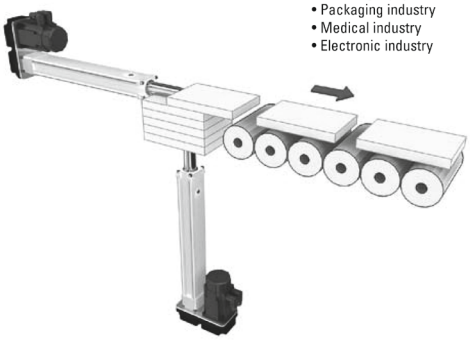
Pressing and clamping
- Machine tools
- Electronic industry
- Plastic industry
- Metal industry
- Wood work industry



Edge Guide Control
- Paper mills
- Print shop equipment
- Textile industry



Backstop Adjust
- Wood work industry
- Machine tools
- Metal industry



Loading or Unloading
- Handling equipment
- Packaging industry
- Medical industry
- Electronic industry

Drilling, Welding, Gluing or Thermo-forming
- Machine tools
- Plastic industry
- Metal industry
- Wood work industry
- Electronic industry
- Packaging industry

Introduction

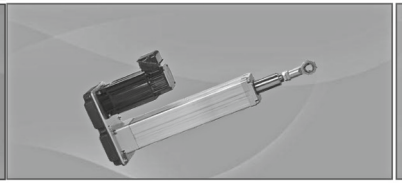
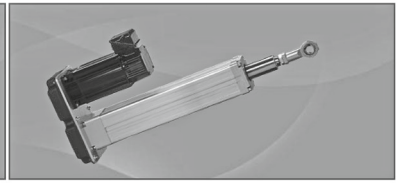
The Benefits of Electrification

Precision linear actuators are often a better choice than hydraulic or pneumatic alternatives with advantages of simpler and smaller installation, easier control, lower energy costs, higher accuracy, less maintenance, less noise, and a cleaner, healthier environment.

Electrical Actuators vs. Hydraulic and Pneumatic Cylinders

	Electrical Linear Actuators	Hydraulic Cylinders	Pneumatic Cylinders
Installation	All electric operation requires simple wiring.	Requires expensive plumbing, filtering, pumps, etc.	Requires expensive plumbing, filtering, pumps, etc.
Accuracy	Very repeatable (to ± 0,013 mm) and rigid, multi-stop capabilities.	Requires expensive position sensing and precise electro-hydraulic valving to implement, has tendency to creep.	Difficult to achieve.Requires expensive position sensing and precise valving to implement, has tendency to creep.
Control	Directly compatible with standard programmable controls allowing easy automatic operation of complex motion sequences.	Requires electronic/fluid interfaces and exotic valve designs. Hysteresis, dead zone, supply pressure and temperature changes complicate control.	Inherently non-linear, compressible power source severely complicates servo control.
Speed	Smooth, variable speed with from 0 to 2 m/s with controlled accleration.	Difficult to control accurately. Varies with temperature and wear. Stick slip can be a problem.	More susceptible to stick slip and varying load. Well-suited for light high speed applications.
Reliability	Repeatable, reproducible performance during the entire product life. Very little maintenance required.	Very contamination sensitive. Require regular maintenance. Seals are prone to leak. Reliable with diligent maintenance.	Very contamination sensitive. Air sources require proper filtration. Good reliability, but usually many system components are involved.
Power	Up to 40 000 N	Virtually unlimited force. Most powerful.	Up to 25 000 N. Typically used below 6000 N.
Life expectancy	Up to millions of cycles at rated load. Easy to predict.	Dependent on design and seal wear, usually good.	Dependent on design and seal wear, usually good.
Environment	Standard models rated for -30 to +70 °C. Inherently clean and energy efficient.	Temperature extremes can be a major problem. Seals are prone to leak. Waste disposal is increasingly problematic.	Temperature extremes can be a major problem. Seals prone to leak. Air-borne oil can be a problem.
Load holding	Acme screw units are selflocking if power fails. Fail-safe brakes available for ball screw models.	Complex back-up safety devices must be used.	Complex back-up safety devices must be used.
Cost	Moderate initial cost, very low operating cost.	Components often cost less, but installation and maintenance are increased. Hydraulic power unit cost is high if not pre-existing.	Components often cost less, but installation and maintenance are increased.

Performance Overview

		T60	T90	T130	ECT90	ECT130
						
Load						
Maximum load, Fx	[N]	10 000	20 000	60 000	20 000	38 000
Maximum load, Fy	[N]	100	500	800	500	800
Maximum load, Fz	[N]	100	500	800	500	800
Maximum load torque, Mx	[Nm]	-	-	-	-	-
Maximum load torque, My	[Nm]	50	150	300	150	300
Maximum load torque, Mz	[Nm]	50	150	300	150	300
Stroke						
Maximum standard stroke	[mm]	1500	1500	2000	1500	2000
Speed						
Maximum speed	[m/s]	2,5	2,0	2,0	1,6	2,0
Accuracy						
Repeatability	[±	0,05	0,05	0,05	0,05	0,05
Backlash	[mm]	0,11	0,11 (0,18) [1]	0,21	0,11 (0,18) [1]	0,21
General data						
Profile size (width × height)	[mm]	75 × 60	90 × 92	130 × 130	90 × 92	130 × 130
Operating temperature limits	[°C]	-20 – +70	-20 – +70	-20 – +70	-20 – +70	-20 – +70
Maximum duty cycle	[%]	100	100	100	100	100
Lead screw diameter	[mm]	25	25, 32	40, 50	25, 32	40
Lead screw type		ball screw	ball screw	ball screw	ball screw	ball screw
Protection class - standard / optional		IP65	IP65	IP65	IP65	IP65
Features						
AC servo motor / Three phase AC motor		-	-	-	•/•	•/•
Single point lubrication		•	•	•	•	•
Mounting options						
Magnetic position sensors		•	•	•	•	•
Mounting feet kit		on request	•	•	•	•
Trunnion mounting kit		•	•	•	•	•
Clevis mounting kit		•	•	•	•	•
Tube end - inside / outside thread / spherical joint		-/•/•	•/•/•	•/•/•	•/•/•	•/•/•

[1] Depending on the screw diameter used in the actuator.

THOMSON

Make the Change to Electric

Enjoy superior performance and save time and energy

Next generation machines and equipment need to be more compact while delivering higher performance and more flexibility. Making the change from pneumatic cylinders to electric actuators can simplify your design and deliver savings at the same time.

Superior Performance

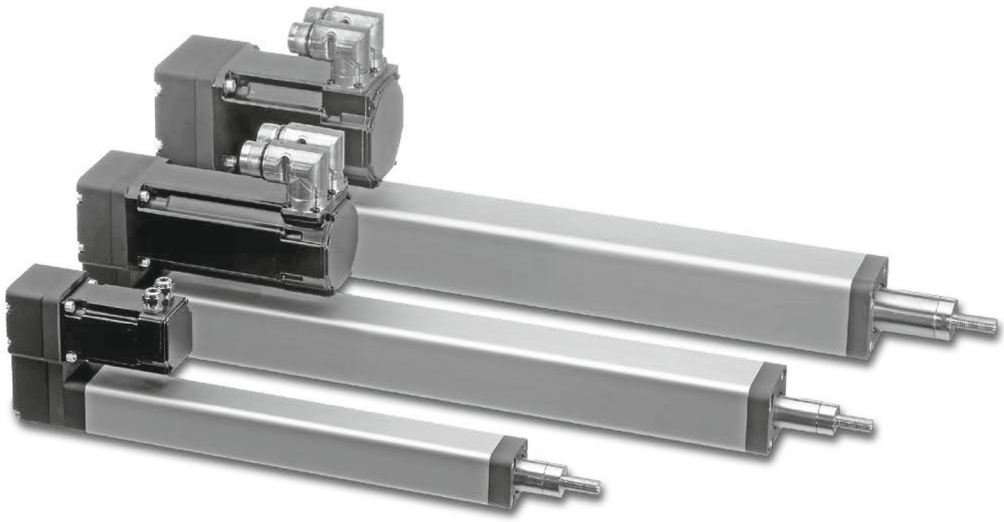
- Higher power density
- More accuracy
- Longer stroke lengths
- Quieter operation
- Side load capability

Time and Energy Savings

- Reduced energy costs
- Reduced setup and changeover time
- Fewer components than a pneumatic system
- No air leaks
- No compressor maintenance

Estimate Your Annual Energy Savings

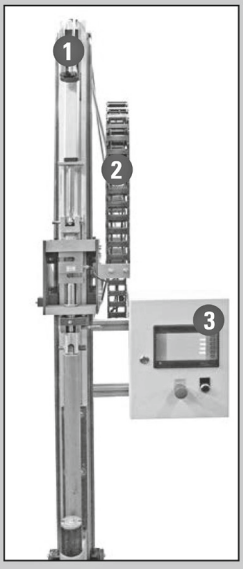
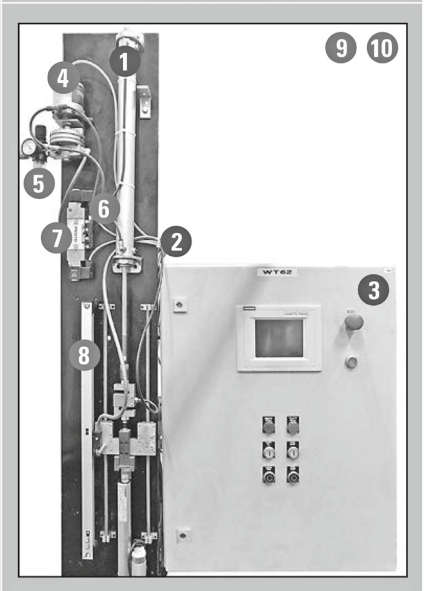
Visit www.thomsonlinear.com/pc_calc to see how much you could save!



Electric Actuators vs. Pneumatic Cylinders

Designing with electric actuators instead of pneumatic cylinders results in fewer components, better performance and a lower total cost of ownership.

Side-by-Side Comparison: Load Testing Equipment

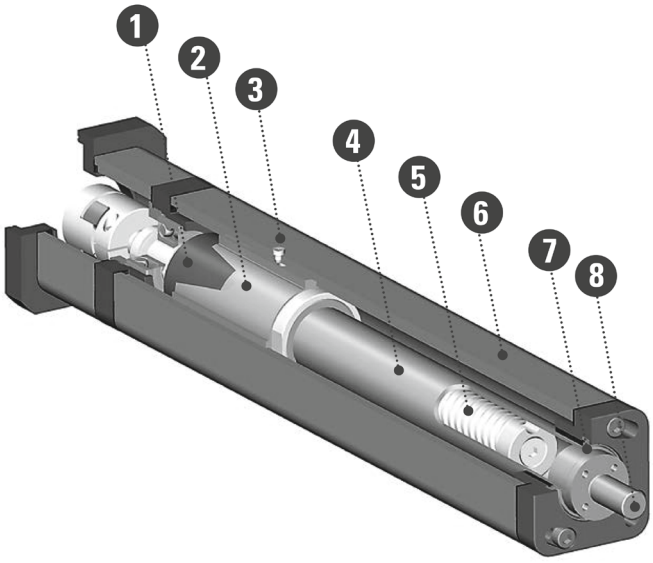
	Electric Design	Pneumatic Design
1. Actuator / cylinder 2. Cables 3. Control box --- 4. Servo valve 5. Regulator 6. Air hoses 7. Valve block 8. Linear scale 9. Compressor 10. Other equipment	 Space required: ~ 0.4 m³	 Space required: ~ 1.3 m³
Controllability	★★★★	★★
Load	★★★	★★
Accuracy	★★★★	★
Speed	★★★	★★★★
Maintenance	★★★	★
Noise	★★★	★★
Installed Cost	★★	★★★★
Operating Cost	★★★★	★
Total Cost	★★★	★★

★ Poor
★★ Fair
★★★ Good
★★★★ Excellent

Equipment shown performs the same operation and is shown in the same scale.

The PC-Series™ – Designed to Deliver Value

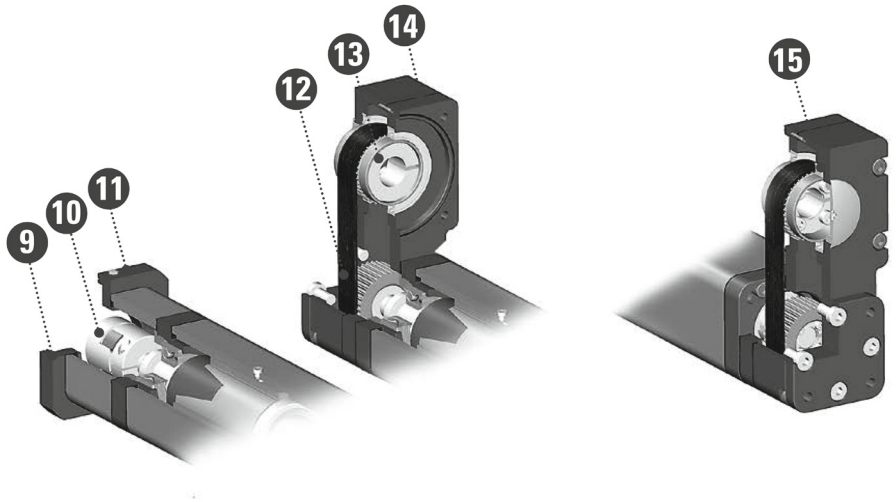
The design of a PC-Series™ precision linear actuator delivers extended life, high repeatability, and quiet operation. In addition, it requires minimal maintenance and resists corrosion in harsh environments.



	Feature	Benefit
1	High precision ball nut	High repeatability and positioning accuracy Smooth, quiet operation
2	Ball nut carrier (US patent pending)	High side load capability Reduced noise Built in anti-rotation of rod end
3	Single point lubrication	Quick and easy maintenance
4	Stainless steel extension tube	Suitable for heavy loads and harsh environments
5	Large diameter ball screw	High power density and long life
6	Smooth exterior profile	No collection points during washdown
7	Extension tube seal	IP 65 rating suitable for harsh environments
8	Stainless steel male rod adapter	Corrosion resistance Simple mounting of ISO standard accessories

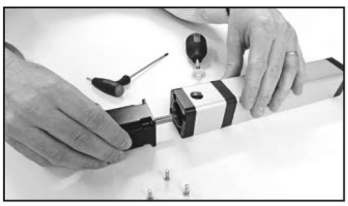
RediMount™ – Designed for Flexibility and Speed

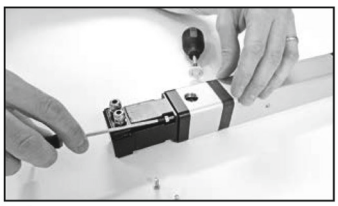
The RediMount™ system is designed for seamless motor installation in less than five minutes. It accommodates a wide range of motor types and sizes. Motor to actuator alignment is guaranteed, ensuring a trouble-free connection and maximum system performance.

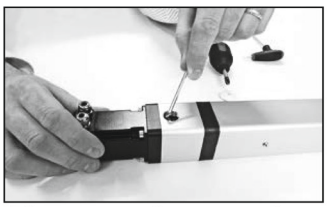


	Feature	Benefit
9	Thomson RediMount™ motor flange	Mounting in less than five minutes Pre-engineered to mount to more than 600 motors
10	Large, flexible coupling	High torque
11	Sealing plug	IP65 protection
12	Extra-wide synchronous belt	High thrust loads
13	Clamping element	Plug and play motor assembly
14	Large housing	Accommodates large frame motors
15	Straddle mounted pulley bearings	No radial load on motor shaft

RediMount™ Motor Mounting Steps

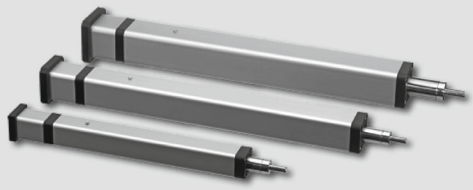
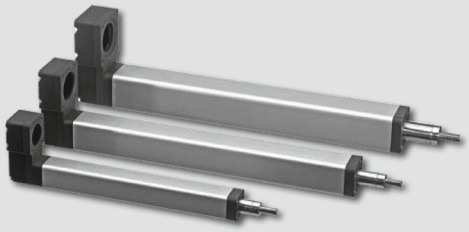

Insert motor shaft into coupling


Tighten motor mounting screws


Tighten motor coupling screws and install sealing plug

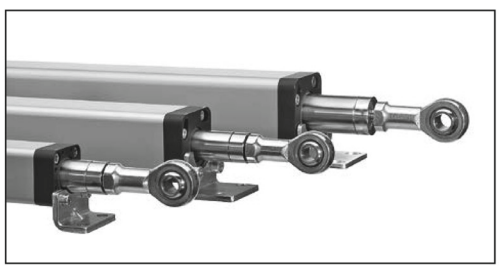
Product Family Overview

The PC-Series™ is available in three sizes (PC25, PC32 and PC40) and two styles (inline and parallel).

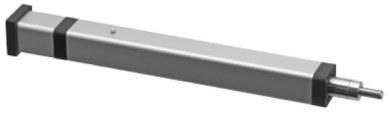
Family Overview	
Inline Style	Parallel Style
	

		PC25	PC32	PC40
Screw Type		ball screw	ball screw	ball screw
Max. Load (Fx)	[N]	1250	3200	6000
Max. Stroke	[mm]	600	1200	1200
Max. Speed	[m/s]	1.33	1.00	1.66
Profile Size	[mm]	34 × 34	45 × 45	55 × 55
Screw Diameter	[mm]	10	12	20
Screw Lead	[mm]	3, 10	4, 10	5, 10, 20
Protection Class	[mm]	IP65	IP65	IP65

Accessories
A complete line of accessories is available – including ISO compatible actuator mounting options, extension tube adapters and limit sensors. See pages 16 - 21.



Specifications - PC25



Standard Features and Benefits

- Compact, robust and reliable
- Stroke up to 600 mm
- Load up to 1250 N
- Speed up to 1.33 m/s
- Stainless steel extension tube
- IP65 as standard
- Mounting accessories according to pneumatic ISO standard

General Specifications

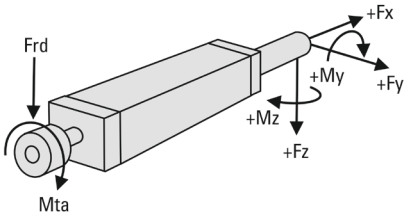
Parameter	PC25
Profile size (w × h) [mm]	34 × 34
Type of screw	ball screw
Protection class	IP65
Lubrication	one point lubrication of ball screw

Performance Specifications

Parameter		PC25
Stroke length (S max), maximum	[mm]	600
Linear speed, maximum	[m/s]	1.33
Acceleration, maximum	[m/s²]	10
Repeatability	[± mm]	0.01
Input speed, maximum	[rpm]	8000
Operation temperature limits	[°C]	-20 – +70
Dynamic load (Fx), maximum	[N]	1250
Dynamic load (Fy), maximum	[N]	20
Dynamic load (Fy), maximum	[N]	20
Dynamic load torque (Mz, My), maximum	[Nm]	10
Screw versions, diameter (d0) / lead (p)	[mm]	10/03, 10/10
Drive shaft force (Frd), maximum	[N]	100
Input torque, maximum (RediMount models)	[Nm]	2.3
Drive shaft torque (Mta), maximum	[Nm]	4.0

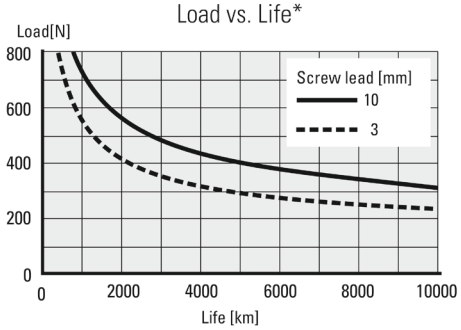
* The Load vs. Life diagram show the life for an actuator with max. dynamic load in one direction and no load in the other. For detailed life time calculations, please see the online sizing and selection tool at www.thomsonlinear.com/pcseries.

Definition of Forces

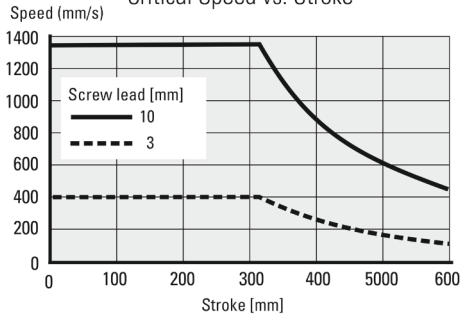


Performance Diagrams

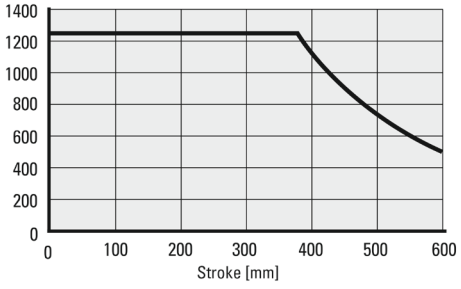
Load vs. Life*



Critical Speed vs. Stroke



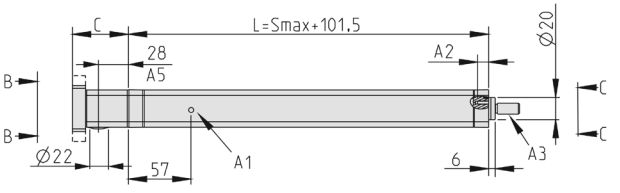
Column Load Limit vs. Stroke

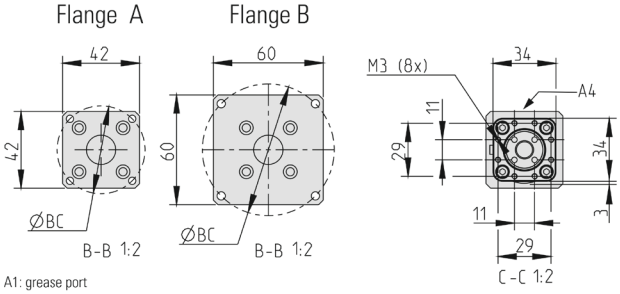


Dimensions - PC25

Dimensions for Inline Style with RediMount Flange

Dimensions	Projection
METRIC	





A1: grease port
A2: M3 thread, max. depth 10 mm.
A3: male threaded rod end shown, see ordering key and accessories for information on all available ends.
A4: side of cover tube for mounting of sensors.
A5: distance to center of coupling tightening hole.

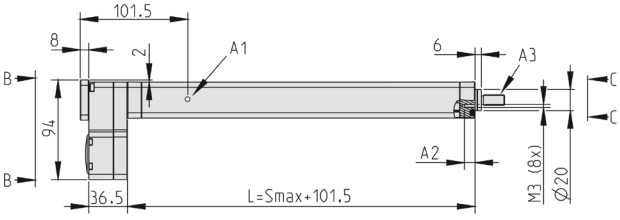
Bell House Length (C)	
Motor shaft length [mm]	C [mm]
19 - 24	52
24 - 29	57
29 - 34	62
34 - 39	67

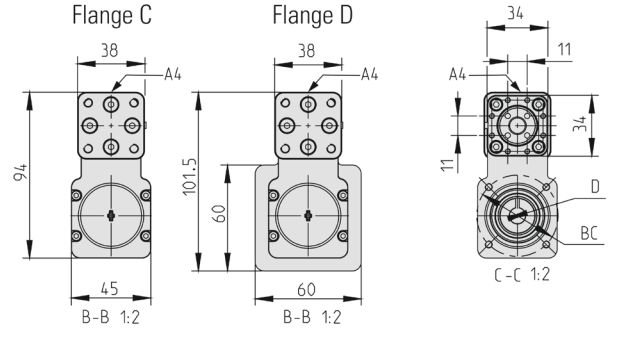
RediMount Flange Motor Dimensions Compatibility		
Motor data	Flange A [mm]	Flange B [mm]
Bolt circle diameter (BC)	43.8 - 48	48 - 72
Shaft diameter	5 - 11	
Shaft length	19 - 39	
Pilot diameter	16 - 36	16 - 54
Pilot length	max. 4	

Weight of Unit [kg]
0.543 + (S [mm] × 0.0021)

Dimensions for Parallel Style with RediMount Motor Flange

Dimensions	Projection
METRIC	





A1: grease port
A2: M3 thread, max. depth 10 mm.
A3: male threaded rod end shown, see ordering key and accessories for information on all available ends.
A4: side of cover tube for mounting of sensors.

RediMount Flange Motor Dimensions Compatibility		
Motor data	Flange C [mm]	Flange D [mm]
Bolt circle diameter (BC)	25 - 51	51 - 72
Shaft diameter	5 - 10	
Shaft length	13 - 35	
Pilot diameter	16 - 39	16 - 54
Pilot length	max. 4	
Motor square/diameter	max. 66.5	

Weight of Unit [kg]
0.778 + (S [mm] × 0.0021)

Specifications - PC32

Standard Features and Benefits

- Compact, robust and reliable
- Stroke up to 1200 mm
- Load up to 3200 N
- Speed up to 1 m/s
- Stainless steel extension tube
- IP65 as standard
- Mounting accessories according to pneumatic ISO standard

General Specifications

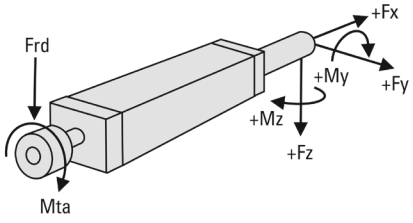
Parameter	PC32
Profile size (w × h) [mm]	45 × 45
Type of screw	ball screw
Protection class	IP65
Lubrication	one point lubrication of ball screw

Performance Specifications

Parameter		PC32
Stroke length (S max), maximum	[mm]	1200
Linear speed, maximum	[m/s]	1
Acceleration, maximum	[m/s²]	10
Repeatability	[± mm]	0.01
Input speed, maximum	[rpm]	6000
Operation temperature limits	[°C]	-20 – +70
Dynamic load (Fx), maximum	[N]	3200
Dynamic load (Fy), maximum	[N]	20
Dynamic load (Fy), maximum	[N]	20
Dynamic load torque (Mz, My), maximum	[Nm]	25
Screw versions, diameter (d0) / lead (p)	[mm]	12/04, 12/10
Drive shaft force (Frd), maximum	[N]	300
Input torque, maximum (RediMount models)	[Nm]	5.1
Drive shaft torque (Mta), maximum	[Nm]	9.2

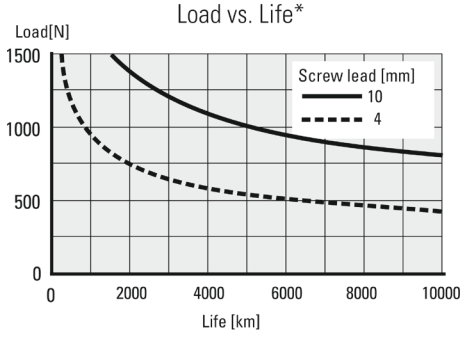
* The Load vs. Life diagram show the life for an actuator with max. dynamic load in one direction and no load in the other. For detailed life time calculations, please see the online sizing and selection tool at www.thomsonlinear.com/pcseries.

Definition of Forces

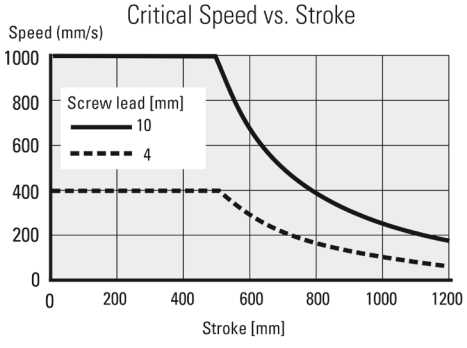


Performance Diagrams

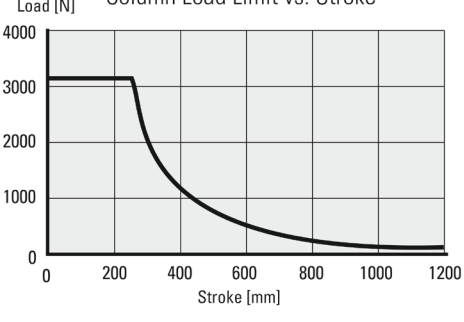
Load vs. Life*



Critical Speed vs. Stroke



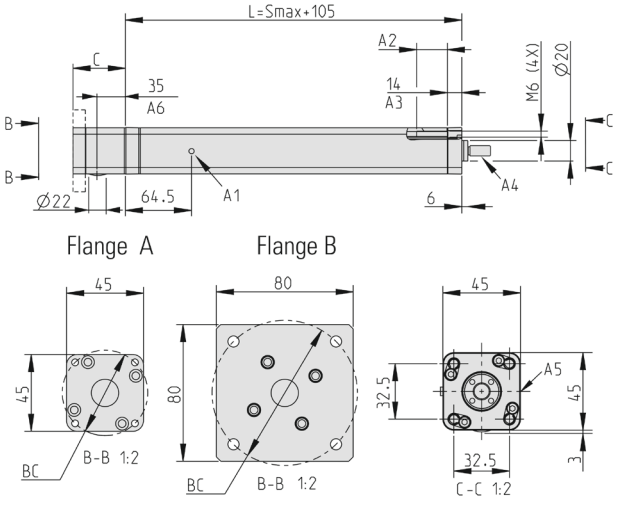
Column Load Limit vs. Stroke



THOMSON

Dimensions - PC32

Dimensions for Inline Style with RediMount Motor Flange



A1: grease port A2: M6 thread, max. depth 30 mm A3: no thread
A4: male threaded rod end shown, see ordering key and accessories for information on all available ends.
A5: side of cover tube for mounting of sensors. A6: distance to center of coupling tightening hole.

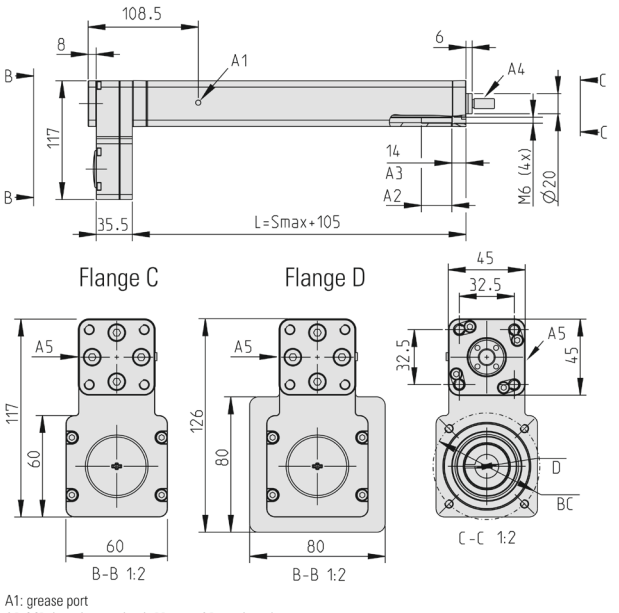
Dimensions	Projection
METRIC	

Bell House Length (C)	
Motor shaft length [mm]	C [mm]
20 - 27	59
27 - 34	66
34 - 41	73

RediMount Flange Motor Dimensions Compatibility		
Motor data	Flange A [mm]	Flange B [mm]
Bolt circle diameter (BC)	37 - 50	50 - 99
Shaft diameter	5 - 16	
Shaft length	20 - 41	
Pilot diameter	16 - 39	16 - 75
Pilot length	max. 4	

Weight of Unit [kg]
0.681 + (S [mm] × 0.0034)

Dimensions for Parallel Style with RediMount Motor Flange



A1: grease port
A2: M6 thread, max. depth 30 mm A3: no thread
A4: male threaded rod end shown, see ordering key and accessories for information on all available ends.
A5: side of cover tube for mounting of sensors.

Dimensions	Projection
METRIC	

RediMount Flange Motor Dimensions Compatibility		
Motor data	Flange C [mm]	Flange D [mm]
Bolt circle diameter (BC)	25 - 72	72 - 99
Shaft diameter	5 - 14	
Shaft length	15 - 34	
Pilot diameter	16 - 54	16 - 74
Pilot length	max. 4	
Motor square/diameter	max. 82.5	

Weight of Unit [kg]
1.221 + (S [mm] × 0.0034)

Specifications - PC40

Standard Features and Benefits

- Compact, robust and reliable
- Stroke up to 1200 mm
- Load up to 6000 N
- Speed up to 1.66 m/s
- Stainless steel extension tube
- IP65 as standard
- Mounting accessories according to pneumatic ISO standard

General Specifications

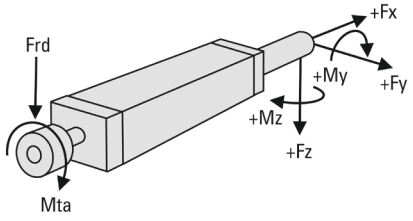
Parameter	PC40
Profile size (w × h) [mm]	55 × 55
Type of screw	ball screw
Protection class	IP65
Lubrication	one point lubrication of ball screw

Performance Specifications

Parameter		PC40
Stroke length (S max), maximum	[mm]	1200
Linear speed, maximum	[m/s]	1.66
Acceleration, maximum	[m/s²]	10
Repeatability	[± mm]	0.01
Input speed, maximum	[rpm]	5000
Operation temperature limits	[°C]	-20 – +70
Dynamic load (Fx), maximum	[N]	6000
Dynamic load (Fy), maximum	[N]	50
Dynamic load (Fy), maximum	[N]	50
Dynamic load torque (Mz, My), maximum	[Nm]	25
Screw versions, diameter (d0) / lead (p)	[mm]	20/05, 20/10, 20/20
Drive shaft force (Frd), maximum	[N]	650
Input torque, maximum (RediMount models)	[Nm]	5.8
Drive shaft torque (Mta), maximum	[Nm]	24

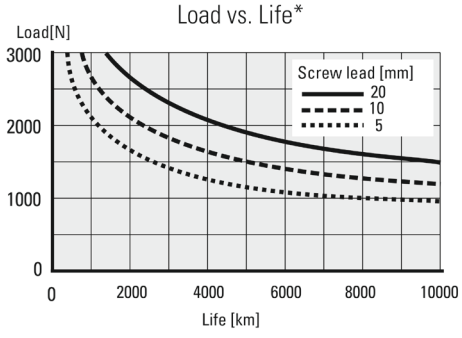
* The Load vs. Life diagram show the life for an actuator with max. dynamic load in one direction and no load in the other. For detailed life time calculations, please see the online sizing and selection tool at www.thomsonlinear.com/pcseries.

Definition of Forces

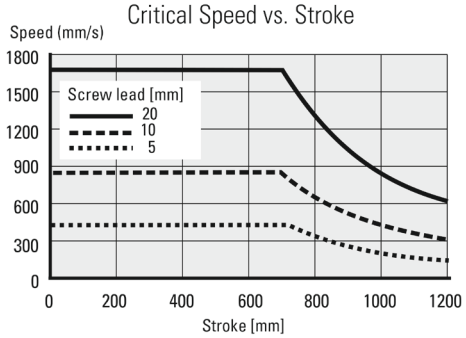


Performance Diagrams

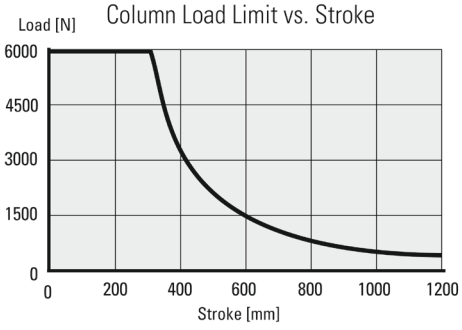
Load vs. Life*



Critical Speed vs. Stroke

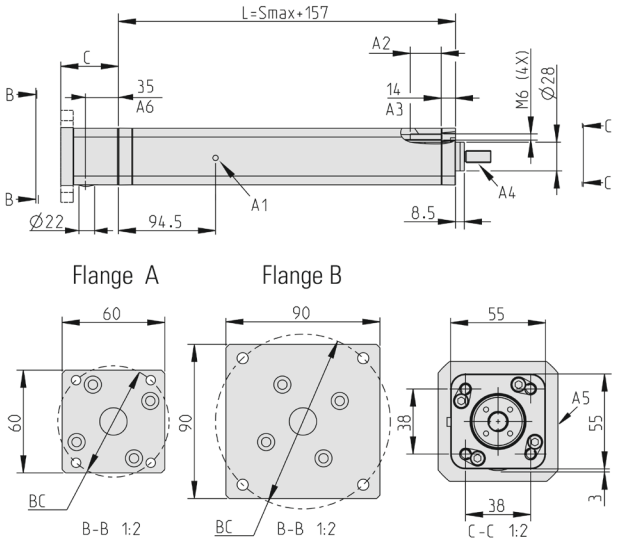


Column Load Limit vs. Stroke



Dimensions and Performance Diagrams - PC40

Dimensions for Inline Style with RediMount Motor Flange



A1: grease port A2: M6 thread, max. depth 30 mm A3: no thread
A4: male threaded rod end shown, see ordering key and accessories for information on all available ends.
A5: side of cover tube for mounting of sensors. A6: distance to center of coupling tightening hole.

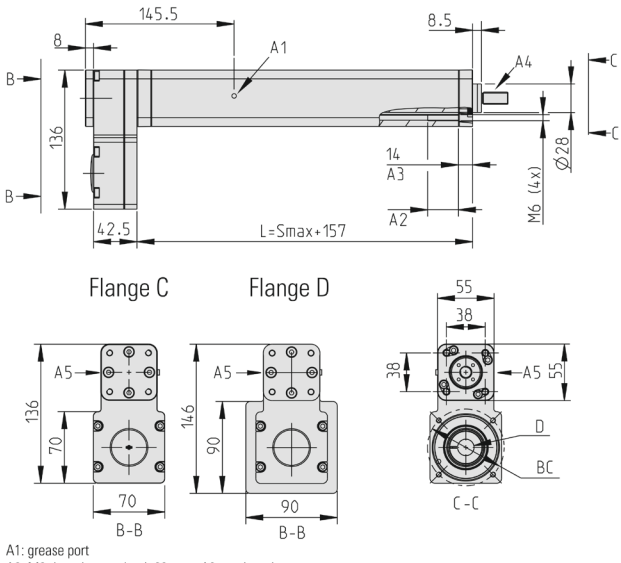
Dimensions	Projection
METRIC	

Bell House Length (C)	
Motor shaft length [mm]	C [mm]
20 - 27	62
27 - 34	69
34 - 41	76

RediMount Flange Motor Dimensions Compatibility		
Motor data	Flange A [mm]	Flange B [mm]
Bolt circle diameter (BC)	37 - 72	72 - 107
Shaft diameter	5 - 16	
Shaft length	20 - 41	
Pilot diameter	16 - 54	16 - 85
Pilot length	max. 4	

Weight of Unit [kg]
1.853 + (S [mm] × 0.0052)

Dimensions for Parallel Style with RediMount Motor Flange



A1: grease port
A2: M6 thread, max. depth 30 mm A3: no thread
A4: male threaded rod end shown, see ordering key and accessories for information on all available ends.
A5: side of cover tube for mounting of sensors.

Dimensions	Projection
METRIC	

RediMount Flange Motor Dimensions Compatibility		
Motor data	Flange C [mm]	Flange D [mm]
Bolt circle diameter (BC)	26 - 85	85 - 107
Shaft diameter	5 - 16	
Shaft length	15 - 41	
Pilot diameter	16 - 64	16 - 85
Pilot length	max. 4	
Motor square/diameter	max. 90.5	

Weight of Unit [kg]
2.318 + (S [mm] × 0.0052)

How To Order

The PC-Series™ ordering key provides a quick overview of the product versions available. It is important to consider many details of your application when selecting a product, including the loads and speeds required as well as the product environment and necessary accessories. Use our online selection tool at www.thomsonlinear.com/pcseries or contact us for further support.

Ordering Key

1	2	3	4	5	6	7	8	9
PC	**25**	**LX**	**423**	**B10–**	**0270**	**M**	**J**	**1**

1. Actuator type
PC = PC-Series precision linear actuator

2. Size
25 = profile size 34 × 34 mm
32 = profile size 45 × 45 mm
40 = profile size 55 × 55 mm

3. Transmission type
SX = inline style, directly coupled, no RediMount flange
LX = inline style, directly coupled, RediMount flange
PA = parallel style, 1:1 belt gear in standard position

4. RediMount motor ID [1]
000 – 998 = code for suitable flange when customers choice of motor is known
999 = code used when customers choice of motor is unknown
XXX = code used when unit has no RediMount flange. [2]

5. Screw type and lead
B03– = ball screw, 3 mm lead (possible for PC25 only)
B04– = ball screw, 4 mm lead (possible for PC32 only)
B05– = ball screw, 5 mm lead (possible for PC40 only)
B10– = ball screw, 10 mm lead (possible for all sizes)
B20– = ball screw, 20 mm lead (possible for PC40 only)

6. Stroke length (S max)
0000 – 9999 = distance in mm

7. Cylinder mounting
R = rear trunnion (fixed, mounted on belt gear)
C = rear clevis
F = feet kit
M = trunnion (movable)
T = front trunnion (fixed, mounted on front housing)
P = front mounting plate
X = without any cylinder mounting

8. Rod end
M = male thread (standard)
F = female thread
J = spherical joint
C = front clevis

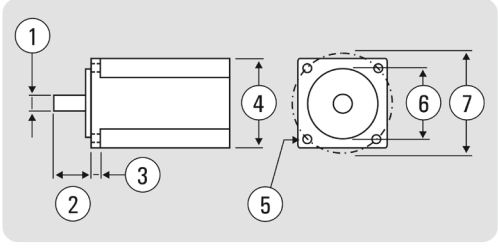
9. Environmental
1 = IP65 rating (standard)

(1) See section "RediMount™ Selection" below.
(2) Always use XXX in combination with transmission type SX.

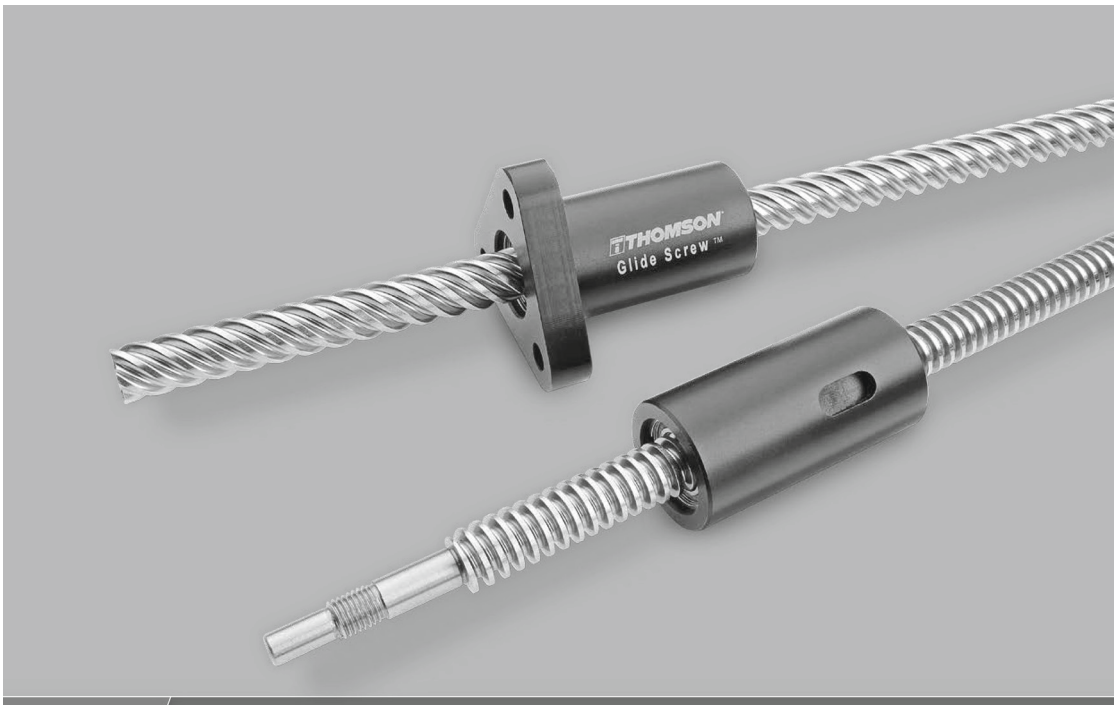
RediMount™ Selection

These are the key dimensions you need to know to be able to define the RediMount code and flange size for your choice of motor and PC-Series actuator.

1. Motor shaft diameter
2. Motor shaft length
3. Mounting flange thickness
4. Motor square/diameter size
5. Mounting bolt thru hole diameter
6. Motor pilot diameter
7. Mounting bolt circle



Let our online RediMount selection tool assist you!
www.thomsonlinear.com/pcseries



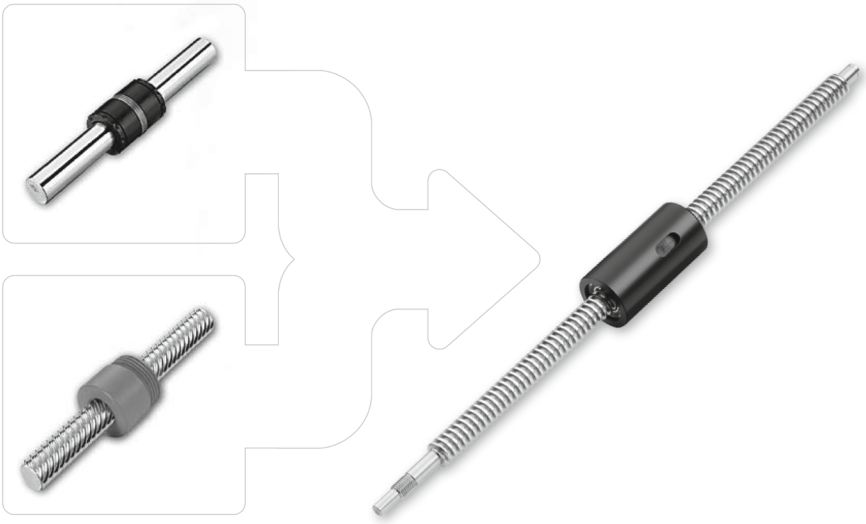
Glide Screw™

Combines the Features of a Linear Bearing and Screw in One Compact Package

THOMSON
Linear Motion. **Optimized.**™

Introduction

What is a Glide Screw™? Part linear bearing, part lead screw; a combination of two favorites to create something better than both. The patent-pending Glide Screw™ brings high performance, fast installation and less complexity in a small package.



Standard Sizes and Configurations Stocked for Immediate Availability!

- Metric Series includes 4, 6 and 10 mm nominal diameters
- Inch Series includes 3/16", 1/4" and 3/8" nominal diameters
- Flanged and cylindrical nut bodies standard

Optional Configurations for Harsh Environments Available

- High temperature resistant – inside ovens or autoclaves (up to 175 °C)
- Clean room – in robot vacuum chambers, laboratories or medical equipment (ISO 6)
- Food grade – in packaging and food processing equipment

Custom Nut Configurations, Screw Diameters and Thread Leads Available

- Don't see your perfect configuration – call us, we make custom sizes!

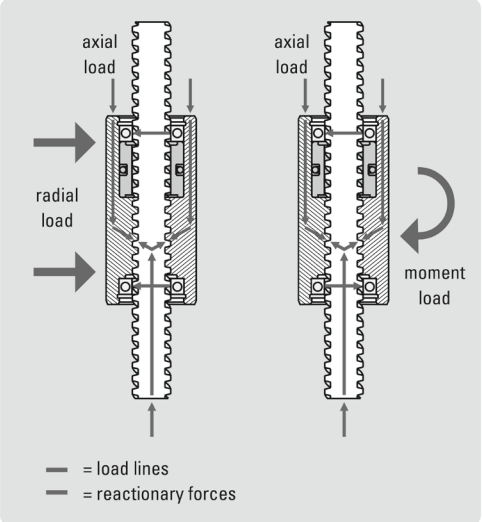
Easy to Install and Maintenance Free!

- All that is required is a Glide Screw™ and an anti-rotation feature
- No need for reference surfaces or the pain of "floating" your system into alignment
- Plug and play! Install it and forget it!
- Integrated Thomson's patented Lube for Life technology
- Bearing grade plastic and stainless steel construction standard

Engineering

The Glide Screw™ is designed to actuate a moment load or a side load without additional linear guidance or support. Therefore, the screw deflection is the determinant feature and the following charts must be used when properly sizing a Glide Screw™ for an application.

How the Glide Screw™ Works
The unique design of Glide Screw™ allows it to handle axial, radial and moment loads without additional guidance. The result is an efficient and space saving design that is quick and easy to install with reduced maintenance needs compared to traditional solutions.

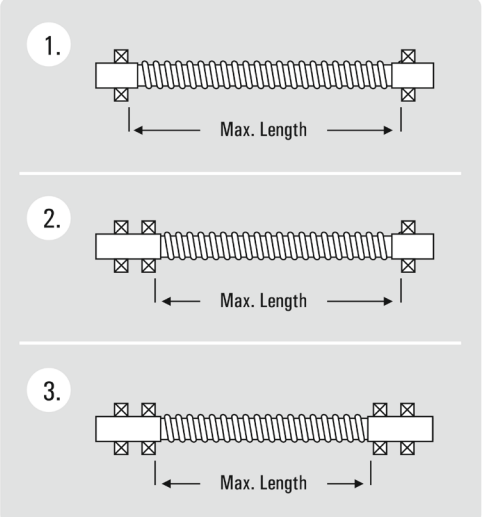


End Support
Decide which type of end support you will use to enable accurate selection of diameter.

Fixed support – utilizes a support journal length at least 1.5 × the journal diameter – such as dual ball bearings.

Simple support – uses a single ball bearing, a plain bearing, or a bushing.

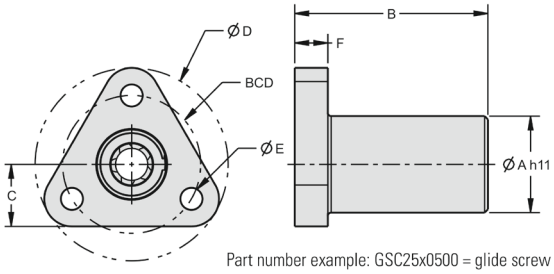
End support configurations shown at left:
1. Simple / simple
2. Fixed / simple
3. Fixed / fixed



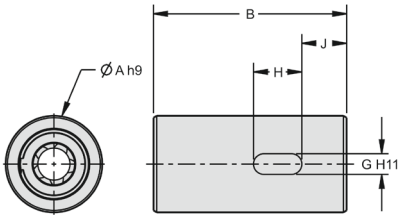
Specifications and Part Numbers

Glide Screw™ configurations

GSF - screw and flanged nut assembly



GSC - screw and cylindrical nut assembly



Part number example: GSC25x0500 = glide screw assembly, cylindrical nut, 0.250 inch diameter by 0.500 inch lead

Inch Series Dimensions

Screw Diam. [in]	Screw Lead [in]	Screw and Nut Assembly Part No.	Max Axial Load [lbs]	Max Moment Load [in-lbs]	Max Screw Length [in]	Dimensions [in]										Effic. [%]
						A	B	C	D	E	F	G	H	J	BCD	
0.188	0.050	GS_18x0050	30.0	20.5	6.000	0.375	0.750	0.281	0.875	0.140	0.125	0.094	0.188	0.177	0.625	46
	0.125	GS_18x0125														68
0.250	0.050	GS_25x0050	45.0	47.5	10.000	0.500	1.000	0.313	1.000	0.140	0.150	0.125	0.250	0.237	0.750	40
	0.500	GS_25x0500														82
0.375	0.063	GS_37x0063	70.0	137.5	18.000	0.875	1.750	0.563	1.500	0.200	0.300	0.188	0.438	0.406	1.188	36
	0.500	GS_37x0500														78
	1.000	GS_37x1000														83

Metric Series Dimensions

Screw Diam. [mm]	Screw Lead [mm]	Screw and Nut Assembly Part No.	Max Axial Load [N]	Max Moment Load [Nm]	Max Screw Length [mm]	Dimensions [mm]										Effic. [%]
						A	B	C	D	E	F	G	H	J	BCD	
4	1	GS_4x1M	89.0	2.3	150	10	20	6.5	20	2.5	3	2	5	5	15	45
	4	GS_4x4M														75
	8	GS_4x8M														82
6	1	GS_6x1M	133.4	5.4	250	13	26	7.75	25	3.5	4	3	7	5.75	19	36
	6	GS_6x6M														75
	12	GS_6x12M														82
10	2	GS_10x2M	311.4	15.5	450	22	44	12	38	5	7	4	10	9.85	30	40
	6	GS_10x6M														66
	12	GS_10x12M														77

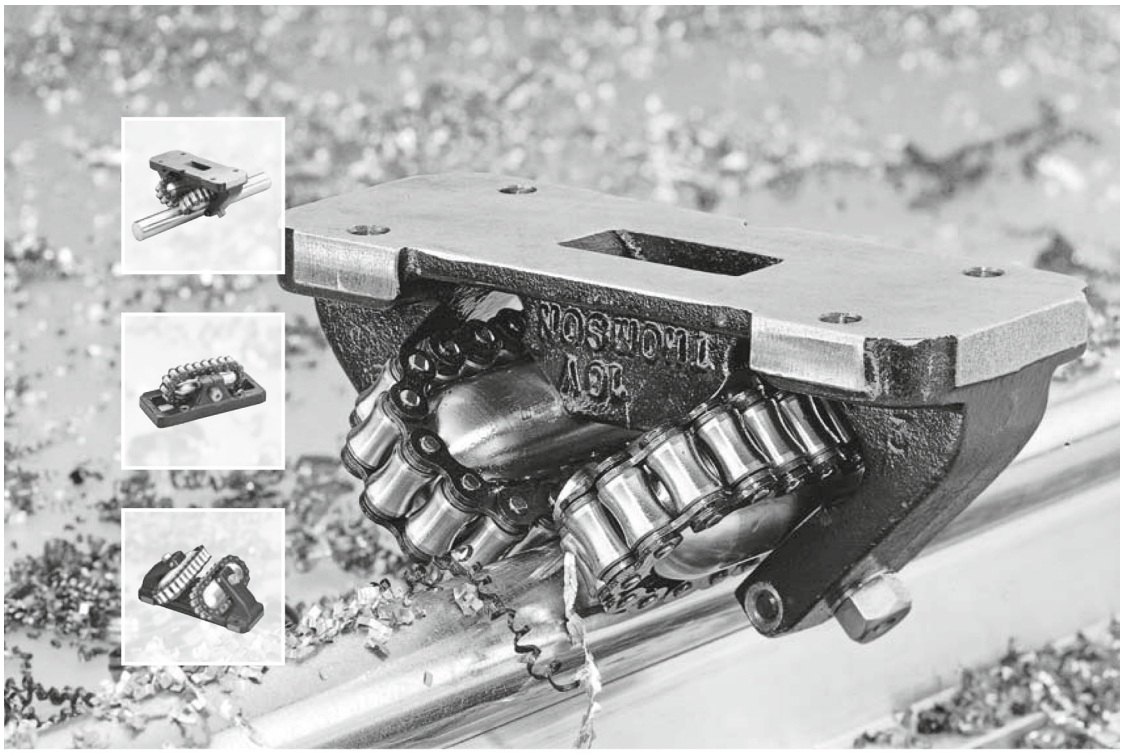
Standard Products
- Acetal nut body with all stainless steel internal components
- 303 stainless steel screw
- Integrated Lube for Life lubrication block
- Temperature Rating: -40° to 65°C (-40° to 150°F)
- Clean Room ISO 7 (Class 10000)

High Temperature
- PEEK nut material and high temperature internal components
- Temperature Rating: -10 to 175 °C (15 to 350 °F)

Clean Room/Vaccum Grade
- Class ISO 6 (Class 1000)
- Vacuum rating of $<10^{-6}$ Torr
- PEEK nut material with appropriate grade components
- Alternative lubrication system

Food Grade Configuration
- Food grade lubricants
- Rulon nut body, USDA-H1 compatible

THOMSON



Thomson RoundWay® Linear Roller Bearings

Designed to withstand extremes of load, speed, temperature and contamination.

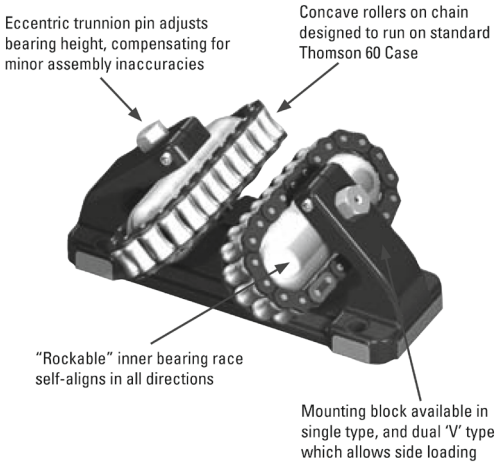
THOMSON™
Linear Motion. ***Optimized.***

Thomson RoundWay® Linear Roller Bearings

The patented RoundWay Linear Roller Bearing operates on 60 Case® LinearRace shafting, with over 20 times the load capacity of a conventional linear ball bearing. RoundWay has the unique advantage of providing high load capacity without the installation costs typical of Profile Rail products with much greater resistance to environmental contaminates.

- Dynamic Load rating of up to 70,000 lbf (310,800 N)[1]
- Velocity up to 100 ft/s (31 m/s)
- Ability to handle exceptionally harsh environmental conditions
  - Extremely contaminant resistant
  - Maximum operating temperature of 500°F (260°C)
- Bearing height infinitely adjustable within up to +/- .030" (+/- .38 mm)[1]
- Size range from ½" to 4"
- Replacement parts available to reduce maintenance cost

(1) Applies to 6" RW "V" bearing



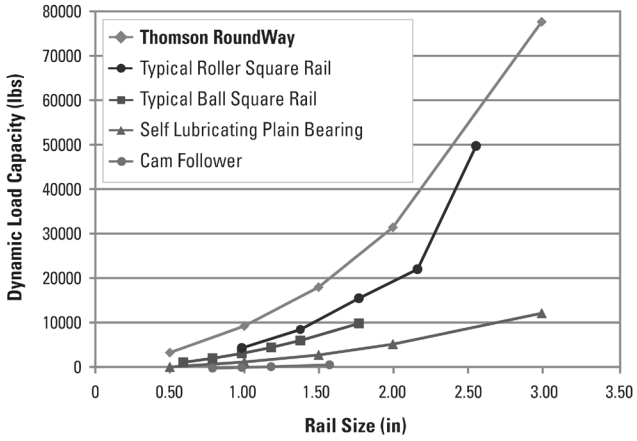
Feature		Advantage	Application Benefits
Concave Rollers	**1**	Double maximum contact ellipse maximizes load capacity of an anti-friction linear bearing. Can carry loads up to 70,000 lbs per bearing at a 10 million inch L10 rated travel life.	Ideal for extremely high load applications.
Chain-linked Rollers	**2**	Ability to travel at speeds up to 100ft/s. Conventional linear bearings and guides are limited to top speeds of 10 ft/s.	High speed automation systems - high speed belt drives, rack systems, etc., are no longer limited by the max. speed of linear bearings and guides.
	3	Ability to operate in severely contaminated environments without protective bellows. There are no pockets where debris can accumulate to bind up the bearing.	Open roller assembly is suited for metal removal, paper and wood processing, and granite quarrying. Metal chips, paper flour, wood chips, and abrasive dust would normally destroy conventional linear bearings and guides.
All Steel and Iron Construction	**4**	Offers: • High temperature capacity to 500°F • Rugged use • Increased rigidity.	Durable in extreme environments.
Circular Inner Race	**5**	Lateral self-alignment feature provides parallelism forgiveness. Rails for RoundWay bearings may be out of parallel as much as 0.1875". Ball Bushing Bearings require rails to be parallel within 0.0010". Profile Rail products require rails to be parallel within 0.0004".	Ideal for use in gantry systems where it is difficult to maintain 0.001" or better parallelism tolerances over long rail lengths that may be spread far apart.
Eccentric Trunion Pin	**6**	Enables: • Pitch self-alignment • ± 0.030" height adjustment which can be used to set preload in "locked-in" arrangements.	• Self-alignment enables operation on inaccurate mounting surfaces • Preload benefits applications requiring maximum stiffness and minimal deflection.
Recirculating Ground Roller Assembly	**7**	Ability to span across gaps in shaft.	Assembly and packaging systems - quicker and more efficient pallet changing is now possible.
	8	Dynamic coefficient of friction of 0.005 and a height tolerance of ±0.003", the equivalent to standard linear bearing tolerances.	Allows for energy efficient, high load and precision linear motion.
	9	Quieter, smoother operation than anti-friction linear bearings and guides. Low capacity nylon balls not necessary.	Minimal noise while still maintaining high load capacity and very low friction.
RoundRail Advantage	**10**	Round shafts enable bearing to rotate thereby eliminating the potential for induced torsional stresses.	Operates on inaccurate mounting surfaces

RoundWay Load, Speed and Performance Capabilities

The RoundWay's rigid all-steel construction makes it ideal for unforgiving environments

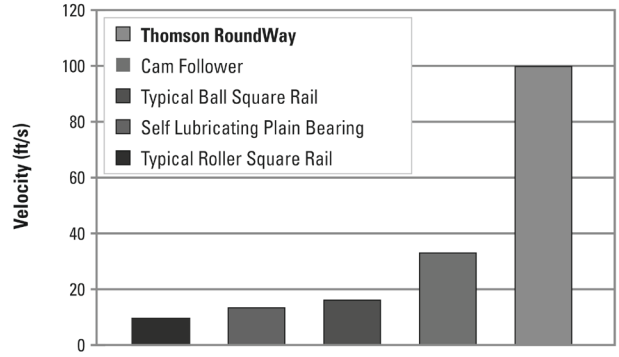
Environment	Cam Follower	Self-Lubricated Plain Bearing	Typical Ball Profile Rail	Thomson RoundWay
Load Capacity	Poor	Good	Very Good	Excellent
Maximum Speed	Good	Fair	Fair	Excellent
Contaminants	Good	Very Good	Fair	Excellent
Impacts/Vibration	Poor	Very Good	Very Good	Excellent
High Temperature	Fair	Very Good	Fair	Excellent

Bearing Dynamic Load Capacity(1)



The RoundWay 'V' dynamic load capacity exceeds other bearing technology types

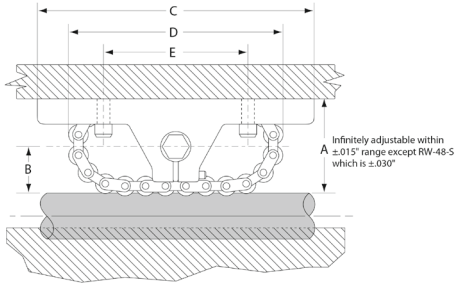
Maximum Bearing Velocity



The RoundWay's chain guided rollers allow it to travel at incredibly high speeds – up to almost 70 mph!

(1) As calculated per ISO 14728-1, based on 10 million inches of travel at a speed of 30ft/min

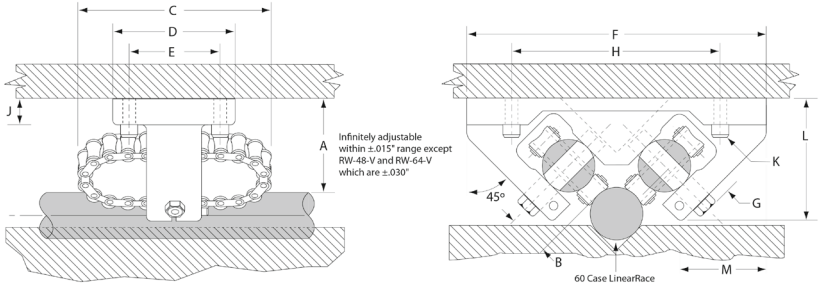
RoundWay Specifications



RoundWay Linear Roller Bearings (Single Type) and 60 Case LinearRace (Dimensions in inches)

Part Number		Nom. Dia.	A	B	C	D	E	F	G	H	J	K		L	Bearing Mass lb	Dynamic (1) Load Capacity lb_f
RoundWay Bearing	60 Case LinearRace											Bolt	Hole			
RW-8-S	1/2 L PD	.500	1.00	.45	3.0	2.38	1.50	1.25	.19	.94	.31	#6	.16	.88	.50	970
RW-16-S	1 L PD	1.000	1.75	.80	5.0	3.75	2.50	2.13	.25	1.63	.50	#10	.25	1.50	2.20	3020
RW-24-S	1 1/2 L PD	1.500	2.50	1.15	6.5	5.38	3.50	2.88	.31	2.13	.63	.31	.38	2.13	5.60	6020
RW-32-S	2 L PD	2.000	3.25	1.50	8.5	7.38	4.50	3.63	.38	2.75	.75	.38	.44	2.88	12.40	12360
RW-48-S	3 L PD	3.000	5.00	2.30	13.0	11.00	7.00	6.00	.50	4.25	1.25	.63	.69	4.25	48.00	24000

(1) Dynamic Load Capacity is based on 10 million inches of travel.



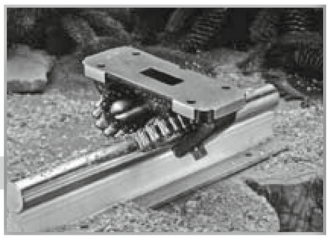
RoundWay Linear Roller Bearings (Dual Type) and 60 Case LinearRace (Dimensions in inches)

Part Number		Nom. Dia.	A	B	C	D	E	F	G	H	J	K		L	M	Bearing Mass lb	Dynamic (1) Load Capacity lb_f
RoundWay Bearing	60 Case LinearRace											Bolt	Hole				
RW-8-V	1/2 L PD	.500	1.00	.45	2.38	1.38	1.00	3.00	.19	2.25	.31	#8	.19	1.38	.69	1.10	1370
RW-16-V	1 L PD	1.000	1.75	.80	3.75	2.25	1.63	5.75	.25	4.0	.50	#10	.25	2.38	1.56	4.90	4300
RW-24-V	1 1/2 L PD	1.500	2.50	1.15	5.38	2.75	2.00	7.88	.31	6.0	.63	.31	.38	3.38	2.13	11.70	8600
RW-32-V	2 L PD	2.000	3.25	1.50	7.38	3.50	2.50	9.75	.38	7.5	.75	.38	.44	4.38	2.50	25.20	17500
RW-48-V	3 L PD	3.000	5.00	2.30	11.00	5.50	4.00	15.50	.63	12.00	1.25	.63	.69	7.00	4.25	90.00	35000
RW-64-V	4 L PD	4.000	6.50	3.00	14.88	7.00	5.00	19.25	.75	15.00	1.50	.75	.81	8.63	5.00	193.00	70000

(1) Dynamic Load Capacity is based on 10 million inches of travel.

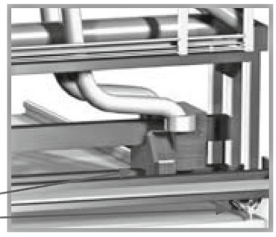
RoundWay Linear Bearings Used Across Numerous Industries:

Steel Processing
Heavy Assembly
Refineries
Woodworking



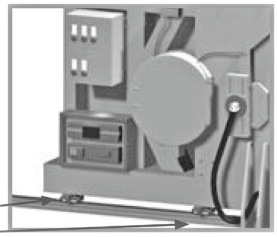
Application: Fiberglass Saw

- Designed using (4) Roundway 32V bearings benefits:
  - High load capacity – 2 ton load
  - High contamination resistance – fiberglass particles
  - Minimal installation time - 60 Case LinearRace shafting can be mounted slightly out or parallel, eliminating the need for costly alignment procedures



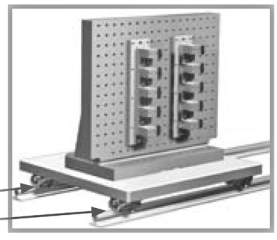
Application: UV Curing System

- Designed using (4) Roundway 32V bearings benefits:
  - High load capacity - 8 ton load
  - High contamination resistance – rubber dust
  - Minimal replacement costs – Roundway bearing components can be replaced without replacing bearing mount

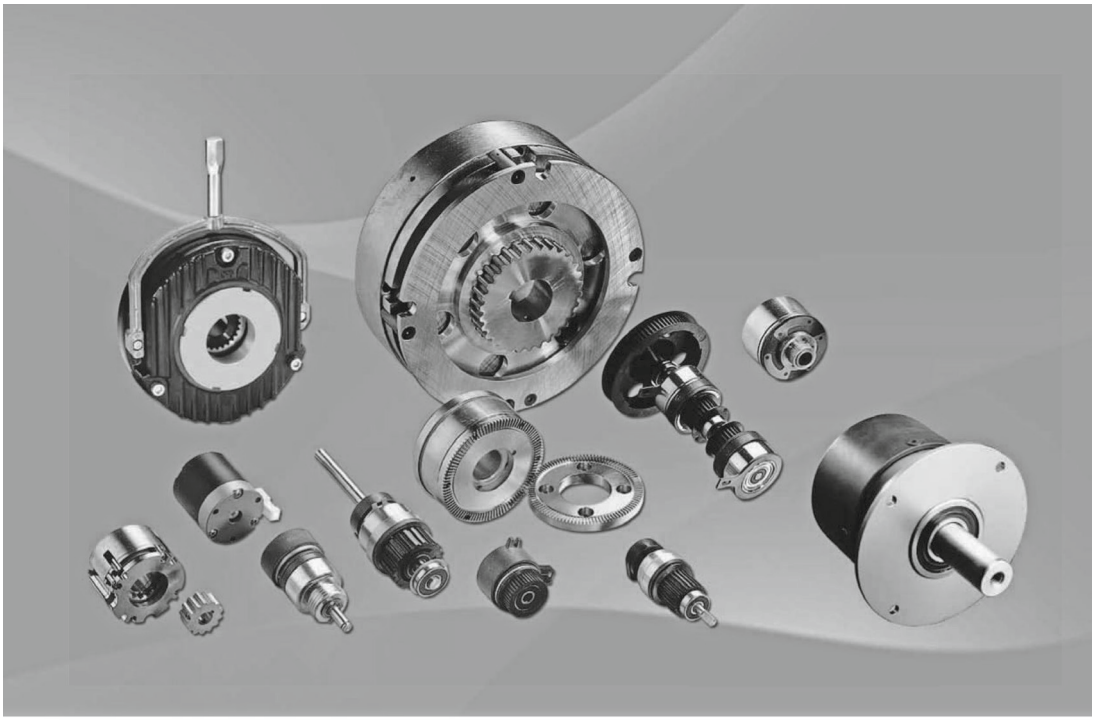


Application: Machining Pallet Transfer

- Designed using (4) RoundWay 24V bearings benefits
  - Long life – bearings in operation for 14 years without replacement
  - Bearing spans .080" gap between shafting in part loading area and transfer station



Let Thomson help define the optimal linear motion solution for your application. We offer the broadest range of linear guides and components including Linear Ball Bushing® Bearings, Profile Rail Bearings, RoundWay Bearings and complete linear motion systems.



DELTRAN

Friction
Clutches & Brakes

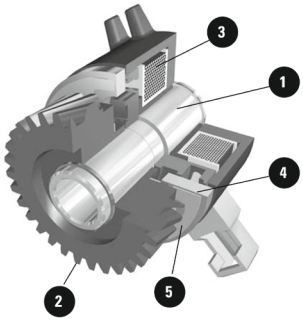
THOMSON
Linear Motion. Optimized.™

Friction Clutches & Brakes

Operation and Design Principles

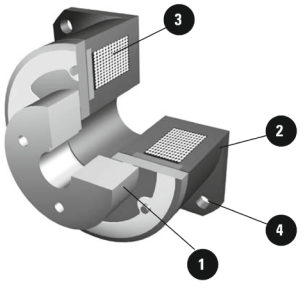
Electromagnetic Clutch

An electromagnetic clutch in its simplest form is a device used to connect a motor to a load. Generally the motor shaft is pinned or keyed to the clutch rotor-shaft assembly (1) bore (input), with the load connected to the armature (output) of the clutch (2) by a pulley or gear. Until the coil (3) is energized, this armature assembly is not coupled, thus not rotating with the input rotor-shaft. Upon coil energization, the rotor-shaft assembly becomes part of an electromagnet, attracting the armature plate (4), engaging this with the rotor assembly, and thus driving the load. When the coil is de-energized, these two attracted elements are no longer attracted and are separated by a spring (5) within the armature assembly. The motor shaft and load are then no longer connected and therefore the load is not driven. The clutch enables the motor to remain on while the load is idle, benefiting in faster cycle time and better overall system efficiency.



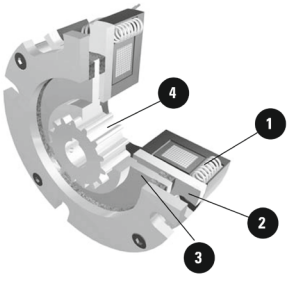
Power-On Electromagnetic Brake

A power-on electromagnetic brake operates using the same principle as the clutch, but with only a single rotating component, the armature assembly (1). The brake is generally positioned on the load shaft with the armature assembly secured to the shaft while the field assembly (2) is mounted to a non-rotating component or bulkhead. Until the coil is (3) energized, the armature assembly will rotate freely. Upon energization, the field assembly becomes an electromagnet, attracting the armature plate (4), thus braking the load.



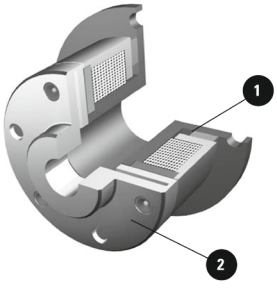
Power-Off Electromagnetic Spring-Set Brake

A power-off electromagnetic spring-set brake operates on a slightly different principle. The actual braking force is applied by the use of compression springs within the field assembly. In normal power-off mode these springs (1) apply pressure to the fixed (non-rotating) armature plate (2) which in-turn applies pressure to the rotor (3). This rotor has the ability to "float" back and forth under the applied pressure depending on the state of the coil. It is coupled to the load shaft by a spline or hex through a hub (4). Some rotors are suspended between two diaphragm-like springs to achieve the "floating" state.



Power-Off Electromagnetic Permanent Magnet Brake

A power-off electromagnetic permanent magnet brake operates on the principle of the attractive force of a permanent magnet creating the braking action, while the electromagnet is used to negate this force allowing load rotation. In normal power-off mode the permanent magnet in the fixed field assembly (1) creates an attractive force on the armature assembly (2) which is attached to the load shaft by means of set screws or pins, hence stopping or holding the load. Upon coil energization, the electromagnet forms an opposing magnetic force to the permanent magnet, thus allowing the armature assembly free rotation (no brake).



Friction Clutches & Brakes

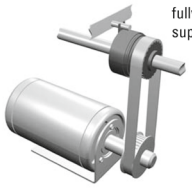
Applications

Electromagnetic Clutches & Clutch Couplings

Electromagnetic clutches provide an efficient, electrically switchable link between a motor and a load. Clutches are used to couple two parallel shafts by the use of pulleys, gears or sheaves. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor and armature assembly are mounted on a single shaft, with the rotor secured to the shaft. The armature is bearing mounted and free to rotate.

When the coil is energized, the armature engages the friction surface of the rotor, thus driving the load.

Electromagnetic clutch couplings provide this same efficient, electrically switchable link between a motor and a load for in-line shafts. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor and armature assembly are securely mounted on opposing in-line shafts



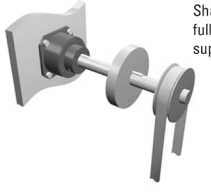
Shafts must be fully bearing supported

When the coil is energized, the armature engages the friction surface of the rotor, coupling the two in-line shafts, thus driving the load.

Electromagnetic Brakes

Electromagnetic power-on brakes provide an efficient, switchable means of stopping and/or holding the load. While the field (electromagnet) assembly is fixed and prevented from rotating by a flange, the armature assembly is secured to the shaft. When the coil is energized, the armature engages the friction surface of the fixed field (electromagnet) assembly, thus stopping and/or holding the load.

Offered in spring-set or permanent magnet designs, electromagnetic power-off brakes provide a safe, efficient means of stopping and/or holding a load in the absence of power. While the field (electromagnet) assembly is fixed and prevented from rotating, the rotor (spring-set design) or armature (permanent magnet design) assembly is secured to the shaft. In the absence of power, the fixed and rotating components are engaged, thus stopping and/or holding the load. When



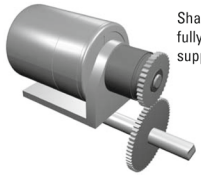
Shafts must be fully bearing supported

the coil is energized, rotating components are disengaged thus allowing the shaft to freely rotate.

Tooth Brakes & Clutches

When used in either static or low speed engagement applications, tooth clutches and clutch couplings provide an efficient, positive, switchable link between a motor and load on in-line or parallel shafts. While the field (electromagnet) assembly is prevented from rotating by a fixed flange, the rotor is generally attached to the input shaft. The armature assembly is securely mounted to either an in-line load shaft or a parallel shaft by means of pulleys or gears. When the coil is energized, the tooth profile of the armature positively engages the tooth profile of the rotor, coupling the two in-line or parallel shafts, thus driving the load.

Tooth brakes provide an efficient, positive, switchable means of either holding a load or decelerating a load from a slow speed, generally 20 RPM or less. Utilizing the same principle as the tooth clutch, these brakes can be used to effectively



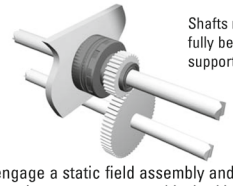
Shafts must be fully bearing supported

hold a load in position. Available in power-on or power-off models, tooth brakes are ideal for applications requiring very high torque in tight places.

Multi Disc Brakes & Clutches

Multiple Disc Clutches provide a smooth efficient, switchable link between a motor and a load on in-line or parallel shafts. While the field (electromagnet) assembly is prevented from rotating by an anti-rotation tab or flange, the rotor is securely mounted on the drive shaft. The armature assembly is then mounted either directly on an opposing in-line shaft, or indirectly on a parallel shaft by means of gears or pulleys. When the coil is energized, the armature engages the friction surface of the rotor, further engaging the multiple discs within the assembly until full torque is achieved, thereby coupling the two in-line or parallel shafts, thus driving the load.

Multiple Disc Brakes offer the very same smooth efficient operation as a braking device. By eliminating the rotor component and using the electromagnet to



Shafts must be fully bearing supported

engage a static field assembly and a rotating armature assembly, braking can be achieved. These units provide high torque in a compact package size primarily for custom applications in the aerospace industries.

Custom Assemblies (Value-Added Designs)

Variations of any device shown in this catalog can be adapted specifically to meet the most demanding needs of your application. Custom gears, pulleys, sprockets, integrally mounted to the clutch can be combined with special

shaft sizes, coil voltages, connector

THOMSON

Friction Applications - Power-Off Brakes

Electric Lift Truck Drive and Lift System

Torque Feedback Device for steer-by-wire application. BRP, SB, AKB, PMB Series Power-Off Brakes for traction motor and lift motor. Brake holds when power is removed.

Advantages

- TFD patented design
- TFD RoHS compliant
- Bi-direction control and holding
- Compact design
- Low cost
- Fast response, repeatable performance
- Energy efficient

Product Selection

- TFD
- BRP
- SB
- AKB
- PM

Floor Sweeper/Scrubber

BRP and SB are used as a parking brake to hold the vehicle on inclines, etc. The BRP/SB eliminates the need for manual brake linkage or expensive hydraulic brakes. TFD is used as a drive-by-wire feedback device.

Advantages

- Uni-directional control
- Compact design
- Non-asbestos friction material
- Factory set air gaps (no need to adjust)
- Manual release options
- Interchangeability with many existing brake designs

Product Selection

- PMB
- BRP
- SB
- AKB
- TFD

Aerospace and Defense

Wrap spring and friction units are used in commercial and military aircraft, vehicles and equipment. Applications include autopilot systems, fuel control, tank gun turrets, helicopter actuators, onboard instrumentation, valves, seat actuation, air cabin control backup systems and missiles/precision guided munition.

Advantages

- Manufacturing facility is AS9100-B Certified
- Fully potted coils with high temperature insulation capabilities
- Able to endure high humidity, shock and vibration
- Mil spec lead wire, plating, fasteners and fastener locking systems
- High performance friction materials for high heat and dynamic low wear applications

Product Selection

- TFD
- TC
- TCR
- MDC
- SB
- AKB

Friction Applications - Power-Off Brakes

Patient Lift

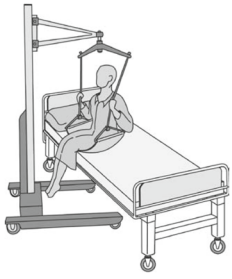
The BRP and SB can be used as a holding brake to consistently hold a load in position at a specific stopping point.

Advantages

- Uni-directional control
- Compact design
- Non-asbestos friction material
- Factory set air gaps (no need to adjust)
- Interchangeability with many existing brake designs

Product Selection

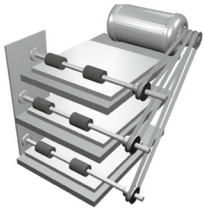
- BRP
- SB
- AKB
- LBRP



Friction Applications - Power-On Clutches & Brakes

Paper Feed

Power-On Clutch Application: CS and CF products are used on paper feed applications. There is a prime motor that drives a series of belts/pulleys that drive feed rollers. The CS or CF are mounted on the feed roller shaft. When power is applied to the CS or CF, the clutch engages and then drives the feed roller. The clutch will continue to drive until power is removed.

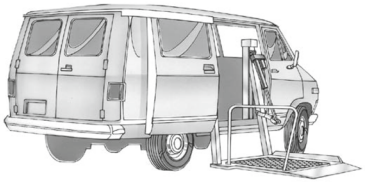


Advantages

- Low inertia and minimal drag
- Fast response, repeatable performance
- Energy efficient
- Simple installation
- Non-asbestos friction material

Product Selection

- CS
- CF



Power Sliding Door

Power-On Tooth Clutch Application: TC is a power-on tooth clutch used to drive a mechanical drive assembly in either direction

Advantages

- Simple installation
- Energy efficient
- Torque to size ratio
- Positive engagement, indexing capability

Product Selection

- TC
- CS
- CF

Conveyor Drive System

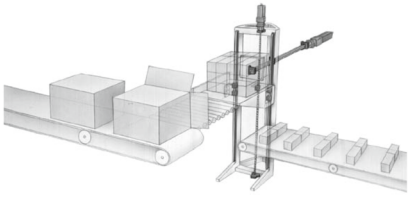
Power-On Clutch and Brake Application: CS, CF power-on clutches are used to drive the conveyor belt. The BF power-on brake is used to stop the conveyor belt.

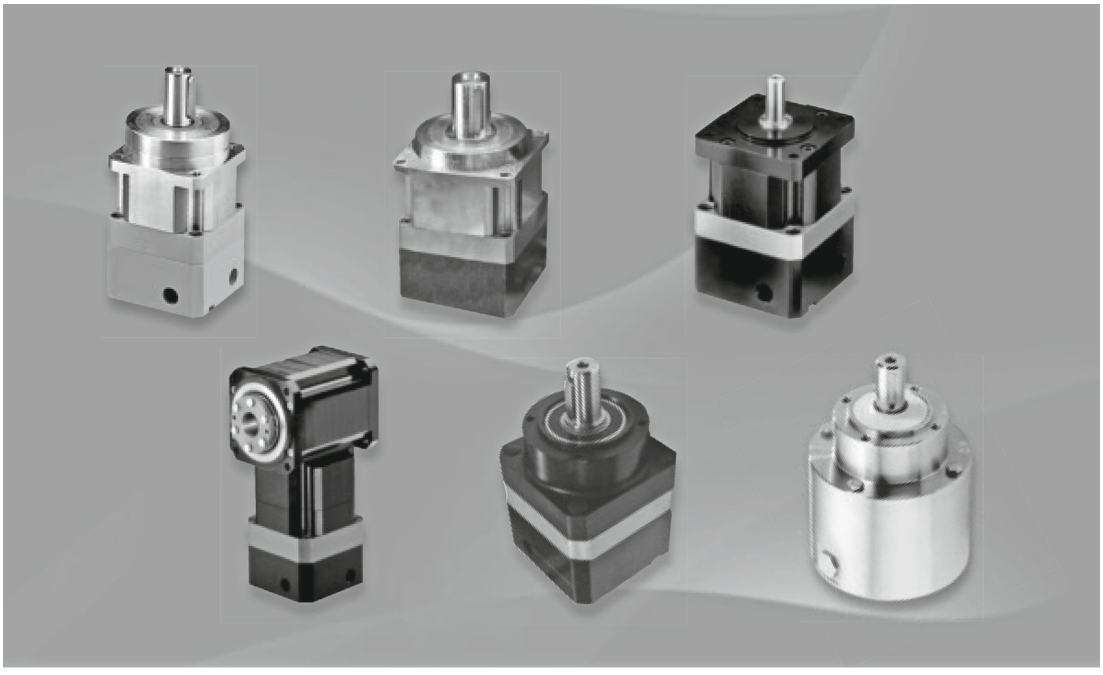
Advantages

- Fast response, repeatable performance
- Static or dynamic engagement
- Simple installation
- Energy efficient
- Economic cost
- Non-asbestos friction material

Product Selection

- CS
- CF
- BF





TRUE Planetary™ Gearheads

MICRON

AquaTRUE™

Features

- Precision: 13 arc-minutes
- Frame Sizes: 60mm, 80mm, 120mm and 160mm
- Torque Capacity: up to 876 Nm
- Ratio Availability: 3:1 thru 10:1
- Radial Load Capacity: up to 3730 N

XTRUE™

Features

- Precision: 13 arc-minutes
- Frame Sizes: 40mm, 60mm, 80mm,120mm and 160mm
- Torque Capacity: up to 876 Nm
- Ratio Availability: 3:1 thru 100:1
- Radial Load Capacity: up to 3730 N

NemaTRUE™

Features

- Precision: 13 arc-minutes
- Frame Sizes: 60mm, 90mm and 115mm
- Torque Capacity: up to 180 Nm
- Ratio Availability: 3:1 thru 100:1
- Radial Load Capacity: up to 3730 N

NemaTRUE 90™ Right Angle

Features

- Precision: 13 arc-minutes
- Frame Sizes: 23mm, 34mm and 42mm
- Torque Capacity: up to 255 Nm
- Ratio Availability: 1:1 thru 500:1
- Radial Load Capacity: up to 2900 N

DuraTRUE™

Features

- Precision: 8 arc-minutes
- Frame Sizes: 60mm, 90mm, 115mm and 142mm
- Torque Capacity: up to 834 Nm
- Ratio Availability: 3:1 thru 100:1
- Radial Load Capacity: up to 11150 N

DuraTRUE 90™ Right Angle

Features

- Precision: 8 arc-minutes
- Frame Sizes: 60mm, 90mm, 115mm and 142mm
- Torque Capacity: up to 842 Nm
- Ratio Availability: 1:1 thru 500:1
- Radial Load Capacity: up to 11150 N

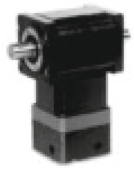
DuraTRUE 90™ Hollow Shaft

Features

- Precision: 8 arc-minutes
- Frame Sizes: 90mm, 115mm and 142mm
- Torque Capacity: up to 865 Nm
- Ratio Availability: 1:1 thru 500:1
- Radial Load Capacity: up to 11150 N

DuraTRUE 90™
Dual Shaft

Features
- Precision: 8 arc-minutes
- Frame Sizes: 60mm, 90mm, 115mm and 142mm
- Torque Capacity: up to 865 Nm
- Ratio Availability: 1:1 thru 500:1
- Radial Load Capacity: up to 11150 N



ValueTRUE™

Features
- Precision: 4 arc-minutes
- Frame Sizes: 60, 75, 90, 100, 115, 140, 180 and 220mm
- Torque Capacity: up to 2969 Nm
- Ratio Availability: 4:1 thru 100:1
- Radial Load Capacity: up to 37910 N

ValueTRUE 90™
Right Angle

Features
- Precision: 4 arc-minutes
- Frame Sizes: 60, 75, 90, 100, 115, 140 and 180mm
- Torque Capacity: up to 2800 Nm
- Ratio Availability: 1:1 thru 50:1
- Radial Load Capacity: up to 37910 N

UltraTRUE™

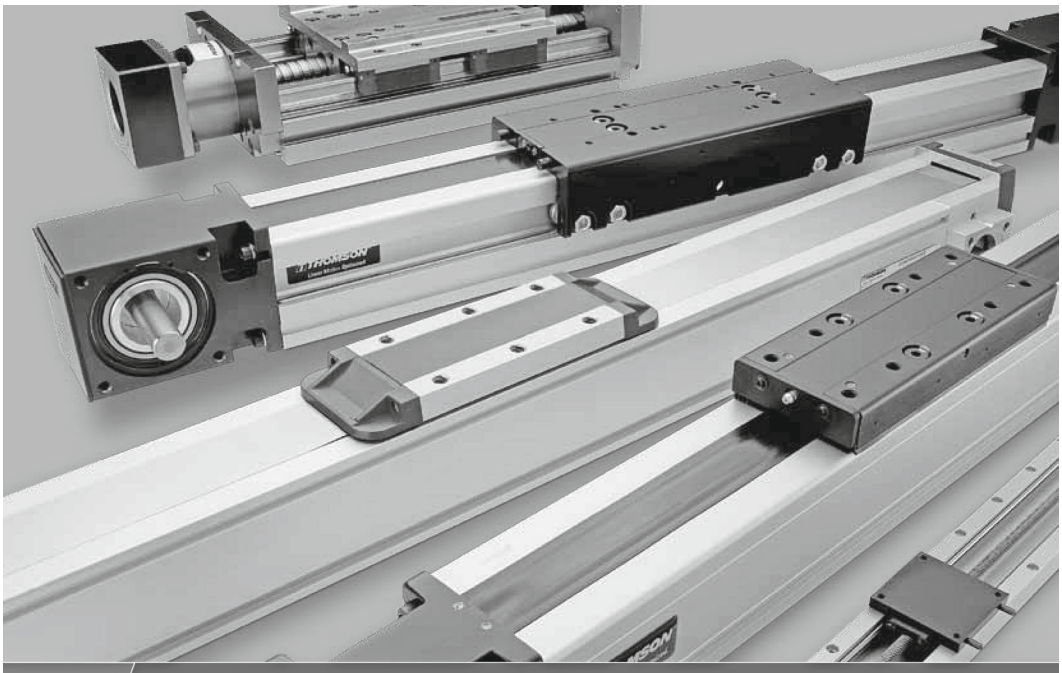
Features
- Precision: 4 arc-minutes
- Frame Sizes: 60mm, 75mm, 90mm, 100mm, 115mm, 140mm, 180mm and 220mm
- Torque Capacity: up to 3300 Nm
- Ratio Availability: 4:1 thru 100:1
- Radial Load Capacity: up to 37910 N

UltraTRUE 90™
Right Angle

Features
- Precision: 4 arc-minutes
- Frame Sizes: 60mm, 75mm, 90mm, 100mm, 115mm, 140mm and 180mm
- Torque Capacity: up to 3111 Nm
- Ratio Availability: 1:1 thru 50:1
- Radial Load Capacity: up to 37910 N

EverTRUE™
Continuous Duty

Features
- Precision: 4 arc-minutes
- Frame Sizes: 100, 140 and 180mm
- Torque Capacity: up to 1010 Nm
- Ratio Availability: 4:1 thru 100:1
- Radial Load Capacity: up to 44600 N



Linear Motion Systems

THOMSON
Linear Motion. **Optimized.**

Linear Motion System Group Selection Chart

How to select appropiate product group

Thomson linear motion systems offers two drive options (screw or belt drive) and three carriage guidance options (ball, slide or wheel guides). The chart below provides reference to the ideal product combination based on the general application type.

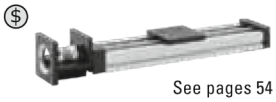
Application Type Group 1

Instrumentation and other low-load applications. Repeatability and/or spatial constraints may be critical.

- Small-scale material handling
- Medical instrumentation
- Lab automation
- Vending machines

Load < 15 kg
Smallest spatial footprint
Repeatability ± 0,005 mm
Stroke up to 0,8 m

→ Type: MS Drive: Screw Guides: Ball



See pages 54 - 61

Repeatability ± 0,05 mm
Speeds up to 3 m/s
Strokes up to 2 m

→ Type: WH40 Drive: Belt Guides: Ball

See pages 82 - 83

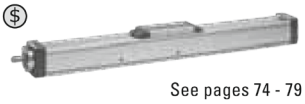
Application Type Group 2

Economical point-to-point transport motion. Speed and/or environmental protection may be critical.

- Packaging
- Filling and dispensing
- Factory automation
- Material handling
- Printing and scanning
- Food processing

Repeatability ± 0,05 mm
Speeds up to 1,6 m/s
Strokes up to 6 m

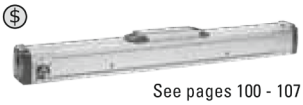
→ Type: M Drive: Screw Guides: Slide



See pages 74 - 79

Repeatability ± 0,2 mm
Speeds up to 5 m/s
Strokes up to 12 m

→ Type: M Drive: Belt Guides: Slide



See pages 100 - 107

Application Type Group 3

Motion with tighter accuracy requirements. Stiffness and rigidity may be critical.

- Machine tool material handling
- Machine tool automation
- Test and measurement
- Inspection equipment
- Inspection equipment
- Automotive assembly

Repeatability
< ± 0,02 mm

→ Type: WM Drive: Screw Guides: Ball

See pages 18 - 29

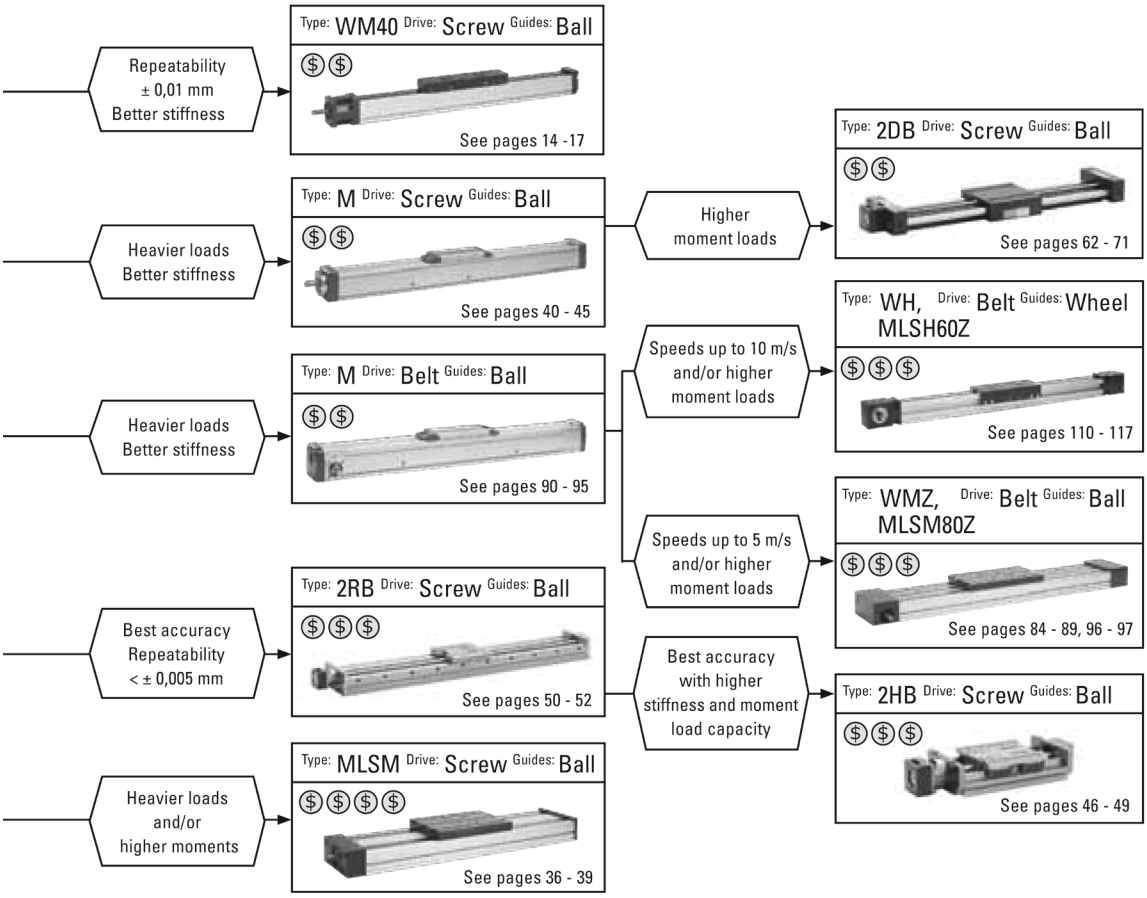
Linear Motion System Group Selection Chart

How to select appropiate product group

How to use the selection chart

1. Chose the one of the three general application type groups that match your application the best.
2. Move right in the chart until you identified a possible unit type for your needs.
3. Look up the unit type in the catalog and see if there is a size or version among them that match.
4. If you find a match, go to step 5. If not, go back to the chart and identify the next possible unit type and repeat.
5. Confirm the choice by performing the necessary calculations. The Linear Motioneering Sizing and Selection Tool or the Thomson customer support team can help you with this.

Cost indicator legend	
$	Lowest cost
$$	
$$$	
$$$$	Highest cost



Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

PowerLine **WM**

WM40

Features

- Can be installed in any orientation
- Patented guide system
- Patented self-adjusting plastic cover band
- Patented screw support system

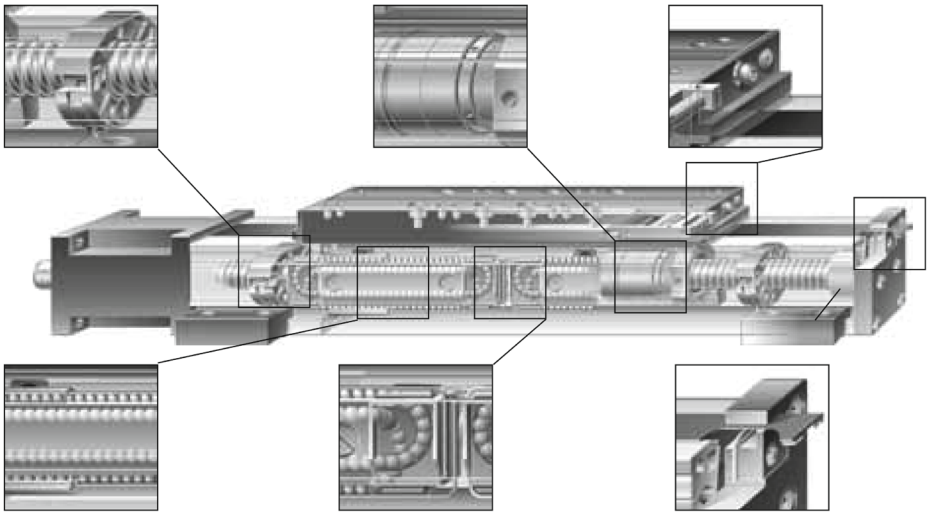
Parameter		WM40S	WM40D	WM60D	WM60S	WM60X	WM80D	WM80S	WM120D
Profile size (width × height)	[mm]	40 × 40	40 × 40	60 × 60	60 × 60	60 × 60	80 × 80	80 × 80	120 × 120
Stroke length (Smax), maximum	[mm]	2000	2000	11000	5000	10340	11000	5000	11000
Linear speed, maximum	[m/s]	0,25	0,25	2,5	2,5	0,25	2,5	2,5	2,0
Dynamic carriage load (Fz), maximum	[N]	600	600	2000	1400	2000	3000	2100	6000
Remarks		single ball nut	double ball nuts	double ball nuts	single ball nut	left/right screw	double ball nuts	single ball nut	double ball nuts
Page		14	16	18	20	22	24	26	28

WM-Series Technical Presentation

Screw support
Patented screw support system permits high speeds at long stroke lengths while reducing the available stroke with a minimum.

Double ball nuts
Double pre-tensioned ball nuts improve the accuracy and allow re-tensioning, increasing the lifetime of the unit.

Central lubrication
One central lubrication point on the carriage services the entire unit resulting in a minimum maintenace requirement.



Ball guides
Integrated patented ball guides with hardened steel tracks for optimum performance.

Ball cages
The balls in the ball guides are protected by a ball cage which ensures a long life.

Cover band
The patented self-adjusting cover band protect the unit from the penetration of dirt, dust and liquids.

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

PowerLine WV

WV80

Features

- Can be installed in any orientation
- Patented self-adjusting plastic cover band
- Patented screw support system
- The units require external guides

Parameter		WV60	WV80	WV120
Profile size (width × height)	[mm]	60 × 60	80 × 80	120 × 120
Stroke length (Smax), maximum	[mm]	11000	11000	11000
Linear speed, maximum	[m/s]	2,5	2,5	2,0
Dynamic carriage load (Fz), maximum	[N]	-	-	-
Remarks		double ball nuts the units has no guides	double ball nuts the units has no guides	double ball nuts the units has no guides
Page		30	32	34

ForceLine MLSM

MLSM80D

Features

- Can be installed in any orientation
- Patented guide system
- Patented plastic cover band
- Patented screw support system

Parameter		MLSM60D	MLSM80D
Profile size (width × height)	[mm]	160 × 65	240 × 85
Stroke length (Smax), maximum	[mm]	5500	5200
Linear speed, maximum	[m/s]	2,5	2,0
Dynamic carriage load (Fz), maximum	[N]	6000	8000
Remarks		double ball nuts	double ball nuts
Page		36	38

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

Movopart M

Features
- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Internal ball guides
- Wash down protected versions available

Parameter		M55	M75	M100
Profile size (width × height)	[mm]	58 × 55	86 × 75	108 × 100
Stroke length (Smax), maximum	[mm]	3000	4000	6000
Linear speed, maximum	[m/s]	1,6	1,0	1,25
Dynamic carriage load (Fz), maximum	[N]	400	1450	3000
Remarks		single ball nut	single ball nut	single ball nut
Page		40	42	44

2HB

Features
- Can be installed in any orientation
- High load capabilities
- Low profile height
- Preloaded ballscrew and bearing carriages offer high stiffness / rigidity
- Corrosion resistant options available.

Parameter		2HB10	2HB20
Profile size (width × height)	[mm]	100 × 60	200 × 90
Stroke length (Smax), maximum	[mm]	1375	2760
Linear speed, maximum	[m/s]	0,47	0,95
Dynamic carriage load (Fz), maximum	[N]	8000	34000
Remarks		bellows or shroud options available	bellows or shroud options available
Page		46	48

2RB

Features
- Can be installed in any orientation
- High load capabilities
- Low profile height
- Preloaded ballscrew and Super Smart bearing configuration provides stiffness / rigidity
- Corrosion resistant options available.

Parameter		2RB12	2RB16
Profile size (width × height)	[mm]	130 × 40	160 × 48
Stroke length (Smax), maximum	[mm]	1951	2815
Linear speed, maximum	[m/s]	0,47	0,73
Dynamic carriage load (Fz), maximum	[N]	1760	5176
Remarks		bellows option available	bellows option available
Page		50	52

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

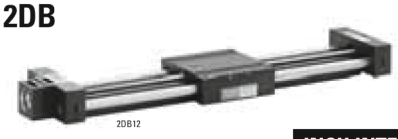
MicroStage MS

MS33

Features
- Compact, lightweight package
- Stainless steel leadscrew with anti-backlash nut offers precise repeatability
- Segmented linear bearings provide smooth motion
- Corrosion resistant options available

Parameter		MS25	MS33	MS46L	MS46B
Profile size (width × height)	[mm]	50 × 25	60 × 33	86 × 46	86 × 46
Stroke length (Smax), maximum	[mm]	705,5	704	821,3	821,3
Linear speed, maximum	[m/s]	0,85	1,02	0,83	0,83
Dynamic carriage load (Fz), maximum	[N]	100	150	450	450
Remarks		bellows option available	bellows option available	bellows option available	bellows option available
Page		54	56	58	60

2DB


2DB12

INCH INTERFACE

Features
- Integrated dual-rail, webbed shaft ideal for loading in all orientations
- Low-profile height
- Super Smart bushings with low friction for smooth motion
- Easy mounting
- Corrosion resistant options available

Parameter		2DB08	2DB12O	2DB12J	2DB16O	2DB16J
Profile size (width × height)	[in]	4.5 × 1.625	6 × 2.125	6 × 2.562	7.5 × 2.625	7.5 × 3.062
Stroke length (Smax), maximum	[in]	41	63	63	84.5	84.5
Linear speed, maximum	[in/s]	33.3	10.0	25.0	8.3	41.67
Dynamic carriage load (Fz), maximum	[lbs]	336	2115	2115	3555	3555
Remarks		leadscrew driven	ballscrew driven integrated carriage	ballscrew driven modular carriage	ballscrew driven integrated carriage	ballscrew driven modular carriage
Page		62	64	66	68	70

Linear Motion Systems with Ball Screw Drive and Slide Guide

Overview

Movopart M

Features

- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Patented internal self-adjusting prism slide guides
- Wash down protected versions available.

Parameter		M55	M75	M100
Profile size (width × height)	[mm]	58 × 55	86 × 75	108 × 100
Stroke length (Smax), maximum	[mm]	3000	4000	6000
Linear speed, maximum	[m/s]	1,0	1,6	1,6
Dynamic carriage load (Fz), maximum	[N]	400	1485	3005
Remarks		single ball nut	single ball nut	single ball nut
Page		74	76	78

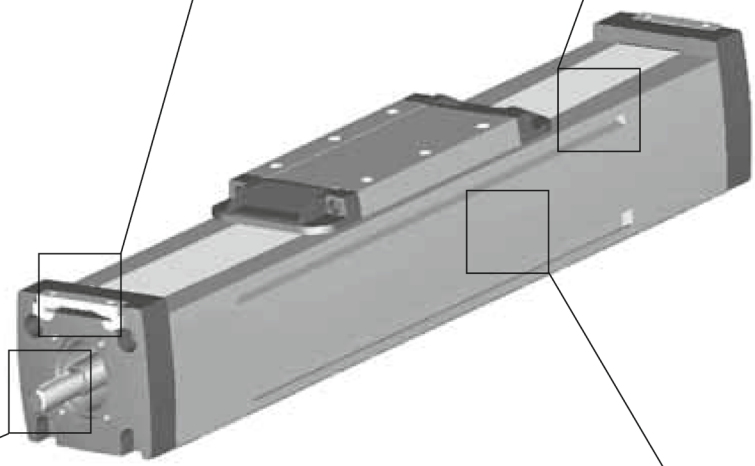
Linear Motion Systems with Ball Screw Drive and Slide Guide

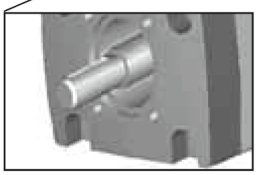
Overview

M-Series Technical Presentation

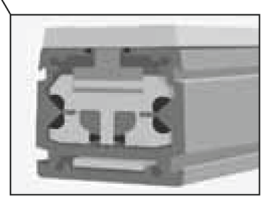
Cover band
The self-adjusting magnetically sealed stainless steel cover band protects the unit from the penetration of dirt, dust and liquids.

Environmental protection
The standard unit can operate in harsh environments but is also available in a wash down version for environments that are dusty, dirty and/or wet.





Ball screw drive
The ball screw ensures high accuracy and efficiency and the optional screw supports enable higher speeds.



Prism slide guides
The patented self aligning prism slide guides are accurate, durable and are resistant to vibrations and shock loads.

THOMSON

Linear Motion Systems with Belt Drive and Ball Guide

Overview

SpeedLine WH

Features
- Can be installed in any orientation
- Stroke up to 2 m
- Acceleration up to 40 m/s²
- Compact

Parameter		WH40
Profile size (width × height)	[mm]	40 × 40
Stroke length (Smax), maximum	[mm]	2000
Linear speed, maximum	[m/s]	3,0
Dynamic carriage load (Fz), maximum	[N]	600
Remarks		no cover band
Page		82

PowerLine WMZ

Features
- Can be installed in any orientation
- Stroke up to 5,5 m
- Speed up to 5 m/s
- Patented plastic cover band

Parameter		WM60Z	WM80Z
Profile size (width × height)	[mm]	60 × 60	80 × 80
Stroke length (Smax), maximum	[mm]	4000	5500
Linear speed, maximum	[m/s]	2,5	5,0
Dynamic carriage load (Fz), maximum	[N]	1400	2100
Remarks		-	-
Page		84	86, 88

Movopart M

Features
- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Stroke up to 12 m
- Wash down protected versions available.

Parameter		M55	M75	M100
Profile size (width × height)	[mm]	58 × 55	86 × 75	108 × 100
Stroke length (Smax), maximum	[mm]	7000	12000	12000
Linear speed, maximum	[m/s]	5,0	5,0	5,0
Dynamic carriage load (Fz), maximum	[N]	750	1750	4000
Remarks		-	-	-
Page		90	92	94

Linear Motion Systems with Belt Drive and Ball Guide

Overview

ForceLine MLSM

Features

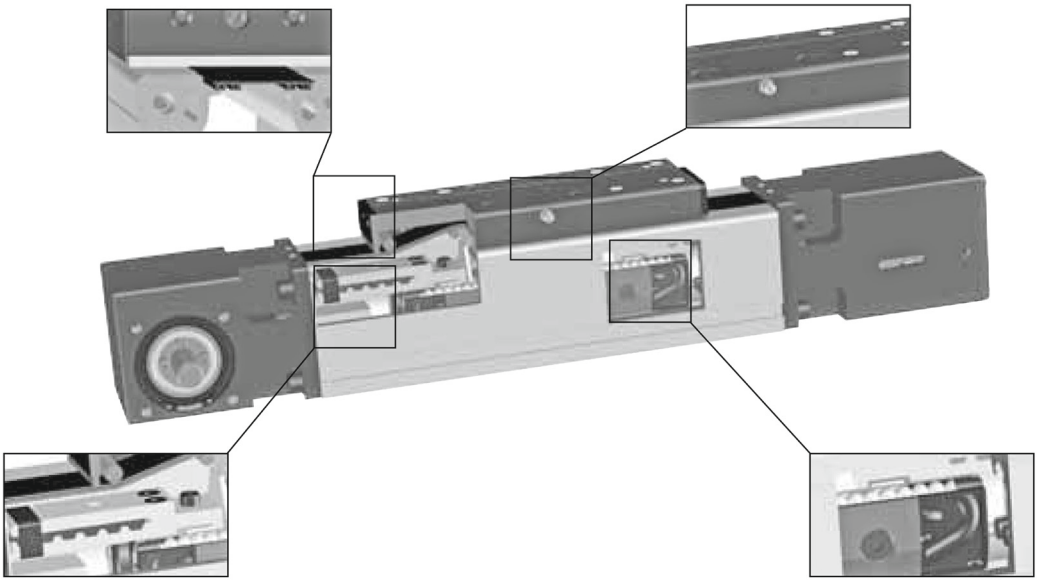
- Can be installed in any orientation
- Patented plastic cover band
- High load capabilities
- Low profile height

Parameter		MLSM80Z
Profile size (width × height)	[mm]	240 × 85
Stroke length (Smax), maximum	[mm]	5900
Linear speed, maximum	[m/s]	5,0
Dynamic carriage load (Fz), maximum	[N]	6400
Remarks		-
Page		96

WMZ-Series Technical Presentation

Cover band
The patented self-adjusting cover band protects the interior of the unit from the penetration of dirt, dust and liquids.

Central lubrication
One central lubrication point on the carriage services the entire unit resulting in a minimum maintenace requirement.



Belt drive
The belt is protected from the outside ensuring long, accurate and safe operation.

Ball guides
Integrated patented ball guides with hardened steel tracks for optimum performance.

Linear Motion Systems with Belt Drive and Slide Guide

Overview

Movopart M

Features

- Can be installed in any orientation
- Patented self-adjusting prism slide guides
- Resistant to shock loads and vibrations
- Low cost

Parameter		M50
Profile size (width × height)	[mm]	50 × 50
Stroke length (Smax), maximum	[mm]	5000
Linear speed, maximum	[m/s]	5,0
Dynamic carriage load (Fz), maximum	[N]	400
Remarks		no cover band
Page		100

Movopart M

Features

- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Patented self-adjusting prism slide guides
- Wash down and enhanced wash down protected versions available

Parameter		M55	M75	M100
Profile size (width × height)	[mm]	58 × 55	86 × 75	108 × 100
Stroke length (Smax), maximum	[mm]	7000	12000	12000
Linear speed, maximum	[m/s]	5,0	5,0	5,0
Dynamic carriage load (Fz), maximum	[N]	400	1485	3005
Remarks		-	-	-
Page		102	104	106

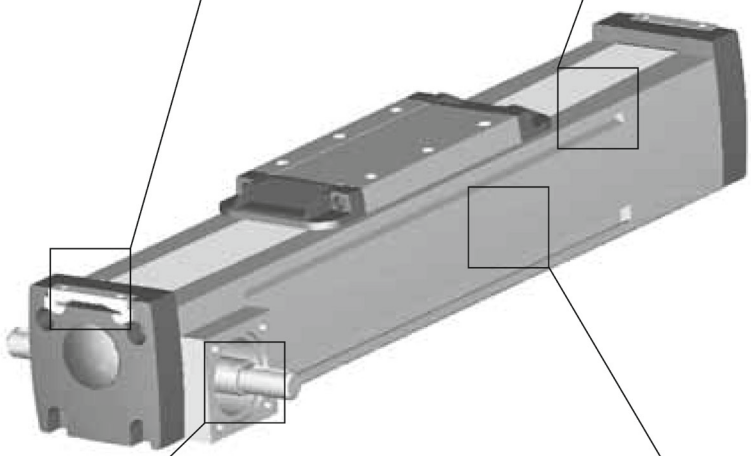
Linear Motion Systems with Belt Drive and Slide Guide

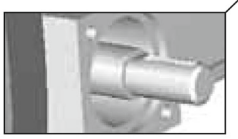
Overview

M-Series Technical Presentation

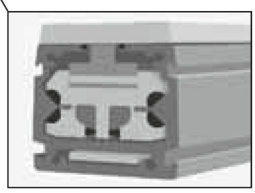
Cover band
The self-adjusting magnetically sealed stainless steel cover band protects the unit from the penetration of dirt, dust and liquids.

Environmental protection
The standard unit can operate in harsh environments but is also available in wash down or enhanced wash down protected versions for the thoughest environments.





Belt drive
The belt runs on the inside of the profile and can easily be re-tensioned without removing the load from the carriage.

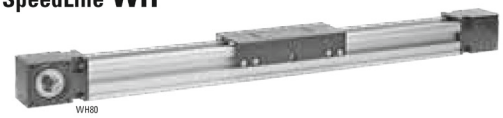


Prism slide guides
The patented self aligning prism slide guides are accurate, durable and are resistant to vibrations and shock loads.

Linear Units with Belt Drive and Wheel Guide

Overview

SpeedLine WH



Features

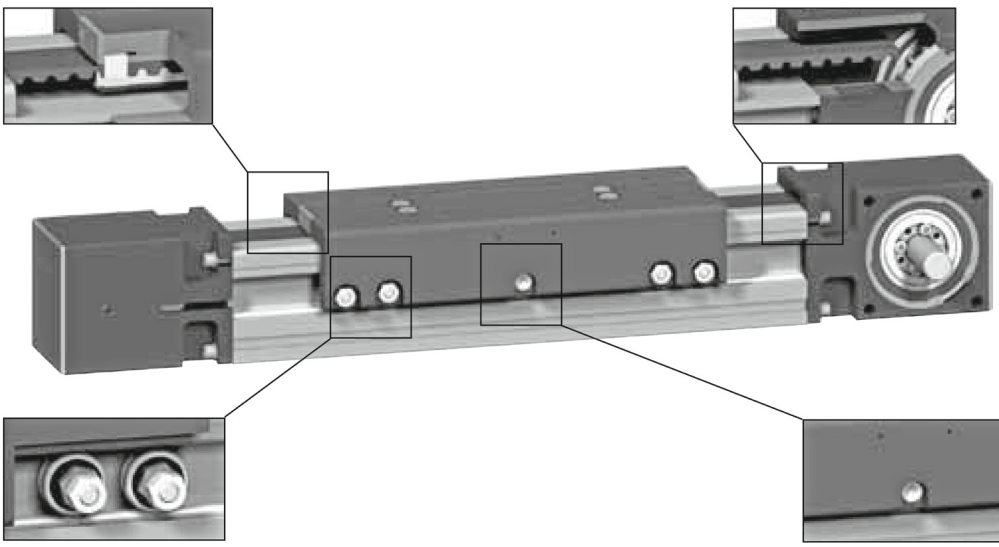
- Can be installed in any orientation
- Speed up to 11 m/s
- Acceleration up to 40 m/s²
- Stroke up to 11 m

Parameter		WH50	WH80	WH120
Profile size (width × height)	[mm]	50 × 50	80 × 80	120 × 110
Stroke length (Smax), maximum	[mm]	3000	11000	11000
Linear speed, maximum	[m/s]	6,5	10,0	10,0
Dynamic carriage load (Fz), maximum	[N]	730	2100	9300
Remarks		external wheel guides no cover band	external wheel guides no cover band	external wheel guides no cover band
Page		110	112	114

WH-Series Technical Presentation

Belt tensioning
The belt can easily be replaced or re-tensioned from the outside of the unit without the load being removed from the carriage.

Belt drive
The steel reinforced belt is wear resistant, highly efficient and very accurate even at high speeds and loads.



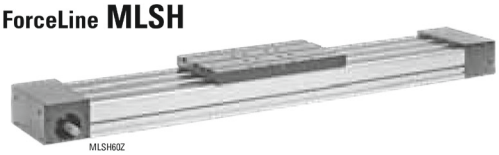
Wheel guides
The H-type arrangement of the guides allows fast moves and high forces and moments.

Central lubrication
The guides are lubricated from a central point that is easy and fast to access.

Linear Units with Belt Drive and Wheel Guide

Overview

ForceLine **MLSH**


MLSH60Z

Features

- Can be installed in any orientation
- Patented plastic cover band
- Speed up to 10 m/s
- Low profile height

Parameter		MLSH60Z
Profile size (width × height)	[mm]	160 × 65
Stroke length (Smax), maximum	[mm]	5500
Linear speed, maximum	[m/s]	10,0
Dynamic carriage load (Fz), maximum	[N]	3000
Remarks		internal wheel guides
Page		116

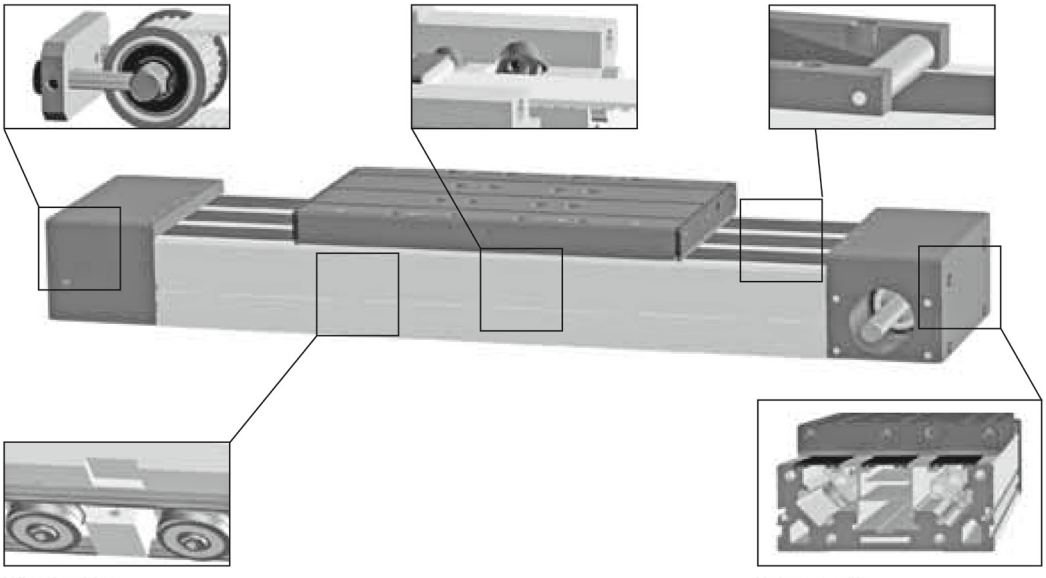
THOMSON

MLSH-Series Technical Presentation

Belt tensioning
The belt can easily be re-tensioned from the outside of the unit without the load being removed from the carriage.

Belt drive
The highly dynamic and accurate belt is protected by the cover band ensuring long and trouble free operation.

Cover band
The patented self-adjusting cover band protect the interior of the unit from the penetration of dirt, dust and liquids.



Wheel guides
The robust wheel guides runs inside of the profile providing superior motion dynamics.

Unique profile
The unique design of the profile guarantees the highest performance and protection of the guides and belt.

Linear Lifting Units

Overview

SpeedLine WHZ

Features

- Can be installed in any orientation
- Belt drive
- External wheel guides
- Speed up to 10 m/s
- Acceleration up to 40 m/s²

Parameter		WHZ50	WHZ80
Profile size (width × length)	[mm]	50 × 50	80 × 80
Stroke length (Smax), maximum	[mm]	1500	3000
Linear speed, maximum	[m/s]	6,5	10,0
Dynamic load (Fx), maximum	[N]	670	1480
Remarks		The load is always attached to the end of the lifting profile	The load is always attached to the end of the lifting profile
Page		120	122

Linear Lifting Units

Overview

Movo Z

Features

- Telescopic movement
- Ball screw drive
- Internal slide guides
- Load up to 7500 N
- Load torque up to 2000 Nm
- Two end stop limit switches (Z2 only)

THOMSON

Parameter		Z2	Z3
Profile size (width × height)	[mm]	188 × 150	188 × 150
Stroke length (Smax), maximum	[mm]	1500	1500
Linear speed, maximum	[m/s]	1,25	1,25
Dynamic load (Fz), maximum	[N]	7500	7500
Remarks		Can be installed in any direction. The load must be attached at the end of the lifting profile	Can only be installed vertically with motor up. The load must be attached at the end of the lifting profile.
Page		124	126

Linear Rod Units

Overview

VarioLine WZ

Features

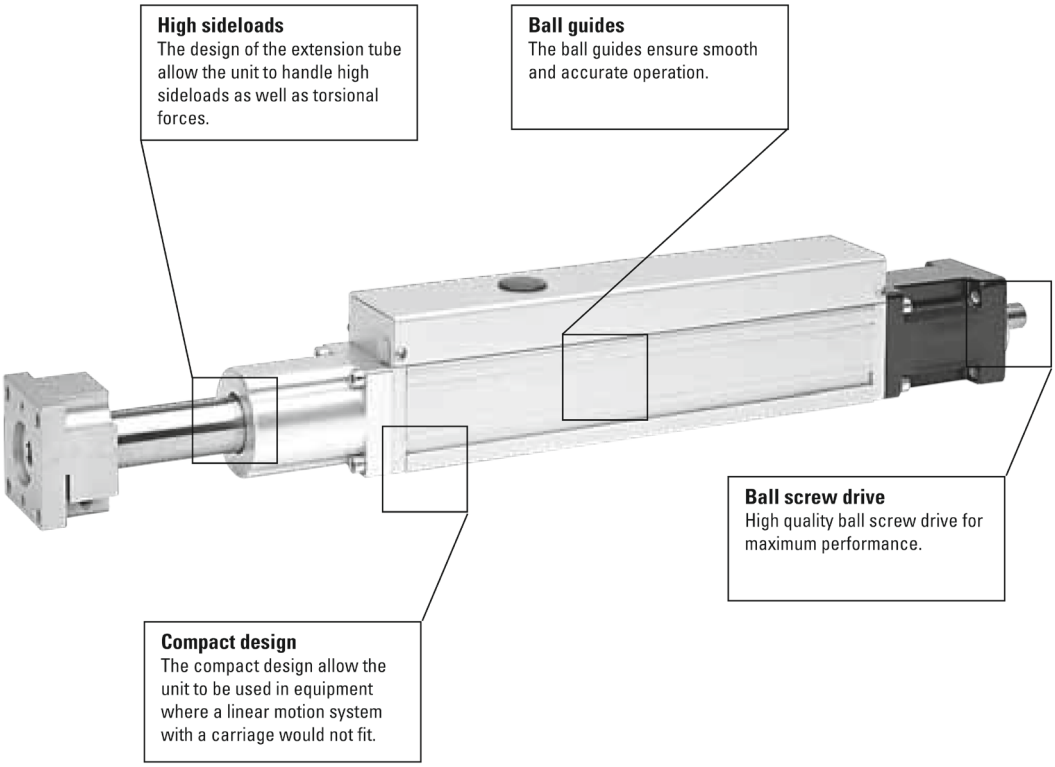
- Can be installed in any orientation
- Ball screw drive
- Ball guides
- Compact

Parameter		WZ60	WZ80
Profile size (width × height)	[mm]	60 × 60	80 × 80
Stroke length (Smax), maximum	[mm]	400	500
Linear speed, maximum	[m/s]	1,5	1,5
Dynamic carriage load (Fx), maximum	[N]	2800	3500
Remarks		-	-
Page		130	132

Linear Rod Units

Overview

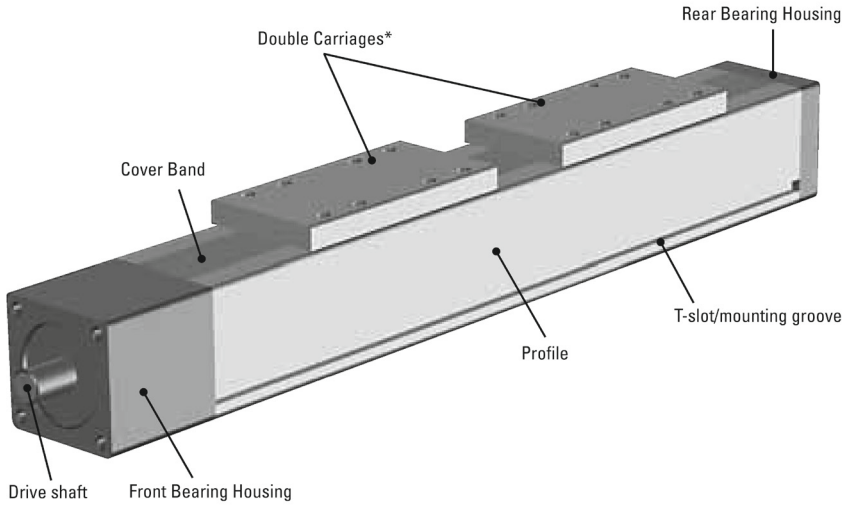
WZ-Series Technical Presentation



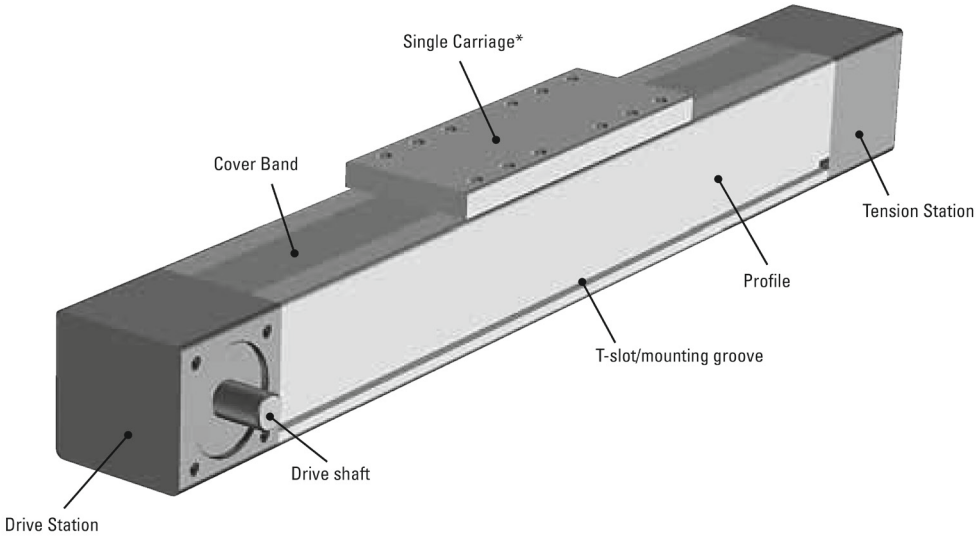
Terminology

Basic Linear Motion System Terminology

Screw Driven Unit



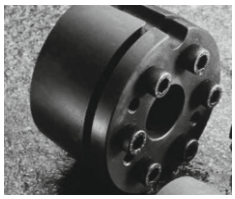
Belt Driven Unit



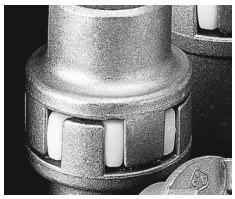
* Both screw and belt driven units can have single or double carriages.

Couplings, Joints & Locking Devices

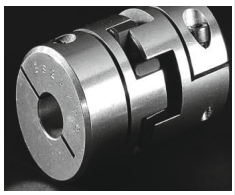
Locking Devices



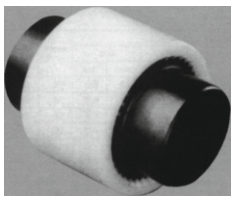
JuboFlex Coupling



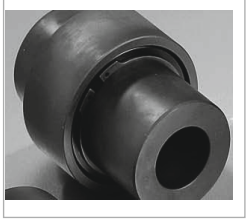
TrascoES Coupling



SitexFL Coupling

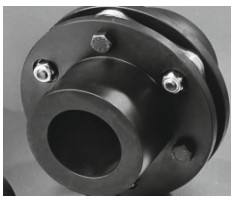


SitexST Coupling

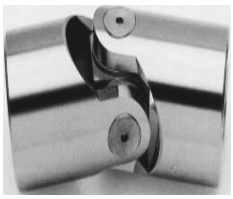


Servo Couplings

Disc Coupling



Joints



SIT-LOCK

TRASCO® ES: “0” Backlash Coupling

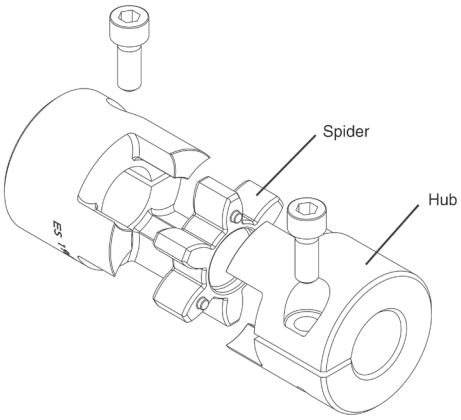
TRASCO® ES: “0” backlash coupling

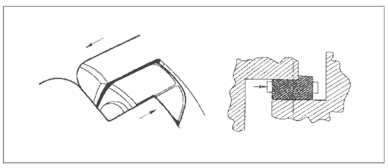
TRASCO® ES is our zero backlash coupling designed to compensate for misalignment and vibration dampening for indexing applications. The compact design of TRASCO® ES makes it the right choice for all precise motion applications.

Description

The TRASCO® ES consists of two hubs, which are either made of high-strength aluminum (up to the 38/45 size) or steel (from size 42) that are connected with an elastic element.
The precise dimensional characteristics of TRASCO® ES are obtained through our accurate machining process.
The special compound polyurethane elastic element, developed through extensive research and laboratory testing, is made through a press-forming process which guarantees high dimensional accuracy.

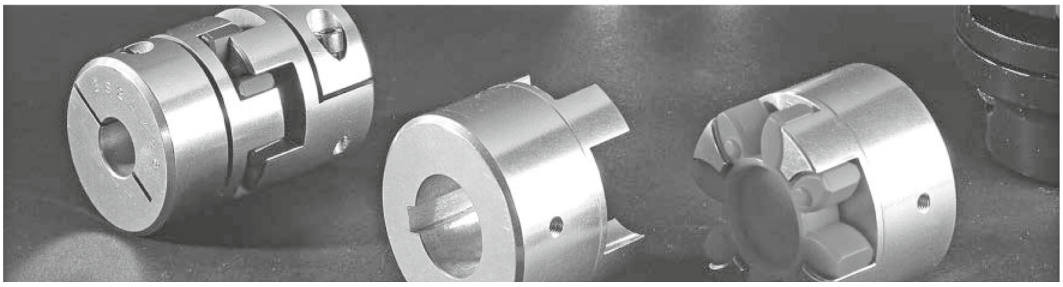
The element is available in 4 different hardnesses: **80 Sh. A (blue)**, **92 Sh. A (yellow)**, **98 Sh. A (red), 64 Sh. D (green).**
Coupling performance depends on the type of element selected (see “**Technical characteristics**”).
Other element hardnesses are available upon request to meet special operating conditions, such as high temperatures and/or high torques, and for providing a high degree of vibration dampening capability. Please contact our Engineering Office for help in selecting the appropriate element hardness.





Operation

When the polyurethane element is installed in its special seats between the hubs, it becomes precompressed, thereby providing the zero backlash feature which characterizes the transmission performance of this coupling.
With zero backlash, the coupling remains torsionally rigid within the range of the precompression load, but does permit the absorption of radial, angular, and axial misalignments as well as undesired vibrations.
The significantly wide precompressed area of the flexible element keeps the contact pressure against the elastic element low. Therefore, the element teeth can be overloaded many times without undergoing any wear or taking a permanent set.



Example of selection

Application

Servomotor driving a recirculating ball screw on a machine tool

Nominal Torque	T_K = 10,0 Nm	Shock Type	Light
Peak Torque	T_{AS} = 22,0 Nm	Table Moment of Inertia	J_3 = 0,0038 kg·m²
Rpm	n = 3.000 1/min	Driven Shaft	dc = 20 mm h6 (without keyway)
Moment of Inertia	J_1 = 0,0058 kg·m²	Motor Shaft	dm = 24 mm h6 (without keyway)
Temperature	T = +40°C		

Selection

24/28 "A" type ES coupling with "Red" elastic element (98 Sh. A)

Standard coupling torque: T_{KN} = 60 [Nm]

Maximum torque: T_{Kmax} = 120 [Nm]

Hub Moment of Inertia: J_z = 0,000135 [kg·m²]

Couple Transmitted by taper locking ring: $Tcal = \begin{cases} 92 \text{ [Nm] bore 20 [mm]} \\ 113 \text{ [Nm] bore 24 [mm]} \end{cases}$

Load check

$$T_{KN} = T_K \cdot S_\theta \cdot S_D = 10 \cdot 1{,}2 \cdot 4 = 48{,}0 \text{ [Nm]}$$

$$T_{KN} = 48{,}0 \text{ Nm} < T_{cal}$$

$$m = \frac{J_A}{J_L} \qquad J_A = J_1 + J_2 \qquad J_L = J_3 + J_2 \qquad m = 1{,}5$$

$$T_S = T_{AS} \cdot \frac{1}{m+1} \cdot S_A = 22{,}0 \cdot \frac{1}{1{,}5+1} \cdot 1{,}5 = 13{,}2 \text{ [Nm]}$$

$$T_{Kmax} = T_S \cdot S_Z \cdot S_\theta + T_K \cdot S_\theta \cdot S_D = 13{,}2 \cdot 1{,}6 \cdot 1{,}2 + 12{,}5 \cdot 1{,}2 \cdot 4 = 85{,}34 \text{ [Nm]}$$

$$T_{Kmax} = 85{,}34 \text{ Nm} < T_{cal}$$

T_{KN}	Coupling nominal torque	Nm
T_K	Motor-side nominal torque	Nm
T_{Kmax}	Coupling maximum torque	Nm
T_S	Motor peak torque	Nm
T_{AS}/T_{AI}	Driver-side peak torque	Nm
T_L	Acceleration delivered torque	Nm
T_{LS}/T_{LI}	Driven-side peak torque	Nm
V_R	Resonance factor	
V_{fi}	Torque amplification factor	
m	Mass factor	
J_A	Motor-side inertia	kgm²
J_L	Driven-side inertia	kgm²
Ψ	Dampening factor	

n_R	Resonance speed	min⁻¹
C_T	Torsional rigidity	Nm/rad
M_T	Transmissible torque moment	Nm
S_A	Motor-side shock factor	
S_L	Driven-side shock factor	
S_Z	Start frequency factor	
S_θ	Temperature factor	
S_D	Torsional rigidity factor	
S_f	Frequency factor	
T_W	Torque with reversal of the machine	Nm
T_{KW}	Torque with reversal transmissible by the coupling	Nm
T_{Cal}	Hub-shaft connection maximum torque	Nm

“M” execution with clamp hubs

This type of coupling permits quick, positive mounting, without any shaft-hub backlash.
With the keyless coupling type, the torque applied for tightening down the screws (Ms) must be as given in the table.
The M coupling type is available with or without keyway.
Approved according to EC standard ATEX 94/9/EC.

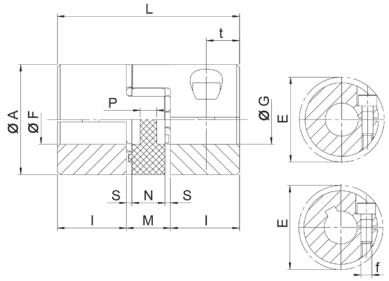


Fig. 1

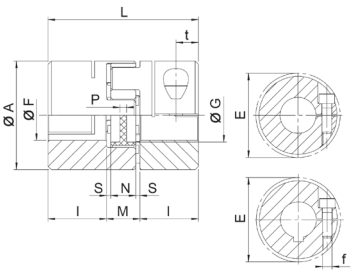


Fig. 2

Size	F min [mm]	F max [mm]	f	Ms [Nm]	Hub		n_{max} [min^{-1}]
					W [kg]	J [kgm^2]	
ALUMINUM HUBS							
7	3	7	M2	0,35	0,003	$0,085 \times 10^{-6}$	40.000
9	4	9	M2,5	0,75	0,007	$0,42 \times 10^{-6}$	28.000
14	6	15	M3	1,4	0,018	$2,6 \times 10^{-6}$	19.000
19/24	10	20	M6	11	0,071	$18,1 \times 10^{-6}$	14.000
24/28	10	28	M6	11	0,156	$74,9 \times 10^{-6}$	10.600
28/38	14	35	M8	25	0,240	$163,9 \times 10^{-6}$	8.500
38/45	19	45	M8	25	0,440	$465,5 \times 10^{-6}$	7.100
STEEL HUBS							
42	25	50	M10	70	2,100	3.095×10^{-6}	6.000
48	25	55	M12	120	2,900	5.160×10^{-6}	5.600
55	35	70	M12	120	4,000	9.737×10^{-6}	5.000
65	40	80	M14	190	5,800	17.974×10^{-6}	4.600

Keyway position	A [mm]	G [mm]	L [mm]	I [mm]	M [mm]	N [mm]	S [mm]	P [mm]	t [mm]	E [mm]	Fig.
ALUMINUM HUBS											
-	14	-	22	7	8	6	1,0	6	4	15,0	1
-	20	7,2	30	10	10	8	1,0	2	5	23,4	1
180°	30	10,5	35	11	13	10	1,5	2	5,5	32,2	1
120°	40	18	66	25	16	12	2,0	3,5	12	45,7	1
90°	55	27	78	30	18	14	2,0	4	12	56,4	2
90°	65	30	90	35	20	15	2,5	5,2	13,5	72,6	2
90°	80	38	114	45	24	18	3,0	5,6	16	83,3	2
STEEL HUBS											
-	95	46	126	50	26	20	3,0	5,6	20	78,8	2
-	105	51	140	56	28	21	3,5	6	21	108,0	2
-	120	60	160	65	30	22	4,0	9	26	122,0	2
-	135	68	185	75	35	26	4,5	8,3	27,5	139,0	2

From size 7 to 19/24: single slot execution
From size 24/28 to 65: double slot execution
Bore tolerance: F7 - JS9 (DIN 6885/1) keyway

Hub — **GESM 48 F50**

- GESM: TRASCO® ES hub
- Size
- F...: bore diameter
  F...C: bore diameter and keyway

Spider — **AES 24/28 R**

- TRASCO® ES spider
- Size
- B: 80 Sh A (blue)
  G: 92 Sh A (yellow)
  R: 98 Sh A (red)
  V: 64 Sh D (green)

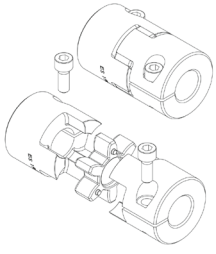


Fig. 1

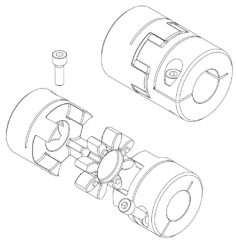


Fig. 2

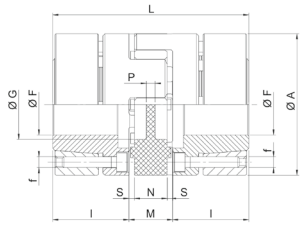
M_S	Screw tightening torque	Nm
W	Weight	kg
J	Coupling moment of inertia	kgm^2
n_{max}	Maximum rpm	min^{-1}

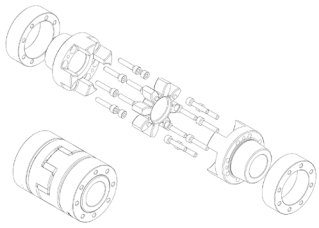
Using hub execution **M** without keyway, the maximum transmissible torque is the minor between the clamp-hub transmissible torque and the value stated in the section **"Technical characteristics".**

Size	Recommended **M** coupling Type Hub Bore Dia. [mm] and Transmissible Torque [Nm], valid for shaft tolerances k6																																				
	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 14	∅ 15	∅ 16	∅ 19	∅ 20	∅ 22	∅ 24	∅ 25	∅ 28	∅ 30	∅ 32	∅ 35	∅ 38	∅ 40	∅ 42	∅ 45	∅ 48	∅ 50	∅ 55	∅ 60	∅ 65	∅ 70	∅ 75	∅ 80
7	0,7	0,8	1	1,1																																	
9	1,1	1,4	1,7	1,9	2,2	2,5	2,8	3																													
14			2,5	2,9	3,3	3,7	4,1	4,6	5	5,8	6,2	6,6																									
19/24							23	25	27	32	34	36	43	45																							
24/28							23	25	27	32	34	36	43	45	50	54	57	63																			
28/38										58	62	66	79	83	91	100	104	116	124	133	145																
38/45													79	83	91	100	104	116	124	133	145	158	166	174	187												
42																	217	243	261	278	304	330	348	365	391	417	435										
48																	299	335	359	383	419	455	479	503	539	575	599	659									
55																					356	387	407	428	458	489	509	560	611	662	713						
65																							558	586	628	670	697	767	837	907	976	1046	1116				

"A" type - Shrink disc execution

This type of coupling provides excellent kinetic uniformity. Furthermore, the absence of keys or set screws makes it a well-balanced coupling and greatly facilitates installation and removal. An exact radial/axial positioning is easy for those applications which require it. The absence of keyways also avoids fretting corrosion and backlash between the shaft and the hub. This is the ideal type of coupling for applications requiring precision and/or high rotational speeds.
Approved according to EC standard ATEX 94/9/EC.





Size	F min [mm]	F max [mm]	f	Screws per locking elements	Ms [Nm]	Hub W [kg]	Hub J [kgm²]	nmax [min⁻¹]
ALUMINUM HUBS AND STEEL LOCKING ELEMENT								
14	6	14	M3	4	1,3	0,049	7×10^{-6}	28.000
19/24	10	20	M4	6	2,9	0,120	30×10^{-6}	21.000
24/28	15	28	M5	4	6,0	0,280	135×10^{-6}	15.500
28/38	19	38	M5	8	6,0	0,450	315×10^{-6}	13.200
38/45	20	45	M6	8	10,0	0,950	960×10^{-6}	10.500
STEEL HUBS AND LOCKING ELEMENT								
42	28	50	M8	4	35,0	2,300	3.150×10^{-6}	9.000
48	35	60	M8	4	35,0	3,080	5.200×10^{-6}	8.000
55	38	65	M10	4	71,0	4,670	10.300×10^{-6}	6.300
65	40	70	M12	4	120,0	6,700	19.100×10^{-6}	5.600

A [mm]	G [mm]	L [mm]	I [mm]	M [mm]	N [mm]	S [mm]	P [mm]
ALUMINUM HUBS AND STEEL LOCKING ELEMENT							
30	10,5	50	18,5	13	10	1,5	2
40	18	66	25	16	12	2,0	3,5
55	27	78	30	18	14	2,0	4
65	30	90	35	20	15	2,5	5,2
80	38	114	45	24	18	3,0	5,6
STEEL HUBS AND LOCKING ELEMENT							
95	46	126	50	26	20	3,0	5,6
105	51	140	56	28	21	3,5	6
120	60	160	65	30	22	4	9
135	68	185	75	35	26	4,5	8,3

Bore tolerance: H7

Using hub execution **A**, the shrink-disc maximum transmissible torque is the minor between the value stated in the table below and the value stated in section **"Technical characteristics"**.

Size	Recommended **A** coupling Type Hub Bore Dia. [mm] and Transmissible Torque [Nm], valid for shaft tolerances k6																									
	∅ 10	∅ 11	∅ 14	∅ 15	∅ 16	∅ 17	∅ 18	∅ 19	∅ 20	∅ 22	∅ 24	∅ 25	∅ 28	∅ 30	∅ 32	∅ 35	∅ 38	∅ 40	∅ 42	∅ 45	∅ 48	∅ 50	∅ 55	∅ 60	∅ 65	∅ 70
14	10	12	22																							
19/24	42	46	60	65	69	74	79	84	88																	
24/28				66	72	77	82	87	92	102	113	118	135													
28/38								175	185	205	225	235	266	287	308	339	373									
38/45									255	283	312	326	367	398	427	471	515	545	577	620						
42													420	460	500	563	627	670	714	790	850	880				
48																557	612	649	687	744	801	840	932	1033		
55																	986	1112	1140	1185	1284	1412	1420	1652	1680	1691
65																		1531	1580	1772	1840	1960	2049	2438	2495	2590

Order form

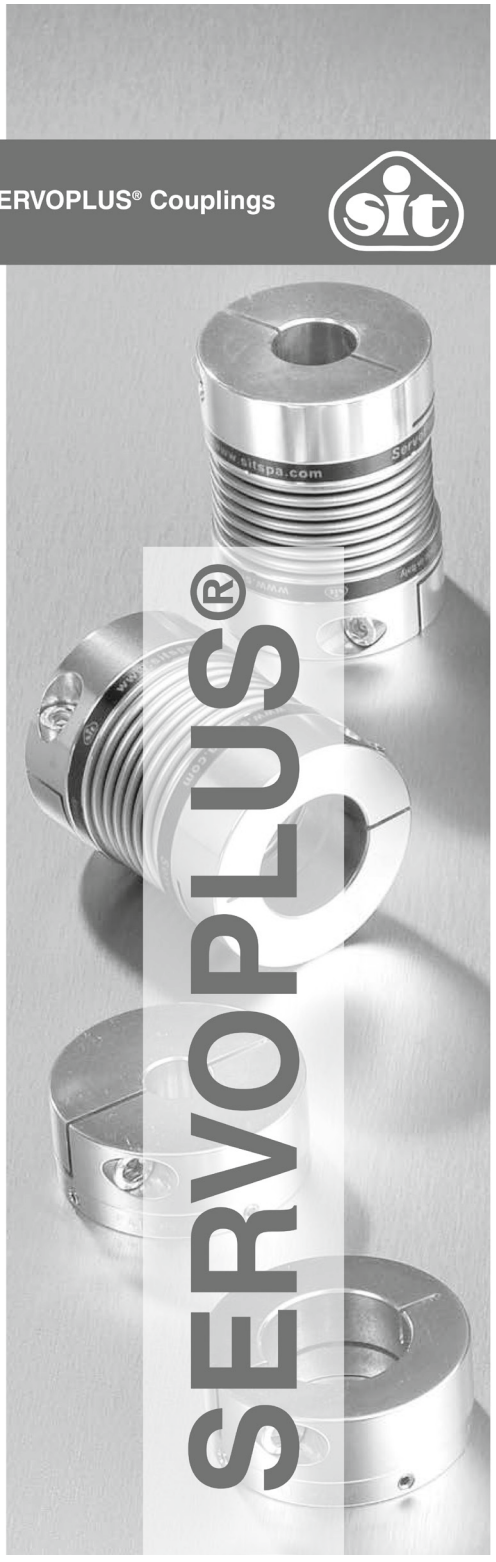
Hub — **GESA 48 F45**

- GESA: TRASCO® ES hub - "A" execution
- Size
- F...: bore diameter

Spider — **AES 24/28 R**

- TRASCO® ES spider
- Size
- B: blue; G: yellow; R: red; V: green

M_S	Screw tightening torque	Nm
W	Weight	kg
J	Coupling moment of inertia	kgm^2
n_{max}	Maximum rpm	min^{-1}


SERVOPLUS®

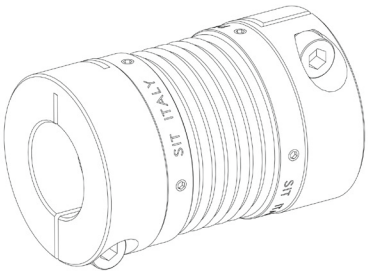
SERVOPLUS® couplings

Description

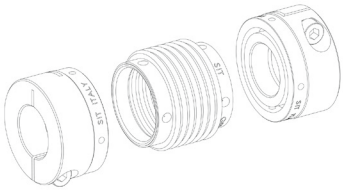
SERVOPLUS® bellows couplings are the perfect coupling in all servo motor applications where high torsional rigidity, truly backlash free torque transmission, low inertia, and superior reliability are required. The innovative modular system allows quick delivery and competitive cost advantage.

SERVOPLUS® couplings feature:

- backlash free for highest torque transmission precision
- low moment of inertia
- excellent dynamic characteristics for superior drives at high speed and torque inversions
- allow for axial, radial and angular misalignment
- easy mounting
- high torsional rigidity
- wear and maintenance free
- working temperature up to 300 °C
- innovative modular execution



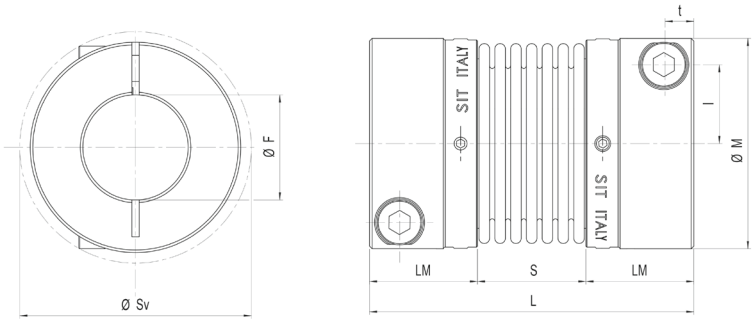
PAT. APPL. FILED



SERVOPLUS® high tech bellows couplings

The innovative modular system allows competitive costs and very quick delivery for any shaft combination. Additional benefits include bellow replacement without moving shaft.

Standard execution



Size	Dimensions[mm]								Screws				Socket set screws		Technical data										
	Pilot bore	F		M	S_v	L_M	S	L	Type	t	l	M_S [Nm]	Type	M_S [Nm]	T_{KN} [Nm]	T_{Kmax} [Nm]	n_{max} [min^{-1}]	Moment of inertia [$x10^{-6}$ Kgm^2]	Torsional rigidity C_T [Nm/rad]	Axial spring stiffness [N/mm]	Radial spring stiffness [N/mm]	Misalignments			W*
		min	max																			Δka	Δkr	Δkw	[kg]
16	4,5	5	16	34	36	17	16,5	50,5	M4	4,5	12	2,9	M3	0,8	5	10	14000	14	3050	29	92	±0.5	0,2	1,5	0,082
20	7,5	8	20	40	44	20,5	21	62	M5	5,5	15	6	M3	0,8	15	30	11900	34	6600	42	126	±0.6	0,2	1,5	0,135
30	9,5	10	30	55	58	22,5	27	72	M6	6,5	20	10	M4	2	35	70	8700	140	14800	65	155	±0.8	0,25	2	0,289
38	13,5	14	38	65	73	26	32	84	M8	8	25	25	M4	2	65	130	7300	310	24900	72	212	±0.8	0,25	2	0,438
45	13,5	14	45	83	89	31	41	103	M10	9,5	30	49	M5	3,8	150	300	5800	1056	64000	88	492	±1,0	0,3	2	0,924

*= with max bore
Bore tolerance F7

Size	SERVOPLUS® coupling																							
	Bore range and dampening hub transmissible torque [Nm]																							
	5	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**16**	**18**	**19**	**20**	**24**	**25**	**28**	**30**	**32**	**35**	**38**	**40**	**42**	**45**
16	4,9	5,9	6,9	7,8	8,8	9,8	10,8	11,8	13,7	14,7	15,7													
20				12,8	14,4	16	17,6	19,2	22,3	23,9	25,5	28,7	30,3	31,9										
30							24,9	27,1	31,7	33,9	36,2	40,7	43	45,2	54,3	56,5	63,3	67,9						
38												74,6	78,8	82,9	99,5	104	116	124	133	145	158			
45														132	158	165	184	198	211	231	250	263	277	296

Additional hub executions available upon request:

- **taper bore for taper bushings**
- **conical bore for FANUC motors**

Order form

Hub and Bellow **GSP 30 MF 20**

- GSP: SERVOPLUS® coupling
- Size
- M: hub with pilot bore
  S: bellow
  MF: hub with finished bore
- Bore diameter in mm (only in case of hub with finished bore)

M_S	Screw tightening torque	Nm
T_{KN}	Coupling nominal torque	Nm
T_{Kmax}	Coupling maximum torque	Nm
n_{max}	Maximum rpm	min^{-1}
C_T	Torsional rigidity	Nm/rad
ΔK_a	Maximum axial misalignment	mm
ΔK_r	Maximum radial misalignment	mm
ΔK_w	Maximum angular misalignment	°
W	Weight	kg

To configure a complete coupling select two hubs with the requested pilot bore/finish bore and one bellows.

SAFEMAX zero backlash Torque Limiters

SAFEMAX zero backlash torque limiters “GLS/SG/N”

In industrial applications, increasingly, automation in the manufacturing processes is becoming a strict requirement; performances are improving steadily. Ever increasing precision utilizing servo systems results in increasingly higher speeds.
Moreover, in order to improve the production capacity it is also important to increase the stiffness of the system thus increasing the resistance to global dynamic loads.
The torque overload generated by human error, mechanical malfunction or other causes is, however, unpredictable and if not intercepted can result in damage to the machine and consequent downtime that can be long and, therefore, expensive.
SAFEMAX torque limiters prevent these problems from happening through instant disengagement of the motor side from the driven side in case of torque overload, thus eliminating the risk of costly downtime. In addition, our torque limiters, being torsionally rigid and backlash free, allow for the rapid and accurate resumption of machine operations once the cause of the overload has been eliminated.

Features

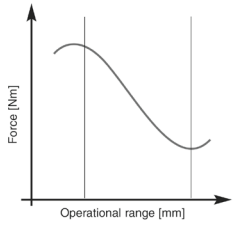
- Backlash-free torque transmission
- Low moment of inertia
- Compact design
- Maintenance-free
- Disengagement within 1-3 milliseconds
- Easy and safe adjustment of the torque
- re-engagement to 360 ° or in phase

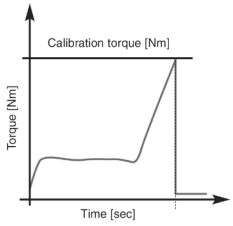
Applications

- Machine tools
- Packaging machines
- Printing machines
- Textile Machinery
- Industrial Robots
- Cartoning machines
- Woodworking machines
- Automatic equipment

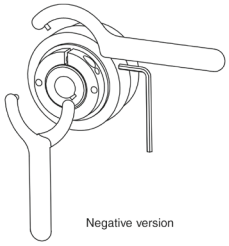
SIT torque limiters are available with regressive springs.
When an overload occurs, there is an immediate disengagement of the torque limiter within a few milliseconds, saving the machine from possible damage.
When the overload ends, the torque limiter re-engages after 360° or in optional preset phases.

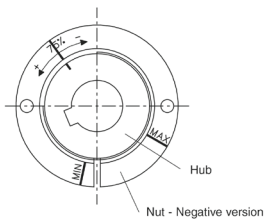
Graph of spring characteristic curve



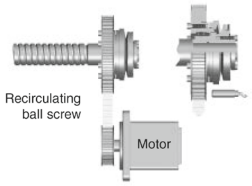
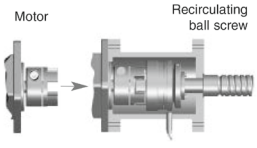
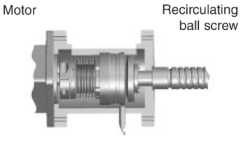
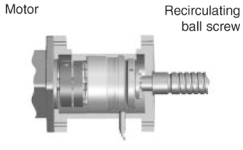


It’s possible to regulate the torque by the adjusting nut. Unless specifically requested, SIT limiters are designed to operate at 75% of the maximum transmissible torque. To allow a different setting, there are reference markings on nut and hub. Moreover, there are the markings of the minimum and maximum torque of the limiter and an indication of the direction of rotation of the nut to increase and decrease the torque of disengagement. Turning the nut clockwise the disengagement torque decreases, turning counter clockwise it increases.





Characteristics

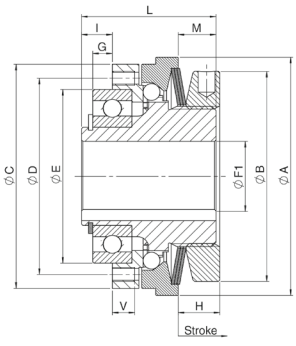
Design	Description	Characteristics	Assembly example
SAFEMAX - Torque limiters 	For direct mounting on timing pulley or power transmission component. Available designs: • With locking device shaft connection • With bore and keyway shaft connection On request also available in stainless steel.	Transmittable torque range: from 0.7 to 720 Nm Sizes: from 12 to 50	 Direct mounting on timing pulley or sprocket
SAFEMAX - Torque limiters with TRASCO® ES coupling 	For connection of two shafts in combination with TRASCO® ES zero backlash coupling. Compensates for axial, radial and angular misalignment and absorb vibrations. Available designs: • Bore and keyway both sides • Locking device - clamping hub • Locking device - shrink disc On request also available in stainless steel.	Transmittable torque range: from 0.7 to 720 Nm Sizes: from 12 to 50	 Mounting with TRASCO® ES coupling with clamping hub
SAFEMAX - Torque limiters with SERVOPLUS® coupling 	For connection of two shafts in combination with SERVOPLUS® torsionally rigid bellows coupling. Compensates for axial, radial and angular misalignment. Available designs: • Bore and keyway - clamping hub • Locking device - clamping hub On request also available in stainless steel.	Transmittable torque range: from 0.7 to 200 Nm Sizes: from 12 to 35	 Mounting with SERVOPLUS® GSP coupling with clamping hub
SAFEMAX - Torque limiters with SERVOMATE® coupling 	For connection of two shafts in combination with SERVOMATE® torsionally rigid bellows coupling. Available designs: • Bore and keyway - clamping hub • Locking device - clamping hub On request also available in stainless steel.	Transmittable torque range: from 0.7 to 200 Nm Sizes: from 15 to 25	 Mounting with SERVOMATE® GSM coupling with clamping hub

Label code

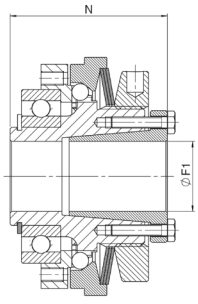
www.sitspa.com SAFEMAX SPGLSNA35/E-4 150Nm N13

- Type: SPGLSN
- Execution:
  - = Torque limiter
  A = with TRASCO ES Coupling
  S = with SERVOPLUS Coupling
  M = with SERVOMATE Coupling
- Size
- Re-engagement:
  ... = every 360°
  /E = in equidistant phase
- Number of springs
- Torque
- Production code

SAFEMAX - Torque limiters “GLS/SG/N”



Bore and keyway execution



Locking device execution

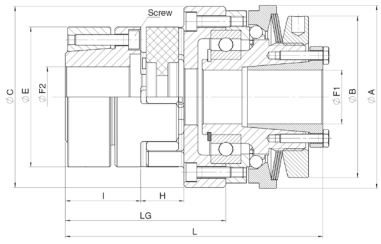
Torque limiter size	Dimensions											
	F1 max [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	G [mm]	I [mm]	L [mm]	M [mm]	N [mm]	V [mm]
12	12	44	38	40	35	30	2	4,5	24	7	28,5	5
17	17	50	42	47	42	37	2	5	29	8,5	34,5	5
20	20	70	62	65	56	47	4	8	40	12	47	6
25	25	85	75	80	71	62	7	11	48	13,5	56	7
35	35*	100	82	95	85	75	9	14	59	16	67	9
42	42	115	97	110	100	90	8	16	64	17	73	10
50	50	135	117	130	116	100	6,5	18	75	20,5	86	11

*F_1 : maximum diameter for finished bore with reduced keyway according to UNI 7510. Bore tolerance H7.

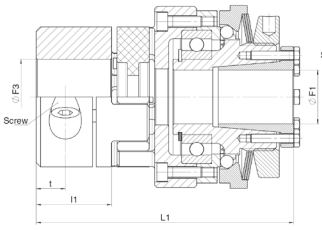
	Size			12	17	20	25	35	42	50
Torque limiter	Limit torques for overload		[Nm]	0,7 - 5	2 - 15	5 - 50	9 - 100	20 - 200	35 - 415	75 - 720
	Maximum speed		[rpm]	4000	4000	4000	3000	2500	2000	1200
	Thrust washer stroke on overload		[mm]	0,8	1,0	1,1	1,3	1,5	2,0	2,2
Mass moments of inertia	Nut side	Bore and keyway	[x10^{-4} kgm^2]	20	40	270	680	1510	2620	6330
		Locking device	[x10^{-4} kgm^2]	20	40	280	710	1580	2820	6820
	Pressure flange side		[x10^{-4} kgm^2]	9	15	80	290	680	1290	3150
Weight	Bore and keyway		[kg]	0,200	0,400	0,900	1,500	2,800	3,700	6,700
	Locking device		[kg]	0,200	0,400	0,900	1,600	3,000	4,100	7,300
Screws	Nut side	N° and type	-	6 x M3	6 x M3	8 x M4	8 x M5	8 x M6	8 x M6	8 x M8
		Tightening torque	[Nm]	1,5	1,5	3,0	5,0	7,5	7,5	14,0
Springs	Torque transmissible according to the set of springs [Nm]	1N	)	0,6 - 1,5	2 - 5	5 - 14	9 - 28	20 - 45	35 - 100	75 - 190
		2N	))	1,5 - 3	4 - 9	12 - 28	18 - 60	42 - 95	75 - 200	140 - 345
		3N	)))	2,7 - 5	7 - 15	24 - 50	40 - 100	-	-	-
		4N	))))	-	-	-	-	85 - 200	195 - 415	245 - 720

Note:
G: installation tolerance + 0,1.
The weights refer to the torque limiter with pilot bore.
Inertias refer to the torque limiter with maximum bore.

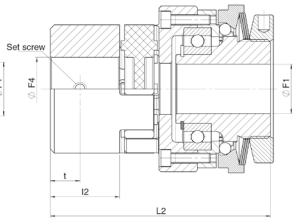
SAFEMAX - Torque limiters “GLS/SG/N” with TRASCO® ES



Locking device execution / GESA



Locking device execution / GESM



Bore and keyway execution / GESF

Torque limiter size	TRASCO® ES size	Dimensions											
		F_1 max [mm]	F_2 max [mm]	F_3 max [mm]	F_4 max [mm]	A [mm]	B [mm]	C [mm]	E [mm]	I [mm]	H [mm]	L_g [mm]	L [mm]
12	14	12	14	15	15	44	38	44	30	18,5	13	42	66
17	19/24	17	20	20	24	50	42	52	40	25	16	53	82,5
20	24/28	20	28	28	28	70	62	68	55	30	18	63	102
25	28/38	25	38	35	38	85	75	84	65	35	20	74,5	119,5
35	38/45	35*	45	45	45	100	82	100	80	45	24	93	146
42	42	42	50	50	55	115	97	115	95	50	26	100	157
50	48	50	60	55	60	135	117	138	105	56	28	110,5	178,5

*: maximum diameter for finished bore with reduced keyway according to UNI 7510.
F_1, F_2, F_3, F_4: bore tolerance H7.

Torque limiter	Size		12	17	20	25	35	42	50
	Limit torques for overload	[Nm]	0,7 - 5	2 - 15	5 - 50	9 - 100	20 - 200	35 - 415	75 - 720
	Maximum speed	[rpm]	4000	4000	4000	3000	2500	2000	1200
	Thrust washer stroke on overload	[mm]	0,8	1	1,1	1,3	1,5	2	2,2

	Size			14	19/24	24/28	28/38	38/45	42	48
TRASCO ES® coupling	Nominal torque	92 Sh A	[Nm]	7,5	10	35	95	190	265	310
		98 Sh A		12,5	17	60	160	325	450	525
		64 Sh D		16	21	75	200	405	560	655
	Maximum torque	92 Sh A		15	20	70	190	380	530	620
		98 Sh A		25	34	120	320	650	900	1050
		64 Sh D		32	42	150	400	810	1120	1310
	Maximum axial misalignment	92 Sh A	[mm]	1,0	1,2	1,4	1,5	1,8	2,0	2,1
		98 Sh A		1,0	1,2	1,4	1,5	1,8	2,0	2,1
		64 Sh D		1,0	1,2	1,4	1,5	1,8	2,0	2,1
	Maximum radial misalignment	92 Sh A		0,15	0,10	0,14	0,15	0,17	0,19	0,23
		98 Sh A		0,09	0,06	0,10	0,11	0,12	0,14	0,16
		64 Sh D		0,06	0,04	0,07	0,08	0,09	0,10	0,11
	Maximum angular misalignment	92 Sh A	[°]	1,0	1,0	1,0	1,0	1,0	1,0	1,0
		98 Sh A		0,9	0,9	0,9	0,9	0,9	0,9	0,9
		64 Sh D		0,8	0,8	0,8	0,8	0,8	0,8	0,8

Mass moments of inertia	Pressure flange side	Bore and keyway	[x10^{-6} kgm^2]	20	40	270	680	1510	2620	6330
		Locking device		20	40	280	710	1580	2820	6820
	Hub side	GESF - Bore and keyway		23	61	228	763	1747	6303	13434
		GESM - Clamping hub		23	59	252	727	1812	7152	14808
		GESA - Shrink disc		27	71	312	878	2306	7207	14848

	Combinations			Total weight						
	Torque limiters	Coupling								
Weight	Bore and keyway	GESF	[kg]	0,269	0,543	1,190	2,028	3,715	7,061	11,453
	Clamping device	GESM		0,267	0,548	1,214	2,115	3,900	7,561	12,433
	Clamping device	GESA		0,298	0,597	1,338	2,325	4,410	7,761	12,613

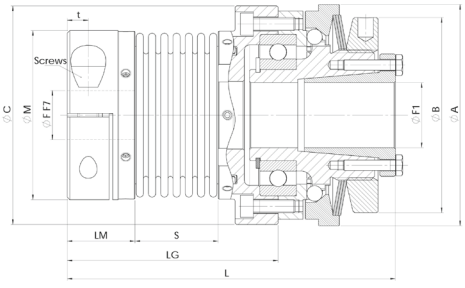
Screws	Clamping device torque limiter	N° and type	-	6 x M3	6 x M3	8 x M4	8 x M5	8 x M6	8 x M6	8 x M8
		Tightening torque	[Nm]	1,5	1,5	3,0	5,0	7,5	7,5	14,0
	GESF - Set screw	Type	-	M4	M5	M5	M6	M8	M8	M8
		Tightening torque	[Nm]	1,5	2,0	2,0	4,0	10,0	10,0	10,0
	GESM - Clamping screw	Type	-	M3	M6	M6	M8	M8	M10	M12
		Tightening torque	[Nm]	1,3	11,0	11,0	25,0	25,0	70,0	120,0
	GESA - Shrink disc screws	N° and type (12.9)	-	4 x M3	6 x M4	4 x M5	8 x M5	8 x M6	4 x M8	4 x M8
		Tightening torque	[Nm]	1,3	2,9	6,0	6,0	10,0	35,0	35,0

TRASCO® ES Coupling Shrink Disc Transmissible Torque

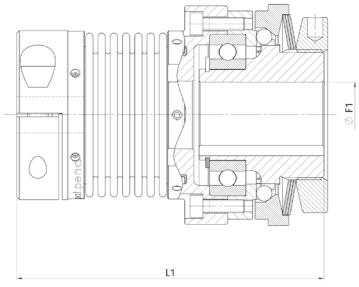
Type		Transmissible torque [Nm] related to shaft diameter [mm]																							
Torque limiters	Coupling	10	11	14	15	16	17	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
12	19/24	48	53	67	72	77	81	86	91	96															
17	24/28				77	82	88	93	98	103	113	124	129	144											
20	28/38							186	196	206	227	247	258	289	309	330	361	392							
25	38/45									291	320	349	364	408	437	466	510	553	582	612	655	699			
35	42													345	584	623	681	740	779	818	876	934	973	1071	
50	48																681	740	779	818	876	934	973	1071	1168

Notes:
The data are related to application with red AES spider 98 Sh A. The weights refer only to applications with coupling with pilot bore. Inertias refer to applications with couplings with maximum bore.

SAFEMAX - Torque limiters “GLS/SG/N” with SERVOPLUS®



Locking device execution / GSP

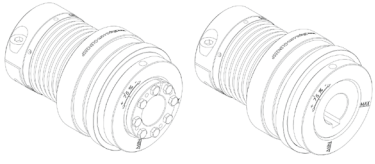


Bore and keyway execution / GSP

Torque limiter size	SERVOPLUS® Size	Dimensions											
		F min [mm]	F max [mm]	F1 max [mm]	A [mm]	B [mm]	C [mm]	M [mm]	Lm [mm]	S [mm]	Lg [mm]	L [mm]	L1 [mm]
12	16	5	16	12	44	38	43	34	17	16,5	48	72	67,5
17	20	8	20	17	50	42	49	40	20,5	21	58	87,5	82
20	30	10	30	20	70	62	65	55	22,5	27	69	108	101
25	38	14	38	25	85	75	84	65	26	32	81	126	118
35	45	14	45	35*	100	82	104	83	31	41	102	155	147

F: bore tolerance F7.
F1: bore tolerance H7.
*: maximum diameter for finished bore with reduced keyway according to UNI 7510.

Torque limiter	Size		12	17	20	25	35
	Limit torques for overload	[Nm]	0,7 - 5	2 - 15	5 - 50	9 - 100	20 - 200
	Maximum speed	[rpm]	4000	4000	4000	3000	2500
	Thrust washer stroke on overload	[mm]	0,8	1,0	1,1	1,3	1,5



	Size		16	20	30	38	45
SERVOPLUS® coupling	Nominal torque	[Nm]	5	15	35	65	150
	Maximum torque	[Nm]	10	30	70	130	300
	Maximum axial misalignment	[mm]	-/+0,5	-/+0,6	-/+0,8	-/+0,8	-/+1,0
	Maximum radial misalignment	[mm]	0,20	0,20	0,25	0,25	0,30
	Maximum angular misalignment	[°]	1,5	1,5	2,0	2,0	2,0

Mass moments of inertia	Pressure flange side	Bore and keyway	[x10^{-6} kgm^2]	20	40	270	680	1510
		Locking device		20	40	280	710	1580
	Hub side	Clamping hub		28	55	248	726	2152

	Combinations			Total weight				
Weight	Torque limiters	Coupling	[kg]					
	Bore and keyway	Clamping hub		0,290	0,539	1,212	2,004	3,870
	Locking device	Clamping hub		0,290	0,539	1,212	2,104	4,070

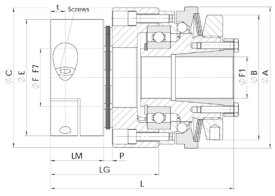
Screws	Clamping device torque limiter	N° and type	-	6 x M3	6 x M3	8 x M4	8 x M5	8 x M6
		Tightening torque	[Nm]	1,5	1,5	3,0	5,0	7,5
	GSP - Bellows set screw	Type	-	4 x M3	4 x M3	4 x M4	6 x M4	6 x M5
		Tightening torque	[Nm]	0,8	0,8	2,0	2,0	3,8
	Clamping screw	Type	-	M4	M5	M6	M8	M10
		Tightening torque	[Nm]	2,9	6,0	10,0	25,0	49,0

SERVOPLUS® Coupling Clamping Hub Transmissible Torque

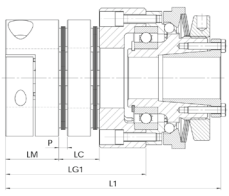
Type		Transmissible torque [Nm] related to shaft diameter [mm]																							
Torque limiters	Coupling	5	6	7	8	9	10	11	12	14	15	16	18	19	20	24	25	28	30	32	35	38	40	42	45
12	16	5	6	7	8	9	10	11	12	14	15	16													
17	20				13	14	16	18	19	22	24	25	29	30	32										
20	30							25	27	32	34	36	41	43	45	54	57	63	68						
25	38												75	79	83	100	104	116	124	133	145	158			
35	45														132	158	165	183	198	211	231	248	263	277	295

Notes:
The data are related to applications with pilot bore coupling.
The weights refer only to application with couplings with pilot bore.

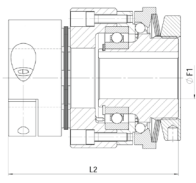
SAFEMAX - Torque limiters “GLS/SG/N” with SERVOMATE®



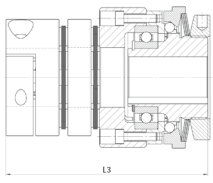
Locking device execution / GSM



Locking device execution / GSMC



Bore and keyway execution / GSM

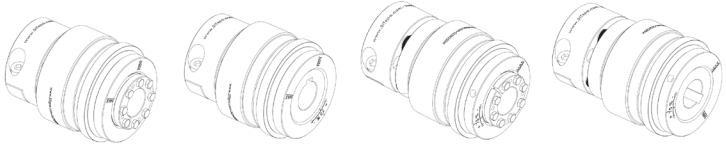


Bore and keyway execution / GSMC

Torque limiter size	SERVOMATE® Size	Dimensions														
		F max [mm]	F_1 max [mm]	A [mm]	B [mm]	C [mm]	E [mm]	L_m [mm]	P [mm	L_c [mm	L_g [mm]	L_{g1} [mm]	L [mm]	L_1 [mm]	L_2 [mm]	L_3 [mm]
17	15	20	17	50	42	52	47	21	3	13	40	50	69,5	79,5	64	74
20	20	25	20	70	62	68	59	24	4	19	48	63	87	102	80	95
25	25	35	25	85	75	84	70	32	5	24	65	84	110	129	102	121

F: bore tolerance F7.
F_1: bore tolerance H7.

Torque limiter	Size		17	20	25
	Limit torques for overload	[Nm]	2 - 15	5 - 50	9 - 100
	Maximum speed	[rpm]	4000	4000	3000
	Thrust washer stroke on overload	[mm]	1,0	1,1	1,3



	Size			Standard			With spacer		
				15	20	25	15	20	25
SERVOMATE® coupling	Nominal torque		[Nm]	20	30	60	20	30	60
	Maximum torque		[Nm]	40	60	120	40	60	120
	Maximum axial misalignment		[mm]	0,5	0,6	0,8	1,0	1,2	1,6
	Maximum radial misalignment		[mm]	-	-	-	0,16	0,25	0,30
	Maximum angular misalignment		[°]	1,0	1,0	1,0	1,0	1,0	1,0
Mass moments of inertia	Pressure flange side	Bore and keyway	[x10^{-6} kgm^2]	40	270	680	40	270	680
		Locking device		40	280	710	40	280	710
	Hub side	Clamping hub		70	272	838	82	318	950

Weight	Combinations			Total weight					
	Torque limiters	Coupling	[kg]						
	Bore and keyway	Clamping hub		0,556	1,218	2,090	0,594	1,310	2,247
	Locking device	Clamping hub		0,556	1,218	2,190	0,594	1,310	2,347

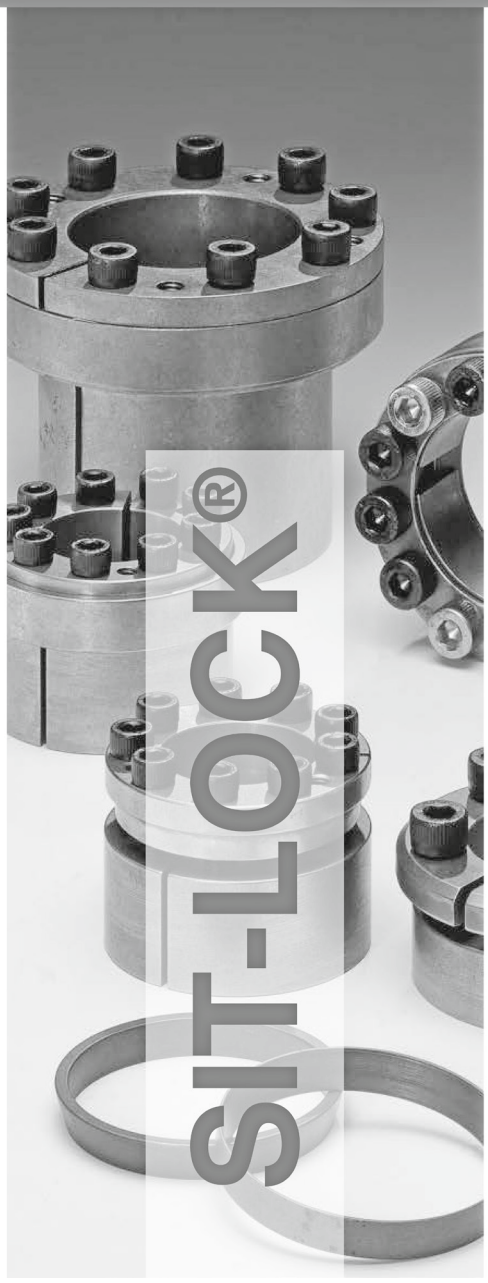
Screws						
Clamping device torque limiter	N° and type	-	6 x M3	8 x M4	8 x M5
	Tightening torque	[Nm]	1,5	3,0	5,0
Clamping screw	Type	-	M6	M6	M8
	Tightening torque	[Nm]	10,0	10,0	25,0

SERVOMATE® Coupling Clamping Hub Transmissible Torque

Type		Transmissible torque [Nm] related to shaft diameter [mm]																							
Torque limiters	Coupling	5	6	7	8	9	10	11	12	14	15	16	18	19	20	24	25	28	30	32	35	38	40	42	45
17	15	5	6	7	8	9	10	11	12	14	15	16													
20	20				13	14	16	18	19	22	24	25	29	30	32										
25	25							25	27	32	34	36	41	43	45	54	57	63	68						

Notes:
The data are related to applications with pilot bore coupling.
The weights refer only to application with couplings with pilot bore.

SIT-LOCK® Self Locking Elements



SIT-LOCK® self locking elements

Advantages of SIT-LOCK® on the shaft-hub connection compared with traditional systems

Easy assembly and disassembly
Both actions take place by locking and unlocking the clamping screws with common tools.
The use of a torque wrench is only necessary when a more precise torque is required.

Superior holding power
The action of the clamping cones creates shaft clamping torque superior to a normal keyed hub.

Overload protection
When the pre-set torque is exceeded SIT-LOCK® will slip, preventing the connected elements from being broken.
Note: SIT-LOCK® units are not friction couplings so, excessive slip will cause damage.

Easy adjustment
Combining the SIT-LOCK® design of smooth cone action with superior holding power, the hub can be clamped at any position along a shaft, eliminating the need for lock washers, spacers, stop rings, etc.

Precision location
With the SIT-LOCK® smooth cone action, the SIT-LOCK is ideal for clamping cams, timing devices, and indexing mechanisms accurately and precisely.

Unlimited use possibilities
SIT-LOCK® units are suitable to connect any type of hub (flywheels, chainwheels, gears, levers, pulleys, eccentrics, coupling, etc).

Various solutions in stock
Available in stock in 10 different types, SIT-LOCK® units can be utilized in a varied range of industrial applications

Order form

SIT-LOCK®	CAL	1	F25	/50

CAL: SIT-LOCK® self locking element
Type
Shaft diameter
External diameter (hub bore)

Performances

Given values of transmissible torque, axial force, and pressure between shaft and hub are valid for a lubricated installation (friction coefficient μ=0,12). Both hub and shaft, as well as locking unit's contact surfaces and screws, should be lubricated.

Locking unit and screws are supplied already oiled.

Always consider tolerances and roughness values per single locking unit.

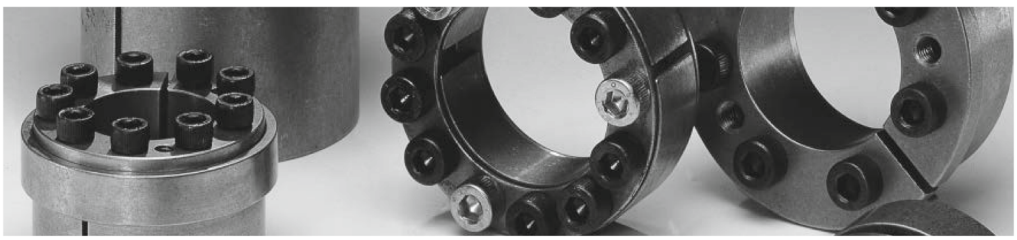
To avoid decrease of locking unit performances, do not use molybdenum disulfide lubricant or other substances that drastically reduce coefficient of friction.

Design procedure

For a correct functioning of SIT-LOCK®, the transmissible torque MT (stated in this catalogue) must always exceed the maximum torque in operation. So, in selecting the SIT-LOCK® dimensions, you must consider the start up torque could be even 4 times larger than the nominal one.
The transmissible axial forces (Fax) given in the tables are valid for cases where there is no torque. If it is necessary to transmit both a torque and an axial force (ex. helical gear), the following formula must be used:

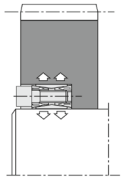
$$M_T \geq \sqrt{M_a^2 + \left(\frac{F_{ax} \cdot d}{2000}\right)^2} \quad [Nm]$$

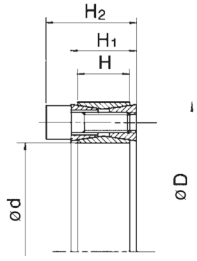
where:
Ma = maximum torque to be transmitted [Nm]
Fax= axial force in operation [N]
d = shaft diameter [mm]



SIT-LOCK® 1 - Not Self-Centering

SITLOCK® locking assembly unit consists of four pieces with two inside double-cone rings joined through a set of tightening screws. It is recommended for medium torques. Although it is not self centering, it can be easily assembled and disassembled.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

SIT-LOCK® 1 are not self-locking. The inner rings are tapered so that they spring apart when all screws are released.
Gradually loosen opposite locking screws in stages until the SIT-LOCK® is released. DO NOT remove the screws completely. In case it should jam, it is necessary to lightly hammer the released screws, so the back cone ring is pushed backwards.

Note: To reuse the locking element, carefully oil the screws and the tapered surfaces, then follow installation instructions.

Percentering hub selection

In order to perform an accurate centering, it is necessary to machine with accuracy a precentering hub section which should be longer than ≥ di 2 x H2.

Axial displacement

During the Installation of the unit no axial displacement of the hubs on the shaft occurs.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 11 - hub H 11

Calculation of (M_T) with more SIT-LOCK®1	
1 unit	$M_T = M_T$ table
2 units	$M_T = M_T$ table x 1,9
3 units	$M_T = M_T$ table x 2,7
4 units	$M_T = M_T$ table x 3,55

Dimensions [mm]				Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H	H_1	H_2	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_S [Nm]
20 x 47	17	20	26	288	29	225	96	8	M 6	15
22 x 47	17	20	26	317	29	204	96	8	M 6	15
24 x 50	17	20	26	345	29	187	90	8	M 6	15
25 x 50	17	20	26	360	29	180	90	8	M 6	15
28 x 55	17	20	26	498	36	198	101	10	M 6	15
30 x 55	17	20	26	533	36	185	101	10	M 6	15
32 x 60	17	20	26	676	42	206	110	12	M 6	15
35 x 60	17	20	26	739	42	188	110	12	M 6	15
38 x 65	17	20	26	928	49	201	117	14	M 6	15
40 x 65	17	20	26	977	49	190	117	14	M 6	15
42 x 75	20	24	32	1.587	76	239	134	12	M 8	37
45 x 75	20	24	32	1.701	76	223	134	12	M 8	37
48 x 80	20	24	32	1.814	76	209	125	12	M 8	37
50 x 80	20	24	32	1.889	76	200	125	12	M 8	37
55 x 85	20	24	32	2.397	87	210	136	14	M 8	37
60 x 90	20	24	32	2.615	87	193	128	14	M 8	37
65 x 95	20	24	32	3.204	99	201	138	16	M 8	37
70 x 110	24	28	38	4.589	131	207	132	14	M10	70
75 x 115	24	28	38	4.917	131	193	126	14	M10	70
80 x 120	24	28	38	5.245	131	181	121	14	M10	70
85 x 125	24	28	38	6.290	148	192	131	16	M10	70
90 x 130	24	28	38	6.660	148	182	126	16	M10	70
95 x 135	24	28	38	7.819	165	192	135	18	M10	70
100 x 145	26	33	45	9.703	194	198	137	14	M12	127
110 x 155	26	33	45	10.673	194	180	128	14	M12	127
120 x 165	26	33	45	13.262	221	188	137	16	M12	127
130 x 180	34	38	50	17.850	275	165	119	20	M12	127
140 x 190	34	38	50	21.089	301	168	124	22	M12	127
150 x 200	34	38	50	24.586	328	171	128	24	M12	127
160 x 210	34	38	50	28.343	354	173	132	26	M12	127
170 x 225	38	44	58	33.541	395	162	122	22	M14	195
180 x 235	38	44	58	38.636	429	166	128	24	M14	195
190 x 250	46	52	66	47.337	498	151	115	28	M14	195
200 x 260	46	52	66	53.261	533	154	118	30	M14	195
220 x 285	50	56	72	68.790	625	151	116	26	M16	300
240 x 305	50	56	72	86.127	718	159	125	30	M16	300
260 x 325	50	56	72	105.229	809	165	132	34	M16	300
280 x 355	60	66	84	128.456	918	145	114	32	M18	410
300 x 375	60	66	84	154.066	1.027	151	121	36	M18	410
320 x 405	72	78	98	211.342	1.321	152	120	36	M20	590
340 x 425	72	78	98	224.551	1.321	143	115	36	M20	590
360 x 455	84	90	112	289.095	1.606	141	111	36	M22	790
380 x 475	84	90	112	305.156	1.606	133	107	36	M22	790
400 x 495	84	90	112	321.217	1.606	127	102	36	M22	790
420 x 515	84	90	112	372.740	1.775	133	109	40	M22	790
440 x 545	96	102	126	447.549	2.034	128	103	40	M24	1.000
460 x 565	96	102	126	467.892	2.034	122	99	40	M24	1.000
480 x 585	96	102	126	511.273	2.130	123	101	42	M24	1.000
500 x 605	96	102	126	556.488	2.226	123	102	44	M24	1.000
520 x 630	96	102	126	591.149	2.274	121	100	45	M24	1.000
540 x 650	96	102	126	613.885	2.274	116	97	45	M24	1.000
560 x 670	96	102	126	676.552	2.416	119	100	48	M24	1.000
580 x 690	96	102	126	728.173	2.511	120	101	50	M24	1.000
600 x 710	96	102	126	753.282	2.511	116	98	50	M24	1.000
620 x 730	96	102	126	807.649	2.605	116	99	52	M24	1.000
640 x 750	96	102	126	863.810	2.699	117	99	54	M24	1.000
660 x 770	96	102	126	921.758	2.793	117	100	56	M24	1.000
680 x 790	96	102	126	949.690	2.793	113	98	56	M24	1.000
700 x 810	96	102	126	1.042.991	2.980	118	102	60	M24	1.000
720 x 830	96	102	126	1.072.791	2.980	114	99	60	M24	1.000
740 x 850	96	102	126	1.136.994	3.073	115	100	62	M24	1.000
760 x 870	96	102	126	1.202.959	3.166	115	101	64	M24	1.000
780 x 890	96	102	126	1.252.660	3.212	114	100	65	M24	1.000
800 x 910	96	102	126	1.303.261	3.258	113	99	66	M24	1.000
820 x 930	96	102	126	1.373.654	3.350	113	100	68	M24	1.000
840 x 950	96	102	126	1.445.789	3.442	113	100	70	M24	1.000
860 x 970	96	102	126	1.519.663	3.534	114	101	72	M24	1.000
880 x 990	96	102	126	1.595.268	3.626	114	101	74	M24	1.000
900 x 1010	96	102	126	1.652.075	3.671	113	100	75	M24	1.000

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

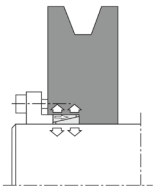
For assemblies requiring larger dimensions, contact our Technical Department.

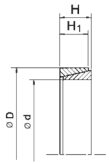
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N

p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 2 - Not Self-Centering

Locking elements consist of one internal and one external tapered rings. They are designed to work in combination with a clamp flange which can be bolted on a hub or shaft depending on application need. The number of locking screws depends on the torque to be transmitted. SIT-LOCK® 2 requires very small axial installation dimensions. Up to 4 units can be arranged behind each other, allowing high torques to be transmitted.





Note: SIT-LOCK® 2 in slotted execution is available upon request

$$M_T = \frac{(N°screws \cdot P_v) - P_o}{0,\ 54} \cdot 0{,}12 \cdot \frac{d}{2000}$$

The values of Pv and Ms are stated in the DIN 912 table.

Note:
The values stated in this catalogue are valid for application 1 (see following page).
With applications 2, MT, Fax, pw, pn, are increased by 25%.

Installation

Carefully clean contact surfaces of shaft and hub. Then lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:
- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub onto the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached, using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Make sure the clamping flange is not laying on the hub and the distance between flange and hub is equally spaced.

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

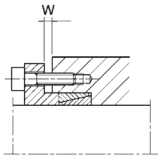
Removal

Gradually loosen opposite clamping screws in stages until the SIT-LOCK® is released. In case it should jam, it is necessary to lightly hammer the hub.

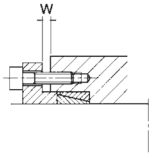
Maximum allowable roughness
Rt 6 µm
Maximum recommended tolerance
shaft h 6 - hub H7 per ∅ ≤ 40
shaft h 8 - hub H8 per ∅ ≥ 42

Calculation of (M_T) with more SIT-LOCK®2	
1 unit	$M_T = M_T$ table
2 units	$M_T = M_T$ table x 1,55
3 units	$M_T = M_T$ table x 1,85
4 units	$M_T = M_T$ table x 2,02

Application 1



Application 2



Dimensions [mm]			Axial force	Total axial force	Performances		"W" - Number of elements arranged in parallel [mm]				Pressure [N/mm²]	
d x D	H	H_1	P_0 [kN]	P_{tot} [kN]	M_T [Nm]	F_{ax} [kN]	1	2	3	4	P_w	P_n
6 x 9	4,5	3,7	-	4	3	0,9	2,5	2,5	3,0	4,0	106	71
7 x 10	4,5	3,7	-	5	4	1,1	2,5	2,5	3,0	4,0	114	80
8 x 11	4,5	3,7	-	6	5	1,3	2,5	2,5	3,0	4,0	119	87
9 x 12	4,5	3,7	8	15	7	1,6	2,5	2,5	3,0	4,0	130	98
10 x 13	4,5	3,7	7	16	10	2,0	2,5	2,5	3,0	4,0	143	110
12 x 15	4,5	3,7	7	16	12	2,0	2,5	2,5	3,0	4,0	119	96
13 x 16	4,5	3,7	7	16	14	2,1	2,5	2,5	3,0	4,0	116	95
14 x 18	6,3	5,3	11	26	23	3,3	3,5	3,5	4,5	5,5	119	93
15 x 19	6,3	5,3	11	27	27	3,6	3,5	3,5	4,5	5,5	120	95
16 x 20	6,3	5,3	10	27	30	3,8	3,5	3,5	4,5	5,5	118	95
17 x 21	6,3	5,3	10	27	33	3,9	3,5	3,5	4,5	5,5	114	92
18 x 22	6,3	5,3	9	33	48	5,3	3,5	3,5	4,5	5,5	147	121
19 x 24	6,3	5,3	13	33	43	4,6	3,5	3,5	4,5	5,5	120	95
20 x 25	6,3	5,3	12	33	47	4,7	3,5	3,5	4,5	5,5	117	93
22 x 26	6,3	5,3	9	34	61	5,6	3,5	3,5	4,5	5,5	126	107
24 x 28	6,3	5,3	8	34	68	5,7	3,5	3,5	4,5	5,5	119	102
25 x 30	6,3	5,3	10	37	75	6,0	3,5	3,5	4,5	5,5	120	100
28 x 32	6,3	5,3	8	40	101	7,2	3,5	3,5	4,5	5,5	129	113
30 x 35	6,3	5,3	9	40	105	7,0	3,5	3,5	4,5	5,5	116	100
32 x 36	6,3	5,3	8	44	128	8,0	3,5	3,5	4,5	5,5	125	112
35 x 40	7,0	6,0	10	54	171	9,8	3,5	3,5	4,5	5,5	124	108
36 x 42	7,0	6,0	12	57	181	10,1	3,5	3,5	4,5	5,5	124	106
38 x 44	7,0	6,0	11	60	207	10,9	3,5	3,5	4,5	5,5	127	109
40 x 45	8,0	6,6	14	70	249	12,5	3,5	4,5	5,5	6,5	125	111
42 x 48	8,0	6,6	16	75	278	13,2	3,5	4,5	5,5	6,5	127	111
45 x 52	10,0	8,6	28	110	409	18,2	3,5	4,5	5,5	6,5	124	108
48 x 55	10,0	8,6	25	110	455	19,0	3,5	4,5	5,5	6,5	122	106
50 x 57	10,0	8,6	24	110	480	19,2	3,5	4,5	5,5	6,5	118	104
55 x 62	10,0	8,6	22	120	601	21,8	3,5	4,5	5,5	6,5	123	109
56 x 64	12,0	10,4	30	150	750	26,8	3,5	4,5	5,5	7,0	122	107
60 x 68	12,0	10,4	28	160	883	29,4	3,5	4,5	5,5	7,0	125	110
63 x 71	12,0	10,4	27	170	1.005	31,9	3,5	4,5	5,5	7,0	129	115
65 x 73	12,0	10,4	26	170	1.044	32,1	3,5	4,5	5,5	7,0	126	112
70 x 79	14,0	12,2	31	210	1.392	39,8	3,5	5,0	6,5	7,5	124	109
71 x 80	14,0	12,2	31	220	1.491	42,0	3,5	5,0	6,5	7,5	129	114
75 x 84	14,0	12,2	35	230	1.628	43,4	3,5	5,0	6,5	7,5	126	112
80 x 91	17,0	15,0	48	300	2.240	56,0	4,0	6,0	6,5	8,0	124	109
85 x 96	17,0	15,0	46	320	2.593	61,0	4,0	6,0	6,5	8,0	127	112
90 x 101	17,0	15,0	44	330	2.864	63,6	4,0	6,0	6,5	8,0	125	111
95 x 106	17,0	15,0	41	340	3.153	66,4	4,0	6,0	6,5	8,0	124	111
100 x 114	21,0	18,7	61	460	4.433	88,7	5,0	6,0	7,0	9,0	126	110
110 x 124	21,0	18,7	66	475	4.999	90,9	5,0	6,0	7,0	9,0	117	104
120 x 134	21,0	18,7	60	475	5.529	92,2	5,0	6,0	7,0	9,0	109	98
130 x 148	28,0	25,3	96	700	8.720	134	5,0	7,0	9,0	11,0	108	95
140 x 158	28,0	25,3	89	740	10.127	145	6,0	7,0	9,0	11,0	108	96
150 x 168	28,0	25,3	85	790	11.750	157	6,0	7,0	8,0	11,0	110	98
160 x 178	28,0	25,3	79	950	15.492	194	6,0	7,0	9,0	11,0	127	114
170 x 191	33,0	30,0	117	1.180	20.071	236	7,0	9,0	10,0	12,0	123	109
180 x 201	33,0	30,0	111	1.200	21.774	242	7,0	9,0	10,0	12,0	119	106
190 x 211	33,0	30,0	105	1.300	25.228	266	7,0	9,0	10,0	12,0	124	111
200 x 224	38,0	34,8	134	1.600	32.573	326	7,0	8,0	11,0	13,0	124	111
220 x 244	38,0	34,8	142	1.700	37.185	345	7,0	9,0	11,0	13,0	124	111
320 x 360	65,0	59,0	292	3.492	113.950	710	10,0	15,0	20,0	25,0	100	100

Design of the screws center distance (l)

a) For applications with screws clamped on the hub:
l = D + 12 + ∅ screw [mm]
b) For applications with screws clamped on the shaft:
l = d – 12 – ∅ screw [mm]

Design of the flange thickness (S_f)

a) For applications with screws quality 12,9 (DIN 912):
S_f = ∅ screw x 1,8 [mm]
b) For applications with screws quality 8,8 (DIN 912):
S_f = ∅ screw x 1,3 [mm]

Note: flanges are available on request

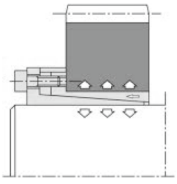
Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

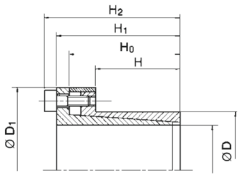
For assemblies requiring larger dimensions, contact our Technical Department.

M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 3 - Self-Centering Low Profile

Locking assembly with single taper design. Consists of two tapered rings and a spacer. It has minimum overall dimensions in virtue of the reduced thickness of the cones.
SIT-LOCK® 3 is suitable for the applications where small hubs are requested. It is recommended for mid-high torques and is self centering.
During the installation of the unit no axial displacement of the hubs on the shaft occurs.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen all locking screws. Remove and transfer the screws into the releasing tapped holes and tighten them until the SIT-LOCK® is released.

Note: To reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]						Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H	H_0	H_1	H_2	D_1	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_S [Nm]
6 x 14	10	18,5	21	24	25	12	4	180	77	3	M 3	2
7 x 15	12	22	25	29	27	26	7	234	109	3	M 4	4,9
8 x 15	12	22	25	29	27	30	7	204	109	3	M 4	4,9
9 x 16	14	23	26	30	28	44	10	208	117	4	M 4	4,9
10 x 16	14	23	26	30	28	49	10	187	117	4	M 4	4,9
11 x 18	14	23	26	30	32	54	10	170	104	4	M 4	4,9
12 x 18	14	23	26	30	32	59	10	156	104	4	M 4	4,9
13 x 23	14	23	26	30	38	64	10	144	81	4	M 4	4,9
14 x 23	14	23	26	30	38	69	10	134	81	4	M 4	4,9
15 x 24	16	29	36	42	45	128	17	189	118	3	M 6	17
16 x 24	16	29	36	42	45	136	17	177	118	3	M 6	17
17 x 26	18	31	38	44	47	193	23	197	129	4	M 6	17
18 x 26	18	31	38	44	47	205	23	186	129	4	M 6	17
19 x 27	18	31	38	44	49	216	23	176	124	4	M 6	17
20 x 28	18	31	38	44	50	227	23	168	120	4	M 6	17
22 x 32	25	38	45	51	54	250	23	110	75	4	M 6	17
24 x 34	25	38	45	51	56	273	23	101	71	4	M 6	17
25 x 34	25	38	45	51	56	284	23	97	71	4	M 6	17
28 x 39	25	38	45	51	61	478	34	129	93	6	M 6	17
30 x 41	25	38	45	51	62	512	34	121	88	6	M 6	17
32 x 43	25	38	45	51	65	546	34	113	84	6	M 6	17
35 x 47	32	45	52	58	69	796	45	108	80	8	M 6	17
38 x 50	32	45	52	58	72	864	45	99	75	8	M 6	17
40 x 53	32	45	52	58	75	910	45	94	71	8	M 6	17
42 x 55	32	45	52	58	78	955	45	90	69	8	M 6	17
45 x 59	45	62	70	78	86	1.891	84	110	84	8	M 8	41
48 x 62	45	62	70	78	87	2.017	84	103	80	8	M 8	41
50 x 65	45	62	70	78	92	2.101	84	99	76	8	M 8	41
55 x 71	55	72	80	88	98	2.600	95	83	64	9	M 8	41
60 x 77	55	72	80	88	104	2.836	95	76	59	9	M 8	41
65 x 84	55	72	80	88	111	3.073	95	70	54	9	M 8	41
70 x 90	65	86	96	106	119	5.254	150	88	68	9	M10	83
75 x 95	65	86	96	106	126	5.630	150	82	64	9	M10	83
80 x 100	65	86	96	106	131	8.006	200	102	82	12	M10	83
85 x 106	65	86	96	106	137	8.507	200	96	77	12	M10	83
90 x 112	65	86	96	106	144	9.007	200	91	73	12	M10	83
95 x 120	65	86	96	106	149	11.092	234	100	79	14	M10	83
100 x 125	65	86	96	106	154	15.012	300	123	98	18	M10	83
110 x 140	90	114	128	140	180	16.029	291	78	61	12	M12	145
120 x 155	90	114	128	140	198	17.486	291	72	55	12	M12	145
130 x 165	90	114	128	140	208	25.257	389	88	69	16	M12	145

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

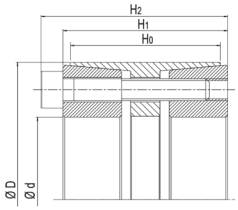
For assemblies requiring larger dimensions, contact our Technical Department.

It is possible to decrease the screws tightening torque Ms by up to 40% of the value stated in the table. Consequently, M_T, F_{ax}, P_w and P_n will decrease proportionally.

M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 4 - Self-Centering Heavy Duty

It is suitable for high torques and is self-centering. Recommended for applications that requires high transmission values and excellent centering capabilities such as belt drums.



Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen the clamping screws. Transfer the screws into the releasing tapped holes and tighten them until the front cone is released. Loosen the clamping screws again. Transfer the clamping screws into the releasing holes of the intermediate ring, and tighten them until the back cone is released.

Note: To reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies, the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]				Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H_0	H_1	H_2	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_S [Nm]
25 x 50	41	45	51	830	66	172	86	6	M6	17
30 x 55	41	45	51	1.239	89	205	104	8	M6	17
30 x 55	41	45	51	1.328	89	191	104	8	M6	17
35 x 60	41	45	51	1.549	89	164	95	8	M6	17
38 x 65	41	45	51	1.682	89	151	88	8	M6	17
40 x 65	41	45	51	2.213	111	179	110	10	M6	17
42 x 75	41	45	53	3.435	164	252	141	8	M8	41
45 x 75	41	45	53	3.680	164	235	141	8	M8	41
48 x 80	58	62	70	3.926	164	156	94	8	M8	41
50 x 80	58	62	70	4.089	164	150	94	8	M8	41
55 x 85	58	62	70	4.498	164	136	88	8	M8	41
60 x 90	58	62	70	6.134	204	156	104	10	M8	41
65 x 95	58	62	70	6.645	204	144	98	10	M8	41
70 x 110	70	76	86	11.363	325	176	112	10	M10	83
75 x 115	70	76	86	12.174	325	164	107	10	M10	83
80 x 120	70	76	86	15.583	390	185	123	12	M10	83
85 x 125	70	76	86	16.557	390	174	118	12	M10	83
90 x 130	70	76	86	17.531	390	164	114	12	M10	83
95 x 135	70	76	86	18.505	390	155	109	12	M10	83
100 x 145	92	98	110	28.361	567	164	113	12	M12	145
110 x 155	92	98	110	31.197	567	149	106	12	M12	145
120 x 165	92	98	110	39.706	662	159	116	14	M12	145
130 x 180	108	114	128	50.589	778	147	106	12	M14	230
140 x 190	108	114	128	63.560	908	159	117	14	M14	230
150 x 200	108	114	128	77.829	1.038	170	127	16	M14	230
160 x 210	108	114	128	83.017	1.038	159	121	16	M14	230
170 x 225	136	146	162	107.267	1.262	145	109	14	M16	355
180 x 235	136	146	162	129.802	1.442	156	120	16	M16	355
190 x 250	136	146	162	137.014	1.442	148	113	16	M16	355
200 x 260	136	146	162	144.225	1.442	141	108	16	M16	355
220 x 285	136	146	162	198.309	1.803	160	123	20	M16	355
240 x 305	136	146	162	237.971	1.983	161	127	22	M16	355
260 x 325	136	146	162	257.802	1.983	149	119	22	M16	355
280 x 355	138	148	168	393.980	2.814	193	152	20	M20	690
300 x 375	165	177	197	464.334	3.096	166	133	22	M20	690
320 x 405	165	177	197	495.289	3.096	156	123	22	M20	690
340 x 425	165	177	197	574.085	3.377	160	128	24	M20	690
360 x 455	188	202	224	693.598	3.853	151	119	22	M22	930
380 x 475	188	202	224	865.246	4.554	169	135	26	M22	930
400 x 495	188	202	224	910.786	4.554	161	130	26	M22	930

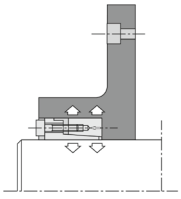
Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

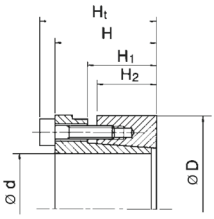
For assemblies requiring larger dimensions, contact our Technical Department.

M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 5A - Sel-Centering without Flange

Locking assembly with single taper design. It is suitable for high torques. Provide good concentricity and self centring. A small axial movement of the hub during the installation operation may occur. Applications in need of an accurate axial positioning are not recommended with this type of locking assembly.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen all locking screws. Remove and transfer the screws into the releasing tapped holes and tighten them until the SIT-LOCK® is released.

Note: To reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]					Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H_t	H	H_1	H_2	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_s [Nm]
20 x 47	49	43	30	26	547	55	279	119	6	M6	17
22 x 47	49	43	30	26	602	55	254	119	6	M6	17
24 x 50	49	43	30	26	657	55	233	112	6	M6	17
25 x 50	49	43	30	26	684	55	223	112	6	M6	17
28 x 55	49	43	30	26	766	55	199	101	6	M6	17
30 x 55	49	43	30	26	821	55	186	101	6	M6	17
32 x 60	49	43	30	26	1.313	82	262	140	9	M6	17
35 x 60	49	43	30	26	1.436	82	239	140	9	M6	17
38 x 65	49	43	30	26	1.559	82	220	129	9	M6	17
40 x 65	49	43	30	26	1.641	82	209	129	9	M6	17
42 x 75	60	52	35	30	2.123	101	213	119	6	M8	41
45 x 75	60	52	35	30	2.275	101	199	119	6	M8	41
48 x 80	60	52	35	30	2.426	101	186	112	6	M8	41
50 x 80	60	52	35	30	2.527	101	179	112	6	M8	41
55 x 85	60	52	35	30	4.170	152	244	158	9	M8	41
60 x 90	60	52	35	30	4.549	152	223	149	9	M8	41
65 x 95	60	52	35	30	4.928	152	206	141	9	M8	41
70 x 110	67	57	46	40	6.555	187	177	113	7	M10	83
75 x 115	67	57	46	40	7.023	187	166	108	7	M10	83
80 x 120	67	57	46	40	7.491	187	155	103	7	M10	83
85 x 125	67	57	46	40	9.096	214	167	114	8	M10	83
90 x 130	67	57	46	40	9.631	214	158	109	8	M10	83
95 x 135	67	57	46	40	12.708	268	187	131	10	M10	83
100 x 145	78	66	53	46	13.634	273	157	108	7	M12	145
110 x 155	80	68	52	45	17.931	326	175	124	8	M12	145
120 x 165	80	68	52	45	24.452	408	200	146	10	M12	145
130 x 180	80	68	52	45	31.787	489	222	160	12	M12	145
140 x 190	90	76	58	50	39.141	559	212	156	10	M14	230
150 x 200	90	76	58	50	50.325	671	237	178	12	M14	230
160 x 210	90	76	58	50	53.680	671	222	170	12	M14	230
170 x 225	90	76	58	50	66.540	783	244	185	14	M14	230
180 x 235	90	76	57	50	70.455	783	231	177	14	M14	230

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

For assemblies requiring larger dimensions, contact our Technical Department.

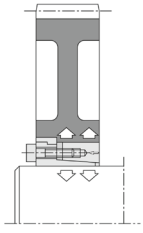
It is possible to decrease the screws tightening torque Ms by up to 40% of the value stated in the table. Consequently, M_T, F_{ax}, P_w and P_n will decrease proportionally.

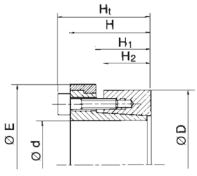
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 5B - Self-Centering with Flange

Locking assembly with single taper design. It is suitable for high torques. Provide good concentricity and self centring.

It is recommended for medium torques and is self-centering. The flange design prevent axial movement during installation.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen all locking screws. Remove and transfer the screws into the releasing tapped holes and tighten them until the SIT-LOCK® is released.

Note: ITo reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies, the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Max allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]						Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H_t	H	H_1	H_2	E	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_s [Nm]
20 x 47	49	43	30	26	53	341	34	174	73	6	M6	17
22 x 47	49	43	30	26	53	375	34	158	73	6	M6	17
24 x 50	49	43	30	26	56	409	34	145	73	6	M6	17
25 x 50	49	43	30	26	56	426	34	139	73	6	M6	17
28 x 55	49	43	30	26	61	478	34	124	73	6	M6	17
30 x 55	49	43	30	26	61	512	34	116	73	6	M6	17
32 x 60	49	43	30	26	66	819	51	163	109	9	M6	17
35 x 60	49	43	30	26	66	895	51	149	109	9	M6	17
38 x 65	49	43	30	26	71	972	51	137	109	9	M6	17
40 x 65	49	43	30	26	71	1.023	51	131	109	9	M6	17
42 x 75	60	52	35	30	81	1.324	63	133	94	6	M8	41
45 x 75	60	52	35	30	81	1.418	63	124	94	6	M8	41
48 x 80	60	52	35	30	86	1.513	63	116	94	6	M8	41
50 x 80	60	52	35	30	86	1.576	63	111	94	6	M8	41
55 x 85	60	52	35	30	91	2.600	95	152	142	9	M8	41
60 x 90	60	52	35	30	96	2.836	95	139	142	9	M8	41
65 x 95	60	52	35	30	102	3.073	95	129	142	9	M8	41
70 x 110	67	57	46	40	117	4.087	117	111	117	7	M10	83
75 x 115	67	57	46	40	122	4.379	117	103	117	7	M10	83
80 x 120	67	57	46	40	127	4.670	117	97	117	7	M10	83
85 x 125	67	57	46	40	132	5.671	133	104	134	8	M10	83
90 x 130	67	57	46	40	137	6.005	133	98	134	8	M10	83
95 x 135	67	57	46	40	142	7.923	167	116	168	10	M10	83
100 x 145	78	66	53	46	153	8.500	170	98	127	7	M12	145
110 x 155	80	68	52	46	163	10.988	200	105	150	8	M12	145
120 x 165	80	68	52	46	173	14.984	250	120	187	10	M12	145
130 x 180	80	68	52	46	188	19.479	300	133	224	12	M12	145
140 x 190	90	76	58	51	199	23.986	343	127	204	10	M14	230
150 x 200	90	76	58	51	209	30.840	411	143	244	12	M14	230
160 x 210	90	76	58	51	219	32.896	411	134	244	12	M14	230
170 x 225	90	76	58	51	234	40.777	480	147	285	14	M14	230
180 x 235	90	76	57	51	244	43.175	480	139	285	14	M14	230

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

For assemblies requiring larger dimensions, contact our Technical Department.

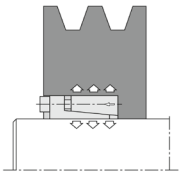
It is possible to decrease the screws tightening torque Ms by up to 40% of the value stated in the table. Consequently, M_T, F_{ax}, P_w and P_n will decrease proportionally.

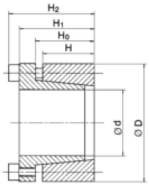
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 6 - Self-Centering without Flange Short Version

Locking assembly with single taper design. Provides good concentricity and is self centering. A small axial movement of the hub during the installation operation may occurr.

Applications requiring accurate axial positioning are not recommended with this type of locking assembly.
SITLOCK® 6 is suitable for applications with medium torques.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen all locking screws. Remove and transfer the screws into the releasing tapped holes and tighten them until the SIT-LOCK® is released.

Note: To reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies, the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]					Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H	H_0	H_1	H_2	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_s [Nm]
20 x 47	17	28	22	34	380	38	297	126	5	M6	14
22 x 47	17	28	22	34	419	38	270	126	5	M6	14
24 x 50	17	28	22	34	457	38	247	119	5	M6	14
25 x 50	17	28	22	34	571	46	285	142	6	M6	14
28 x 55	17	28	22	34	639	46	254	130	6	M6	14
30 x 55	17	28	22	34	685	46	237	130	6	M6	14
32 x 60	17	28	22	34	974	61	297	158	8	M6	14
35 x 60	17	28	22	34	1.065	61	271	158	8	M6	14
38 x 65	17	28	22	34	1.157	61	250	146	8	M6	14
40 x 65	17	28	22	34	1.218	61	237	146	8	M6	14
42 x 75	20	34	26	42	2.060	98	310	173	7	M8	35
45 x 75	20	34	26	42	2.207	98	289	173	7	M8	35
48 x 80	20	34	26	42	2.354	98	271	163	7	M8	35
50 x 80	20	34	26	42	2.452	98	260	163	7	M8	35
55 x 85	20	34	26	42	3.082	112	270	175	8	M8	35
60 x 90	20	34	26	42	3.363	112	248	165	8	M8	35
65 x 95	20	34	26	42	4.098	126	257	176	9	M8	35
70 x 110	24	40	30	50	6.240	178	281	179	8	M10	70
75 x 115	24	40	30	50	6.685	178	263	171	8	M10	70
80 x 120	24	40	30	50	7.131	178	246	164	8	M10	70
85 x 125	24	40	30	50	8.524	201	261	177	9	M10	70
90 x 130	24	40	30	50	9.025	201	246	171	9	M10	70
95 x 135	24	40	30	50	10.585	223	259	182	10	M10	70
100 x 145	26	44	32	56	13.045	261	266	184	8	M12	125
110 x 155	26	44	32	56	14.349	261	242	172	8	M12	125
120 x 165	26	44	32	56	17.610	294	250	181	9	M12	125
130 x 180	34	54	40	66	25.437	391	235	170	12	M12	125
140 x 190	34	54	40	68	28.155	402	224	165	9	M14	190
150 x 200	34	54	40	68	33.518	447	232	174	10	M14	190
160 x 210	34	54	40	68	39.327	492	240	183	11	M14	190
170 x 225	44	64	50	78	45.584	536	190	144	12	M14	190
180 x 235	44	64	50	78	48.265	536	180	138	12	M14	190
190 x 250	44	64	50	78	63.683	670	213	162	15	M14	190
200 x 260	44	64	50	78	67.035	670	202	155	15	M14	190

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

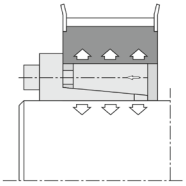
For assemblies requiring larger dimensions, contact our Technical Department.

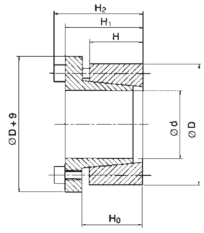
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 7 - Self-Centering with Flange, Short Version

Locking assembly with single taper design. Provides good concentricity and self centering.
It is recommended for medium torques and is self-centring.

The flange design prevents axial movement during installation.
It is suitable for applications with medium torques, and need very precise axial positioning.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen all locking screws. Remove and transfer the screws into the releasing tapped holes and tighten them until the SIT-LOCK® is released.

Note: To reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]					Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H	H_0	H_1	H_2	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Tipo	M_s [Nm]
20 x 47	17	22	28	34	284	28	222	94	5	M6	17
22 x 47	17	22	28	34	313	28	202	94	5	M6	17
24 x 50	17	22	28	34	341	28	185	89	5	M6	17
25 x 50	17	22	28	34	426	34	213	106	6	M6	17
28 x 55	17	22	28	34	478	34	190	97	6	M6	17
30 x 55	17	22	28	34	512	34	177	97	6	M6	17
32 x 60	17	22	28	34	728	45	222	118	8	M6	17
35 x 60	17	22	28	34	796	45	203	118	8	M6	17
38 x 65	17	22	28	34	864	45	187	109	8	M6	17
40 x 65	17	22	28	34	910	45	177	109	8	M6	17
42 x 75	20	26	34	42	1.544	74	232	130	7	M8	41
45 x 75	20	26	34	42	1.655	74	217	130	7	M8	41
48 x 80	20	26	34	42	1.765	74	203	122	7	M8	41
50 x 80	20	26	34	42	1.838	74	195	122	7	M8	41
55 x 85	20	26	34	42	2.311	84	203	131	8	M8	41
60 x 90	20	26	34	42	2.521	84	186	124	8	M8	41
65 x 95	20	26	34	42	3.073	95	193	132	9	M8	41
70 x 110	24	30	40	50	4.670	133	211	134	8	M10	83
75 x 115	24	30	40	50	5.004	133	197	128	8	M10	83
80 x 120	24	30	40	50	5.338	133	184	123	8	M10	83
85 x 125	24	30	40	50	6.380	150	195	133	9	M10	83
90 x 130	24	30	40	50	6.755	150	184	128	9	M10	83
95 x 135	24	30	40	50	7.923	167	194	137	10	M10	83
100 x 145	26	32	44	56	9.714	194	198	137	8	M12	145
110 x 155	26	32	44	56	10.686	194	180	128	8	M12	145
120 x 165	26	32	44	56	13.114	219	186	135	9	M12	145
130 x 180	34	40	54	66	18.943	291	175	126	12	M12	145
140 x 190	34	40	54	68	20.993	300	167	123	9	M14	230
150 x 200	34	40	54	68	24.992	333	173	130	10	M14	230
160 x 210	34	40	54	68	29.324	367	179	136	11	M14	230
170 x 225	44	50	64	78	33.989	400	142	107	12	M14	230
180 x 235	44	50	64	78	35.989	400	134	103	12	M14	230
190 x 250	44	50	64	78	47.485	500	159	121	15	M14	230
200 x 260	44	50	64	78	49.984	500	151	116	15	M14	230

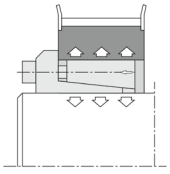
Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

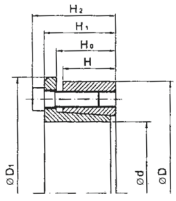
For assemblies requiring larger dimensions, contact our Technical Department.

M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 8 - Self-Centering - Special Outside Diameters

Locking assembly with single taper design. The flange design prevents axial movement during installation.
SIT-LOCK® 8 has a very small axial dimension, is self centering and has been designed to suit various shaft diameters although the overall dimensions are the same. SIT-LOCK® 8 is recommended for applications with medium torques which need a good axial positioning. The limited number of screws make the installation fast.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Gradually loosen all locking screws. Remove and transfer the screws into the releasing tapped holes and tighten them until the SIT-LOCK® is released.

Note: To reuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Concentricity

For self-centering locking assemblies, the clamping element has a centering effect and the concentricity error can be considered 0.02-0.04 mm.

Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

Dimensions [mm]						Performances		Pressure [N/mm²]		Clamping screws (DIN 912 - 12,9)		
d x D	H	H_0	H_1	H_2	D_1	M_T [Nm]	F_{ax} [kN]	p_w	p_n	N°	Type	M_S [Nm]
14 x 55	17	22	30	38	62	130	19	208	53	3	M8	25
16 x 55	17	22	30	38	62	149	19	182	53	3	M8	25
18 x 55	17	22	30	38	62	168	19	162	53	3	M8	25
19 x 55	17	22	30	38	62	177	19	153	53	3	M8	25
20 x 55	17	22	30	38	62	186	19	145	53	3	M8	25
22 x 55	17	22	30	38	62	288	26	186	74	3	M8	35
24 x 55	17	22	30	38	62	314	26	170	74	3	M8	35
25 x 55	17	22	30	38	62	328	26	164	74	3	M8	35
28 x 55	17	22	30	38	62	441	32	176	89	3	M8	41
30 x 55	17	22	30	38	62	473	32	164	89	3	M8	41
24 x 65	17	23	31	39	72	448	37	243	90	5	M8	30
25 x 65	17	23	31	39	72	467	37	233	90	5	M8	30
28 x 65	17	23	31	39	72	611	44	243	105	5	M8	35
30 x 65	17	23	31	39	72	655	44	227	105	5	M8	35
32 x 65	17	23	31	39	72	699	44	213	105	5	M8	35
35 x 65	17	23	31	39	72	919	53	234	126	5	M8	41
38 x 65	17	23	31	39	72	998	53	216	126	5	M8	41
40 x 65	17	23	31	39	72	1.051	53	205	126	5	M8	41
30 x 80	20	26	34	42	87	785	52	231	87	7	M8	30
32 x 80	20	26	34	42	87	837	52	217	87	7	M8	30
33 x 80	20	26	34	42	87	863	52	210	87	7	M8	30
35 x 80	20	26	34	42	87	1.070	61	232	101	7	M8	35
38 x 80	20	26	34	42	87	1.162	61	213	101	7	M8	35
40 x 80	20	26	34	42	87	1.223	61	203	101	7	M8	35
42 x 80	20	26	34	42	87	1.544	74	232	122	7	M8	41
45 x 80	20	26	34	42	87	1.655	74	217	122	7	M8	41
48 x 80	20	26	34	42	87	1.765	74	203	122	7	M8	41
50 x 80	20	26	34	42	87	1.838	74	195	122	7	M8	41

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

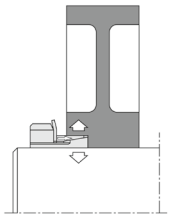
For assemblies requiring larger dimensions, contact our Technical Department.

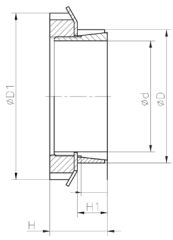
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 9 - Not Self-Centering

Consists of two tapered rings and a lock nut. In virtue of the simple design, very fast assembly/disassembly is allowed.

SIT-LOCK® 9 is suitable for applications with small-medium torques.





Installation

Carefully clean contact surfaces of shaft and hub. Then lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® in the machined bore of the hub. Insert the shaft. Gradually and uniformly tighten the locking nut to the tightening torque (Ms).

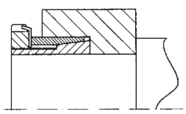
Note: once the tightening torque is reached, do no tighten the locking nut anymore.

Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

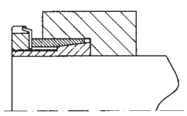
Removal

Loosen the lock nut until the SIT-LOCK® is completely released.

Application 1



Application 2



Dimensions [mm]				Performances		Pressure [N/mm²]		Slotten Nut		
d x D	D_1	H	H_1	M_T [Nm]	F_{ax} [kN]	p_w	p_n	Size		M_S [Nm]
14 x 25	32,0	17,0	9,0	52	7	241	135	KM4	M20x1	95
15 x 25	32,0	17,0	9,0	56	7	225	135	KM4	M20x1	95
16 x 25	32,0	17,0	9,0	60	7	211	135	KM4	M20x1	95
17 x 26	38,0	18,0	9,0	86	10	271	177	KM5	M25x1,5	160
18 x 26	38,0	18,0	9,0	91	10	256	177	KM5	M25x1,5	160
18 x 30	38,0	17,5	9,0	91	10	256	154	KM5	M25x1,5	160
19 x 30	38,0	18,0	9,0	96	10	242	154	KM5	M25x1,5	160
20 x 30	38,0	18,0	9,0	102	10	230	154	KM5	M25x1,5	160
22 x 32	45,0	18,0	9,0	127	12	238	164	KM6	M30x1,5	220
24 x 35	45,0	18,0	9,0	139	12	218	150	KM6	M30x1,5	220
25 x 35	45,0	18,0	9,0	144	12	210	150	KM6	M30x1,5	220
28 x 36	52,0	18,0	10,0	215	15	231	179	KM7	M35x1,5	340
28 x 40	52,0	18,0	9,0	215	15	248	174	KM7	M35x1,5	340
30 x 40	52,0	20,0	11,0	230	15	188	141	KM7	M35x1,5	340
32 x 42	58,0	22,0	11,0	302	19	218	166	KM8	M40x1,5	480
35 x 45	58,0	22,0	11,0	331	19	199	155	KM8	M40x1,5	480
36 x 45	58,0	22,0	11,0	340	19	194	155	KM8	M40x1,5	480
38 x 48	65,0	25,0	14,0	453	24	185	147	KM9	M45x1,5	680
40 x 50	65,0	25,0	14,0	477	24	176	141	KM9	M45x1,5	680
42 x 55	70,0	26,0	14,0	576	27	193	147	KM10	M50x1,5	870
45 x 55	70,0	26,0	14,0	617	27	180	147	KM10	M50x1,5	870
48 x 62	75,0	26,0	14,0	669	28	171	133	KM11	M55x2	970
50 x 60	75,0	26,0	14,0	697	28	164	137	KM11	M55x2	970
50 x 62	75,0	26,0	14,0	697	28	164	126	KM11	M55x2	970
55 x 65	80,0	27,0	15,0	796	29	129	109	KM12	M60x2	1.100
55 x 68	80,0	27,0	15,0	796	29	129	105	KM12	M60x2	1.100
56 x 68	80,0	27,0	15,0	810	29	127	105	KM12	M60x2	1.100
60 x 70	85,0	29,0	15,0	946	32	129	111	KM13	M65x2	1.300
60 x 73	85,0	29,0	15,0	946	32	129	106	KM13	M65x2	1.300
63 x 79	92,0	31,0	17,0	1.136	36	121	96	KM14	M70x2	1.600
65 x 79	92,0	31,0	17,0	1.172	36	117	96	KM14	M70x2	1.600
70 x 84	98,0	31,0	17,0	1.470	42	126	105	KM15	M75x2	2.000

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

For assemblies requiring larger dimensions, contact our Technical Department.

Note:
M_T, F_{ax}, P_w and P_n stated in this catalogue are valid for application 1. For application 2, they have to be increased by 25%.

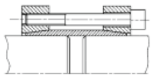
Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8 - hub H 8

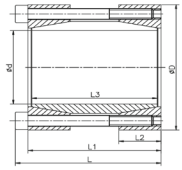
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N
p_w	Shaft pressure	N/mm^2
p_n	Hub pressure	N/mm^2

SIT-LOCK® 10 - External Rigid Shaft Coupling

SIT-LOCK® 10 are shrink disk couplings with double taper design. They offer easy angular timing and axial adjustment of shaft ends.

They transmit high torque and bending moment without keys and offer a low cost solution for shaft to shaft rigid connection.





Installation

Carefully clean contact surfaces of shaft and hub. Then, lightly oil both surfaces with standard mineral oil. Position the SIT-LOCK® on the shaft and into the hub machined bore. Align them as required by the application. Gradually and uniformly tighten the locking screws to the tightening torque (Ms).

You must tighten the screws in diametrically opposite sequence in stages:

- hand tighten the screws until the surfaces are in contact
- carefully check the position of the hub on the shaft
- tighten the screws to half the value of the tightening torque (Ms) stated in the catalogue
- repeat the operation until the tightening torque is reached using the dynamometric screw-driver
- check every locking screw to insure it has been tightened to the specific tightening torque

Note: once the tightening torque is reached, do not continue to tighten the screws. Do not use lubricant like "Molykote" or molybdenum disulfide based oils.

Removal

Loosen all the locking screws in a clockwise sequence until coupling can be moved on shafts. Do not remove screws completely.

Note: Toreuse the locking element, carefully oil the screws and the conical surfaces, then follow installation instructions.

Dimensions [mm]					Performances		Clamping screws (DIN 912 - 12,9)		
d x D	L	L_1	L_2	L_3	M_T [Nm]	F_{ax} [kN]	N°	Type	M_S [Nm]
17 x 50	56	50	16	44	179	21	4	M6x45	17
18 x 50	56	50	16	44	190	21	4	M6x45	17
19 x 50	56	50	16	44	200	21	4	M6x45	17
20 x 50	56	50	16	44	211	21	4	M6x45	17
22 x 55	66	60	18,5	54	347	32	6	M6x55	17
24 x 55	66	60	18,5	54	379	32	6	M6x55	17
25 x 55	66	60	18,5	54	394	32	6	M6x55	17
28 x 60	66	60	18,5	54	442	32	6	M6x55	17
30 x 60	66	60	18,5	54	473	32	6	M6x55	17
32 x 63	66	60	18,5	54	505	32	6	M6x55	17
35 x 75	83	75	22	67	682	39	4	M8x70	42
38 x 75	83	75	22	67	741	39	4	M8x70	42
40 x 75	83	75	22	67	780	39	4	M8x70	42
42 x 78	83	75	22	67	819	39	4	M8x70	42
45 x 85	93	85	24,5	76	1.317	59	6	M8x80	42
48 x 90	93	85	24,5	76	1.405	59	6	M8x80	42
50 x 90	93	85	24,5	76	1.463	59	6	M8x80	42
55 x 94	93	85	24,5	76	2.147	78	8	M8x80	42
60 x 100	93	85	24,5	76	2.343	78	8	M8x80	42
65 x 105	93	85	24,5	76	2.538	78	8	M8x80	42
70 x 115	110	100	29	90	3.239	93	6	M10x95	83
75 x 120	110	100	29	90	3.471	93	6	M10x95	83
80 x 125	110	100	29	90	4.938	123	8	M10x95	83

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

For assemblies requiring larger dimensions, contact our Technical Department.

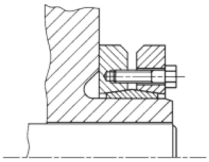
Maximum allowable roughness
Rt 16 µm
Maximum recommended tolerance
shaft h 8

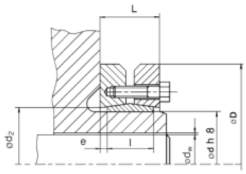
M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N

SIT-LOCK® 11 - External Shrink Discs

Shrink discs are external locking devices which are installed over hub projections. By locking the screws, radial pressures act on the hub allowing an effective and solid connection.

Recommended for medium and high torque. SIT-LOCK® 11S is also available in “SPLIT” and “HALF” for special applications.





Installation

Carefully remove, if present, protection spacers used during transport.
Check if the screws and the rings’ cone surfaces are well lubricated, otherwise, lightly oil them with molybdenum disulfide lubricants, like “Molykote” or similar. Clean, with care, contact surfaces of shaft and hub.

Position the components to connect. In uniform sequence, tighten the clamping screws to the tightening torque (Ms). Check optically that the gap between outer rings is the most uniform possible.
Note: once the tightening torque is reached, do not tighten the screws.

Removal

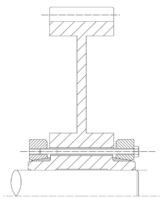
Loosen the screws uniformly and gradually to prevent rings from jamming. When all the screws are loose, remove the shaft or separate the hub and shaft itself.

Note: To reuse the locking element, carefully disassemble, clean and inspect all the components; oil the screws and the conical surfaces, then follow Installation instructions.

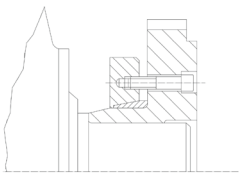
Maximum recommended tolerance

diameter shaft d; h 8
diameter shaft d_w;
j6 for ∅ ≤ 30
h6 for ∅ between 30 to 50
g6 for ∅ between 50 to 80
g6 for ∅ > 80

diameter bore d_w;
H6 for ∅ ≤ 30
H6 for ∅ between 30 to 50
H6 for ∅ between 50 to 80
H7 for ∅ > 80



“Split” version



“Half” version

Maximum allowable roughness
Rt 16 µm

Dimensions [mm]							Performances		Clamping screws (DIN 931 - 10,9)		
d	D	d_w	l	L	d_2	e	M_T [Nm]	F_{ax} [kN]	N°	type	M_S [Nm]
24	**50**	19 20 21	14	19,5	26	2,75	170 210 250	3 3 3	6	M 5	4
30	**60**	24 25 26	16	21,5	32	2,75	300 340 380	3 3 3	7	M 5	4
36	**72**	28 30 31	18	23,5	38	2,75	440 570 630	5 6 6	5	M 6	12
44	**80**	32 35 36	20	25,5	47	2,75	620 780 860	6 7 8	7	M 6	12
50	**90**	38 40 42	22	27,5	53	2,75	940 1.160 1.380	9 9 9	8	M 6	12
55	**100**	42 45 48	23	30,5	58	3,75	1.160 1.520 1.880	8 9 10	8	M 6	12
62	**110**	48 50 52	23	30,5	66	3,75	1.750 2.000 2.250	10 11 12	10	M 6	12
68	**115**	50 55 60	23	30,5	72	3,75	2.000 2.600 3.150	10 11 12	10	M 6	12
75	**138**	55 60 65	25	32,5	79	3,75	2.400 3.200 3.950	12 14 16	7	M 8	30
80	**145**	60 65 70	25	32,5	84	3,75	3.200 3.900 4.600	12 14 16	7	M 8	30
90	**155**	65 70 75	30	39	94	4,5	4.750 6.000 7.250	17 19 21	10	M 8	30
100	**170**	70 75 80	34	44	104	5,0	6.900 7.500 9.000	20 22 24	12	M 8	30
110	**185**	75 80 85	39	50	114	5,5	7.200 9.000 10.800	23 25 26	9	M10	59
125	**215**	85 90 95	42	54	134	6,0	11.000 13.000 15.000	30 32 35	12	M10	59
140	**230**	95 100 105	46	60,5	146	7,25	15.100 17.600 20.100	37 40 43	10	M12	100
155	**265**	105 110 115	50	64,5	165	7,25	22.000 25.000 28.000	45 48 51	12	M12	100
165	**290**	115 120 125	56	71	175	7,5	31.000 35.000 39.000	60 63 66	8	M16	250
175	**300**	125 130 135	56	71	185	7,5	36.000 41.000 45.000	61 64 68	8	M16	250
185	**330**	135 140 145	71	86	195	7,5	52.000 57.000 62.000	78 82 86	10	M16	250

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

For assemblies requiring larger dimensions, contact our Technical Department.

M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N

SIT-LOCK® 11S - standard series

Dimensions [mm]							Performances		Clamping screws (DIN 931 - 10,9)		
d	**D**	d_w	l	L	d_2	e	M_T [Nm]	F_{ax} [kN]	N°	type	M_S [Nm]
195	**350**	140 150 155	71	86	210	7,5	65.000 76.000 81.500	93 103 107	12	M16	250
200	**350**	150 155 160	71	86	210	7,5	74.000 80.000 86.000	99 104 108	12	M16	250
220	**370**	160 165 170	88	104	230	8	95.000 102.000 110.000	119 124 129	15	M16	250
240	**405**	170 180 190	92	109	248	8,5	120.000 138.000 156.000	146 158 168	12	M20	490
260	**430**	190 200 210	103	120	268	8,5	164.000 184.000 205.000	176 188 201	14	M20	490
280	**460**	210 220 230	114	134	288	10	217.000 244.000 270.000	209 222 235	16	M20	490
300	**485**	230 240 245	122	142	308	10	275.000 295.000 315.000	247 257 264	18	M20	490
320	**520**	240 250 260	122	142	328	10	312.000 340.000 374.000	265 279 290	20	M20	490
340	**570**	250 260 270	134	156	348	11	390.000 422.500 460.000	312 325 340	24	M20	490
350	**580**	270 280 285	140	162	358	11	442.000 480.000 500.000	328 343 350	24	M20	490
360	**590**	280 290 295	140	162	368	11	463.000 502.000 522.000	331 346 354	24	M20	490
380	**645**	290 300 310	144	168	387	12	567.000 610.000 658.000	391 408 425	20	M24	840
390	**660**	300 310 320	144	168	397	12	624.000 671.000 718.000	416 433 448	21	M24	840
400	**680**	315 320 330	144	168	407	12	670.000 695.000 744.000	426 435 450	21	M24	840
420	**690**	330 340 350	164	188	427	12	780.000 840.000 900.000	485 504 522	24	M24	840
440	**750**	340 350 360	177	202	447	12,5	806.000 860.000 917.000	474 491 509	24	M24	840
460	**770**	360 370 380	177	202	468	12,5	1.000.000 1.070.000 1.140.000	567 586 605	28	M24	840
480	**800**	380 390 400	188	213	488	12,5	1.170.000 1.240.000 1.310.000	615 635 655	30	M24	840

Notes:
Dimensions representing the total length of the hub are indicative; they are calculated according to the geometric rules.

For assemblies requiring larger dimensions, contact our Technical Department.

M_S	Screw tightening torque	Nm
M_T	Transmissible torque moment	Nm
F_{ax}	Transmissible axial load	N

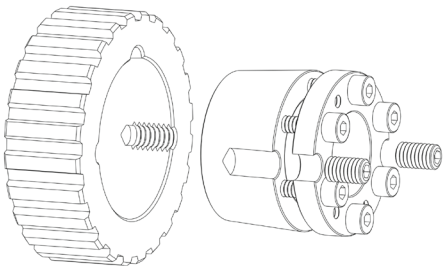
SERLOCK®

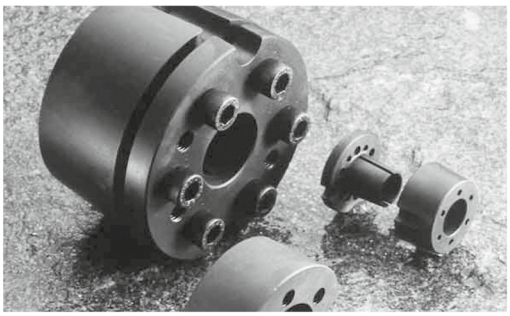
SERLOCK® is the new patented, keyless self locking bushing for immediate use with all power transmission components suitable for the SER-SIT®, T/L or similar tapered bushings:

- Is directly interchangeable with SER-SIT® or T/L tapered bushings
- Available in 1108, 1210, 1610, 2012, 2517, 3020 sizes
- With bore diameters from 12 to 70 mm according to the bush sizes
- Allows infinite axial and angular adjustments

SERLOCK® is an innovative clamping system which combines all the advantages of SIT-LOCK® friction keyless bushings with the extensive availability of a wide range of PT components for tapered bushings such as:

- V and Poly-V Pulleys
- Timing Pulleys
- Couplings
- Sprockets





SERLOCK® eliminates:

- All problems related to conventional keyway systems (backlash, breakage, fretting corrosion, difficult disassembly, restrained axial and angular positioning of the component on the shaft);
- Additional machining on the component to be fixed on the shaft, required when using conventional cone/clamping elements.

With the following benefits:

- Immediate availability of the system (element to be clamped + advanced clamping system);
- Easy assembly and disassembly;
- Possibility of reducing the diameter of the shafts used by up to 25%;
- Easy angular and axial adjustment of the component with respect to the shaft;
- Possibility of using SERLOCK® also on shafts with keyway.

All this means an immediate advantage for the user as a result of the potential increase in productivity.

Order form

SERLOCK®	SL	1108	F10
SL: SERLOCK®			
Size			
F...: bore diameter [mm]			

Assembly is extremely simple and fast:

1) Couple the SERLOCK® bushing to the hub by means of the two set screws;
2) Position the part on the shaft in the required axial and angular position;
3) Gradually tighten the set screws until the torque Ms, indicated in the technical tables, is achieved;
4) Tighten the clamping screws gradually and evenly according to the cross outline until the torque Ms, indicated in the technical tables is achieved.

Note:
Do not lubricate the SERLOCK® bushing or the shaft on which it is mounted.

To disassemble:

1) Disassemble the tightening screws;
2) Insert the screws in the threaded disassembly holes, tightening them until the tapered bushing is released;

In order to remove the outer ring, if necessary:

3) After having removed the inner bushing, loosen the set screws;
4) Keeping the loosened set screws in place, position the inner bushing rotated 30° in relation to the original position;
5) Insert the screws and tighten them gradually until the inner ring is released.

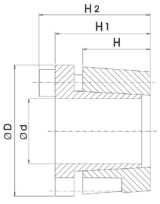
Dimensions and performances of standard types

For different bore, sizes, or hollow shaft application, please contact our Technical Dept.

Shaft tolerance h8 or better if not otherwise specified, are shown in mm dimensions.

SERLOCK® 1108

Type	Dimensions [mm]					Performances		Screws				Setscrews			
	d	H	H1	H2	D	M_T [Nm]	F_{ax} [N]	N°	Type	M_S	Key	N°	Type	M_S	Key
SL1108F12	12	20	29,5	33,5	39	109	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F14	14	20	29,5	33,5	39	128	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F15	15	20	29,5	33,5	39	137	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F16	16	20	29,5	33,5	39	146	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F18	18	20	29,5	33,5	39	164	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F19	19	20	29,5	33,5	39	173	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F20	20	20	29,5	33,5	39	182	18200	6	M4	4,9	3	2	1/4 W	4,9	3
SL1108F22	22	20	29,5	33,5	39	201	18200	6	M4	4,9	3	2	1/4 W	4,9	3



SERLOCK® 1210

Type	Dimensions [mm]					Performances		Screws				Setscrews			
	d	H	H1	H2	D	M_T [Nm]	F_{ax} [N]	N°	Type	M_S	Key	N°	Type	M_S	Key
SL1210F14	14	25	37,5	43,5	49	246	35100	6	M6	14	5	2	3/8 W	14	5
SL1210F15	15	25	37,5	43,5	49	263	35100	6	M6	14	5	2	3/8W	14	5
SL1210F16	16	25	37,5	43,5	49	281	35100	6	M6	14	5	2	3/8 W	14	5
SL1210F18	18	25	37,5	43,5	49	316	35100	6	M6	14	5	2	3/8W	14	5
SL1210F19	19	25	37,5	43,5	49	333	35100	6	M6	14	5	2	3/8 W	14	5
SL1210F20	20	25	37,5	43,5	49	351	35100	6	M6	14	5	2	3/8W	14	5
SL1210F22	22	25	37,5	43,5	49	386	35100	6	M6	14	5	2	3/8 W	14	5
SL1210F24	24	25	37,5	43,5	49	421	35100	6	M6	14	5	2	3/8W	14	5
SL1210F25	25	25	37,5	43,5	49	438	35100	6	M6	14	5	2	3/8W	14	5

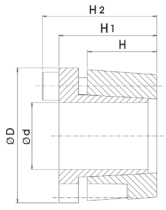
SERLOCK® 1610

Type	Dimensions [mm]					Performances		Screws				Setscrews			
	d	H	H1	H2	D	M_T [Nm]	F_{ax} [N]	N°	Type	M_S	Key	N°	Type	M_S	Key
SL1610F14	14	25	37,5	43,5	59	246	35100	6	M6	14	5	2	3/8 W	14	5
SL1610F15	15	25	37,5	43,5	59	263	35100	6	M6	14	5	2	3/8W	14	5
SL1610F16	16	25	37,5	43,5	59	281	35100	6	M6	14	5	2	3/8 W	14	5
SL1610F18	18	25	37,5	43,5	59	316	35100	6	M6	14	5	2	3/8W	14	5
SL1610F19	19	25	37,5	43,5	59	333	35100	6	M6	14	5	2	3/8 W	14	5
SL1610F20	20	25	37,5	43,5	59	351	35100	6	M6	14	5	2	3/8W	14	5
SL1610F22	22	25	37,5	43,5	59	386	35100	6	M6	14	5	2	3/8 W	14	5
SL1610F24	24	25	37,5	43,5	59	421	35100	6	M6	14	5	2	3/8W	14	5
SL1610F25	25	25	37,5	43,5	59	438	35100	6	M6	14	5	2	3/8W	14	5
SL1610F26	26	25	37,5	43,5	59	456	35100	6	M6	14	5	2	3/8W	14	5
SL1610F28	28	25	37,5	43,5	59	491	35100	6	M6	14	5	2	3/8 W	14	5
SL1610F30	30	25	37,5	43,5	59	526	35100	6	M6	14	5	2	3/8W	14	5
SL1610F32	32	25	37,5	43,5	59	561	35100	6	M6	14	5	2	3/8 W	14	5
SL1610F35	35	25	34,8	40,8	59	614	35100	6	M6	14	5	2	3/8W	14	5

M_T	Transmissible torque moment	Nm
M_S	Screw tightening torque	Nm
F_{ax}	Transmissible axial load	N

SERLOCK® 2012

Type	Dimensions [mm]					Performances		Screws				Setscrews			
	d	H	H1	H2	D	MT [Nm]	Fax [N]	N°	Type	Ms	Key	N°	Type	Ms	Key
SL2012F19	19	30	45,5	53,5	71	436	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F20	20	30	45,5	53,5	71	459	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F22	22	30	45,5	53,5	71	505	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F24	24	30	45,5	53,5	71	551	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F25	25	30	45,5	53,5	71	574	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F26	26	30	45,5	53,5	71	597	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F28	28	30	45,5	53,5	71	643	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F30	30	30	45,5	53,5	71	689	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F32	32	30	45,5	53,5	71	735	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F35	35	30	45,5	53,5	71	804	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F38	38	30	45,5	53,5	71	873	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F40	40	30	45,5	53,5	71	919	45900	6	M8	25	6	2	7/16 W	25	6
SL2012F42	42	30	45,5	53,5	71	965	45900	6	M8	25	6	2	7/16 W	25	6



SERLOCK® 2517

Type	Dimensions [mm]					Performances		Screws				Setscrews			
	d	H	H1	H2	D	MT [Nm]	Fax [N]	N°	Type	Ms	Key	N°	Type	Ms	Key
SL2517F24	24	45	60,5	68,5	86	551	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F25	25	45	60,5	68,5	86	574	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F26	26	45	60,5	68,5	86	597	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F28	28	45	60,5	68,5	86	643	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F30	30	45	60,5	68,5	86	689	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F 32	32	45	60,5	68,5	86	735	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F35	35	45	60,5	68,5	86	804	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F38	38	45	60,5	68,5	86	873	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F40	40	45	60,5	68,5	86	919	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F42	42	45	60,5	68,5	86	965	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F45	45	45	60,5	68,5	86	1034	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F48	48	45	60,5	68,5	86	1103	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F50	50	45	60,5	68,5	86	1148	45900	6	M8	25	6	2	1/2 W	35	6
SL2517F55	55	45	60,5	68,5	86	1263	45900	6	M8	25	6	2	1/2 W	35	6

SERLOCK® 3020

Type	Dimensions [mm]					Performances		Screws				Setscrews			
	d	H	H1	H2	D	MT [Nm]	Fax [N]	N°	Type	Ms	Key	N°	Type	Ms	Key
SL3020F30	30	50	68,5	78,5	108	993	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F32	32	50	68,5	78,5	108	1059	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F35	35	50	68,5	78,5	108	1159	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F38	38	50	68,5	78,5	108	1258	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F40	40	50	68,5	78,5	108	1324	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F42	42	50	68,5	78,5	108	1391	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F45	45	50	68,5	78,5	108	1490	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F48	48	50	68,5	78,5	108	1589	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F50	50	50	68,5	78,5	108	1655	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F55	55	50	68,5	78,5	108	1821	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F60	60	50	68,5	78,5	108	1986	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F65	65	50	68,5	78,5	108	2152	66200	6	M10	49	8	2	5/8 W	65	8
SL3020F70	70	50	68,5	78,5	108	2318	66200	6	M10	49	8	2	5/8 W	65	8

M_T	Transmissible torque moment	Nm
M_S	Screw tightening torque	Nm
F_{ax}	Transmissible axial load	N

PRECISION UNIVERSAL JOINT

Sit universal joints with plain or needle roller bearings Type “E” - “H” (DIN 808)

Of this series both single and double joints are available. Types E are with sliding bushes while type H has needle roller bearings.

Joints with plain bearings are available in 2 versions:

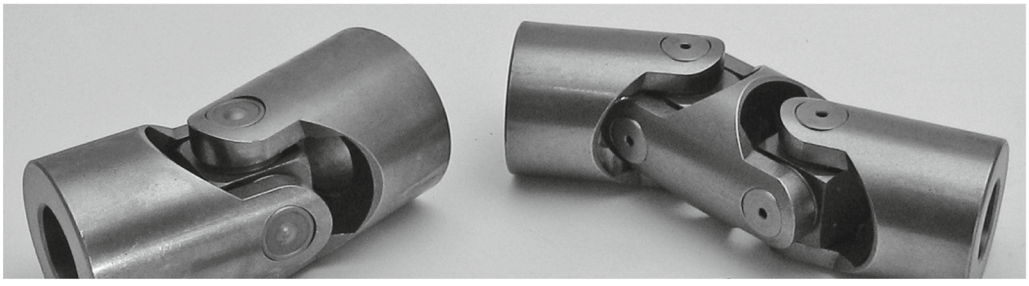
- **types E to DIN 808;**
- **types EB to DIN 808/7551**

Joints with roller bearings are available in 2 versions:

- **types H to DIN 808;**
- **types HB to DIN 808/7551**

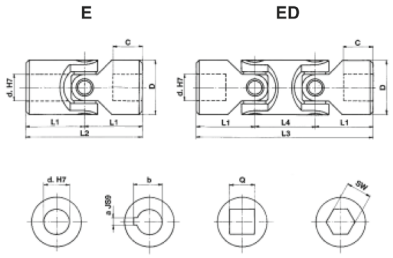
They all consist of a star wheel core and 2 half joints with fork ends. Between the pins of the star wheel and the holes of the forks, 4 wear-resistant sliding bushes (for type E) or roller bearings (type H - high speed) are fitted in.
The 4 bushes have holes for lubrication and each one contains a grease reserve.
The hermetic structure prevents lubricant losses and impurity entry.
Neither lubrication or maintenance is required for type H (high speed joints with roller bearings) as their bearings are lubricated for life.

Joints with plain bearings - type E - are for middle-low speeds and where there are shock loads. For high speeds and relatively low torques types with roller bearings (H) are recommended.
Both versions offer high efficiency, silent running, low friction, coefficient at competitive prices.
All rubbing surfaces are hardened and ground.
Maximum working angle is 45° for single joints and 90° for double joints.
Maximum speed is 1.000 rpm for type E, while type H can exceed 4.000 rpm.
All versions are also supplied in telescopic versions.



Precision joint
Series “E” (DIN 808)

- Wear resistant sliding bushes from cemented and hardened steel.
- Strong, precise, and versatile; wide application field.
- Max. angle: 45° type “E”, 90° type “ED”. max. speed 1.000 rpm.
- Special executions upon request.



Type	Type	d [mm]	D [mm]	L2 [mm]	L1 [mm]	C [mm]	L4 [mm]	L3 [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Weight [kg]		
													E	ED	
GU01E	GU01ED	6	16	34	17	8	22	56	2	7	6	6	0,05	0,08	DIN 808
GU02E	GU02ED	8	16	40	20	11	22	62	2	9	8	8	0,05	0,08	
GU03E	GU03ED	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15	
GU04E	GU04ED	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25	
GU05E	GU05ED	14	28	60	30	14	36	96	5	16,3	14	14	0,20	0,40	
GU1E	GU1ED	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45	
GU2E	GU2ED	18	36	74	37	17	40	114	6	20,8	18	18	0,45	0,70	
GU3E	GU3ED	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00	
GU4E	GU4ED	22	45	95	47,5	22	50	145	6	24,8	22	22	0,95	1,55	
GU5E	GU5ED	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00	
GU6E	GU6ED	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90	
GU6E1	GU6ED1	32	58	130	65	33	68	198	10	35,3	30	30	2,00	3,00	
GU7E	GU7ED	35	70	140	70	35	72	212	10	38,3	••	••	3,15	4,75	
GU8E	GU8ED	40	80	160	80	39	85	245	12	43,3	••	••	4,60	7,20	
GU9E	GU9ED	50	95	190	95	46	100	290	14	53,8	••	••	7,60	12,00	

Type	Type	d [mm]	D [mm]	L2 [mm]	L1 [mm]	C [mm]	L4 [mm]	L3 [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Weight [kg]		
													E	ED	
GU03EB	GU03EBD	10	16	52	26	15	22	74	3	11,4	8	8	0,05	0,08	DIN 808/7551
GU04EB	GU04EBD	12	22	62	31	18	26	88	4	13,8	10	10	0,12	0,20	
GU1EB	GU1EBD	16	25	74	37	21	30	104	5	18,3	12	12	0,20	0,30	
GU3EB	GU3EBD	20	32	86	43	24	38	124	6	22,8	16	16	0,35	0,50	
GU5EB	GU5EBD	25	42	108	54	31	48	156	8	28,3	20	20	0,80	1,20	
GU6EB	GU6EBD	30	50	132	66	38	56	188	8	33,3	25	25	1,20	1,70	
GU8EB	GU8EBD	40	70	166	83	47	72	238	12	43,3	••	••	2,90	4,30	

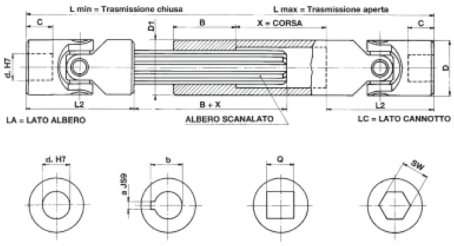
•• = upon request

Extensible transmissions
Series “E” (DIN 808)

- Joints series “E” type “EA” with wear resistant sliding bushes.
- Min. and max. length upon request:

$$L_{MIN} \geq \frac{L_{MAX} + 2\,L2 + B}{2} \qquad \text{Corsa } X \leq \frac{L_{MAX} - 2\,L2 - B}{2}$$

- Special execution upon request



Type	d [mm]	D [mm]	L2 [mm]	C [mm]	Lmin [mm]	Lmax [mm]	X [mm]	B [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Shaft profile	D1 [mm]
GU01EA	6	16	34	8	upon request			25	2	7	6	6	SW 8	16
GU02EA	8	16	40	11				25	2	9	8	8	SW 8	16
GU03EA	10	22	48	12				30	3	11,4	10	10	11 x 14 Z6	22
GU04EA	12	25	56	13				40	4	13,8	12	12	13 x 16 Z6	26
GU05EA	14	28	60	14				40	5	16,3	14	14	13 x 16 Z6	29
GU1EA	16	32	68	16				40	5	18,3	16	16	16 x 20 Z6	32
GU2EA	18	36	74	17				40	6	20,8	18	18	18 x 22 Z6	37
GU3EA	20	42	82	18				45	6	22,8	20	20	21 x 25 Z6	42
GU4EA	22	45	95	22				45	6	24,8	22	22	23 x 28 Z6	47
GU5EA	25	50	108	26				45	8	28,3	25	25	26 x 32 Z6	52
GU6EA	30	58	122	29				50	8	33,3	30	30	32 x 38 Z8	58
GU7EA	35	70	140	35				70	10	38,3	••	••	36 x 42 Z8	70
GU8EA	40	80	160	39				80	12	43,3	••	••	42 x 48 Z8	80
GU9EA	50	95	190	46				90	14	53,8	••	••	46 x 54 Z8	95

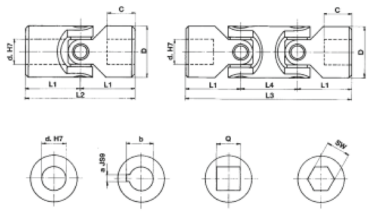
Type	d [mm]	D [mm]	L2 [mm]	C [mm]	Lmin [mm]	Lmax [mm]	X [mm]	B [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Shaft profile	D1 [mm]
GU03EBA	10	16	52	14	upon request			25	3	11,4	8	8	SW 8	16
GU04EBA	12	22	62	18				30	4	13,8	10	10	11 x 14 Z6	22
GU1EBA	16	25	74	21				40	5	18,3	12	12	13 x 16 Z6	26
GU3EBA	20	32	86	24				40	6	22,8	16	16	16 x 20 Z6	32
GU5EBA	25	42	108	31				45	8	28,3	20	20	21 x 25 Z6	42
GU6EBA	30	50	132	38				45	8	33,3	25	25	26 x 32 Z6	52
GU8EBA	40	70	166	47				75	12	43,3	••	••	36 x 42 Z8	70

•• = upon request

High speed precision joints with needle roller bearings
Series “H” (DIN 808)

- Roller bearings lubricated for life. No maintenance required.
- Precise and versatile, silent and smooth running; wide application field.
- Max. angle: 45° type “H”, 90° type “HD”, max. speed 4.000 rpm.
- Special executions upon request.

H HD



SIT

Type	Type	d [mm]	D [mm]	L2 [mm]	L1 [mm]	C [mm]	L4 [mm]	L3 [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Weight [kg]		
													H	HD	
GU03H	**GU03HD**	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15	DIN 808
GU04H	**GU04HD**	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25	
GU05H	**GU05HD**	14	28	60	30	14	36	96	5	16,3	14	14	0,20	0,40	
GU1H	**GU1HD**	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45	
GU2H	**GU2HD**	18	36	74	37	17	40	114	6	20,8	18	18	0,45	0,70	
GU3H	**GU3HD**	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00	
GU4H	**GU4HD**	22	45	95	47,5	22	50	145	6	24,8	22	22	0,95	1,55	
GU5H	**GU5HD**	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00	
GU6H	**GU6HD**	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90	
GU6H1	**GU6HD1**	32	58	130	65	33	68	198	10	35,3	30	30	2,00	3,00	
GU7H	**GU7HD**	35	70	140	70	35	72	212	10	38,3	••	••	3,15	4,75	
GU8H	**GU8HD**	40	80	160	80	39	85	245	12	43,3	••	••	4,60	7,20	
GU9H	**GU9HD**	50	95	190	95	46	100	290	14	53,8	••	••	7,60	12,00	

Type	Type	d [mm]	D [mm]	L2 [mm]	L1 [mm]	C [mm]	L4 [mm]	L3 [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Weight [kg]		
													HB	HBD	
GU04HB	**GU04HBD**	12	22	62	31	18	26	88	4	13,8	10	10	0,12	0,20	DIN 808/7551
GU1HB	**GU1HBD**	16	25	74	37	21	30	104	5	18,3	12	12	0,20	0,30	
GU3HB	**GU3HBD**	20	32	86	43	24	38	124	6	22,8	16	16	0,35	0,50	
GU5HB	**GU5HBD**	25	42	108	54	31	48	156	8	28,3	20	20	0,80	1,20	
GU6HB	**GU6HBD**	30	50	132	66	38	56	188	8	33,3	25	25	1,20	1,70	
GU8HB	**GU8HBD**	40	70	166	83	47	72	238	12	43,3	••	••	2,90	4,30	

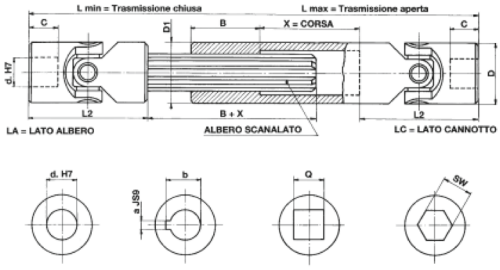
•• = upon request

Extensible transmissions high speed
Series “H” (DIN 808)

- High speed joints series “H”, type “HA”, with needle roller bearings.
- Min. and max. length upon request: rpm.

$$L_{MIN} \geq \frac{L_{MAX} + 2\,L2 + B}{2} \qquad \text{Corsa } X \leq \frac{L_{MAX} - 2\,L2 - B}{2}$$

- Special executions on request.



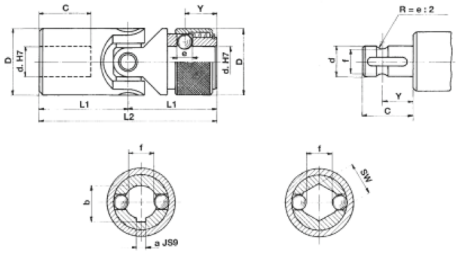
Typo	d [mm]	D [mm]	L2 [mm]	C [mm]	Lmin [mm]	Lmax [mm]	X [mm]	B [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Albero	D1 [mm]
GU03HA	10	22	48	12	upon request			30	3	11,4	10	10	11 x 14 Z6	22
GU04HA	12	25	56	13				40	4	13,8	12	12	13 x 16 Z6	26
GU05HA	14	28	60	14				40	5	16,3	14	14	13 x 16 Z6	29
GU1HA	16	32	68	16				40	5	18,3	16	16	16 x 20 Z6	32
GU2HA	18	36	74	17				40	6	20,8	18	18	18 x 22 Z6	37
GU3HA	20	42	82	18				45	6	22,8	20	20	21 x 25 Z6	42
GU4HA	22	45	95	22				45	6	24,8	22	22	23 x 28 Z6	47
GU5HA	25	50	108	26				45	8	28,3	25	25	26 x 32 Z6	52
GU6HA	30	58	122	29				50	8	33,3	30	30	32 x 38 Z8	58
GU7HA	35	70	140	35				70	10	38,3	••	••	36 x 42 Z8	70
GU8HA	40	80	160	40				80	12	43,3	••	••	42 x 48 Z8	80
GU9HA	50	95	190	50				90	14	53,8	••	••	46 x 54 Z8	95

Tipo	d [mm]	D [mm]	L2 [mm]	C [mm]	Lmin [mm]	Lmax [mm]	X [mm]	B [mm]	a [mm]	b [mm]	Q [mm]	SW [mm]	Albero	D1 [mm]
GU04HBA	12	22	62	18	upon request			30	4	13,8	10	10	11 x 14 Z6	22
GU1HBA	16	25	74	21				40	5	18,3	12	12	13 x 16 Z6	26
GU3HBA	20	32	86	24				40	6	22,8	16	16	16 x 20 Z6	32
GU5HBA	25	42	108	31				45	8	28,3	20	20	21 x 25 Z6	42
GU6HBA	30	50	132	38				45	8	33,3	25	25	26 x 32 Z6	52
GU8HBA	40	70	166	47				70	12	43,3	••	••	36 x 42 Z8	70

•• = upon request

Precision joints
Series “ER” (sliding bushes) - “HR” (needle roller bearings)

- Type “ER”: max. speed 1.000 rpm.
- Type “HR”: max. speed 4.000 rpm.
- Max. angle 45°.



ER

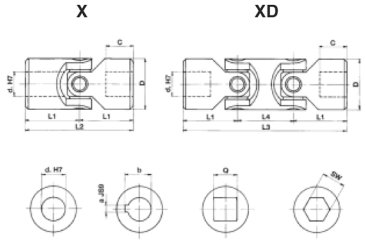
HR

SIT

Type	Type	d [mm]	D [mm]	L2 [mm]	L1 [mm]	C [mm]	Y [mm]	e [mm]	f [mm]	a [mm]	b [mm]	SW [mm]
GU02ER	-	8	16	52	26	14	9,5	3,5	6,3	2	9	8
GU03ER	**GU03HR**	10	22	62	31	17	11,5	4	8,7	3	11	10
GU04ER	**GU04HR**	12	25	74	37	21	13,5	4	11	4	13,3	12
GU05ER	**GU05HR**	14	25	74	37	21	13,5	4	13	5	15,3	14
GU1ER	**GU1HR**	16	32	86	43	24	14	6,35	14,8	5	17,3	16
GU2ER	**GU2HR**	18	36	96	48	28	19	8	16	6	19,8	18
GU3ER	**GU3HR**	20	42	108	54	31	19	8	18	6	22,8	20
GU4ER	**GU4HR**	22	45	120	60	34	20,5	10	20	6	24,8	22
GU5ER	**GU5HR**	25	50	132	66	38	20,5	10	23	8	28,3	25
GU6ER	**GU6HR**	30	58	166	83	49	25	10	28	8	33,3	30

Stainless steel joints
Series “X” (DIN 808)

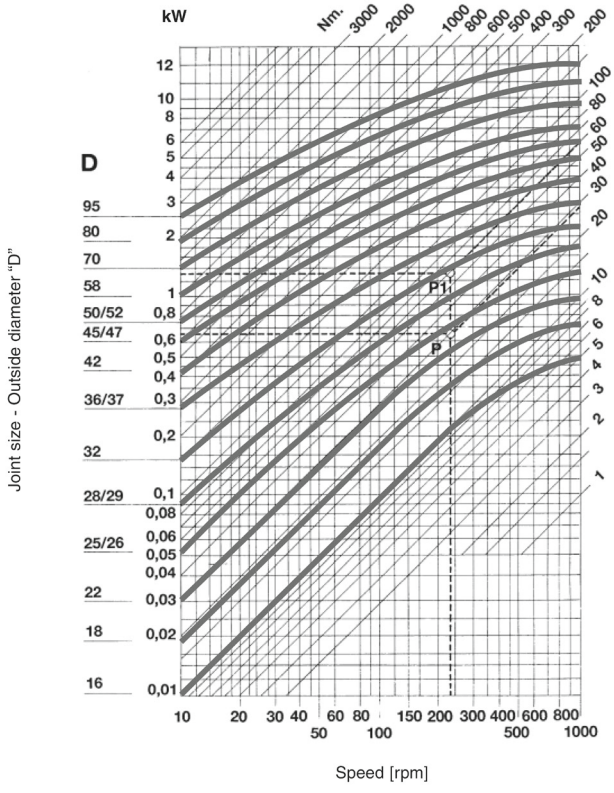
- Max. angle: 45° type “X”, 90°type “XD”.
- Special executions upon request.



Type	Type	d [mm]	D [mm]	L2 [mm]	L1 [mm]	C [mm]	L4 [mm]	L3 [mm]	a* [mm]	b* [mm]	Q* [mm]	SW* [mm]	Weight [kg]	
													X	XD
GU01X	**GU01XD**	6	16	34	17	8	22	56	2	7	6	6	0,05	0,08
GU02X	**GU02XD**	8	16	40	20	11	22	62	2	9	8	8	0,05	0,08
GU03X	**GU03XD**	10	22	48	24	12	26	74	3	11,4	10	10	0,10	0,15
GU04X	**GU04XD**	12	25	56	28	13	30	86	4	13,8	12	12	0,16	0,25
GU1X	**GU1XD**	16	32	68	34	16	36	104	5	18,3	16	16	0,30	0,45
GU3X	**GU3XD**	20	42	82	41	18	46	128	6	22,8	20	20	0,60	1,00
GU5X	**GU5XD**	25	50	108	54	26	55	163	8	28,3	25	25	1,20	2,00
GU6X	**GU6XD**	30	58	122	61	29	68	190	8	33,3	30	30	1,85	2,90

* = check availability

Diagram for joints
Series “E”



Torque Mᴛ in [Nm]

WORKING ANGLE “α”	5°	10°	15°	20°	25°	30°	35°	40°	45°
CORRECTION FACTOR “F”	1,25	1,00	0,80	0,65	0,55	0,45	0,38	0,30	0,25

Example

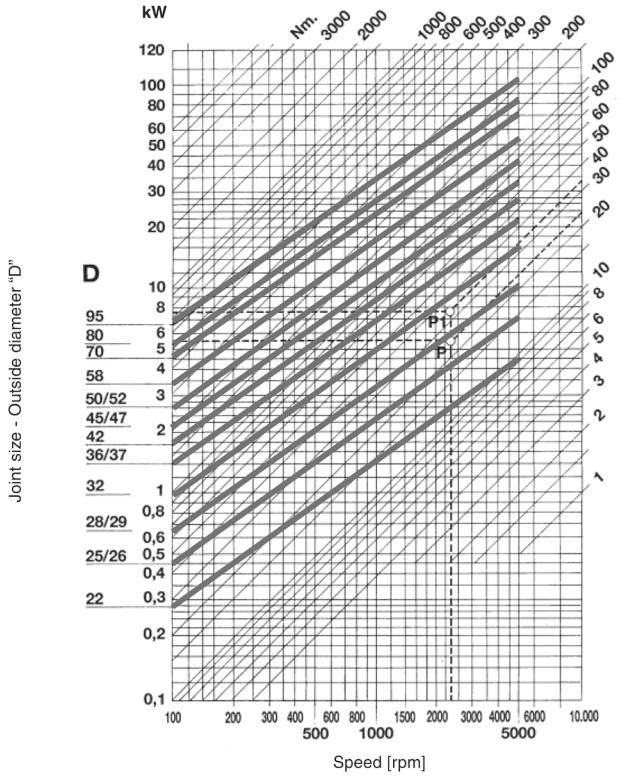
- Power: 0,65 kW
- rpm: 230 min^{-1}
- With working angle α = 10°, Factor F = 1,00 (0,65 kW : 1,00 = 0,65 kW) we get point P and Torque Mᴛ = 27 Nm corresponding to joint size D = 25/26 mm (type 04E, 1EB)
- With working angle α = 30°, Factor F = 0,45 (0,65 kW : 0,45 = 1,44 kW) we get point P1 and Torque Mᴛ = 60 Nm corresponding to joint size D = 32 mm (type 1E, 3EB).

Consider that:

$$M_T = 9.550 \times \frac{\text{Power [kW]}}{\text{rpm [min}^{-1}\text{]}} \quad [Nm]$$

$$M_T = 7.020 \times \frac{\text{Power [CV]}}{\text{rpm [min}^{-1}\text{]}} \quad [Nm]$$

Diagram for joints
Series “H” - High Speed



Torque MT in [Nm]

WORKING ANGLE “α”	5°	10°	15°	20°	25°	30°	35°	40°	45°
CORRECTION FACTOR “F”	1,25	1,00	0,90	0,80	0,70	0,50	0,40	0,30	0,25

Example

- Power: 5,5 kW
- rpm: 2300 min^{-1}
- With working angle α = 10°, Factor F = 1,00 (5,5 kW : 1,00 = 5,5 kW) we get point P and Torque MT = 23 Nm corresponding to joint size D = 28/29 mm (type 05H, 1HB)
- With working angle α = 25°, Factor F = 0,70 (5,5 kW : 0,70 = 7,85 kW) we get point P1 and Torque MT = 33 Nm corresponding to joint size D = 32 mm (type 1H, 3HB).

Consider that:

$$M_T = 9.550 \times \frac{\text{Power [kW]}}{\text{rpm [min}^{-1}\text{]}} \quad \text{[Nm]}$$

$$M_T = 7.020 \times \frac{\text{Power [CV]}}{\text{rpm [min}^{-1}\text{]}} \quad \text{[Nm]}$$

Instructions for a correct fitting

Fig. 1

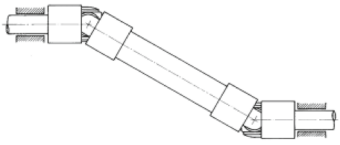
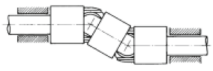


Fig. 2



To obtain a uniform rotary motion, always use two opposite single joints or one double joint. The pillow blocks must be positioned as close as possible to the joints (see Picture 1 and 2).

Fig. 3

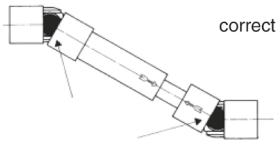
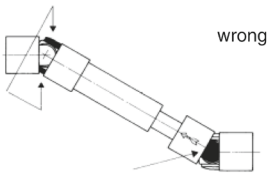


Fig. 4



When using two opposite single joints, respect the alignment of the inside yokes. In extensible transmissions also pay attention to the arrows stamped tally (see Picture 3 CORRECT, Picture 4 WRONG).

Fig. 5

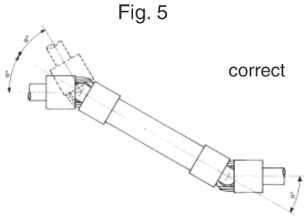
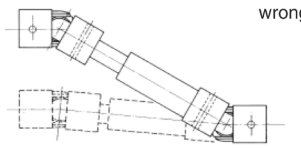


Fig. 6



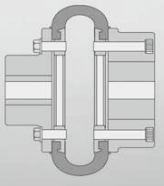
The joints angle α must be equal (see Picture 5). The shafts can be moved one from the other either parallel or symmetrically. Pin holes must not be executed over the yokes to avoid damage (see Picture 6).

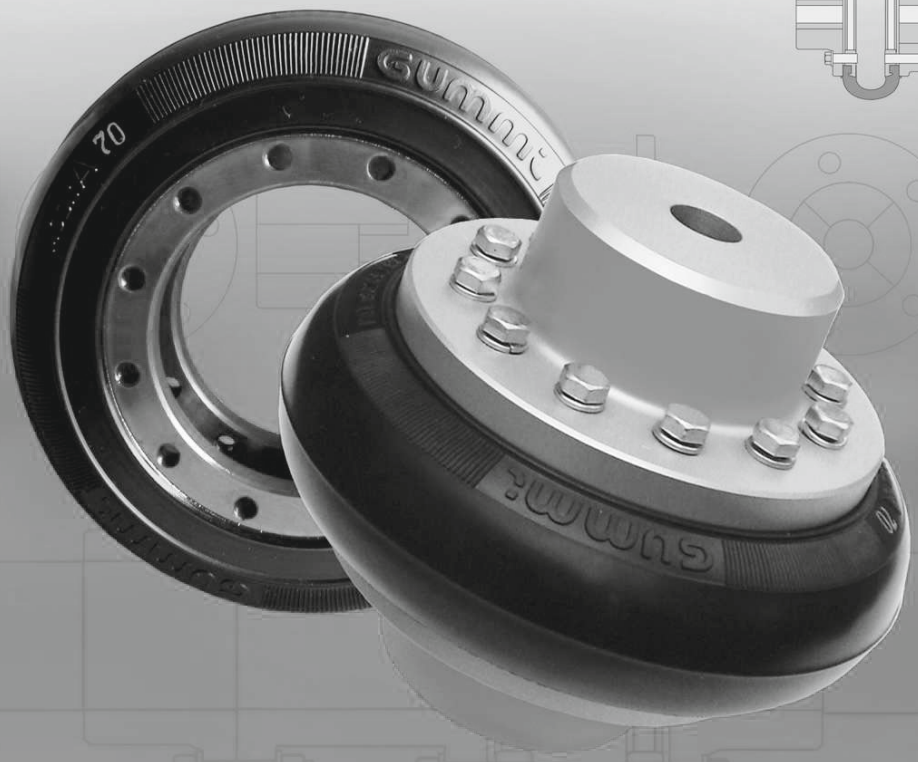
endo

Total Quality

SYSTEM CERTIFICATION ISO 9001:2000 SGS
Certificate since 1999

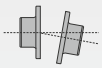
Flexible couplings
Type A



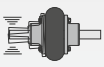


SIT

General Characteristics



Misalignment Solutions Misalignment is a major reason for failure in bearings, as well as the other components of the motor (gears, gaskets, seals) which were not originally designed to absorb stresses caused by misalignment. The Gummi flexible coupling is the ideal solution to this issue, since its primary features are elasticity, misalignment compensation and shock absorption.



Vibration and Shock Load Dampening
The flexible couplings ability to absorb torsional vibrations and shock loads provides for an extended working life of the machine and or equipment. The amount of vibrations is reduced by approximately 70% when a flexible coupling is installed properly.

Simple Installation
The replacement is simpler and faster because it is comprised of only one rubber element. Using smaller alignment tolerances allows the element to extend the working life of its flexible coupling. It is not necessary to move the parts in order to replace the flexible element.

Symmetry - Security - Balance
Since the rubber element utilized in the Gummi flexible coupling is one single element with integrated mounting flanges, it is guaranteed to be balanced and free from safety or security issues and concerns.

Different models
- Back-Pull-Out - Diesel engines - Axial displacements - Shafts with different diameters - Floating shafts - Torque limiters - Security locking - Conical Shafts - Space Limited Areas

No need to Lubricate
As a result of its design and constructive characteristics, the element does not require lubrication.

Economy
The working life capacity in the applications spare parts increases, reducing costly down time, minimizing the cost of replacement components, lubricants and inventory. The flexible element of the coupling works for a prolonged period of time without needing to be replaced.

Assured quality
Manufactured under the strict Quality System, and produced using only the highest quality raw materials.

SIT

Example: Flexible coupling model A-105 with two integral hubs and 1 spacer L= 250 mm.

We recommend that you read all instructions before beginning the assembly or installation of our couplings. (see page 8)

A 105 - CI / CI - ES - 250

1- Model
2- Type of Hub
3- Type of Assembly
4- Additional Information

1- MODEL
According to the selection (Tables I and III)

2- TYPE OF HUB
Advise the selected type of hub
Without indication - Two conventional hubs
CN Conventional hub
CI Integral hub
CX Axial hub
EC Conventional hub for point of conical shafts
ECI Integral hub for point of conic shafts

3- TYPE OF ASSEMBLY
EF Floating shafts
ES Spacer

LT Torque limiting
BS Security ties
RE Special covering
DF Disk brakes
CIN Invert hub
APF Pulley brakes
CE Reel
CF Bridle plate
CC Fitted hubs

4- ADDITIONAL INFORMATION
Dimension required

Selection Method

Data required to select appropriate coupling:

- **Power in Kw.**
- **R.P.M.**
- **Shaft diameters.**
- **Service Factor (Table II).**

Quick selection:

multiply the Kw by the Service Factor

Once the value is obtained from the formula, go to Table I below, and read down on the rpm column until the rpm for the case engine is found. Read across until the closest bigger number or equivalent, to result obtained from the formula is found. Then read up to the top of the chart to fin the recommended coupling Verify on the Table III the diameter of each shaft in relation of its maximun and minimun.

Table I - Max. Temp. 80°C

MODEL	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
RPM	20	25	30	35	45	50	60	70	80	90	95	105	120	140	155	165	170	200	240	300	350	400
100	0.37	0.60	0.82	1.19	2.16	4.48	6.64	12.16	16.79	22.39	25.02	32.69	52.24	89.55	101,49	126,86	154.85	265.90	455.22	910.45	1254.70	1783.58
200	0.75	1.19	1.72	2.31	4.18	8.96	13.06	25.22	32.69	44.78	50.37	66.27	104.48	180.07	202,98	253,73	308.81	532.69	910.45	1820.00	2510.30	3566.27
300	1.19	1.79	2.61	3.58	6.34	13.06	19.63	37.31	49.48	67.16	75.60	98.88	156.72	269.63	304,48	381,34	463.66	798.51	1365.67	2730.45	3764.93	5349.85
400	1.57	2.31	3.43	4.78	8.43	17.76	26.12	49.48	65.30	89.55	100.75	132.46	208.96	359.18	406,07	508,95	618.51	1064.40	1820.00	3640.90	5019.53	7133.43
500	1.94	2.99	4.33	5.97	10.30	22.39	32.69	62.54	82.09	11.94	125.97	165.15	261.19	448.73	507,46	635,82	772.39	1331.19	2275.22	4550.37	6274.25	8917.01
600	2.31	3.59	5.15	7.09	13.06	27.09	39.18	74.63	97.99	134.33	150.22	197.76	313.43	539.18	609,70	762,68	927.24	1597.01	2730.45	5460.82	7529.85	10699.63
700	2.84	4.18	5.97	8.28	14.93	31.72	46.64	86.79	114.79	157.69	175.37	231.34	365.67	628.73	711,19	889,55	1082.09	1862.91	31.85.67	6371.27	8784.55	12483.21
720	2.91	4.33	6.19	8.58	15.37	32.69	47.61	89.55	117.54	161.42	180.97	237.91	375.97	646.49	731,34	914,92	1112.91	2129.70	3276.12	6553.21	9035.45	12839.55
800	3.21	4.78	6.94	9.33	16.79	36.42	53.21	98.88	130.60	180.07	200.60	264.03	417.01	718.28	813,43	1017,16	1236.04	2262.16	3640.90	7280.82	10039.18	14266.79
850	3.36	5.07	7.31	10.30	17.76	38.28	55.97	105.45	139.03	191.27	213.66	280.82	443.13	763.06	864,17	1080,59	1313.43	2395.52	3868.51	7736.04	10667.01	15158.58
900	3.58	5.30	7.76	10.90	18.66	40.15	59.70	111.94	147.39	202.46	225.75	297.61	469.25	808.81	914,17	1144,02	1390.90	2661.42	4096.12	8191.27	11294.78	16049.49
1000	3.96	5.97	8.58	12.16	21.49	44.78	66.27	124.10	164.18	224.85	250.97	330.22	521.49	898.36	1015,67	1270,89	1545.75	2928.21	4550.37			
1100	4.40	6.57	9.33	13.06	23.36	49.48	72.76	136.19	180.07	247.24	276.12	362.91	573.73	987.91	1117,16	1398,50	1700.60	3060.67	5005.60			
1150	4.55	6.79	10.30	14.03	24.25	51.34	75.60	142.76	188.43	259.43	288.28	379.70	599.85	1032.69	1167,91	1461,90	1777.09	3194.03				
1200	4.78	7.09	10.75	14.63	25.22	54.10	79.33	149.25	196.87	269.63	301.24	396.49	625.97	1078.36	1218,65	1525,37	1854.48	3385.30				
1300	5.15	7.76	11.19	15.90	27.09	58.81	85.82	161.42	212.69	292.01	326.49	429.10	678.21	1167.91	1320,89	1652,23	2009.33	3385.30				
1400	5.52	8.28	12.16	16.79	29.85	62.54	92.39	173.51	229.48	314.40	351.72	462.69	730.45	1257.46	1422,38	1779,85	2164.18	3726.72				
1500	5.97	8.96	13.06	17.76	31.72	67.16	98.88	186.57	245.37	336.79	376.87	495.37	782.69	1347.54	1523,88	1906,71						
1600	6.34	9.33	14.03	18.66	33.58	71.87	105.45	198.73	262.16	359.18	401.12	527.99	834.93	1527.09								
1700	6.72	10.30	14.93	20.52	36.42	76.49	111.94	210.82	278.96	381.57	426.34	561.57	887.16									
1750	6.94	10.60	15.37	21.04	37.31	78.36	115.67	217.39	286.42	392.76	439.40	578.36										
1800	7.09	10.90	15.90	21.49	38.28	81.19	118.51	223.88	294.78	403.96	451.49	594.25										
2000	7.91	12.16	16.79	23.36	42.41	89.55	132.46	248.13	327.46	448.73	501.87	660.45										
2250	8.96	13.06	16.93	27.09	47.61	100.75	148.36	279.85	368.51	498.13	564.40	743.51										
2500	10.30	14.93	21.49	29.85	53.21	111.94	165.15	310.67	409.55	561.57	627.84	825.60										
2750	11.19	16.79	23.26	32.69	57.84	123.13	181.94	341.42	450.60	617.54	690.30	907.69										
3000	12.16	17.76	26.12	35.45	63.43	134.33	197.76	372.24	491.64	673.51	904.85											
3250	13.06	19.63	27.99	38.28	69.03	145.52	214.55	403.96														
3500	14.03	20.52	29.85	42.01	73.73	157.69	231.34	434.70														
3600	14.40	21.49	30.12	42.91	76.49	161.42																
3750	14.93	22.39	32.69	44.78	79.33	168.88																
4000	15.90	23.36	34.55	47.61																		
4500	17.76	27.09	38.28	53.21																		
5000	19.55	29.85	42.91	59.70																		

For velocity lower than 100 rpm see BR catalogue

Nominal K.W.
All the reading between that fall below the heavy black line correspond to Flexible Couplings models with hubs that are fitted on the flanges (CE).

The information displayed in this catalog is subject to modifications without warning.

Engine drive service factor :

In case that engine has four or more cylinders, must be added 1,0 to the Service Factor selected in table II. For engines with more than 6 cylinders add 0,5 to the Service Factor selected in table II.

GENERAL INDUSTRY

Table II

AGITATORS	
Vertical and Horizontal Screw Propeller, Paddle	1.00
GARGE HAUL PULLER	2.00
BLOWERS	
Centrifugal	1.00
Lobe or Vane	1.25
CAR DUMPERS	2.50
CAR PULLERS	1.50
CLARIFIER OR CLASSIFIER	1.00
COMPRESSORS	
Centrifugal	1.00
Rotary, Lobe or Vane	2.00
Rotary, Screw	1.75
Reciprocating	
Direct Connected	Refer to factory
Without Flywhees	Refer to factory
* With Flyweel and Gear between Compressor and Prime Mover	
1 cylinder, single acting	4.00
1 cylinder, double acting	3.50
2 cylinders, single acting	3.50
2 cylinders, double acting	3.00
3 cylinder, single acting	3.00
3 cylinder, double acting	2.00
4 cylinders, single acting	1.75
4 cylinders, double acting	1.75
CONVERYORS	
Apron, Assembly, Belt, Chain	
Flight, Screw	1.00
Bucket	1.25
Live Roll, Shaker and Reciprocating	3.00
CRANES AND HOIST	
Main Hoist	2.00
Skip Hoist	1.75
Slope	1.50
Bridge, Travel or Trolley	1.75
DYNAMOMETER ELEVATORS	
Bucket, Centrifugal Discharge	2.00
Freight	▲
Gravity Discharge	1.25
Passenger	▲
ESCALATORS	1.00
EXCITER, GENERATOR	1.00
EXTRUDER, PLASTIC	1.50
FANS	
Centrifugal	1.00
Cooling Tower	2.00
Forced Draft - Across the Line start	1.50
Forced Draft Motor Driven thru fluid or electric slip clutch	1.00
Gas Recirculating	1.50
Induced Draft with damper control or blade cleaner	1.25
Indiced Draft without controls	2.00
FEEDERS	
Apron, Belt, Disc, Screw	1.00
Reprocating	2.50
GENERATORS	
Even Load	1.00
Hoist or Railway Service	1.50
Welder Load	2.00
HAMMERMILL	1.75
LAUNDRY WASHER OR TUMBLER	2.00
LINE SHAFTS	
Any Processing Machinery	1.50
MACHINE TOOLS	
Auxiliary Drive	1.00
Bending Roll, Notching Press, Punch Press, Planer, Plate Reversing	1.75
Main Drive	1.50
Traverse Drive	1.00
MAN LIFTS	▲
METAL FORMING MACHINES	
Draw Brench Carriage andMain Drive	2.00
Extruder	2.00
Forming Machine and Forming Mills	2.00
Slitters	1.00
Wire Drawing or Flattening	2.00
Wire Winder	1.50
Corlers and Uncorlers	1.50
MIXERS (see Agitators)	
Concrete	1.75
Muller	1.50
PRESS, PRINTIN	1.50
PUG MILL	1.75
PULVERIZERS	
Hammermill	1.75
Hog	2.00
Roller	1.50
PUMPS	
Centrifugal	
Constant speed	1.00
Frequent speed changers under load	1.25
Descaling, with accumulators	1.50
Gear, Rotary, or Vane	1.50
Reciprocating	
1 cylinder, single acting	2.50
1 cylinder, double acting	2.00
2 cylinders, single acting	2.00
2 cylinders, double acting	1.75
3 or more cylinders	1.50
SCRENS	
Air Washing	1.00
Grizzly	2.00
Rotary Coal or Sand	1.50
Vibrating	2.50
Water	1.00
STEERING GEAR	1.00
STOKER	1.00
TUMBLING BARREL	1.75
WINCH, MANEUVERING	
Dredge, Marine	1.50
WINDLASS	1.50
WOODWORKING MACHINERY	1.00

APPLICATION BY INDUSTRY

AGGREGATE PROCESSING, CEMENT, MINING KILNS, TUBE, ROD AND BALL MILLS	
Director or on L.S. schaft of Reducer, with final drive:	
Machined Spur Gears	2.50
Single Helical or Herringbone Gears	2.00
Conveyors, Feeders, Screens,	1.00
Elevators	See General Listing
Crushers, Ore or Stone	2.50
Dryer, Rotary	1.75
Grizzly	2.00
Hammermill or Hog	1.75
Tumbling Mill or Barrel	1.75
BREWING AND DISTILLING	
Bottle and Can Filling Machines	1.00
Brew Kettle	1.00
Cookers, Continuous Duty	1.25
Lauter Tub	1.50
Mash Tub	1.25
Scale Hopper, Frequent Peaks	1.75
CLAY WORKING INDUSTRY	
Brick Press, Briquette Machine, Clay Working Machine, Pug Mill	1.75
DREGES	
Cable Reel	1.75
Conveyors	1.50
Cutter Head, Jig Drive	2.00
Maneuvering Winch	1.50
Pumps (uniform load)	1.50
Screen Drive, Stacker	1.75
Utility Winch	1.50
FOOD INDUSTRY	
Beet Slicer	1.75
Bottling, Can Filling Machine	1.00
Cereal Cooker	1.25
Dough Mixer, Meat Grinder	1.75
LUMBER	
Band Resaw	1.50
Circular Resaw, Cut off	1.75
Edger, Head Rig, Hog	2.00
Grang Saw	
(Reciproacting)	Refer to Factory
Log Haul	2.00
Planer	1.75
Rolls, Non-Reversing	1.50
Rolls, Reversing	2.00
Sawdust Conveyor	1.25
Slab Conveyor	1.75
Sorting Table	1.50
Trimmer	1.75
METAL ROLLING MILL AUXILIARIES	
Coilers (up or down) Cold Mills only	1.50
Coilers (up or down) Hot Mills only	2.00
Coke Plants	
Door Opener	2.00
Pusher or Larry Car Traction Drive	3.50
Pusher Ram Drive	2.50
Cold Mills	
Strip Mills	Refer to factory
Temper	Refer to factory
Cooling Beds	1.50
Drawbench	2.00
Feed Rolls - Blooming Mill	3.50
Furnace Pushers	2.00
Hot and Cold Saws	2.00
Hot Mills	
Edger Drivers	Refer to factory
Reversing Blooming or Slabbing Mills	Refer to factory
Strip or Sheet Mills	Refer to factory
Ingot Cars	2.50
Manipulators	3.50
Merchant Mills	Refer to factory
Mill Tables	
Hot Bed or Transfer non-reversing	2.00
Roughing Breakdown Mills	4.00
Runout, non-reversing, non-plugging	2.50
Runuot, reversing	4.00
Reel Drives	1.75
Rod Mills	Refer to factory
Screwdown	1.50
Seamless Tube Mills	
Kickout	2.00
Piercer	3.00
Reeler	2.50
Thrust Black	2.50
Tube Conveyor Rolls	2.00
Sideguards	2.00
Skelp Mills	Refer to factory
Slitters, Steel Mill only	1.75
Soaking Pit Cover Drives	
Lift	1.50
Travel	2.50
Straightiners	2.00
Unscrammblers (Billet Bundle Busters)	2.00
Wire Drawing Machinery	2.00
OIL INDUSTRY	
Chiller	1.25
Oilwell Pumping (not over 150% peak torque)	2.00
Paraffin Filter Press	1.50
Rotary Kiln	2.00
PAPAR MILLS	
Barker Auxiliary, Hydraulic	2.25
Barker, Mechanical	2.25
Barking Drum	
L.S. shaft of reducer with final drive - Helical or Herringbone Gear	2.00
Machined Spur Gear	2.50
Cast Tooth Spur Gear	3.00
Beater & Pilper	1.75
Bleachers, Coaters	1.00
Calender & Super Calender	2.00
Chipper	3.00
Converting Machine	1.50
Couch	1.75
Cutter, Felt Whipper	2.00
Cylinder, Dryer	1.75
Felt Strtcher	1.25
Fourdrinier	1.75
Jordan	2.00
Log Haul	2.00
Line Shaft	1.50
Press	2.00
Pulp Grinder	2.00
Reel, Rwinder, Winder	1.50
Stock Chest, Washer, Thickener	1.50
Suction Roll	1.75
RUBBER INDUSTRY	
Calender	2.00
Craker, Plasticator	2.50
Extruder	1.75
Intensive or Banbury Mixer	2.50
Mixing Mill, Refiner or Sheeter	
One or two in line	2.50
Three or four in line	2.00
Five or more in line	1.75
Tire Building Machine	2.50
Tire & Tube Press Opener (Peak Torque)	1.00
Tuber, Strainer, Pelletizer	1.75
Warming Mill	
Oner or two Mills in line	2.00
Three or more Mills in line	1.75
Washer	2.50
SEWAGE DISPOSAL EQUIPMENT	
Bar Screen, Chemical Feeders, Collectors, Dewatering Screen, Grit Collector	1.00
SUGAR INDUSTRY	
Cane Carrier & Leveler	1.75
Cane Knife & Crusher	2.00
Mill Stands, Turbine Driven with all helical or herringbone gears	1.50
Electric Drive or Steam Engine Drive with Helical Herringbone, or Spur Gears with any Prime Mover	1.75
TEXTILE INDUSTRY	
Batcher	1.25
Calender, Card Machine	1.50
Cloth Finishing Machine	1.50
Dry Can, Loom	1.50
Dyeing Machinery	1.25
Knitting Machine	Refer to factory
Mangle, Napper, Soaper	1.25
Spinner, Tenter Frame, Winder	1.50

● For motor driven reducers with resilient high speed and low speed shaft coupling, refer to Table II A. For motors with brakes, select the coupling based on the higher of the two torque ratings.
* For balanced opposed design, divide number of cylinders by two and use abova table for reciprocating compresors.

Selection of the coupling using the nominal torque (tn)

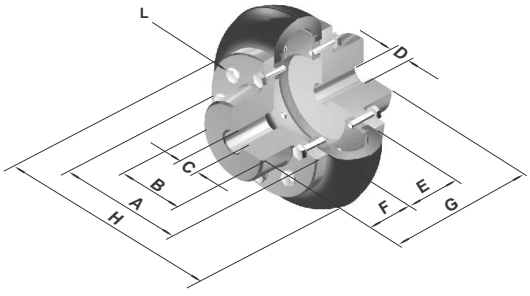
Please use the following formula:

$$tn: \frac{9460 \times Kw \times fs}{rpm}$$

Please look in Table III for the model which the nominal torque is the same or higher than the one which was originally calculated, and verify the diameter between the shafts depending on the max and minimum. (see table III - page 4)

Conventional Model

With two Normal Hubs (drawing 1)



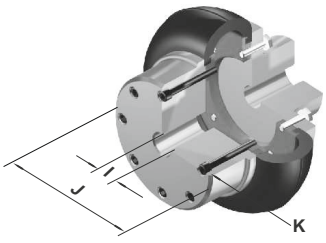
A - Ø Flange of the Hub
B - Ø Neck of the Hub
C - Ø Máx. bore
D - Ø Min. bore
E - With of the Flexible Element
F - Length of the Hub
G - Length of the Flexible Coupling
H - Ø Flexible Element
L - Screw

Table III

NORMAL HUB													Metric Hex Cap Screws	
MODEL	Nominal Torque Nm	Torsion (°)	weight (1) (Kg.)	Gd2 (Kg m2)	A	B	C Max	D Min	E	F	G	H	N.	Dimension mm
A-20	38	2°	1.05	0.0017	74	36	20	10	30	25	80	95	12	6 x 1 x 20
A-25	56	5°	1.09	0.0018	74	36	23	10	30	25	80	95	12	6 x 1 x 20
A-30	82	2°	2.40	0.0094	96	49	30	10	40	35	110	127	16	8 x 1,25 x 25
A-35	113	4°	2.65	0.0098	96	49	32	10	40	35	110	127	16	8 x 1,25 x 25
A-45	200	3°	5.00	0.0382	127	70	40	15	50	45	140	167	20	8 x 1,25 x 25
A-50	420	6°	5.32	0.0402	127	70	46	15	50	45	140	167	20	8 x 1,25 x 25
A-60	620	5°	12.50	0.1065	169	100	55	25	65	60	185	224	24	10 x 1,50 x 35
A-70	1170	9°	13.30	0.1593	169	100	65	25	65	60	185	224	24	10 x 1,50 x 35
A-80	1550	5°	24.90	0.594	218	116	75	30	90	80	250	302	20	12 x 1,75 x 45
A-90	2170	6°	26.00	0.639	218	116	85	30	90	80	250	302	20	12 x 1,75 x 45
A-95	2380	4°	34.90	0.912	235	138	90	40	90	80	250	330	24	12 x 1,75 x 45
A-105	3130	8°	44.00	0.982	235	138	100	40	90	80	250	330	24	12 x 1,75 x 45
A-120/120	4940	5°	86.00	3.80	297	195	120	45	120	130	380	403	20	16 x 2 x 60
A-140/140	8500	9°	94.00	3.82	297	195	140	45	120	130	380	403	20	16 x 2 x 60
A-155/155	9750	6°	126.00	5.76	350	220	155	50	140	150	440	470	14	16 x 2 x 60
A-165/165	12200	10°	135.00	5.85	350	220	165	50	140	150	440	470	14	16 x 2 x 60
A-170/70			170.20	12.22		150	70	30		80	345			
A-170/130	14630	7°	211.80	13.75	436	236	130	70	185	130	445	550	24	20 x 2,50 x 75
A-170/170			242.80	17.65		276	170	120		180	545			
A-200/90			192.60	13.30		186	90	40		100	385			
A-200/140	25190	11°	202.40	13.75	436	200	140	70	185	130	445	550	24	20 x 2,50 x 75
A-200/200			276.80	19.20		276	200	120		180	545			
A-240/150			364.70	51.50		225	150	100		160	556			
A-240/200	43060	4°	447.40	55.35	535	290	200	100	236	180	596	740		
A-240/240			633.60	84.50		390	240	100		275	786			
A-300/150			370.00	50.70		225	150	110		160	556			
A-300/200	86120		450.00	54.50		290	200	100		200	636			
A-300/250		10°	640.00	69.40	535	350	250	100	236	275	786	740		
A-300/300			695.00	83.70		390	300	100		275	786			
A-350/200			1049.00	453.20		290	200	120		200	735			
A-350/250	118750	6°	1211.00	466.40	820	350	250	120	335	275	885	1130		
A-350/350			2237.00	691.00		600	350	120		375	1085			
A-400/250	168750	10°	1219.00	459.20	820	350	250	120	335	275	885	1130		
A-400/400			2245.00	697.00		600	400	120		375	1085			

The information displayed in this catalog is subject to modifications without warning.

With one Normal hub and one integral hub (design 2)



I - Ø Máx. bore
J - Ø Neck of the Hub
K - Screw

Table IV

INTEGRAL HUB			Metric Socket Head Cap Screws		INTEGRAL HUB			Metric Socket Head Cap Screws	
Size	I Max	J	N. (1)	Dimension mm	Size	I Max	J	N. (1)	Dimension mm
A-20	30	66	6	6 x 1 x 30	A-120	170	*	10	16 x 2 x 150
A-25	30	66	6	6 x 1 x 30	A-140	170	*	10	16 x 2 x 150
A-30	44	86	8	8 x 1,25 x 40	A-155	200	*	14	16 x 2 x 165
A-35	44	86	8	8 x 1,25 x 40	A-165	200	*	14	16 x 2 x 165
A-45	60	110	10	8 x 1,25 x 50	A-170	250	*	12	20 x 2,5 x 200
A-50	60	110	10	8 x 1,25 x 50	A-200	250	*	12	20 x 2,5 x 200
A-60	90	150	12	10 x 1,50 x 65	A-240	*	*	30	
A-70	90	150	12	10 x 1,50 x 65	A-300	*	*	30	
A-80	100	180	10	12 x 1,75 x 95	A-350	*	*	30	
A-90	100	180	10	12 x 1,75 x 95	A-400	*	*	30	
A-95	125	198	12	12 x 1,75 x 95					
A-105	125	198	12	12 x 1,75 x 95					

Integral Hubs can be used when the shaft diameter is greater than the ones listed in Table III.

The Assembly can be used with one or two integral hubs according to the applications needs.

SIT

The information displayed in this catalog is subject to modifications without warning.

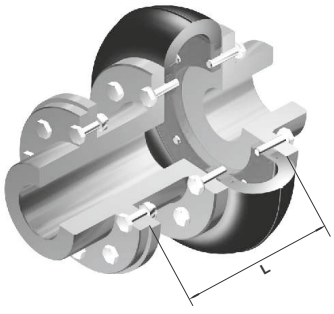
TYPE OF ASSEMBLY

With spacer (ES)

All the different coupling version can be outfitted with a spacer, which facilitates the disassembling, which is common in pump applications (Back pull-out).

For this request, please indicate the distances between the shaft points “L”.

MODEL	ES 75	ES 100	ES 140	ES 180
A-20/25	*	*	*	
A-30/35		*	*	*
A-45/50		*	*	*
MODEL	**ES 140**	**ES 180**	**ES 215**	**ES 250**
A-60/70	*	*	*	
A-80/90		*	*	*
A-95/105		*	*	*

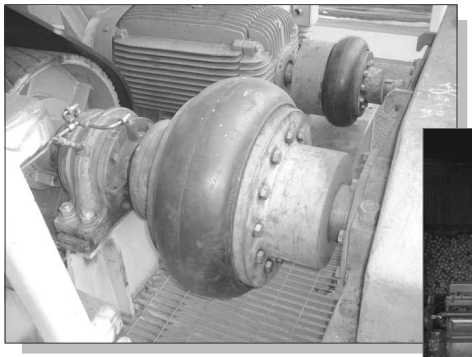


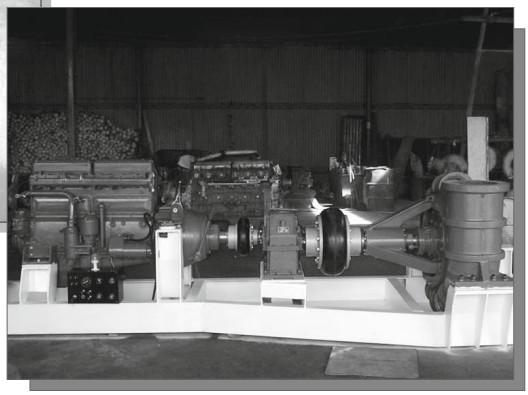
Hazardous Environments (BE)

The elastomeric compound used within Gummi's rubber elements generally provides good resistance to chemical products and aggressive agents. In the cases where the coupling will be continuously operating Hazardous environments, the application of a special coating on to the rubber element is recommended.
When ordering, please indicate what agents and conditions will be encountered and on what frequency.

Steam	○○
Acid	○○
Oil	○
Ethanol Glycerin	○○○
Outdoors - extreme heat or cold	○○

○ Low ○○ Medium ○○○ High

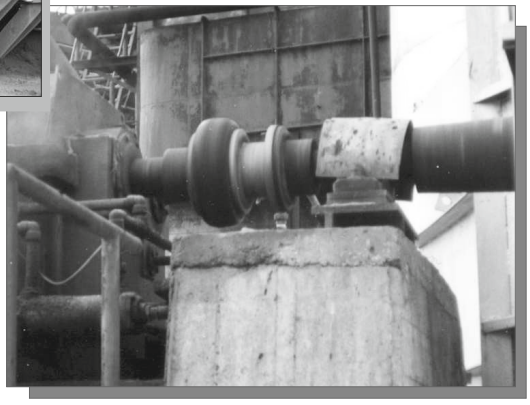




As a result, we have designed couplings with the following performance characteristics;

- High Capacity to transmit torque
- Compact Designs*
- Protection to increase working life of primary and secondary machine components and parts

* in the same side of flexible coupling, we get until 5 times the nominal torque.



Certificated since 1999

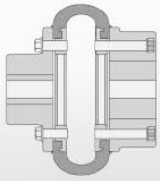
ATEX

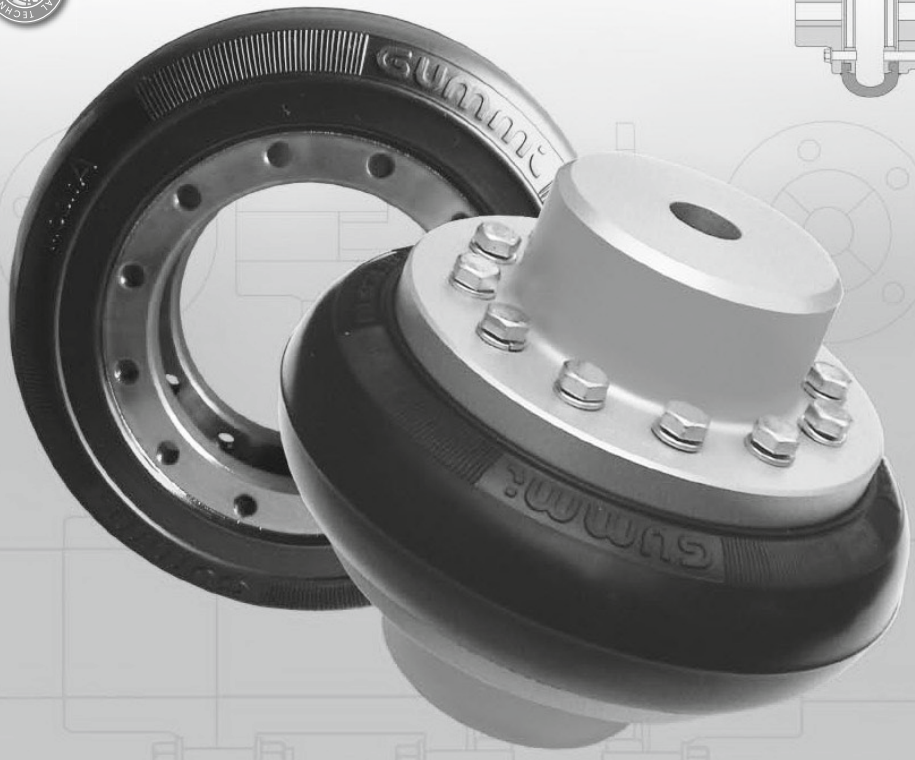
Total Quality

Flexible Coupling

for High Torque Applications and Transmissions

Type BR





Flexible Couplings for High Torque Transmissions

Using only the best raw materials, Gummi has developed a flexible coupling for High Torque Applications and Transmissions. The type BR Flexible Couplings are more compact in design and efficiency, yet have similar dimensions of the rigid and semi-rigid couplings. They can transmit a torque value between 4.000 Nm and 150.000 Nm, while keeping their capacity to absorb the shaft misalignments, vibrations, and torque fluctuations. The coupling protects and increases the working lift of the rest of the working components within the applications as well. The type BR coupling do not require lubrication, minimizing the corrective and preventative maintenance to the coupling. Coupling inspection can also be performed without any tyoe of disassembly as well. All Gummi products are backed by our standard warranty, and are manufactured unter the ISO 9001 Quality Management System.

The Flexible Couplings Gummi may be requested with ATEX certification under European Directive 94/9/CE (ATEX 95) Ex II 2GD c 120°C(T4)X

Engine drive service factor :

In case that engine has four or more cylinders, must be added 1,0 to the Service Factor selected in table II. For engines with more than 6 cylinders add 0,5 to the Service Factor selected in table II.

GENERAL INDUSTRY

Table I

AGITATORS	
Vertical and Horizontal Screw Propeller, Paddle	1.00
GARGE HAUL PULLER	2.00
BLOWERS	
Centrifugal	1.00
Lobe or Vane	1.25
CAR DUMPERS	2.50
CAR PULLERS	1.50
CLARIFIER OR CLASSIFIER	1.00
COMPRESSORS	
Centrifugal	1.00
Rotary, Lobe or Vane	2.00
Rotary, Screw	1.75
Reciprocating	
Direct Connected	Refer to factory
Without Flywhees	Refer to factory
* With Flyweel and Gear between Compressor and Prime Mover	
1 cylinder, single acting	4.00
1 cylinder, double acting	3.50
2 cylinders, single acting	3.50
2 cylinders, double acting	3.00
3 cylinder, single acting	3.00
3 cylinder, double acting	2.00
4 cylinders, single acting	1.75
4 cylinders, double acting	1.75
CONVERYORS	
Apron, Assembly, Belt, Chain	
Flight, Screw	1.00
Bucket	1.25
Live Roll, Shaker and Reciprocating	3.00
CRANES AND HOIST	
Main Hoist	2.00
Skip Hoist	1.75
Slope	1.50
Bridge, Travel or Trolley	1.75
DYNAMOMETER ELEVATORS	
Bucket, Centrifugal Discharge	2.00
Freight	▲
Gravity Discharge	1.25
Passenger	▲
ESCALATORS	1.00
EXCITER, GENERATOR	1.00
EXTRUDER, PLASTIC	1.50
FANS	
Centrifugal	1.00
Cooling Tower	2.00
Forced Draft - Across the Line start	1.50
Forced Draft Motor	
Driven thru fluid or electric slip clutch	1.00
Gas Recirculating	1.50
Induced Draft with damper control or blade cleaner	1.25
Indiced Draft without controls	2.00
FEEDERS	
Apron, Belt, Disc, Screw Reprocating	1.00 2.50
GENERATORS	
Even Load	1.00
Hoist or Railway Service	1.50
Welder Load	2.00
HAMMERMILL	1.75
LAUNDRY WASHER OR TUMBLER	2.00
LINE SHAFTS	
Any Processing Machinery	1.50
MACHINE TOOLS	
Auxiliary Drive	1.00
Bending Roll, Notching Press, Punch Press, Planer, Plate Reversing	1.75
Main Drive	1.50
Traverse Drive	1.00
MAN LIFTS	▲
METAL FORMING MACHINES	
Draw Brench Carriage andMain Drive	2.00
Extruder	2.00
Forming Machine and Forming Mills	2.00
Slitters	1.00
Wire Drawing or Flattening	2.00
Wire Winder	1.50
Corlers and Uncorlers	1.50
MIXERS (see Agitators)	
Concrete	1.75
Muller	1.50
PRESS, PRINTIN	1.50
PUG MILL	1.75
PULVERIZERS	
Hammermill	1.75
Hog	2.00
Roller	1.50
PUMPS	
Centrifugal	
Constant speed	1.00
Frequent speed changers under load	1.25
Descaling, with accumulators	1.50
Gear, Rotary, or Vane	1.50
Reciprocating	
1 cylinder, single acting	2.50
1 cylinder, double acting	2.00
2 cylinders, single acting	2.00
2 cylinders, double acting	1.75
3 or more cylinders	1.50
SCRENS	
Air Washing	1.00
Grizzly	2.00
Rotary Coal or Sand	1.50
Vibrating	2.50
Water	1.00
STEERING GEAR	1.00
STOKER	1.00
TUMBLING BARREL	1.75
WINCH, MANEUVERING	
Dredge, Marine	1.50
WINDLASS	1.50
WOODWORKING MACHINERY	1.00

APPLICATION BY INDUSTRY

AGGREGATE PROCESSING, CEMENT, MINING KILNS, TUBE, ROD AND BALL MILLS	
Director or on L.S. schaft of Reducer, with final drive:	
Machined Spur Gears	2.50
Single Helical or Herringbone Gears	2.00
Conveyors, Feeders, Screens, Elevators	1.00 See General Listing
Crushers, Ore or Stone	2.50
Dryer, Rotary	1.75
Grizzly	2.00
Hammermill or Hog	1.75
Tumbling Mill or Barrel	1.75
BREWING AND DISTILLING	
Bottle and Can Filling Machines	1.00
Brew Kettle	1.00
Cookers, Continuous Duty	1.25
Lauter Tub	1.50
Mash Tub	1.25
Scale Hopper, Frequent Peaks	1.75
CLAY WORKING INDUSTRY	
Brick Press, Briquette Machine, Clay Working Machine, Pug Mill	1.75
DREGES	
Cable Reel	1.75
Conveyors	1.50
Cutter Head, Jig Drive	2.00
Maneuvering Winch	1.50
Pumps (uniform load)	1.50
Screen Drive, Stacker	1.75
Utility Winch	1.50
FOOD INDUSTRY	
Beet Slicer	1.75
Bottling, Can Filling Machine	1.00
Cereal Cooker	1.25
Dough Mixer, Meat Grinder	1.75
LUMBER	
Band Resaw	1.50
Circular Resaw, Cut off	1.75
Edger, Head Rig, Hog	2.00
Grang Saw	
(Reciprocating)	Refer to Factory
Log Haul	2.00
Planer	1.75
Rolls, Non-Reversing	1.50
Rolls, Reversing	2.00
Sawdust Conveyor	1.25
Slab Conveyor	1.75
Sorting Table	1.50
Trimmer	1.75
METAL ROLLING MILL AUXILIARIES	
Coilers (up or down) Cold Mills only	1.50
Coilers (up or down) Hot Mills only	2.00
Coke Plants	
Door Opener	2.00
Pusher or Larry Car Traction Drive	3.50
Pusher Ram Drive	2.50
Cold Mills	
Strip Mills	Refer to factory
Temper	Refer to factory
Cooling Beds	1.50
Drawbench	2.00
Feed Rolls - Blooming Mill	3.50
Furnace Pushers	2.00
Hot and Cold Saws	2.00
Hot Mills	
Edger Drivers	Refer to factory
Reversing Blooming or Slabbing Mills	Refer to factory
Strip or Sheet Mills	Refer to factory
Ingot Cars	2.50
Manipulators	3.50
Merchant Mills	Refer to factory
Mill Tables	
Hot Bed or Transfer non-reversing	2.00
Roughing Breakdown Mills	4.00
Runout, non-reversing, non-plugging	2.50
Runuot, reversing	4.00
Reel Drives	1.75
Rod Mills	Refer to factory
Screwdown	1.50
Seamless Tube Mills	
Kickout	2.00
Piercer	3.00
Reeler	2.50
Thrust Black	2.50
Tube Conveyor Rolls	2.00
Sideguards	2.00
Skelp Mills	Refer to factory
Slitters, Steel Mill only	1.75
Soaking Pit Cover Drives	
Lift	1.50
Travel	2.50
Straighteners	2.00
Unscrammblers (Billet Bundle Busters)	2.00
Wire Drawing Machinery	2.00
OIL INDUSTRY	
Chiller	1.25
Oilwell Pumping (not over 150% peak torque)	2.00
Paraffin Filter Press	1.50
Rotary Kiln	2.00
PAPAR MILLS	
Barker Auxiliary, Hydraulic	2.25
Barker, Mechanical	2.25
Barking Drum L.S. shaft of reducer with final drive - Helical or Herringbone Gear	2.00
Machined Spur Gear	2.50
Cast Tooth Spur Gear	3.00
Beater & Pilper	1.75
Bleachers, Coaters	1.00
Calender & Super Calender	2.00
Chipper	3.00
Converting Machine	1.50
Couch	1.75
Cutter, Felt Whipper	2.00
Cylinder, Dryer	1.75
Felt Strtcher	1.25
Fourdrinier	1.75
Jordan	2.00
Log Haul	2.00
Line Shaft	1.50
Press	2.00
Pulp Grinder	2.00
Reel, Rwinder, Winder	1.50
Stock Chest, Washer, Thickener	1.50
Suction Roll	1.75
RUBBER INDUSTRY	
Calender	2.00
Craker, Plasticator	2.50
Extruder	1.75
Intensive or Banbury Mixer	2.50
Mixing Mill, Refiner or Sheeter	
One or two in line	2.50
Three or four in line	2.00
Five or more in line	1.75
Tire Building Machine	2.50
Tire & Tube Press Opener (Peak Torque)	1.00
Tuber, Strainer, Pelletizer	1.75
Warming Mill	
Oner or two Mills in line	2.00
Three or more Mills in line	1.75
Washer	2.50
SEWAGE DISPOSAL EQUIPMENT	
Bar Screen, Chemical Feeders, Collectors, Dewatering Screen, Grit Collector	1.00
SUGAR INDUSTRY	
Cane Carrier & Leveler	1.75
Cane Knife & Crusher	2.00
Mill Stands, Turbine Driven with all helical or herringbone gears	1.50
Electric Drive or Steam Engine Drive with Helical Herringbone, or Spur Gears with any Prime Mover	1.75
TEXTILE INDUSTRY	
Batcher	1.25
Calender, Card Machine	1.50
Cloth Finishing Machine	1.50
Dry Can, Loom	1.50
Dyeing Machinery	1.25
Knitting Machine	Refer to factory
Mangle, Napper, Soaper	1.25
Spinner, Tenter Frame, Winder	1.50

● For motor driven reducers with resilient high speed and low speed shaft coupling, refer to Table II A. For motors with brakes, select the coupling based on the higher of the two torque ratings.
* For balanced opposed design, divide number of cylinders by two and use abova table for reciprocating compresors.

Selection of the coupling using the nominal torque (tn)

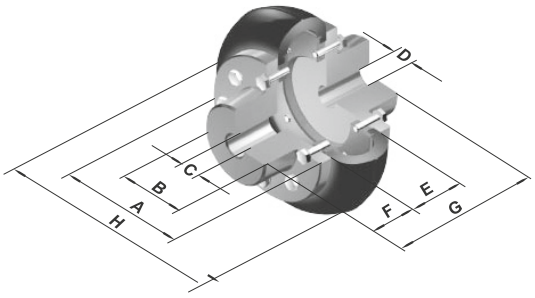
Use one of de the following formula in relation to the power unit" y poner las 3 formulas:

$$Tn: \frac{7062 \times HP \times FS}{RPM} \qquad Tn: \frac{7162 \times CV \times FS}{RPM} \qquad Tn: \frac{9550 \times KW \times FS}{RPM}$$

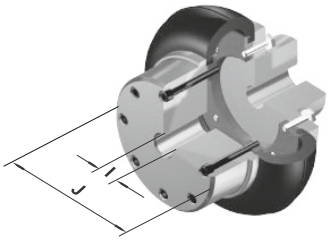
The following information is required to select the right flexible coupling Power motor KW, CV, o HP, speed RPM, shafts diameter , service factor according to table I.

Flexible Couplings for High Torque Transmissions

With 2 normal hubs (drawing 1)



With 1 normal hub and 1 integral hub (drawing 2)



A Ø Flange of the Hub
B - Ø Body of the Hub
C - Ø max. bore
D - Ø min bore
E - Width of the Flexible Element
F - Length of the Hub
G - Length of the Flexible Element
H - Ø Flexible Element
I - Ø max. bore
J - Ø of the Hub

Tabla II

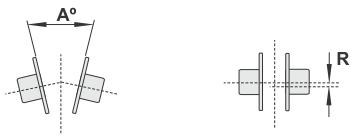
NORMAL HUB *drawing 1*												INTEGRAL *draw 2* HUB		SCREWS	
MODEL	Nominal Torque Nm	KW x 100 rpm	Weight (Kg.) (1)	A	B	C Max	D Min	E	F	G	H	I Máx	J	Nr	L- Cab. hex.
BR-100	4080	42,52	27.00	218	116	85	30	90	80	250	302	100	180	28	12 x 1,75 x 45
BR-110	8090	84,32	36.00	235	138	100	40	90	80	250	330	125	198	32	12 x 1,75 x 45
BR-150	15040	156,71	99.00	297	195	140	45	120	130	380	403	170	270	36	16 x 2 x 60
BR-160	20410	212,68	99.50	297	195	140	45	120	130	380	403	170	270	36	16 x 2 x 60
BR-180	29250	304,80	128.00	350	220	165	50	140	150	440	470	200	316	40	16 x 2 x 60
BR-220	35090	365,67	210.00	436	276	200	120	185	180	545	550	250	380	40	20 x 2,75 x 75
BR-230	80210	836,00	215.00	436	276	200	120	185	180	545	550	250	380	40	20 x 2,75 x 75
BR-320	150400	1567,16	520.00	535	390	300	100	236	275	786	740	300	475	64	20 x 2,75 x 75

Assembly Instructions

In the initial assembly, the hubs must be aligned and left with a gap between both hubs equal to the distance “E” indicated on the table.

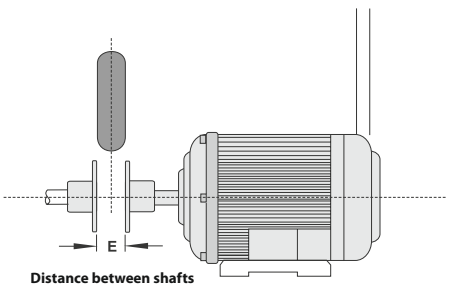
A and R are maximum tolerances.

MODELS	E (mm)	+ tol (mm)	ANGULAR (º)	RADIAL (mm)	TORQUE (Nm) Cross	TORQUE (Nm) Circular
BR-100	90	1	1	1	35	45
BR-110	90	2	1	1	30	40
BR-150	120	2	1.5	1.5	35	40
BR-160	120	4	1.5	2	35	40
BR-180	140	4	2	2.5	60	60
BR-220	185	4	2	2.5	60	60
BR-230	185	5	3	2.5	60	60
BR-320	236	5	3	2.5	140	210



Angular misalignment

Radial misalignment



Distance between shafts

“For a precise adjustment, use a torque wrench and tighten according to the toque values shown in the table. For the adjustment and tightening of If the larger sized hubs, a torque wrench is required.”

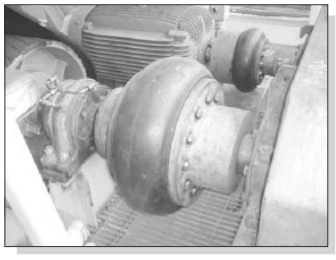
The information displayed in this catalog is subject to modifications without warning.

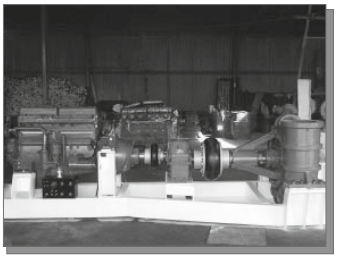
Hazardous Environments (BE)

The elastomeric compound used within Gummi's rubber elements generally provides good resistance to chemical products and aggressive agents. In the cases where the coupling will be continuously operating Hazardous environments, the application of a special coating on to the rubber element is recommended.
When ordering, please indicate what agents and conditions will be encountered and on what frequency.

Steam	○○
Acid	○○
Oil	○
Ethanol Glycerin	○○○
Outdoors - extreme heat or cold	○○

○ Low ○○ Medium ○○○ High

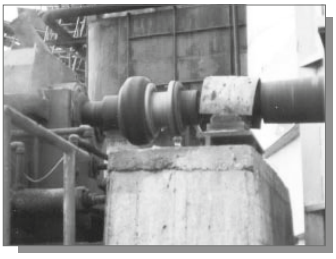




As a result, we have designed couplings with the following performance characteristics:

- High Capacity to transmit torque.
- Compact Designs*.
- Protection to increase working life of primary and secondary machine components and parts.

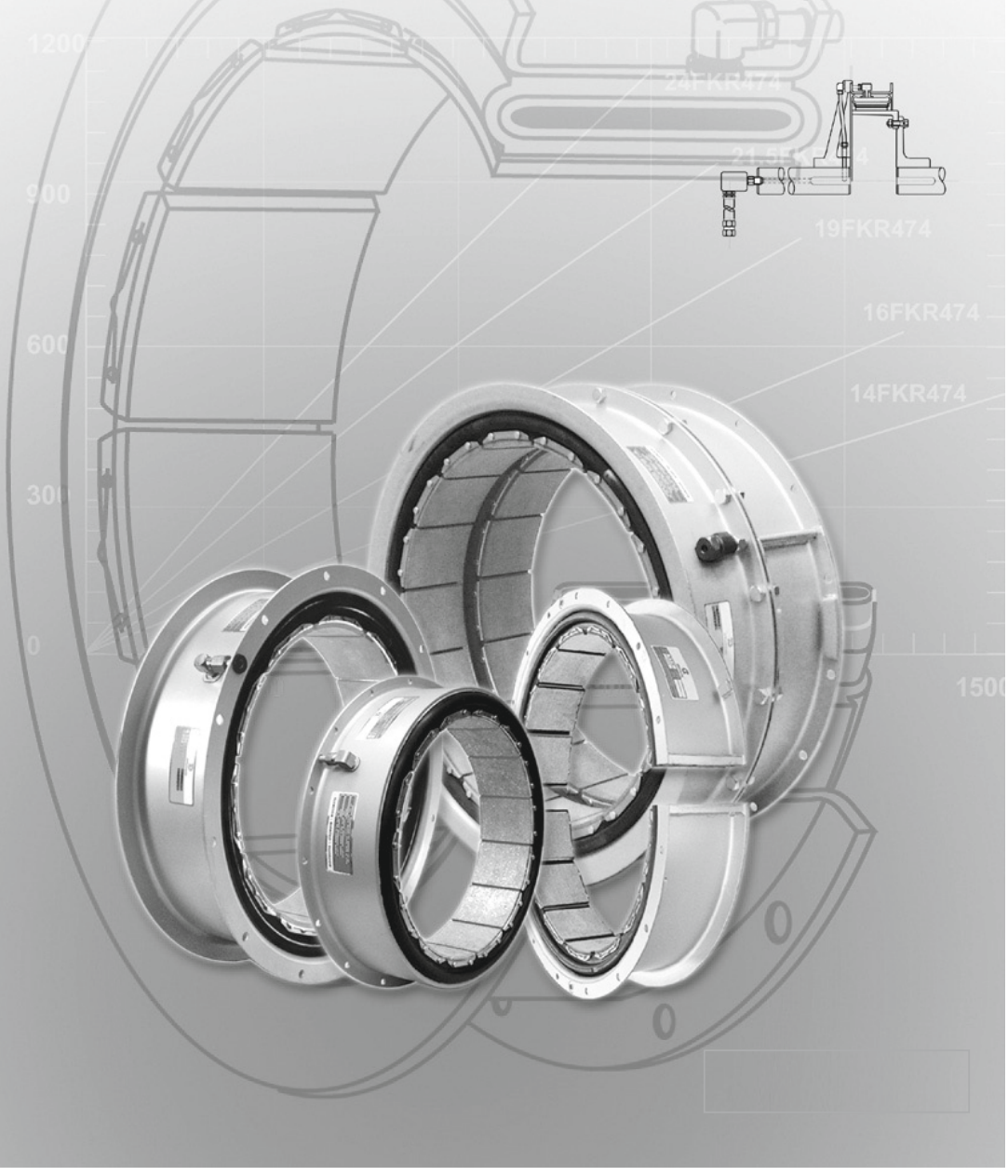
* In the same side of flexible coupling, we get until 5 times the nominal torque.



Total Quality

ISO 9002 REGISTERED FIRM

Pneumatic clutches and brakes
Type FK



Circunferencial pneumatic clutches and brakes type FK - FKE and FKR

SIS

Contents

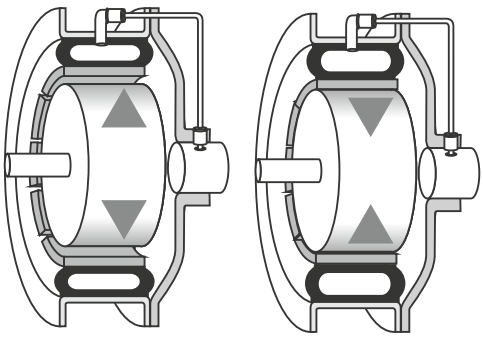
General Characteristics
Element Description
Element FK
Construction and Characteristics
FK Element components
Technical and dimensional data
Clutch and Brake applications
Types of Assembly
Element FK Dual
Element FK-2S
Element FKR
Element FKE
Selection Procedure

General characteristics

The Gummi Element is designed and constructed to provide a reliable service of a clutch or brake in a majority of industrial applications, even in the severest ones. The Element combines the advantages of a strong robust clutch with the characteristics of a flexible coupling, while not requiring lubrication or adjustment. The connection is constant on the entire friction surface, and working on the maximum diameter, provides the greater torque.

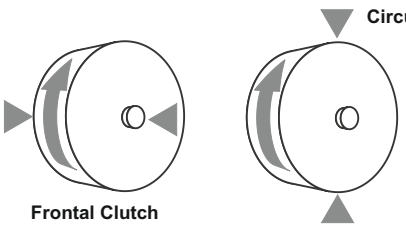
Type FK
It is suited to high speed, cyclical operations, as well as for general power transmission and coupling.

Drive principle



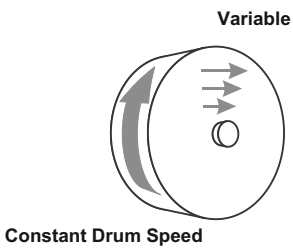
The FK Elements use a neoprene rubber tube, reinforced by cord materials that quickly expands inward when pressurized. This action causes the friction shoes attached to the tube's inside diameter to engage brake around the surface ofthe cylindrical drum. The elements torque capacity is always dependent upon the air pressure being applied and the rotating speed.

The force is applied at the maximum radius to the axis



The FK Elements concentrate all the frictional force on the outer diameter of the drum, obtaining the maximum torque. The torque lever arm is the drum radius, not a reduced radius that is common in plate clutches. The force in not only generated through the optimal radius, but is also applied around the circumference of the drum.

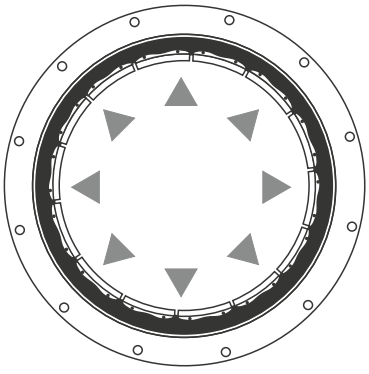
Uniform contact speeds

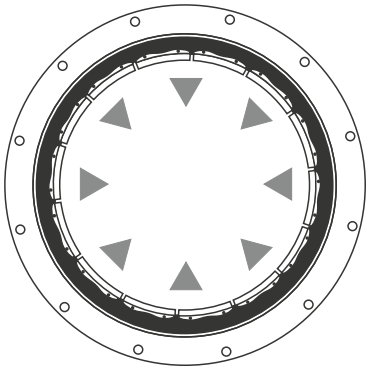


The contact of the friction shoe occurs around the cylindrical surface of the drum where the contact speed is constant unlike plate types, where the contact speed can vary across the face of the friction plate.

Self Adjustment
The Elements tube automatically compensate as the friction surface wears down, eliminating the necessity of adjustment, without reducing the torque capacity.

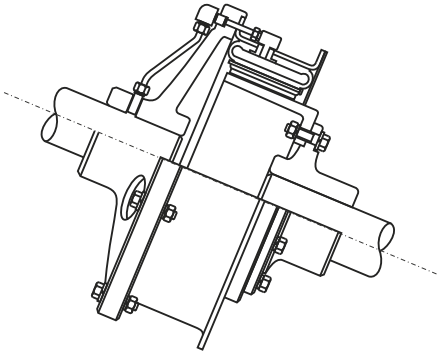
No Lubrication
There are no crucial sliding components, which require lubrication.

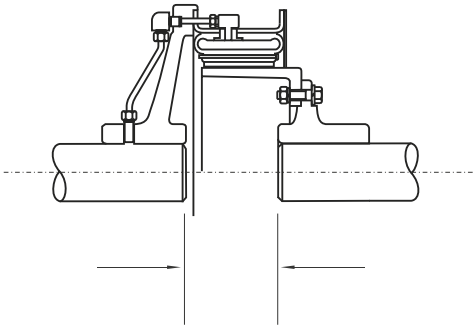




The centrifugal force aids in the clutch disengagement
When the pressure is released from the tube, the centrifugal force, acting on the friction shoes at the rotating element, retracts the shoes away from the surface of the drum. This type of effect retracts the tube pressurizing source and the possibility for disengaged friction shoe drag is minimized.

Any Plane Operation
The construction design and characteristics, combined with the centrifugal force, allows the clutch operation in any plane.

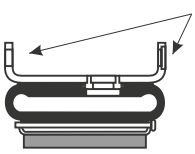




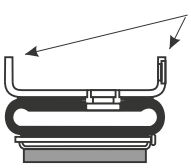
Assembly
The circumferencial clutches assembled with discontinuous axes, as the figure indicates, allows the assembly and the disassembly of its parts with no necessity of moving its axes, and facilitating its alignment.

Element description

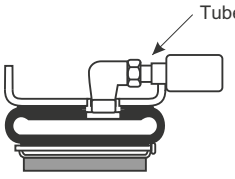
The Elements are identified by a number and type of different fittings used to make the connection from the tube valve or inlet to flange on the rim, and also by the type of friction material and any other unique rim features. Most of the unique rim features only pertain to FK elements.



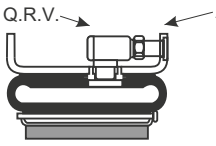
DUAL DRILLED (DD)
Holes are drilled in both flanges to be used for the air and mounting connections such as in the case of a dual Element.



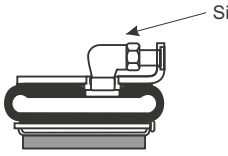
DUAL FLANGE (DFL)
This is the description for rims with dual flange, standard for FK Elements versions: from 16FK500 to 45FK525.
This description is used to differentiate those of single flange from those of double flange, as 12FK and 14FK Elements.



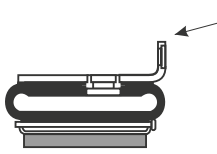
PIPE ADAPTER
An adapter that connects the standard tube fittings to the pipefittings.



QUICK RELEASE VALVE (Q.R.V)
The plumbing that connects the flange of the rim to the air inlet (valve) utilizing a quick release valve and an air connection tube.

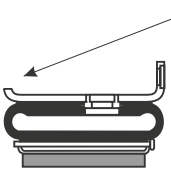


SIDE CONNECTION (SC)
The plumbing from the flange of the rim to the air inlet (valve) utilizing an elbow and an air connection tube.

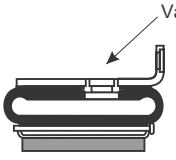


SINGLE FLANGE (SGL-FL)
A FK Element description for rim having only a single flange. Standard for sizes 3FK150 thru 10FK300. Size 12FK350 thru 14FK400 can be manufactured with single or dual flange.

SLOTTED RIM
A "U" shaped cutout in the flange of the rim, providing access for piping directly to the air inlet (valve). Especially in small sizes.



TURNED DOWN FLANGE
Applies to FK elements only. Sizes from 16FK500 thru 45FK525 come standard with dual flange, this description is used when one of its flanges is reduced or turned down to provide clearance for adjacent components.



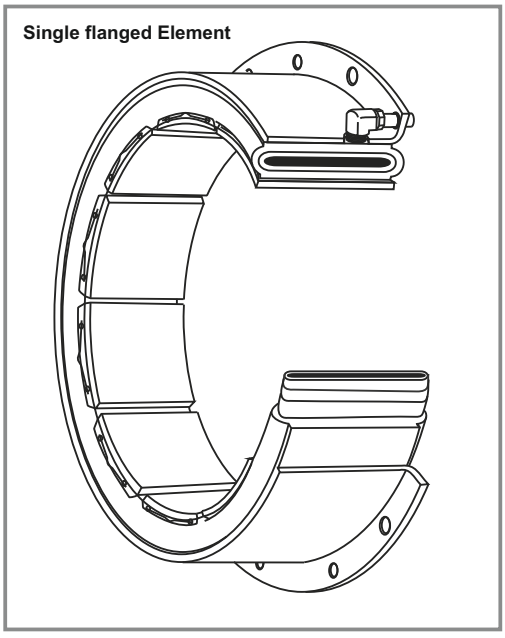
VALVE (VA or VAL or VL)
This part of the tube allows for a mechanical connection to inflate and deflate. The Elements of sizes from 3FK150 to 14FK400 and 11.5FKT500 can be manufactured with one or two valves, with the largest sizes having one, two or four valves.

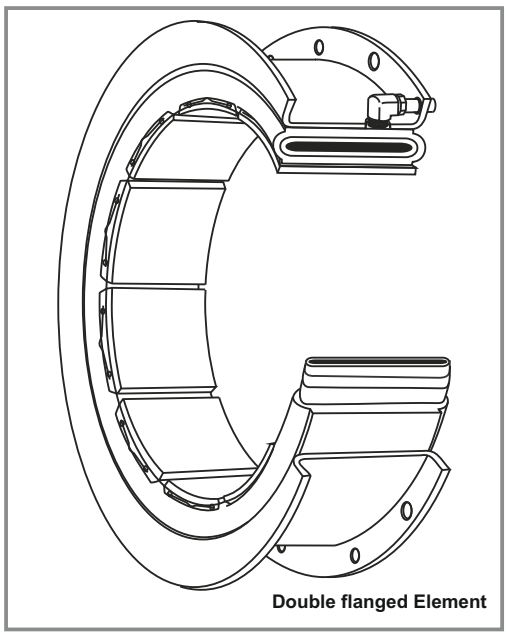
LINING (LNG or LN) FRICTION LINING
Elements can be furnished with linings that have different friction coefficients. When there is no mention made within the description, the element is outfitted with a standard lining.

STANDARD LINING
This lining produces the torque as indicated in the catalog.

LOW COEFFICIENT (LO-CO) OR SLIP LINING
This lining has a lower friction coefficient than the standard.
This LO-CO lining is recommended for continuous slip or tensioning applications.

HIGH COEFFICIENT (HI-CO) OR CORK LINING
This lining has a higher friction coefficient than standard.
It is used in applications where the Element works in the engaged position for long periods of time.





The FK type Element is designed and manufactured to offer a reliable clutch or break service in the most demanding industrial applications. They are best suited to high velocity, cyclical operations in a variety of general power transmission applications.

The FK design and construction is operationally simple. A tube in shape of neoprene tube, reinforced with several ply of cords, is vulcanized to the inside of a steel rim. Inside, is a set of friction shoes that are attached to the tube using shoe pins and lock wire kit. When the tube is pressurized, the friction shoes are forced to engage around the drum.

The Element capacity to transmit torque is dependent upon the applied air pressure and rotating velocity. The values indicated in the catalog are given at a pressure of 75psi (5.2 bar) and zero R.P.M. The maximum recommended pressure is 110 psi (7.6 bar). Adjustments for velocity values appear in the Selection Procedure Section.

The FK Elements are available in 20 sizes, which are identified by the drum diameter in inches, as well as the width in inches of the friction lining. For example, a 16FK500 is designed to constrict on a drum with 16" diameter and its friction lining width 5".

Elements from 3FK150 thru 10FK300 come standard with a single flange. Elements from 12FK350 thru 14FK400 are normally provided with a single flange, but can be outfitted with 2 flanges if required. The 16FK500 thru 45FK525 Elements come standard with 2 flanges. Two Elements with double flanges can be bolted together in order to form a Dual Element, which would have twice the torque capacity of a single element. The Dual Elements are provided in sizes from 12FK350 thru 45FK525.

Due to the fact that rubber tube is the connection element between the driving and driven shafts, the FK type design offers the following additional qualities and features:

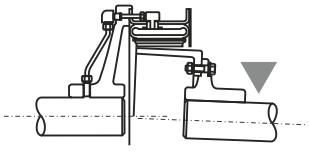
Torque rating
1.220.000 lb.pulg
137.890 N.m.

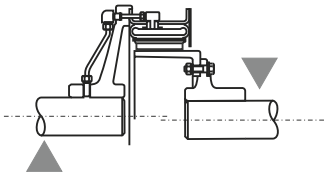
A single moving component
The tube is the only moving component; there are no springs or sliding parts.

Split Elements
Size 6FK200 thru 45FK52 can be provided in this configuration. This type of element is used to facilitate the installation, maintenance, and disassembly in applications where there is a limited amount of axial space. Normally, the single flange Elements thru size 10FK300 are used as breaks, whereas the Dual flange Elements can be used both as a clutch or break.

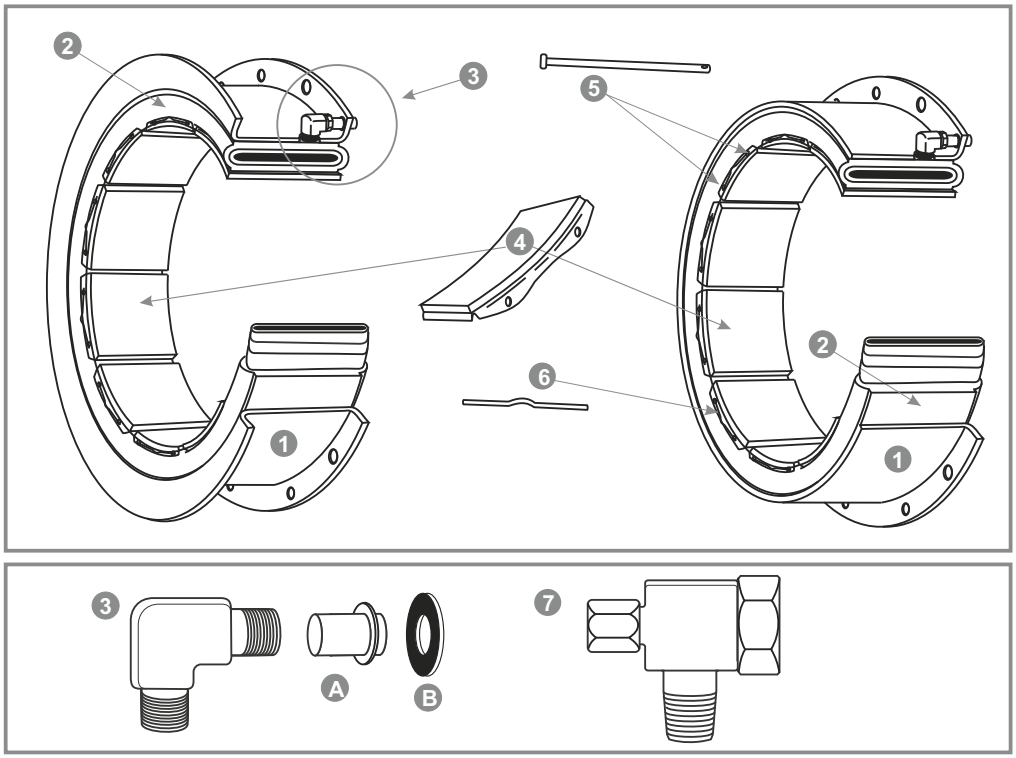
Shock-absorbing effect
Due to the fact that the tube transmits torque through its sidewalls, it works like a shock absorber, absorbing the shock loads thereby protecting the drive components of the transmission. The construction of the rubber tube also reduces the effects of the torsional vibration.

Flexible Coupling
The flexibility of the tube allows for it to compensate minor misalignments and axial movements of the shaft.





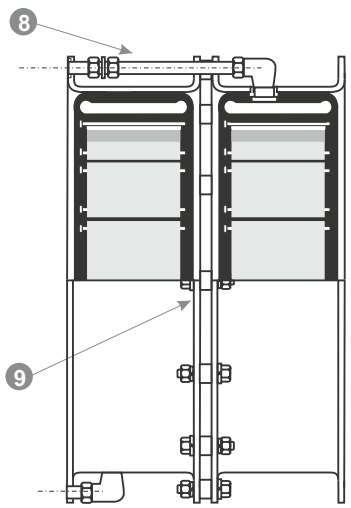
SIZE	Nominal torque	
	lb.pulg @75psi	N.m @5.2 bar
3FK150	360	41
4FK200	1.00	113
5FK200	1.460	165
6FK200	2.040	231
8FK250	4.290	485
10FK300	8.150	921
12FK350	13.300	1500
14FK400	19.700	2230
16FK500	35.200	3980
18FK500	44.000	4970
20FK500	53.600	6060
22FK500	62.300	7040
24FK500	75.000	8480
26FK525	92.400	10400
28FK525	106.000	12000
30FK525	121.000	13700
32FK525	137.000	15500
36FK525	172.000	19400
40FK525	211.000	23800
45FK525	260.000	29400



Type - FK/RN

1 - Rim
2 - Tube
3 - Elbow
A- Air Connection tube
B- Gasket
4 - Friction Shoe 1
5 - Shoe Pin 1
6 - Lockwire 1
7 - Quick release valve 2
8 - Air tube for dual assembly
9 - Spacer for dual assembly

NOTES:
1- Unavailable item for size 3FK thru 5FK, due to the fact that friction material is vulcanized with the chamber and is not interchangeable.
2- Optional.



Single FK
Technical data
Size 3 to 14

ENGLISH		lb.in @ 75 psi	rpm	psi/rpm²	lb-ft²	lb	in²	Inches new	Inches worn	in³	inches
3FK150	100001	360	2000	1.5	0.1	1.8	14	0.18	0.04	3	2.90
4FK200	100002	1000	2000	1.7	0.2	2.5	23	0.18	0.03	9	3.90
5FK200	100005	1460	2000	2.0	0.4	3.5	30	0.18	0.04	16	4.90
6FK200	100012	2040	1800	6.0	1.0	7.0	36	0.18	0.06	20	5.90
8FK250	100032	4290	1800	7.0	2.0	9.0	61	0.18	0.06	30	7.90
10FK300	100052	8150	1800	10.0	6.0	19.0	91	0.18	0.06	50	9.90
12FK350	100072	13300	1800	12.0	11.0	26.0	128	0.18	0.06	80	11.90
14FK400	100093	19700	1800	15.0	17.0	31.0	170	0.18	0.06	70	13.90

Size	Part number	M. torque rating	Maximun speed	C. Centrifugal loss constant	Wk² J	Weight mass	Friction area	Friction lining thickness		Air tube cavity	Minimun drum diameter
3FK150	100001	40.7	2000	0.10	0.00	0.8	90.3	5	1	0.05	74
4FK200	100002	113	2000	0.12	0.01	1.1	148.4	4.77	1	0.15	99
5FK200	100005	165	2000	0.14	0.02	1.6	193.5	4.77	1	0.26	124
6FK200	100012	231	1800	0.41	0.04	3.2	232.2	4.77	2	0.33	150
8FK250	100032	485	1800	0.48	0.08	4.1	393.5	4.77	2	0.49	201
10FK300	100052	921	1800	0.69	0.25	8.6	587.0	4.77	2	0.82	251
12FK350	100072	1500	1800	0.83	0.46	11.8	825.6	4.77	2	1.31	302
14FK400	100093	2227	1800	1.04	0.72	14	1096.7	4.77	2	1.15	353
SI		N·m @ 5,2 bar	rpm	Bar/rpm²	Kg-m²	Kg	cm²	new / worn Millimeters		dm³	Millimeters

* The data displayed in the catalog is current and subject to change without previous notice.

NOTES:

1- Refers to basic part number only. Does not include union or hose. When ordering, please specify the number of air inlets and the type of connection.

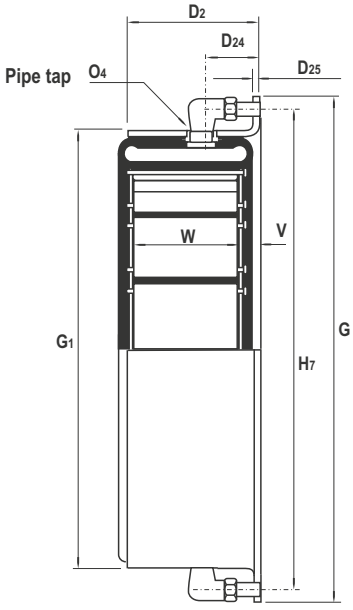
2- Dynamic torque is shown, while the static torque is about 25% greater. In each application, the torque depends on the air pressure and the velocity.

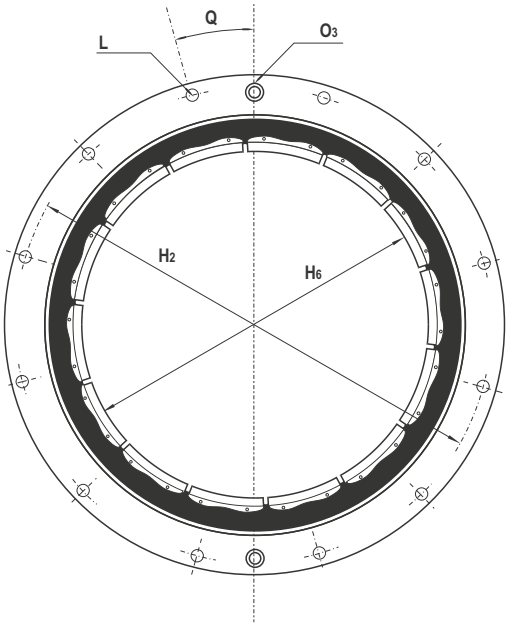
3- Tolerance by size
Size 3 to 5: +0,000/-0,003 ins. (+0,00/-0,8 mm).
6 and next: +0,000/-0,005 ins. (+0,00/-0,13 mm)

4- NPT threads. Sizes from 3FK thru 5FK only available with a single air inlet.
The other sizes are available with one or two air inlets.

5- The maximum r.p.m. depends on the operational conditions, and may vary according to each application. Consult the factory for applications that exceed the appropriated speed.

6- Contact at Drum with worn shoes.





ENGLISH		lb.in @ 75 psi	Dimensions in inches															
3FK150	100001	360	2.16	1.18	0.10	6.299	4.86	5.740	3.15	5.75	8	0.25	0.25	1/8-27	22.500	0.30	6	1.50
4FK200	100002	1000	2.63	1.38	0.09	7.248	5.81	6.688	4.13	6.69	8	0.25	0.19	1/8-27	22.500	0.38	6	2.00
5FK200	100005	1460	2.85	1.50	0.10	8.819	7.20	8.071	5.16	7.07	8	0.31	0.25	1/8-27	22.500	0.37	6	2.00
6FK200	100012	2040	2.94	1.56	0.09	10.752	9.06	10.000	6.16	10.00	8	0.38	0.31	3/8-18	22.500	0.56	6	2.00
8FK250	100032	4290	3.44	1.91	0.09	12.875	11.19	12.125	8..16	12.13	8	0.38	0.31	3/8-18	22.500	0.56	8	2.50
10FK300	100052	8150	4.13	2.00	0.19	15.373	13.63	14.625	10.13	14.63	12	0.38	0.31	3/8-18	15.000	0.69	10	3.00
12FK350	100072	13300	4.72	2.00	0.19	17625	15.88	16.875	12.13	16.88	14	0.38	0.31	3/8-18	12.857	0.69	12	3.50
14FK400	100093	19700	5.22	2.00	0.19	19.625	17.88	18.875	14.13	18.88	16	0.38	0.31	3/8-18	11.250	0.69	14	4.00
Size	Part ❶ number	M. Torque rating ❷	D_2	D_{24}	D_{25}	G ❸	G_1	H_2	H_6	H_7	L Bolt N.	L Bolt Size	O_3	O_4 ❹	Q deg.	V	W N.	W width
3FK150	100001	40.7	55	30	2	160.0	123	145.8	80	146	8	6	6	1/8-27	22.500	7	6	38
4FK200	100002	113	67	35	2	184.1	148	169.9	105	170	8	6	5	1/8-27	22.500	10	6	51
5FK200	100005	165	72	38	2	224.0	183	205.0	131	205	8	8	6	1/8-27	22.500	9	6	51
6FK200	100012	231	75	40	2	273.1	230	254.0	156	254	8	10	8	3/8-18	22.500	14	6	51
8FK250	100032	485	87	48	2	327.0	284	308.0	207	308	8	10	8	3/8-18	22.500	14	8	64
10FK300	100052	921	105	51	5	390.5	346	371.5	257	371	12	10	8	3/8-18	15.000	17	10	76
12FK350	100072	1503	120	51	5	447.7	403	428.6	308	429	14	10	8	3/8-18	12.857	17	12	89
14FK400	100093	2227	133	51	5	498.5	454	479.4	359	479	16	10	8	3/8-18	11.250	17	14	102
SI		N-m @ 5.2 bar	Dimensions in millimeters															

* The data displayed in the catalog is current and subject to change without previous notice.

Single FK
Technical data
Size 12 to 45

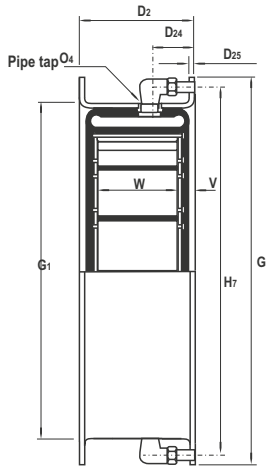
ENGLISH		lb.in @ 75 psi	rpm	psi/rpm²	lb-ft²	lb	in²	Inches new	Inches worn	in³	Inches
12FK350	100082	13000	1800	12	12	30	128	0.18	0.06	80	11.90
14FK400	100092	19700	1800	15	21	35	170	0.18	0.06	70	13.90
16FK500	100112	35200	1550	20	52	74	241	0.27	0.06	140	15.87
18FK500	100132	44000	1400	23	70	81	262	0.27	0.06	160	17.87
20FK500	100152	53600	1300	25	90	88	288	0.27	0.06	170	19.87
22FK500	100172	62300	1250	28	114	95	312	0.27	0.06	190	21.87
24FK500	100192	75000	1200	30	142	102	338	0.27	0.06	200	23.87
26FK525	100212	92400	1100	34	210	133	404	0.31	0.06	260	25.81
28FK525	100232	106000	1000	37	252	140	430	0.31	0.06	280	27.81
30FK525	100252	121000	950	40	303	148	458	0.31	0.06	290	29.81
32FK525	100272	137000	900	43	359	157	483	0.31	0.06	310	31.81
38FK525	100292	172000	800	48	510	178	550	0.31	0.06	350	35.81
40FK525	100312	211000	750	52	730	201	610	0.31	0.06	380	39.81
45FK525	100332	260000	670	64	1115	262	675	0.31	0.06	430	44.75

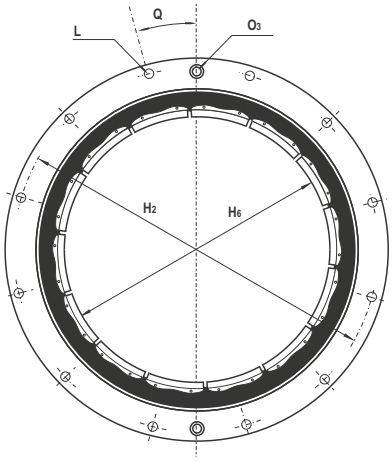
Size	Part number [1]	M. Torque rating [2]	Maximun speed [6]	C. Centrifugal loss constant	Wk² J	Weight mass	Friction area	Friction lining thickness		Air tube cavity [7]	Minimun drum diameter
12FK350	100082	1470	1800	0.83	0.50	14	826	4.77	2	1.31	302
14FK400	100092	2227	1800	1.04	0.88	16	1097	4.77	2	1.15	353
16FK500	100112	3978	1550	1.38	2.19	34	1555	7	2	2.3	403
18FK500	100132	4973	1400	1.59	2.95	37	1690	7	2	2.62	454
20FK500	100152	6058	1300	1.73	3.79	39	1858	7	2	2.79	505
22FK500	100172	7042	1250	1.93	4.80	43	2013	7	2	3.12	555
24FK500	100192	8477	1200	2.07	5.97	46	2181	7	2	3.28	606
26FK525	100212	10443	1100	2.35	8.84	60	2606	8	2	4.26	656
28FK525	100232	11980	1000	2.55	10.61	63	2774	8	2	4.59	706
30FK525	100252	13676	950	2.76	12.76	67	2955	8	2	4.74	757
32FK525	100272	15484	900	2.97	15.11	71	3116	8	2	5.08	808
38FK525	100292	19440	800	3.31	21.47	81	3548	8	2	5.74	910
40FK525	100312	23848	750	3.59	30.73	91	3935	8	2	6.23	1011
45FK525	100332	29386	670	4.42	46.94	119	4355	8	2	7.05	1137
SI		N·m @ 5,2 bar	rpm	Bar/rpm²	Kg-m²	Kg	cm²	new / worn Millimeters		dm³	Millimeters

* The data displayed in the catalog is current and subject to change without previous notice.

NOTES:

1- Refers to basic part number only. When ordering, please specify the number of air inlets and the type of connection.
2- Dynamic torque is shown, while the static torque is about 25% greater. In each application, the torque depends on the air pressure and the velocity.
3- Tolerance by size
Size 12 to 24, 28 and 32: +0,000/-0,005 in. (+0,00/-0,13 mm).
26 and 30: +0,000/-0,008 in. (+0,00/-0,20 mm).
36 to 45: +0,000/-0,010 in. (+0,00/-0,25 mm).
4- NPT threads. Sizes 12 and 14 available with 1 or 2 air inlet.
The other sizes are available with 1, 2 or 4 air inlets.
5- 10º for elements with 1 air inlet, 5º for elements with 2 or 4 air inlets.
6- The maximum r.p.m. depends on the operational conditions, and may vary according to each application. Consult the factory for applications that exceed the appropriated speed.
7- Contact at Drum with worn shoes.





ENGLISH		lb.in @ 75 psi	Dimensions in inches															
12FK350	100082	13300	4.75	2.00	0.19	17.625	15.88	16.875	12.13	16.88	14	0.375	0.31	3/8-18	12.857	0.69	12	3.50
14FK400	100092	19700	5.22	2.00	0.19	19.625	17.88	18.875	14.13	18.88	16	0.375	0.31	3/8-18	11.250	0.69	14	4.00
16FK500	100112	35200	6.63	2.50	0.19	23.500	20.75	22.500	16.19	22.25	8	0.500	0.38	3/8-18	22.500	0.81	10	5.00
18FK500	100132	44000	6.63	2.50	0.19	25.500	22.75	24.375	18.19	24.38	12	0.500	0.38	3/8-18	15.000	0.81	11	5.00
20FK500	100152	53600	6.63	2.50	0.19	27.500	24.75	26.375	20.19	26.38	12	0.500	0.38	3/8-18	15.000	0.81	12	5.00
22FK500	100172	62300	6.63	2.50	0.19	29.500	26.75	28.375	22.19	28.38	12	0.500	0.38	3/8-18	15.000	0.81	13	5.00
24FK500	100192	75000	6.63	2.50	0.19	31.500	28.75	30.375	24.19	30.38	16	0.500	0.38	3/8-18	11.250	0.81	14	5.00
26FK525	100212	92400	6.94	2.50	0.25	34.000	31.00	32.750	26.19	32.50	16	0.625	0.50	1/2-14	11.250	0.84	16	5.25
28FK525	100232	106000	6.94	2.50	0.25	36.000	33.00	34.750	28.19	34.50	16	0.625	0.50	1/2-14	11.250	0.84	17	5.25
30FK525	100252	121000	6.94	2.50	0.25	38.000	35.00	36.750	30.19	36.50	16	0.625	0.50	1/2-14	11.250	0.84	18	5.25
32FK525	100272	137000	6.94	2.50	0.25	40.000	37.00	38.750	32.19	38.50	18	0.625	0.50	1/2-14	⑤	0.84	19	5.25
36FK525	100292	172000	6.94	2.75	0.28	44.625	41.56	43.125	36.19	43.25	18	0.750	0.63	3/4-14	⑤	0.84	22	5.25
40FK525	100312	211000	6.94	2.75	0.28	48.625	45.56	47.125	40.19	47.25	20	0.750	0.63	3/4-14	9.000	0.84	24	5.25
45FK525	100332	260000	6.94	2.75	0.28	53.625	50.69	52.125	45.19	52.25	24	0.750	0.63	3/4-14	7.500	0.84	27	5.25

Size	Part ① number	M. Torque rating ②	D_2	D_{24}	D_{25}	G ③	G_1	H_2	H_6	H_7	L Bolt N.	L Bolt Size	O_3	O_4 ④	Q deg.	V	W N.	W width
12FK350	100082	1503	120	51	5	447.7	403	428.6	308	429	14	10	8	3/8-18	12.857	17	12	89
14FK400	100092	2227	133	51	5	498.5	454	479.4	359	479	16	10	8	3/8-18	11.250	17	14	102
16FK500	100112	3978	168	64	5	596.9	527	571.5	411	565	8	13	10	3/8-18	22.500	20	10	127
18FK500	100132	4973	168	64	5	647.7	578	619.1	462	619	12	13	10	3/8-18	15.000	20	11	127
20FK500	100152	6058	168	64	5	698.5	629	669.9	513	670	12	13	10	3/8-18	15.000	20	12	127
22FK500	100172	7041	168	64	5	749.3	679	720.7	564	721	12	13	10	3/8-18	15.000	20	13	127
24FK500	100192	8476	168	64	5	800.1	730	771.5	614	772	16	13	10	3/8-18	11.250	20	14	127
26FK525	100212	10443	176	64	6	863.6	787	831.9	665	826	16	16	13	1/2-14	11.250	21	16	133
28FK525	100232	11980	176	64	6	914.4	838	882.7	716	876	16	16	13	1/2-14	11.250	21	17	133
30FK525	100252	13676	176	64	6	965.2	889	933.5	767	927	16	16	13	1/2-14	11.250	21	18	133
32FK525	100272	15484	176	64	6	1016.0	940	984.3	818	978	18	16	13	1/2-14	⑤	21	19	133
36FK525	100292	19440	176	70	7	1133.5	1056	1095.4	919	1099	18	19	16	3/4-14	⑤	21	22	133
40FK525	100312	23848	176	70	7	1235.1	1157	1197.0	1021	1200	20	19	16	3/4-14	9.000	21	24	133
45FK525	100332	29386	176	70	7	1362.1	1287	1324.0	1148	1327	24	19	16	3/4-14	7.500	21	27	133

SI	N-m @ 5.2 bar	Dimensions in millimeters

* The data displayed in the catalog is current and subject to change without previous notice.

Dual FK
Technical data
Size 12 to 45

ENGLISH		lb.in @ 75 psi	rpm	psi/rpm²	lb-ft²	lb	pulg²	Inches new	Inches worn	in³	Inches
12FK350	100397	26600	1800	12	25	62	256	0.18	0.06	160	11.90
14FK400	100399	39400	1800	15	42	75	340	0.18	0.06	140	13.90
16FK500	100401	70400	1550	20	106	151	482	0.27	0.06	280	15.87
18FK500	100403	88000	1400	23	144	166	524	0.27	0.06	320	17.87
20FK500	100405	107200	1300	25	185	180	576	0.27	0.06	340	19.87
22FK500	100407	124600	1250	28	233	194	624	0.27	0.06	380	21.87
24FK500	100409	150000	1200	30	292	209	676	0.27	0.06	400	23.87
26FK525	100411	184800	1050	34	432	272	808	0.31	0.06	520	25.81
28FK525	100413	212000	1000	37	517	286	860	0.31	0.06	560	27.81
30FK525	100415	242000	950	40	621	302	916	0.31	0.06	580	29.81
32FK525	100418	274000	900	43	736	321	966	0.31	0.06	620	31.81
36FK525	100419	344000	800	48	1052	366	1100	0.31	0.06	700	35.81
40FK525	100421	422000	750	52	1502	413	1220	0.31	0.06	760	39.81
45FK525	100423	520000	670	64	2293	537	1350	0.31	0.06	860	44.75

Size	Part number [1]	M. Torque rating [2]	Maximun speed [6]	C. Centrifugal loss constant	Wk² J	Weight mass	Friction area	Friction lining thickness		Air tube cavity [7]	Minimun drum diameter
12FK350	100397	3006	1800	0.83	1.05	28	1651	5	2	2.62	302
14FK400	100399	4453	1800	1.04	1.76	34	2193	5	2	2.30	352
16FK500	100401	7957	1550	1.38	4.46	68	3109	7	2	4.59	403
18FK500	100403	9946	1400	1.59	6.06	75	3380	7	2	5.25	454
20FK500	100405	12116	1300	1.73	7.77	82	3716	7	2	5.58	505
22FK500	100407	14083	1250	1.93	9.80	88	4226	7	2	6.23	555
24FK500	100409	16954	1200	2.07	12.30	95	4361	7	2	6.56	606
26FK525	100411	20887	1050	2.35	18.19	123	5212	8	2	8.53	656
28FK525	100413	23961	1000	2.55	21.71	130	5548	8	2	9.18	706
30FK525	100415	27352	950	2.76	26.14	137	5910	8	2	9.15	757
32FK525	100418	30969	900	2.97	30.98	145	6232	8	2	10.2	808
36FK525	100419	38881	800	3.31	44.21	166	7097	8	2	11.5	910
40FK525	100421	47697	750	3.59	63.23	187	7871	8	2	12.5	1011
45FK525	100423	58773	670	4.42	96.53	243	8710	8	2	14.1	1137

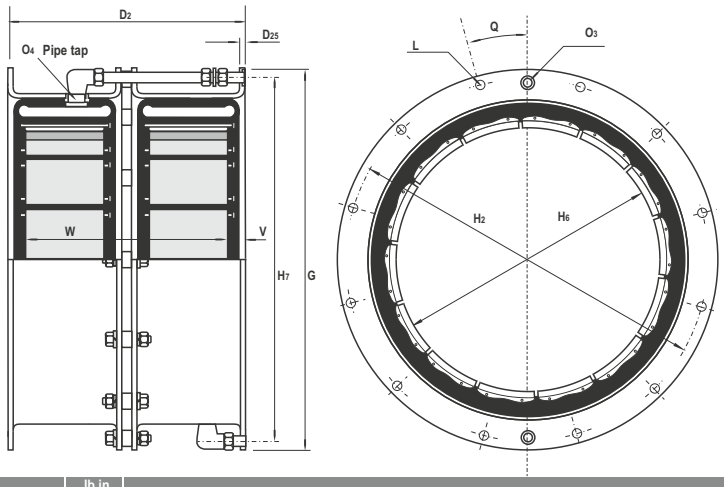
SI	N·m @ 5,2 bar	rpm	Bar/rpm²	Kg-m²	Kg	cm²	new / worn (Millimeters)	dm³	Millimeters

* The data displayed in the catalog is current and subject to change without previous notice.

NOTES:

1- Refers to basic part number only. When ordering, please specify the number of air inlets and the type of connection.
2- Dynamic torque is shown, while the static torque is about 25% greater. In each application, the torque depends on the air pressure and the velocity.
3- Tolerance by size
Size 12 to 24, 28 and 32: +0,000/-0,005 in. (+0,00/-0,13 mm).
26 and 30: +0,000/-0,008 in. (+0,00/-0,20 mm).
36 to 45: +0,000/-0,010 in. (+0,00/-0,25 mm).
4- NPT threads. Sizes 12 to 14 available with 2 air inlet.
The other sizes are available with 2 or 4 air inlets.
5- 10º for elements with 1 air inlet, 5º for elements with 2 or 4 air inlets.
6- The maximum r.p.m. depends on the operational conditions, and may vary according to each application. Consult the factory for applications that exceed the appropriated speed.
7- Contact at Drum with worn shoes.

Dual FK
Dimensional data
Size 12 to 45



ENGLISH		lb.in @ 75 psi	Dimensions in inches													
12FK350	100397	26600	10.13	0.19	17.625	16.875	12.13	16.88	14	0.375	0.31	3/8-18	12.857	0.69	24	8.75
14FK400	100399	39400	11.13	0.19	19.625	18.875	14.13	18.88	16	0.375	0.31	3/8-18	11.250	0.69	28	9.75
16FK500	100401	70400	13.36	0.19	23.500	22.500	16.19	22.25	8	0.500	0.38	3/8-18	22.500	0.81	20	12.00
18FK500	100403	88000	13.63	0.19	25.500	24.375	18.19	24.38	12	0.500	0.38	3/8-18	15.000	0.81	22	12.00
20FK500	100405	107200	13.63	0.19	27.500	26.375	20.19	26.38	12	0.500	0.38	3/8-18	15.000	0.81	24	12.00
22FK500	100407	124600	13.63	0.19	29.500	28.375	22.19	28.38	12	0.500	0.38	3/8-18	15.000	0.81	26	12.00
24FK500	100409	150000	13.63	0.19	31.500	30.375	24.19	30.38	16	0.500	0.38	3/8-18	11.250	0.81	28	12.00
26FK525	100411	184800	14.25	0.25	34.000	32.750	26.19	32.50	16	0.625	0.50	1/2-14	11.250	0.84	32	12.56
28FK525	100413	212000	14.44	0.25	36.000	34.750	28.19	34.50	16	0.625	0.50	1/2-14	11.250	0.84	34	12.69
30FK525	100415	242000	14.44	0.25	38.000	36.750	30.19	36.50	16	0.625	0.50	1/2-14	11.250	0.84	36	12.69
32FK525	100418	274000	14.44	0.25	40.000	38.750	32.19	38.50	18	0.625	0.50	1/2-14	⑤	0.84	38	12.69
36FK525	100419	344000	14.44	0.25	44.625	43.125	36.19	43.25	18	0.750	0.63	3/4-14	⑤	0.84	44	12.69
40FK525	100421	422000	14.44	0.25	48.625	47.125	40.19	47.25	20	0.750	0.63	3/4-14	9.000	0.84	48	12.69
45FK525	100423	520000	14.44	0.28	53.625	52.125	45.19	52.25	24	0.750	0.63	3/4-14	7.500	0.84	54	12.69

Size	Part ① number	M. Torque rating ②	D_2	D_{25}	G ③	H_2	H_6	H_7	L Bolt N.	L Bolt Size	O_3	O_4 ④	Q deg.	V	W N.	W width
12FK350	100397	3006	257	5	447.7	428.6	308	429	14	10	8	3/8-18	12.857	17	24	222
14FK400	100399	4453	283	5	498.5	479.4	359	479	16	10	8	3/8-18	11.250	17	28	248
16FK500	100401	7957	346	5	596.9	571.5	411	565	8	13	10	3/8-18	22.500	20	20	305
18FK500	100403	9946	346	5	647.7	619.1	462	619	12	13	10	3/8-18	15.000	20	22	305
20FK500	100405	12116	346	5	698.5	669.9	513	670	12	13	10	3/8-18	15.000	20	24	305
22FK500	100407	14083	346	5	749.3	720.7	564	721	12	13	10	3/8-18	15.000	20	26	305
24FK500	100409	16954	346	5	800.1	771.5	614	772	16	13	10	3/8-18	11.250	20	28	319
26FK525	100411	20887	362	6	863.6	831.9	665	826	16	16	13	1/2-14	11.250	21	32	322
28FK525	100413	23961	367	6	914.4	882.7	716	876	16	16	13	1/2-14	11.250	21	34	322
30FK525	100415	27352	367	6	965.2	933.5	767	927	16	16	13	1/2-14	11.250	21	36	322
32FK525	100418	30969	367	6	1016.0	984.3	818	978	18	16	13	1/2-14	⑤	21	38	322
36FK525	100419	38881	367	6	1133.5	1095.4	919	1099	18	19	16	3/4-14	⑤	21	44	322
40FK525	100421	47696	367	6	1235.1	1197.0	1021	1200	20	19	16	3/4-14	9.000	21	48	322
45FK525	100423	58873	367	7	1362.1	1324.0	1148	1327	24	19	16	3/4-14	7.500	21	54	322

SI	N-m @ 5.2 bar	Dimensions in millimeters

* The data displayed in the catalog is current and subject to change without previous notice.

NOTES:

Crossed Roller Bearings & Gonio Ways

SFT

SF TECHNOLOGY CO.,LTD

Precision transmission components

POSITIONING STAGES

GONIO WAYS

LABORATORY JACKS

CROSSED ROLLER BEARINGS

SFT

SÜPER İNCE YATAKLAMA RULMANI

SRAU

DIŞ HALKASI AYRIK YATAKLAR

SRB

İÇ VE DIŞ HALKALARI ENTEGRE EDİLMİŞ YATAKLAR

SRU

GONIO WAY

SRV

Kavisli Kayar Yataklar

Redüktörlere Özel Döner Tabla Yatakları

SSHF

SCSG

Cross Roller Bearing

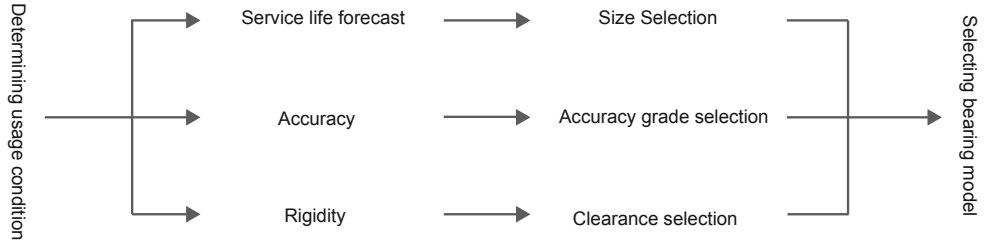
Cross roller bearings consist of inner rings, outer rings, spacer retainers and cylindrical rollers cross arranged on the V-shaped 90° groove between the inner and outer rings. This structure can withstand radial, axial and moment loads in all directions because the rollers' line contact with raceway surfaces achieve a large load-bearing area despite the minimum dimensions. Therefore these bearings are widely used on the rotating parts of industrial robots, machine tools, precision rotary tables, measuring instruments and IC manufacturing machines.

Product Features

- High rigidity
- Large load capacity
- High rotation accuracy
- Compactness
- Easy to install and handle

Cross Roller Bearing selection

The procedures for the selection and usage of cross roller bearings are based on the following figure



Models & Features

SRU Model (One-Piece Inner & Outer Ring)

The single structure with mounting holes on inner and outer rings does not require the use of flange discs or housings; therefore reduces mounting errors, achieves stable rotational accuracy and moment torque. Suitable for inner and outer ring rotation

SRB models (Split Outer Ring model for inner ring rotation)

Standard model with two split outer rings bolted together and a one-piece inner ring suitable for precision inner ring rotation.

SRBE Model (One-Piece Inner & Outer Ring)

The one-piece inner & outer ring structure provides high rigidity, high accuracy and smooth rotation; suitable for inner and outer ring rotation

SRAU Model (One-Piece Inner & Outer Ring)

Super slim type cross roller bearing with three choice of bearing width: 5mm, 8mm and 13mm. Rigid and compact design is suitable for limited space and lightweight mechanism.

SSHF Model (One-Piece Inner & Outer Ring)

Specifically designed for SHF type strain wave gears, this cross roller bearing has mounting holes for easier installation.

SCSG Model (One-Piece Inner & Outer Ring)

Specifically designed for CSG type strain wave gears, this cross roller bearing has mounting holes for easier installation.

Accuracy Standards

SRU、SRB、SRBE inner diameter dimensional accuracy

unit : µm

Inner ring diameter (d) Nominal dimension (mm)		Tolerance dm					
		Grade 0、P5、P4、P2		Grade PS5		Grade PS4、PS2	
Above	Below	Above	Below	Above	Below	Above	Below
18	30	0	-10	0	-6	0	-5
30	50	0	-12	0	-8	0	-6
50	80	0	-15	0	-9	0	-7
80	120	0	-20	0	-10	0	-8
120	150	0	-24	0	-12	0	-9
150	180	0	-24	0	-12	0	-10
180	250	0	-30	0	-14	0	-12
250	315	0	-34	0	-17	-	-

SRU、SRB、SRBE outer diameter dimensional accuracy

unit : µm

Outer ring diameter (D) Nominal dimension (mm)		Tolerance dm					
		Grade 0、P5、P4、P2		Grade PS5		Grade PS4、PS2	
Above	Below	Above	Below	Above	Below	Above	Below
30	50	0	-11	0	-7	0	-6
50	80	0	-13	0	-9	0	-7
80	120	0	-15	0	-10	0	-8
120	150	0	-18	0	-10	0	-9
150	180	0	-24	0	-12	0	-9
180	250	0	-30	0	-15	0	-10
250	315	0	-34	0	-18	0	-12

SRAU ID and OD dimensional accuracy

unit : µm

Inner ring diameter (d) Nominal dimension (mm)		SRAU Inner Ring		SRAU Outer Ring	
Above	Below	Above	Below	Above	Below
-	18	0	-8	-	-
18	30	0	-10	0	-9
30	50	0	-12	0	-11
50	80	0	-15	0	-13
80	120	0	-20	0	-15
120	150	0	-25	0	-18
150	180	0	-25	0	-25
180	315	0	-30	0	-30

SRU inner ring rotational accuracy

unit : μm

Model	Inner ring radial/axial run-out tolerance		
	Grade P5	Grade P4	Grade P2
SRU42	4	3	2.5
SRU66	5	4	2.5
SRU85	5	4	2.5
SRU124	5	4	2.5
SRU148	6	5	2.5
SRU178	6	5	2.5
SRU228	8	6	5

SRU outer ring rotational accuracy

unit : μm

Model	Outer ring radial/axial run-out tolerance		
	Grade P5	Grade P4	Grade P2
SRU42	8	5	4
SRU66	10	6	5
SRU85	10	6	5
SRU124	12	8	5
SRU148	15	10	7
SRU178	15	10	7
SRU228	18	11	7

SRB inner ring rotational accuracy

unit : μm

Inner ring diameter (d) Nominal dimension (mm)		Inner ring radial run-out tolerance				Inner ring axial run-out tolerance			
Above	Below	Grade P0	Grade P5	Grade P4	Grade P2	Grade P0	Grade P5	Grade P4	Grade P2
18	30	12	4	3	2.5	12	4	3	2.5
30	50	12	5	4	2.5	13	5	4	2.5
50	80	15	5	4	2.5	15	5	4	2.5
80	120	20	6	5	2.5	20	6	5	2.5
120	150	20	8	6	2.5	20	8	6	2.5
150	180	25	8	6	5	25	8	6	5
180	250	25	10	8	5	25	10	8	5
250	315	35	13	10	-	35	13	10	-

SRBE inner ring rotational accuracy

unit : µm

Inner ring diameter (d) Nominal dimension (mm)		Inner ring radial run-out tolerance					Inner ring axial run-out tolerance				
		P0	P6	P5	P4	2P	P0	P6	P5	P4	P2
Above	Below	Maximum					Maximum				
-	20	13	8	4	3	2.5	13	8	4	3	2.5
20	30	15	10	5	4	2.5	15	10	5	4	2.5
30	35	15	10	5	4	2.5	15	10	5	4	2.5
35	50	20	10	5	4	2.5	20	10	5	4	2.5
50	65	20	10	5	4	2.5	20	10	5	4	2.5
65	80	25	13	6	5	2.5	25	13	6	5	2.5
80	100	25	13	6	5	2.5	25	13	6	5	2.5
100	120	30	18	8	6	2.5	30	18	8	6	2.5

SRBE outer ring rotational accuracy

unit : µm

Outer ring diameter (D) Nominal dimension (mm)		Outer ring radial run-out tolerance					Outer ring axial run-out tolerance				
		P0	P6	P5	P4	P2	P0	P6	P5	P4	P2
Above	Below	Maximum					Maximum				
50	60	20	10	7	5	2.5	20	10	7	5	2.5
60	80	25	13	8	5	4	25	13	8	5	4
80	95	25	13	8	5	4	25	13	8	5	4
95	120	35	18	10	6	5	35	18	10	6	5
120	140	35	18	10	6	5	35	18	10	6	5
140	150	40	20	11	7	5	40	20	11	7	5
150	165	40	20	11	7	5	40	20	11	7	5
165	180	45	23	13	8	5	45	23	13	8	5
180	210	45	23	13	8	5	45	23	13	8	5
200	240	50	25	15	10	7	50	25	15	10	7

SRAU inner ring rotational accuracy

unit : µm

Inner ring diameter (d) Nominal dimension (mm)		Inner ring radial run-out tolerance				Inner ring axial run-out tolerance			
Above	Below	P0	P6	P5	P4	P0	P6	P5	P4
-	18	10	-	-	-	10	-	-	-
18	40	13	-	-	-	13	-	-	-
40	65	13	10	5	4	13	10	5	4
65	80	15	10	5	4	15	10	5	4
80	100	15	13	6	5	15	13	6	5
100	120	20	13	6	5	20	13	6	5
120	140	25	18	8	6	25	18	8	6
140	180	25	18	8	6	25	18	8	6
180	200	30	20	10	8	30	20	10	8

SRAU outer ring rotational accuracy

unit : µm

Outer ring diameter (d) Nominal dimension (mm)		Outer ring radial run-out tolerance				Outer ring axial run-out tolerance			
Above	Below	P0	P6	P5	P4	P0	P6	P5	P4
-	65	13	-	-		13	-	-	
65	80	13	8	5		13	8	5	
80	100	15	10	6		15	10	6	
100	120	15	10	6		15	10	6	
120	140	20	11	7		20	11	7	
140	180	25	11	7		25	11	7	
180	200	25	15	10		25	15	10	
200	250	30	15	10		30	15	10	

Inner & Outer ring width tolerances

SRU Inner & Outer ring width tolerances

unit : µm

Model	Tolerances	
	Above	Below
SRU42	0	-70
SRU66	0	-70
SRU85	0	-70
SRU124	0	-70
SRU148	0	-70
SRU178	0	-80
SRU228	0	-80

SRB Inner & Outer ring width tolerances (for all grades)

unit : µm

Inner ring diameter (d) Nominal dimension (mm)		Tolerances		Tolerances	
		Inner Ring		Outer Ring	
Above	Below	Above	Below	Above	Below
18	30	0	-70	0	-90
30	50	0	-70	0	-90
50	80	0	-70	0	-90
80	120	0	-70	0	-90
120	150	0	-80	0	-100
150	180	0	-80	0	-100
180	250	0	-80	0	-100
250	315	0	-80	0	-130

SRBE Inner & Outer ring width tolerances

Tolerances	
Above	Below
0	-75

SRAU Inner & Outer ring width tolerances

Tolerances	
Above	Below
0	-120

Radial Clearances

SRU model radial clearance

unit : μm

Model	S1 Radial Clearance		C1 Radial Clearance	
	Minimum	Maximum	Minimum	Maximum
SRU42	-8	0	0	24
SRU66	-8	0	0	28
SRU85	-8	0	0	38
SRU124	-12	0	0	38
SRU148	-12	0	0	38
SRU178	-12	0	0	48
SRU228	-12	0	0	58

SRB、SRBE model radial clearance

unit : μm

Roller Pitch Circle Diameter (dp) (mm)		S1 Radial Clearance		C1 Radial Clearance	
Above	Below	Minimum	Maximum	Minimum	Maximum
18	30	-8	0	0	14
30	50	-8	0	0	24
50	80	-8	0	0	28
80	120	-8	0	0	38
120	140	-8	0	0	38
140	160	-10	0	0	38
160	180	-10	0	0	48
180	200	-10	0	0	48
200	225	-10	0	0	58
225	250	-10	0	0	58
250	280	-14	0	0	78
280	315	-14	0	25	98
315	355	-14	0	25	108

SRAU radial clearance

unit : μm

Roller Pitch Circle Diameter (dp) (mm)		S1 Radial Clearance		C1 Radial Clearance	
Above	Below	Minimum	Maximum	Minimum	Maximum
-	18	-	-	0	15
18	30	-	-	0	15
30	50	-	-	0	15
50	80	-8	0	0	15
80	120	-8	0	0	15
120	140	-8	0	0	15
140	160	-8	0	0	15
160	180	-10	0	0	20
180	200	-10	0	0	20
200	225	-10	0	0	20

SRU Model (One piece inner & outer ring)

Accuracy mark (*2)

Radial clearance mark (*1)

SRU124 UU S1 P2 B G X -N

Model number

Seal mark

If no mark is available: no seal
UU: seal on both sides
U: seal on outer ring counterbore hole side
UT: seal on outer ring opposite counterbore hole side

Accuracy symbol

If no mark is available: inner ring rotational accuracy
R: outer ring rotational accuracy
B: inner & outer ring rotational accuracy

Mounting hole orientation

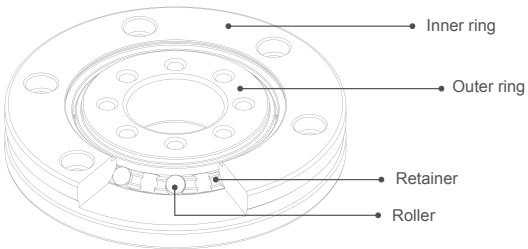
【For models : RU124~RU445 (except X models)】
No mark: the counterbore holes on inner and outer rings are in the same direction
G: The counterbore holes on inner and outer rings are in reverse direction

Inner ring mounting hole symbol

【For models : SRU124~SRU445】 No mark: counterbore hole on the inner ring.
Tapped holes (through holes)

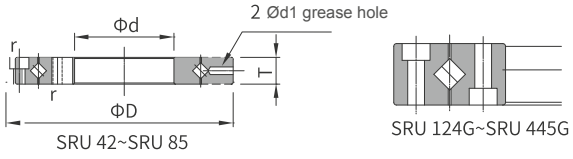
Option symbol

No mark: no nozzle attached
N: nozzle attached
SRU42~SRU178: NP3.2×3.5
SRU228~SRU445: NP6×5



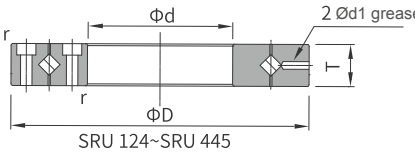
unit: mm

Shaft Diameter	Model Number	Main Dimensions					Shoulder Height		Basic Load Rating (Radial)		Mass
		Inner Diameter d	Outer Diameter D	Width T_1	Greasing Hole d1	Chamfer r_{min}	da	Dh	C kN	C_0 kN	kg
20	SRU42	20	70	12	3	0.5	36	46	7.3	8.33	0.28
35	SRU66	35	95	15	3	0.5	58	75	17.53	22.31	0.6
55	SRU85	55	120	15	3	0.5	78	94	20.31	29.55	1.1
80	SRU124(G) SRU124X	80	165	22	3	1	115	133	33	50.85	2.61
90	SRU148(G) SRU148X	90	210	25	3	1.5	134	161	49	76.83	4.95
115	SRU178(G) SRU178X	115	240	28	3	1.5	162	194	80.32	134.9	6.78
160	SRU228(G) SRU228X	160	295	35	6.1	2	207	247	103.5	172.8	10.5

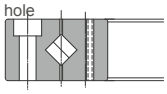


SRU 42~SRU 85

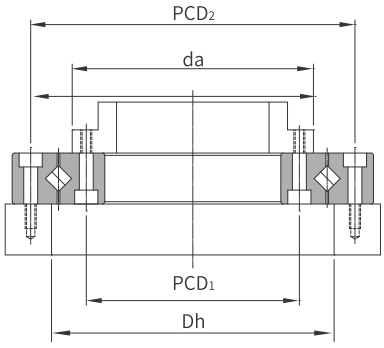
SRU 124G~SRU 445G

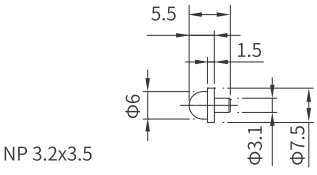


SRU 124~SRU 445

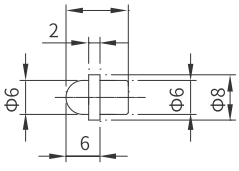


SRU 124X~SRU 445X

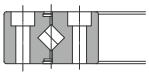




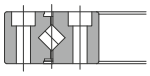
NP 3.2x3.5



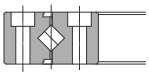
NP 6x5



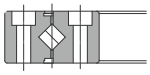
SRU



SRU…U



SRU…UU



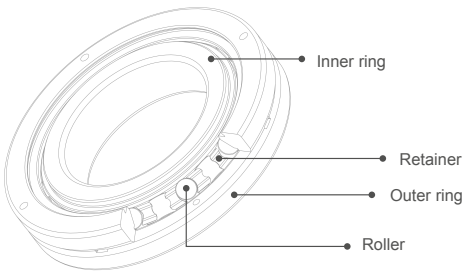
SRU…UT

Mounting Hole Specification			
Inner Ring		Outer Ring	
PCD1	Mounting Hole	PCD2	Mounting Hole
28	6-M3 Through	57	6-Ø3.5 Through，Ø6 hole depth 3.5
45	8-M4 Through	83	8-Ø4.5 Through，Ø8 hole depth 4.5
65	8-M5 Through	105	8-Ø5.5 Through，Ø10 hole depth 5.5
97	10-Ø5.5 Through ，Ø10 hole depth 5.5 10-M5 Through	148	10-Ø5.5 Through，Ø10 hole depth 5.5
112	12-Ø9.0Through ，Ø14 hole depth 8.5 12-M8 Through	187	12-Ø9.0 Through，Ø14 hole depth 8.5
139	12-Ø9.0 Through ，Ø14 hole depth 8.5 12-M8 Through	217	12-Ø9.0 Through，Ø14 hole depth 8.5
184	12-Ø11 Through，Ø18 hole depth 10.5 12-M10Through	270	12-Ø11 Through，Ø18 hole depth 40.5

SRB Model (Outer ring split type)

SRB20030 UU S1 P2

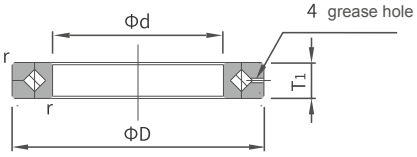
- SRB20030: Model number
- UU: Seal mark
  - If no mark is available: no seal
  - UU: seal on both sides
  - U: seal on either side
- S1: Radial clearance mark (*1)
  - S1: Preloaded (negative clearance)
  - C1: No preload (positive clearance)
- P2: Accuracy mark (*2)
  - if no mark is available: ordinary grade (0 grade)
  - P5： rotating accuracy grade 5
  - PS5：rotating accuracy grade 5+size accuracy grade 5
  - P4: rotating accuracy grade 4
  - PS4: rotating accuracy grade 4 +size accuracy grade 4
  - P2: rotating accuracy grade 2
  - PS2: rotating accuracy grade 2 + size accuracy grad 2

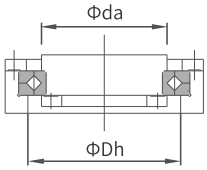


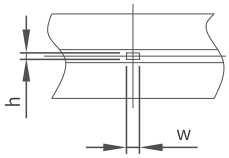
unit: mm

Shaft Diameter	Model Number	Main Dimensions						Shoulder Height		Basic Load Rating (Radial)		Mass
		Inner Diameter d	Outer Diameter D	Width T_1	Greasing Hole w	Greasing Hole h	Chamfer r_{min}	da	Dh	C kN	C_0 kN	kg
20	SRB2008	20	36	8	2.1	0.7	0.5	24	30	3.2	3.1	0.06
25	SRB2508	25	41	8	2.1	0.7	0.5	29	35	3.6	3.8	0.07
30	SRB3010	30	55	10	2.6	0.8	0.6	37.5	46.5	7.4	8.4	0.14
35	SRB3510	35	60	10	2.6	0.8	0.6	41.5	51	7.6	9.1	0.12
40	SRB4010	40	65	10	2.6	0.8	0.6	47	58	8.3	10.8	0.18
45	SRB4510	45	70	10	2.6	0.8	0.6	51.5	61	8.6	11.1	0.15
50	SRB5013	50	80	13	2.6	1.5	0.6	57	72.5	16.6	20.7	0.28
60	SRB6013	60	90	13	2.6	1.5	0.6	67.5	82.5	18	24.1	0.32
70	SRB7013	70	100	13	2.6	1.5	0.6	78.5	91.5	19.5	27.9	0.37
80	SRB8016	80	120	16	3.1	1.5	0.8	91.5	110	30	42	0.72
90	SRB9016	90	130	16	3.1	1.5	1.0	98.8	117	31.3	45.1	0.77
100	SRB10016	100	140	16	3.6	1.5	1.0	110	128	31.8	48.8	0.82
100	SRB10020	100	150	20	3.6	1.5	1.0	117	132	33	51	1.47
110	SRB11012	110	135	12	2.6	0.8	0.6	118	126	12.6	24	0.42
110	SRB11015	110	145	15	3.6	1.5	0.6	123	135	23.8	41.8	0.76
110	SRB11020	110	160	20	3.6	1.5	1.0	121	139	34	54	1.58
120	SRB12016	120	150	16	3.6	1.5	0.8	128	140	24.3	43.4	0.74
120	SRB12025	120	180	25	3.6	2.1	1.5	134	163	66.8	100.2	2.62

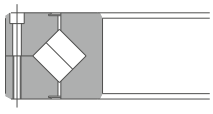
Note) (w) and (h) greasing hole dimensions in the detailed view are reference values.



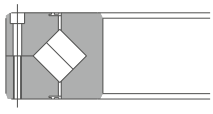




grease hole detailed view



SRB



SRB...UU

unit: mm

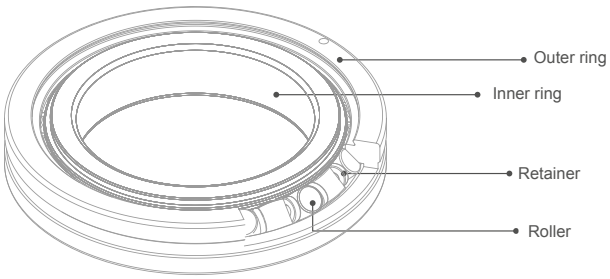
Shaft Diameter	Model Number	Main Dimensions						Shoulder Height		Basic Load Rating (Radial)		Mass
		Inner Diameter d	Outer Diameter D	Width T_1	Greasing Hole w	Greasing Hole h	Chamfer r_{min}	da	Dh	C kN	C_0 kN	kg
130	SRB13015	130	160	15	3.6	1.5	0.8	136	151	25	46.9	0.74
130	SRB13025	130	190	25	3.6	2.1	1.2	144	173	69.7	107.3	2.8
140	SRB14016	140	175	16	2.6	1.5	0.8	148	163	26	50.3	1.1
140	SRB14025	140	200	25	3.6	2.1	1.2	155	184	74.7	121	2.98
150	SRB15013	150	180	13	2.6	1.5	0.5	158	171	27.1	53.7	0.66
150	SRB15025	150	210	25	3.6	2.1	1.2	165	193	76.5	128	3.18
150	SRB15030	150	230	30	4.6	3.1	1.5	174	210	100	156	5.2
160	SRB16025	160	220	25	3.6	2.1	1.2	172	205	81.6	135	3.12
170	SRB17020	170	220	20	3.6	1.5	1.2	185	197	29.2	62	2.2
180	SRB18025	180	240	25	3.6	1.8	1.2	196	224	84.3	143	3.41
190	SRB19025	190	240	25	3.6	1.5	0.8	203	221	41.8	82.7	2.97
200	SRB20025	200	260	25	3.6	1.8	1.8	214	246	84.1	157	4.2
200	SRB20030	200	280	30	4.6	2.8	1.8	222	257	113	202	6.8
200	SRB20035	200	295	35	5.1	2.8	1.8	224	271	151	251	9.8
220	SRB22025	220	280	25	3.6	1.8	1.8	236	264	92.1	173	4
240	SRB24025	240	300	25	3.6	1.8	2.2	255	282	68.4	146	4.7
250	SRB25025	250	310	25	3.6	1.8	2.2	264	291	69.2	152	5.2

Note) (w) and (h) greasing hole dimensions in the detailed view are reference values.

SRBE Model (One piece inner & outer ring)

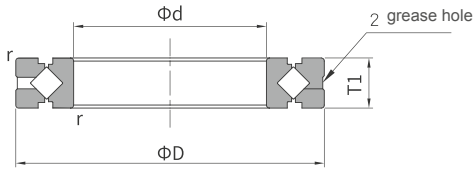
SRBE20030 **UU** **S1** **P2**

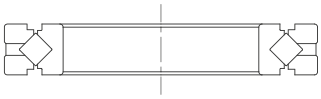
- **SRBE20030** — Model number
- **UU** — Seal mark
  - If no mark is available: no seal
  - UU: seal on both sides
  - U: seal on either side
- **S1** — Radial clearance mark (*1)
  - S1: Preloaded (negative clearance)
  - C1: No preload (positive clearance)
- **P2** — Accuracy mark (*2)
  - if no mark is available: ordinary grade (0 grade)
  - P5： rotating accuracy grade 5
  - PS5：rotating accuracy grade 5+size accuracy grade 5
  - P4: rotating accuracy grade 4
  - PS4: rotating accuracy grade 4 +size accuracy grade 4
  - P2: rotating accuracy grade 2
  - PS2: rotating accuracy grade 2 + size accuracy grad 2



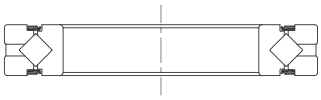
unit: mm

Shaft Diameter	Model Number	Main Dimensions					Shoulder Height		Basic Load Rating (Radial)		Mass
		Inner Diameter d	Outer Diameter D	Width T_1	Greasing Hole	Chamfer r_{min}	da	Dh	C kN	C_0 kN	kg
20	SRBE2008	20	36	8	2-Φ2	0.5	24	30	3.2	3.1	0.06
25	SRBE2508	25	41	8	2-Φ2	0.5	29	35	3.6	3.8	0.07
30	SRBE3010	30	55	10	2-Φ2	0.6	37.5	46.5	7.4	8.4	0.14
35	SRBE3510	35	60	10	2-Φ2	0.6	41.5	51	7.6	9.1	0.12
40	SRBE4010	40	65	10	2-Φ2	0.6	47	58	8.3	10.8	0.18
45	SRBE4510	45	70	10	2-Φ2	0.6	51.5	61	8.6	11.1	0.15
50	SRBE5013	50	80	13	2-Φ3	0.6	57	72.5	16.6	20.7	0.28
60	SRBE6013	60	90	13	2-Φ3	0.6	67.5	82.5	18	24.1	0.32
70	SRBE7013	70	100	13	2-Φ3	0.6	78.5	91.5	19.5	27.9	0.37
80	SRBE8016	80	120	16	2-Φ3	0.8	91.5	110	30	42	0.72
90	SRBE9016	90	130	16	2-Φ3	1.0	98.8	117	31.3	45.1	0.77
100	SRBE10016	100	140	16	2-Φ3	1.0	110	128	31.8	48.8	0.82
100	SRBE10020	100	150	20	2-Φ3	1.0	117	132	33	51	1.47
110	SRBE11012	110	135	12	2-Φ3	0.6	118	126	12.6	24	0.42
110	SRBE11015	110	145	15	2-Φ3	0.6	123	135	23.8	41.8	0.76
110	SRBE11020	110	160	20	2-Φ3	1.0	121	139	34	54	1.58
120	SRBE12016	120	150	16	2-Φ3	0.8	128	140	24.3	43.4	0.74
120	SRBE12025	120	180	25	2-Φ3	1.5	134	163	66.8	100.2	2.62

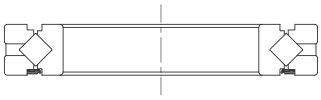




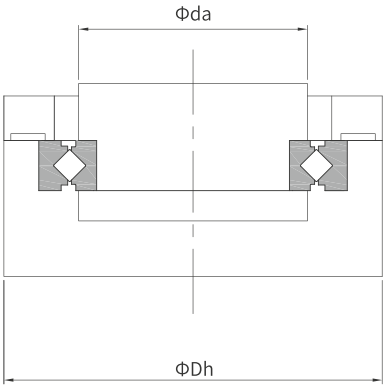
SRBE



SRBE - UU



SRBE - U



unit: mm

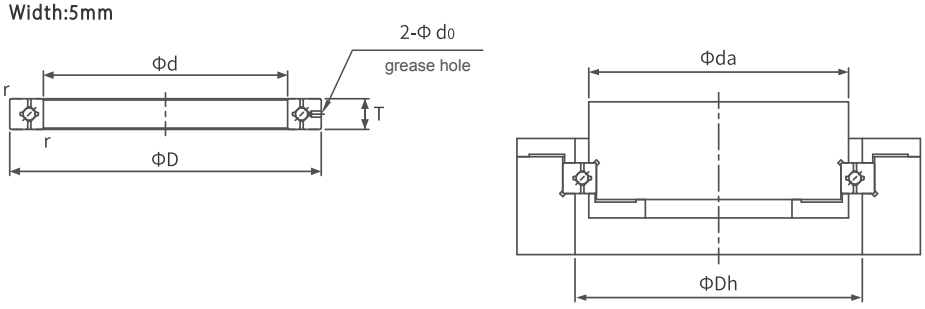
Shaft Diameter	Model Number	Main Dimensions					Shoulder Height		Basic Load Rating (Radial)		Mass
		Inner Diameter d	Outer Diameter D	Width T_1	Greasing Hole	Chamfer r_{min}	da	Dh	C kN	C_0 kN	kg
130	SRBE13015	130	160	15	2-Φ3	0.8	136	151	25	46.9	0.74
130	SRBE13025	130	190	25	2-Φ3	1.2	144	173	69.7	107.3	2.8
140	SRBE14016	140	175	16	2-Φ3	0.8	148	163	26	50.3	1.1
140	SRBE14025	140	200	25	2-Φ3	1.2	155	184	74.7	121	2.98
150	SRBE15013	150	180	13	2-Φ3	0.5	158	171	27.1	53.7	0.66
150	SRBE15025	150	210	25	2-Φ3	1.2	165	193	76.5	128	3.18
150	SRBE15030	150	230	30	2-Φ3	1.5	174	210	100	156	5.2
160	SRBE16025	160	220	25	2-Φ3	1.2	172	205	81.6	135	3.12
170	SRBE17020	170	220	20	2-Φ3	1.2	185	197	29.2	62	2.2
180	SRBE18025	180	240	25	2-Φ3	1.2	196	224	84.3	143	3.41
190	SRBE19025	190	240	25	2-Φ3	0.8	203	221	41.8	82.7	2.97
200	SRBE20025	200	260	25	2-Φ3	1.8	214	246	84.1	157	4.2
200	SRBE20030	200	280	30	2-Φ3	1.8	222	257	113	202	6.8
200	SRBE20035	200	295	35	2-Φ3	1.8	224	271	151	251	9.8
220	SRBE22025	220	280	25	2-Φ3	1.8	236	264	92.1	173	4
240	SRBE24025	240	300	25	2-Φ3	2.2	255	282	68.4	146	4.7
250	SRBE25025	250	310	25	2-Φ3	2.2	264	291	69.2	152	5.2

SRAU Model (One piece inner & outer ring)

SRAU8008 UU S1 P5 B

- **SRAU8008** — Model number
- **UU** — Seal mark
  - If no mark is available: no seal
  - UU: seal on both sides
  - U: seal on either side
- **S1** — Radial clearance mark (*1)
  - S1: Preloaded (negative clearance)
  - C1: No preload (positive clearance)
- **P5** — Accuracy mark (*2)
  - if no mark is available: ordinary grade (0 grade)
  - P6： rotating accuracy grade 6
  - P5：rotating accuracy grade 5
  - P4: rotating accuracy grade 4
- **B** — Accuracy symbol
  - If no mark is available: inner ring rotational accuracy
  - R: outer ring rotational accuracy
  - B: inner & outer ring rotational accuracy

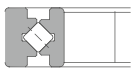
Width:5mm



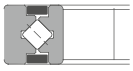
unit: mm

Shaft Diameter	Model Number	Main Dimensions						Shoulder Height		Basic Load Rating (Radial)		Mass
		ID d	OD D	Pitch Circle Diameter dp	Width T	Greasing Hole d0	Chamfer r min	da	Dh	C kN	C0 kN	kg
20	SRAU2005	20	31	24.7	5	1.5	0.15	22.5	27	1.49	1.4	0.015
30	SRAU3005	30	41	34.7	5	1.5	0.15	32.5	37	1.89	2.14	0.021
40	SRAU4005	40	51	44.7	5	1.5	0.15	42.5	47	2.14	2.74	0.027
50	SRAU5005	50	61	54.7	5	1.5	0.15	52.5	57	2.43	3.49	0.032
60	SRAU6005	60	71	64.7	5	1	0.15	62.5	67	2.63	4.09	0.038
70	SRAU7005	70	81	74.7	5	1	0.15	72.5	77	2.81	4.68	0.044
80	SRAU8005	80	91	84.7	5	1.5	0.15	82.5	87	3.05	5.43	0.5
90	SRAU9005	90	101	94.5	5	1	0.15	92.5	97	3.19	6.03	0.056
100	SRAU10005	100	111	104.7	5	1	0.15	102.5	107	3.37	6.63	0.061

unit: mm

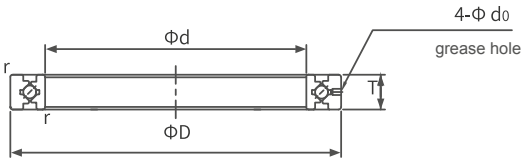


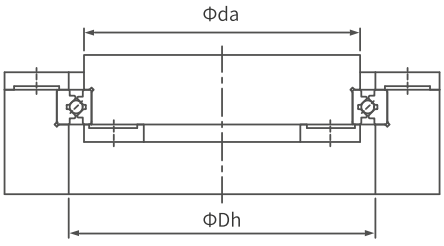
SRAU Model



SRAU...UU Model

Width:8mm.13mm





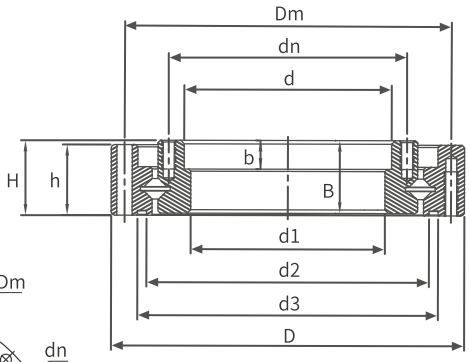
unit: mm

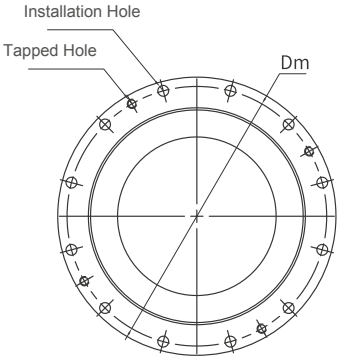
Shaft Diameter	Model Number	Main Dimensions						Shoulder Height		Basic Load Rating (Radial)		Mass
		ID d	OD D	Pitch Circle Diameter dp	Width T	Greasing Hole d0	Chamfer rmin	da	Dh	C kN	C0 kN	kg
50	SRAU5008	50	66	57	8	1.5	0.5	51.5	60.5	5.1	7.19	0.08
60	SRAU6008	60	76	67	8	1.5	0.5	53.5	70.5	5.68	8.68	0.09
70	SRAU7008	70	86	77	8	1.5	0.5	73.5	80.5	5.98	9.8	0.1
80	SRAU8008	80	96	87	8	1.5	0.5	83.5	90.5	6.37	11.3	0.11
90	SRAU9008	90	106	97	8	1.5	0.5	93.5	100.5	6.76	12.4	0.12
100	SRAU10008	100	116	107	8	1.5	0.5	103.5	110.5	7.15	13.9	0.14
110	SRAU11008	110	126	117	8	1.5	0.5	113.5	120.5	7.45	15	0.15
120	SRAU12008	120	136	127	8	1.5	0.5	123.5	130.5	7.84	16.5	0.17
130	SRAU13008	130	146	137	8	1.5	0.5	133.5	140.5	7.94	17.6	0.18
140	SRAU14008	140	156	147	8	1.5	0.5	143.5	150.5	8.33	19.1	0.19
150	SRAU15008	150	166	157	8	1.5	0.5	153.5	160.5	8.82	20.6	0.2
160	SRAU16013	160	186	172	13	2	0.8	165	179	23.3	44.9	0.59
170	SRAU17013	170	196	182	13	2	0.8	175	189	23.5	46.5	0.64
180	SRAU18013	180	206	192	13	2	0.8	185	199	24.5	49.8	0.68
190	SRAU19013	190	216	202	13	2	0.8	195	209	24.9	51.5	0.69
200	SRAU20013	200	226	212	13	2	0.8	205	219	25.8	54.5	0.71

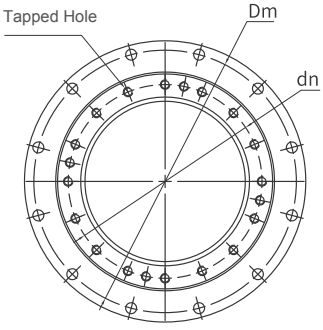
SSHF Model (One piece inner & outer ring)

SSHF14

Model number







SLT

unit: mm

Model Number	Main Dimensions								
	D	d	d1	d2	d3	H	h	B	b
SSHF14	70	38	36	53	57	15.1	14.1	14.7	5
SSHF17	80	47	45.5	64	68.1	17	16	16.5	6.5
SSHF20	90	54	51.3	72.6	78	18.5	17.5	17.5	7
SSHF25	110	67	64.2	90	94.8	20.7	19.7	19.7	7.5
SSHF32	142	88	84	117.5	123	24.4	23.4	22.9	8

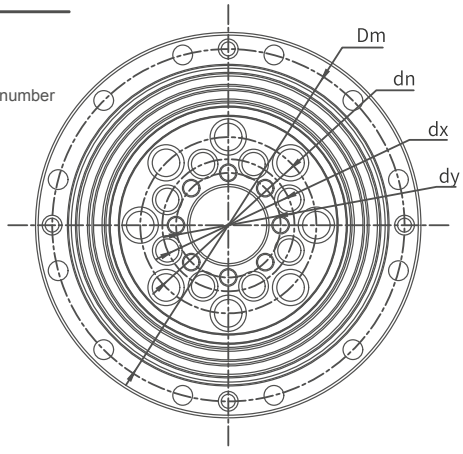
unit: mm

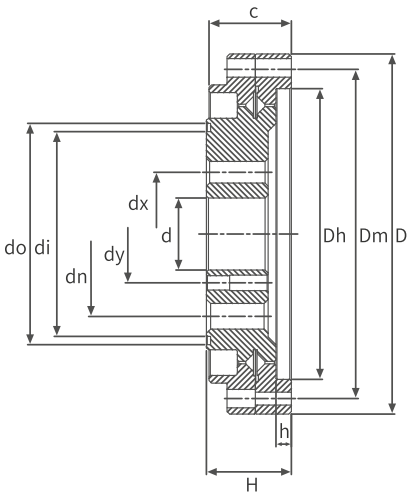
Model Number	Installation Hole Dimension (PCD&PEC)					Basic Load Rating (Radial)		Mass
	Inner Ring			Outer Ring		C kN	C0 kN	kg
	Dm	Installation Hole	Tapped Hole	dn	Tapped Hole			
SSHF14	64	8-Φ3.5	2-M3	44	12-M3	6	14	0.1
SSHF17	74	12-Φ3.5	4-M3	54	20-M3	9.5	16.3	0.34
SSHF20	84	12-Φ3.5	4-M3	62	4-M3 16-M3	20	31	0.45
SSHF25	102	12-Φ4.5	4-M3	77	4-M3 16-M4	28.7	45.3	0.7
SSHF32	132	12-Φ5.5	4-M4	100	8-M4 16-M5	47.5	77.1	1.55

SCSG Model (Outer ring split type)

SCSG14

Model number





unit: mm

Model Number	Main Dimensions								Basic Load Rating (Radial)		Mass
	D	Dh	d	do	di	H	h	C	Cr kN	Cor kN	kg
SCSG14	55	41.8	11	29.7	28.3	16.5	2.5	16	7	9	0.13
SCSG17	62	49	10	36	33.8	16.5	2.7	16	7.4	10.5	0.22
SCSG20	70	56.5	14	43	39.8	16.5	3	16	8.6	13.5	0.2
SCSG25	85	68	20	55.4	52.5	18.5	2	18	13.6	21.5	0.45
SCSG32	112	90	26	74.1	68.4	22.5	3	21.5	12.5	36.5	0.88

unit: mm

Model Number	Installation Hole Size (PCD&PEC)							
	Outer Ring		Inner Ring					
	Dm	Installation Hole	dn	Tapped Hole	dx	Tapped Hole	dy	Hole Size
SCSG14	49	8-Φ3.5	23	6-M4	17	6-M4	15	6-Φ2.5
SCSG17	56	10-Φ3.5	27	6-M5	19	6-M5	15	6-Φ3
SCSG20	64	12-Φ3.5	32	8-M6	24	8-M5	19	8-Φ3
SCSG25	79	16-Φ3.5	42	8-M8	30	8-M6	26	8-Φ3
SCSG32	104	16-Φ4.5	55	8-M10	40	8-M8	34	4-Φ5

Gonio way

SFT Gonio Way is a non-circulating, curved cross roller slide way, and the precision rollers that have extremely low friction resistance provide a stable arc movement. They are mainly used in high-precision positioning where rotation centers remain unchanged and accurate tilting angles are required. They are widely used to meet the purposes of optical instruments and measuring devices.

Product features

- High rigidity and load capacity
- Same rotation centers
- Low friction and accurate movement
- Easy installation
- Low noise

Accuracy

SFT Gonio Way accuracy is measured by the method shown in the following figure which measures the mutual dimensional deviations of the four rails along their full length.

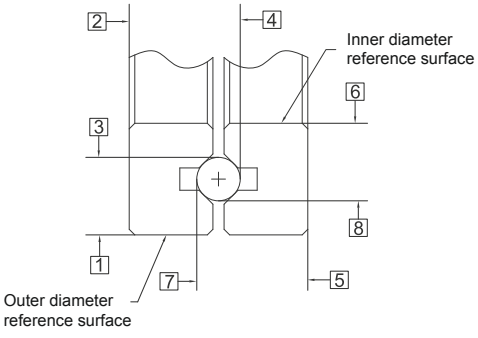
Accuracy measurement method

unit : μm

Model Number	Accuracy
SRV0240-50	10
SRV0260-60	
SRV0370-90	
SRV0370-110	
SRV03100-160	

unit : μm

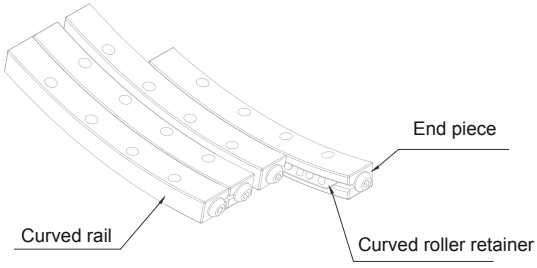
Model Number	Accuracy
SCRV0240-51	10
SCRV0240-70	
SCRV0240-89.5	
SCRV0260-65	
SCRV0260-89	
SCRV0260-113.5	
SCRV0260-138.5	



SRV Model

SRV 03 70 - 110 - 10G

- SRV — SRV model
- 03 — Roller diameter
- 70 — Rail length
- 110 — Radius from rotation center
- 10G — Number of rollers



◆ One set contains 4 rails, 2 curved roller retainers and 8 end pieces.

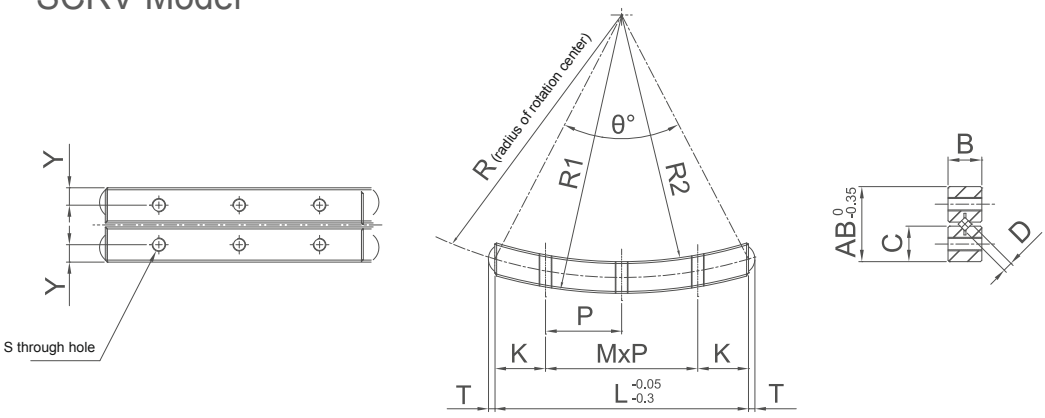
unit: mm

Model Number	Rotation range	Roller diameter (D)	Roller quantity (G)	Main dimensions						
				L	R	R1	R2	A	B	C
SRV0240-50-7G	±10°	2	7	40	50	53	47	15	6	7.25
SRV0260-60-12G	±10°	2	12	60	60	63	57	15	6	7.25
SRV0370-90-11G	±10°	3	11	70	90	94	86	18	8	8.5
SRV0370-110-10G	±10°	3	10	70	110	114	106	18	8	8.5
SRV03100-160-14G	±10°	3	14	100	160	164	156	18	8	8.5

unit : μm

Model Number	Weight per set (g)	Allowable load (F)(N)	Basic load rating		θ°	T	S	Y	K	MxP
			Static (C_0)(N)	Dyanmic (C)(N)						
SRV0240-50-7G	47	480	1420	800	47.1°	1.5	M3	2.5	7.5	2x12.5
SRV0260-60-12G	78	930	2870	1430	59.9°	1.5	M3	2.5	11.25	3x12.5
SRV0370-90-11G	135	1820	5480	2620	45.7°	1.9	M3	3	12.5	3x15
SRV0370-110-10G	131	1800	5600	2420	37°	1.9	M3	3	12.5	3x15
SRV03100-160-14G	191	2600	7870	2480	36.3°	1.9	M3	3	12.5	5x15

SCRV Model



unit: mm

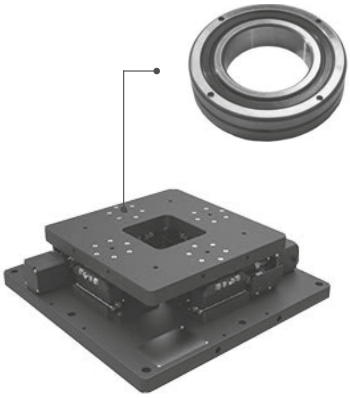
Model Number	Rotation range	Roller diameter (D)	Roller quantity (G)	Main dimensions						
				L	R	R1	R2	A	B	C
SCRV0240-51-7G	±8°	2	7	40	51	53.5	48.5	11.3	5	5.25
SCRV0240-70-7G	±6°	2	7	40	70	72.5	67.5	11.3	5	5.25
SCRV2040-89.5-7G	±5°	2	7	40	89.5	92	87	11.3	5	5.25
SCRV0260-65-11G	±8°	2	11	60	65	68	62	16	6	7.6
SCRV0260-89-11G	±8°	2	11	60	89	92	86	16	6	7.6
SCRV0260-113.5-11G	±6°	2	11	60	113.5	116.5	110.5	16	6	7.6
SCRV0260-138 5-9G	±5°	2	9	60	138 5	141.5	135.5	16	6	7.6

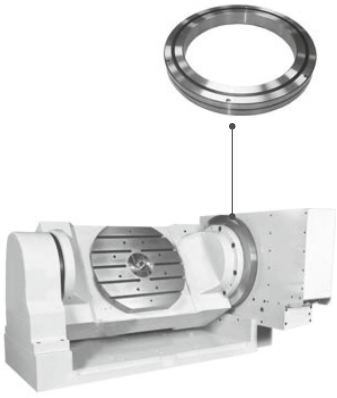
unit: mm

Model Number	Weight per set (g)	Allowable load (F)(N)	Basic load rating		θ°	T	S	Y	K	MxP
			Static (C_0)(N)	Dyanmic (C)(N)						
SCRV0240-51-7G	29	480	1420	800	46.2°	1.5	M2	2.0	8	2x12
SCRV0240-70-7G	29	480	1420	800	33.2°	1.5	M2	2.0	8	2x12
SCRV0240-89.5-7G	29	480	1420	800	25.8°	1.5	M2	2.0	8	2x12
SCRV0260-65-11G	79	853	2629	1320	55°	1.5	M3	2.5	11.25	3x12.5
SCRV0260-89-11G	77	853	2629	1320	39.4°	1.5	M3	2.5	11.25	3x12.5
SCRV0260-113.5-11G	77	853	2629	1320	30.7°	1.5	M3	2.5	11.25	3x12.5
SCRV0260-138.5-9G	77	853	2629	1320	25 °	1.5	M3	2.5	11.25	3x12.5

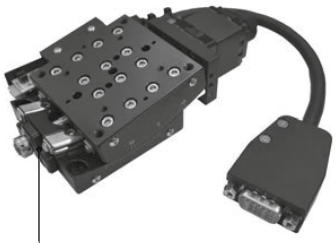
Application examples

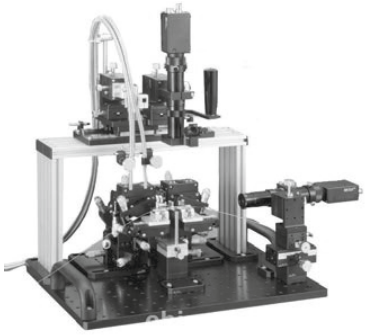
Cross roller bearings（SRB、SRU）

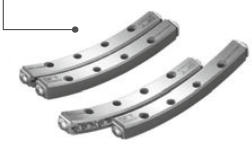


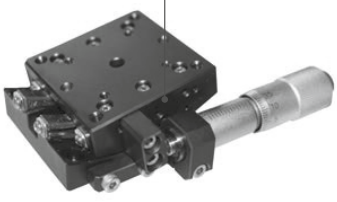


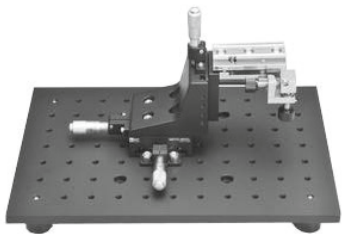
Gonio ways



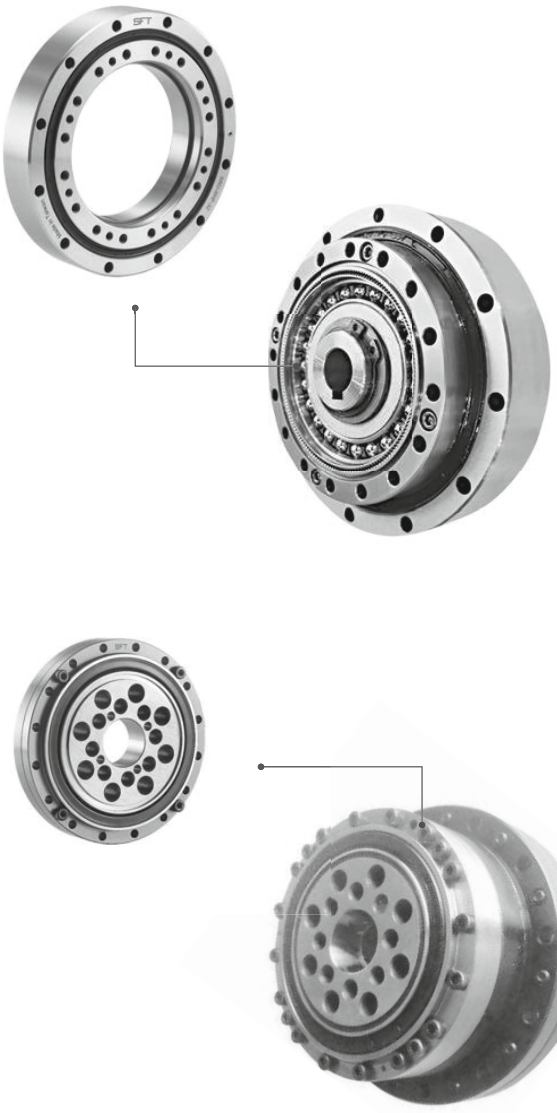








Strain wave gear cross roller bearings



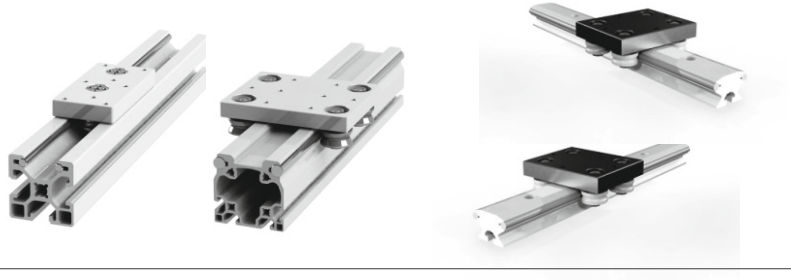
Aluminium Profiles & Systems

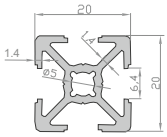
Aluminium Profiles

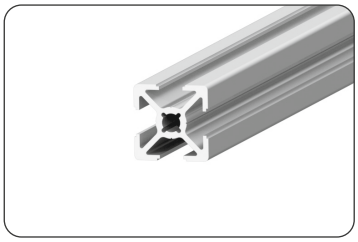
Accessories

Applications

Aluminium Profile Linear Systems







20x20 Alu-Profile
Produkt ID:1.1.06.020020.01

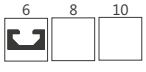
Geeignet für Kabinenbau,Panos,Tabeln,Vitrinen ect. Bietet optimale und praktische Lösungen an..

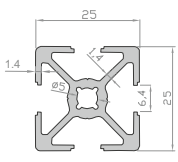
20x20 Industrial Profile
Code:1.1.06.020020.01

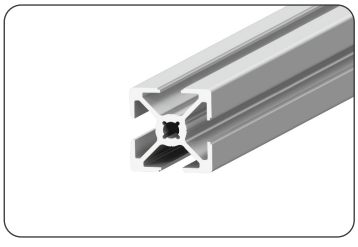
It provides considerable practical solutions for optimized constructions such as panels, signboards, display cabinets etc.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.020020.01	20x20	6063	0,61cm^4	0,61cm^4	0,61cm^3	0,61cm^3	1,42cm^2	0,36 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







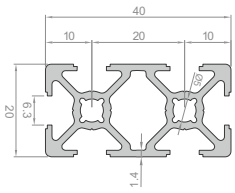
25x25 Alu-Profile
Produkt ID:1.1.06.025025.01

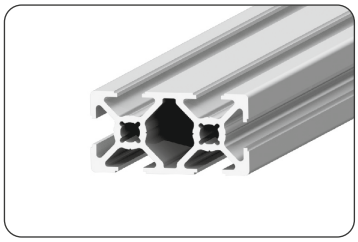
Es eignet sich für nicht unter Vibration oder Schlag stehende Bereiche wie z.B. Leichte Öfnungen, Rahmen, Panos ect.

25x25 Industrial Profile
Code:1.1.06.025025.01
It is suitable for panels, frames and light covers which are not for aplications with impact or vibration.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.025025.01	25x25	6063	1,39cm^4	1,39cm^4	1,11cm^3	1,11cm^3	2,12cm^2	0,55 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





20x40 Alu-Profil
Produkt ID:1.1.06.020040.01

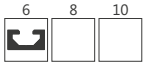
Dieses Profil wird bei Gerätengehäuse, Systemeinhausungen, Vitrine,Stände, Panos ect. angewendet.

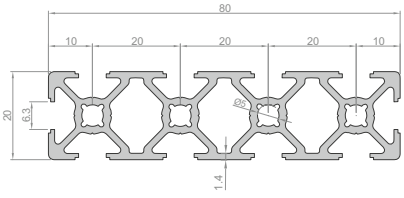
20x40 Industrial Profile
Code:1.1.06.020040.01

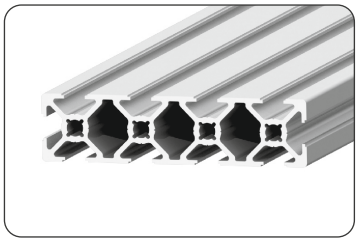
It is used in production of cabinets of devices, and applications such as stand and panels

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.020040.01	20x40	6063	4,17cm^4	1,12cm^4	2,08cm^3	1,12cm^3	2,6cm^2	0,73 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







20x80 Alu-Profil
Produkt ID:1.1.06.020080.01

Anwendungsgebiet : Frontplatte von Arbeitstische, Trennwände,Schränke,Transpotwagen etc.

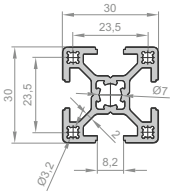
20x80 Industrial Profile
Code:1.1.06.020080.01

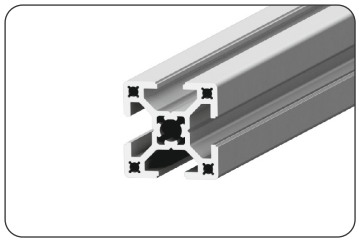
It is suitable for using on study tables front plates, division panels, cabinets and service carts.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.020080.01	20x80	6063	29,14cm^4	2,12cm^4	7,28cm^3	2,12cm^3	4,88cm^2	1,32 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

Design



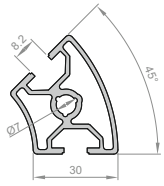


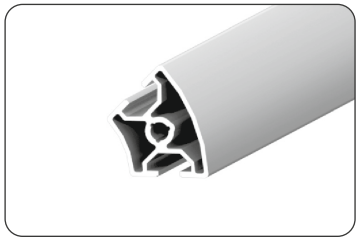
30x30 Alu-Profile
Produkt ID: 1.1.08.030030.02
Dieses Profil wird überwiegend bei Maschinengestelle verwendet. Es wird auch bei Leichtkonstruktionen benutzt, wie Panos, Vitrine, Ausstellungsstände ect

30x30 Industrial Profile
Code: 1.1.08.030030.02
It is mostly used in production of machine cabinets. 30x30 profiles are also preferred light constructions. Other usage of this profile are panels, display cases and stands.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.030030.02	30X30	6063	2,95cm^4	2,95cm^4	1,97cm^3	1,97cm^3	3,16cm^2	0,85 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



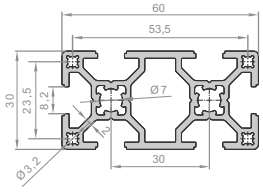


30x45 Winkelprofil
Produkt ID: 1.1.08.030045.08
Der Winkel beträgt 45 Grad. Das Profil kann leicht integriert werden. Wenn bei der Konstruktion Ästhetik bevorzugt wird ist dieses Profil eine gute Lösung.

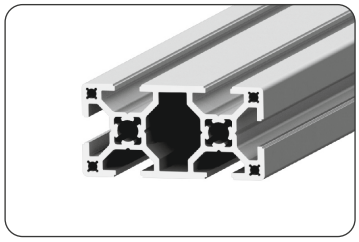
30x45 Angled Profile
Code: 1.1.08.030045.08
The profile that has 45 degree surface is easy to install. Your machine cabinets and tables can have better appearance through its aesthetic.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.030045.08	30x45 Winkelprofil	6063	3,02cm^4	4,57cm^4	2,1cm^3	2,2cm^3	3,35cm^2	0,91 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU
Design



30x60 Alu-Profil
Produkt ID: 1.1.08.030060.02

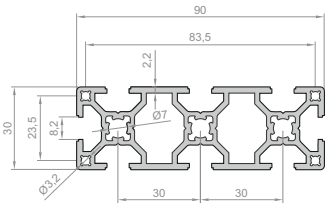
Dieses Profil wir bei leichte Maschinengestelle, öffnungsgerüste von Kabinen, Schieberöffnungen etc. verwendet. Andere Anwendungsbereiche sind, Sicherheitseinrichtungen, Laboreinheiten, Automationsgruppen und Sonderfördertechnik.

30x60 Industrial Profile
Code: 1.1.08.030060.02

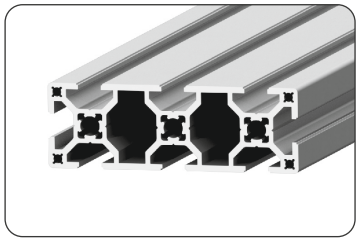
It's used in the production of light machine frames, cabin applications, body side of cabin covers, sliding covers. It is often used on protection hardware, laboratory mechanisms, automation group constructions and special conveyor chassis.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			Ix	Iy	Wx	Wy		
1.1.08.030060.02	30X60	6063	20,12cm^4	5,46cm^4	6,71cm^3	3,64cm^3	5,59cm^2	1,51 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU
Design



30x90 Alu-Profil
Produkt ID: 1.1.08.030090.02

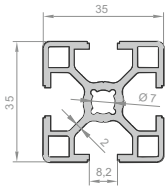
Mit drei T-Nuten design bietet das Profil breite Oberfläche zur Verbindungsmöglichkeit an. Es wird bei Maschinengestelle, und seitlichegerüst von Sonderförderer angewendet. der kreisförmige Lager im mittlerer Bereich bietet mehr Anwendungsmöglichkeiten an.

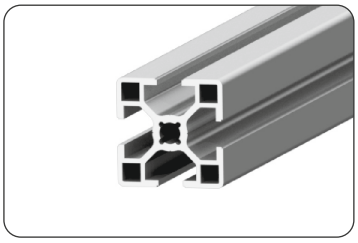
30x90 Industrial Profile
Code: 1.1.08.030090.02

Triple canal feature provides wide connection area. This profile can be used as the body side profile of machinery frames and conveyor frames. The housing hole provides several usage opportunities on the center.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			Ix	Iy	Wx	Wy		
1.1.08.030090.02	30X90	6063	63,29cm^4	7,99cm^4	14,06cm^3	5,32cm^3	8,12cm^2	2,19 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





35x35 Light Alu-Profil
Produkt ID: 1.1.08.035035.02

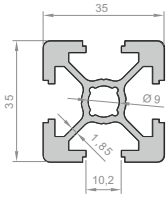
Das Profil wird bei Kleinmaschinenkonstruktionen und Schutzeinhausungen verwendet. Die mit "Light " gekennzeichnete Profile ermöglichen kostengünstige Lösungen für Ihre Projekte.

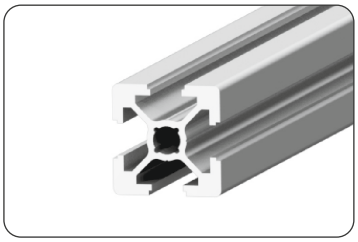
35x35 Industrial Light Profile
Code: 1.1.08.035035.02

It is used on producing of protection cabinets on light machine constructions. The applications that is made of light profiles provide cost advantage.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.035035.02	35X35 Light	6063	4,55cm^4	4,55cm^4	2,6cm^3	2,6cm^3	3,67cm^2	0,98 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





35x35 Heavy Alu-Profil
Produkt ID: 1.1.10.035035.01

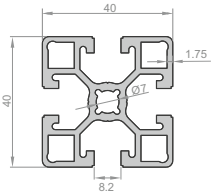
Dieses Profil wird durch seine starke Schnittfläche mehr im Bereich Fördererfüße, Gefächer, Montagetische ect. verwendet,

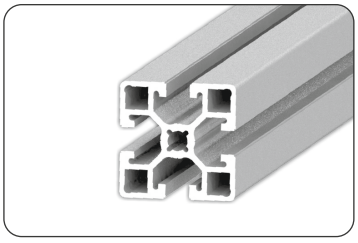
35x35 Industrial Heavy Profile
Code: 1.1.10.035035.01

It's strong structure and design is suitable for using under heavy weight. It is mostly used on conveyor feet and working tables.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.035035.01	35x35 Heavy	6063	6,7cm^4	6,7cm^4	3,8cm^3	3,8cm^3	4,92cm^2	1,29 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





40x40 Light Alu-Profil
Produkt ID: 1.1.08.040040.02

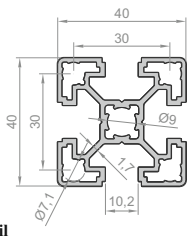
Es wird überwiegend bei leichte Maschinenkonstruktionen und Schutzkabinen verwendet. Bei "Light" bezeichnete Profile sind kostengünstig.

40x40 Industrial Light Profile
Code: 1.1.08.040040.02

It is used on producing of protection cabinets on light machine constructions. The applications that is made of light profiles provide cost advantage.

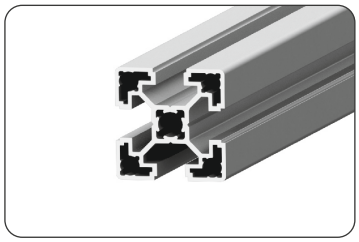
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.040040.02	40x40 Light (K8)	6063	14,9cm^4	14,9cm^4	5,8cm^3	5,8cm^3	7,29cm^2	1,38 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU

Design



40x40 Light Alu-Profil
Produkt ID: 1.1.10.040040.02

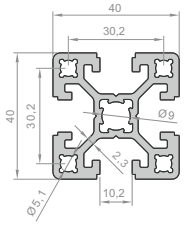
Leichte Gestelle, algemeine Kabinen und Förderergestelle sind einige Verwendungsbereiche. Es wird bei echtkonstruktionen als panelle, Gestelle und Füße von Fächer oder Plattformbalken etc. angewendet.

40x40 Industrial Light Profile
Code: 1.1.10.040040.02

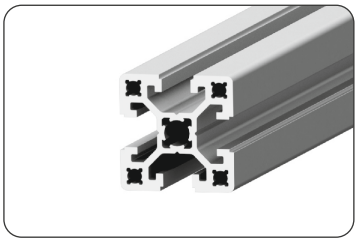
It is suitable to use in light chassis, cabinet applications, and legs of conveyor chassis. It is used in many applications such as light constructions, panels, chassis feet, platform beams.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040040.02	40x40 Light (K10)	6063	7,10cm^4	7,10cm^4	3,55cm^3	3,55cm^3	4,49cm^2	1,21Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

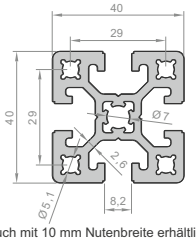


NEU

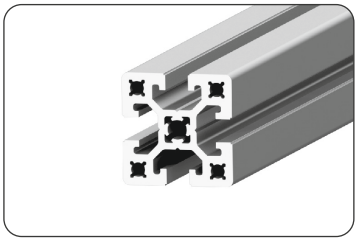


Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040040.01	40x40 Heavy (K10)	6063	10,37cm^4	10,37cm^4	6,05cm^3	6,05cm^3	6,12cm^2	1,65 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU



PS: Dieses Profil ist auch mit 10 mm Nutenbreite erhältlich

40x40 Heavy Alu-Profil
Produkt ID: 1.1.08.040040.01

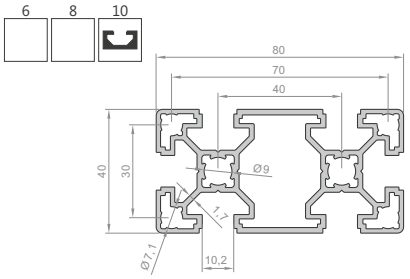
Der Schnittfläche entspricht insbesonders mitlere Widerstand bzw. Kraft-Bereich, wie Gestelle, Fussstütze ect.

40x40 Industrial Heavy Profil
Code: 1.1.08.040040.01

As cross-sectional, it is designed to provide more resistance in comparison with equal-sized profiles. Preferable for the parts that require support on medium-loaded chassis and bearing feet.

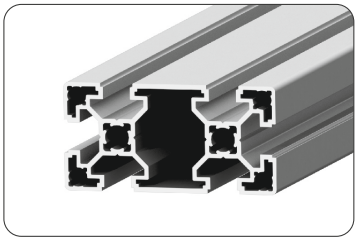
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.040040.01	40x40 Heavy (K8)	6063	12,1cm^4	12,1cm^4	5,18cm^3	5,18cm^3	7,32cm^2	1,98 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU

Design



40x80 Light Alu-Profil
Produkt ID: 1.1.10.040080.02

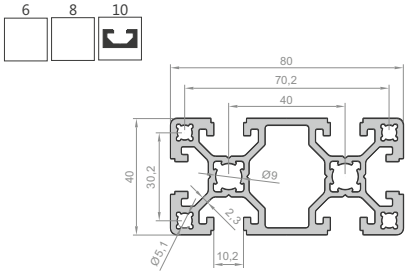
Es wird bei Leichtkonstruktionen angewendet, wie Gestelle und Fächer.

40x80 Industrial Light Profile
Code: 1.1.10.040080.02

The profile is used on frames' and platform's sections which provide light constructions.

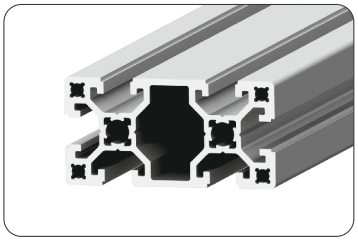
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040080.02	40x80 Light (K10)	6063	49,98 cm^4	13,13 cm^4	12,49cm^3	6,56cm^3	7,67 cm^2	2,07 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



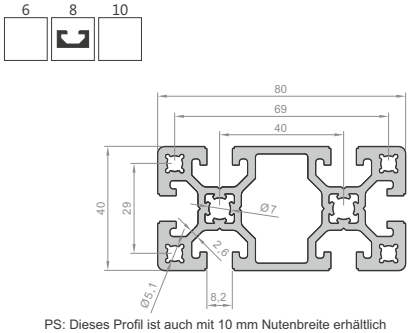
NEU

Design

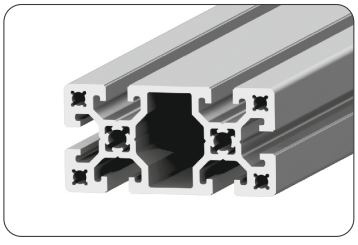


Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040080.01	40x80 Heavy (K10)	6063	69,52 cm^4	18,51 cm^4	20,57cm^3	10,45cm^3	10,23 cm^2	2,76 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU



PS: Dieses Profil ist auch mit 10 mm Nutenbreite erhältlich

40x80 Heavy Alu-Profil
Produkt ID: 1.1.08.040080.01

Dieses Profil wird bei mittelstarkenkonstruktionen wie, Großkabinen, Maschinengestelle, und Förderbandgestelle verwendet.

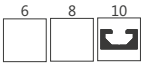
40x80 Industrial Heavy Profil
Code: 1.1.08.040080.01

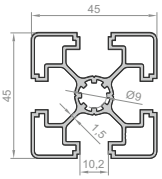
Used on Conveyor frame legs,on machine frame applications,on big sized cabinets which can carry medium loads.

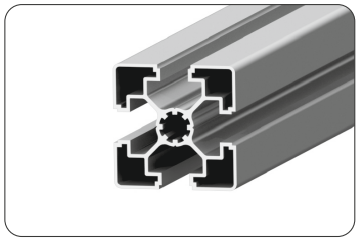
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.040080.01	40x80 Heavy (K8)	6063	82,3 cm^4	20,9 cm^4	17,38cm^3	9,25cm^3	11,9 cm^2	3,22 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

SIGMA PROFILE







45x45 Super Light Alu-Profil
Produkt ID: 1.1.10.045045.03

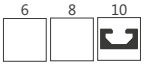
Einige anwendungsbereiche sind : Gestelle die unter niedrige Last stehen, Öfnungen von Kabinen und Panos ect.

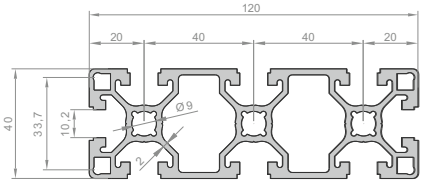
45x45 Industrial Super Light Profile
Code: 1.1.10.045045.03

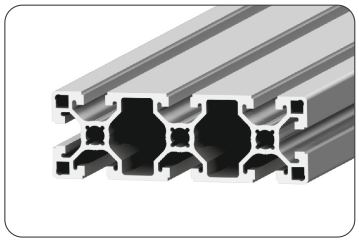
Suitable for light chassis that require low resistance. Used for producing of close cabinets of machines, panels etc.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045045.03	45x45 Super Light	6063	8.26 cm^4	8.26 cm^4	3,67cm^3	3,67cm^3	4,28cm^2	1,16 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







40x120 Alu-Profil
Produkt ID: 1.1.10.040120.02

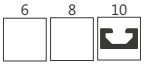
Es wird bei unter hoche Last stehende Maschinengehäuse verwendet.

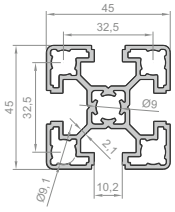
40x120 Industrial Profile
Code: 1.1.10.040120.02

Provides the desired strenght on extra forced applications and on machine constructions

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040120.02	40x120	6063	200,5 cm^4	25,7 cm^4	33,4cm^3	12,8cm^3	13,93 cm^2	3,76 Kg/m

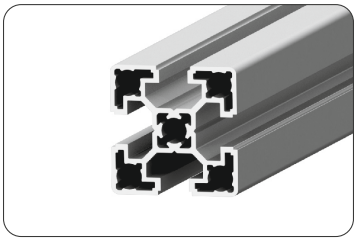
Standartlänge : 6010 mm Lmax : 7800 mm





NEU

Design



45x45 Light Alu-Profil
Produkt ID: 1.1.10.045045.02

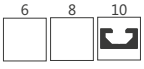
Es wird bei Gestelle die unter normale kräfte stehen benutzt. Einige Beispiele sind Maschineneinhausungen, Öfnungen und Panos.

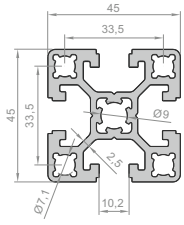
45x45 Industrial Light Profile
Code: 1.1.10.045045.02

Suitable for chassis that require low resistance. Used for producing of close cabinets of machines, panels etc.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045045.02	45x45 Light	6063	11,09 cm^4	11,09 cm^4	4,93cm^3	4,93cm^3	5,62cm^2	1,52 Kg/m

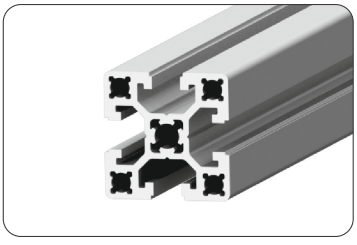
Standartlänge : 6010 mm Lmax : 7800 mm





NEU

Design



45x45 Heavy Alu-Profil
Produkt ID: 1.1.10.045045.01

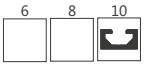
Es wird bei Zwischenverbindungen von Maschinengestellen verwendet, die unter höhere Kraft stehen. Wie z.B. Maschinengruppen, Automationsprozesse, Verbindungsgehäuse von Pneumatischesysteme.

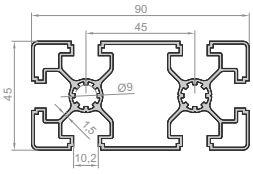
45x45 Industrial Heavy Profile
Code: 1.1.10.045045.01

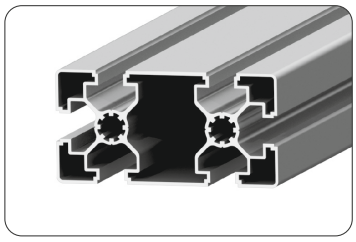
Preferred interconnectors of machine chassis, strength constructions, line groups, automation process, and pneumatic-connected frames.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045045.01	45x45 Heavy	6063	15,65 cm^4	15,65 cm^4	6,9cm^3	6,9cm^3	7,63cm^2	2,06 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







45x90 Super Light Alu-Profil
Produkt ID: 1.1.10.045090.03

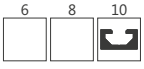
Diese Profilklasse hat besonders dünne Wandstärke. Es wird bei maschineneinhausungen, Kabinen, und Leichtbauten angewendet.

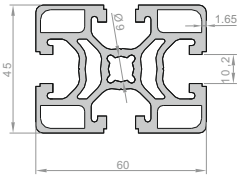
45x90 Industrial Super Light Profile
Code: 1.1.10.045090.03

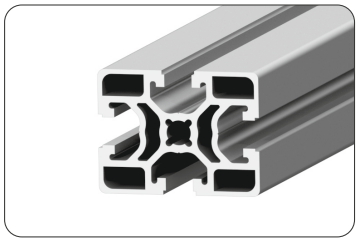
Super Light series are thin-structured which is used for low Machines closing of cabins and light constructions.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045090.03	45x90 Super Light	6063	59,21 cm^4	15,21 cm^4	13,15 cm^3	6,76 cm^3	7,14 cm^2	1,90 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







45x60 Alu-Profil
Produkt ID: 1.1.10.045060.01

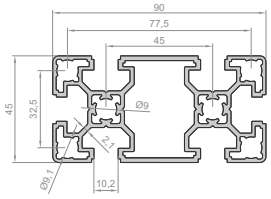
Es ist als Verbindungsteile von maschinengestelle, Zwischenelemente von Serienproduktionsmodule, Automationsprozesse und Verbindungskörper von Pneumatik verwendbar.

45x60 Industrial Profile
Code: 1.1.10.045060.01

Preferred interconnectors of machine chassis, strength constructions, line groups, automation process, and pneumatic-connected frames.

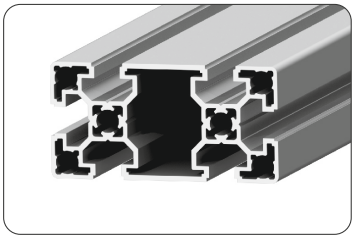
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045060.01	45x60	6063	31,29 cm^4	18,45 cm^4	10,4cm^3	8,2cm^3	9,45 cm^2	2,61 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU

Design



45x90 Light Alu-Profil
Produkt ID: 1.1.10.045090.02

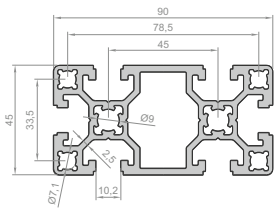
Light Profile mit dünnwandigem Schnitt wird bei nicht unter Last stehende leichtbauten, wie Kabinen, Panos und Stände angewendet.

45x90 Industrial Light Profile
Code: 1.1.10.045090.02

Light series are thin-structured and are used for light loads that are preferred on cabinets, clipboards and stands.

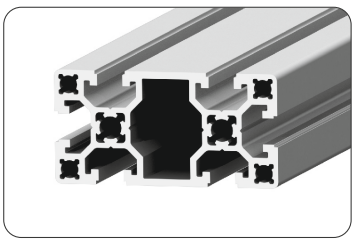
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045090.02	45x90 Light	6063	78,98 cm^4	20,74 cm^4	17,5cm^3	9,2cm^3	9,63 cm^2	2,60 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU

Design



45x90 Heavy Alu-Profil
Produkt ID: 1.1.10.045090.01

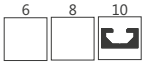
Es wird an Seitenverbindungen von Maschinengestelle, robuste Konstruktionen, Vertigugsstraßen, Automationprozesse und Verbindungskörper von Pneumatik verwendet.

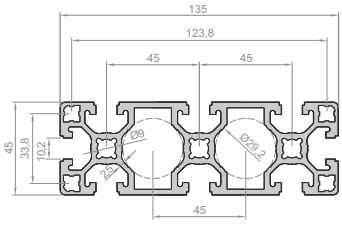
45x90 Industrial Heavy Profil
Code: 1.1.10.045090.01

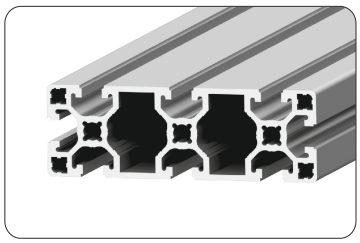
Side connection of the machine chassis, strength constructions, line groups, automation process, and pneumatic-connected frames.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045090.01	45x90 Alu-Profil	6063	108,14 cm^4	28,67 cm^4	24,03cm^3	12,74cm^3	12,86 cm^2	3,47 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







45x135 Alu-Profil
Produkt ID: 1.1.10.045135.02

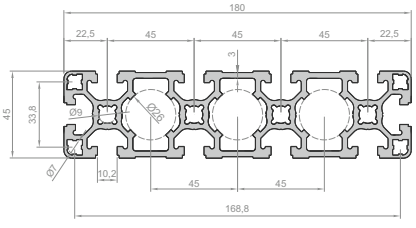
Dieses Profil bietet mit drei Nuten eine breite Fläche zur Verbindungsmöglichkeit an. Es ist bei Maschinengestelle, Seitenplatte von Förderbandgestelle verwendbar

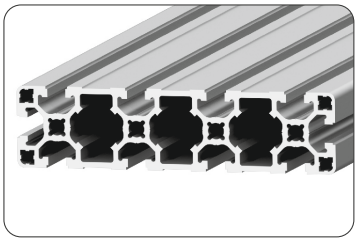
45x135 Industrial Profil
Code: 1.1.10.045135.02

Triple canal feature provides wide connection area. This profile can be used as the body side profile of machinery frames and conveyor frames. The housing hole provides several usage opportunities on the center.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045135.02	45x135	6063	41,8cm^4	32,4cm^4	6,19cm^3	14,4cm^3	18,3cm^2	4,85 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





45x180 Alu-Profil
Produkt ID: 1.1.10.045180.01

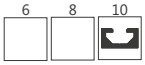
Es wird bei Maschinenkarkasse, Seitengestelle, und Widerstand feste Konstruktionen verwendet. Als besonderheit bietet dieses Profil auch drei als Gleitlager an, in den man Ø26 mm Kugellager montiert werden kann.

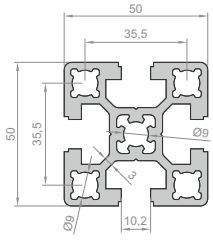
45x180 Industrial Profil
Code: 1.1.10.045180.01

It is one of the ideally preferred profile series for resistance required machine skeletons, side chassis and strong physical structures. Also it is produced as to be mounted with, 3 centers and 26 mm diameter bearing those provide sliding guidance feature with its design.

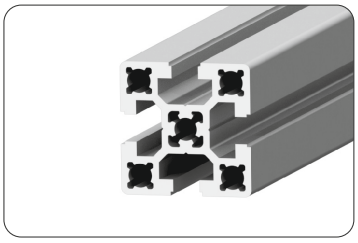
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045180.01	45x180	6063	747cm^4	56,7cm^4	83cm^3	25,2cm^3	25,1cm^2	6,77 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





NEU



50x50 Heavy Alu-Profil
Produkt ID: 1.1.10.050050.01

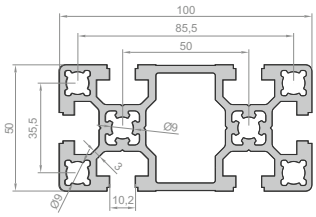
Zur Verwendung von besonders Widerstandfächigen Maschinenkarkasse, seitliche Gestelle und Starke Konstruktionen.

50x50 Industrial Heavy Profile
Code: 1.1.10.050050.01

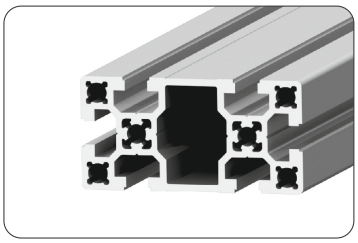
It is one of the ideally preferred profile series for resistance required machine skeletons, side chassis and strong physical structures.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			Ix	Iy	Wx	Wy		
1.1.10.050050.01	50x50 Heavy	6063	24,7 cm^4	24,5 cm^4	9,88cm^3	9,8cm^3	10 cm^2	2,70 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU



50x100 Heavy Alu-Profil
Produkt ID: 1.1.10.050100.01

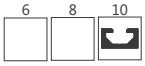
zur Verwendung von besonders Widerstandfächigen Maschinenkarkasse, seitliche Gestelle und Starke Konstruktionen verwendbar.

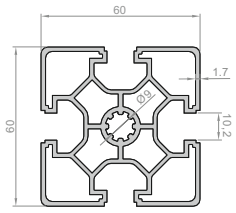
50x100 Industrial Heavy Profile
Code: 1.1.10.050100.01

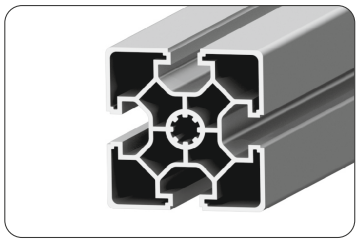
It is one of the ideally preferred profile series for resistance required machine skeletons, side chassis and strong physical structures.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			Ix	Iy	Wx	Wy		
1.1.10.050100.01	50x100 Heavy	6063	175 cm^4	45,2 cm^4	35cm^3	18,1cm^3	16,92 cm^2	4,57 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







60x60 Alu-Profil
Produkt ID: 1.1.10.060060.02

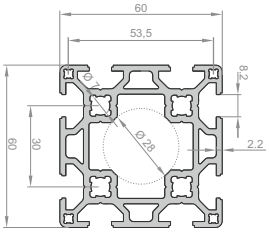
Dieses Profilserie werden bei Trennwandbalken, Deckendekorgestelle, Spotlichtbalken, die nicht unter Last stehen angewendet.

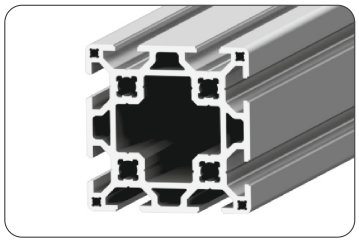
60x60 Industrial Profile
Code: 1.1.10.060060.02

These series are used in the absence of more direct loading by carrier frame and spot beams in the ceiling decor some use.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			Ix	Iy	Wx	Wy		
1.1.10.060060.02	60x60	6063	29,85 cm^4	29,85 cm^4	9,9cm^3	9,9cm^3	8,8cm^2	2,46 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





60x60 Doppelnut Alu-Profil
Produkt ID: 1.1.08.060060.02

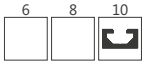
Bei allen Seiten angebrachte Zwei Nutenkanälle bietet dieses Profil eine Flexibler Montagemöglichkeit an. Es wird bei Mascchinengestelle und als Seitenprofil von Förderbandgestelle angewendet.

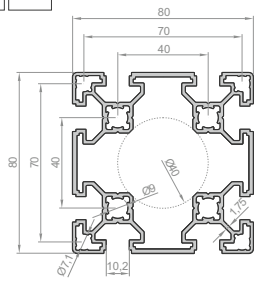
60x60 Two Slot Industrial Profile
Code: 1.1.08.060060.02

Its two canal feature provides wide connection area. This profile can be used as the body side profile of machinery frames and conveyor frames.

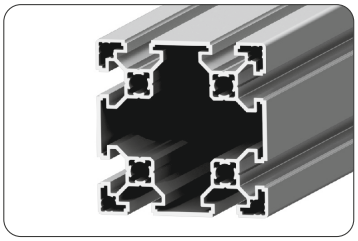
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			Ix	Iy	Wx	Wy		
1.1.08.060060.02	60x60 Doppelnut	6063	41 cm^4	41 cm^4	13,6cm^3	13,6cm^3	11,06 cm^2	3,27 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





NEU
Design

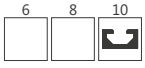


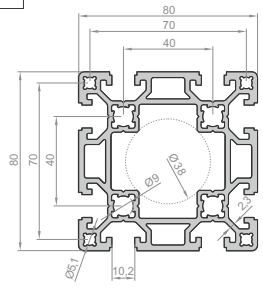
80x80 Light Alu-Profil
Produkt ID: 1.1.10.080080.02
Verwendung nur bei niedrige widerstandfächige Konstruktionen, wie große Fächer, Deckendekorgestelle, Spotlichtmast etc. verwendbar.

80x80 Industrial Light Profile
Code: 1.1.10.080080.02
It is used in forming of poles of high constructions and ceiling decoration chassis as spot bearing beams. This wide profile types is made of thin-structured plate and suitable for low-loaded constructions.

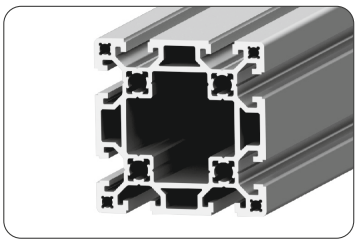
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.080080.02	80x80 Light	6063	88,08 cm^4	88,08 cm^4	22,02cm^3	22,02cm^3	11,91 cm^2	3,22 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





NEU
Design

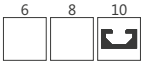


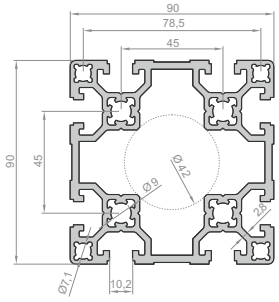
80x80 Heavy Alu-Profil
Produkt ID: 1.1.10.080080.01
Geeignet für mitlerer Belastungen. Es wird bei Herstellung von Maschinengehäuse, Maschinengestelle, Balken von Trägerplattformen bevorzugt.

80x80 Industrial Heavy Profile
Code: 1.1.10.080080.01
The profile that provides resistance against middle loaded capacity is suitable for frames, machine chassis and bearing platform beams.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.080080.01	80x80 Heavy	6063	127,1cm^4	127,1cm^4	31,78cm^3	31,78cm^3	17,77cm^2	4,80 Kg/m

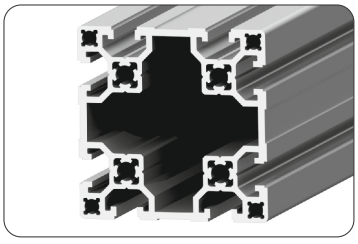
Standartlänge : 6010 mm Lmax : 7800 mm





NEU

Design



90x90 Light Alu-Profil

Produkt ID: 1.1.10.090090.02

Ausgelegt für mittelstarke Belastungen. Beispielsweise CNC Maschinengerüst und Füße, die breite Fläche benötigen verwendbar.

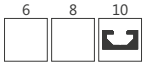
90x90 Industrial Light Profile

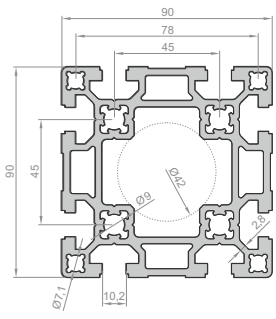
Code: 1.1.10.090090.02

90x90 Industrial Light Profile It comes into prominence thanks to its ideal structure for systems that require middle resistance. Besides it is used for CNC chassis and feet, it is favourite for applications in long dimensions.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.090090.02	90x90 Light	6063	192,84cm^4	192,84cm^4	42,8cm^3	42,8cm^3	20,67cm^2	5,58 Kg/m

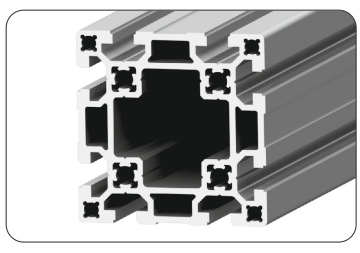
Standartlänge : 6010 mm Lmax : 7800 mm





NEU

Design



90x90 Heavy Alu-Profil

Produkt ID: 1.1.10.090090.01

Ausgelegt für höhere Belastungen. Verwendung bei Maschinengerüste. Schnittfläche erlaubt Einbau von mechanichen Bauteilen und kann als Lagereinheit benützt werden.

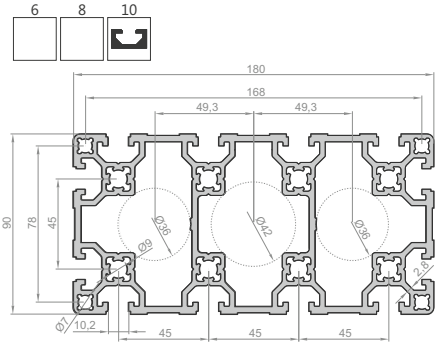
90x90 Industrial Heavy Profile

Code: 1.1.10.090090.01

It is used in machine chassis that require high resistance and big constructions as carrier profile. It can be used also as chassis of guidance axis with mechanical parts integrated on it.

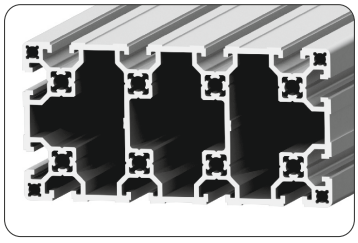
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.090090.01	90x90 Heavy	6063	220,49cm^4	220,49cm^4	48,9cm^3	48,9cm^3	25,31cm^2	6,83 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU

Design



90x180 Light Alu-Profil

Produkt ID: 1.1.10.090180.02

Ausgelegt für mittelstarke Belastungen. Beispielsweise CNC Maschinengerüst und Füße, die breite Fläche benötigen verwendbar.

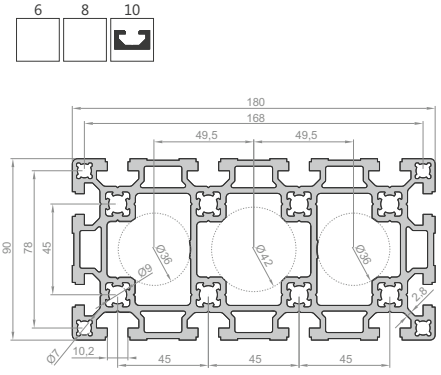
90x180 Industrial Light Profile

Code: 1.1.10.090180.02

90x90 Industrial Light Profile It comes into prominence thanks to its ideal structure for systems that require middle resistance. Besides it is used for CNC chassis and feet, it is favourite for applications in long dimensions.

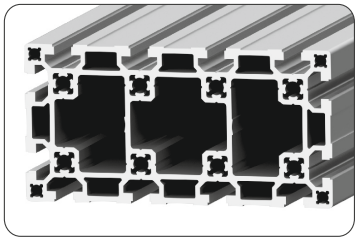
Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.090180.02	90x180 Light	6063	1240,6cm^4	361,5cm^4	137,8cm^3	80,3cm^3	37,1cm^2	10,01 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm



NEU

Design



90x180 Heavy Alu-Profil

Produkt ID: 1.1.10.090180.01

Ausgelegt für höhere Tragfähigkeit. Verwendung bei Maschinengerüste. Schnittfläche erlaubt Einbau von mechanichen Bauteilen und kann als Lagereinheit benützt werden.

90x180 Industrial Heavy Profile

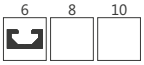
Code: 1.1.10.090180.01

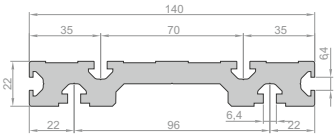
It is used in machine chassis that require high resistance and big constructions as carrier profile. It can be used also as chassis of guidance axis with mechanical parts integrated on it.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.090180.01	90x180 Heavy	6063	1499cm^4	427,6cm^4	166,5cm^3	95,02cm^3	46,7cm^2	12,60 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

(22x140)-(27x170) Nutenplatte





22x140 Nutenplatte
Produkt ID: 1.1.06.022140.07

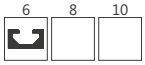
Es ist ein Starke Flächenprofil. Anwendung bei Maschinentische, Übungsaufbauten, Seitenplattevon Messgeräte ect. Starke Waddicke erlaubt eine sichere Befestigung von mechanische und pneumatische Bauteile der Nut.

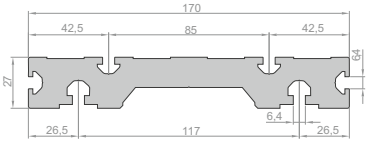
22x140 Surface Coating Profile
Code: 1.1.06.022140.07

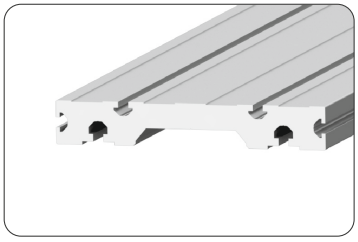
It is a strong surface coating profile. 22x140 Surface Coating Profile uses on the surface of machineries, part of testing equipment etc.Powerfull thickness of the 22x140 Surface Coating Profile provides strong connection between mechanical and pneumatic components.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.022140.07	22x140	6063	365cm^4	7,2cm^4	52,14cm^3	6,54cm^3	19,8cm^2	5,39 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







27x170 Nutenplatte
Produkt ID: 1.1.06.027170.07

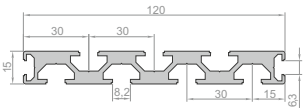
Dieses Flächenprofil wurde bei stark belastbare Maschinentische bzw. Seitenplatten ausgelegt. Starke Wanddicke erlaubt eine sichere Befestigung von mechanische und pneumatische Bauteile an die Nut.

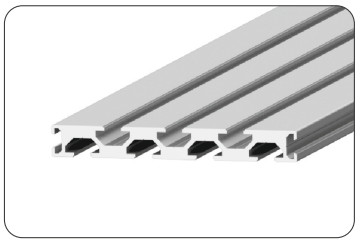
27x170 Surface Coating Profile
Code: 1.1.06.027170.07

It is a highly strong surface coating profile. 27x170 Surface Coating Profile is used on the surface of heavy industrial machineries and on the componenets. Powerfull thickness of the 27 x 170 Surface Coating Profile provides strong and trustfull connection between mechanical and pneumatic components.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.027170.07	27x170	6063	852cm^4	16,8cm^4	100,2cm^3	12,4cm^3	32,44cm^2	8,79 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





15x120 Nutenplatte
Produkt ID: 1.1.08.015120.07

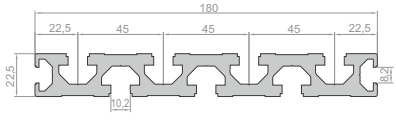
Die Wandstärke ist niedrig ausgelegt worden, damit es bei einfachen Flächen, Tische Bzw. Seitenplatten verwendbar wird. Die Nutgestalt ermöglicht Verschiedene art von Bauteilen und Elemente zu Befestigen.

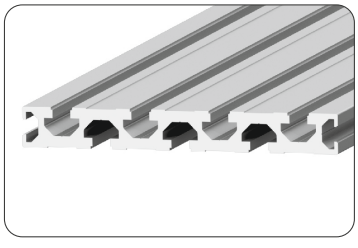
15x120 Surface Coating Profile
Code: 1.1.08.015120.07

15x120 Surface Coating Profile mostly used for lighter and simple surface coating application according to other strong surface coatings. Slots on the surface are avaliable to equipped for different components. Besides 15x120 Surface Coating profile can be used for working tables.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.015120.07	15x120	6063	105,7cm^4	2,1cm^4	17,6cm^3	2,8cm^3	8.6 cm^2	2,33 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





22,5x180 Nutenplatte
Produkt ID: 1.1.10.225180.07

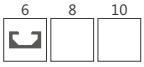
Als Plattenprofil wird es bei CNC Maschinentische, seitenplatte von Messgeräte und Maschinenplatten angewendet. Die Nutengestalt ermöglicht Verschiedene art von Bauteilen und Elemente zu Befestigen.

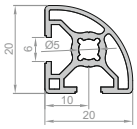
22,5x180 Surface Coating Profile
Code: 1.1.10.225180.07

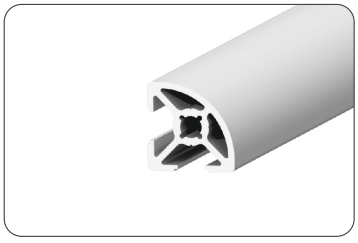
It is a kind of surface coating profile. It is used on CNC machine tables, test apperatus' side surfaces. Slots and powerfull thickness of the profile provides fixing connection of milling equipments.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.225180.07	22,5x180	6063	570,9cm^4	11,7cm^4	63,43cm^3	10,4cm^3	21,1cm^2	5,70 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

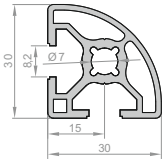


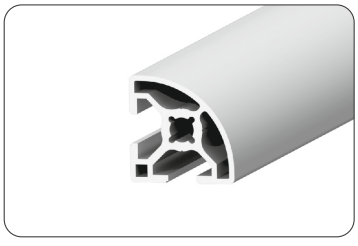




Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.06.020020.08	20x20 Radius	6063	0,65 cm^4	0,65 cm^4	0,61cm^3	0,61cm^3	1,42 cm^2	0,38 Kg/m

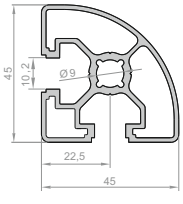
Standartlänge : 6010 mm Lmax : 7800 mm

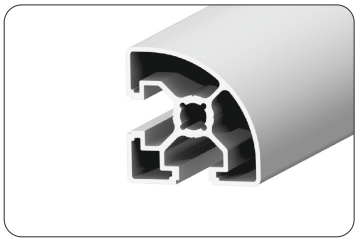




Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.030030.08	30x30 Radius	6063	2,15 cm^4	2,15 cm^4	1,30cm^3	1,30cm^3	2,78 cm^2	0,77 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.045045.08	45x45 Radius	6063	8,5 cm^4	8,5 cm^4	3,38cm^3	3,38cm^3	4,46 cm^2	1,24 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

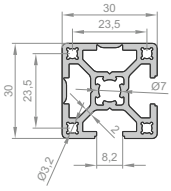
Anwendungsbereich

Bei dem Ästhetik bevorzugte Projekte wie Stände,Panos, Kabine ect. findet man mit diesem abgerundete Profile eine gute Lösung. Es ist auch geeignete Verbindungselemente und Zubehör vorhanden.

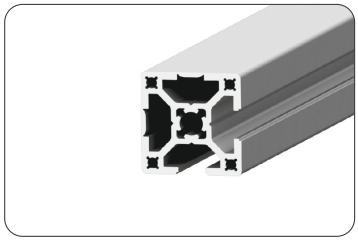
UsingArea

This profile is used in where decorative appearance is preferred such as designs of stands, panels, and cabins. An aesthetic appearance is obtained by applications of special connectors and accessories.

SIGMA PROFILE

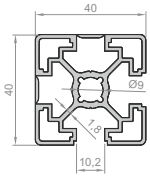


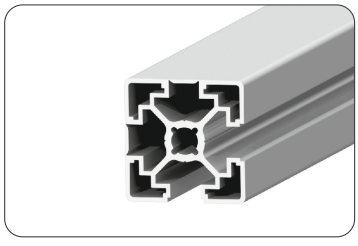
NEU
Design



Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.030030.05	30x30 Geschlossen	6063	3,17cm^4	3,18cm^4	2,05cm^3	2,05cm^3	3,37cm^2	0,91 Kg/m

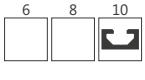
Standartlänge : 6010 mm Lmax : 7800 mm

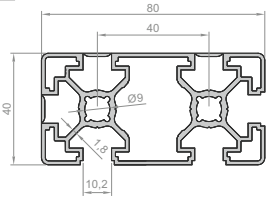


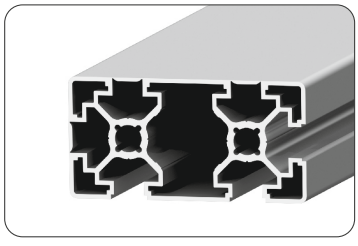


Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040040.05	40x40 Geschlossen	6063	7,24cm^4	7,27cm^4	3,52cm^3	3,52cm^3	4,6cm^2	1,27 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm







Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.10.040080.05	40x80 Geschlossen	6063	50,9cm^4	12,9cm^4	12,51cm^3	6,23cm^3	7,7cm^2	2,04 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

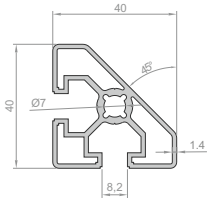
Anwendungsbereich

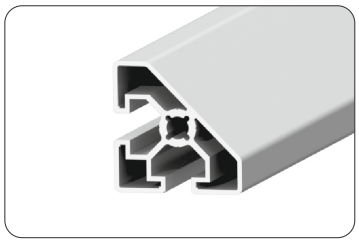
Besonders bei Hygiene Anforderung ist dieses Profil gut geeignet. Abfüllanlagen, Pharma-Industrie etc. bevorzügen dieses Profil. Die Geschloßene Nutfäche ist leicht zerreißbar.

Using Area

Its closed exterior surface provides hygiene and aesthetic appearance. Preferable to use on building of filling machines,medicine production lines, packing units etc. Closed canals can be opened for the accessories to be place in.

(40x40x45°) Prf. - (45x75) Förderbandprofil





40x40 45° Fasenprofil
Produkt ID: 1.1.08.040040.06

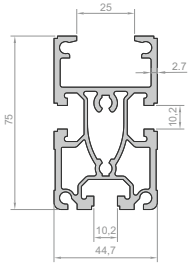
Bei Ästhetik bevorzugte Projekte wie Maschinengestelle oder Stände findet man mit diesem 45 Grad gefasertes Profil eine gute Lösung.

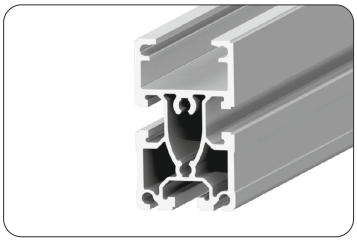
40x40 45° Industrial Angled Profile
Code: 1.1.08.040040.06

The profile which has 45° degree surface provides aesthetic apperance in machine cabins, displays and frames.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.1.08.040040.06	40x40 (45°)	6063	4,4cm^4	4,4cm^4	1,90cm^3	1,90cm^3	3,43cm^2	0,93 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





45x75 Förderband-Profil
Produkt ID: 1.2.00.045075.00

Schmale Breite ermöglicht im Bereich Pallettenförderung praktische Lösungen. Die in oberen Profilnut einsetzbare Reibungsplastik dient als Gurtführung.

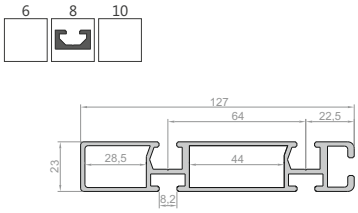
45x75 Conveyor Profile
Code: 1.2.00.045075.00

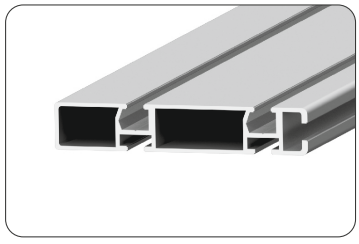
It provides practical solutions for narrow band conveyors carrying pallets. Friction plastic placed on the top of profile provides guidance of moving belt.

Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.2.00.045075.00	45x75 Förderer	6063	23,46cm^4	45,80cm^4	10,7cm^3	9,21cm^3	9,42cm^2	2,56 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

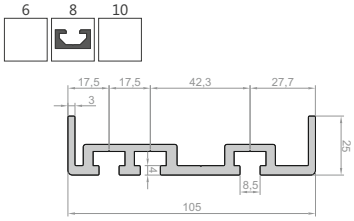
(23x127)-(25x105)-(25x150) Förderbandprofil

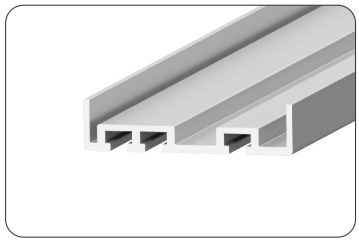




Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.2.00.023127.00	23x127	6063	114,6cm^4	5,5cm^4	17,47cm^3	4,8cm^3	7,4cm^2	2,05 Kg/m

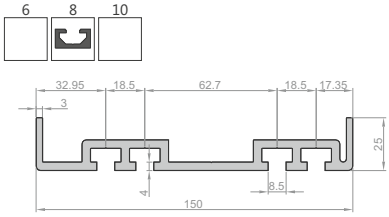
Standartlänge : 6010 mm Lmax : 7800 mm

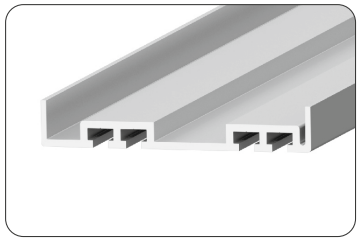




Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.2.00.025105.00	25x105	6063	87,1cm^4	2,4cm^4	15,07cm^3	1,49cm^3	7,45cm^2	1,98 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm





Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.2.00.025150.00	25x150	6063	87,1cm^4	2,4cm^4	11,46cm^3	1,9cm^3	7,45cm^2	2,90 Kg/m

Standartlänge : 6010 mm Lmax : 7800 mm

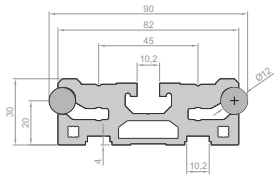
Anwendungsbereich

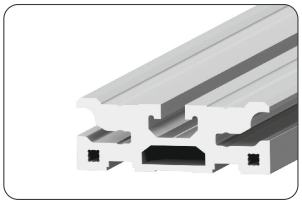
23x127; Dieses Profil dient als Grundkörper bei verschiedene Art von Fördersysteme. Die geeignete Verbindungselemente und Zubehör ermöglicht praktische Montage.
25x105 & 25x150; Das Profil wird bei Acetal und Modular-Gurtförderer als seitenprofil angewendet. Anwendungsbereiche sind Abfüllanlagen und Verpackungseinheiten ect.

Using Area

23x127; İs used in the production of many different conveyors for forming the main body of the conveyor. Easily integrated connection equipments and accessories provide to practically mounting.
25x105 & 25x150; The profiles are produced by two different dimension for usage as side frame profile of Acetal and Modular belt conveyors.Mostly bottle filling, packaging and packaging units are preferred.

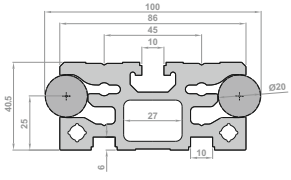
Ø 12 Blok Yatak Profili
Produkt ID: 1.3.12.030082.00

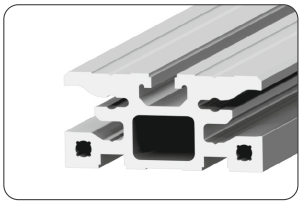




Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.3.12.030082.00	Ø12 Wellenaufnahmeprofil	6063	10,49cm^4	82,56cm^4	2,33cm^3	51,6cm^3	13,9cm^2	3,75 Kg/m

Ø 20 Blok Yatak Profili
Produkt ID: 1.3.20.040086.00





Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.3.20.040086.00	Ø20 Wellenaufnahmeprofil	6063	29,89cm^4	107,41cm^4	5,97cm^3	53,7cm^3	16,96cm^2	4,58 Kg/m

Anwendungsbereich

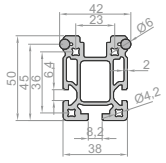
Wellenaufnahmeprofil diese Art wird im mittlerer Lastbereich eingesetzt. Es ist auf T-Nutenprofile Montierbar und so erlaubt es starkes System aufbau.

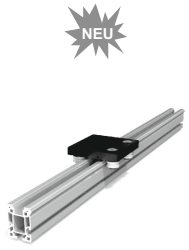
Using Area

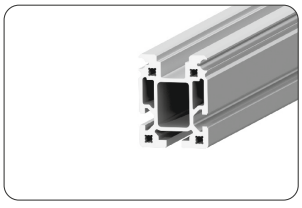
The block guidance profiles are preferred for guidances by middle loading.It can be mounted on different sigma profiles and can be formed strong guidance group profiles.

SIGMA PROFILE

38x50 Wellenlager
Produkt ID: 1.3.15.038050.0

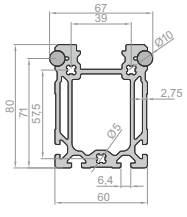


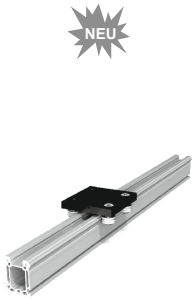


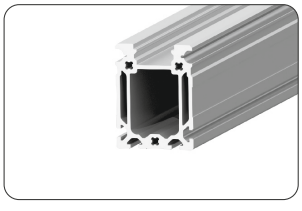


Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.3.15.038050.0	38x50 Wellenlager	6063	11,6cm^4	18,5cm^4	6,1cm^3	7,4cm^3	7,14cm^2	1,93 Kg/m

60x80 Wellenlager
Produkt ID 1.3.15.060080.0

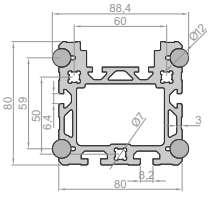


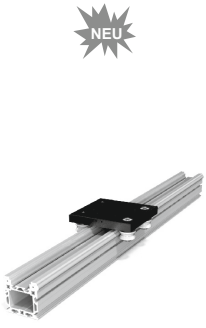


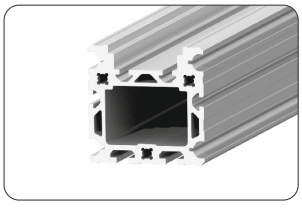


Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.3.15.060080.0	60x80 Wellenlager	6063	68,2cm^4	108,8cm^4	22,3cm^3	27,2cm^3	15,2cm^2	4,11 Kg/m

80x80 Wellenlager
Produkt ID: 1.3.0.15.080080.00







Produkt ID	Produkt-Name	Material	Trägheitsmoment		Widerstandsmoment		Fläche	Masse
			I_x	I_y	W_x	W_y		
1.3.0.15.080080.00	80x80 Wellenlager	6063	135,3cm^4	161cm^4	33,8cm^3	40,2cm^3	21cm^2	5,68 Kg/m

Anwendungsbereich

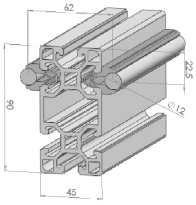
Besondere Eigenschaft des Profils:Es erlaubt stabile Wellenankoppelung ohne zusätzliches Profil oder Lagarelemente. Der Profilschnitt erlaubt einwandfreie integration mit T-Nutenprofile.

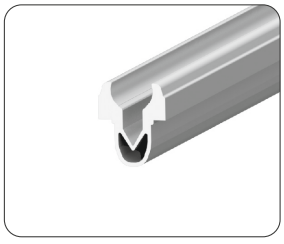
Using Area

The most important characteristics of these bearing shafts claw profile. Without being directly coupled with a profile more stable It is possible to create a bearing. In addition, the nominal cross-section industrial profiles can be easily integrated.

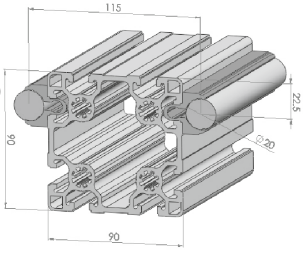
Basisträger für Wellen

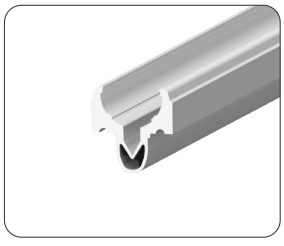
Ø 12 Wellenlager
Produkt ID: 1.3.12.000000.00





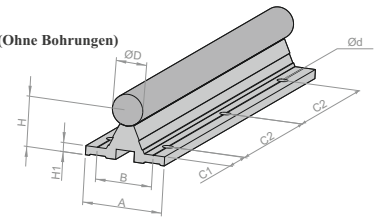
Ø 20 Wellenlager
Produkt ID: 1.3.20.000000.00

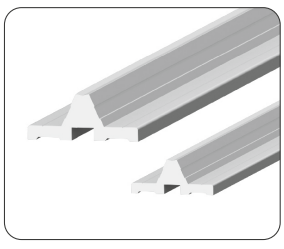




Produkt ID	Produkt-Name	Material	Masse
1.3.12.000000.00	Ø 12 Wellenlageri	Aluminium	1mt/0,41 Kg
1.3.20.000000.00	Ø 20 Wellenlager	Aluminium	1mt/0,58 Kg

Wellenstützprofil (Ohne Bohrungen)





Wellenstützprofil ohne Bohrungen (Produkt ID)	Produkt-Name	Gewicht KG/M	Abmessungen (MM)				L MAX ; 6000 MM			
			A	H	H1	B	Ød1	C1	C2	K DIN 6912
1.3.12.040016.00	Ø12 Wellenstützprofile	0.69	40	22 +0.1	5	29	4.5	50	75	M4x16
1.3.16.045018.00	Ø16 Wellenstützprofile	0.84	45	26 +0.1	5	33	5.5	50	100	M5x20
1.3.20.052022.00	Ø20 Wellenstützprofile	1.23	52	32 +0.1	5.8	37	6.5	50	100	M6x25
1.3.25.057024.00	Ø25 Wellenstützprofile	1.44	57	36 +0.1	6	42	6.5	60	120	M8x30
1.3.30.069027.00	Ø30 Wellenstützprofile	2.00	69	42 +0.15	7	51	8.5	75	150	M10x35
1.3.40.073030.00	Ø40 Wellenstützprofile	2.60	73	50 +0.15	8	55	9	100	200	M10x40

NEU

Anwendungsbereich

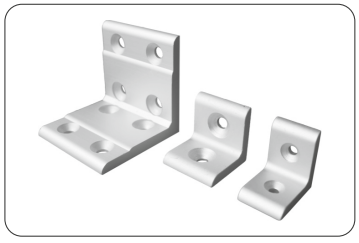
Zur Montage der Welle bei leichtlastführungen werden Wellenlager-Profil verwendet und sind bei T-Nutenprofile direkt einsetzbar.
Zur Montage der Welle bei Schwerlastführungen werden Wellenstützprofile verwendet.

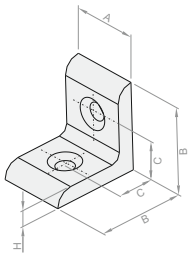
Using Area

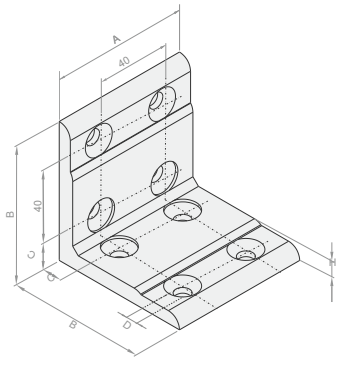
Clamping profiles provide assembling of light weighted guidance profiles. (above)
Bar connections are preferred with shaft support units on heavy load designs. (below)

SIGMA PROFILE

Winkelbefestigung







Produkt ID	Prf. Maße	Produkt-Name	A	B	C	D	H	Material	Gewicht
2.2.001.08.3030.01	30x30	Winkelbefestigung	29	29	15	Ø6.5	6	Aluminium	21 gr
2.2.001.10.4040.01	40x40	Winkelbefestigung	37	37	20	Ø8.2	6.5	Aluminium	39 gr
2.2.001.10.4545.01	45x45	Winkelbefestigung	42	42	22.5	Ø8.2	7	Aluminium	56 gr
2.2.001.10.8080.01	80x80	Winkelbefestigung	76	76	20	Ø8.5	8,3	Aluminium	206 gr

NEU

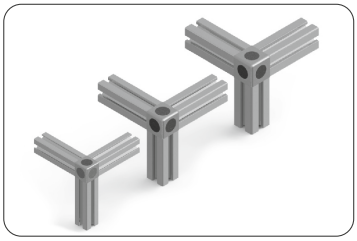
Anwendungsbereich

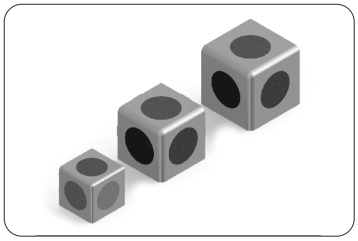
Bei Eckverbindung von Lotrecht positionierte Profile. Es verhindert die Profile sich drehen. Verbindungsstelle ist frei zu Wählen. Es ist auch bei niedrigen Belastungsbereiche zu verwenden.

Using Area

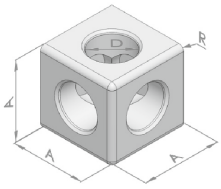
Aluminum corner connections fix the profile and stops its rotation. With the connection feature fixing can be made on the desired place. It is used on lighter connections that do not require durability.

Verbindungswürfel und Abdeckkappe





NEU



Produkt ID	Prf. Maße	Produkt-Name	A	D	R	Material	Gewicht
2.2.001.08.3030.08	30x30	Verbindungswürfel	30	Ø20,5	2	Aluminium	38,5 gr
2.2.001.08.4040.08	40x40 (K8)	Verbindungswürfel	40	Ø26,6	4	Aluminium	94,5 gr
2.2.001.10.4545.08	45x45	Verbindungswürfel	45	Ø26,6	4	Aluminium	151 gr

Anwendungsbereich

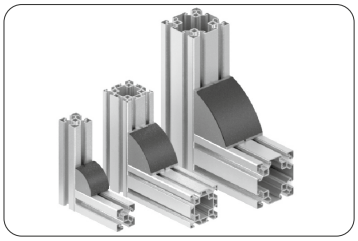
Zu praktische Verbindung drei Profile ohne zusätzliche Bohrungen. Mit Abdeckkappen erzielt man ein ästhetisches Aussehen.

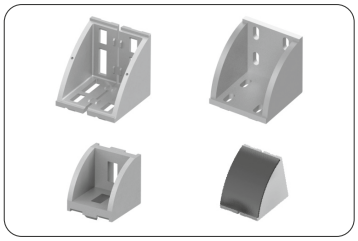
Using Area

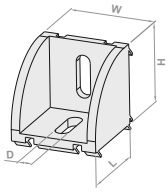
These corner connections provide connection of three profiles. It allows eliminating the drilling operation and creates easy installation. It's possible to create an aesthetics appearence within plastic caps.

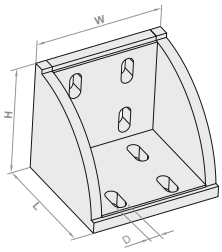
Guss-Winkelbefestigung

6 8 10









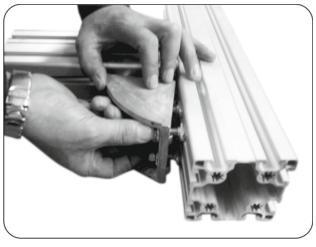
Produkt ID	Prf. Maße	Produkt-Name	L	H	W	D	Material	Gewicht
2.2.001.06.2025.03	20-25	Guss-Winkel	20	20	17.5	5	Aluminium	15.5 gr
2.2.001.08.3030.03	30x30	Guss-Winkel	28	28	28	6.5	Aluminium	41.5 gr
NEU 2.2.001.10.4040.03	40x40	Guss-Winkel	37	37	37.7	9	Aluminium	49 gr
2.2.001.10.4545.03	45x45	Guss-Winkel	44	44	43	9	Aluminium	75 gr
NEU 2.2.001.08.6060.03	60x60	Guss-Winkel	57	57	57	6.5	Aluminium	98 gr
NEU 2.2.001.10.8080.03	80x80	Guss-Winkel	78	78	77	10	Aluminium	226 gr
2.2.001.10.9090.03	90x90	Guss-Winkel	84.7	84.7	86.5	9	Aluminium	366 gr
2.3.001.2025.04	20-25	Abdeckkappe	-	-	-	-	Plastik	2 gr
2.3.001.3030.04	30x30	Abdeckkappe	-	-	-	-	Plastik	4 gr
NEU 2.3.001.4040.04	40x40	Abdeckkappe	-	-	-	-	Plastik	8 gr
2.3.001.4545.04	45x45	Abdeckkappe	-	-	-	-	Plastik	10 gr
NEU 2.3.001.6060.04	60x60	Abdeckkappe	-	-	-	-	Plastik	8 gr
NEU 2.3.001.8080.04	80x80	Abdeckkappe	-	-	-	-	Plastik	27 gr
2.3.001.9090.04	90x90	Abdeckkappe	-	-	-	-	Plastik	24 gr

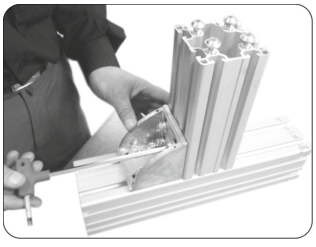
Anwendungsbereich

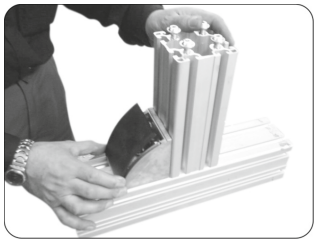
Gestelle die stark unter Belastung stehen. Mit Abdeckkappen erzielt man ein ästhetisches Aussehen.

Using Area

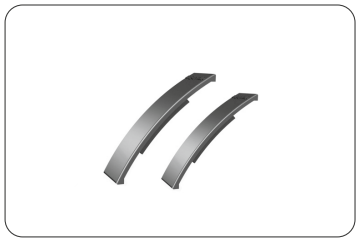
it's used on the frames which needs extra strenght. it's possible to provide aesthetic view within plastic covers.

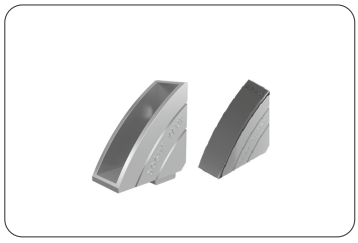






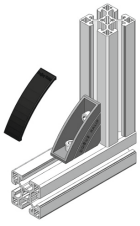
Eckverbinder u. Abdeckkappe

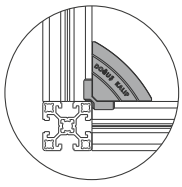


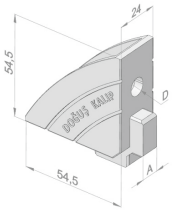


NEU

Design







Produkt ID	Prf. Maße	Produkt-Name	A	D	Material	Gewicht
2.2.001.08.3030.07	30x30	Eckverbinder	8	Ø6.5	Aluminium	54 gr
2.2.001.10.4545.07	45x45	Eckverbinder	10	Ø8.5	Aluminium	59 gr
2.3.001.3045.00	45x45 30x30	Abdeckkappe	-	-	Plastik	7.5 gr

Anwendungsbereich

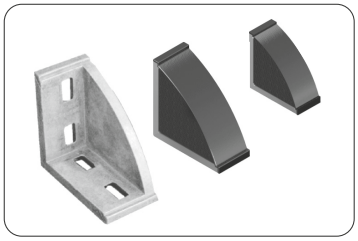
Für Eckverbindungen mit 90° Winkel. Zu Befestigen der Eckverbindung. Es ermöglicht widerstandsfächigkeit bei Rahmen und andere Konstruktionen. Nuteneinsetzausbuchtung ermöglicht auch T-förmige verbindung.

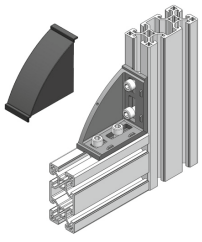
Using Area

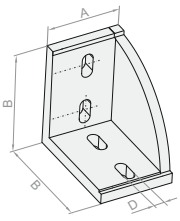
İt provides 90° degree connection on applications and make the corner lines stabilized.Mostly use for more required stronger frame and constructions. Material surface has an aesthetics appearance within sandblasting operations.

Lange Gusswinkelbefestigung

6 8 10







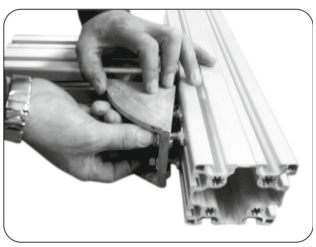
Produkt ID	Prf. Maße	Produkt-Name	A	B	D	Material	Gewicht
2.2.001.08.3060.04	30x60	Lange Winkel	27.2	57	6.5	Aluminium	48 gr
2.2.001.10.4080.04	40x80	Lange Winkel	37.5	78	10.5	Aluminium	114 gr
2.2.001.10.4590.04	45x90	Lange Winkel	42	84.2	9	Aluminium	185 gr
2.3.001.3060.03	30x60	Abdeckkappe	-	-	-	Plastik	10 gr
2.3.001.4080.03	40x80	Abdeckkappe	-	-	-	Plastik	10 gr

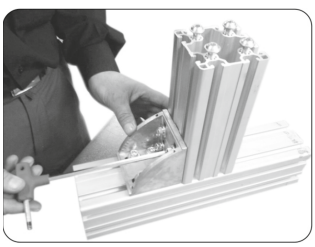
Anwendungsbereich

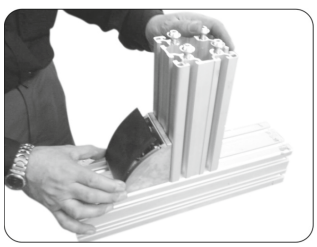
Es wird eher bei breiten Profilschnitte, die unter hohe Belastung stehen angewendet

Using Area

This corner connection is mostly used for large profiles. It is preferred at the places where it is necessary for increasing the durability.

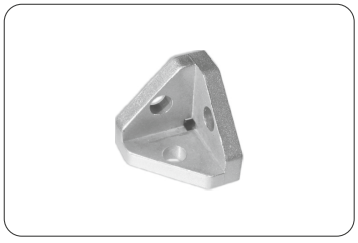
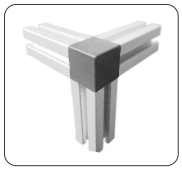
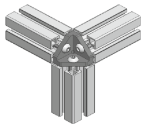


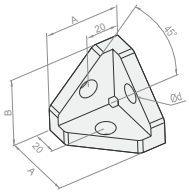




Eckwinkel u. Abbdeckkappe

6 8 10



Produkt ID	Prf. Maße	Produkt-Name	A	B	D	Material	Gewicht
2.2.001.10.4040.06	40x40 A	Eckwinkel	36	36	Ø8.5	Aluminium	56 gr
2.3.001.4040.08	40x40 A	Abdeckkappe (Dreieck)	40	40	-	Plastik	7 gr
2.3.001.4040.07	40x40	Abdeckkappe (Viereck)	40	40	-	Plastik	13.5 gr

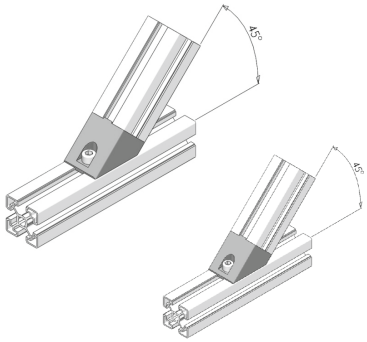
Anwendungsbereich

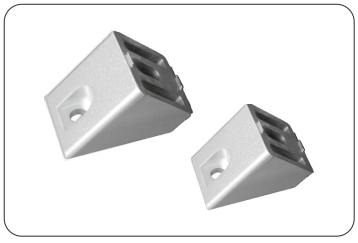
Es ermöglicht drei Profile lotrecht zu verbinden. Sorgt für ästhetisches Aussehen. Es wird überwiegend bei Maschineneinhausungen angewendet

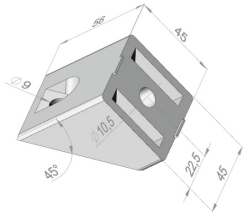
Using Area

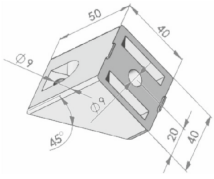
This profile can fix a few same profile with in internal corners.It presents an aesthetics view.It mostly use for machinery cabinets coating. Square section and angle sectioned profiles can be fixed with this profiles.

Verbinder 45°

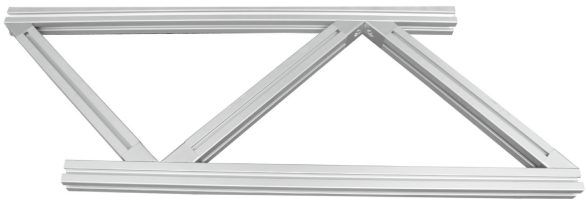








Produkt ID	Prf. Maße	Produkt-Name	D	Material	Gewicht
2.2.006.4040.10	40x40 (K8)	Verbinder 45°	Ø8.5	Aluminium	86 gr
NEU 2.2.006.4545.10	45x45	Verbinder 45°	Ø10	Aluminium	98 gr



Anwendungsbereich

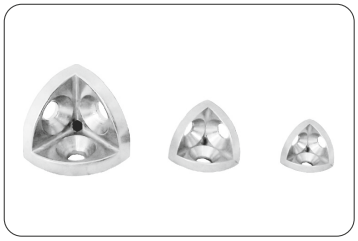
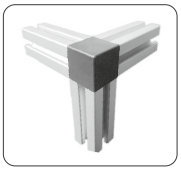
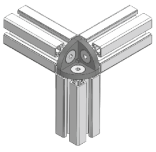
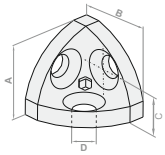
Ermöglicht 45° Verbindungen. Zum Befestigen der Eckverbindung. Rahmen und Konstruktionen werden Widerstandsfest.

Using Area

It provides connection of 45 degrees at profile applications. It is used for fixing corner combinations. It is preferred at the places where it is necessary to increase the durability and the resistance of frames and constructions.

Eckwinkel für halbrunden Profilen

6 8 10

	Produkt ID	Prf. Maße	Produkt-Name	A	B	C	D	Material	Gewicht
NEU	2.2.001.06.2020.05	20x20	Eckwinkel abgerundet	18.5	18.5	10	6.5	Aluminium	12 gr
	2.2.001.08.3030.05	30x30	Eckwinkel abgerundet	28	28	15	8.5	Aluminium	42 gr
	2.2.001.10.4545.05	45x45	Eckwinkel abgerundet	42	42	22,5	10.5	Aluminium	136 gr
NEU	2.3.001.2020.05	20x20	Abdeckkappe (abgerundet)	20	20	3	-	Plastik	2 gr
	2.3.001.3030.05	30x30	Abdeckkappe (abgerundet)	30	30	3	-	Plastik	4 gr
	2.3.001.4545.05	45x45	Abdeckkappe (abgerundet)	45	45	3	-	Plastik	14 gr
	2.3.001.2020.07	20x20	Abdeckkappe (Viereck)	20	20	2	-	Plastik	3 gr
	2.3.001.3030.07	30x30	Abdeckkappe (Viereck)	30	30	3	-	Plastik	8 gr
	2.3.001.4545.07	45x45	Abdeckkappe (Viereck)	45	45	3	-	Plastik	22 gr

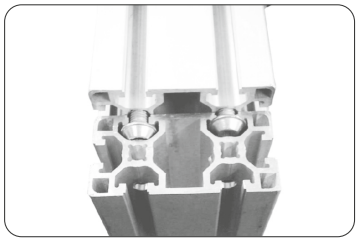
Anwendungsbereich

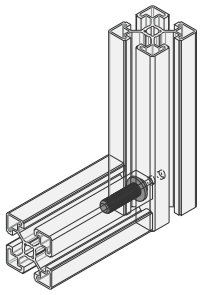
Eckverbindung für abgerundete Profile. Bei Tische, Regale, Stände und Panos erzielt man ein ästhetisches Aussehen

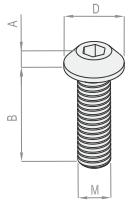
Using Area

This material can be used for connection profiles with radius. It presents an aesthetics view on table, booths, shelfs and wall panels. Square and rectangular profile with radius can be fixed with this profile.

Bundschraube







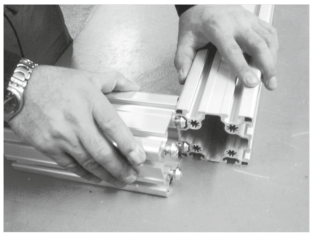
Produkt ID	⌐¬	Produkt-Name	M	A	B	ØD	Material	Gewicht
2.1.011.06.25	6 mm Nut	Bundschraube	M6	3.5	20	10.5	DIN 931 8.8	4.5 gr
2.1.011.08.30	8 mm Nut	Bundschraube	M8	5.2	25	16	DIN 931 8.8	13 gr
2.1.011.10.30	10 mm Nut	Bundschraube	M10	6	30	17.5	DIN 931 8.8	21 gr

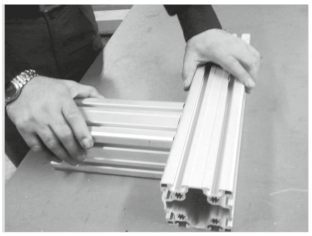
Anwendungsbereich

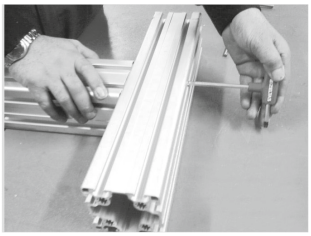
Bundschrauben ermöglicht feste und praktische Verbindung. Rändelierter Schraubenkopf sorgt dafür, das der Verbindung sich nicht entspannt. Der Schraubenkopf bleibt in Nut versteckt .

Using Area

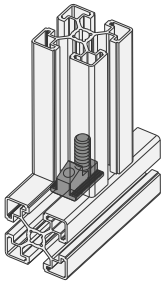
Head bolts provide strong and practical connection into profiles. Springs under the bolts makes pressure throught profile surface and not let weakness.Connection bolts stay into interior slots of profile and it brings an aesthetics to profiles.

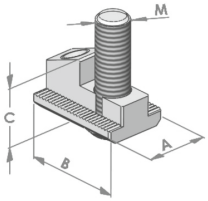






Innenverbinder





Produkt ID	⌐¬	Produkt-Name	M	A	B	C	Material	Gewicht
2.1.012.08.01	8 mm Nut	Inennverbinder	M8	15	26.4	12.5	Stahl	15 gr
2.1.012.10.04	10 mm Nut	Inennverbinder	M10	19	30	17.5	Stahl	27 gr

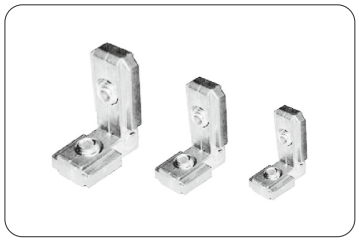
Anwendungsbereich

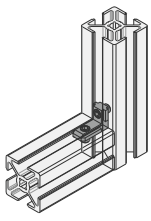
Ermöglicht 90 Grad Winkelverbindung ohne zusätzliche Bohrung. Durch entspannen der Stellschraube ist es an beliebte Position verschiebbar.

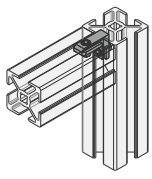
Using Area

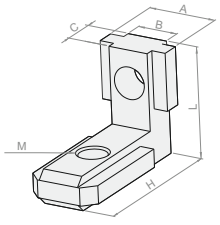
It provides 90° angle connection without making any holes on profiles. It's possible to fix the profile on desired area by loosening the setscrew.

Innenwinkel









Produkt ID	⌐¬	Produkt-Name	M	A	B	C	L	H	Material	Gewicht
2.1.010.06.00	6 mm Nut	Innenwinkel	M5	9	6	4.8	13.5	20	DIN 1743-2	6 gr
2.1.010.08.00	8 mm Nut	Innenwinkel	M6	13	8	6.7	21	30	DIN 1743-2	18.5 gr
2.1.010.10.00	10 mm Nut	Innenwinkel	M8	17	10	8.4	27	40	DIN 1743-2	41 gr

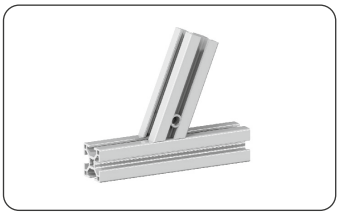
Anwendungsbereich

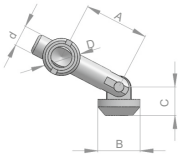
Verbindung bei nicht unter Belastung stehenden Bauten. Verbinder bleibt in der Nut versteckt. Es ist im inneres Eck als auch aussen Eck verwendbar.

Using Area

Hide corner connection part mostly used into weak internal or outside slots of profiles.Hide corner connections are used on applications which needs to hide connections.

Winkel-Zentralverbinder 75°-180°





Produkt ID		Produkt-Name	A	B	C	D	d	Material	Gewicht
2.1.012.08.02	8 mm Nut	30x30 Winkel-Zentralverbinder	12.5	15	9	12	6.8	Stahl	22.5 gr
2.1.012.10.02	10 mm Nut	45x45 Winkel-Zentralverbinder	26	17	11.5	15	8.5	Stahl	53 gr

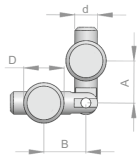
Anwendungsbereich

Zur Verbindung von winkel gesägten Profilen an Profilnut. Beweglicher Spannkopf ermöglicht 60 bis 180 Grad Winkelverbindungen.

Using Area

It provides connection between degreed cut profile and other profile surface. It presents connection 60° degree to 180° degree with adjustable head.

Gelenk-Zentralverbinder



Produkt ID		Produkt-Name	A	D	d	Material	Gewicht
2.1.012.08.03	8 mm Nut	30x30 Gelenk-Zentralverbinder	12.5	12	6.8	Stahl	32.5 gr
2.1.012.10.03	10 mm Nut	45x45 Gelenk-Zentralverbinder	26	15	8.5	Stahl	84 gr

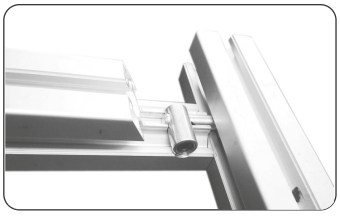
Anwendungsbereich

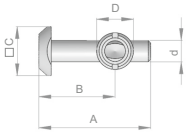
Zur Stirn an Stirn Verbindung von winkel gesägten Profilen mit Spannverbindung. Bewegliches Gelenk ermöglicht 75 bis 180 Grad Winkelverbindungen.

Using Area

It is used for connecting two profile with their front side by pulling method. It provides connection between 75° - 180° angle.

Zentralverbinder





Produkt ID	⌴	Produkt-Name	A	B	C	D	d	Material	Gewicht
2.1.012.08.00	8 mm Nut	30x30 Zentralverbinder	29	21	16	12	6.8	Stahl	24.5 gr
2.1.012.10.01	10 mm Nut	45x45 Zentralverbinder	45.5	31	20	15	8.5	Stahl	54 gr

Anwendungsbereich

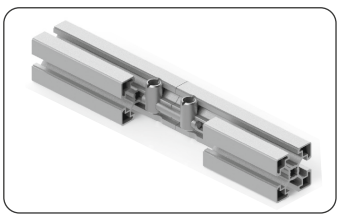
zur Verbindung İn gleicheachsigen Profile. Die Verbindung ist auch bei parallel positionierten Profilen verwendbar.

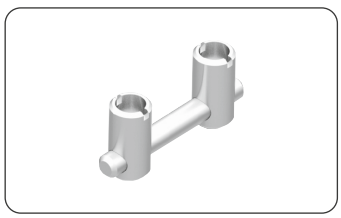
Using Area

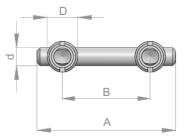
This connection part provides fixing profile equipment which is same connection axis. Besides can be used for parallel joints.

Zentralverbinder Stirn-Stirn

NEU







Produkt ID	⌴	Produkt-Name	A	B	D	d	Material	Gewicht
2.1.012.10.05	10 mm Nut	Zentralverbinder Stirn-Stirn	68	48	15	8.8	Stahl	80.5 gr

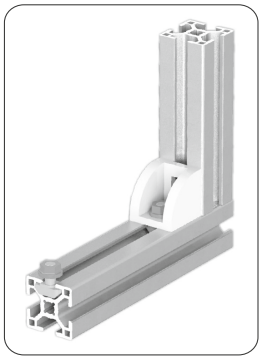
Anwendungsbereich

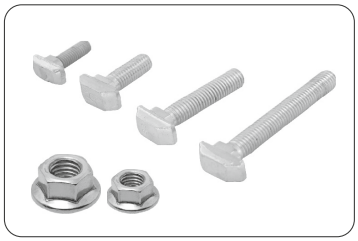
bei verlängerung der Profil am Stirn.

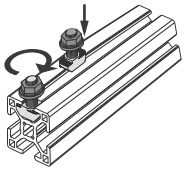
Using Area

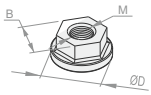
It provides addition of profiles and to and where the addition is needed

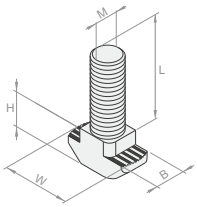
Flanschmutter











Produkt ID	⌐¬	Produkt-Name	D	L	M	H	W	B	Material	Gewicht
2.1.002.08.0620	8 mm Nut	M6x20 Flanschmutter	-	18,5	6	6,8	16,5	7,7	DIN 931 8.8	7.5 gr
2.1.002.08.0625	8 mm Nut	M6x25 Flanschmutter	-	23,5	6	6,8	16,5	7,7	DIN 931 8.8	8 gr
2.1.002.10.0825	10 mm Nut	M8x25 Flanschmutter	-	17	8	9,7	19,5	8,3	DIN 931 8.8	14 gr
2.1.002.10.0830	10 mm Nut	M8x30 Flanschmutter	-	27	8	9,7	19,5	8,3	DIN 931 8.8	16 gr
2.1.002.10.0840	10 mm Nut	M8x40 Flanschmutter	-	37	8	9,7	19,5	8,3	DIN 931 8.8	18.5 gr
2.1.002.10.0860	10 mm Nut	M8x60 Flanschmutter	-	57	8	9,7	19,5	8,3	DIN 931 8.8	25.5 gr
2.1.009.00.06	8 mm Nut	Hutmutter	Ø13	-	6	-	-	9,8	DIN 931 8.8	3 gr
2.1.009.00.08	10 mm Nut	Hutmutter	Ø21	-	8	-	-	12,7	DIN 931 8.8	9,5 gr

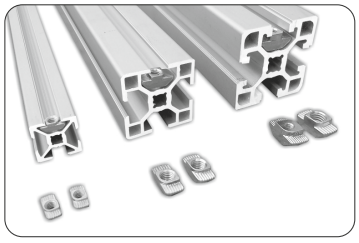
Anwendungsbereich

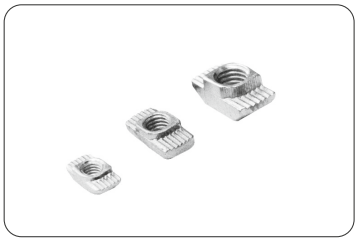
Zur Verbindung verschidene bauteile an die Profilnut. Je nach die Höhe der Verbindungsteil sind passende Muttern zur Verfügung gestellt.

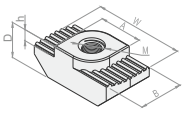
Using Area

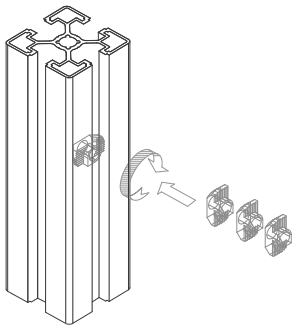
Hammer spring nuts provide practical connection of additional components into profiles.Lenght of hammer spring nuts are changeable according to lenght of the connection part.

Hammermutter









Produkt ID	⌴	Produkt-Name	M	B	W	D	H	A	Material	Gewicht
2.1.001.06.04	6 mm Nut	Hammermutter	M4	5.7	11.4	4.1	1.2	5.6	DIN 931 8.8	1.2 gr
2.1.001.06.05	6 mm Nut	Hammermutter	M5	5.7	11.4	4.1	1.2	5.6	DIN 931 8.8	1 gr
2.1.001.08.04	8 mm Nut	Hammermutter	M4	7.9	16	6.3	2	7.7	DIN 931 8.8	3.6 gr
2.1.001.08.05	8 mm Nut	Hammermutter	M5	7.9	16	6.3	2	7.7	DIN 931 8.8	3.3 gr
2.1.001.08.06	8 mm Nut	Hammermutter	M6	7.9	16	6.3	2	7.7	DIN 931 8.8	3 gr
2.1.001.10.04	10 mm Nut	Hammermutter	M4	10	19	8.7	3	9.8	DIN 931 8.8	7.5 gr
2.1.001.10.05	10 mm Nut	Hammermutter	M5	10	19	8.7	3	9.8	DIN 931 8.8	7 gr
2.1.001.10.06	10 mm Nut	Hammermutter	M6	10	19	8.7	3	9.8	DIN 931 8.8	6.5 gr
2.1.001.10.08	10 mm Nut	Hammermutter	M8	10	19	8.7	3	9.8	DIN 931 8.8	5.5 gr
2.1.001.08.06.00	8 mm Nut	Hammermutter (Rostfrei)	M6	7,9	16	6.3	2	7.7	Rostfrei	2.7 gr
2.1.001.10.06.00	10 mm Nut	Hammermutter (Rostfrei)	M6	10	19	8.7	3	9.8	Rostfrei	5.9 gr
2.1.001.10.08.00	10 mm Nut	Hammermutter (Rostfrei)	M8	10	19	8.7	3	9.8	Rostfrei	5 gr

YENİ / NEU / NEU

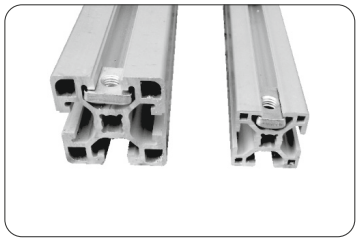
Anwendungsbereich

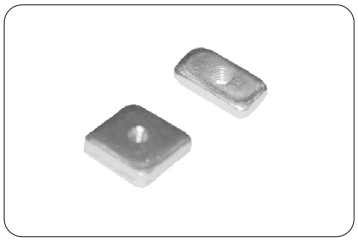
Vereinfacht die Verbinder-Montage. Angebrachte Verzahnung erzeugt ein guter Halt und verhindert Entspannuung der Mutter. Es Gleitet im Nutenkanal und kann leicht entnommen werden.

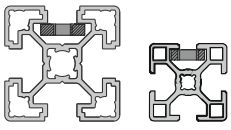
Using Area

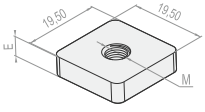
It provides making connections at profiles easily. Plus owing to its deckles it prevents getting loosen by pressing inside the profile. As it provides connection chance to profile canal from any place, it also can be taken out practically from the place it is mounted.

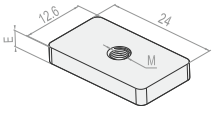
Gewindeplatten











Produkt ID	⌴	Produkt-Name	M	E	Material	Gewicht
2.1.005.08.04	8 mm Nut	Rechteck-Gewindeplatten	M4	5	HRP	10.5 gr
2.1.005.08.05	8 mm Nut	Rechteck-Gewindeplatten	M5	5	HRP	10 gr
2.1.005.08.06	8 mm Nut	Rechteck-Gewindeplatten	M6	5	HRP	10 gr
2.1.005.08.08	8 mm Nut	Rechteck-Gewindeplatten	M8	5	HRP	9 gr
2.1.004.10.04	10 mm Nut	Quadrad-Gewindeplatten	M4	5	HRP	13.5 gr
2.1.004.10.05	10 mm Nut	Quadrad-Gewindeplatten	M5	5	HRP	13 gr
2.1.004.10.06	10 mm Nut	Quadrad-Gewindeplatten	M6	5	HRP	13 gr
2.1.004.10.08	10 mm Nut	Quadrad-Gewindeplatten	M8	5	HRP	12 gr
2.1.004.10.10	10 mm Nut	Quadrad-Gewindeplatten	M10	5	HRP	10.5 gr

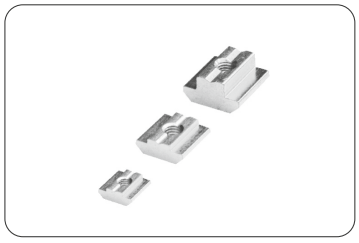
Anwendungsbereich

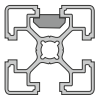
Quadrad-Gewindeplatten: Es wird als Alternative zur Hammermuttern benutzt.
Rechteck-Gewindeplatten: Gegenteil zur Hammermuttern muss der Gewindeplatte vorher in die Nut eingeschoben werden.

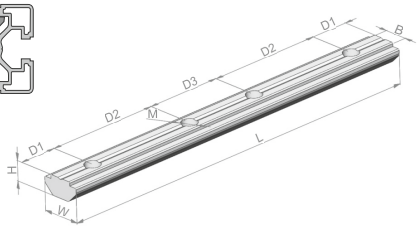
Using Area

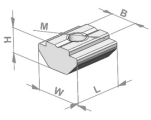
Square Nuts: are mostly preferred at profiles having 10mm canal as an alternative of jugged nut applications.
Rectangular Nuts: are necessary to determine the place where it will be used and it can be connected by mounting to the profile channel at the begining.

Befestigungsmutter









Ermöglicht sichere Stirn an Stirn Profilverbindung. / *It is used on additional profile connections and strong connections.*

Produkt ID		Produkt-Name	M	B	W	L	D3	D2	D1	H	Material	Gewicht
2.1.008.06.100	6 mm Nut	Befestigungsmutter	M5	6	10	100	20	30	10	5	DIN 931 8.8	29 gr
2.1.008.08.120	8 mm Nut	Befestigungsmutter	M6	7,8	16	120	35	35	7,5	6	DIN 931 8.8	77.5 gr
2.1.008.10.140	10 mm Nut	Befestigungsmutter	M8	10	20	140	30	40	15	10,5	DIN 931 8.8	150 gr

Produkt ID		Produkt-Name	M	B	W	L	H	Material	Gewicht
2.1.006.06.04	6 mm Nut	T-Nutenmutter	M4	6	10	10	5	DIN 931 8.8	2.5 gr
2.1.006.06.05	6 mm Nut	T-Nutenmutter	M5	6	10	10	5	DIN 931 8.8	2 gr
2.1.006.06.06	6 mm Nut	T-Nutenmutter	M6	6	10	10	5	DIN 931 8.8	2 gr
2.1.006.08.04	8 mm Nut	T-Nutenmutter	M4	7.8	16	16	6	DIN 931 8.8	9 gr
2.1.006.08.05	8 mm Nut	T-Nutenmutter	M5	7.8	16	16	6	DIN 931 8.8	8.5 gr
2.1.006.08.06	8 mm Nut	T-Nutenmutter	M6	7.8	16	16	6	DIN 931 8.8	8.5 gr
2.1.006.08.08	8 mm Nut	T-Nutenmutter	M8	7.8	16	16	6	DIN 931 8.8	7.5 gr
2.1.006.10.04	10 mm Nut	T-Nutenmutter	M4	10.1	20	20	10,5	DIN 931 8.8	21.5 gr
2.1.006.10.05	10 mm Nut	T-Nutenmutter	M5	10.1	20	20	10,5	DIN 931 8.8	20.5 gr
2.1.006.10.06	10 mm Nut	T-Nutenmutter	M6	10.1	20	20	10,5	DIN 931 8.8	19.5 gr
2.1.006.10.08	10 mm Nut	T-Nutenmutter	M8	10.1	20	20	10,5	DIN 931 8.8	18.5 gr

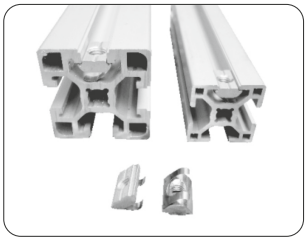
Anwendungsbereich

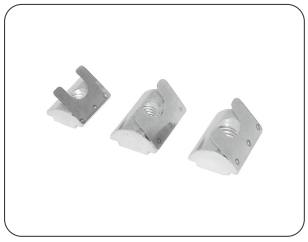
Es erzeugt sichere Verbindung in stark Belasteten stellen . Länge Muttern hilf mit großer Auflagefläche mehr Befestigungskraft.

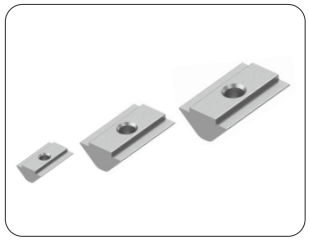
Using Area

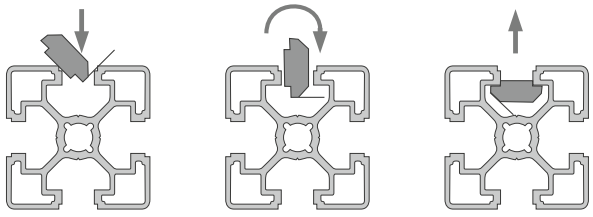
T slot nuts should be use for strong connection needed places. Long type of Tslot nuts fix profile clearly and make possible to tightly scewing profiles.

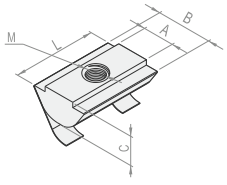
Federnutenmutter/Schwenkbare Mutter

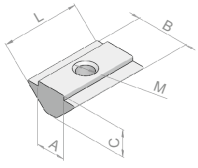












Produkt ID		Produkt-Name	M	A	B	C	L	Material	Gewicht
2.1.003.08.04	8 mm Nut	Federmutter	M4	8	13	5.5	16	DIN 931 8.8	3.8 gr
2.1.003.08.05	8 mm Nut	Federmutter	M5	8	13	5.5	16	DIN 931 8.8	4 gr
2.1.003.08.06	8 mm Nut	Federmutter	M6	8	13	5.5	16	DIN 931 8.8	5.5 gr
2.1.003.08.08	8 mm Nut	Federmutter	M8	8	13	5.5	16	DIN 931 8.8	4.5 gr
2.1.003.10.04	10 mm Nut	Federmutter	M4	10	15	7.5	20	DIN 931 8.8	12 gr
2.1.003.10.05	10 mm Nut	Federmutter	M5	10	15	7.5	20	DIN 931 8.8	11.5 gr
2.1.003.10.06	10 mm Nut	Federmutter	M6	10	15	7.5	20	DIN 931 8.8	11.5 gr
2.1.003.10.08	10 mm Nut	Federmutter	M8	10	15	7.5	20	DIN 931 8.8	10.5 gr
NEU 2.1.007.06.04	6 mm Nut	Modul T-Nutenmutter	M4	6.1	11	5.5	16	DIN 931 8.8	4 gr
NEU 2.1.007.06.05	6 mm Nut	Modul T-Nutenmutter	M5	6.1	11	5.5	16	DIN 931 8.8	4 gr
NEU 2.1.007.06.06	6 mm Nut	Modul T-Nutenmutter	M6	6.1	11	5.5	16	DIN 931 8.8	3 gr

Anwendungsbereich

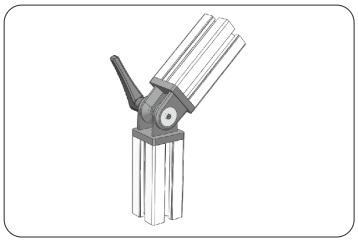
Federmuttern verhindert das die Mutter in der Nut abrutscht. Bei Vertikele Montage ist es sehr hilfsreich.

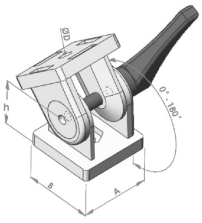
Using Area

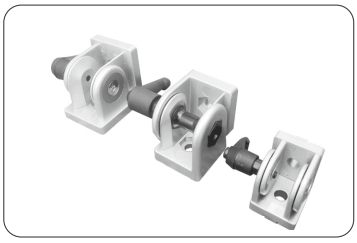
Spring nuts are mostly used when the nut needed stable and on vertical positons on assembles.

Gelenk mit Klemmhebel

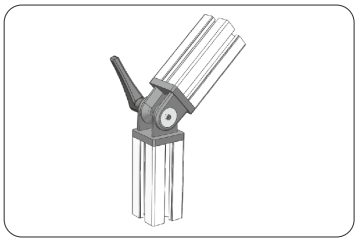
6 8 10

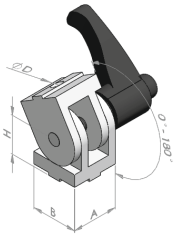


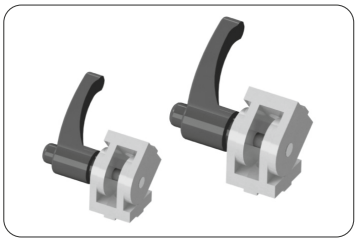




Produkt ID	Produkt-Name	A	B	D	H	Material	Gewicht
2.2.009.08.3030.0001	30x30 Gelenk mit Klemmhebel	30	30	Ø8.5	22.5	DIN 1743-2	154 gr
2.2.009.08.4040.0001	40x40 Gelenk mit Klemmhebel	40	40	Ø8.5	30	DIN 1743-2	372 gr
2.2.009.10.4545.0001	45x45 Gelenk mit Klemmhebel	45	45	Ø10.5	30	DIN 1743-2	342 gr







Produkt ID	Produkt-Name	A	B	D	H	Material	Gewicht
2.2.009.08.3030	30x30 Gelenk mit Klemmhebel	30	30	Ø8	22.5	Aluminium	132,5 gr
2.2.009.08.4545	45x45 Gelenk mit Klemmhebel	45	45	Ø8.5	30	Aluminium	309 gr

Anwendungsbereich

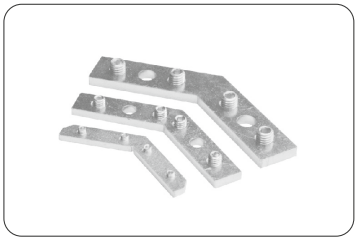
Es ermöglicht bei bewegliche Profilen 0 bis 180 Grad Winkelverstellung. Es wird praktisch am Stirn bzw. an die Nut Montiert. Es ist auch bei doppelseitige Anwendungen nützlich, in den man Multiachsensysteme erzeugt.

Using Area

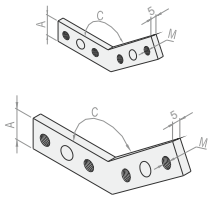
It is used to connect fixed or moving profiles within an 180° angle area. It is easily connected to forehead and channel of the profile by the connection bolt. It provides a movement out of standards for the part.This profile make possible to create multi axis at double side applications.

120°-135° Gehrungswinkel

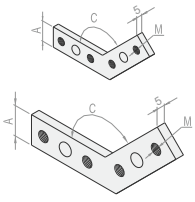
6 8 10



135°



120°



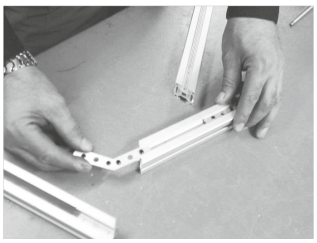
Produkt ID	Prf. Maße	Produkt-Name	A	C	M	Material	Gewicht
2.2.011.06.120.20	20x20	120°Gehrungswinkel	9.3	120	M4	Stahl	17 gr
2.2.011.06.120.25	25x25	120° Gehrungswinkel	12.3	120	M5	Stahl	27 gr
2.2.011.08.120	30x30	120° Gehrungswinkel	14	120	M6	Stahl	43 gr
2.2.011.10.120	45x45	120° Gehrungswinkel	19.5	120	M8	Stahl	92 gr
2.2.011.06.135.20	20x20	135° Gehrungswinkel	9.3	135	M4	Stahl	16 gr
2.2.011.06.135.25	25x25	135° Gehrungswinkel	12.3	135	M5	Stahl	27 gr
2.2.011.08.135	30x30	135° Gehrungswinkel	14	135	M6	Stahl	41 gr
2.2.011.10.135	45x45	135° Gehrungswinkel	19.5	135	M8	Stahl	88 gr

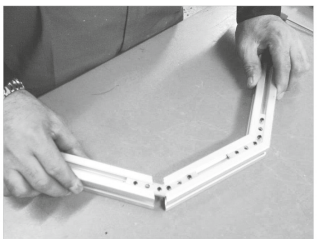
Anwendungsbereich

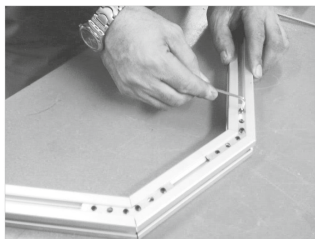
Der Gehrungsverbinder verbindet mit 120° bzw. 135° gesägte Profile. Es bleibt in der Nut versteckt.

Using Area

It's used on connections 120° - 135° degree which is not preferred from outside. Degreed connection parts are mounted inside channels and it provides easy and practical connections.

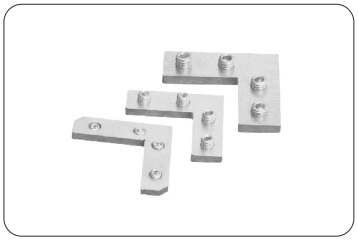


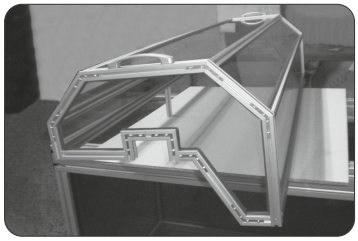


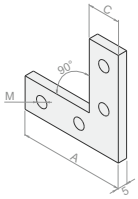


90° Gehrungswinkel

6 8 10







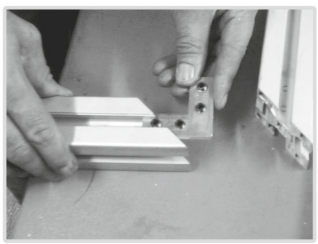
Produkt ID	Prf. Maße	Produkt-Name	A	C	M	Material	Gewicht
2.2.011.06.090.20	20x20	90° Gehrungswinkel	45	9.3	M4	Stahl	17.5 gr
2.2.011.06.090.25	25x25	90° Gehrungswinkel	45	12.3	M5	Stahl	30 gr
2.2.011.08.090	30x30	90° Gehrungswinkel	45	14	M6	Stahl	33.5 gr
2.2.011.10.090	45x45	90° Gehrungswinkel	55	19,5	M8	Stahl	71 gr

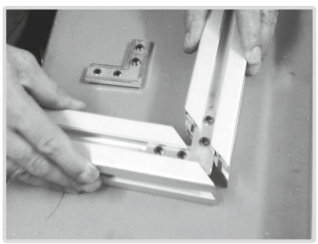
Anwendungsbereich

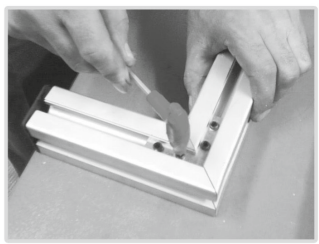
Der Gehrungsverbinder verbindet mit 90° gesägte Profile. Es bleibt in der Nut versteckt.

Using Area

It is preferred on 90 degree connections which are undesired connection elements at outer side of profile . Graded connection parts are attached easily and quickly by connecting into the canal.



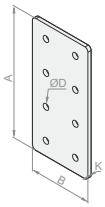




6 8 10

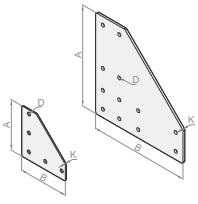
Knotenplatten

Produkt ID	Prf. Maße	Produkt-Name	A	B	ØD	K	Material	Gewicht
2.2.002.10.4590.01	45x90	Knotenplatte	175	85	8.5	5	Stahl	564 gr



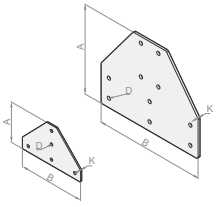
Zwei Seiten-Knotenplatten

Produkt ID	Prf. Maße	Produkt-Name	A	B	ØD	K	Material	Gewicht
2.2.002.06.2025.02	20x25	Knotenplatte	75	75	5	3	Stahl	96.5 gr
2.2.002.08.3030.02	30x30	Knotenplatte	80	80	6.5	3	Stahl	119 gr
2.2.002.10.4545.02	45x45	Knotenplatte	120	120	8.5	3	Stahl	256 gr
2.2.002.10.4590.02	45x90	Knotenplatte	180	180	8.5	4	Stahl	850 gr
2.2.002.10.9090.02	90x90	Knotenplatte	240	240	8.5	5	Stahl	1.782 gr



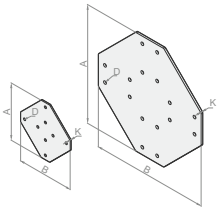
Drei seiten-Knotenplatten

Produkt ID	Prf. Maße	Produkt-Name	A	B	ØD	K	Material	Gewicht
2.2.002.06.2025.03	20x25	Knotenplatte	75	86	5	3	Stahl	109.5 gr
2.2.002.08.3030.03	30x30	Knotenplatte	90	150	6.5	3	Stahl	221.5 gr
2.2.002.10.4545.03	45x45	Knotenplatte	120	160	8.5	3	Stahl	322 gr
2.2.002.10.4590.03	45x90	Knotenplatte	170	130	8.5	4	Stahl	622 gr
2.2.002.10.9090.03	90x90	Knotenplatte	200	250	8.5	5	Stahl	1.581 gr



Vier seiten-Knotenplatten

Produkt ID	Prf. Maße	Produkt-Name	A	B	ØD	K	Material	Gewicht
2.2.002.06.2025.04	20x25	Knotenplatte	130	130	5	3	Stahl	248 gr
2.2.002.08.3030.04	30x30	Knotenplatte	150	150	6.5	3	Stahl	334 gr
2.2.002.10.4545.04	45x45	Knotenplatte	180	180	8.5	4	Stahl	689 gr
2.2.002.10.9090.04	90x90	Knotenplatte	311	311	8.5	5	Stahl	2.739 gr

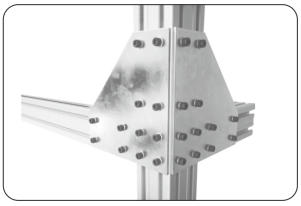


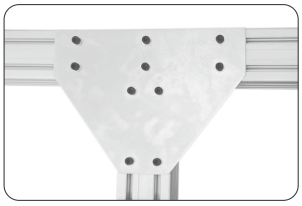
Anwendungsbereich

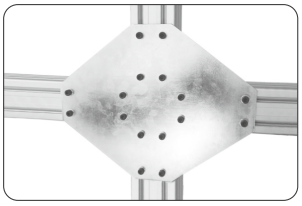
Knotenplatten zur Aussteifung bestehender Verbindungen. Eine nachträgliche Montage problemlos möglich. Bei Montage ist keine zusätzliche Bohrung nötig.

Using Area

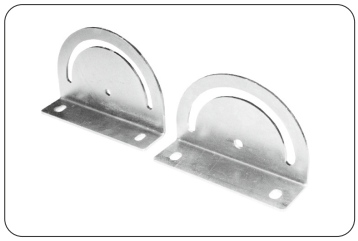
It's possible to mount more than one profile by using bolts without making any holes on profiles. It's mostly used on machines and conveyors's feets and it provides an aesthetics apperiance. It's used as support on areas which need strenght Also it provides alternative option connection as support.

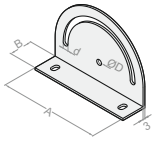






Regal-Schwenkwinkel





Produkt ID	⌐¬	Produkt-Name	A	B	d	Ø D	Material	Gewicht
2.2.007.08	8 mm Nut	Regal-Schwenkwinkel	120	30	6.5	6.5	Stahl	247.5 gr
2.2.007.10	10 mm Nut	Regal-Schwenkwinkel	120	38	8.5	8.5	Stahl	242.5 gr

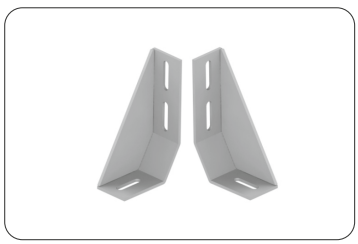
Anwendungsbereich

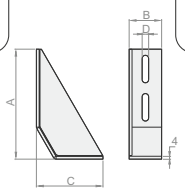
Zur Befestigung und Verstellen von Regele in 180 Grad Spalte. Mit Spannhebel in beliebigen Winkel Verstellbar.

Using Area

It enables adjustment of the tripods and tables desired in an area of 180 degrees. It provides fixing by tightening arms at desired angle.

Bodenwinkel





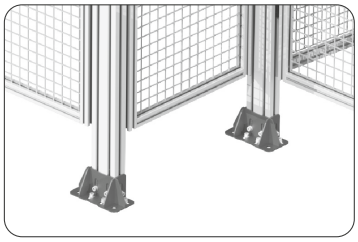
Produkt ID	Produkt-Name	A	B	C	D	Material	Gewicht
2.2.002.00.00	Bodenwinkel	153	45	92	9	Stahl	488.5 gr

Anwendungsbereich

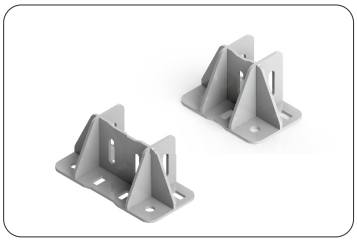
Mit dem Fundamentwinkel werden Maschinengestelle und Fördererfuß am Boden gesichert. Es besteht aus zwei symetrischen Teile.

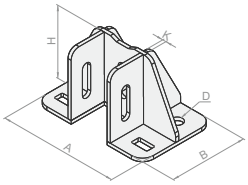
Using Area

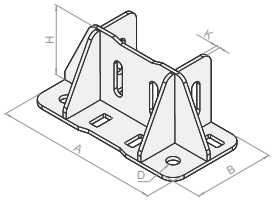
It provides fixing feet to the floor by conveyor and machine chassis according to the usage place. It consists of two types; left and right.One side is attached to profile and the other side is fixed to the floor by steel plugs.



NEU







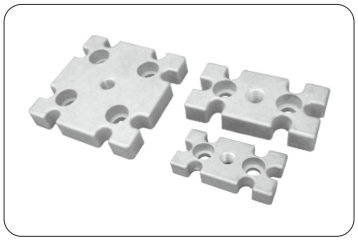
Produkt ID	Prf. Maße	Produkt-Name	A	B	D	H	K	Material	Gewicht
2.2.002.045045.00.10	45x45	Fußkonsole	135	89	13	80	4	Stahl	862 gr
2.2.002.045090.00.10	45x90	Fußkonsole	180	89	13	80	4	Stahl	972 gr

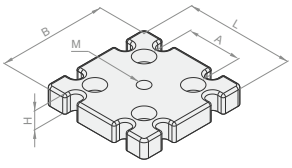
Anwendungsbereich

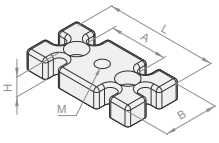
Für die kantenbündige Aufnahme von Profilstützen.
Ermöglicht starke Verankerung am Boden.

Using Area

It is using in cabin, chassis applications to fix the food to the floor. They are high strength metal fittings.







SIGMA PROFILE

Produkt ID	Prf. Maße	Produkt-Name	M	A	L	B	H	Material	Gewicht
2.2.005.3060.06	30x30 30x60	Fußplatte	M6	30	60	30	16	Aluminium	45 gr
2.2.005.3060.08	30x30 30x60	Fußplatte	M8	30	60	30	16	Alu-Druckguss	45 gr
2.2.005.4080.10	40x80 45x45	Fußplatte	M10	40	80	40	15	Aluminium	76 gr
2.2.005.4080.12	40x80 45x45	Fußplatte	M12	40	80	40	15	Aluminium	74.5 gr
2.2.005.4590.10	45x90	Fußplatte	M10	45	90	45	15	Alu-Druckguss	101 gr
2.2.005.4590.12	45x90	Fußplatte	M12	45	90	45	15	Alu-Druckguss	100 gr
2.2.005.4590.16	45x90	Fußplatte	M16	45	90	45	15	Alu-Druckguss	95.5 gr
NEU 2.2.005.6060.10	60x60	Fußplatte	M10	30	60	60	15	Alu-Druckguss	119 gr
NEU 2.2.005.6060.12	60x60	Fußplatte	M12	30	60	60	15	Alu-Druckguss	119 gr
NEU 2.2.005.8080.10	80x80	Fußplatte	M10	40	80	80	15	Alu-Druckguss	218.5 gr
NEU 2.2.005.8080.12	80x80	Fußplatte	M12	40	80	80	15	Alu-Druckguss	217.5 gr
2.2.005.9090.12	90x90	Fußplatte	M12	45	90	90	15	Alu-Druckguss	201 gr
2.2.005.9090.16	90x90	Fußplatte	M16	45	90	90	15	Alu-Druckguss	195 gr

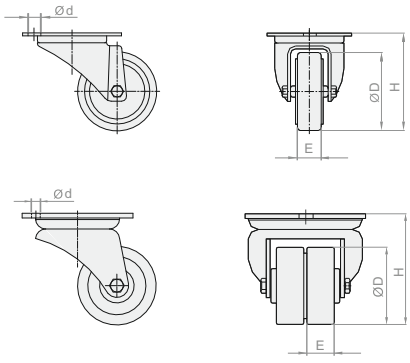
Anwendungsbereich

Befestigung von Gelenkfüßen oder Lenkrollen in Profilstützen. Erzeugt sichere und feste Verbindung. Es muss nach Profilschnitt passend ausgewählt.

Using Area

Foot connection parts provide strong assemble opportunity for connecting wheels just as in the case of plastic and metal feet on constructions.

Lenkrollen mit Feststellbremse



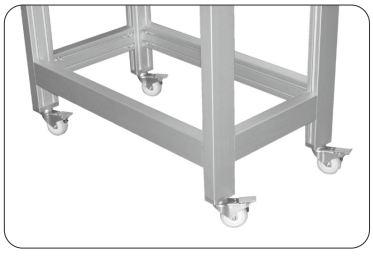
Produkt ID	Produkt-Name	E	Ø D	Ø d	H	Tragfähigkeit	Material	Gewicht
2.3.004.050.01	Ø 50 Einzelrad	20	50	10	70	35 kg	Polyamid	204 gr
2.3.004.050.02	Ø 50 Doppelrad	20	50	10	70	55 kg	Polyamid	277 gr
2.3.004.075.01	Ø 75 Einzelrad	25	75	10	100	60 kg	Polyamid	298 gr
2.3.004.075.02	Ø 75 Doppelrad	25	75	10	100	80 kg	Polyamid	538 gr
2.3.004.100.01	Ø 100 Einzelrad	30	100	12	130	140 kg	Polyamid	719 gr

Anwendungsbereich

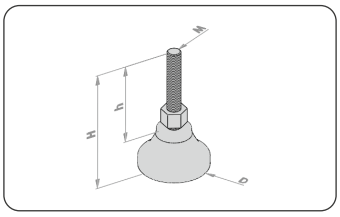
Bei Baukastensysteme und Förderer ermöglicht es Mobilität. Je nach Anwendung muss passende Rollen ausgewehl sein.

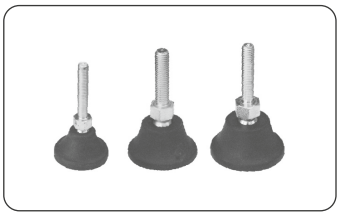
Using Area

Rollers present movement on modular applications e-g Service carts, Chasis and conveyors. Various roller types are preferred in accordance to different profile types. Also it can be fixed apperatus with locking.

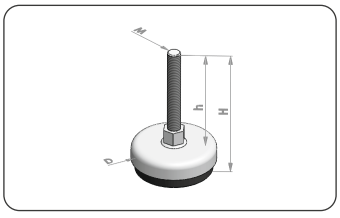


SIGMA PROFILE





Produkt ID	Produkt-Name	D	M	H	h	Material	Gewicht	Tragfähigkeit
2.3.002.0650	M6 Plastikfuß	Ø 41	M6	80	50	Plastik	41 gr	39 kg
2.3.002.0845	M8 Plastikfuß	Ø 41	M8	80	50	Plastik	47 gr	49.5 kg
2.3.002.1050	M10 Plastikfuß	Ø 60	M10	100	60	Plastik	116 gr	114 kg
2.3.002.1250	M12 Plastikfuß	Ø 60	M12	100	60	Plastik	136 gr	152kg
2.3.002.1650	M16 Plastikfuß	Ø 110	M16	160	110	Plastik	314 gr	325.5 kg



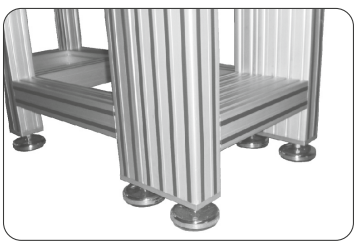
Produkt ID	Produkt-Name	D	M	H	h	Material	Gewicht	Tragfähigkeit
2.3.003.060	M10 Fuß Verchromt	Ø 60	M10	85	50	Chrom-Stahl	188 gr	190 kg
2.3.003.080	M12 Fuß Verchromt	Ø 80	M12	150	100	Chrom-Stahl	479 gr	489 kg
2.3.003.120	M16 Fuß Verchromt	Ø 120	M16	150	100	Chrom-Stahl	1.081 gr	1.150 kg

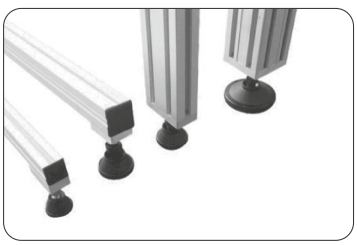
Anwendungsbereich

Bei Maschinen, Förderbänder und ähnliche Konstruktionen gleichen Gelenkfüße Bodenunebenheiten aus. Je nach Anwendung gibt es verschiedene modelle zum Auswahl.

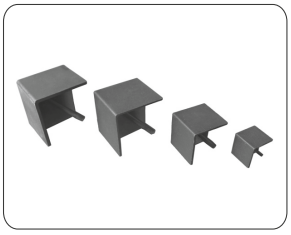
Using Area

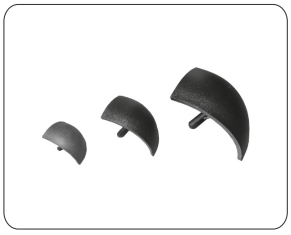
It presents contact betwen conveyors machine etc and floor. It can be adapted with floor easily with hinged structure. It has various options accordance to usage area.

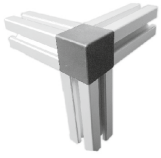


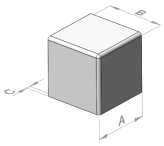


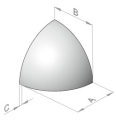
Abdeckkappen für Eckverbindungen

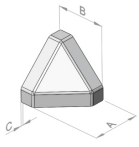












Produkt ID	Produkt-Name	A	B	C	Material	Gewicht
2.3.001.2020.07	20x20 würfel	20	20	2	Plastik	3 gr
2.3.001.3030.07	30x30 würfel	30	30	3	Plastik	8 gr
2.3.001.4040.07	40x40 würfel	40	40	3	Plastik	13.5 gr
2.3.001.4545.07	45x45 würfel	45	45	3	Plastik	22 gr
2.3.001.4040.08	40x40 Dreieck	40	40	3	Plastik	7 gr

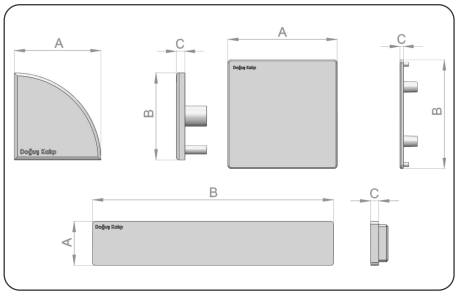
Produkt ID	Produkt-Name	A	B	C	Material	Gewicht
2.3.001.2020.05	Eckverbinderkappe Abgerundet	20	20	3	Plastik	2 gr
2.3.001.3030.05	Eckverbinderkappe Abgerundet	30	30	3	Plastik	4 gr
2.3.001.4545.05	Eckverbinderkappe Abgerundet	45	45	3	Plastik	14 gr

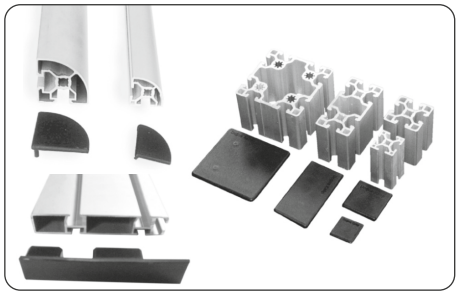
Anwendungsbereich

Passende Abdeckkappen für Eck undWinkel -Verbinder. Deckt die Schraubenkopf ab und ermöglicht optische Ästhetik.

Using Area

It is possible to cover corner connector parts which preferred profiles' corner connection and their bolts with an aesthetic apperiance.





Produkt ID	Produkt-Name	A	B	C	Farbe	Material	Gewicht
2.3.001.2020.01	20x20 Profilkappe	20	20	2	●	Plastik	1 gr
2.3.001.2040.01	20x40 Profilkappe	20	40	3	●	Plastik	2 gr
2.3.001.2080.01	20x80 Profilkappe	20	80	3	●	Plastik	4 gr
2.3.001.2525.01	25x25 Profilkappe	25	25	3	●	Plastik	1.5 gr
2.3.001.3030.01	30x30 Profilkappe	30	30	3	●○	Plastik	3.5 gr
2.3.001.3535.02	35x35 Profilkappe (Heavy)	35	35	4	●	Plastik	4 gr
2.3.001.3535.01	35x35 Profilkappe (Light)	35	35	3	●	Plastik	4.5 gr
2.3.001.3060.01	30x60 Profilkappe	30	60	3	●○	Plastik	7 gr
2.3.001.4040.01	40x40 Profilkappe (10 mm Nut)	40	40	3	●○	Plastik	5.5 gr
2.3.001.4040.02	40x40Profilkappe (8 mm Nut)	40	40	3	●	Plastik	5.5 gr
2.3.001.4080.01	40x80 Profilkappe	40	80	3	●○	Plastik	9.5 gr
2.3.001.4545.01	45x45 Profilkappe	45	45	3	●○	Plastik	8 gr
2.3.001.4560.01	45x60 Profilkappe	45	60	3	●	Plastik	9.5 gr
2.3.001.4590.01	45x90 Profilkappe	45	90	3	●○	Plastik	15.5 gr
2.3.001.6060.01	60x60 Profilkappe	60	60	3	●	Plastik	11.5 gr
2.3.001.8080.01	80x80 Profilkappe	80	80	3	●	Plastik	19.5 gr
2.3.001.9090.01	90x90 Profilkappe	90	90	3	●	Plastik	31 gr
2.3.001.2020.03	20x20 Profilkappe Abgerundet	20	20	3	●	Plastik	1 gr
2.3.001.3030.03	30x30 Profilkappe Abgerundet	30	30	3	●	Plastik	2.5 gr
2.3.001.4545.03	45x45 Profilkappe Abgerundet	45	45	3	●	Plastik	7 gr
2.3.001.23127.01	23x127 Profilkappe	23	126.8	4.2	●	Plastik	18.5 gr

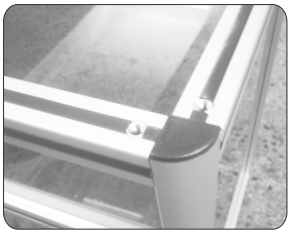
PS: Produkt ID for graue Farbe 2.3.001.xxxx.11

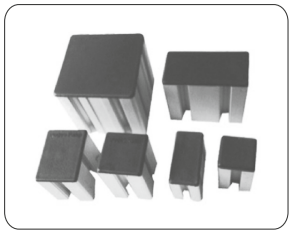
Anwendungsbereich

Abdeckkappen in verschiedenen Farben verbessern die Optik und Schützt vor Verletzungen durch Profilenden. Auserdem schützt vor Verschmutzungen der Profilinenraum.

Using Area

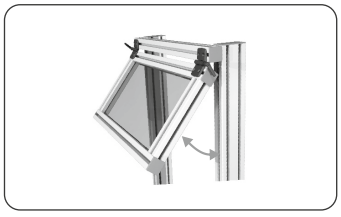
It provides a good view by mounting to profile foreheads and prevents dirt at open places. Also it keeps solution for the possibility of the damage of profile ends.

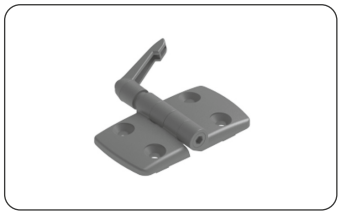


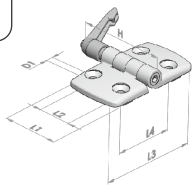


Scharnier mit Klemmhebel

NEU







Produkt ID	Prf. Maße	Produkt-Name	H	L1	L2	L3	L4	D1	Material	Gewicht
2.2.003.2525.03	25x25	Scharnier m. Hebel	72	48	28	52	30	6,6	Pa6 Schwarz	46 gr
2.2.003.3030.03	30x30	Scharnier m. Hebel	72	48	28	59	35	6,6	Pa6 Schwarz	48 gr
2.2.003.4545.03	45x45	Scharnier m. Hebel	72	48	28	87	50	6,6	Pa6 Schwarz	60,5 gr

Anwendungsbereich

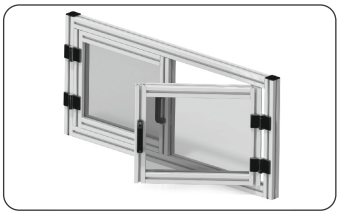
Ermöglicht Winkelverstellung bei Öfnungen. Mit Klemmhebel kann man die Öfnungen in beliebigen Winkel fixieren.

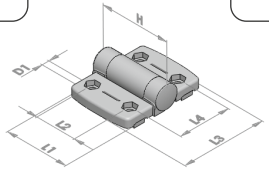
Using Area

Locked Hingles are a kind of plactic hingles using for fixing by doing angle setting in windows open with spring arm.

Systemscharnier mit Abdeckkappe

NEU





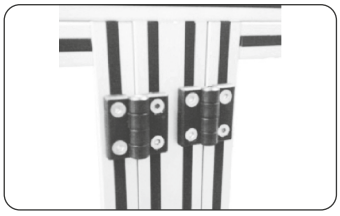
Produkt ID	Prf. Maße	Produktname	H	L1	L2	L3	L4	D1	Material	Gewicht
2.2.003.4545.04	45x45	Systemscharnier mit Abdeckkappe	72	48	28	84	50	6,6	Pa6 Schwarz	41 gr

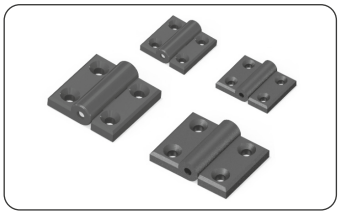
Anwendungsbereich

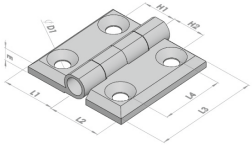
Mit Abdeckkappen erzielt man ästhetische Ausasehen.

Using Area

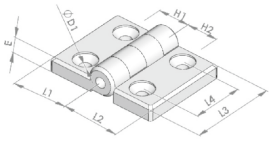
This hinges attaching the plastic cover on the outer surface appearing bolts to the hinge connection obstacles. In this way, it supplies very aesthetic appearance.







Metall



Kunststoff

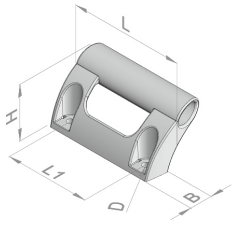
Produkt ID	Prf. Maße	Produkt-Name	E	H1	H2	L1	L2	L3	L4	D1	Material	Gewicht
2.2.003.2020	20x20	Scharnier (Flach)	5	10.25	10.25	18.35	18.35	35	19	6	Pa6 Schwarz	8.5 gr
2.2.003.2025	20x25	Scharnier (Flach)	5	10.25	12.75	18.35	23.35	35	19	6	Pa6 Schwarz	10 gr
2.2.003.2525	25x25	Scharnier (Flach)	5	12.75	12.75	23.35	23.35	35	19	6	Pa6 Schwarz	11 gr
2.2.003.2030	20x30	Scharnier (Flach)	5	10.25	15.25	18.35	23.35	35	19	6	Pa6 Schwarz	9.5 gr
2.2.003.2530	25x30	Scharnier (Flach)	5	15.25	12.75	23.35	23.35	35	19	6	Pa6 Schwarz	10 gr
2.2.003.3030.5	30x30	Scharnier (Flach)	5	15.25	15.25	23.35	23.35	35	19	6	Pa6 Schwarz	10.5 gr
2.2.003.3030	30x30	Scharnier	8	15	15	25	25	50	30	6.5	Pa6 Schwarz	29.5 gr
2.2.003.3535	35x35	Scharnier	8	17.5	17.5	32	32	50	30	6.5	Pa6 Schwarz	34 gr
2.2.003.4530	45x30	Scharnier	8	22.75	15	25	32	50	30	6.5	Pa6 Schwarz	31 gr
2.2.003.4535	40x40	Scharnier	8	22.75	17.5	32	32	50	30	6.5	Pa6 Schwarz	33 gr
2.2.003.4545	45x45	Scharnier	8	22.75	22.75	32	32	50	30	6.5	Pa6 Schwarz	34 gr
2.2.003.2525.01	25x25	Metall-Scharnier	5	12.5	12.5	20	20	40	25	5.5	Zinkguss	44 gr
2.2.003.3030.01	30x30	Metall-Scharnier	6	15.5	15.5	25	25	50	30	6.5	Zinkguss	83 gr

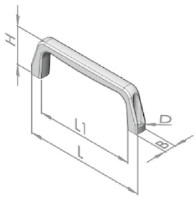
Anwendungsbereich

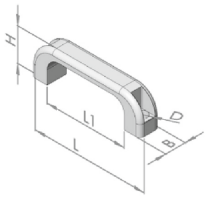
Bei Öfnungen von Kabinen. Entworfen nach verschiedenen Maße. Verwendbar bei zwei unterschidlichen Profilschnitte.

Using Area

Different size designed hinge provides open and closing different type cabin lid and wings.This designed hinges are manufactured to different type profile assembly







	Produkt ID	Produkt-Name	H	L	L_1	B	D	Material	Gewicht
	2.3.008.00	Plastikgriff	40.5	120	100	24	Ø8.5	Plastik	44.5 gr
NEU	2.3.008.03	Plastikgriff Schmal	40.5	130	104	12	Ø5	Plastik	25 gr
NEU	2.3.008.02.00	Plastik-Gleitgriff	65	134	100	27	Ø8.5	Plastik	110 gr

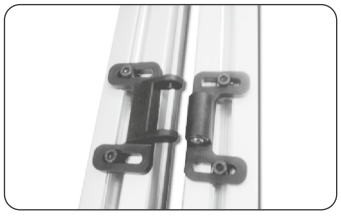
Anwendungsbereich

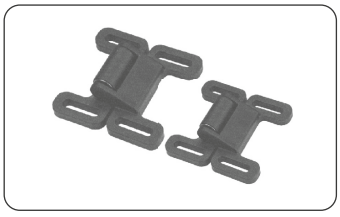
Ästhetische Bügelgriffe werden zum Öffnen von Türen oder an Wagen eingesetzt. Die Konstruktion hält auch hoher Kräfte aus.

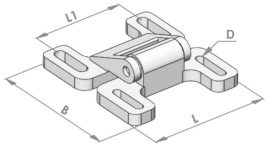
Using Area

Handle It helps opening/closing of the cabin covers made of profiles.It represents an artistic view other connector accessories.

Doppelkugelschnäpper







Produkt ID	Produkt-Name	Prf.Maße	L	L_1	B	D	Material	Gewicht
2.2.004.2520	Schnäpper (klein)	20 - 25 - 30	53	40	55	Ø5	Plastik	25 gr
2.2.004.4545	Schnäpper (groß)	35 - 40 - 45	74	57	77	Ø5.5	Plastik	40 gr

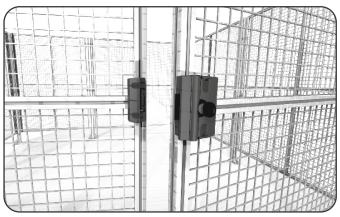
Anwendungsbereich

Doppelkugelschnäpper verhindert das die Öfnungen bzw. Türe, die unter Vibration stehen sich öfnen.

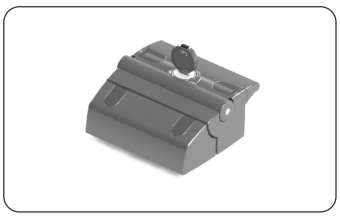
Using Area

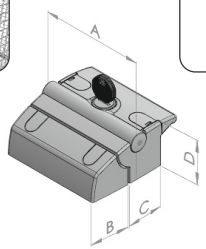
Ball Lock Itś used to prevent opening windows on machine cabinets which has high vibration.

Fallenverschluss



NEU





Produkt ID	Produkt-Name	A	B	C	D	Material	Gewicht
2.2.002.10.180180.10	Fallenverschluss	104	40	38	43	Alüminyum	345 gr

Anwendungsbereich

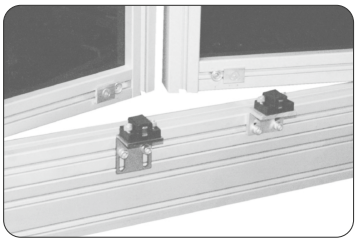
Verwendung bei Schutz und Sicherheit-Systeme.

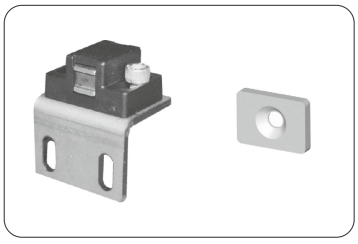
Using Area

It used for the protection and safety systems a key mechanism used.

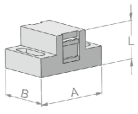
Magnetverschluss

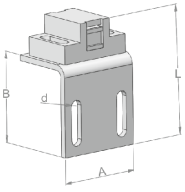
6 8 10





Mıknatıs





Tutucu Parçası

Produkt ID	⌐¬	Produkt-Name	A	B	L	Ød	Material	Gewicht
2.2.004.2025	Kanal 6	Mıknatıs Bağlantı Takımı	45	20	40	Ø5.5	Sac+Plastik	88.5 gr
2.2.004.3035	Kanal 8	Mıknatıs Bağlantı Takımı	45	35	55	Ø6.5	Sac+Plastik	104 gr
2.2.004.4045	Kanal 10	Mıknatıs Bağlantı Takımı	45	47	67	Ø6.5	Sac+Plastik	113 gr
2.2.004.0001	6 - 8 - 10	Mıknatıs Tutucu Parçası	28	20	4	Ø6.5	Sac	14.5 gr
2.2.004.0000.00	-	Mıknatıs	40	28	20	-	Alnico	31 gr

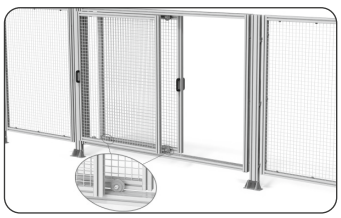
Anwendungsbereich

Es hilft dabei das die Öfnungen bzw. Türe geschlossen bleiben. Es wir an Profilnut montiert.

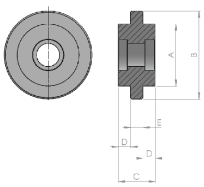
Using Area

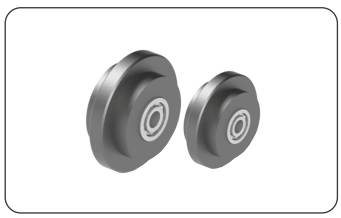
It provides keeping cabinet covers and wings closed. Magnets are mounted to profile channels.

Laufrollen



NEU





Produkt ID	⌐¬	Produkt-Name	A	B	C	D	E	Material	Gewicht
2.2.015.08.010	Kanal 8	Kanal Sürgü Tekerleği	33.5	47	19.3	5.8	7.8	Polietilen	47 gr
2.2.015.10.010	Kanal 10	Kanal Sürgü Tekerleği	68.5	48	29	9.5	9.5	Polietilen	117 gr

Anwendungsbereich

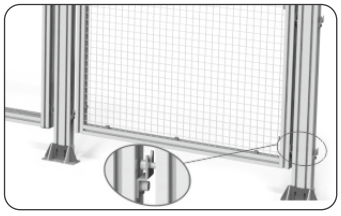
Es gleitet in der Nut. Es wird bei Schiebetüre, Schiebefenster etc. angewendet.

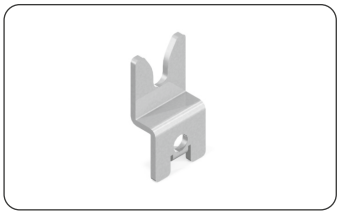
Using Area

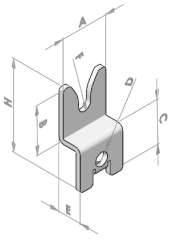
A kind of roller wheels which provide slot guidance by using profile slot. Cabin windows, sliding doors to the exemplary for it's usage.

Parallelhalter

NEU







Produkt ID	Produkt-Name	A	B	C	ØD	E	F	H	Material	Gewicht
2.2.002.10.180180.10	Parallelhalter	30	30	27	8,5	15	8,5	57	Stahl	38.5 gr

Anwendungsbereich

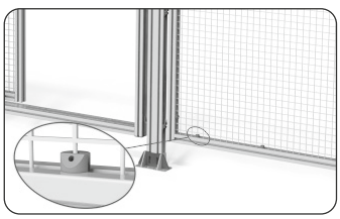
Bei der Montage von gleichlafende Sicherheitspanelle an dem Profilskin. Es erlaubt prakrische Demontierung von anmontierte Elemente.

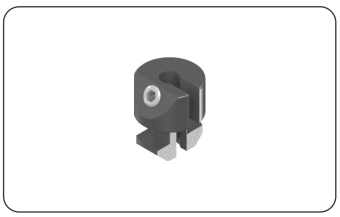
Using Area

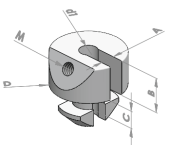
The security panel of the machine environment created Parel allows each connection. This equipment made links with the disassembled easily removed around the desired feature machine.

Klemmbuchse

NEU







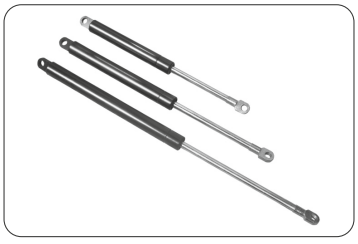
Produkt ID	Produkt-Name	A	B	C	D	d1	M	Material	Gewicht
2.2.015.10.006	Klemmbuchse	5	12	6	24	5	M5	Aluminium	13.5 gr

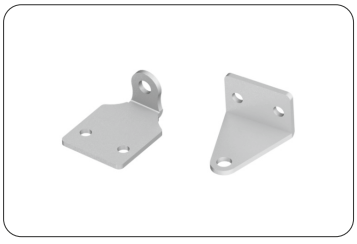
Anwendungsbereich

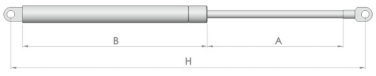
Klemmbuchse wird für klapperfreie Befestigung von Wellengittern verwendet.

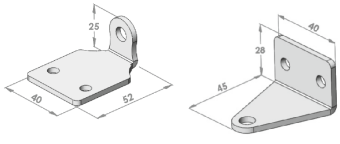
Using Area

It is fixing parts used in wireframe system by reducing the gap and provide rigidity.









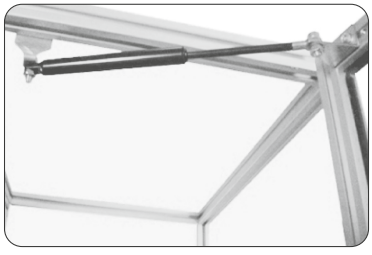
Produkt ID	Produkt-Name	A	C	H Min. Max	Material	Gewicht
2.3.010.150300	Stoßdämpfer (Strok 150mm) F300N	150	195	233 - 383	Stahl	205 gr
2.3.010.105150	Stoßdämpfer (Strok 105mm) F150N	105	145	188 - 293	Stahl	159 gr
2.3.010.085085	Stoßdämpfer (Strok 85mm) F85N	85	130	168 - 253	Stahl	148 gr
2.3.010.00	Stoßdämpfer-Halter	45	40	28	Stahl	48 gr

Anwendungsbereich

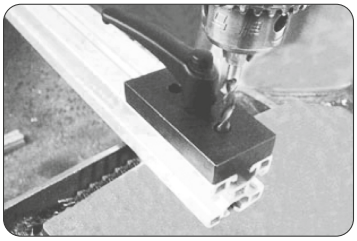
Zur Erleichterung öffnen der Kabinentüre. Zur Montage wird der Halter verwendet. Nach dem Öffnen der Tür bleibt es offen.

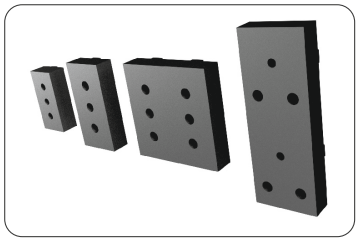
Using Area

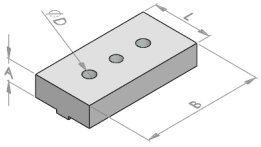
The dampers which are used for opening / closing cabinet caps mounted to the systems. It keeps the caps opened without any force.



6 8 10







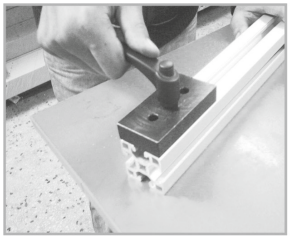
Produkt ID	Produkt-Name	Verwendete Profile	A	B	L	ØD	Material	Gewicht
2.3.007.2020	Bohrvorrichtung	20x20	20	40	20	Ø5.5	Stahl 50-55 Hrc	108 gr
2.3.007.2525	Bohrvorrichtung	25x25	20	50	25	Ø5.5	Stahl 50-55 Hrc	169 gr
2.3.007.3030	Bohrvorrichtung	30x30	18.5	60	30	Ø7	Stahl 50-55 Hrc	222 gr
2.3.007.3535.01	Bohrvorrichtung	35x35 (L)	19	70	35	Ø7	Stahl 50-55 Hrc	328 gr
2.3.007.3535.02	Bohrvorrichtung	35x35 (A)	19	70	35	Ø9	Stahl 50-55 Hrc	356 gr
2.3.007.4040	Bohrvorrichtung	40x40-40x80 (K10)	19,5	80	40	Ø9	Stahl 50-55 Hrc	411 gr
2.3.007.4040.01	Bohrvorrichtung	40x40-40x80 (K8)	18.5	80	40	Ø7	Stahl 50-55 Hrc	417 gr
2.3.007.4545	Bohrvorrichtung	45x45-45x90	19	90	45	Ø9	Stahl 50-55 Hrc	508 gr
2.3.007.3060	Bohrvorrichtung	30x60-60x60	19	60	60	Ø7	Stahl 50-55 Hrc	460 gr
2.3.007.8080	Bohrvorrichtung	40x80-80x80	20	80	80	Ø8,3	Stahl 50-55 Hrc	795 gr
2.3.007.9090	Bohrvorrichtung	45x90-90x90	19	90	90	Ø9	Stahl 50-55 Hrc	1026 gr
2.3.007.23127	Bohrvorrichtung	23x127	19	127	46	Ø8	Stahl 50-55 Hrc	745 gr

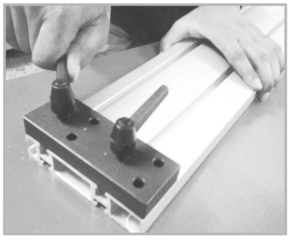
Anwendungsbereich

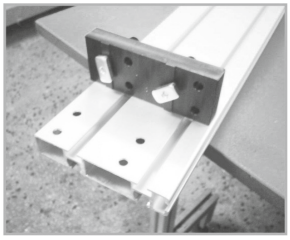
Bohrvorrichtungen für das passgenaue Bohren von Durchgangslöchern für Innensechsrundschraubendreher, von Aufnahmebohrungen für Bolzenverbinder, Schnellspannverbinder und Gewindehülsen von Senkungen für Pneumatikanschlüsse etc.

Using Area

Six corner Hex hole is opened for tightening to head bolt which are used for connecting to profiles. We can open very comfortable to hex holes with drilling apparatus. Drilling apparatus is suitable for all types of profiles.

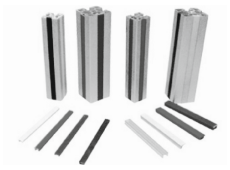




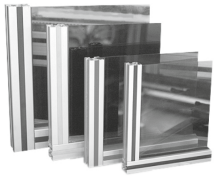


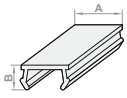
6 8 10

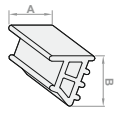
Nutabdeckprofil



Einfassprofil







Produkt ID		Produkt-Name	Farbe	A	B	Material
2.3.005.06.01	Kanal 6	Nutabdeckprofil	●	7.3	3.8	Plastik
2.3.005.08.01	Kanal 8	Nutabdeckprofil	●	8.9	4.3	Plastik
2.3.005.10.01	Kanal 10	Nutabdeckprofil	●	11.7	8.1	Plastik
2.3.005.06.xx	Kanal 6	Nutabdeckprofil Farbig	●●	7.3	3.8	Plastik
2.3.005.08.xx	Kanal 8	Nutabdeckprofil Farbig	●●●	8.9	4.3	Plastik
2.3.005.10.xx	Kanal 10	Nutabdeckprofil Farbig	●●●	11.7	8.1	Plastik

Bei Bestellung: Grau Produkt ID: 2.3.005.xx.02
Rot Produkt ID: 2.3.005.xx.03
Blau Produkt ID: 2.3.005.xx.04

Produkt ID		Produkt-Name	Farbe	A	B	Material
2.3.006.06.01	Kanal 6	Einfassprofil	●●●○	7	7	Plastik
2.3.006.08.01	Kanal 8	Einfassprofil	●●●○	8.5	11.3	Plastik
2.3.006.10.01	Kanal 10	Einfassprofil	●●●○	11	12.1	Plastik

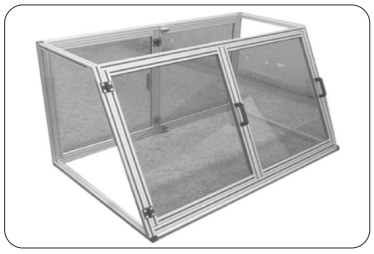
Bei Bestellung: Transparent Produkt ID: 2.3.006.xx.02
Rot Produkt ID: 2.3.006.xx.03
Blau Produkt ID: 2.3.006.xx.04
Schwarz Produkt ID: 2.3.006.xx.01

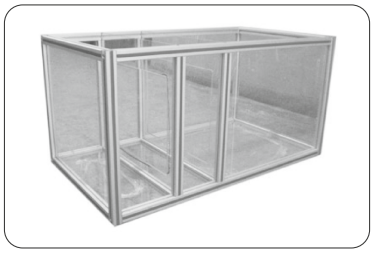
Anwendungsbereich

Einfassprofil zum dichten Einbau von Flächenelementen wie Plexiglass in der Profilnut. Es verhindert den Kontakt zwischen Profilnut und Flächenelement. Neben Rot, Blau, Schwarz, und Grau Farben steht Transparrenter Profile auch zer Verfügung. Nutenabdeckprofile hilft optische Verbesserung. Deckt die Kabelführung in der Nut ab. Schützt die Nut vor Verschmutzungen.

Using Area

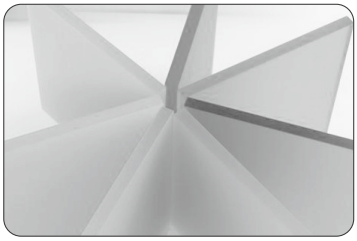
Glass Seal At the cabin applications made with profiles, it provides fixing the plexiglass in the profile canal by entering between plexiglass and profile. There are black, blue, red, gray and transparent glass seals Canal Seal It is a obtained an artistic image mounting preferably on the outside of the profile canal. It also hides the cables that pass trought inside the canal and keeps canal clean.

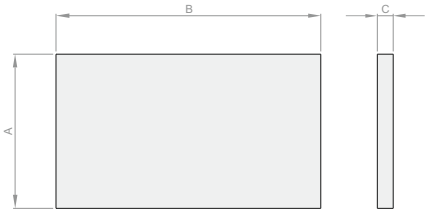




SIGMA PROFILE

6 8 10





Produkt ID	Produkt-Name	A	B	C	Material	Gewicht
2.3.009.03.01	Plexiglass 3 mm	1350	2000	3	Pleksiglas	9,55 gr
2.3.009.04.01	Plexiglass 4 mm	1350	2000	4	Pleksiglas	12,75 gr
2.3.009.05.01	Plexiglass 5 mm	1350	2000	5	Pleksiglas	15,93 gr
2.3.009.06.01	Plexiglass 6 mm	1350	2000	6	Pleksiglas	19,11 gr
2.3.009.08.01	Plexiglass 8 mm	1350	2000	8	Pleksiglas	25,48 gr
2.3.009.10.01	Plexiglass 10 mm	1350	2000	10	Pleksiglas	31,86 gr

Anwendungsbereich

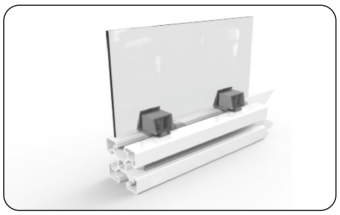
Plexiglass wird in allen Konstruktionen zum schliessen der Fläche angewendet. Nach Anwendungsbereich sind entsprechende Farbenauswahl und Wandstärken vorhanden. Es sieht ästhetisch aus und hilft der System - Hygiene.

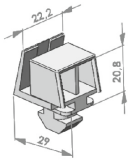
Using Area

Plexiglass parts usefull for covering all type of constructions by different colours. Thickness can be adjustable up to application area . Plexiglass provides aesthetics and hygiene. The production of a variety of colors are available.

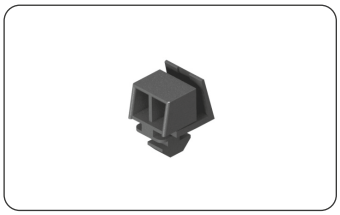
Klemmblock

6 8 10





Plastik
9.9 gr



Plexiglasshalter mit Klemmnagel
Produkt ID: 2.2.013.10.001

Anwendungsbereich

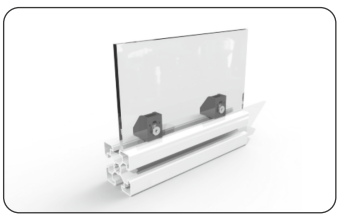
Zur Montage für Flächenelemente, die es nicht in der Profilnut eingestekt werden soll. Der Block wird in die Nut gefürt. Es erlaubt teilweise demontage von Plexiglass.

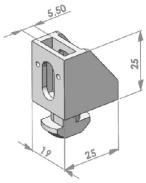
Using Area

Plexi holder is used for assembling of plexiglass, in case inserting plexiglass into profile's channel is not desirable. Plexiglas is held by its external pawl. Easy to disassemble in needed.

Scheibenhalter mit eingebaute Mutter

6 8 10





Plastik
11 gr

Scheibenhalter mit eingebaute Mutter
Produkt ID: 2.2.013.10.002

Anwendungsbereich

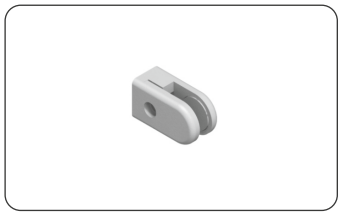
Zur Montage für Flächenelemente, die es nicht in der Profilnut eingestekt werden soll. Der Block wird in die Nut eingefürt. Es erlaubt schnelle demontage von Flächenelemente.

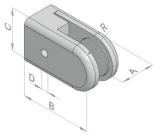
Using Area

The holder is used for assembling of plexiglass, iIn case inserting plexiglass into profile's channel is not desirable. Plexiglass is held by this holder's external screws. Easy to disassemble in needed.

Glasscheibenhalter

NEU





Produkt ID	Produkt-Name	A	B	C	D	R	Material	Gewicht
2.2.013.00.001	Scheibenhalter einseitig	20	32,5	25	4,2	12,5	Aluminium	25 gr

Anwendungsbereich

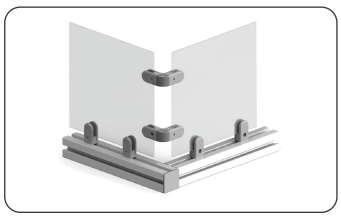
Eine ästhetische Losung zur Montage des Flächenelement.

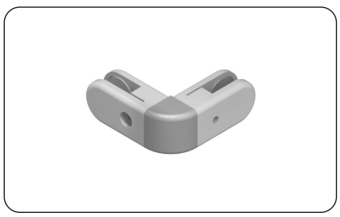
Using Area

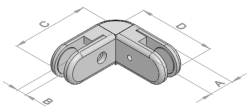
It is a single holder provide aesthetics view.

Eckglasscheibenhalter-Metall

NEU







Produkt ID	Produkt-Name	A	B	C	D	R	Material	Gewicht
2.2.013.00.003	Scheibenhalter zweiseitig	20	8	65	65	-	Aluminium	82 gr

Anwendungsbereich

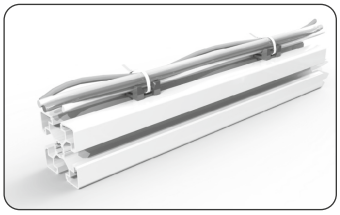
bei 90 Grad Ecken verwendbare Scheibenhalter.

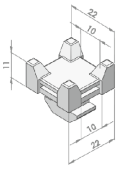
Using Area

It is a rotational metal part, which can be assembled 90 ° degree of two plexiglass aesthetic the way.It is used in cabin applications to provode turning parts.

Kabelbinder ohne Kappe

6 8 10





Kabelbinder ohne Kappe
Produkt ID: 2.2.012.10.002

Plastik
5.9 gr

Anwendungsbereich

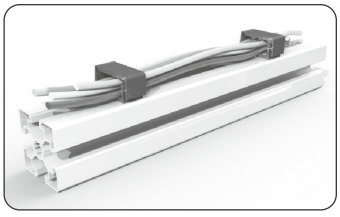
Es wird für anbinden von Kabeln verwendet, die durch Verwendung von Motoren oder Encodern entstehen.

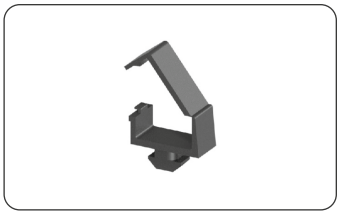
Using Area

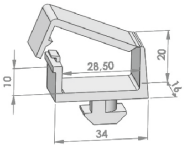
It provides smooth mounting at profiles on automation (with motor or encoder) and electrification units. It prevents visual pollution.

Kabelbinder mit Kappe

6 8 10







Kabelbinder mit Kappe
Produkt ID: 2.2.012.10.001

Plastik
6.5 gr

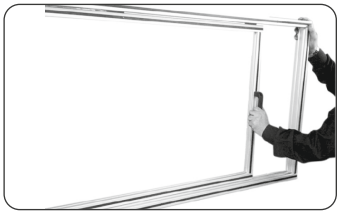
Anwendungsbereich

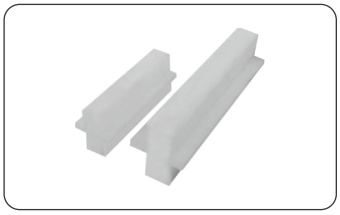
Es wird für anbinden von Kabeln verwendet, die durch Verwendung von Motoren oder Encodern entstehen. Kabelbinder mit Kappe erfordert kein zusätzliche Klemmelement.

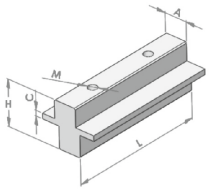
Using Area

It provides smooth mounting at profiles on automation (with motor or encoder) and electrification units. This type does'nt need fastener.

Profilgleiter

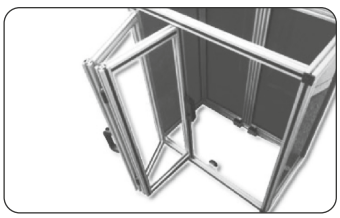


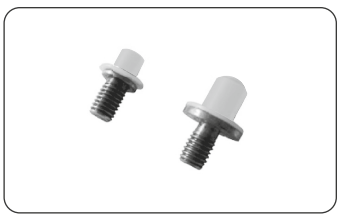


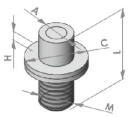


Produkt ID	⌴	Produkt-Name	A	C	H	L	M	Material	Gewicht
2.2.008.08.01	8 mm Nut	Gleitschiene	8	2	18.7	53	M4	Delrin	8.5 gr
2.2.008.10.01	10 mm Nut	Gleitschiene	10	2.5	20.3	60	M4	Delrin	13 gr

Gleitstifte







Produkt ID	⌴	Produkt-Name	A	C	H	L	M	Material	Gewicht
2.2.008.08.02	8 mm Nut	Gleiter	8	15	3	24	M8	Stahl+Delrin	7 gr
2.2.008.10.02	10 mm Nut	Gleiter	10	18	3	27	M10	Stahl+Delrin	12.5 gr

Anwendungsbereich

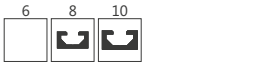
Verwendung bei Falttüre oder auch bei schiebetüre.
Gleitet in der Nut.

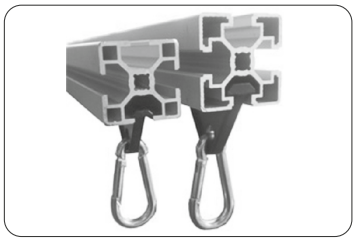
Using Area

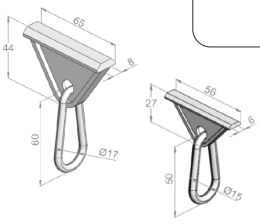
It is the connection part, which ensures guidance at movement in the canal sliding door cabins.

Kabinen Zubehör
Cabin Materials

Werkzeuggleiter







Produkt ID	Produkt-Name	Material	Gewicht
2.2.010.2025	Werkzeuggleiter 20.25	Stahl+Delrin	18 gr
2.2.010.3045	Werkzeuggleiter 30.45	Stahl+Delrin	36 gr

Anwendungsbereich

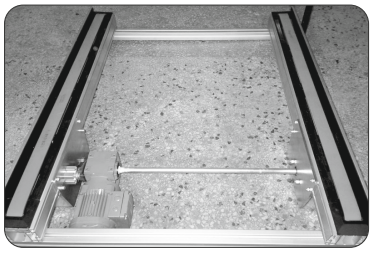
Zum aufhängen von erschiebbare Werkzeuge in die Profilnut.

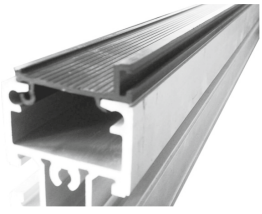
Using Area

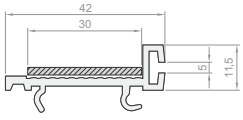
The hanger which is placable into slot of profiles' chanels is used for hanging tools.

Förderer-Zubehör
Conveyor Equipments

Reibungschutzprofil







Produkt ID	Produkt-Name	Material	Gewicht
3.001.00.4575	Reibungsprofil	Plastik	18 mt/gr

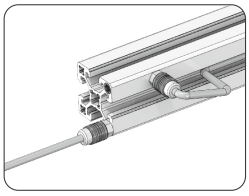
Anwendungsbereich

Verwendung bei Palettenförderer, die an 45*75 mm bezeichnete Alu-Profil eingebaut wird und als Reibungsfläche dient.

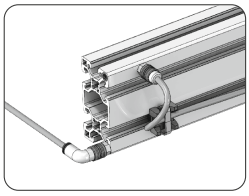
Using Area

It presents friction surfaces for belt of pallet carrier conveyors. Plastic ground increases slickness. It is applied to top of the 45x75 profile canal (See page :22)

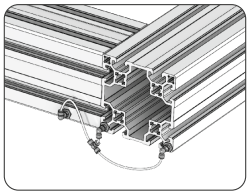
NEUE PROFIL REIHE
DESIGN EIGENSCHAFTEN



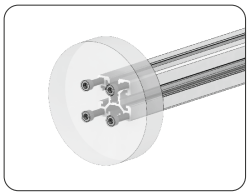
Druckluft und Hydraulische Anschluss möglichkeiten bei Einzelnuten-Profilen.



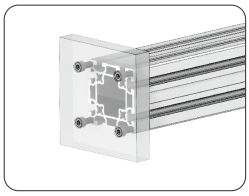
Druckluft und Hydraulische Anschluss möglichkeiten bei Doppelnut-Profilen.



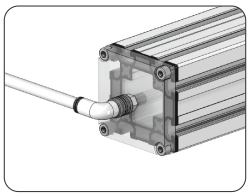
Druckluft und Hydraulische Anschluss möglichkeiten bei Vielfachnuten-Profilen durch Gewindeanschluss.



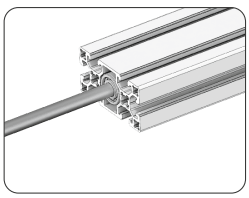
Gewindeschneide Möglichkeit in außenkanal bei Einzelnut-Profilen erlaubt flexibler montage Gelegenheit.



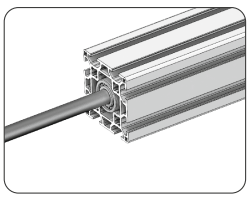
Gewindeschneide Möglichkeit in außenkanal bei Vielfachnut-Profilen erlaubt flexibler montage Gelegenheit.



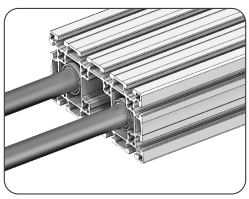
Bei Vielfachnut-Profile kann man Dichtungen einsetzen und sichere Flüssigkeitstunnel beschaffen.



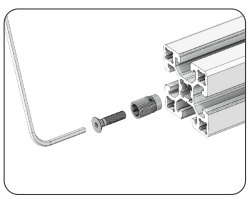
Bei Doppelnut-Profile sind Kugellager und Welle einsetzbar.



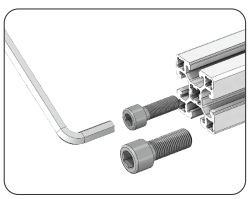
Bei Doppelnut-Profile sind Kugellager und Welle einsetzbar.



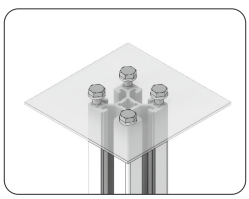
Bei Vielfachnut-Profile sind doppel Kugellager und Welle einsetzbar.



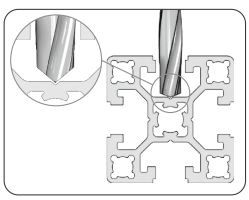
Gewindeschneiden in Zentralkanal bei alle Profilen möglich.



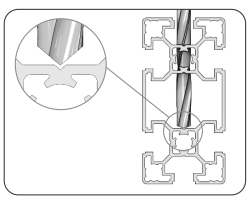
Gewindeschneiden in Zentralkanal bei allen Profilen möglich. Auch für Große Schrauben.



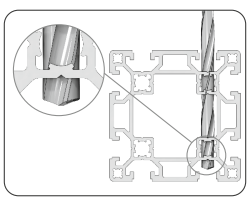
Bei allen Profilen Verbindungsschrauben einsetzbar.



Bei Einzelnut-Profilen Lagerung durch Bohrung möglich.



Bei Doppelnut-Profilen Lagerung von innen durch Bohrung möglich.



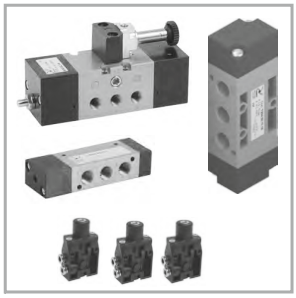
Bei Vielfachnut-Profilen Lagerung von innen durch Bohrung möglich.

Pneumatic Systems

PNEUMAX

Mechanical & Manual Valves

Pneumatic & Solenoid Valves



Air Service Units

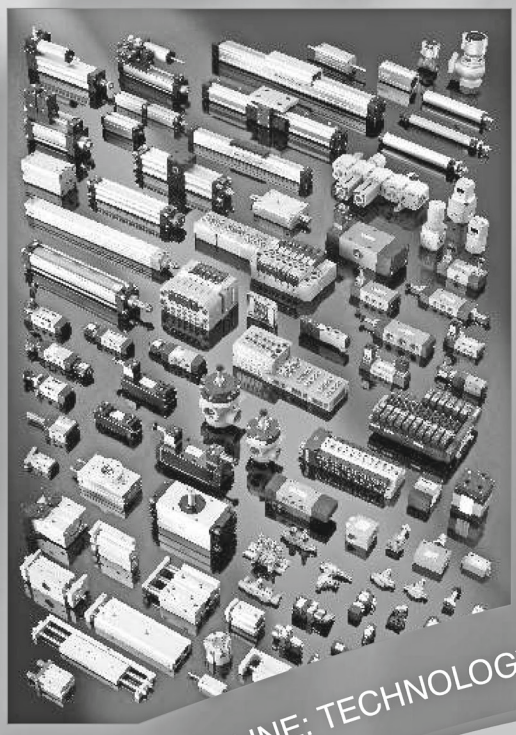
Cylinders

Sensors

Manipulation

GENERAL CATALOGUE

Components for Pneumatic Automation



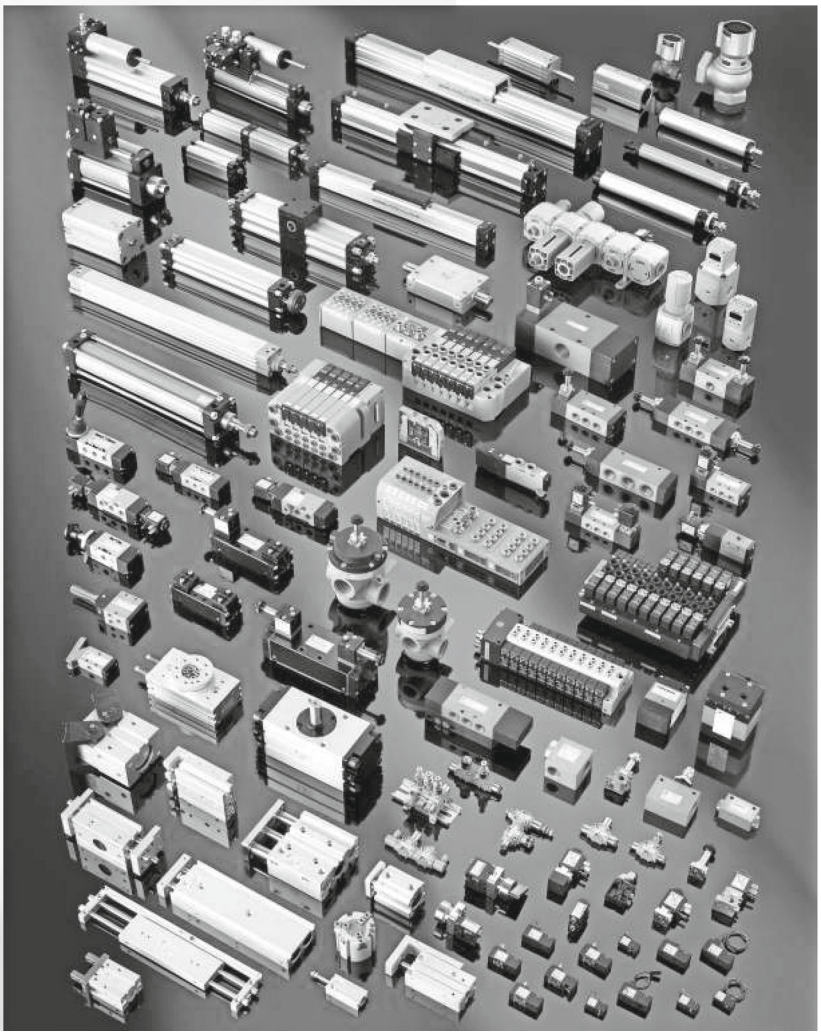
PNEUMAX GREEN LINE: TECHNOLOGY & INNOVATION

PNEUMAX®

www.pneumaxspa.com

products

The complete and innovative product range offered by Pneumax offers intelligent solutions to all application problems.
Beginning with air preparation units, moving on to air management devices such as manual and solenoid operated valves and finally through to actuators, cylinders and handling equipment; Pneumax can always offer the right product.
The range is complemented by the most advanced electronic components, in the form of serial communication modules, which can be integrated, with most ranges of valves, helping reduce and optimise wiring procedures. Accessories, such as fittings, cylinder mountings, sensors, flow regulators, check valves, timers, pressure boosters, etc. complete the range. Special care has been taken in the design and manufacturing of the latest series of products; by selecting innovative and technologically advanced materials, high performance and long life are guaranteed.



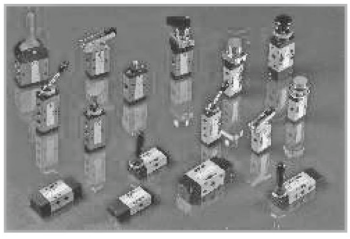
General index

PNEUMAX GREEN LINE: technology & innovation

General technical information

- Pneumatic principles
- Standards
- Measures, conversion tables
- Pneumatic symbols
- Materials
- Air treatment units
- Valves
- Cylinders
- Sizing: how to choose the correct cylinder and valve Electrotechnics and electronics

Mechanical - manual valves and accessories



Miniature valves 2/2, 3/2, 5/2, 5/3 tube ø4
(Series 104)

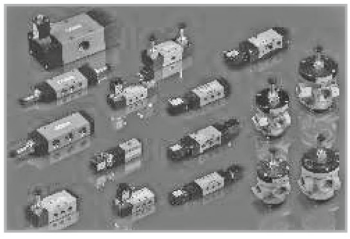
Miniature valves 3/2, 5/2, M5
(Series 105)

Valves 3/2, 5/2, 5/3 - G1/8" - G1"
(Series 200 - T200 - T400)

Valves 3/2 - 5/2 - G1/4" - G1/8"
(Series 800)

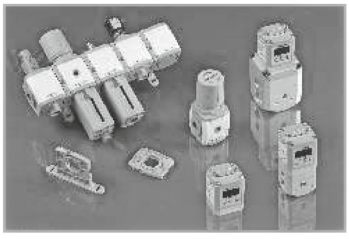
Accessories
M5 - G1"
(Series 600)
Complementary valves
(Series 900)
Blocking valves
(Series 50 - T50)
Function fittings
(Series 55)

Pneumatic and solenoid valves



Direct operated solenoid valves 2/2, 3/2
(Series 300)
Solenoid valves 3/2, 5/2, 5/3, G 1/8" - G1"
(Series 400 - Series T400)
Pneumatic actuator valves and solenoid poppet valves
3/2, 5/2, 5/3, G3/8" - G1/2"
(Series 700)
Distributors and electrodistributors 3/2, 5/2, 5/3 - M5 - G1/8"
(Series 800)
Distributors and electrodistributors ISO 5599/1
5/2, 5/3 - Size 1, 2 and 3
(Series 1000-1010)
Distributors and electrodistributors 5/2, 5/3 Size 10, 18 and 26 mm
(LINE, FLAT, VDMA or BASE)
(Series 2000)
Electrodistributors 5/2 - 5/3 - 2x3/2 - 2x2/2 Size 12,5
(**Series ENOVA**)
Solenoid valves 5/2 - 5/3 - 2x3/2 - 2x2/2 Size 12,5 18,8
(**Series OPTYMA**)

Air service units



FRL **Size 1**

FRL **Size 2**

FRL **Size 3**

FRL **Size 4**

Electronic proportional regulator available also with CANopen protocol

Size 0
Size 1
Size 3

Pressure Booster

Pressure Booster series P+

Air service units series AIRPLUS

FRL **Size 1**

FRL **Size 2**

FRL **Size 3**

PNEUMAX

Cylinder

Microcylinders according to standard ISO 6432
special performance microcylinders
threaded end covers version
rolled end covers version "MIR"
rolled end covers version "MIR-INOX"
Microcylinders "TECNO-MIR"

Cylinders according to standard CNOMO - CETOP - ISO
(tye rods cylinders)
- series 1303 - 1308
- series 1315
Cylinders according to standard ISO 15552 - VDMA 24562
profile tube series 1319-1321
twin rod cylinder series 1325-1326-1345-1347
non rotating cylinder series 1348-1350
rotary actuators series 1330-1333
profile tube cylinders
series 1386-1388,1396-1398 ECOPLUS
profile tube cylinders
series 1390-1392 ECOLIGHT
linear control units, piston rod lock
profile tube cylinders
series 1370÷1373 ECOFLAT

Hydraulic speed controll check cylinders

Hydro-Pneumatic cylinders

Short stroke compact cylinders

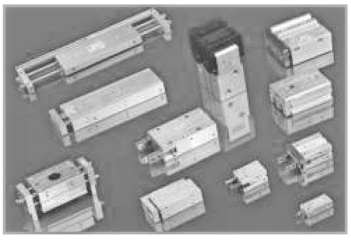
Compact cylinders "Europe"

Compact cylinders ECOMPACT

Rodless cylinders

Cable cylinders

Manipulation



Guided compact cylinder
Series 6100

Twin rod slide units
Series 6200

Twin rod slide units
Serie 6210

Pneumatic grippers
Version grippers, angular:
- Standard version (series 6301)
- 180 °angular (series 6302)
- 180° angular gripper rack & pinion style (series 6303)

Version Parallel style:
- Standard version (series 6310)
- Wide opening (series 6311)
- 3 Finger parallel style (series 6312)

Rotary actuators
-Double rack Rotary actuators with turn table (series 6400)
-Single rack Rotary actuators (series 6410)

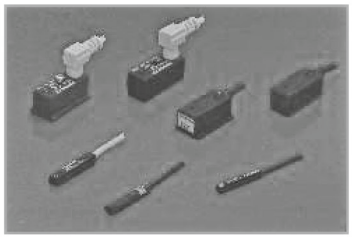
Arbitrary mount cylinders
-Series 6500

Slide cylinders
-Series 6600

Guide cylinders
-Series 6700

Dampers
-Series 6900

Sensors



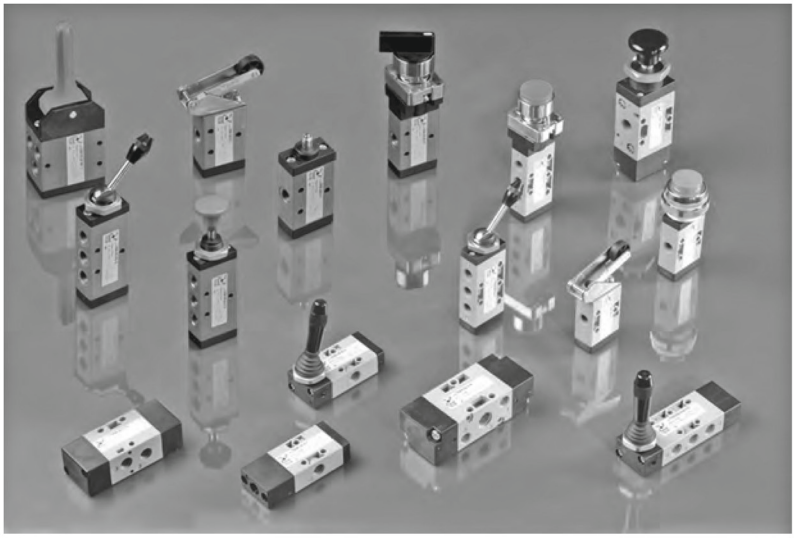
Magnetic sensors REED type with cable

Magnetic sensors REED type for connector

Magnetic sensors Hall effect with cable

Magnetic sensors Hall effect for connector

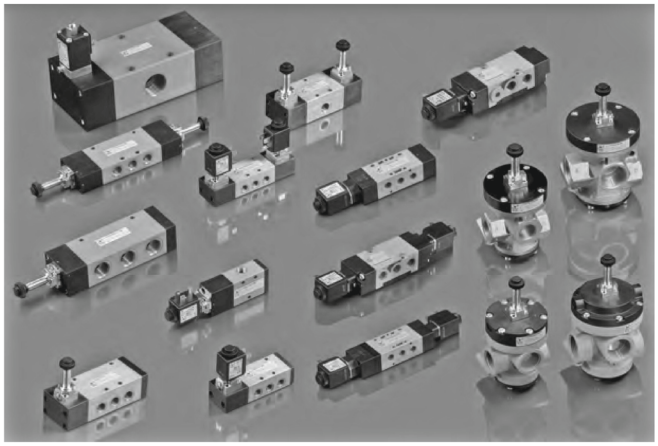
Miniaturized magnetic sensors
- rectangular profile
- oval profile
- round profile



MECHANICAL - MANUAL AND PNEUMATIC VALVES

Miniature valves 2/2, 3/2, 5/2 - 5/3 - and tube ø4 (Series 104)
Miniature valves 3/2, 5/2, M5 (Series 105)
Tappet / Pneumatic / Pusch button / Switch
Lever roller / Accessories / Lever button
Lever panel / Push button / Switch / Whisker / Handle

Valvole 3/2, 5/2, 5/3 - G1/8" ÷ G1"
(Serie 200)
Tappet / Lever roller / Lever button / Lever sensitive
Lever panel / Lever front / Push button / Switch
Lever lateral / Pedal



SOLENOID VALVES

Direct operated solenoid valves (Series 300)
Miniature solenoid valves 10-15-22 mm modular and Bistable
Electric pilot CNOMO 30 mm / Solenoid valves 32 mm / **"CURUS"** homologated.

Eelectrodistributors (Series 800)
M5 compact (series 805) - G 1/8" (series 808) individual, for manifold.

Solenoid valves 3/2, 5/2, 5/3, G1/8" ÷ G1" (Series 400)
G 1/8" ECO and TECNO-ECO G 1/8"
G 1/4" compact series and TECNO-ECO G1/4"
G 1/2" compact series
G 1"

Pneumatic actuated valves and solenoid valves - poppet system 2/2, 3/2, 5/2 - M5" ÷ G1" (Series 700)
Valves and solenoid valves G 3/8" / G 3/4" / G 1" for air and vacuum
Valves and solenoid valves G 3/8" / G 3/4" / G 1" for air and vacuum in Technopolymer

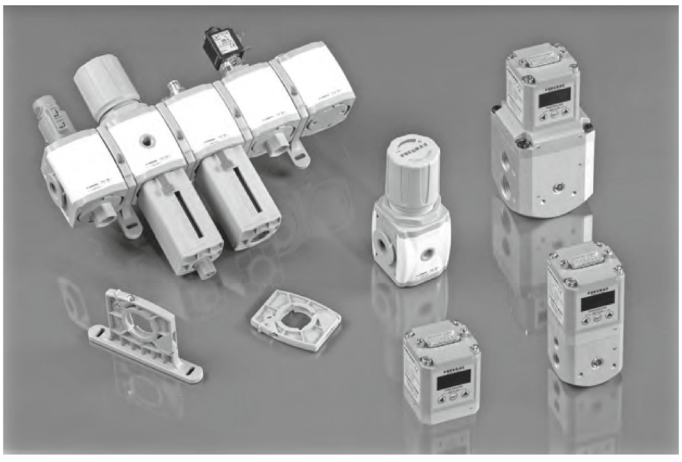
Solenoid valves NAMUR Interface 3/2, 4/2, 5/2 (Series 514 and T514)
G 1/4" NAMUR interface

Distributors and electrodistributors ISO 5599/1
5/2, 5/3 - Size 1, 2 and 3 (Series 1000-1010)
size 1 / size 2 / size 3 - Technopolymer Distributors and electrodistributors size 1 / size 2
Modular bases / Inlet blocks / Single use bases

Distributors and electrodistributors 5/2, 5/3 - Size 10, 18 and 26 mm (LINE, FLAT, VDMA or BASE) (Series 2000)
10-18-26 mm (LINE / FLAT) Sizes - 10 mm (BASE) Size
18-26 mm (VDMA 24563-02) Sizes
Integral electrical connections 10,5 e 19

Electrodistributors 5/2 - 5/3 - 2x3/2 - 2x2/2, 12,5 Size - Series ENOVA®

Electrodistributors 5/2 - 5/3 - 2x3/2 - 2x2/2, 18,8 Size - Series OPTYMA 32



AIR SERVICE UNITS

Air Service Units - Size 1
Filter / Coalescing filter / Panel mounting pressure regulator / Panel mounting pressure regulator including manometer / Mo
dular pressure regulator / Modular pressure regulator including manometer / Manifold pressure regulators / Lubricator / Filte
- pressure regulator / Progressive start-up valve / Shut-off valve / Filter pressure regulator + Lubricator / Filter + Pressure r
gulator + Lubricator / High sensitive air pressure regulator with high flow rate relieving / Pressure Switch complete with adapte
/ Accessories

Air Service Units - Size 2
Filter / Coalescing filter / Pressure regulator / Pressure regulator including manometer / Lubricator / Filter - pressure regulatc
/ Progressive start-up valve / Shut-off valve / Filter pressure regulator + Lubricator / Filter + Pressure regulator + Lubricator
High sensitive air pressure regulator with high flow rate relieving / Pressure Switch complete with adapter / Accessories

Air Service Units - Size 3
Filter / Coalescing filter / Pressure regulator / Pressure regulator including manometer / Lubricator / Filter - pressure regulatc
/ Progressive start-up valve / Shut-off valve / Filter pressure regulator + Lubricator / Filter + Pressure regulator + Lubricator
High sensitive air pressure regulator with high flow rate relieving / Filter G 3/4" / Coalescing filter G 3/4" / Pressure regulator G
3/4" / Lubricator G 3/4" / Filter - pressure regulator G 3/4" / Filter pressure regulator + Lubricator G 3/4" / Filter + Pressure
regulator + Lubricator G 3/4" / Pressure Switch complete with adapter / Accessories

Air Service Units - Size 4
Filter / Coalescing filter / Pressure regulator / Lubricator / Progressive start-up valve / Filter + Pressure regulator + Lubricatc
/ Shut-off valve / Pressure Switch complete with adapter / Accessories

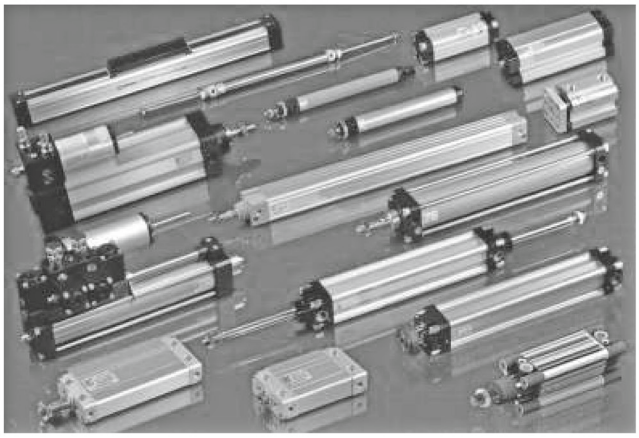
Electronic proportional regulator
Size 0 / Size 1 / Size 3

Pressure booster
ø40 / ø40 complete with pressure regulator - ø63 / ø63 complete with pressure regulator - ø100 / ø100 complete with pressur
regulator / Accessories

Pressure booster Series
ø40 / ø40 complete with pressure regulator
Pressure booster Series P+
ø40 / ø40 complete with pressure regulator

AIR SERVICE UNITS Series AIRPLUS

Filter (F) / Coalescing filter (D) / Pressure regulator (R) and including gauge (RM) / Modular pressure regulator (B) and incl
ding gauge (M) - Manifold pressure regulator *(only for Size 1)* / Filter - regulator (E) and including gauge (EM) / Lubricator (L
/ Shut-off valve (VL) / Electric Shut-off valve (VE) / Progressive start-up valve (AP) / Air intake (PA) / Pressure Switch (PP) /
Accessories / 2 or more component service unit assembled.



CYLINDERS

Microcylinders according to standard ISO 6432
- Special performance microcylinders
- threaded end cover version
- rolled end cover version "MIR"
- rolled end cover version "MIR-INOX"
- technopolymer version “TECNO-MIR”

Cylinders according to standard CNOMO - CETOP - ISO (tie rods cylinders)
- series 1303 - 1308

Cylinders according to standard ISO 15552 (tie rods cylinders)
- series 1315 (Ø250)

Cylinders according to standard ISO 15552
- profile tube cylinders according to standard 1319-1321
- twin rod cylinders series 1325-1326-1345-1347
- piston rod lock 1348-1350
- linear control unit 1330-1333
- profile tube cylinders ECOPLUS series 1386-1388 / 1396-1398
- profile tube cylinders ECOLIGHT series 1390-1392
- linear control units, piston rod lock
- profile tube cylinders ECOFLAT series 1370-1373

Hydraulic speed control check cylinders

Hydro-pneumatic cylinders

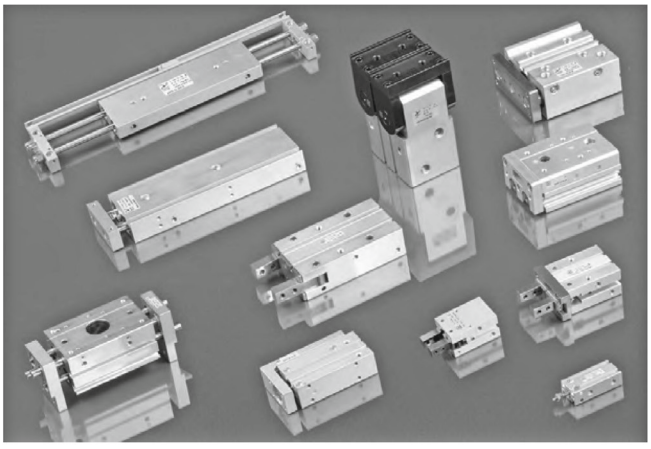
Short stroke compact cylinders

"Europe" compact cylinders

Compact cylinders according to standard ISO 21287 ECOMPACT

Rodless cylinders

Cable cylinders



MANIPULATION

Guided compact cylinder
Series 6100
Series 6101

Twin-rod slide unit
Series 6200

Push/pull-twin rod slide unit
Series 6210

Pneumatic grippers
Series 6301 - Angular grippers - standard version
Series 6302 - 180° angular grippers
Series 6303 - Angular gripper, rack & pinion style
Series 6310 - Parallel style grippers- standard version
Series 6311 - Wide opening
Series 6312 - 3 fingers parallel style (air chuck)

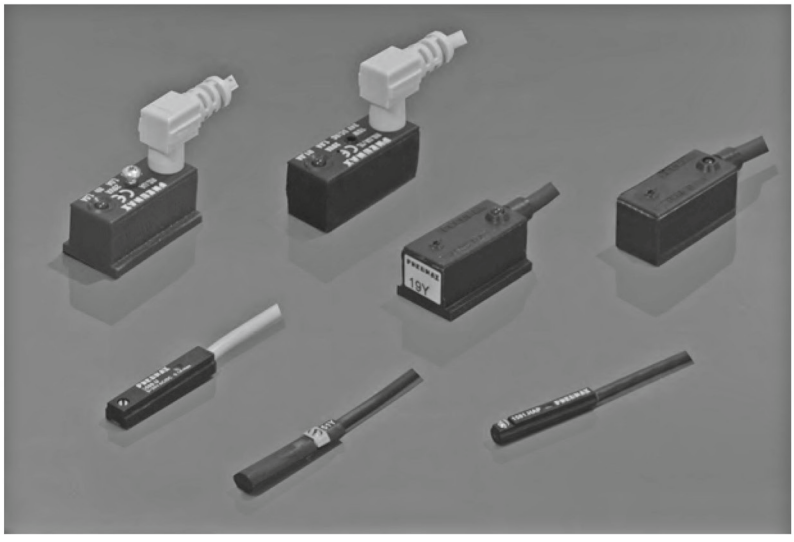
Rotary actuators
Series 6400 - Double rack rotary actuators with turn table
Series 6410 - Single rack rotary actuators

Arbitrary mount cylinders
Series 6500

Slide cylinders
Series 6600

Guide cylinders
Series 6700

Dampers
Series 6900



MAGNETIC SENSORS FOR CYLINDERS

Magnetic sensors REED type with cable

Magnetic sensors REED type for connector

Magnetic sensors HALL effect with cable

Magnetic sensors HALL effect for connector

Miniaturized magnetic sensors
REED and HALL type
- rectangular profile
- oval profile
- round profile

NOTES:

Industrial Shock Absorbers

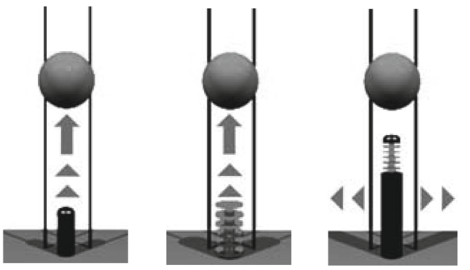
ENIDINE

Theory of Energy Absorption

ITT Enidine Inc.

Overview

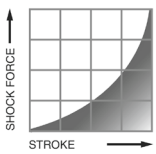
As companies strive to increase productivity by operating machinery at higher speeds, often the results are increased noise, damage to machinery/products, and excessive vibration. At the same time, safety and machine reliability are decreased. A variety of products are commonly used to solve these problems. However, they vary greatly in effectiveness and operation. Typical products used include rubber bumpers, springs, cylinder cushions and shock absorbers. The following illustrations compare how the most common products perform:



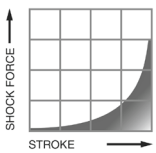
Rubber Bumper | **Metal Spring** | **ITT Enidine Shock Absorber**

All moving objects possess kinetic energy. The amount of energy is dependent upon weight and velocity. A mechanical device that produces forces diametrically opposed to the direction of motion must be used to bring a moving object to rest.

Rubber bumpers and springs, although very inexpensive, have an undesirable recoil effect. Most of the energy absorbed by these at impact is actually stored. This stored energy is returned to the load, producing rebound and the potential for damage to the load or machinery. Rubber bumpers and springs initially provide low resisting force which increases with the stroke.



Cylinder cushions are limited in their range of operation. Most often they are not capable of absorbing energy generated by the system. By design, cushions have a relatively short stroke and operate at low pressures resulting in very low energy absorption. The remaining energy is transferred to the system, causing shock loading and vibration.



Shock absorbers provide controlled, predictable deceleration. These products work by converting kinetic energy to thermal energy. More specifically, motion applied to the piston of a hydraulic shock absorber pressurizes the fluid and forces it to flow through restricting orifices, causing the fluid to heat rapidly. The thermal energy is then transferred to the cylinder body and harmlessly dissipated to the atmosphere.

The advantages of using shock absorbers include:

1. Longer Machine Life – The use of shock absorbers significantly reduces shock and vibration to machinery. This eliminates machinery damage, reduces downtime and maintenance costs, while increasing machine life.

2. Higher Operating Speeds – Machines can be operated at higher speeds because shock absorbers control or gently stop moving objects. Therefore, production rates can be increased.

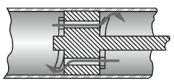
3. Improved Production Quality – Harmful side effects of motion, such as noise, vibration and damaging impacts, are moderated or eliminated so the quality of production is improved. Therefore, tolerances and fits are easier to maintain.

4. Safer Machinery Operation – Shock absorbers protect machinery and equipment operators by offering predictable, reliable and controlled deceleration. They can also be designed to meet specified safety standards, when required.

5. Competitive Advantage – Machines become more valuable because of increased productivity, longer life, lower maintenance costs and safer operation.

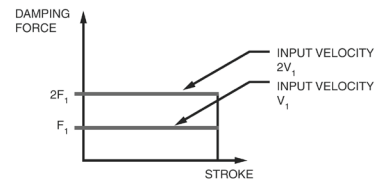
Automotive vs. Industrial Shock Absorbers

It is important to understand the differences that exist between the standard automotive-style shock absorber and the industrial shock absorber.

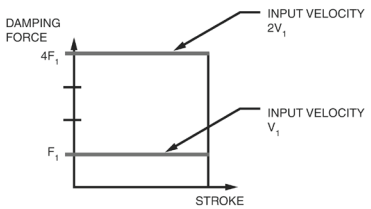


DEFLECTIVE BEAM ORIFICE

The automotive style employs the deflective beam and washer method of orificing. Industrial shock absorbers utilize single orifice, multi-orifice and metering pin configurations. The automotive type maintains a damping force which varies in direct proportion to the velocity of the piston, while the damping force in the industrial type varies in proportion to the square of the piston velocity. In addition, the damping force of the automotive type is independent of the stroke position while the damping force associated with the industrial type can be designed either dependent or independent of stroke position.



AUTOMOTIVE TYPE SHOCK ABSORBER



INDUSTRIAL TYPE SHOCK ABSORBER

ENIDINE

Theory of Energy Absorption
ITT Enidine Inc.

Equally as important, automotive-style shock absorbers are designed to absorb only a specific amount of input energy. This means that, for any given geometric size of automotive shock absorber, it will have a limited amount of absorption capability compared to the industrial type.

This is explained by observing the structural design of the automotive type and the lower strength of materials commonly used. These materials can withstand the lower pressures commonly found in this type. The industrial shock absorber uses higher strength materials, enabling it to function at higher damping forces.

Adjustment Techniques

A properly adjusted shock absorber safely dissipates energy, reducing damaging shock loads and noise levels. For optimum adjustment setting see useable adjustment setting graphs. Watching and "listening" to a shock absorber as it functions aids in proper adjustment.

To correctly adjust a shock absorber, set the adjustment knob at zero (0) prior to system engagement. Cycle the mechanism and observe deceleration of the system.

If damping appears too soft (unit strokes with no visual deceleration and bangs at end of stroke), move indicator to next largest number. Adjustments must be made in gradual increments to avoid internal damage to the unit (e.g., adjust from 0 to 1, not 0 to 4).

Increase adjustment setting until smooth deceleration or control is achieved and negligible noise is heard when the system starts either to decelerate or comes to rest.

When abrupt deceleration occurs at the beginning of the stroke (banging at impact), the adjustment setting must be moved to a lower number to allow smooth deceleration.

If the shock absorber adjustment knob is set at the high end of the adjustment scale and abrupt deceleration occurs at the end of the stroke, a larger unit may be required.

Shock Absorber Performance When Weight or Impact Velocity Vary

When conditions change from the original calculated data or actual input, a shock absorber's performance can be greatly affected, causing failure or degradation of performance. Variations in input conditions after a shock absorber has been installed can cause internal damage, or at the very least, can result in unwanted damping performance. Variations in weight or impact velocity can be seen by examining the following energy curves:

Varying Impact Weight: Increasing the impact weight (impact velocity remains unchanged), without reorificing or readjustment will result in increased damping force at the end of the stroke. Figure 1 depicts this undesirable bottoming peak force. This force is then transferred to the mounting structure and impacting load.

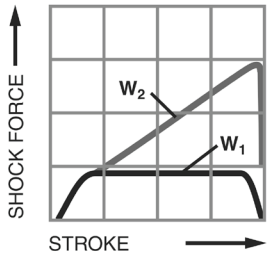
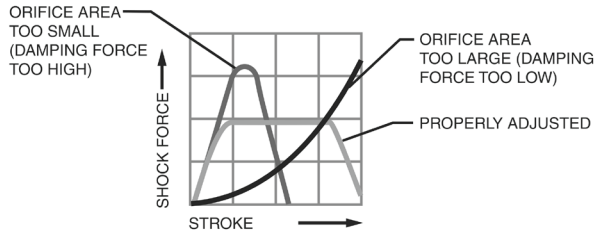


Figure 1

Varying Impact Velocity: Increasing impact velocity (weight remains the same) results in a radical change in the resultant shock force. Shock absorbers are velocity conscious products; therefore, the critical relationship to impact velocity must be carefully monitored. Figure 2 depicts the substantial change in shock force that occurs when the velocity is increased. Variations from original design data or errors in original data may cause damage to mounting structures and systems, or result in shock absorber failure if the shock force limits are exceeded.



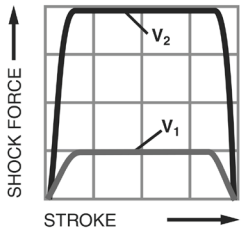


Figure 2

Shock Absorber Sizing Examples
Typical Shock Absorber Applications

SYMBOLS
a = Acceleration (in./sec.^{2})(mls^2)
A = Width (in.)(m)
B = Thickness (in.)(m)
C = Number of cycles per hour
d = Cylinder bore diameter (in.)(mm)
D = Distance (in.)(m)
E_K = Kinetic energy (in-lbs.)(Nm)
E_T = Total energy per cycle (in-lbs./c)(Nm/c), $E_K + E_W$
E_TC = Total energy to be absorbed per hour (in-lbs./hr)(Nm/hr)
E_W = Work or drive energy (in-lbs.)(Nm)
F_D = Propelling force (lbs.)(N)
F_P = Shock force (lbs.)(N)
H = Height (in.)(m)
Hp = Motor rating (hp)(kw)
I = Mass moment of inertia (in-lbs./sec^2)(Kgm^2)
K = Radius of gyration (in.)(m)
L = Length (in.)(m)
P = Operating pressure (psi)(bar)
R_S = Mounting distance from pivot point (in.)(m)
S = Stroke of shock absorber (in.)(m)
t = Time (sec.)
T = Torque (in-lbs.)(Nm)
V = Impact velocity (in./sec.)(m/s)
W = Weight (lbs.)(Kg)

α = Angle of incline (degrees)
θ = Start point from true vertical 0° (degrees)
μ = Coefficient of friction
Ø = Angle of rotation (degrees)
ω = Angular velocity (radians/sec)

USEFUL FORMULAS

1. To Determine Shock Force

$$F_P = \frac{E_T}{S \times \mathbf{.85}}$$

For PRO and PM Series only, use

$$F_P = \frac{E_T}{S \times \mathbf{.50}}$$

2. To Determine Impact Velocity

A. If there is no acceleration (V is constant) (e.g., load being pushed by hydraulic cylinder or motor driven.)
$$V = \frac{D}{t}$$

B. If there is acceleration. (e.g., load being pushed by air cylinder)
$$V = \frac{\mathbf{2} \times D}{t}$$

3. To Determine Propelling Force Generated by Electric Motor

$$F_D = \frac{\mathbf{19,800} \times Hp}{V} \qquad F_D = \frac{\mathbf{3\ 000} \times Hp}{V} \text{ (metric)}$$

4. To Determine Propelling Force of Pneumatic or Hydraulic Cylinders

$F_D = \mathbf{.7854} \times d^2 \times P$ $F_D = 0,\mathbf{07854} \times d^2 \times P$ (metric)

5. Free Fall Applications

A. Find Velocity for a Free Falling Weight:
$V = \sqrt{\mathbf{772} \times H}$ $V = \sqrt{19,6 \times H}$ (metric)

B. Kinetic Energy of Free Falling Weight:
$E_K = W \times H$

6. Deceleration and G Load

A. To Determine Approximate G Load with a Given Stroke
$$G = \frac{F_P - F_D}{W} \qquad G = \frac{F_P - F_D}{kg \times 9,81} \text{ (metric)}$$

B. To Determine the Approximate Stroke with a Given G Load (Conventional Damping Only)
$$S = \frac{E_K}{GW\ .85 - .15\ F_D}$$

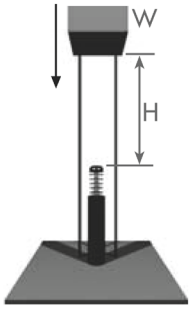
*For PRO/PM and TK Models:
$$S = \frac{E_K}{GW\ .5 - .5\ F_D}$$

NOTE: Constants are printed in **bold**.

The following examples are shown using Imperial formulas and units of measure.

Shock Absorbers

EXAMPLE 1:
Vertical Free Falling Weight



STEP 1: Application Data
(W) Weight = 3,400 lbs.
(H) Height = 20 in.
(C) Cycles/Hr = 2

STEP 2: Calculate kinetic energy
$E_K = W \times H$
$E_K = 3,400 \times 20 = 68,000$ in-lbs.

Assume Model OEM 4.0M x 6 is adequate (Page 31).

STEP 3: Calculate work energy
$E_W = W \times S$
$E_W = 3,400 \times 6$
$E_W = 20,400$ in-lbs.

STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W$
$E_T = 68,000 + 20,400$
$E_T = 88,400$ in-lbs./c

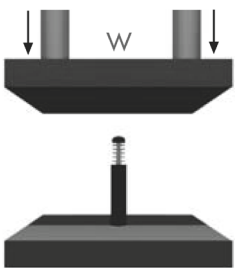
STEP 5: Calculate total energy per hour
$E_TC = E_T \times C$
$E_TC = 88,400 \times 2$
$E_TC = 176,800$ in-lbs./hr

STEP 6: Calculate impact velocity and confirm selection

$V = \sqrt{\mathbf{772} \times H}$
$V = \sqrt{\mathbf{772} \times 20}$
$V = 124$ in./sec.

Model OEM 4.0M x 6 is adequate.

EXAMPLE 2:
Vertical Moving Load with Propelling Force Downward



STEP 1: Application Data
(W) Weight = 3,400 lbs.
(V) Velocity = 80 in./sec.
(d) Cylinder bore dia. = 4 in.
(P) Pressure = 70 psi
(C) Cycles/Hr = 200

STEP 2: Calculate kinetic energy
$E_K = \frac{W}{\mathbf{772}} \times V^2 = \frac{3,400}{\mathbf{772}} \times 80^2$
$E_K = 28,187$ in-lbs.

Assume Model OEM 4.0M x 4 is adequate (Page 31).

STEP 3: Calculate work energy
$F_D = [\mathbf{.7854} \times d^2 \times P] + W$
$F_D = [\mathbf{.7854} \times 4^2 \times 70] + 3,400$
$F_D = 4,280$ lbs.
$E_W = F_D \times S$
$E_W = 4,280 \times 4$
$E_W = 17,120$ in-lbs.

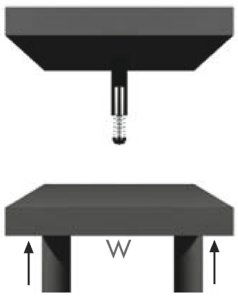
STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W$
$E_T = 28,187 + 17,120$
$E_T = 45,307$ in-lbs./c

STEP 5: Calculate total energy per hour
$E_TC = E_T \times C$
$E_TC = 45,307 \times 200$
$E_TC = 9,061,400$ in-lbs./hr

Model OEM 4.0M x 4 is adequate.

Shock Absorber Sizing Examples
Typical Shock Absorber Applications

EXAMPLE 3:
Vertical Moving Load with Propelling Force Upward



STEP 1: Application Data
(W) Weight = 3,400 lbs.
(V) Velocity = 80 in./sec.
(d) 2 Cylinders bore dia. = 6 in.
(P) Operating pressure = 70 psi
(C) Cycles/Hr = 200

STEP 2: Calculate kinetic energy

$$E_K = \frac{W}{772} \times V^2 = \frac{3{,}400}{772} \times 80^2$$

E_K = 28,187 in-lbs.

Assume Model OEM 3.0M x 5 is adequate (Page 31).

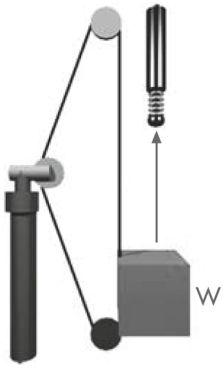
STEP 3: Calculate work energy
F_D = 2 x [**.7854** x d^2 x P] – W
F_D = 2 x [**.7854** x 6^2 x 70] – 3,400
F_D = 558 lbs.
E_W = F_D X S
E_W = 558 x 5
E_W = 2,790 in-lbs.

STEP 4: Calculate total energy per cycle
E_T = E_K + E_W
E_T = 28,187 + 2,790
E_T = 30,977 in-lbs./c

STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 30,977 x 200
E_TC = 6,195,400 in-lbs./hr

Model OEM 3.0M x 5 is adequate.

EXAMPLE 4:
Vertical Moving Load with Propelling Force from Motor



(e.g., Load Moving Force Up)

STEP 1: Application Data
(W) Weight = 200 lbs.
(V) Velocity = 60 in./sec.
(Hp) Motor horsepower = 1.5 Hp
(C) Cycles/Hr = 100

STEP 2: Calculate kinetic energy

$$E_K = \frac{W}{772} \times V^2 = \frac{200}{772} \times 60^2$$

E_K = 933 in-lbs.

CASE A: UP
STEP 3: Calculate work energy

$$F_D = \frac{\mathbf{19{,}800} \times Hp}{V} - W$$

$$F_D = \frac{\mathbf{19{,}800} \times 1.5}{60} - 200$$

F_D = 295 lbs.

Assume Model OEM 1.25 x 2 is adequate (Page 24).
E_W = F_D X S
E_W = 295 x 2
E_W = 590 in-lbs.

STEP 4: Calculate total energy per cycle
E_T = E_K + E_W
E_T = 933 + 590
E_T = 1,523 in-lbs./c

STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 1,523 x 100
E_TC = 152,300 in-lbs./hr
Model OEM 1.25 x 2 is adequate.

CASE B: DOWN
STEP 3: Calculate work energy

$$F_D = \frac{\mathbf{19{,}800} \times Hp}{V} + W$$

$$F_D = \frac{\mathbf{19{,}800} \times 1.5}{60} + 200$$

F_D = 695 lbs.

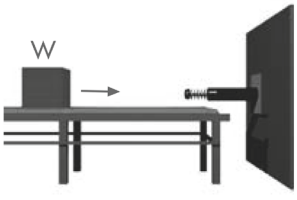
Assume Model OEMXT 2.0M x 2 is adequate (Page 29).
E_W = F_D x S
E_W = 695 x 2
E_W = 1,390 in-lbs.

STEP 4: Calculate total energy per cycle
E_T = E_K + E_W
E_T = 933 + 1,390
E_T = 2,323 in-lbs./c

STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 2,323 x 100
E_TC = 232,300 in-lbs./hr

Model OEMXT 2.0M x 2 is adequate.

EXAMPLE 5:
Horizontal Moving Load



STEP 1: Application Data
(W) Weight = 1,950 lbs.
(V) Velocity = 60 in./sec.
(C) Cycles/Hr = 200

STEP 2: Calculate kinetic energy

$$E_K = \frac{W}{772} \times V^2$$

$$E_K = \frac{1950}{772} \times 60^2$$

E_K = 9,093 in-lbs.

Assume Model OEMXT 2.0M x 2 is adequate (Page 29).

STEP 3: Calculate work energy: N/A

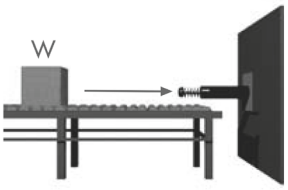
STEP 4: Calculate total energy per cycle
E_T = E_K = 9,093 in-lbs./c

STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 9,093 x 200
E_TC = 1,818,600 in-lbs./hr

Model OEMXT 2.0M x 2 is adequate.

Shock Absorber Sizing Examples
Typical Shock Absorber Applications

EXAMPLE 6:
Horizontal Moving Load with Propelling Force



STEP 1: Application Data
(W) Weight = 1,950 lbs.
(V) Velocity = 60 in./sec.
(d) Cylinder bore dia. = 3 in.
(P) Operating pressure = 70 psi
(C) Cycles/Hr = 200

STEP 2: Calculate kinetic energy

$$E_K = \frac{W}{\mathbf{772}} \times V^2$$

$$E_K = \frac{1{,}950}{\mathbf{772}} \times 60^2$$

E_K = 9,093 in-lbs.

Assume Model OEMXT 2.0M x 2 is adequate (Page 29).

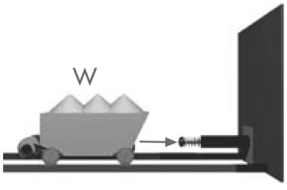
STEP 3: Calculate work energy
F_D = **.7854** x d^2 x P
F_D = **.7854** x 3^2 x 70
F_D = 495 lbs.
E_W = F_D x S
E_W = 495 x 2
E_W = 990 in-lbs.

STEP 4: Calculate total energy per cycle
E_T = E_K + E_W
E_T = 9,093 + 990
E_T = 10,083 in-lbs./c

STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 10,083 x 200
E_TC = 2,016,600 in-lbs./hr

Model OEMXT 2.0M x 2 is adequate.

EXAMPLE 7:
Horizontal Moving Load, Motor Driven



STEP 1: Application Data
(W) Weight = 2,200 lbs.
(V) Velocity = 60 in./sec.
(Hp) Motor horsepower = 1.5 Hp
(C) Cycles/Hr = 120

STEP 2: Calculate kinetic energy

$$E_K = \frac{W}{\mathbf{772}} \times V^2$$

$$E_K = \frac{2{,}200}{\mathbf{772}} \times 60^2$$

E_K = 10,259 in-lbs

Assume Model OEMXT 2.0M x 2 is adequate (Page 29).

STEP 3: Calculate work energy

$$F_D = \frac{\mathbf{19{,}800} \times Hp}{V}$$

$$F_D = \frac{\mathbf{19{,}800} \times 1.5}{60}$$

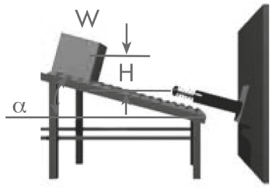
F_D = 495 lbs.
E_W = F_D x S
E_W = 495 x 2
E_W = 990 in-lbs.

STEP 4: Calculate total energy per cycle
E_T = E_K + E_W
E_T = 10,259 + 990
E_T = 11,249 in-lbs./c

STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 11,249 x 120
E_TC = 1,349,880 in-lbs./hr

Model OEMXT 2.0M x 2 is adequate.

EXAMPLE 8:
Free Moving Load Down an Inclined Plane



STEP 1: Application Data
(W) Weight = 550 lbs.
(H) Height = 8 in.
(α) Angle of incline = 30°
(C) Cycles/Hr = 250

STEP 2: Calculate kinetic energy
E_K = W x H
E_K = 550 x 8
E_K = 4,400 in-lbs.

Assume Model OEMXT 1.5M x 3 is adequate (Page 27).

STEP 3: Calculate work energy
F_D = W x Sin α
F_D = 550 x .5
F_D = 275 lbs.
E_W = F_D x S
E_W = 275 x 3
E_W = 825 in-lbs.

STEP 4: Calculate total energy per cycle
E_T = E_K + E_W
E_T = 4,400 + 825
E_T = 5,225 in-lbs./c

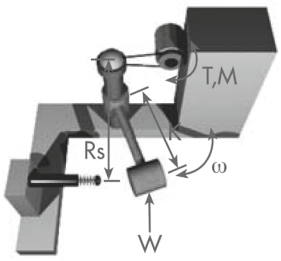
STEP 5: Calculate total energy per hour
E_TC = E_T x C
E_TC = 5,225 x 250
E_TC = 1,306,250 in-lbs./hr

STEP 6: Calculate impact velocity and confirm selection
$V = \sqrt{\mathbf{772} \times H}$
$V = \sqrt{\mathbf{772} \times 8} = 79$ in./sec.

Model OEMXT 1.5M x 3 is adequate.

Shock Absorber Sizing Examples
Typical Shock Absorber Applications

EXAMPLE 9:
Horizontal Rotating Mass



STEP 1: Application Data
(W) Weight = 200 lbs.
(ω) Angular velocity = 1.5 rad./sec.
(T) Torque = 1,065 in-lbs.
(K) Radius of gyration = 15 in.
(R_S) Mounting radius = 20 in.
(C) Cycles/Hr = 120

STEP 2: Calculate kinetic energy

$$I = \frac{W}{386} \times K^2$$

$$I = \frac{200}{386} \times 15^2$$

$$I = 117 \text{ in-lbs./sec.}^2$$

$$E_K = \frac{I \times \omega^2}{2}$$

$$E_K = \frac{117 \times 1.5^2}{2}$$

E_K = 132 in-lbs.
Assume Model STH .5M is adequate (Page 40).

STEP 3 Calculate work energy

$$F_D = \frac{T}{R_S}$$

$$F_D = \frac{1{,}065}{20}$$

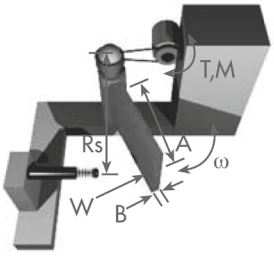
F_D = 53 lbs.
$E_W = F_D \times S$
E_W = 53 X .5
E_W = 27 in-lbs.

STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W$
E_T = 132 + 27
E_T = 159 in-lbs./c

STEP 5: Calculate total energy per hour
$E_TC = E_T \times C$
E_TC = 159 X 120
E_TC = 19,080 in-lbs./hr

Model STH .5M is adequate.

EXAMPLE 10:
Horizontal Rotating Door



STEP 1: Application Data
(W) Weight = 50 lbs.
(ω) Angular velocity = 2.5 rad./sec.
(T) Torque = 100 in-lbs.
(R_S) Mounting radius = 20 in.
(A) Width = 40 in.
(B) Thickness = .5 in.
(C) Cycles/Hr = 250

STEP 2: Calculate kinetic energy

$$K = .289 \times \sqrt{4 \times A^2 + B^2}$$

$$K = .289 \times \sqrt{4 \times 40^2 + .5^2}$$

K = 23.12

$$I = \frac{W}{386} \times K^2$$

$$I = \frac{50}{386} \times 23.12^2$$

I = 69 in-lbs./sec.^{2}

$$E_K = \frac{I \times \omega^2}{2}$$

$$E_K = \frac{69 \times 2.5^2}{2}$$

E_K = 216 in-lbs.
Assume Model OEM .5 is adequate (Page 21).

STEP 3: Calculate work energy

$$F_D = \frac{T}{R_S}$$

$$F_D = \frac{100}{20}$$

F_D = 5 lbs.
$E_W = F_D \times S = 5 \times .5 = 2.5$ in-lbs.

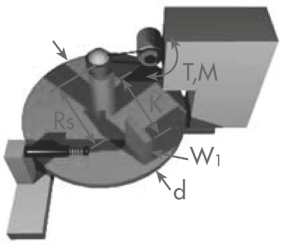
STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 216 + 2.5 =$ 218.5 in-lbs./c

STEP 5: Calculate total energy per hour
$E_TC = E_T \times C = 218.5 \times 250 =$ 54,625 in-lbs./hr

STEP 6: Calculate impact velocity and confirm selection
$V = R_S \times \omega = 20 \times 2.5 = 50$ in./sec.

Model OEM .5 is adequate.

EXAMPLE 11:
Horizontal Moving Load, Rotary Table Motor Driven with Additional Load Installed



STEP 1: Application Data
(W) Weight = 440 lbs.
(W_1) Installed load = 110 lbs.
Rotational speed = 10 RPM
(T) Torque = 2,200 in-lbs.
Rotary table dia. = 20 in.
(K_{Load}) Radius of gyration = 8 in.
(R_S) Mounting radius = 8.86 in.
(C) Cycles/Hr = 1
(ω) Direction

Step 2: Calculate kinetic energy
To convert RPM to rad./sec., multiply by **.1047**
ω = RPM x **.1047** = 10 x **.1047** = **1.047** rad./sec.

$$I = \frac{W}{386} \times K^2$$

In this case, the mass moment of inertia of the table and the mass moment of inertia of the load on the table must be calculated.
K_{Table} =Table Radius x **.707**
K_{Table} =10 x **.707** = 7.07 in.

$$I_{Table} = \frac{W}{386} \times K^2_{Table}$$

$$I_{Table} = \frac{440}{386} \times 7.07^2 = 57 \text{ in-lbs./sec.}^2$$

$$I_{Load} = \frac{W_1}{386} \times K^2_{Load}$$

$$I_{Load} = \frac{110}{386} \times 8^2 = 18 \text{ in-lbs./sec.}^2$$

$$E_K = \frac{(I_{Table} + I_{Load}) \times \omega^2}{2}$$

$$E_K = \frac{(57 + 18) \times 1.047^2}{2} = 41 \text{ in-lbs.}$$

Assume Model ECO 50 is adequate (Page 46).

STEP 3: Calculate work energy

$$F_D = \frac{T}{R_S} = \frac{2{,}200}{8.86} = 248 \text{ lbs.}$$

$E_W = F_D \times S = 248 \times .875 =$ 217 in-lbs.

STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 41 + 217 =$ 258 in-lbs./c

STEP 5: Calculate total energy per hour: not applicable, C = 1

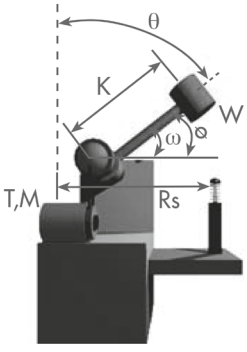
STEP 6: Calculate impact velocity and confirm selection
$V = R_S \times \omega = 8.86 \times 1.047 =$ 9 in./sec.

From ECO Sizing Graph.
Model ECO 50 is adequate.

Shock Absorber Sizing Examples

Typical Shock Absorber Applications

EXAMPLE 12:
Vertical Motor Driven Rotating Arm with Attached Load
CASE A–Load Aided by Gravity



STEP 1: Application Data
(W) Weight = 110 lbs.
(ω) Angular velocity = 2 rad./sec.
(T) Torque = 3,100 in-lbs.
(θ) Starting point of load from true vertical = 20°
(Ø) Angle of rotation at impact = 30°
(K_{Load}) Radius of gyration = 24 in.
(R_S) Mounting radius = 16 in.
(C) Cycles/Hr = 1

STEP 2: Calculate kinetic energy

$$I = \frac{W}{386} \times K^2 = \frac{110}{386} \times 24^2$$

$$I = 164 \text{ in-lbs-sec}^2$$

$$E_K = \frac{I \times \omega^2}{2}$$

$$E_K = \frac{164 \times 2^2}{2}$$

$$E_K = 328 \text{ in-lbs.}$$

Assume Model OEM 1.0 is adequate (Page 21).

CASE A

STEP 3: Calculate work energy

$$F_D = \frac{[T + (W \times K \times \text{Sin}\ (\theta + Ø))]}{R_S}$$

$$F_D = \frac{[3{,}100 + (110 \times 24 \times .77)]}{16}$$

$$F_D = 320.8 \text{ lbs.}$$

$$E_W = F_D \times S = 320.8 \times 1 = 320.8 \text{ in-lbs.}$$

STEP 4: Calculate total energy per cycle

$$E_T = E_K + E_W = 328 + 320.8$$

$$E_T = 648.8 \text{ in-lbs./c}$$

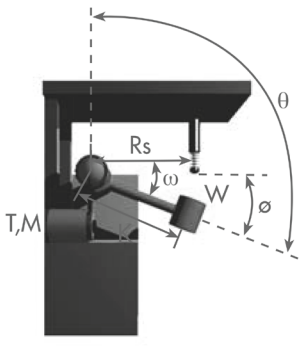
STEP 5: Calculate total energy per hour: not applicable, C = 1

STEP 6: Calculate impact velocity and confirm selection

$$V = R_S \times \omega = 16 \times 2 = 32 \text{ in./sec.}$$

Model LROEM 1.0 is adequate. Needed for higher calculated propelling force.

EXAMPLE 13:
Vertical Motor Driven Rotating Arm with Attached Load
CASE B–Load Opposing Gravity



STEP 1: Application Data
(W) Weight = 110 lbs.
(ω) Angular velocity = 2 rad./sec.
(T) Torque = 3,100 in-lbs.
(θ) Starting point of load from true vertical = 30°
(Ø) Angle of rotation at impact = 150°
(K_{Load}) Radius of gyration = 24 in.
(R_S) Mounting radius = 16 in.
(C) Cycles/Hr = 1

STEP 2: Calculate kinetic energy

$$I = \frac{W}{386} \times K^2 = \frac{110}{386} \times 24^2$$

$$I = 164 \text{ in-lbs-sec}^2$$

$$E_K = \frac{I \times \omega^2}{2}$$

$$E_K = \frac{164 \times 2^2}{2}$$

$$E_K = 328 \text{ in-lbs.}$$

Assume Model OEM 1.0 is adequate (Page 21).

CASE B

STEP 3: Calculate work energy

$$F_D = \frac{[T - (W \times K \times \text{Sin}\ (\theta - Ø))]}{R_S}$$

$$F_D = \frac{[3{,}100 - (110 \times 24 \times .77)]}{16}$$

$$E_W = F_D \times S = 67 \times 1 = 67 \text{ in-lbs.}$$

STEP 4: Calculate total energy per cycle

$$E_T = E_K + E_W = 328 + 67$$

$$E_T = 394.7 \text{ in-lbs./c}$$

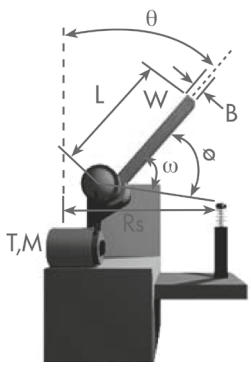
STEP 5: Calculate total energy per hour: not applicable, C = 1

STEP 6: Calculate impact velocityand confirm selection.

$$V = R_S \times \omega = 16 \times 2 = 32 \text{ in./sec.}$$

Model OEM 1.0 is adequate.

EXAMPLE 14:
Vertical Rotating Beam



STEP 1: Application Data
(W) Weight = 540 lbs.
(ω) Angular velocity = 3.5 rad./sec.
(T) Torque = 250 in-lbs.
(θ) Starting point of load from true vertical = 20°
(Ø) Angle of rotation at impact = 50°
(R_S) Mounting radius = 20 in.
(B) Thickness = 2.5 in.
(L) Length = 24 in.
(C) Cycles/Hr = 1

STEP 2: Calculate kinetic energy

$$K = .289 \times \sqrt{4 \times L^2 + B^2}$$

$$K = .289 \times \sqrt{4 \times 24^2 + 2.5^2} = 13.89$$

$$I = \frac{W}{386} \times K^2 = \frac{540}{386} \times 13.89$$

$$I = 270 \text{ in-lbs./sec.}^2$$

$$E_K = \frac{I \times \omega^2}{2} = \frac{270 \times 3.5^2}{2} = 1{,}653 \text{ in-lbs.}$$

Assume Model OEM 1.5M x 2 is adequate (Page 27).

STEP 3: Calculate work energy

$$F_D = \frac{T + (W \times K \times \text{Sin}\ (\theta + Ø))}{R_S}$$

$$F_D = \frac{250 + (540 \times 13.89 \times \text{Sin}\ (20º + 50º))}{20}$$

$$F_D = 365 \text{ lbs.}$$

$$E_W = F_D \times S = 365 \times 2 = 730 \text{ in-lbs.}$$

STEP 4: Calculate total energy per cycle

$$E_T = E_K + E_W = 1{,}653 + 730 = 2{,}383 \text{ in-lbs./c}$$

STEP 5: Calculate total energy per hour: not applicable, C = 1

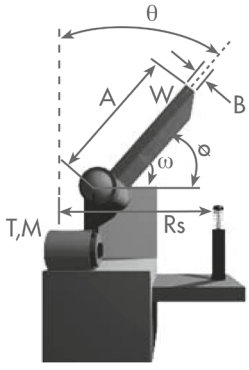
STEP 6: Calculate impact velocity and confirm selection

$$V = R_S \times \omega = 20 \times 3.5 = 70 \text{ in./sec.}$$

Model OEM 1.5M x 2 is adequate.

Shock Absorber Sizing Examples
Typical Shock Absorber Applications

EXAMPLE 15:
Vertical Rotating Lid



STEP 1: Application Data
(W) Weight = 2,000 lbs.
(ω) Angular velocity = 2 rad./sec.
(Hp) Motor horsepower = .25 Hp
(θ) Starting point of load from true vertical = 30°
(Ø) Angle of rotation at impact = 60°
(R_S) Mounting radius = 30 in.
(A) Width = 60 in.
(B) Thickness = 1 in.
(C) Cycle/Hr = 1

STEP 2: Calculate kinetic energy
$K = .289 \times \sqrt{4 \times A^2 + B^2}$
$K = .289 \times \sqrt{4 \times 60^2 + 1^2} = 34.68$ in.

$I = \frac{W}{386} \times K^2 = \frac{2,000}{386} \times 34.68^2$ in.
$I = 6,232$ in-lbs./sec.^{2}
$E_K = \frac{I \times \omega^2}{2} = \frac{6,232 \times 2^2}{2}$
$E_K = 12,464$ in-lbs.
Assume Model OEM 3.0M x 2 is adequate (Page 31).

STEP 3: Calculate work energy
$T = \frac{19,800 \times Hp}{\omega}$
$T = \frac{19,800 \times .25}{2} = 2,475$ in-lbs.
$F_D = \frac{T + (W \times K \times \sin(\theta + Ø))}{R_S}$
$F_D = \frac{2,475 + (2,000 \times 34.68 \times \sin(30° + 60°))}{30}$
$F_D = 2,395$ lbs.
$E_W = F_D \times S = 2,395 \times 2 = 4,790$ in-lbs.

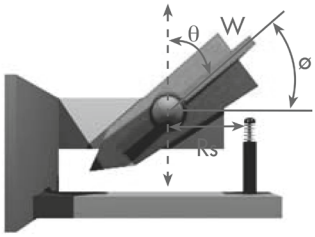
STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 12,464 + 4,790$
$= 17,254$ in-lbs./c

STEP 5: Calculate total energy per hour: not applicable, C = 1

STEP 6: Calculate impact velocity and confirm selection
$V = R_S \times \omega = 30 \times 2 = 60$ in./sec.

Model OEM 3.0M x 2 is adequate.

EXAMPLE 16:
Vertical Rotation with Known Intertia Aided by Gravity



STEP 1: Application Data
(W) Weight = 220.5 lbs
(I) Known Intertia = 885 in-lbs/sec.^{2}
(C/G) Center-of-Gravity = 12 in.
(θ) Starting point from true vertical = 60°
(Ø) Angle of rotation at impact = 30°
(R_S) Mounting radius = 10 in.
(C) Cycles/Hr = 1

STEP 2: Calculate kinetic energy
$H = C/G \times [\cos(\theta) - \cos(Ø+\theta)]$
$H = 12 \times [\cos(60°) - \cos(30º+60º)]$
$E_K = W \times H$
$E_K = 220.5 \times 6$
$E_K = 1,323$ in-lbs.

STEP 3: Calculate work energy
$F_D = (W \times C/G \times \sin(\theta + Ø))/R_S$
$F_D = (220.5 \times 12 \times \sin(60º + 30º))/10$
$F_D = 264.6$ lbs.
$E_W = F_D \times S = 264.6 \times 1 = 264.6$ in-lbs.

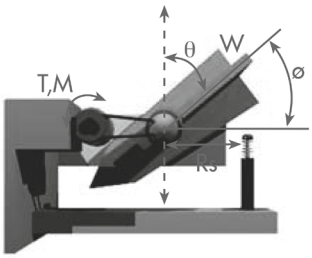
STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 1,323 + 264.6$
$E_T = 1,587.6$ in-lbs/cyc.

STEP 5: Calculate total energy per hour: not applicable, C = 1
$E_TC = E_T \times C$
$E_TC = 1,587.6 \times 1$
$E_TC = 1,587.6$ in-lbs/hr.

STEP 6: Calculate impact velocity and confirm selection
$\omega = ((2 \times E_K)/I)\ 0.5$
$\omega = ((2 \times 1,323)/885)\ 0.5 = 1.7$
$V = R_S \times \omega = 10 \times 1.7 = 17$ in./sec.

Model OEM 1.15 x 1 is adequate (Page 24).

EXAMPLE 17:
Vertical Rotation with Known Intertia Aided by Gravity (w/Torque)



STEP 1: Application Data
(W) Weight = 220.5 lbs
(ω) Angular Velocity = 2 rad/sec.
(T) Torque = 2,750 in-lbs.
(I) Known Intertia = 885 in-lbs/sec.^{2}
(C/G) Center-of-Gravity = 12 in.
(θ) Starting point from true vertical = 60°
(Ø) Angle of rotation at impact = 30°
(R_S) Mounting radius = 10 in.
(C) Cycles/Hr = 100

STEP 2: Calculate kinetic energy
$E_K = (I \times \omega^2)/2$
$E_K = (885 \times 2^2)/2$
$E_K = 1,770$ in-lbs.

STEP 3: Calculate work energy
$F_D = [T - (W \times C/G \times \sin(\theta + Ø)]/R_S$
$F_D = [2,750 - (220.5 \times 12 \times \sin(60º+30º)]/10$
$F_D = 539.6$ lbs.
$E_W = F_D \times S = 539.6 \times 1 = 539.6$ in-lbs.

STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 1,770 + 539.6$
$E_T = 2,309.6$ in-lbs/cyc.

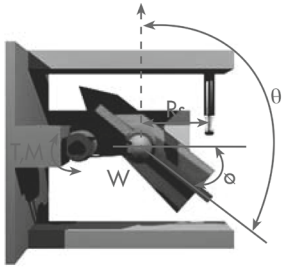
STEP 5: Calculate total energy per hour: not applicable, C = 1
$E_TC = E_T \times C$
$E_TC = 2,309.6 \times 1$
$E_TC = 230,960$ in-lbs/hr.

STEP 6: Calculate impact velocity and confirm selection
$V = R_S \times \omega = 10 \times 2 = 20$ in./sec.

Model OEM 1.15 x 1 is adequate (Page 24).

Shock Absorber Sizing Examples
Typical Shock Absorber Applications

EXAMPLE 18:
Vertical Rotation with Known Intertia Aided by Gravity (w/Torque)



STEP 1: Application Data
(W) Weight = 220.5 lbs
(ω) Angular Velocity = 2 rad/sec.
(T) Torque = 2,750 in-lbs.
(I) Known Intertia = 885 in-lbs/sec.^{2}
(C/G) Center-of-Gravity = 12 in.
(θ) Starting point from true vertical = 120°
(Ø) Angle of rotation at impact = 30°
(R_S) Mounting radius = 10 in.
(C) Cycles/Hr = 100

STEP 2: Calculate kinetic energy
$E_K = (I \times \omega^2)/2$
$E_K = (885 \times 2^2)/2$
$E_K = 1,770$ in-lbs.

STEP 3: Calculate work energy
$F_D = [T - (W \times C/G \times \text{Sin}\ (\theta - Ø)]/R_S$
$F_D = [2,750 - (220.5 \times 12 \times \text{Sin}\ (120^o - 30^o)]/10$
$F_D = 10.4$ lbs.
$E_W = F_D \times S = 10.4 \times 1 = 10.4$ in-lbs.

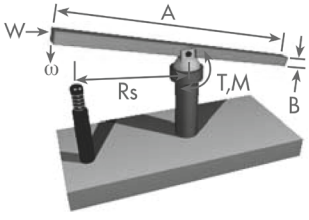
STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 1,770 + 10.4$
$E_T = 1,780.4$ in-lbs/cyc.

STEP 5: Calculate total energy per hour: not applicable, C=1
$E_TC = E_T \times C$
$E_TC = 1,780.4 \times 100$
$E_TC = 178,040$ in-lbs/hr.

STEP 6: Calculate impact velocity and confirm selection
$V = R_S \times \omega = 10 \times 2 = 20$ in./sec.

Model OEMXT 1.5M x 1 is adequate (Page 27).

EXAMPLE 19:
Vertical Roation Pinned at Center (w/Torque)



STEP 1: Application Data
(W) Weight = 220.5 lbs.
(ω) Angular velocity = 2 rad./sec.
(T) Torque = 2,750 in-lbs.
(A) Length = 40 in.
(R_S) Mounting radius = 10 in.
(B) Thickness = 2 in.
(C) Cycles/Hr = 100

STEP 2: Calculate kinetic energy
$K = .289 \times (A^2 + B^2)^{0.5}$
$K = .289 \times (40^2 + 2^2)^{0.5} = 11.6$ in.
$I = (W/386) \times K^2$
$I = (220.5/386) \times 11.6^2 = 76.9$ in-lb/sec^2
$E_K = (I \times \omega^2)/2$
$E_K = (76.9 \times 2^2)/2$
$E_K = 153.8$ in-lbs.

Assume Model OEM 1.0 is adequate (Page 21).

STEP 3: Calculate work energy
$F_D = T/R_S$
$F_D = 2,750/10$
$F_D = 275$ lbs.
$E_W = F_D \times S = 275 \times 1 = 275$ in-lbs.

STEP 4: Calculate total energy per cycle
$E_T = E_K + E_W = 153.8 + 275$
$E_T = 428.8$ in-lbs./cycle

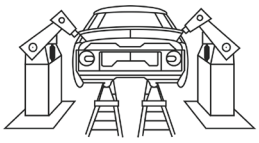
STEP 5: Calculate total energy per hour
$E_TC = E_T \times C$
$E_TC = 428.8 \times 100$
$E_TC = 42,880$ in-lbs./hr.

STEP 6: Calculate impact velocity and confirm selection
$V = R_S \times \omega = 10 \times 2 = 20$ in./sec.

Model OEM 1.0 is adequate.

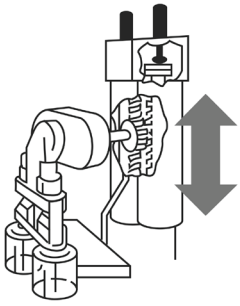
Application Examples

The following are examples of shock absorber and rate control applications:



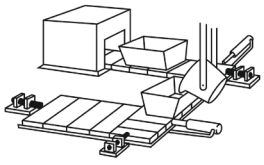
AUTOMOTIVE – ROBOTICS

Low Range OEM shock absorbers, mounted close to the pivot point of body side assembly robots, control high drive forces for precise robot positioning and improved assembled product quality.



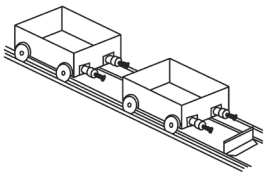
GLASS FORMING EQUIPMENT

A single OEM adjustable shock absorber replaces three distinct non-adjustable units, to cushion the high velocity motion of the take out-out, take out-in, and blow head positions of a glass forming machine. The single unit simplifies installation, reduces inventory costs and improves machine uptime.



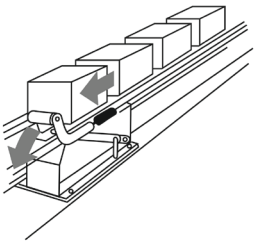
FOUNDRY – CONVEYOR LINE

An OEM shock absorber smoothly decelerates metal flasks traveling on a conveyor line, eliminating damage to flasks and decreasing foundry scrap caused by mold defects.



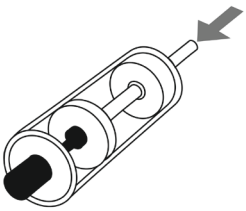
MANUFACTURING FACILITY – RAIL CARTS

OEM Low Profile shock absorbers offer smooth, steady resistance that prevents assembly carts from over-traveling endstops, while also protecting transported goods from potential damage.



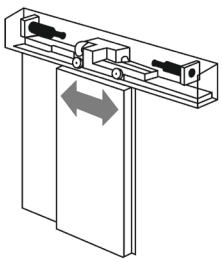
PALLET STOP

An OEM model, used in conjunction with a pallet stop, smoothly decelerates and precisely positions assembled parts as they move to various production stations on a motorized conveyor system.



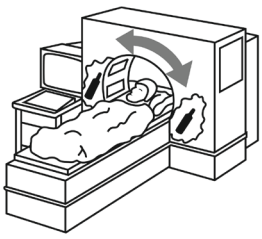
AIR CYLINDER

As air cylinders operate at higher velocities and with increased loads, the cylinder cushion becomes ineffective. An OEM Model with BAC package is needed to accommodate high impact forces, allow quieter operation, increase production rates and extend cylinder life.



ROLLING DOOR

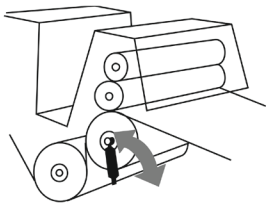
As automatic rolling doors open and close, OEM models are used for linear deceleration to decrease noise, protect precision mechanical components and prolong door life.



CAT SCAN EQUIPMENT

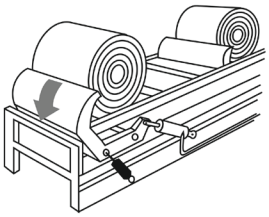
OEM Models assist with deceleration and protection of the delicate CAT scan camera during start/stop patient scanning procedures.

Application Examples



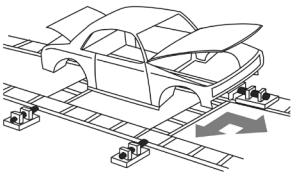
PRINTING

An OEM large shock absorber assists in paper positioning and prevents equipment damage during printing press test runs (when the press is stopped frequently to confirm proper colors, focus and paper position).



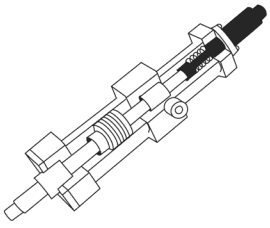
PAPER ROLLS

Shock absorbers used in conjunction with stop arm mechanisms/air cylinders quickly decelerate large paper rolls moving through production on inclined planes, without damage or jolting. This increases operating speed and decreases machinery damage and paper waste.



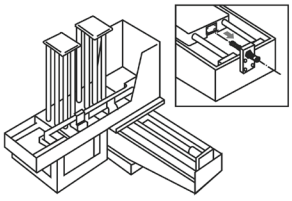
AUTOMOTIVE – TRANSFER LINE

Automated assembly plants use OEM large shock absorbers extensively to decelerate and protect shuttle/ transfer line systems. This is especially beneficial in the robotic welding location.



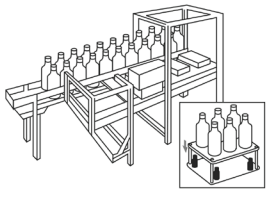
AIR CYLINDER

Special OEM series shock absorber installed on a trunion mounted, thru-rod, pneumatic cylinder, absorbs the energy created from this drive actuator, which controls the seal and cut operation on a vertical form, fill seal and packaging machine.



ROBOTIC ASSEMBLY EQUIPMENT

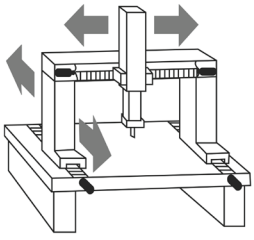
Use of an HP 110 on high speed robotic assembly equipment prevents potential equipment damage from slide mechanism overrun and increases maximum equipment operating speed.



PACKAGING MACHINERY

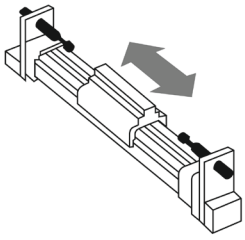
Standard HP models control rapid movement of a table transporting loaded packages to an automated case packer sealing station, for safe and precise machinery operation.

Application Examples



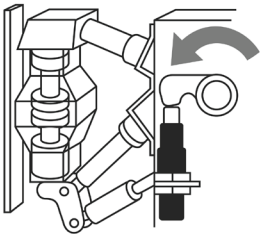
COORDINATE MEASURING MACHINE

PRO Series shock absorbers decelerate horizontal movement of tower to protect delicate electronic device from damage. PRO Model also decelerates total carriage movement during override conditions.



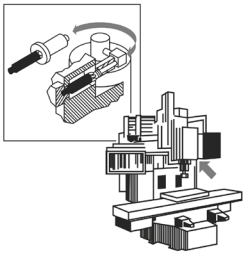
RODLESS CYLINDERS

PRO Series shock absorbers permit higher rod cylinder loads/ velocities, as well as increased operational life, by providing smooth, even deceleration.



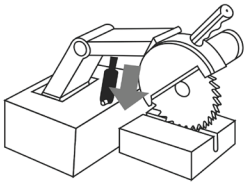
CIRCUIT BREAKER

On an industrial circuit breaker, an STH is used to extend equipment life by controlling the bounce back of the large springs used to open and close circuit connections.



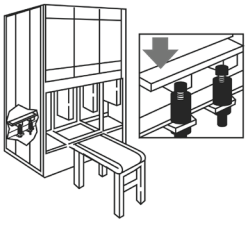
MACHINE TOOLS

PM shock absorbers installed on a vertical CNC tool changer allow rapid tool changing by controlling rotational motion, vibration and impact noise of the spindle.



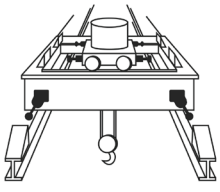
WOODWORKING EQUIPMENT

An ADA 500 model ensures consistent cutting speeds through varied material on a cut-off saw.



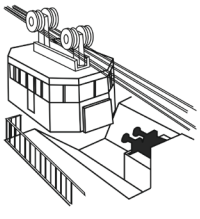
AUTOMATED STORAGE & RETRIEVAL SYSTEM

HP Models serve as industry-approved safety stops and also cushion a vertical carriage's deceleration in an automatic storage/retrieval system, for more accurate carriage positioning, decreased product spillage and increased system life.



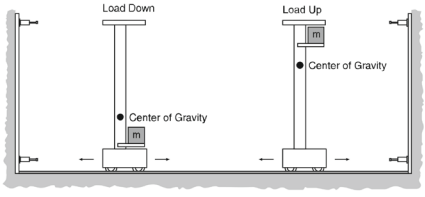
OVERHEAD CRANES

Shock absorbers softly yet quickly decelerate trolley movement and serve as safety stops when mounted at each end of an overhead crane bridge (can be designed to meet various safety standards).



TRANSPORT EQUIPMENT

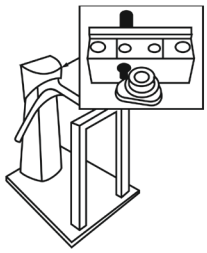
Jarring of passengers and cargo is eliminated when HD shock absorbers are installed at end positions of cable and other transport systems.



STACKER CRANES

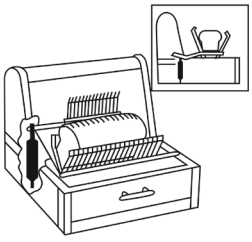
Shock absorbers designed to meet custom operational requirements, provide reliable, positive deceleration and prevent potential tipping of a computer-operated stacker crane, under runaway conditions.

Application Examples



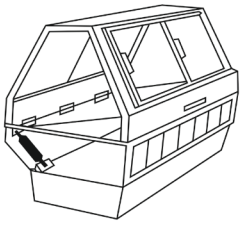
TURNSTILE

A PM Series shock absorber on a turnstile eliminates over-rotation and bounce back of turnstile arms, which prolongs the turnstile's life, while providing for a more comfortable entry and exit.



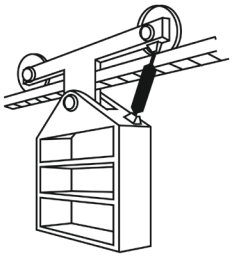
FOOD PROCESSING

Using an Enidine ADA Series unit on a bread/ food slicer controls blade descent rate to extend slicer life expectancy, eliminate bread/food breakage when slicing, increase safety of the slicing operation and reduce frequency of knife sharpening.



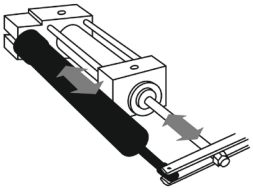
REFRIGERATION CASE

Installation of an ADA Series rate control on a refrigeration case allows both controlled opening and closing of a refrigeration case lid, resulting in improved energy savings, customer safety, and decreased case damage.



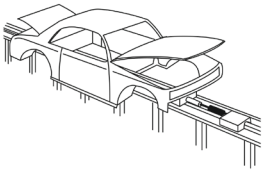
MATERIAL HANDLING

Potential damage to transported parts caused by swinging of overhead conveyor system is eliminated by employing an ADA Series rate control to stabilize swinging load.



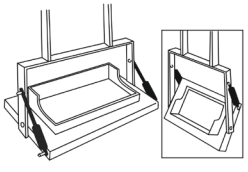
AIR CYLINDER

An ADA Series rate control attached to an air cylinder allows it to operate with the smooth, operational consistency of a hydraulic cylinder.



POWER & FREE CONVEYOR

Special Double Acting DA's or Tow-Bar (TB) snubbers are used on a conveyor system to eliminate the abrupt start and stop motion imposed on the transported load. This eliminates damage to the load and conveyor.



OVERHEAD CARRIER

DA Models mounted on an overhead carrier allow the loaded transport bed to be smoothly and safely unfolded for assembly and refolded for compact travel through the production line.

Shock Absorber and Rate Controls Quick Selection Guide

Typical Selections

Use this **ITT Enidine Product Quick Selection Guide** to quickly locate potential shock absorber models most suited for your requirements. Models are organized in order of smallest to largest energy capacity per cycle within their respective product families.

ITT Enidine Adjustable Shock Absorbers

Catalog No. (Model)	(S) Stroke (in.)	(E_T) Max. in.-lbs./cycle	(E_TC) Max. in.-lbs./hour	Damping Type	Page No.
	1 in. = 25,4mm	1 in.-lb. = .11 Nm			
ECO OEM 0.1M (B)	0.28	62	120,000	D	21
ECO OEM .15M (B)	0.38	62	185,000	D	21
ECO OEM .25 (B)	0.38	62	195,000	D	21
ECO LROEM .25 (B)	0.38	62	195,000	D	21
ECO OEM .35 (B)	0.50	170	331,000	D	21
ECO LROEM .35 (B)	0.50	170	331,000	D	21
ECO OEM .5 (B)	0.50	275	311,000	D	21
ECO LROEM .5 (B)	0.50	275	311,000	D	21
ECO OEM 1.0 (B)	1.00	715	681,000	C	21
ECO LROEM 1.0 (B)	1.00	715	681,000	C	21
ECO OEM 1.15 X 1	1.00	1,900	737,000	C	24
ECO LROEM 1.15 X 1	1.00	1,900	737,000	C	24
ECO OEM 1.15 X 2	2.00	3,750	963,000	C	24
ECO LROEM 1.15 X 2	2.00	3,750	963,000	C	24
ECO OEM 1.25 x 1	1.00	1,900	886,000	C	24
ECO LROEM 1.25 x 1	1.00	1,900	886,000	C	24
ECO OEM 1.25 x 2	2.00	3,750	1,084,000	C	24
ECO LROEM 1.25 x 2	2.00	3,750	1,084,000	C	24
LROEMXT ¾ x 1	1.00	3,750	1,120,000	C	27
OEMXT ¾ x 1	1.00	3,750	1,120,000	C	27
LROEMXT 1.5M x 1	1.00	3,750	1,120,000	C	27
OEMXT 1.5M x 1	1.00	3,750	1,120,000	C	27
LROEMXT ¾ x 2	2.00	7,500	1,475,000	C	27
OEMXT ¾ x 2	2.00	7,500	1,475,000	C	27
LROEMXT 1.5M x 2	2.00	7,500	1,475,000	C	27
OEMXT 1.5M x 2	2.00	7,500	1,475,000	C	27
OEMXT ¾ x 3	3.00	11,500	1,775,000	C	27
OEMXT 1.5M x 3	3.00	11,500	1,775,000	C	27
LROEMXT 1⅛ x 1	1.00	6,000	2,000,000	C	27
LROEMXT 1⅛ x 2	2.00	20,000	2,400,000	C	29
OEMXT 1⅛ x 2	2.00	20,000	2,400,000	C	29
LROEMXT 2.0M x 2	2.00	20,000	2,400,000	C	29
OEMXT 2.0M x 2	2.00	20,000	2,400,000	C	29
OEM 3.0M x 2	2.00	20,000	3,290,000	C	31
OEMXT 1⅛ x 4	4.00	40,000	3,200,000	C	29
OEMXT 2.0M x 4	4.00	40,000	3,200,000	C	29
OEM 4.0M x 2	2.00	34,000	13,300,000	C	31
OEM 3.0M x 3.5	3.50	35,000	5,770,000	C	31
OEMXT 1⅛ x 6	6.00	60,000	3,730,000	C	29
OEMXT 2.0M x 6	6.00	60,000	3,730,000	C	29
OEM 3.0M x 5	5.00	50,000	8,260,000	C	31
OEM 3.0M x 6.5	6.50	65,000	10,750,000	C	31
OEM 4.0M x 4	4.00	68,000	16,000,000	C	31
OEM 4.0M x 6	6.00	102,000	18,600,000	C	31
OEM 4.0M x 8	8.00	136,000	21,300,000	C	31
OEM 4.0M x 10	10.00	170,000	24,000,000	C	31

Key for Damping Type:
D – Dashpot
C – Conventional
P – Progressive
SC – Self-compensating

ITT Enidine Non-Adjustable Shock Absorbers

Catalog No. (Model)	(S) Stroke (in.)	(E_T) Max. in.-lbs./cycle	(E_TC) Max. in.-lbs./hour	Damping Type	Page No.
	1 in. = 25,4mm	1 in.-lb. = .11 Nm			
TK 6	0.25	9	31,863	D	39
TK 8	0.25	50	42,480	D	39
TK 21	0.25	20	36,000	D	40
ECO 8	0.25	35	55,000	SC	47
TK 10M	0.25	50	115,000	D	40
ECO 10	0.28	62	120,700	SC	47
ECO 15	0.41	106	275,000	SC	47
STH .25M	0.25	100	39,000	D	41
ECO 25	0.50	265	389,000	SC	47
ECOS 50	0.50	285	440,000	SC	47
ECO 50	0.88	550	523,000	SC	47
STH .5M	0.50	585	390,000	D	41
ECO 100	1.00	930	681,500	SC	47
ECO 110	1.56	1,860	743,500	P	50
ECO 120	1.00	1,640	743,000	SC	50
ECO 125	1.00	1,640	920,500	SC	50
PMXT 1525	1.00	3,250	1,120,000	SC	59
STH .75M	0.75	2,150	780,000	D	41
ECO 220	2.00	3,100	911,600	SC	50
ECO 225	2.00	3,100	1,124,000	SC	50
PMXT 1550	2.00	6,500	1,475,000	SC	59
STH 1.0M	1.00	4,400	1,300,000	D	41
PMXT 1575	3.00	10,000	1,775,000	SC	59
STH 1.0M x 2	2.00	8,800	2,100,000	D	41
PMXT 2050	2.00	16,500	2,400,000	SC	59
STH 1.5M x 1	1.00	10,200	2,200,000	D	41
PMXT 2100	4.00	33,000	3,200,000	SC	59
STH 1.5M x 2	2.00	20,400	3,200,000	D	41
PMXT 2150	6.00	50,000	3,730,000	SC	59

Key for Damping Type:
D – Dashpot
C – Conventional
P – Progressive
SC – Self-compensating

Shock Absorber and Rate Controls Quick Selection Guide

Typical Selections

Use this **ITT Enidine Product Quick Selection Guide** to quickly locate potential shock absorber models most suited for your requirements. Models are organized in order of smallest to largest energy capacity per cycle within their respective product families.

ITT Enidine Heavy Duty Shock Absorbers

Catalog No. (Model)	(S) Stroke (in.)	(E_T) Min./Max. in.-lbs./cycle		Damping Type	Page No.
	1 in. = 25,4mm	1 in.-lb. = .11 Nm			
HDN 1.5 x (Stroke)	2-24	27,000	185,000	C, P, SC	66
HDN 2.0 x (Stroke)	10-56	212,000	680,000	C, P, SC	67
HDN 3.0 x (Stroke)	2-56	83,000	1,200,000	C, P, SC	68
HDA 3.0 x (Stroke)	2-12	40,000	240,000	C	71
HDN 3.5 x (Stroke)	2-48	112,500	1,800,000	C, P, SC	69
HDN 4.0 x (Stroke)	2-48	134,000	2,400,000	C, P, SC	70
HDA 4.0 x (Stroke)	2-10	120,000	600,000	C	72
HD 5.0 x (Stroke)	4-40	414,000	4,150,000	C, P, SC	74
HDA 5.0 x (Stroke)	4-12	327,000	1,000,000	C	74
HD 6.0 x (Stroke)	4-48	677,000	7,125,000	C, P, SC	75
HDA 6.0 x (Stroke)	4-12	540,000	1,625,000	C	75

Key for Damping Type:
D – Dashpot
C – Conventional
P – Progressive
SC – Self-compensating

ITT Enidine Heavy Industry Shock Absorbers

Catalog No. (Model)	(S) Stroke (in.)	(E_T) Min./Max. in.-lbs./cycle		Damping Type	Page No.
	1 in. = 25,4mm	1 in.-lb. = .11 Nm			
HI 50 x (Stroke)	2-4	26,500	55,000	C, P, SC	83
HI 85 x (Stroke)	2-4	60,000	120,000	C, P, SC	83
HI 100 x (Stroke)	2-32	88,000	1,150,000	C, P, SC	83
HI 120 x (Stroke)	4-40	283,000	2,301,000	C, P, SC	83
HI 130 x (Stroke)	10-32	885,000	2,400,000	C, P, SC	84
HI 150 x (Stroke)	5-40	548,000	4,500,000	C, P, SC	84

Key for Damping Type:
D – Dashpot
C – Conventional
P – Progressive
SC – Self-compensating

Jarret Shock Absorbers

Catalog No. (Model)	(S) Stroke (in.)	(E_T) Min./Max. in.-lbs./cycle		Damping Type	Page No.
	1 in. = 25,4mm	1 in.-lb. = .11 Nm			
BC1N	0.5-3	885,000	123,910	–	87
BC5	4-7	221,000	1,327,612	–	89
XLR	6-31.5	53,000	1,327,612	–	91
LR	16-51	885,000	8,850,746	–	93

ITT Enidine Adjustable Rate Controls

Catalog No. (Model)	(S) Stroke (in.)	(Fp) Max. Propelling Force		(E_TC) Max. in.-lbs./hour	Page No.
	1 in. = 25,4mm	Tension lbs.	Compression lbs.	1 in.-lb. = .11 Nm	
ADA 505	2.00	450	450	650,000	101
ADA 510	4.00	450	375	850,000	101
ADA 515	6.00	450	300	1,050,000	101
ADA 520	8.00	450	200	1,250,000	101
ADA 525	10.00	450	125	1,450,000	101
ADA 705	2.00	2,500	2,500	1,100,000	101
ADA 710	4.00	2,500	2,500	1,400,000	102
ADA 715	6.00	2,500	2,500	1,800,000	102
ADA 720	8.00	2,500	2,500	2,100,000	102
ADA 725	10.00	2,500	2,500	2,500,000	102
ADA 730	12.00	2,500	2,500	2,800,000	102
ADA 735	14.00	2,500	2,500	3,200,000	102
ADA 740	16.00	2,500	2,500	3,500,000	103
ADA 745	18.00	2,500	2,000	3,900,000	103
ADA 750	20.00	2,500	1,700	4,200,000	103
ADA 755	22.00	2,500	1,400	4,600,000	103
ADA 760	24.00	2,500	1,200	4,900,000	103
ADA 765	26.00	2,500	1,000	5,300,000	103
ADA 770	28.00	2,500	900	5,600,000	103
ADA 775	30.00	2,500	800	6,000,000	103
ADA 780	32.00	2,500	700	6,300,000	103

ITT Enidine Non-Adjustable Rate Controls

Catalog No. (Model)	(S) Stroke (in.)	(Fp) Max. Propelling Force		(E_TC) Max. in.-lbs./hour	Page No.
	1 in. = 25,4mm	Tension lbs.	Compression lbs.	1 in.-lb. = .11 Nm	
DA 705	2.00	2,500	2,500	1,400,000	105
DA 710	4.00	2,500	2,500	1,700,000	105
DA 720	6.00	2,500	2,500	2,000,000	105
DA 720	8.00	2,500	2,500	2,300,000	105
DA 75 x 2	2.00	5,000	5,000	2,700,000	105
DA 75 x 4	4.00	5,000	5,000	3,100,000	105
DA 75 x 6	6.00	5,000	5,000	3,600,000	106
DA 75 x 8	8.00	5,000	5,000	4,100,000	106
DA 75 x 10	10.00	5,000	5,000	4,500,000	106
TB 100 x 4	4.00	10,000	10,000	4,400,000	106
TB 100 x 6	6.00	10,000	10,000	4,400,000	106

Adjustable Series Hydraulic Shock Absorbers
ECO OEM and OEMXT Series

Overview

ITT Enidine Adjustable Hydraulic Series shock absorbers offer the most flexible solutions to energy absorption application requirements when input parameters vary or are not clearly defined.

ITT Enidine's **New ECO OEM Series** adjustable hydraulic shock absorbers are an expansion of our previously released ECO Series product line. These adjustable shock absorbers provide maximum flexibility in a RoHS compliant package. By simply turning an adjustment knob, the damping force can be changed to accommodate a wide range of conditions. ITT Enidine offers the broadest range of adjustable shock absorbers and mounting accessories in the marketplace today.

The ITT Enidine **OEMXT Series** provides a low profile adjustment knob offered in imperial or metric thread configurations with stroke lengths of 1 to 6 inches. For drop-in competitive interchange. **Low Range (LROEMXT) Series** products are also available to control velocities as low as 3 in./sec. and propelling forces as high as 4,000 lbs. OEMXT and OEM Large Series shock absorbers are fully field repairable.

Features and Benefits

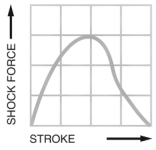
- **Adjustable design lets you "fine-tune"** your desired damping and lock the numbered adjustment setting.
- **Internal orifice design** provides deceleration with the most efficient damping characteristics, resulting in the lowest reaction forces in the industry.
- **Threaded cylinders provide mounting flexibility** and increase surface area for improved heat dissipation.
- **Operational parameters can be expanded** through the use of ITT Enidine's Low Range and High Performance products.
- **Custom orificed non-adjustable** units (CBOEM) can be engineered to meet specific application requirements or **emergency impact only requirements.**
- **Special materials and finishes** can be designed to meet specific customer requirements.
  - Optional fluids and seal packages can expand the standard operating temperature range from (15°F to 180°F) to (–30°F to 210°F)
  - Food grade options available
- **ISO quality standards** result in reliable, long-life operation.
- **Fully field repairable units are available** in mid-bore and larger bore product ranges.

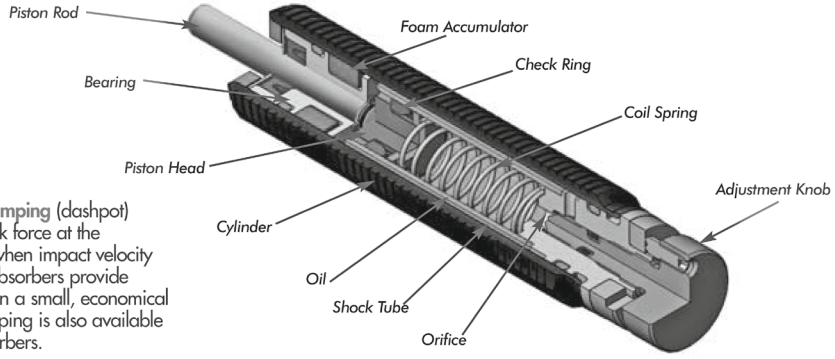
Added New Features for the ECO OEM Series

- **Environmentally friendly materials:**
  - ROHS Compliant materials
  - Bio-degradable hydraulic oil
  - Copper-Free design
  - Recyclable packaging materials
- **Introducing our new Enicote II surface finish:**
  - ROHS Compliant
  - Rated at 350 hours salt spray corrosion protection
- **Jam Nut included** with every shock absorber.
- **Wrench flats** promote ease of mounting
- **Capability to mount into pressure chambers**
- **Integrated positive stopping capabilities** up to 100 psi (7 bar).

Adjustable Series Hydraulic Shock Absorbers
ECO OEM and OEMXT Series

ITT Enidine Adjustable Single Orifice Shock Absorbers



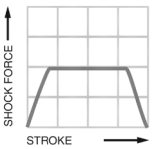


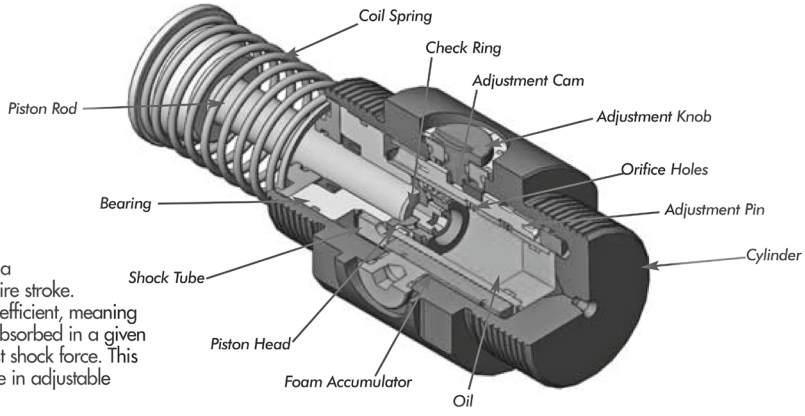
Constant orifice area damping (dashpot) provides the largest shock force at the beginning of the stroke when impact velocity is highest. These shock absorbers provide high-energy absorption in a small, economical design. This type of damping is also available in adjustable shock absorbers.

The damping force of an ITT Enidine single orifice shock absorber can be changed by turning the adjustment knob. Maximum damping force is achieved by turning the adjustment knob to eight (8), while minimum damping force is achieved by turning the adjustment knob to zero (0). Turning the adjustment knob causes the adjustment ball to increase or decrease the clearance (orifice area) between the ball and its seat, depending on rotation direction.

The internal structure of an adjustable single orifice shock absorber is shown above. When force is applied to the piston rod, the check ball is seated and the valve remains closed. Oil is forced out of the high pressure shock tube chamber through the orifice, creating internal pressure allowing smooth, controlled deceleration of the moving load. When the load is removed, the compressed coil spring moves to reposition the piston head, the check ball unseats, opening the valve that permits rapid piston rod return to the original extended position. The closed cellular foam accumulator compensates for fluid displaced by the piston rod during compression and extension. Without the fluid displacement volume provided by the foam accumulator, the closed system would be hydraulically locked. This type of orifice design results in .

ITT Enidine Adjustable Multiple Orifice Shock Absorbers





Conventional damping allows linear deceleration by providing a constant shock force over the entire stroke. This standard design is the most efficient, meaning it allows the most energy to be absorbed in a given stroke, while providing the lowest shock force. This type of damping is also available in adjustable shock absorbers.

The adjustable multiple orifice shock absorber is similar to the principles described earlier. The check ring replaces the check ball and the adjustment feature uses an adjustment pin instead of an adjustment ball. The damping force of the shock absorber can be changed by turning the adjustment knob. Maximum damping force is achieved by turning the adjustment knob to eight (8), while minimum damping force is achieved by turning the adjustment knob to zero (0).

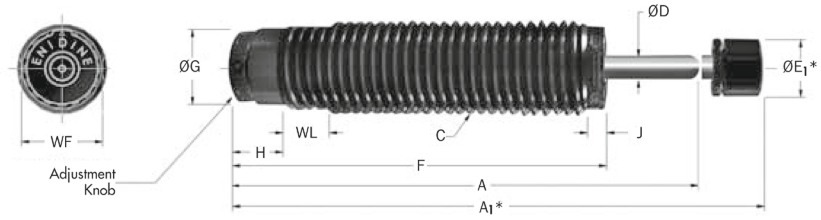
Turning the adjustment knob rotates the adjustment cam within the shock absorber. The cam, in turn, moves the adjustment pin in the shock tube, closing or opening the orifice holes. By closing the orifice holes, the total orifice area of the shock absorber is reduced, thus increasing the damping force of the shock absorber. The adjustable shock absorber enables the user to change the damping force of the unit, should input conditions change, while still maintaining a conventional-type damping curve. Low velocity range (LR) series configurations are available for controlling velocities that fall below the standard adjustable range.

Adjustable Series Hydraulic Shock Absorbers
ECO OEM Small Bore Series

OEM 0.1M → (LR)OEM 1.0 Series

Technical Data

Standard



*Note: A_1 and E_1 apply to button models. One Hex Jam Nut included with every shock absorber.

Catalog No./Model	(S) Stroke in. (mm)	Optimal Velocity Range in./sec. (m/s)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Model Weight (mass) oz (g)
						Extended lbs. (N)	Compressed lbs. (N)		
ECO OEM .1M (B)	0.28 (7,0)	12-130 (0,3-3,30)	62 (7,0)	120,000 (13 600)	275 (1 220)	0.5 (2,2)	1.0 (4,5)	80 (350)	1 (28)
ECO OEM .15M (B)	0.38 (10,0)	12-130 (0,3-3,30)	62 (7,0)	185,000 (20 900)	200 (890)	0.8 (3,5)	1.7 (7,5)	80 (350)	2 (56)
ECO OEM .25 (B)	0.38	12-130	62	195,000	200	0.8	1.7	80	2
ECO OEM .25M (B)	(10,0)	(0,3-3,30)	(7,0)	(22 000)	(890)	(3,5)	(7,5)	(350)	(56)
ECO LROEM .25 (B)	0.38	3-50	62	195,000	200	0.8	1.7	100	2
ECO LROEM .25M (B)	(10,0)	(0,08-1,30)	(7,0)	(22 000)	(890)	(3,5)	(7,5)	(440)	(56)
ECO OEM .35 (B)	0.50	12-130	120	331,000	450	1.0	2.2	120	3
ECO OEM .35M (B)	(12,7)	(0,3-3,30)	(19,0)	(37 400)	(2 000)	(4,5)	(9,8)	(530)	(85)
ECO LROEM .35 (B)	0.50	3-50	120	331,000	450	1.0	2.2	200	3
ECO LROEM .35M (B)	(12,7)	(0,08-1,30)	(19,0)	(37 400)	(2 000)	(4,5)	(9,8)	(890)	(85)
ECO OEM .5 (B)	0.50	12-180	275	311,000	775	1.3	2.8	150	5
ECO OEM .5M (B)	(12,0)	(0,3-4,50)	(31,0)	(35 200)	(3 500)	(5,8)	(12,4)	(670)	(141)
ECO LROEM .5 (B)	0.50	3-50	275	311,000	775	2.0	3.8	250	5
ECO LROEM .5M (B)	(12,0)	(0,08-1,30)	(31,0)	(35 200)	(3 500)	(8,9)	(17,0)	(1 120)	(141)
ECO OEM 1.0 (B)	1.00	12-130	715	681,000	1,000	3.0	6.0	300	10
ECO OEM 1.0M (B)	(25,0)	(0,3-3,30)	(81,0)	(77 000)	(4 400)	(13,0)	(26,0)	(1 330)	(285)
ECO OEM 1.0MF (B)	(25,0)	(0,3-3,30)	(81,0)	(77 000)	(4 400)	(13,0)	(26,0)	(1 330)	(285)
ECO LROEM 1.0 (B)	1.00	3-50	715	681,000	1,000	3.0	6.0	450	10
ECO LROEM 1.0M (B)	(25,0)	(0,08-1,30)	(81,0)	(77 000)	(4 400)	(13,0)	(27,0)	(2 016)	(285)
ECO LROEM 1.0MF (B)	(25,0)	(0,08-1,30)	(81,0)	(77 000)	(4 400)	(13,0)	(27,0)	(2 016)	(285)

Catalog No./Model	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E_1 in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	J in. (mm)	WF in. (mm)	WL in. (mm)
ECO OEM 0.1M (B)	2.25 (57,0)	2.63 (67,0)	M10 x 1,0	.12 (3,0)	0.34 (8,6)	1.95 (49,4)	.34 (8,6)	.40 (10,2)	– –	– –	– –
ECO OEM .15M (B)	3.22 (81,8)	3.61 (91,7)	M12 x 1,0	.13 (3,3)	0.34 (8,6)	2.81 (71,4)	.43 (10,9)	.56 (14,2)	– –	.43 (11,0)	.38 (9,7)
ECO (LR)OEM .25 (B)	3.22	3.59	¼-20 UNF	.13	0.44	2.81)	.43	.56	–	.44	.50
ECO (LR)OEM .25M (B)	(81,8)	(91,2)	(M14 x 1,5)	(3,3)	(11,2)	(71,4	(10,9)	(14,2)	–	(12,0)	(12,7)
ECO (LR)OEM .35 (B)	3.96	4.36	5/16-18 UNF	.16	0.44	3.44	.44	.57	.02	.50	.50
ECO (LR)OEM .35M (B)	(100,6)	(110,7)	(M16 x 1,5)	(4,0)	(11,2)	(87,4)	(11,2)	(14,5)	(0,5)	(14,0)	(12,7)
ECO (LR)OEM .5 (B)	3.88	4.35	⅜-16 UNF	.19	0.50	3.31	.63	.67	–	.68	.50
ECO (LR)OEM .5M (B)	(98,6)	(110,5)	(M20 x 1,5)	(4,8)	(12,7)	(84,1)	(16,0)	(17,0)	–	(18,0)	(12,7)
ECO (LR)OEM 1.0 (B)	5.12	5.62	1-12 UNF	.25	0.62	4.09	.87	.55	.18	.88	.50
ECO (LR)OEM 1.0M (B)	(130,0)	(142,7)	(M27 x 3,0)	(6,4)	(15,7)	(104,0)	(22,0)	(14,0)	(4,6)	(23,0)	(12,7)
ECO (LR)OEM 1.0MF (B)	(130,0)	(142,7)	(M25 x 1,5)	(6,4)	(15,7)	(104,0)	(22,0)	(14,0)	(4,6)	(23,0)	(12,7)

Notes: 1. All shock absorbers will function satisfactorily at 5% of their maximum rated energy per cycle. If less than 5%, a smaller model should be specified.
2. For mounting accessories, see pages 22-23.
3. (B) indicates button model of shock absorber. Buttons cannot be added to non-button models or removed from button models OEM .1M to OEM 1.0M.

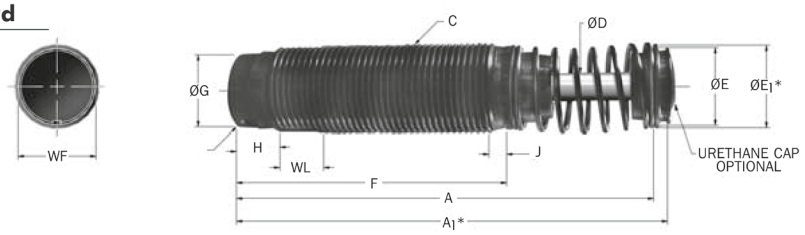
ENDINE

Adjustable Series Hydraulic Shock Absorbers
ECO OEM Small Bore Series

OEM 1.15 → (LR)OEM 1.25 Series

Technical Data

Standard



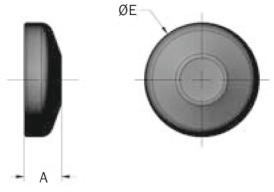
*Note: A_1 and E_1 apply to urethane striker cap accessory.

Catalog No./Model	(S) Stroke in. (mm)	Optimal Velocity Range in./sec. (m/s)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Weight (mass) oz (g)
						Extended lbs. (N)	Compressed lbs. (N)		
△ ECO OEM 1.15 x 1	1.00	12-130	1,900	137,000	2,500	12.5	20.0	500	17
△ ECO OEM 1.15M x 1	(25,0)	(0,3-3,30)	(215,0)	(83 300)	(11 120)	(56,0)	(89,0)	(2 220)	(482)
△ ECO LROEM 1.15 x 1	1.00	3-80	1,900	237,000	2,500	12.5	20.0	750	17
△ ECO LROEM 1.15M x 1	(25,0)	(0,08-2,0)	(215,0)	(83 300)	(11 120)	(56,0)	(89,0)	(3 335)	(482)
△ ECO OEM 1.15 x 2	2.00	12-130	3,750	963,000	2,500	7.0	20.0	500	25
△ ECO OEM 1.15M x 2	(50,0)	(0,3-3,30)	(424,0)	(108 800)	(11 120)	(31,0)	(89,0)	(2 220)	(708)
△ ECO LROEM 1.15 x 2	2.00	3-80	3,750	963,000	2,500	7.0	20.0	750	25
△ ECO LROEM 1.15M x 2	(50,0)	(0,8-2,0)	(424,0)	(108 800)	(11 120)	(31,0)	(89,0)	(3 335)	(708)
△ ECO OEM 1.25 x 1	1.00	12-130	1,900	886,000	2,500	12.5	20.0	500	20
△ ECO OEM 1.25M x 1	(25,0)	(0,3-3,30)	(215,0)	(100 100)	(11 120)	(56,0)	(89,0)	(2 220)	(567)
△ ECO LROEM 1.25 x 1	1.00	3-80	1,900	886,000	2,500	12.5	20.0	750	20
△ ECO LROEM 1.25M x 1	(25,0)	(0,8-2,0)	(215,0)	(100 100)	(11 120)	(56,0)	(89,0)	(3 335)	(567)
△ ECO OEM 1.25 x 2	2.00	12-130	3,750	1,084,000	2,500	7.0	20.0	500	26
△ ECO OEM 1.25M x 2	(50,0)	(0,3-3,30)	(424,0)	(122 500)	(11 120)	(31,0)	(89,0)	(2 220)	(737)
△ ECO LROEM 1.25 x 2	2.00	3-80	3,750	1,084,000	2,500	7.0	20.0	750	26
△ ECO LROEM 1.25M x 2	(50,0)	(0,8-2,0)	(424,0)	(122 500)	(11 120)	(31,0)	(89,0)	(3 335)	(737)

Catalog No./Model	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	E_1 in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	J in. (mm)	WF in. (mm)	WL in. (mm)
△ ECO (LR)OEM 1.15 x 1	5.92	6.12	1 ¼ - 12 UNF	.38	1.13	1.20	3.81	1.10	.55	.21	1.12	.63
△ ECO (LR)OEM 1.15M x 1	(150,0)	(155,5)	(M33 x 1,5)	(9,5)	(29,0)	(30,5)	(97,0)	(28,0)	(14,0)	(5,3)	(30,0)	(16,0)
△ ECO (LR)OEM 1.15 x 2	8.54	8.74	1 ¼ - 12 UNF	.38	1.13	1.20	5.43	1.10	.55	.21	1.12	.63
△ ECO (LR)OEM 1.15M x 2	(217,0)	(222,0)	(M33 x 1,5)	(9,5)	(29,0)	(30,5)	(138,0)	(28,0)	(14,0)	(5,3)	(30,0)	(16,0)
△ ECO (LR)OEM 1.25 x 1	5.92	6.12	1 ⅜ - 12 UNF	.38	1.13	1.20	3.81	1.10	.55	.21	1.25	.63
△ ECO (LR)OEM 1.25M x 1	(150,0)	(155,5)	(M36 x 1,5)	(9,5)	(29,0)	(30,5)	(97,0)	(28,0)	(14,0)	(5,3)	(33,0)	(16,0)
△ ECO (LR)OEM 1.25 x 2	8.54	8.74	1 ⅜ - 12 UNF	.38	1.13	1.20	5.43	1.10	.55	.21	1.25	.63
△ ECO (LR)OEM 1.25M x 2	(217,0)	(222,0)	(M36 x 1,5)	(9,5)	(29,0)	(30,5)	(138,0)	(28,0)	(14,0)	(5,3)	(33,0)	(16,0)

Notes: 1. All shock absorbers will function satisfactorily at 5% of their maximum rated energy per cycle. If less than 5%, a smaller model should be specified.
2. For mounting accessories, see pages 25-26.
3. Urethane striker caps are available as accessories for models OEM 1.15M x 1 to OEM 1.25M x 2.
4. △ = Non-standard lead time items, contact ITT Enidine.

Urethane Striker Cap (USC)



Catalog No./ Model	Part Number	Model (Ref)	A in. (mm)	E in. (mm)	Weight (mass) oz. (g)
UC 8609	C98609079	ECO (LR)OEM 1.15/1.25	.39 (10,0)	1.20 (30,5)	0.2 (6)

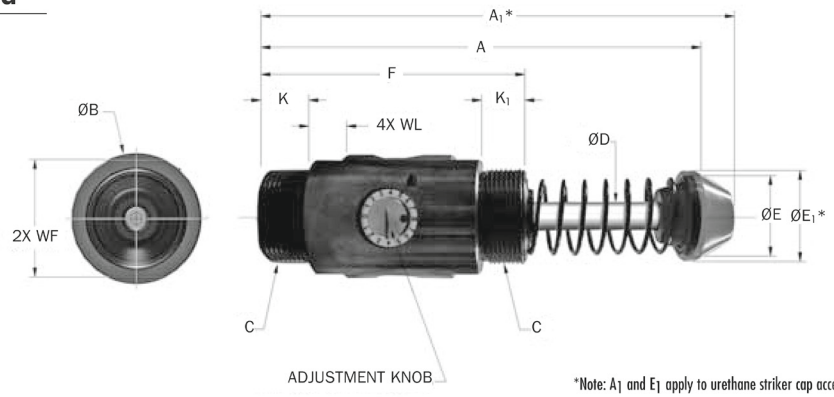
ENIDINE

Adjustable Series Hydraulic Shock Absorbers
OEMXT Mid-Bore Series

OEMXT 3/4 & OEMXT 1.5M Series

Technical Data

Standard



*Note: A_1 and E_1 apply to urethane striker cap accessory.

Imperial Catalog No./Model	(S) Stroke in.	Optimal Velocity Range in./sec.	(E_T) Max. in.-lbs./cycle	(E_TC) Max. in.-lbs./hour	(F_P) Max. Reaction Force lbs.	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs.	Weight lbs.
						Extended lbs.	Compressed lbs.		
OEMXT ¾ x 1	1	12-140	3,750	1,120,000	4,500	11	15	650	2.7
LROEMXT ¾ x 1	1	3-55	3,750	1,120,000	4,500	11	15	1,500	2.7
OEMXT ¾ x 2	2	12-140	7,500	1,475,000	4,500	7	15	650	3.7
LROEMXT ¾ x 2	2	3-55	7,500	1,475,000	4,500	11	18	1,500	3.7
OEMXT ¾ x 3	3	12-140	11,500	1,775,000	4,500	7	18	650	4.6
Metric Catalog No./Model	**(S) Stroke mm**	**Optimal Velocity Range mm/sec.**	**(E_T) Max. Nm/cycle**	**(E_TC) Max. Nm/hour**	**(F_P) Max. Reaction Force N**	**Nominal Coil Spring Force**		**(F_D) Max. Propelling Force N**	**Mass Kg**
						Extended N	**Compressed N**		
OEMXT 1.5M x 1	25,0	0,3-3,5	425	126 000	20 000	48	68	2 890	1,2
LROEMXT 1.5M x 1	25,0	0,08-1,3	425	126 000	20 000	48	68	6 660	1,2
OEMXT 1.5M x 2	50,0	0,3-3,5	850	167 000	20 000	29	68	2 890	1,7
LROEMXT 1.5M x 2	50,0	0,08-1,3	850	167 000	20 000	48	85	6 660	1,7
OEMXT 1.5M x 3	75,0	0,3-3,5	1 300	201 000	20 000	29	85	2 890	2,1

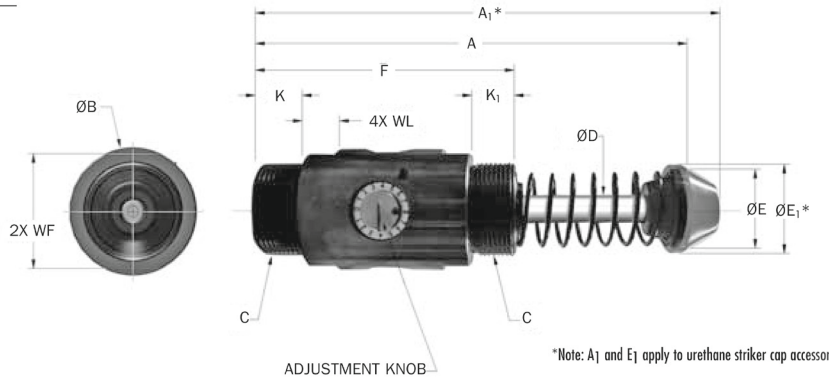
Imperial Catalog No./Model	C in.	A in.	A_1 in.	B in.	D in.	E in.	E_1 in.	F in.	K in.	K_1 in.	WF in.	WL in.
(LR)OEMXT ¾ x 1	1 ¾ - 12 UN	5.68	6.38	2.25	0.50	1.50	1.75	3.63	0.91	0.82	1.59	0.75
(LR)OEMXT ¾ x 2	1 ¾ - 12 UN	7.68	8.38	2.25	0.50	1.50	1.75	4.63	0.91	0.82	1.59	0.75
(LR)OEMXT ¾ x 3	1 ¾ - 12 UN	9.68	10.38	2.25	0.50	1.50	1.75	5.63	0.91	0.82	1.59	0.75
Metric Catalog No./Model	**C mm**	**A mm**	**A_1 mm**	**B mm**	**D mm**	**E mm**	**E_1 mm**	**F mm**	**K mm**	**K_1 mm**	**WF mm**	**WL mm**
(LR)OEMXT 1.5M x 1	M42 x 1.5	144	162	58	13	38	44	92	32	32	40,5	19
(LR)OEMXT 1.5M x 2	M42 x 1.5	195	213	58	13	38	44	118	45	45	40,5	19
(LR)OEMXT 1.5M x 3	M42 x 1.5	246	264	58	13	38	44	143	57	57	40,5	19

Adjustable Series Hydraulic Shock Absorbers
OEMXT Mid-Bore Series

OEMXT 1-⅛ & OEMXT 2.0M Series

Technical Data

Standard



*Note: A_1 and E_1 apply to urethane striker cap accessory.

Imperial Catalog No./Model	(S) Stroke in.	Optimal Velocity Range in./sec.	(E_T) Max. in.-lbs./cycle	(E_TC) Max. in.-lbs./hour	(F_P) Max. Reaction Force lbs.	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs.	Weight lbs.
						Extended lbs.	Compressed lbs.		
△(LR)OEMXT 1 ⅛ x 1	1	3-30	10,000	2,000,000	11,500	26	35	4,000	4.5
OEMXT 1 ⅛ x 2	2	12-140	20,000	2,400,000	11,500	17	35	1,500	7.9
(LR)OEMXT 1 ⅛ x 2	2	3-30	20,000	2,400,000	11,500	17	35	4,000	7.9
OEMXT 1 ⅛ x 4	4	12-140	40,000	3,200,000	11,500	16	36	1,500	10.8
OEMXT 1 ⅛ x 6	6	12-140	60,000	3,730,000	11,500	20	64	1,500	14.1
Metric Catalog No./Model	**(S) Stroke mm**	**Optimal Velocity Range mm/sec.**	**(E_T) Max. Nm/cycle**	**(E_TC) Max. Nm/hour**	**(F_P) Max. Reaction Force N**	**Nominal Coil Spring Force**		**(F_D) Max. Propelling Force N**	**Mass Kg**
						Extended N	**Compressed N**		
△(LR)OEMXT 2.0M x 1	25,0	0,08-1,35	1 130	226 000	51 000	115	155	17 760	2,1
OEMXT 2.0M x 2	50,0	0,3-3,5	2 260	271 000	51 000	75	155	6 660	3,6
LROEMXT 2.0M x2	50,0	0,08-1,35	2 260	271 000	51 000	75	155	17 760	3,6
OEMXT 2.0M x 4	100,0	0,3-3,5	4 520	362 000	51 000	70	160	6 660	4,9
OEMXT 2.0M x 6	150,0	0,3-3,5	6 780	421 000	51 000	90	284	6 660	6,4

Note: △ = Non-standard lead time items, contact ITT Enidine.

Imperial Catalog No./Model	C in.	A in.	A_1 in.	B in.	D in.	E in.	E_1 in.	F in.	K in.	K_1 in.	WF in.	WL in.
△(LR)OEMXT 1 ⅛ x 1	2 ½ - 12 UN	6.90	7.55	3.00	0.75	2.00	2.25	4.50	1.03	1.03	2.75	1.00
(LR)OEMXT 1 ⅛ x 2	2 ½ - 12 UN	8.90	9.55	3.00	0.75	2.00	2.25	5.50	1.03	1.03	2.75	1.00
OEMXT 1 ⅛ x 4	2 ½ -12 UN	12.90	13.59	3.00	0.75	2.00	2.25	7.50	1.03	1.03	2.75	1.00
OEMXT 1 ⅛ x 6	2 ½ -12 UN	17.97	18.62	3.00	0.75	2.38	2.38	9.50	1.03	1.03	2.75	1.00
Metric Catalog No./Model	**C mm**	**A mm**	**A_1 mm**	**B mm**	**D mm**	**E mm**	**E_1 mm**	**F mm**	**K mm**	**K_1 mm**	**WF mm**	**WL mm**
△(LR)OEMXT 2.0M x 1	M64 x 2.0	175	192	77	19	50	57	114	38	38	61.5	25
LROEMXT 2.0M x 2	M64 x 2.0	226	243	77	19	50	57	140	50	50	61.5	25
OEMXT 2.0M x 4	M64 x 2.0	328	345	77	19	50	57	191	75	75	61.5	25
OEMXT 2.0M x 6	M64 x 2.0	456	473	77	19	57	57	241	75	75	61.5	25

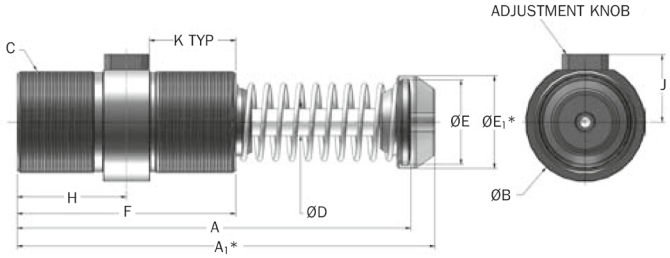
Note: △ = Non-standard lead time items, contact ITT Enidine.

Adjustable Series Hydraulic Shock Absorbers
OEM Mid-Bore Series

OEM 3.0M → OEM 4.0M Series

Technical Data

Standard



*Note: A_1 and E_1 apply to urethane striker cap accessory.

Catalog No./Model	(S) Stroke in. (mm)	Optimal Velocity Range in./sec. (mm)	(E_T) Max. in.-lbs./cycle (m/s)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Weight (mass) lbs. (Kg)
						Extended lbs. (N)	Compressed lbs. (N)		
OEM 3.0M x 2	2.0 (50)	12-170 (0,3-4,3)	20,000 (2 300)	3,290,000 (372 000)	15,000 (67 000)	25 (110)	45 (200)	2,700 (12 000)	15.5 (7,0)
OEM 3.0M x 3.5	3.5 (90)	12-170 (0,3-4,3)	35,000 (4 000)	5,770,000 (652 000)	15,000 (67 000)	25 (110)	45 (200)	2,700 (12 000)	20.0 (9,1)
OEM 3.0M x 5	5.0 (125)	12-170 (0,3-4,3)	50,000 (5 700)	8,260,000 (933 000)	15,000 (67 000)	16 (71)	45 (200)	2,700 (12 000)	24.0 (10,9)
OEM 3.0M x 6.5	6.5 (165)	12-170 (0,3-4,3)	65,000 (7 300)	10,750,000 (1 215 000)	15,000 (67 000)	27 (120)	75 (330)	2,700 (12 000)	30.0 (13,6)
OEM 4.0M x 2	2.0 (50)	12-170 (0,3-4,3)	34,000 (3 800)	13,300,000 (1 503 000)	25,000 (111 000)	50 (225)	65 (290)	4,800 (21 000)	33.0 (15,0)
OEM 4.0M x 4	4.0 (100)	12-170 (0,3-4,3)	68,000 (7 700)	16,000,000 (1 808 000)	25,000 (111 000)	35 (155)	65 (290)	4,800 (21 000)	40.0 (18,2)
OEM 4.0M x 6	6.0 (150)	12-170 (0,3-4,3)	102,000 (11 500)	18,600,000 (2 102 000)	25,000 (111 000)	30 (135)	70 (310)	4,800 (21 000)	44.0 (20,0)
△OEM 4.0M x 8	8.0 (200)	12-170 (0,3-4,3)	136,000 (15 400)	21,300,000 (2 407 000)	25,000 (111 000)	40 (180)	80 (355)	4,800 (21 000)	66.0 (30,0)
△OEM 4.0M x 10	10.0 (250)	12-170 (0,3-4,3)	170,000 (19 200)	24,000,000 (2 712 000)	25,000 (111 000)	30 (135)	80 (355)	4,800 (21 000)	73.0 (33,0)

Note: △ = Non-standard lead time items, contact ITT Enidine.

Catalog No./Model	A in. (mm)	A_1 in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	E_1 in. (mm)	F in. (mm)	H in. (mm)	J in. (mm)	K in. (mm)
OEM 3.0M x 2	9.66 (245)	10.43 (265)	3.88 (98)	M85 x 2	0.88 (22)	2.75 (69)	3.00 (76)	5.53 (140)	2.77 (70)	2.25 (58)	2.02 (51
OEM 3.0M x 3.5	12.72 (323)	13.49 (343)	3.88 (98)	M85 x 2	0.88 (22)	2.75 (69)	3.00 (76)	7.06 (179)	3.53 (90)	2.25 (58)	2.78 (71)
OEM 3.0M x 5	15.72 (399)	16.49 (419)	3.88 (98)	M85 x 2	0.88 (22)	2.75 (69)	3.00 (76)	8.50 (217)	4.28 (109)	2.25 (58)	2.78 (71)
OEM 3.0M x 6.5	19.46 (494)	20.23 (514)	3.88 (98)	M85 x 2	0.88 (22)	3.19 (81)	3.19 (81)	10.06 (256)	5.03 (128)	2.25 (58)	2.78 (71)
OEM 4.0M x 2	12.32 (313)	13.20 (335)	5.00 (127)	M115 x 2	1.38 (35)	3.50 (88)	3.75 (95)	8.00 (203)	4.00 (102)	2.89 (74)	3.13 (80)
OEM 4.0M x 4	16.32 (414)	17.20 (436)	5.00 (127)	M115 x 2	1.38 (35)	3.50 (88)	3.75 (95)	10.00 (254)	5.00 (127)	2.89 (74)	4.13 (105)
OEM 4.0M x 6	20.32 (516)	21.20 (538)	5.00 (127)	M115 x 2	1.38 (35)	3.50 (88)	3.75 (95)	12.00 (305)	6.00 (153)	2.89 (74)	4.25 (108)
OEM 4.0M x 8	25.32 (643)	26.20 (665)	5.00 (127)	M115 x 2	1.38 (35)	3.50 (88)	3.75 (95)	14.00 (356)	7.00 (178)	2.89 (74)	4.25 (108)
OEM 4.0M x 10	29.32 (745)	30.20 (767)	5.00 (127)	M115 x 2	1.38 (35)	3.50 (88)	3.75 (95)	16.00 (406)	8.00 (203)	2.89 (74)	4.25 (108)

Notes: 1. All shock absorbers will function satisfactorily at 5% of their maximum rated energy per cycle. If less than 5%, a smaller model should be specified.
2. For mounting accessories, see pages 32.
3. Rear flange mounting of OEM 3.0M x 6.5, OEM 4.0M x 8 and OEM 4.0M x 10 models not recommended when mounting horizontally.

Adjustable Series Hydraulic Shock Absorbers
ECO OEM/OEMXT/OEM Large Bore Series

Adjustment Techniques

After properly sizing the shock absorber, the useable range of adjustment settings for the application can be determined:

1. Locate the intersection point of the application's impact velocity and the selected model graph line.
2. The intersection is the **maximum** adjustment setting to be used. Adjustments exceeding this maximum suggested setting could overload the shock absorber.
3. The useable adjustment setting range is from the 0 setting to the **maximum** adjustment setting as determined in step 2.

Example: OEM 1.25 x 1

1. Impact Velocity: 40 in./sec.
2. Intersection Point: Adjustment Setting 5
3. Useable Adjustment: Setting Range 0 to 5

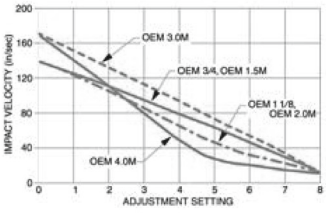
Example: (LR)OEMXT 1⅛ x 2

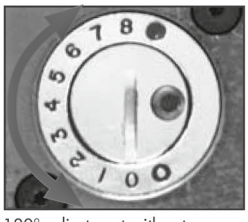
1. Impact Velocity: 20 in./sec.
2. Intersection Point: Adjustment Setting 3
3. Useable Adjustment: Setting Range 0 to 3

Useable Adjustment Setting Range

Position 0 provides minimum damping force.
Position 8 provides maximum damping force.

OEMXT Large

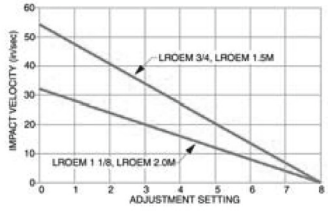




180° adjustment with setscrew locking. OEMXT 3.0M – OEM 4.0M

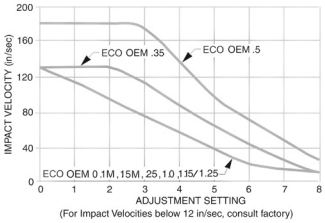
360° adjustment with setscrew locking. OEMXT 3/4 and OEMXT 1 1/8 OEMXT 1.5M and OEMXT 2.0M

(LR)OEMXT Large



360° adjustment with setscrew locking
(LR)OEMXT 3/4 and (LR)OEMXT 1 1/8
(LR)OEMXT 1.5M and (LR)OEMXT 2.0M

ECO OEM Small Series

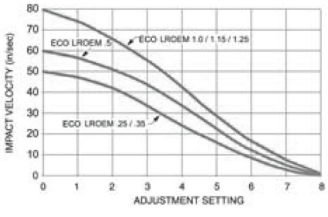


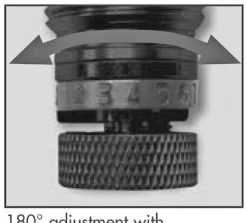
(For Impact Velocities below 12 in/sec, consult factory)

180° adjustment with setscrew locking
ECO OEM 0.1M - ECO OEM .5

360° adjustment with setscrew locking
ECO OEM 1.0

ECO (LR)OEM Small Series



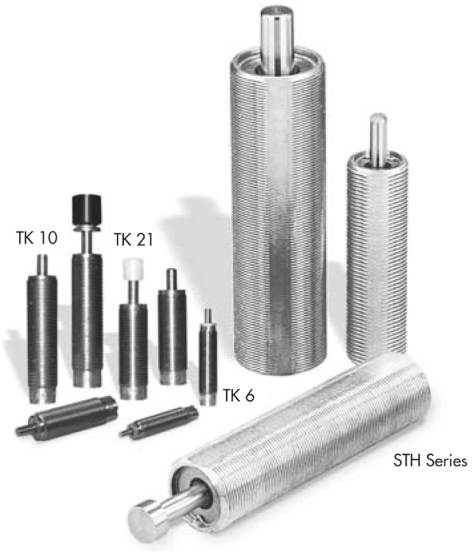


180° adjustment with setscrew locking
ECO (LR)OEM 0.15M - (LR)OEM .5

360° adjustment with setscrew locking
ECO (LR)OEM 1.0

ENDINE

Non-Adjustable Series Hydraulic Shock Absorbers
TK, STH Micro-Bore Series



ITT Enidine non-adjustable micro-bore hydraulic shock absorbers can accommodate varying energy conditions. This family of tamperproof shock absorbers provides consistent performance, cycle after cycle. Non-adjustable models are designed to absorb maximum energy within a compact envelope size.

The **TK Series** is a versatile, miniature design which provides effective, reliable deceleration and vibration control for light loads. Models can accommodate a wide range of operating conditions.

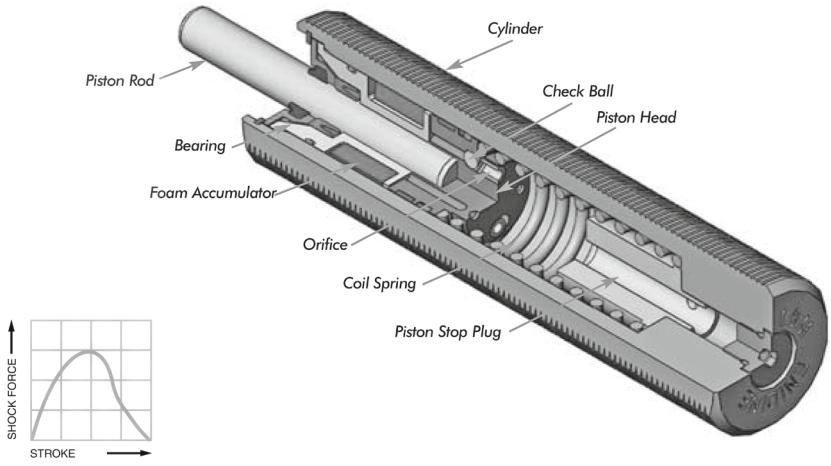
The ITT Enidine **STH Series** offers the highest energy absorption capacity relative to its size. These custom-orificed shock absorbers are designed to meet exact application requirements. STH Series shock absorbers are available in fully threaded cylinder bodies, providing flexibility in mounting configurations.

Features and Benefits

- Extensive non-adjustable product line offers flexibility in both size and energy absorption capacity to fulfill a wide range of application requirements.
- Tamperproof design ensures repeatable performance.
- Special materials and finishes can be designed to meet specific customer requirements.
- Incorporating optional fluids and seal packages can expand the standard operating temperature range from (15°F to 180°F) to (–30°F to 210°F).
- Threaded cylinders provide mounting flexibility and increase surface area for improved heat dissipation.
- A select variety of surface finishes maintains original quality appearance and provides the longest corrosion resistance protection.
- ISO quality standards result in reliable, long-life operation.

Non-Adjustable Series Hydraulic Shock Absorbers
TK, STH Micro-Bore Series

ITT Enidine Non-Adjustable Single-Orifice Shock Absorbers



Constant orifice area damping (dashpot) provides the largest shock force at the beginning of the stroke when impact velocity is highest. These shock absorbers provide high-energy absorption in a small, economical design.

The internal structure of a single orifice shock absorber is shown above. When a force is applied to the piston rod, the check ball is seated and the valve remains closed. Oil is forced through the orifice, creating internal pressure allowing smooth, controlled deceleration of the moving load. When the load is removed, the compressed coil spring moves to reposition the piston head, the check ball unseats, opening the valve that permits rapid return of the piston head rod to the original extended position.

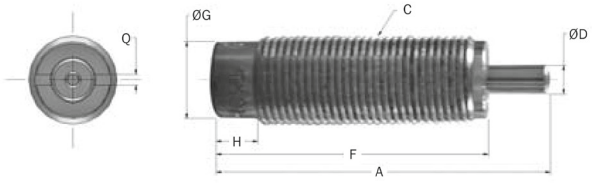
The closed cellular foam accumulator is compressed by the oil during the stroke, compensating for fluid displaced by the piston rod during compression. Without the fluid displacement volume provided by the foam accumulator, the closed system would be hydraulically locked.

Single-orifice shock absorbers provide constant orifice area (dashpot) damping.

Non-Adjustable Series Hydraulic Shock Absorbers
TK Micro-Bore Series

TK 6M, TK 8 Series

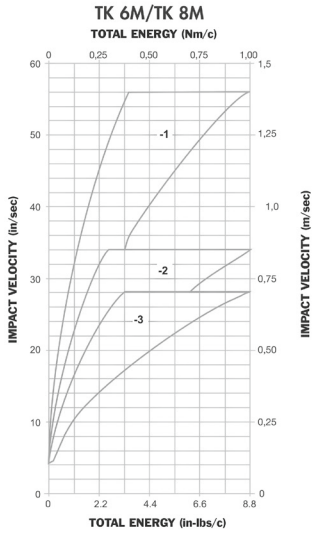
Standard



Catalog No./ Model	Bore Size in. (mm)	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/c)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Shock Force lbs. (N)	Nominal Coil Spring Force		Weight (mass) oz. (g)
						Extended lbs. (N)	Compressed lbs. (N)	
TK 6M	.28 (4,2)	.25 (4,0)	9 (1,0)	31,863 (3 600)	81 (360)	0.2 (1,0)	0.8 (3,5)	.14 (4)
TK 8M	.16 (4,2)	.25 (4,0)	9 (1,0)	42,480 (4 800)	81 (360)	0.2 (1,0)	0.8 (3,5)	.2 (6)

Catalog No./ Model	Damping Constant	A in. (mm)	C in. (mm)	ØD in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	Q in. (mm)
TK 6M	-1, -2, -3	1.14 (28,0)	M6 x 0,5	.08 (2,0)	1.0 (25,0)	.20 (5,0)	.16 (4,0)	.04 (1,0)
TK 8M	-1, -2, -3	1.14 (29,0)	M8 x 1,0	.08 (2,0)	1.0 (25,0)	.25 (6,4)	.16 (4,0)	.04 (1,0)

Notes: 1. Dash numbers are non-standard lead time items, contact ITT Enidine.
2. A positive stop is required to prevent the internal damage of the TK 6 and TK 8 shock absorbers.

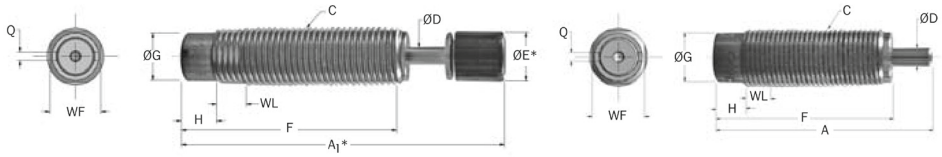


ENIDINE

Non-Adjustable Series Hydraulic Shock Absorbers
TK Micro-Bore Series

TK 10M Series

Standard



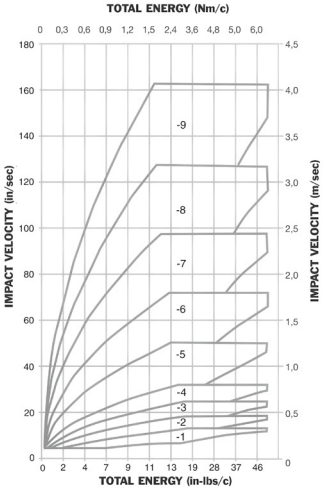
*Note: A_1 and E apply to button models and urethane striker cap accessory.

Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/c)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Shock Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Weight (mass) oz. (g)
					Extended lbs. (N)	Compressed lbs. (N)		
TK 10M (B)	.25 (6,4)	50 (6,0)	115,000 (13 000)	315 (1 400)	0.3 (1,5)	2.2 (10,0)	– –	.6 (17)

Catalog No./ Model	Damping Constant	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	ØE in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	Q in. (mm)	WF in. (mm)	WL in. (mm)	Stroke (S) in. (mm)
TK 10M (B)	-1 to -9	1.75 (44,6)	2.14 (54,4)	M10 x 1.0 M10 x 1,0	.12 (3,1)	.35 (8,5)	1.50 (38,0)	.33 (8,3)	.20 (5,0)	.06 (1,5)	.35 (9,0)	.16 (4,0)	0.25 (6,4)

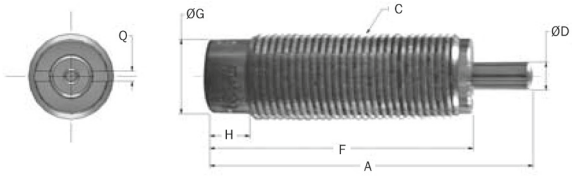
Note: Dash numbers in page color are non-standard lead time items, contact ITT Enidine.

TK 10M



TK 21M Series

Standard



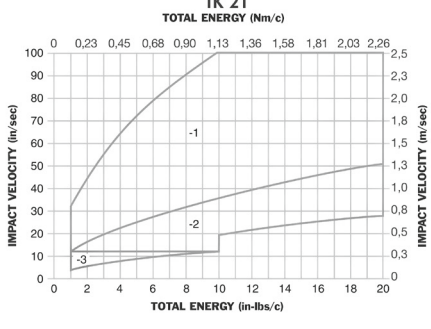
*Note: A_1 and E apply to button models and urethane striker cap accessory.

Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/c)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Shock Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Weight (mass) oz. (g)
					Extended lbs. (N)	Compressed lbs. (N)		
TK 21 TK 21M	.25 (6,4)	20 (2,2)	36,000 (4 100)	160 (700)	0.65 (2,9)	1.13 (5,0)	20 (89)	.4 (12)

Catalog No./ Model	Damping Constant	A in. (mm)	C in. (mm)	D in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	Q in. (mm)
TK 21	-1, -2, -3	1.39	⅜ - 32 UNEF	.12	1.13	.32	.17	.05
TK 21M	-1, -2, -3	(35,4)	M10 x 1,0	(3,1)	(28,7)	(8,2)	(4,4)	(1,2)

Note: A positive stop is required to prevent the bottoming of the TK 21 shock absorber.

TK 21

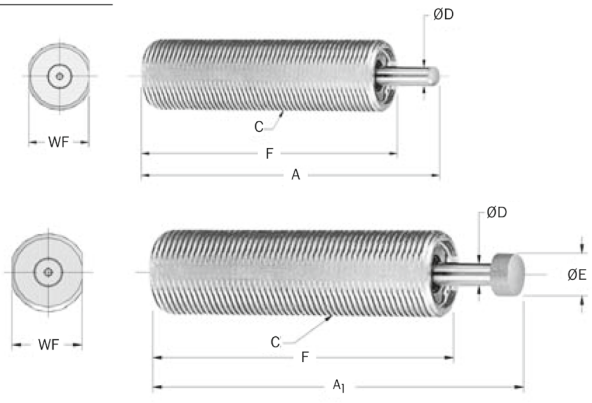


ENIDINE

Non-Adjustable Series Hydraulic Shock Absorbers
STH Small-Bore Series

STH .25M → STH 1.5M x 2 Series

Custom Orificed Products



Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/c)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Shock Force lbs. (N)	Nominal Coil Spring Force		Model Weight lbs. (g)
					Extended lbs. (N)	Compressed lbs. (N)	
△STH .25M	0.25 (6,0)	100 (11)	39,000 (4 420)	615 (2 730)	2.5 (11)	4.0 (18)	2.8 oz. (79)
△STH .5M	0.50 (12,5)	585 (65)	390,000 (44 200)	1,800 (8 000)	4.0 (18)	7.0 (31)	7.7 oz (218)
△STH .75M	0.75 (19,0)	2,180 (245)	780,000 (88 400)	4,400 (19 600)	8.0 (35)	20.0 (90)	1.1 (500)
△STH 1.0M	1.00 (25,0)	4,400 (500)	1,300,000 (147 000)	6,700 (29 800)	22.0 (98)	53.0 (235)	1.6 (726)
△STH 1.0M x 2	2.00 (50,0)	8,800 (1 000)	2,100,000 (235 000)	6,700 (29 800)	15.0 (66)	30.0 (133)	1.9 (862)
△STH 1.5M x 1	1.00 (25,0)	10,200 (1 150)	2,200,000 (250 000)	14,600 (65 000)	20.0 (90)	51.0 (227)	3.1 (1 400)
△STH 1.5M x 2	2.00 (50,0)	20,400 (2 300)	3,200,000 (360 000)	14,600 (65 000)	12.5 (56)	51.0 (227)	4.0 (1 800)

Notes: 1. Custom orificed application data needed.
2. All shock absorbers will function at 5% of their rated energy per cycle. If less than 5%, a smaller model should be specified.
3. Enidine recommends a positive stop to prevent bottoming of the shock absorber.
4. △ = Non-standard lead time items, contact ITT Enidine.

Catalog No./ Model	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	WF in. (mm)
STH .25M	–	2.81	M14 X 1.0	.19	.50	2.00	.50
	–	(71,0)	M14 x 1,0	(4,8)	(12,7)	(51,0)	(13,0)
STH .5M	–	3.50	M22 X 1.5	.22	.38	2.70	.88
	–	(89,0)	M22 x 1,5	(5,6)	(9,5)	(68,5)	(20,0)
STH .75M	–	5.13	M30 X 2.0	.31	.56	4.06	1.13
	–	(130,0)	M30 x 2,0	(8,0)	(14,3)	(103,0)	(27,0)
STH 1.0M	–	6.70	M36 X 1.5	.38	.69	5.38	1.25
	–	(170,0)	M36 x 1,5	(9,5)	(17,5)	(136,5)	(32,0)
STH 1.0M x 2	–	9.38	M36 X 1.5	.38	.69	7.02	1.25
	–	(238,2)	M36 x 1,5	(9,5)	(17,5)	(178,3)	(32,0)
STH 1.5M x 1	7.09	–	M45 X 1.5	.63	–	6.06	1.63
	(180,0)	–	M45 x 1,5	(16,0)	–	(154,0)	(42,0)
STH 1.5M x 2	10.63	–	M45 X 1.5	.63	–	8.62	1.63
	(270,0)	–	M45 x 1,5	(16,0)	–	(219,0)	(42,0)

Non-Adjustable Series Hydraulic Shock Absorbers
ECO Series

Overview

RoHS COMPLIANT

ITT Enidine's **New ECO Series** non-adjustable hydraulic shock absorbers can accommodate varying energy conditions. This family of tamperproof shock absorbers provides consistent performance, cycle after cycle. Non-adjustable models are designed to absorb maximum energy within a compact envelope size.

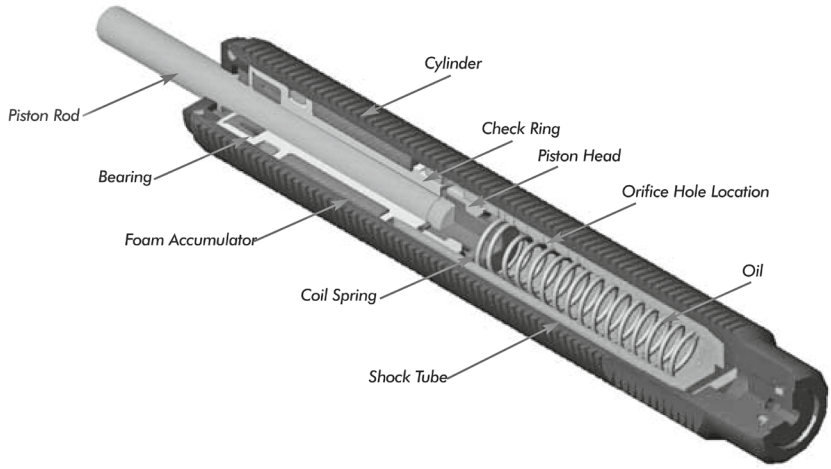
The ECO Series was designed using materials and fluids that are safe for our environment. Models can accommodate a wide range of operating conditions with varying masses or propelling forces. The ECO Series offers a flexible design to accomodate a wide variety of application parameters. Whether your application has a low velocity/high drive force or high velocity/low drive force condition, the **New ECO Series** will deliver the performance that you have come to expect.

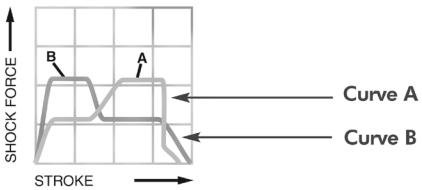
Features and Benefits

- **Extensive non-adjustable product line** offers flexibility in both size and energy absorption capacity to fulfill a wide range of application requirements.
- **Environmentally friendly materials:**
  - RoHS Compliant materials
  - Bio-degradable hydraulic oil
  - Copper-Free design
  - Recyclable packaging materials
- **Introducing our new Enicote II surface finish:**
  - RoHS Compliant
  - Rated at 350 hours salt spray corrosion protection
- **Jam Nut included** with every shock absorber.
- **ISO quality standards** result in reliable, long-life operation.
- **Tamperproof design** ensures repeatable performance.
- **Threaded cylinders provide mounting flexibility** and increase surface area for improved heat dissipation.
- **Wrench flats** promote ease of mounting
- **Capability to mount into pressure chambers**
- **Integrated positive stopping capabilities** up to 100 psi (7 bar).
- **Special materials and finishes** can be designed to meet specific customer requirements
  - Optional fluids and seal packages can expand the standard operating temperature range from (15°F to 180°F) to (–30°F to 210°F)
  - Food grade options available
- **Custom orificed (CBECO)** can be engineered to meet specific application requirements or emergency impact only requirements.

Non-Adjustable Series Hydraulic Shock Absorbers
ECO Series

ITT Enidine Non-Adjustable Multiple Orifice Shock Absorbers





Self-compensating damping maintains acceptable deceleration with conventional type damping characteristics. Self-compensating shock absorbers operate over a wide range of weights and velocities. These shock absorbers are well suited for high drive force, low velocity applications, and where energy conditions may change. **Curve A** shows the *shock force vs. stroke* curve of a self-compensating shock absorber impacted with a low velocity and high drive force. **Curve B** shows the *shock force vs. stroke* curve of a self-compensating shock absorber impacted with a high velocity and low drive force.

The design of a multi-orifice shock absorber features a double cylinder arrangement with space between the concentric shock tube and cylinder, and a series of orifice holes drilled down the length of the shock tube wall.

During piston movement, the check ring is seated and oil is forced through the orifices in the shock tube wall, into the closed cellular foam accumulator and behind the piston head.

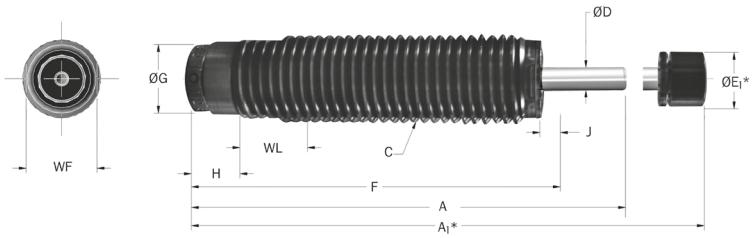
As the piston head moves it closes off orifice holes, thus reducing the available orifice area in proportion to the velocity. After the load is removed the coil spring pushes the piston rod outward. This unseats the check ring and permits the oil to flow from the accumulator and across the piston head, back into the shock tube. This allows quick repositioning for the next impact.

Low Pressure multiple orifice shock absorbers can provide progressive or self-compensating damping, depending on the impact conditions.

Non-Adjustable Series Hydraulic Shock Absorbers
ECO Series

Technical Data

Standard
ECO 8 → ECO 100 Series



*Note: A_1 and E_1 apply to button models and urethane striker cap accessory. One Hex Jam Nut included with every shock absorber.

Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TE) Emergency Max. in.-lbs./cycle (Nm/cycle)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Model Weight oz. (g)
						Extended lbs. (N)	Compressed lbs. (N)		
ECO 8 (B)	0.25 (6,4)	35 (4,0)	– –	55,000 (6 215)	200 (890)	0.6 (2,7)	1.2 (5,6)	45 (200)	.5 (16)
ECO 10 (B)	0.28 (7,0)	62 (7,0)	– –	120,700 (13 640)	360 (1 600)	0.5 (2,2)	1.0 (4,5)	80 (350)	1.0 (28)
ECO 15 (B)	0.41 (10,4)	106 (12,0)	220 (25)	275,000 (31 020)	450 (2 000)	0.7 (3,0)	1.6 (7,0)	50 (220)	2.0 (56)
ECO S 25 (B)	0.50 (12,7)	212 (24,0)	390 (44)	331,000 (37 400)	625 (2 800)	1.0 (4,5)	2.5 (11,0)	200 (890)	2.4 (68)
ECO 25 (B)	0.63 (16,0)	265 (30,0)	500 (56)	389,000 (44 000)	625 (2 800)	1.0 (4,5)	2.5 (11,0)	200 (890)	2.4 (68)
ECO S 50 (B)	0.50 (12,7)	285 (32,0)	560 (63)	440,000 (49 720)	850 (3 750)	1.5 (6,0)	3.5 (15,0)	360 (1 600)	4.0 (123)
ECO 50 (B)	0.88 (22,0)	550 (62,0)	975 (110)	523,000 (59 070)	850 (3 750)	2.0 (8,9)	6.8 (30,0)	360 (1 600)	4.8 (136)
ECO 100 (B)	1.00 (25,0)	930 (105,0)	2210 (250)	681,500 (77 000)	1,250 (5 500)	3.0 (13,0)	6.0 (27,0)	500 (2 200)	10.5 (297)

*Notes: Maximum energy rating for emergency use only. Estimated cycle life of 1-5 cycles if used at maximum emergency rating.

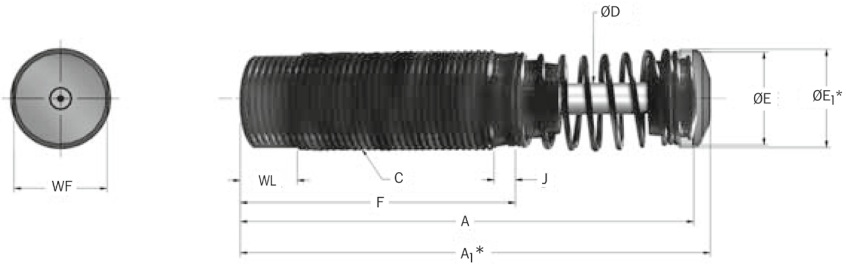
Catalog No./ Model	Damping Constant	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E_1 in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	J in. (mm)	WF in. (mm)	WL in. (mm)
ECO 8 IF (B)	-1,-2,-3	1.86 (47,0)	2.25 (57,0)	3/8 - 32 UNEF	.10 (2,5)	0.27 (6,8)	1.61 (40,9)	.26 (6,6)	.18 (4,6)	.10 (2,5)	–	–
ECO 8 MF (B)	-1,-2,-3			M8 x 0,75							–	–
ECO 8 MC (B)	-1,-2,-3			M8 x 1,0								
ECO 10 IF (B)	-1,-2,-3	2.12 (54,0)	2.51 (64,0)	7/16 - 28 UNEF	.12 (3,0)	0.34 (8,6)	1.83 (46,5)	.34 (8,6)	.18 (4,6)	.13 (3,3)	–	–
ECO 10 MF (B)	-1,-2,-3			M10 x 1,0							–	–
ECO 15 IF (B)	-1,-2,-3,-4	2.45 (62,2)	2.85 (72,4)	7/16 - 28 UNEF	.12 (3,0)	.40 (10,2)	2.10 (52,1)	.39 (9,9)	.27 (6,9)	.10 (2,5)	.39 (11,0)	.38 (9,5)
ECO 15 MF(B)	-1,-2,-3,-4			M12 x 1,0								
ECO 15 IC (B)	-1,-2,-3,-4			1/2 - 20 UNEF								
ECO S 25 MF (B)	-1,-2,-3	3.25 (82,7)	3.63 (92,2)	M14 x 1,0	.16 (4,0)	0.44 (11,2)	2.74 (69,5)	.43 (10,9)	.20 (5,1)	.04 (1,0)	(12,0) .50	.50 (12,7)
ECO S 25 IC (B)	-1,-2,-3			5/16 - 18 UNF								
ECO S 25 MC (B)	-1,-2,-3			M14 x 1,5								(12,0)
ECO 25 IF (B)	-1,-2,-3,-4	3.84 (97,5)	4.22 (107,2)	1/2 - 20 UNF	.16 (4,0)	.44 (11,2)	3.20 (81,3)	.43 (10,9)	.30 (7,6)	.04 (1,0)	(12,0) .50	.44 .50 (12,7)
ECO 25 MF (B)	-1,-2,-3,-4			M14 x 1,0								
ECO 25 IC (B)	-1,-2,-3,-4			5/16 - 18 UNF								
ECO 25 MC (B)	-1,-2,-3,-4			M14 x 1,5								(12,0)
ECO S 50 IF (B)	-1,-2,-3	3.46 (87,9)	3.93 (99,9)	3/4 - 16 UNF	.19 (4,8)	0.50 (12,7)	2.93 (74,4)	.64 (16,3)	.30 (7,6)	.04 (1,0)	.68 (18,0)	.50 (12,7)
ECO S 50 MC (B)	-1,-2,-3			M20 x 1,5								
ECO 50 IF (B)	-1,-2,-3,-4	4.66 (118,4)	5.13 (130,3)	3/4 - 16 UNF	.19 (4,8)	0.50 (12,7)	3.76 (95,5)	.64 (16,3)	.30 (7,6)	.04 (1,0)	.68 (18,0)	.50 (12,7)
ECO 50 MC (B)	-1,-2,-3,-4			M20 x 1,5								
ECO 100 IF (B)	-1,-2,-3,-4	5.07 (128,8)	5.57 (141,5)	1-12 UNF	.25 (6,4)	0.62 (15,7)	4.04 (102,6)	.87 (22,0)	.50 (12,7)	.18 (4,6)	.88 (23,0)	.50 (12,7)
ECO 100 MF (B)	-1,-2,-3,-4			M25 x 1,5								
ECO 100 MC (B)	-1,-2,-3,-4			M27 x 3,0								

Notes: 1. See page 54 for constant damping curves.

Non-Adjustable Series Hydraulic Shock Absorbers
ECO Series

Technical Data

ECO 110 → ECO 225 Series
Standard



*Note: A_1 and E_1 apply to button models and urethane striker cap accessory.

Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TE) Emergency Max. in.-lbs./cycle (Nm/cycle)	(F_P) (E_TC) Max. in.-lbs./hour (Nm/h)	(F_D) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		Max. Propelling Force lbs. (N)	Weight (mass) lbs. (Kg)
						Extended lbs. (N)	Compressed lbs. (N)		
ECO 110 IF (B)	1.56	1,860	–	743,500	1,700	4.0	11.0	500	16.0
ECO 110 MF (B)	(40,0)	(210,0)	–	(84 000)	(7 500)	(18,0)	(49,0)	(2 220)	(454)
ECO 110 MC (B)	(40,0)	(210,0)	–	(84 000)	(7 500)	(18,0)	(49,0)	(2 220)	(454)
ECO 120 IF (B)	1.00	1,640	4,425	743,500	2,500	12.5	20.0	700	17.0
ECO 120 MF (B)	(25,0)	(185,0)	(500)	(84 000)	(11 120)	(56,0)	(89,0)	(3 100)	(482)
ECO 125 IF (B)	1.00	1640	4,425	920,500	2,500	12.5	20.0	700	21.0
ECO 125 MF (B)	(25,0)	(185,0)	(500)	(104 000)	(11 120)	(56,0)	(89,0)	(3 100)	(595)
ECO 220 IF (B)	2.00	3,100	8,850	911,600	2,500	7.0	20.0	700	23.0
ECO 220 MF (B)	(50,0)	(350,0)	(1 000)	(103 000)	(11 120)	(31,0)	(89,0)	(3 100)	(652)
ECO 225 IF (B)	2.00	3,100	8,850	1,124,000	2,500	7.0	20.0	700	27.0
ECO 225 MF (B)	(50,0)	(350,0)	(1 000)	(127 000)	(11 120)	(31,0)	(89,0)	(3 100)	(765)

*Notes: Maximum energy rating for emergency use only. Estimated cycle life of 1-5 cycles if used at maximum emergency rating.

Catalog No./ Model	Damping Constant	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	E_1 in. (mm)	F in. (mm)	J in. (mm)	WF in. (mm)	WL in. (mm)
ECO 110 IF (B)	-1,-2,-3	7.93	8.06	1-12 UNF	.31	0.88	0.88	5.00	.06	–	–
ECO 110 MF (B)	-1,-2,-3	(201,4)	(204,7)	(M25 x 1,5)	(8,0)	(22,2)	(22,2)	(127,0)	(1,5)	–	–
ECO 110 MC (B)	-1,-2,-3	(201,4)	(204,7)	(M25 x 1,5)	(8,0)	(22,2)	(22,2)	(127,0)	(1,5)	–	–
ECO 120 IF (B)	-1,-2,-3	5.52	5.72	1 1/4-12 UNF	.38	1.13	1.20	3.41	.21	1.12	.63
ECO 120MF (B)	-1,-2,-3	(140,2)	(145,3)	M33 x 1,5	(9,5)	(29,0)	(30,5)	(87,0)	(5,3)	(30,0)	(16,0)
ECO 125 IF (B)	-1,-2,-3	5.52	5.72	1 3/8-12 UNF	.38	1.13	1.20	3.41	.21	1.12	.63
ECO 125 MF (B)	-1,-2,-3	(140,2)	(145,3)	M36 x 1,5	(9,5)	(29,0)	(30,5)	(87,0)	(5,3)	(33,0)	(16,0)
ECO 220 IF (B)	-1,-2,-3	8.14	8.34	1 1/4-12 UNF	.38	1.13	1.20	5.03	.21	1.12	.63
ECO 220 MF (B)	-1,-2,-3	(207,0)	(212,0)	M33 x 1,5	(9,5)	(29,0)	(30,5)	(128,0)	(5,3)	(30,0)	(16,0)
ECO 225 IF (B)	-1,-2,-3	8.14	8.34	1 3/8-12 UNF	.38	1.13	1.20	5.03	.21	1.25	.63
ECO 225 MF (B)	-1,-2,-3	(207,0)	(212,0)	M36 x 1,5	(9,5)	(29,0)	(30,5)	(128,)0	(5,3)	(33,0)	(16,0)

Notes: 1. See page 55 for constant damping curves.

Non-Adjustable Series Hydraulic Shock Absorbers
PMXT Mid-Bore Series

PMXT 1525/2150
Mid-Bore Series

ITT Enidine non-adjustable hydraulic shock absorbers can accommodate varying energy conditions. This family of tamperproof shock absorbers provides consistent performance, cycle after cycle. Non-adjustable models are designed to absorb maximum energy within a compact envelope size.

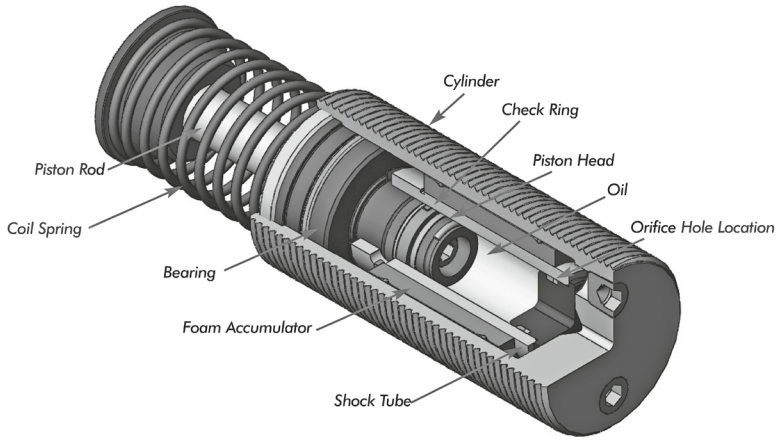
The PM Series uses a self-compensating design to provide energy absorption in low velocity and high drive force applications. The PM Series also includes the added benefit of corrosion-resistant, nickel-plated components and positive stop capabilities. Models can accommodate a wide range of operating conditions with varying masses or propelling forces.

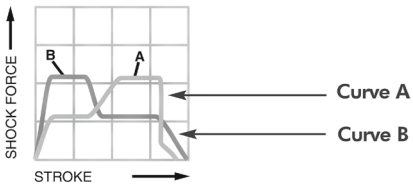
Features and Benefits

- Extensive non-adjustable product line offers flexibility in both size and energy absorption capacity to fulfill a wide range of application requirements.
- Tamperproof design ensures repeatable performance.
- Special materials and finishes can be designed to meet specific customer requirements.
- Incorporating optional fluids and seal packages can expand the standard operating temperature range from (15°F to 180°F) to (–30°F to 210°F).
- Threaded cylinders provide mounting flexibility and increase surface area for improved heat dissipation.
- A select variety of surface finishes maintains original quality appearance and provides the longest corrosion resistance protection.
- ISO quality standards result in reliable, long-life operation.

Non-Adjustable Series Hydraulic Shock Absorbers
PMXT Mid-Bore Series

ITT Enidine Non-Adjustable Multiple Orifice Shock Absorbers





Self-compensating damping maintains acceptable deceleration with conventional type damping characteristics. Self-compensating shock absorbers operate over a wide range of weights and velocities. These shock absorbers are well suited for high drive force, low velocity applications, and where energy conditions may change. **Curve A** shows the *shock force vs. stroke* curve of a self-compensating shock absorber impacted with a low velocity and high drive force. **Curve B** shows the *shock force vs. stroke* curve of a self-compensating shock absorber impacted with a high velocity and low drive force.

The design of a multi-orifice shock absorber features a double cylinder arrangement with space between the concentric shock tube and cylinder, and a series of orifice holes drilled down the length of the shock tube wall.

During piston movement, the check ring is seated and oil is forced through the orifices in the shock tube wall, into the closed cellular foam accumulator and behind the piston head.

As the piston head moves it closes off orifice holes, thus reducing the available orifice area in proportion to the velocity. After the load is removed the coil spring pushes the piston rod outward. This unseats the check ring and permits the oil to flow from the accumulator and across the piston head, back into the shock tube. This allows quick repositioning for the next impact.

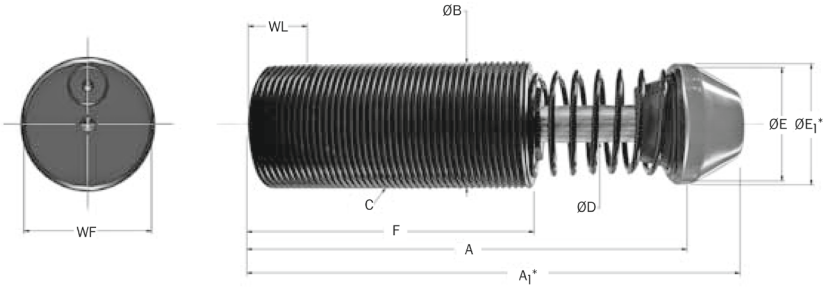
Low Pressure multiple orifice shock absorbers can provide progressive or self-compensating damping, depending on the impact conditions.

Non-Adjustable Series Hydraulic Shock Absorbers
PMXT Mid-Bore Series

PMXT 1525 → PMXT 2150 Series

Standard

Technical Data



*Note: A_1 and E_1 apply to button models and urethane striker cap accessory.

Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Weight (mass) lbs. (Kg)
					Extended lbs. (N)	Compressed lbs. (N)		
PMXT 1525	1.00 (25,0)	3,250 (367,0)	1,120,000 (126 000)	6,500 (29 000)	11.0 (48,0)	15.0 (68,0)	1,500 (6 700)	2.2 (1,0)
PMXT 1550	2.00 (50,0)	6,500 (735,0)	1,475,000 (167 000)	6,500 (29 000)	11.0 (29,0)	18.0 (78,0)	1,500 (6 700)	2.4 (1,1)
PMXT 1575	3.00 (75,0)	10,000 (1 130,0)	1,775,000 (201 000)	6,500 (29 000)	7.0 (31,0)	18.0 (78,0)	1,500 (6 700)	2.7 (1,3)
PMXT 2050	2.00 (50,0)	16,500 (1 865,0)	2,400,000 (271 000)	13,750 (60 500)	17.0 (80,0)	35.0 (155,0)	4,000 (17 800)	6.0 (2,7)
PMXT 2100	4.00 (100,0)	33,000 (3 729,0)	3,200,000 (362 000)	13,750 (60 500)	16.0 (69,0)	36.0 (160,0)	4,000 (17 800)	7.3 (3,3)
PMXT 2150	6.00 (150,0)	50,000 (5 650,0)	3,730,000 (421 000)	13,750 (60 500)	20.0 (87,0)	64.0 (285,0)	4,000 (17 800)	9.3 (4,2)

Catalog No./ Model	Damping Constant	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	E_1 in. (mm)	F in. (mm)	WF in. (mm)	WL in. (mm)
PMXT 1525 IF	-1,-2,-3	5.68	6.37	(IF) 1 3/4-12 UN	.50	1.48	1.75	3.63	1.70	0.75
PMXT 1525 MF	-1,-2,-3	(144,0)	(162,0)	(MF) M45 x 1,5	(12,7)	(38,0)	(44,5)	(92,0)	(43,5)	(19,0)
PMXT 1550 IF	-1,-2,-3	7.68	8.37	(IF) 1 3/4-12 UN	.50	1.48	1.75	4.63	1.70	0.75
PMXT 1550 MF	-1,-2,-3	(195,0)	(213,0)	(MF) M45 x 1,5	(12,7)	(38,0)	(44,5)	(118,0)	(43,5)	(19,0)
PMXT 1575 IF	-1,-2,-3	9.68	10.37	(IF) 1 3/4-12 UN	.50	1.48	1.75	5.63	1.70	0.75
PMXT 1575 MF	-1,-2,-3	(246,0)	(264,0)	(MF) M45 x 1,5	(12,7)	(38,0)	(44,5)	(143,0)	(43,5)	(19,0)
PMXT 2050 IF	-1,-2,-3	8.90	9.55	(IF) 2 1/2-12 UN	.75	1.98	2.25	5.50	2.42	0.75
PMXT 2050 MF	-1,-2,-3	(226,0)	(243,0)	(MF) M64 x 2,0	(19,0)	(50,0)	(57,0)	(140,0)	(61,5)	(19,0)
PMXT 2100 IF	-1,-2,-3	12.90	13.55	(IF) 2 1/2-12 UN	.75	1.98	2.25	7.50	2.42	0.75
PMXT 2100 MF	-1,-2,-3	(328,0)	(345,0)	(MF) M64 x 2,0	(19,0)	(50,0)	(57,0)	(191,0)	(61,5)	(19,0)
PMXT 2150 IF	-1,-2,-3	17.97	18.62	(IF) 2 1/2-12 UN	.75	2.38	2.38	9.50	2.42	0.75
PMXT 2150 MF	-1,-2,-3	(956,0)	(473,0)	(MF) M64 x 2,0	(19,0)	(60,0)	(60,0)	(241,0)	(61,5)	(19,0)

Notes: 1. Dash numbers in page color are non-standard lead time items, contact ITT Enidine.
2. See page 59 for constant damping curves.
3. Urethane striker caps are available as accessories for models PM 1525 to PM 2150.

ENIDINE

Rate Controls
ADA/DA Series

Overview

ITT Enidine Rate Controls are designed to regulate the speed and time required for a mechanism to move from one position to another. Adjustable and non-adjustable models are available to accommodate a wide variety of motion control applications. Both single and double acting hydraulic damper designs allow smooth, controllable machine operation by providing rate control for both linear and rotational (hinged) loads. Each product family offers a variety of stroke lengths from which to choose.

Adjustable, Double Acting (ADA 500 and ADA 700 Series) rate controls regulate speed in both tension and/or compression modes independently. ADA products let the user adjust the rate to suit specific application requirements. Fixed orifice interchangeable cartridges are available for the ADA 500 Series, which provide tamperproof operation once the desired rate has been determined. An optional remote adjustment cable provides adjustment control in otherwise inaccessible locations for the ADA 500 Series.

The **DA Series** are non-adjustable, custom-orificed at factory, double acting rate controls which provide smooth, reliable motion control for high load capacities. Tow Bar (TB) snubbers are specially designed DA's which dampen the abrupt starts and stops of power and free conveying systems.

ENIDINE

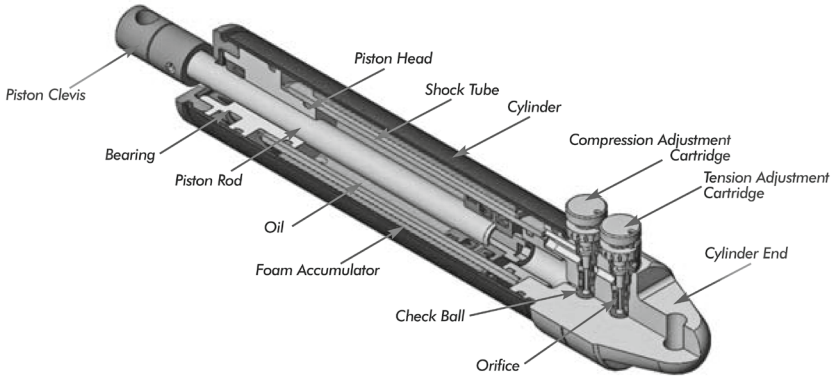
Features and Benefits

- Extensive product line offers flexibility in both size and load capacities to fulfill a wide range of application requirements.
- ISO quality standards result in reliable, long-life operation.
- A select variety of surface finishes maintains original quality appearance and provides the longest corrosion resistance protection.
- Custom stroke lengths and damping characteristics can be designed to suit your application requirements.
- Incorporating optional fluids can expand the standard operational temperature range from (15°F to 180°F) to (–30°F to 210°F).
- Special materials and finishes available to meet specific customer requirements.

Rate Controls
ADA/DA Series

Adjustable Double Acting (ADA) Series Rate Control

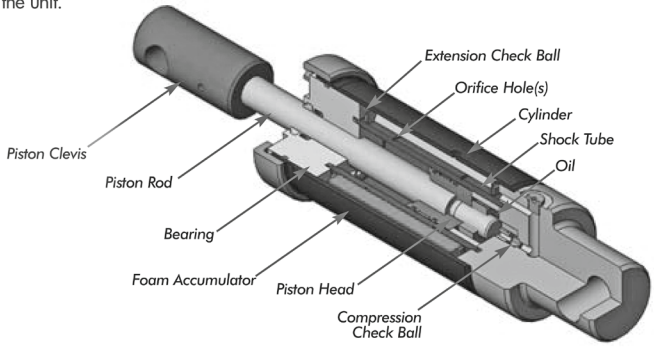
Overview



ITT Enidine Double Acting Adjustable (ADA) rate controls control the velocity of both linear and rotational loads throughout their entire motion. Adjustment cartridges on the ADA 500 Series allow flexibility in controlling the speed for an applied force in both the tension and compression directions. Maximum damping is achieved by turning the adjustment knob to the number eight (8) setting, while turning the knob to the zero (0) setting provides minimal resistance. Interchangeable, threaded, fixed-orifice cartridges can provide consistent, tamper-resistant damping to meet particular application requirements.

The ADA 500 Series utilizes two independent adjustment cartridges for motion control in each direction, housed in the cylinder end. The ADA 700 Series has independently controlled tension and compression capabilities located at each end of the unit.

Resistance is controlled by using a wrench key at either end of the rate control and adjusting the movement by following the stiffer (+) or softer (-) indications. When the rate control is compressed, the oil is orificed through the compression adjustment cartridge and flows freely through the tension adjustment cartridge. The tension cartridge check ball unseats and allows free flow of the oil to the rod end of the shock tube. A foam accumulator is utilized to accept the volume of oil displaced by the piston rod. When the rate control is extended, oil is moved through an internal flow path in the shock tube and is orificed through the tension adjustment cartridge. The compression cartridge check ball unseats and allows free flow of the oil into the blind end of the shock tube.



DA Series rate controls are ideally suited for high-energy, heavy load applications requiring rate control in tension, compression or both directions. These non-adjustable, custom-orificed units are designed to specific input conditions, and allow for single and multiple orifice configurations.

Upon compression of the rate control, the compression check ball seats. As the piston head moves, oil is forced through the orifice hole(s) located in the shock tube, producing the required damping force. After the oil has passed through the orifice hole(s), a portion of the oil passes through the extension check valve and fills the rod end of the shock tube. The remainder of the oil volume displaced by the piston rod compresses the foam accumulator.

Upon extension of the rate control, the extension check ball seats. As the piston head moves, oil is forced through the orifice hole(s) located in the shock tube producing the required damping force. The compression check ball is unseated by the flow of oil which fills the blind end of the shock tube.

Rate Controls
ADA/DA Series

ITT Enidine Rate Controls are used to regulate the speed or time required for a mechanism to move from one position to another. They use proven technology to enhance performance in a variety of product applications. Rate controls are typically used to control pneumatic cylinders, linear slides, lids, and other moving mechanisms.

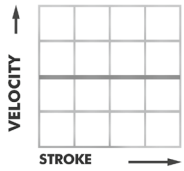
The advantages of using rate controls include:

1. **Longer Machine Life –** The use of rate controls significantly reduces shock and vibration to machinery caused by uncontrolled machine operation. This further reduces machinery damage, downtime and maintenance costs, while increasing machine life.

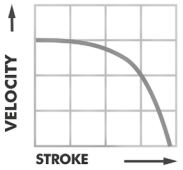
2. **Improved Production Quality –** Harmful effects of uncontrolled motion, such as noise, vibration and damaging impacts, are moderated or eliminated so that production quality is improved.

3. **Safer Machinery Operation –** Rate controls protect machinery and equipment operators by offering predictable, reliable and controlled machine operation.

4. **Competitive Advantage –** Machines and end products become more valuable because of increased productivity, longer life, lower maintenance and safer operation.



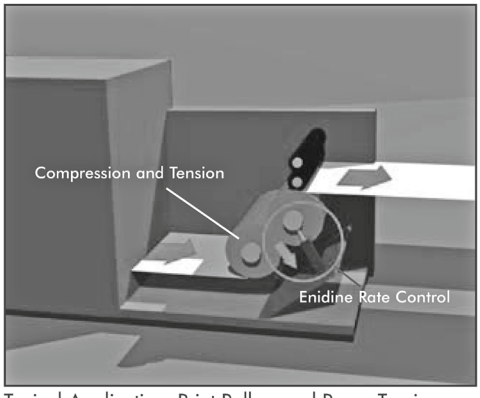
SINGLE ORIFICE RATE CONTROL
CONSTANT FORCE OPERATION



MULTIPLE ORIFICE RATE CONTROL
CONSTANT FORCE OPERATION

ITT Enidine offers a wide range of rate controls that provide motion control in tension, compression, or both directions. Adjustable and non-adjustable tamperproof models are available to fit your particular application requirements.

The resisting force provided by ITT Enidine rate controls is typically constant over the entire stroke when the piston rod is moved at a constant velocity, since the rate controls are single orifice products. DA Series models can be custom orificed to provide increasing resisting force over the stroke through the use of multiple orifices in the shock tube. This can be beneficial when controlling the velocity of a lid as it closes, since the torque from the weight of the lid changes as it closes.



Typical Application: Print Rollers and Paper Tensioners

Rate Control Adjustment Techniques

A properly adjusted rate control safely controls machinery operation, and reduces noise levels from uncontrolled motion. To correctly adjust the rate control after it has been properly sized for the application, set the adjustment knob (per the useable adjustment setting graphs for the applicable model. Cycle the mechanism and observe the motion of the system.

If the motion of the mechanism is too fast, move the adjustment dial to the next largest number until the desired velocity is achieved.

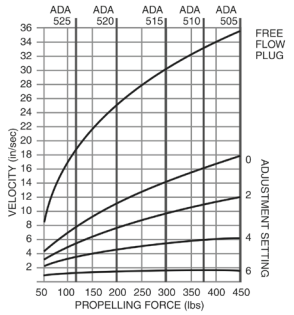
If the motion of the mechanism is too slow, move the adjustment dial to the next smallest number until the desired velocity is achieved.

Rate Controls
ADA/DA Series

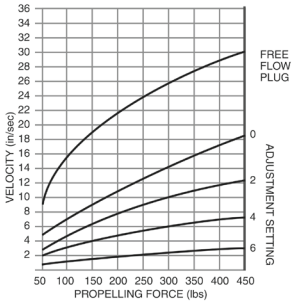
ADA 500

Useable Adjustment Setting Range
Green lines are model's maximum allowable propelling force.

Compression Mode Adjustment Setting Curve



Tension Mode Adjustment Setting Curve



Damping Force

Position 0 provides minimum damping force.
Position 8 provides maximum damping force.
180° adjustment with setscrew locking.

1. Determine the damping direction (tension [T], compression [C] or both [T and C]), stroke (in. or mm) required, propelling force (lbs. or N), desired velocity (in./sec. or m/s) and cycles per hour.
2. Calculate total energy per hour (in-lbs./hr or Nm/hr).
3. Compare the damping direction (T, C, or T and C), stroke (in. or mm) required, propelling force (lbs. or N) and total energy per hour (in-lbs./hr or Nm/hr) to the values listed in the Rate Controls Engineering Data charts.

   NOTE: Propelling force and velocity should be measured at the location of the rate control.
4. Determine if adjustable or non-adjustable model is desired.
5. Select the appropriate rate control model.
   A. For adjustable rate control models, refer to the Useable Adjustment Settings section for the selected model to determine the proper adjustment setting.

   B. For non-adjustable rate control models, refer to the Damping Constant Selection Instructions for the selected model to determine the proper damping constant.

Example:

1. Damping Direction (T, C or T and C): T and C
   Stroke (S): 4 in. (102 mm)
   Propelling Force (F_D): 200 lbs. (890 N) (T and C)
   Velocity (V): 8 in./sec. (0.2 m/s)
   Cycles/Hour (C): 20
2. Total Energy/Hour: 16,000 in-lbs./hr (1 808 Nm/hr) compression
   16,000 in-lbs./hr (1 808 Nm/hr) tension
   32,000 in-lbs./hr (3 616 Nm/hr) Total
3. Compare damping direction (T and C), stroke, propelling force and total energy per hour, to the values listed in the rate controls engineering data charts.
4. An adjustable model is desired.
5. Selection: ADA 510 (T and C), The proper adjustment is two (2) in tension and compression per the ADA 500 Series Useable Adjustment Setting Range Curves.

After properly sizing the ADA, the adjustment setting can be determined.

1. To determine the approximate adjustment setting when the selected model, propelling force, and velocity are known: compare velocity to the propelling force in the compression and/or tension mode adjustment setting curves. The intersection point of the velocity and the propelling force is the approximate adjustment setting to be used. Adjustment higher or lower than this setting will result in slower or faster damper operation, respectively.

2. To determine the velocity when the selected model, adjustment setting, and propelling force are known: compare the propelling force to the adjustment setting in the compression and/or tension mode adjustment setting curves. The intersection point of the propelling force and the adjustment setting is the approximate velocity for the selected model. Higher velocities are obtained at lower adjustment settings and lower velocities are obtained at higher adjustment settings.

EXAMPLE: Double Acting Application

Stroke required: 2 in. (51 mm)
Control direction: Tension and Compression
Propelling force: 350 lbs. (1 557 N) (tension),
400 lbs. (1 780 N) (compression)
Selection: ADA 505
1. Velocity: 11 in./sec. (.28 m/s) (tension),
6 in./sec. (.15 m/s) (compression)
Intersection point: Adjustment setting 2 (tension),
4 (compression)
2. Adjustment setting: 2 (tension), 4 (compression)
Velocity: 11 in./sec. (.28 m/s) (tension),
6 in./sec. (.15 m/s) (compression)

NOTE: When a free flow plug is used, the intersection point of the propelling force and free flow plug curve determines the velocity.

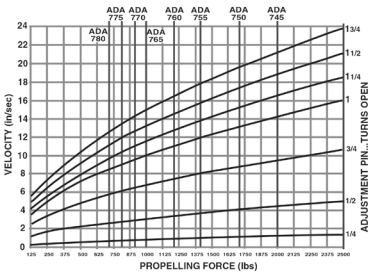
NOTE: Propelling force and velocity should be measured at the location of the rate control.

ADA 700

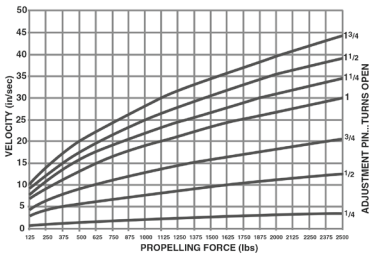
Useable Adjustment Setting Range

Red lines are model's maximum allowable propelling force.

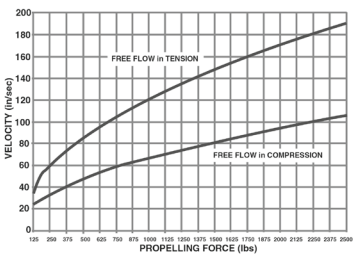
Compression



Tension



Free Flow



Damping Force

Turn adjustment pin 1 ¾ turns open to provide minimum damping force. Turn adjustment pin fully closed to provide maximum damping force.

1. To determine the approximate adjustment setting, when the selected model, propelling force, and velocity are known, compare velocity to the propelling force in the compression and/or tension mode adjustment setting curves. The intersection point of the velocity and the propelling force is the approximate adjustment setting to be used. Adjustment lower or higher than this setting will result in slower or faster damper operation respectively.

2. To determine the velocity, when the selected model, adjustment setting, and propelling force are known, compare the propelling force to the adjustment setting in the compression and/or tension mode adjustment setting curves. The intersection point of the propelling force and the adjustment setting is the approximate velocity for the selected model. Higher velocities are obtained at higher adjustment settings and lower velocities are obtained at lower adjustment settings.

3. A 1.5mm Hex Wrench (provided) is required to adjust the unit.

NOTE: When a free flow plug is used, the intersection point of the propelling force and free flow plug curve determines the velocity.

EXAMPLE: Adjustable Double Acting Rate Control Application

Stroke required:	6 in. (152 mm)
Control direction:	Tension and Compression
Propelling force:	1,000 lbs. (4 4448 N) (tension), 1,625 lbs. (7 228 N) (compression)
Selection:	ADA 715
1. Velocity:	25 in./sec. (0,635 m/s) (tension), 4 in./sec. (0,1 m/s) (compression)
Intersection point:	Adjustment setting 1 ½ (tension), ½ (compression)
2. Adjustment setting:	1 ½ (tension), ½ (compression)
Velocity:	25 in./sec. (0,635 m/s) (tension), 4 in./sec. (0,1 m/s) (compression)

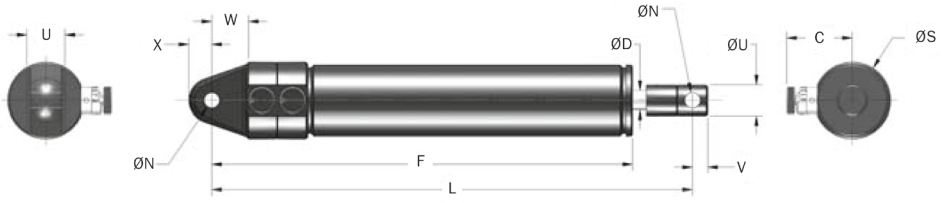
NOTE: Propelling force and velocity should be measured at the location of the rate control.

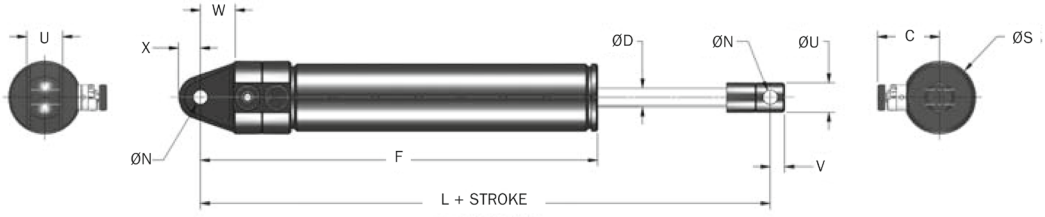
ENIDINE

Rate Controls
ADA Series

ADA 505 → ADA 525 Series

Technical Data





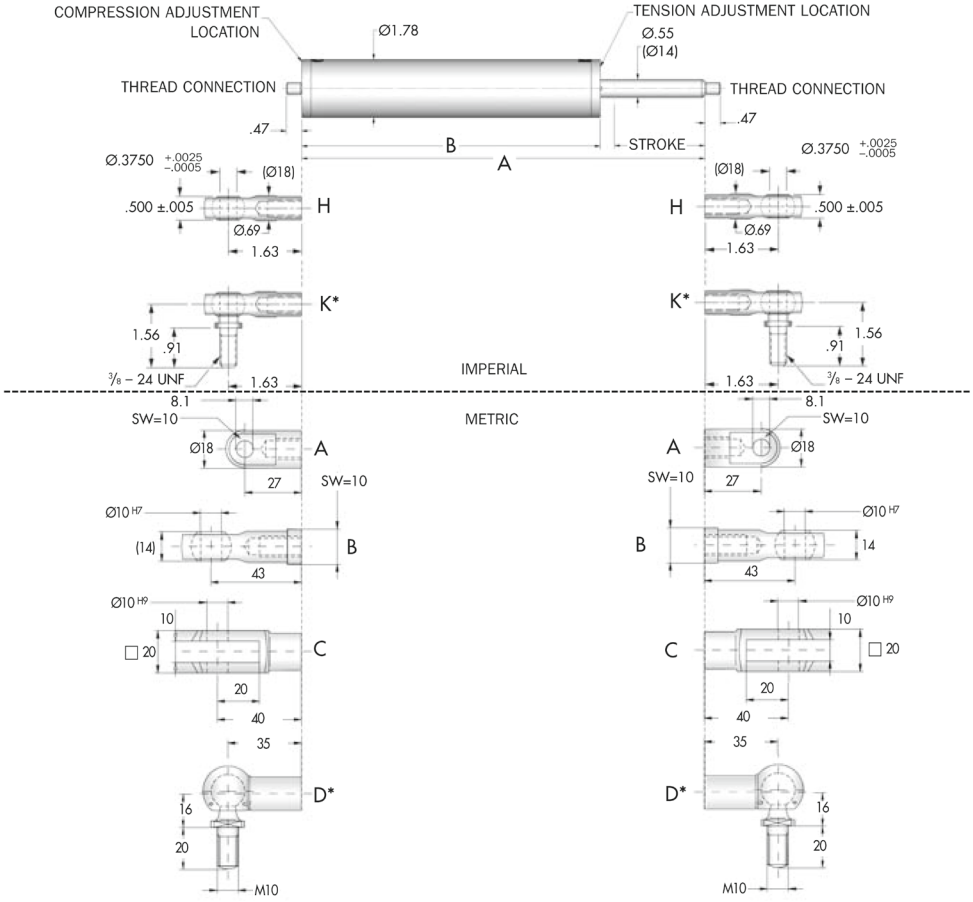
Catalog No./ Model	Damping Direction	Bore Size in. (mm)	(S) Stroke in. (mm)	(F_D) Max. Propelling Force Extension lbs. (N)	(F_D) Max. Propelling Force Compression lbs. (N)	(E_TC) Max. in.-lbs./hour (Nm/hr)	Model Weight lbs. (Kg)
ADA 505	T, C or T and C	.63	2	450	450	650,000	0.68
ADA 505M		(16,0)	(50,0)	(2 000)	(2 000)	(73 450)	(0,3)
ADA 510	T, C or T and C	.63	4	450	375	850,000	0.80
ADA 510M		(16,0)	(100,0)	(2 000)	(1 670)	(96 050)	(0,372)
ADA 515	T, C or T and C	.63	6	450	300	1,050,000	1.0
ADA 515M		(16,0)	(150,0)	(2 000)	(1 335)	(118 650)	(0,445)
ADA 520	T, C or T and C	.63	8	450	200	1,250,000	1.1
ADA 520M		(16,0)	(200,0)	(2 000)	(900)	(141 250)	(0,520)
ADA 525	T, C or T and C	.63	10	450	125	1,450,000	1.3
ADA 525M		(16,0)	(250)	(2 000)	(550)	(163 850)	(0,590)

Catalog No./ Model	C in. (mm)	D in. (mm)	F in. (mm)	L in. (mm)	N +.005/-.000 +0,13/-0,00 in. (mm)	S in. (mm)	U +.000/-.010 +0,00/-0,381 in. (mm)	V in. (mm)	W in. (mm)	X in. (mm)	(S) Stroke in. (mm)	Damping Direction in. (mm)
ADA 505	1.06	.31	6.87	7.81	.251	1.25	.500	.25	.563	.375	2	T, C or T and C
ADA 505M	(27,0)	(8,0)	(173,0)	(200)	(6,0)	(31,8)	(12,7)	(6,3)	(14,2)	(9,5)	(50,0)	
ADA 510	1.06	.31	8.87	9.81	.251	1.25	.500	.25	.563	.375	4	T, C or T and C
ADA 510M	(27,0)	(8,0)	(224,0)	(250)	(6,0)	(31,8)	(12,7)	(6,3)	(14,2)	(9,5)	(100,0)	
ADA 515	1.06	.31	10.87	11.81	.251	1.25	.500	.25	.563	.375	6	T, C or T and C
ADA 515M	(27,0)	(8,0)	(275,0)	(300)	(6,0)	(31,8)	(12,7)	(6,3)	(14,2)	(9,5)	(150,0)	
ADA 520	1.06	.31	12.87	13.81	12.87	1.25	.500	.25	.563	.375	8	T, C or T and C
ADA 520M	(27,0)	(8,0)	(325,0)	(350)	(6,0)	(31,8)	(12,7)	(6,3)	(14,2)	(9,5)	(200,0)	
ADA 525	1.06	.31	14.87	15.81	.251	1.25	.500	.25	.563	.375	10	T, C or T and C
ADA 525M	(27,0)	(8,0)	(376,0)	(400)	(6,0)	(31,8)	(12,7)	(6,3)	(14,2)	(9,5)	(250,0)	

Rate Controls
ADA Series

Technical Data

ADA 705 → ADA 735 Series



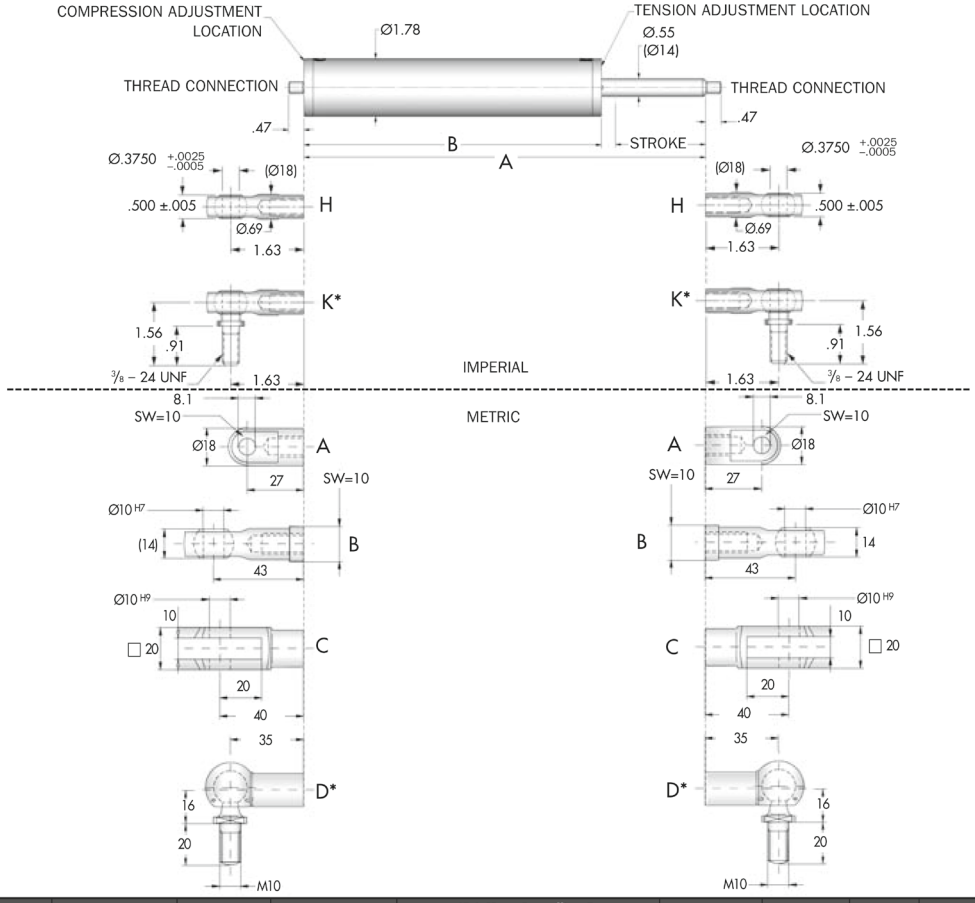
Catalog No./ Model	Damping Direction	Bore Size in. (mm)	(S) Stroke in. (mm)	(F_D) Max. Propelling Force Tension lbs. (N)	(F_D) Max. Propelling Force Compression lbs. (N)	(E_TC) Max in.-lbs./hour (Nm/hr)	Model Weight lbs. (Kg)	A in. (mm)	B in. (mm)
ADA 705	T, C or T and C	.98 (25)	2 (50,0)	2,500 (11 000)	2,500 (11 000)	1,100,000 (129 000)	3.5 (1,6)	9.35 (237)	7.10 (180)
ADA 710	T, C or T and C	.98 (25)	4 (100,0)	2,500 (11 000)	2,500 (11 000)	1,400,000 (168 000)	4.4 (2,0)	13.35 (339)	9.10 (231)
ADA 715	T, C or T and C	.98 (25)	6 (150,0)	2,500 (11 000)	2,500 (11 000)	1,800,000 (206 000)	5.1 (2,3)	17.35 (441)	11.10 (282)
ADA 720	T, C or T and C	.98 (25)	8 (200,0)	2,500 (11 000)	2,500 (11 000)	2,100,000 (247 000)	5.7 (2,6)	21.30 (541)	13.10 (332)
ADA 725	T, C or T and C	.98 (25)	10 (250,0)	2,500 (11 000)	2,500 (11 000)	2,500,000 (286 000)	6.4 (2,9)	25.30 (643)	15.10 (383)
ADA 730	T, C or T and C	.98 (25)	12 (300,0)	2,500 (11 000)	2,500 (11 000)	2,800,000 (326 000)	7.1 (3,2)	29.35 (745)	17.10 (434)
ADA 735	T, C or T and C	.98 (25)	14 (350,0)	2,500 (11 000)	2,500 (11 000)	3,200,000 (366 000)	7.9 (3,6)	33.35 (847)	19.10 (485)

*Notes: 1. The maximum load capacity for mounting option K and D is 650 lbs.
2. The maximum load capacity for mounting option K and D is 1 600 N

Rate Controls
ADA Series

Technical Data

ADA 740 → ADA 780 Series



Catalog No./ Model	Damping Direction	Bore Size in. (mm)	(S) Stroke in. (mm)	(F_D) Max. Propelling Force Tension lbs. (N)	(F_D) Max. Propelling Force Compression lbs. (N)	(E_TC) Max in.-lbs./hour (Nm/hr)	Model Weight lbs. (Kg)	A in. (mm)	B in. (mm)
ADA 740	T, C or T and C	.98 (25,0)	16 (400)	2,500 (11 000)	2,500 (11 000)	3,500,000 (405 000)	8.6 (3,9)	37.30 (947)	21.10 (535)
ADA 745	T, C or T and C	.98 (25,0)	18 (450)	2,500 (11 000)	2,000 (8 800)	3,900,000 (444 000)	9.3 (4,2)	41.30 (1 049)	23.10 (586)
ADA 750	T, C or T and C	.98 (25,0)	20 (500)	2,500 (11 000)	1,700 (7 500)	4,200,000 (484 000)	9.9 (4,5)	45.30 (1 151)	25.10 (637)
ADA 755	T, C or T and C	.98 (25,0)	22 (550)	2,500 (11 000)	1,400 (6 200)	4,600,000 (524 000)	10.6 (4,8)	49.35 (1 253)	27.10 (688)
ADA 760	T, C or T and C	.98 (25,0)	24 (600)	2,500 (11 000)	1,200 (5 300)	4,900,000 (563 000)	11.5 (5,2)	53.35 (1 355)	29.10 (739)
ADA 765	T, C or T and C	.98 (25,0)	26 (650)	2,500 (11 000)	1,000 (4 500)	5,300,000 (603 000)	12.1 (5,5)	57.35 (1 457)	31.10 (790)
ADA 770	T, C or T and C	.98 (25,0)	28 (700)	2,500 (11 000)	900 (4 000)	5,600,000 (642 000)	12.8 (5,8)	61.30 (1 557)	33.10 (840)
ADA 775	T, C or T and C	.98 (25,0)	30 (750)	2,500 (11 000)	800 (3 500)	6,000,000 (681 000)	13.4 (6,1)	65.30 (1 659)	35.10 (891)
ADA 780	T, C or T and C	.98 (25,0)	32 (800)	2,500 (11 000)	700 (3 100)	6,300,000 (721 000)	14.3 (6,5)	69.35 (1 761)	37.10 (942)

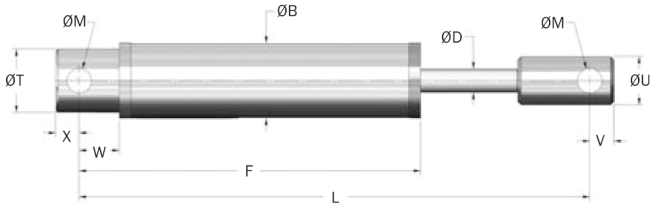
*Notes: 1. The maximum load capacity for mounting option for K and D is 650 lbs. 2. The maximum load capacity for mounting option for K and D is 1 600 N.

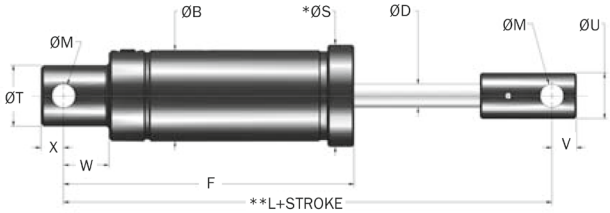
Rate Controls
DA Series

Technical Data

DA 705 ➞ DA720 Series

DA 75M x 50 ➞ DA 75M x 100 Series





Catalog No./ Model	Damping Direction	Bore Size in. (mm)	(S) Stroke in. (mm)	(F_D) Max. Propelling Force lbs. (N)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TC) Max. in-lbs/hr (Nm/cycle)	Model Weight lbs. (Kg)
DA 705	T, C or T and C	.98 (25,0)	2 (50,0)	2,500 (11 000)	–	1,100,000 (129 000)	3.5 (1,6)
DA 710	T, C or T and C	.98 (25,0)	4 (100,0)	2,500 (11 000)	–	1,400,000 (168 000)	4.4 (2,0)
DA 715	T, C or T and C	.98 (25,0)	2 (50,0)	2,500 (11 000)	–	1,800,000 (206 000)	5.1 (2,3)
DA 720	T, C or T and C	.98 (25,0)	4 (100,0)	2,500 (11 000)	–	2,100,000 (247 000)	5.7 (2,6)
DA 75 x 2 DA 75M x 50	T, C or T and C	1.50 (38,0)	2 (50,0)	5,000 (22 250)	10,000 (1 120)	2,700,000 (305 000)	25.0 (11,4)
DA 75 x 4 DA 75M x 100	T, C or T and C	1.50 (38,0)	4 (100,0)	5,000 (22 250)	20,000 (2 240)	3,100,000 (350 000)	29.0 (13,2)

Catalog No./ Model	B in. (mm)	D in. (mm)	F in. (mm)	L in. (mm)	M ±.015 (±0,38) in. (mm)	S in. (mm)	T ±.015 (±0,38) in. (mm)	U ±.010 (±0,25) in. (mm)	V in. (mm)	W in. (mm)	X in. (mm)	(S) Stroke in. (mm)
DA 705	1.77 (45,0)	.55 (14,0)	8.04 (255,1)	12.09 (307,1)	.579 (14,7)	–	1.50 (38,0)	1.14 (29,0)	.571 (14,5)	.945 (24,0)	.551 (14,0)	2 (50,0)
DA 710	1.77 (45,0)	.55 (14,0)	10.04 (255,1)	16.11 (409,1)	.579 (14,7)	–	1.50 (38,0)	1.14 (29,0)	.571 (14,5)	.945 (24,0)	.551 (14,0)	4 (100,0)
DA 715	1.77 (45,0)	.55 (14,0)	12.05 (306,1)	20.12 (511,1)	.579 (14,7)	–	1.50 (38,0)	1.14 (29,0)	.571 (14,5)	.945 (24,0)	.551 (14,0)	6 (150,0)
DA 720	1.77 (45,0)	.55 (14,0)	14.02 (356,1)	24.06 (611,1)	.579 (14,7)	–	1.50 (38,0)	1.14 (29,0)	.571 (14,5)	.945 (24,0)	.551 (14,0)	8 (200,0)
DA 75 x 2 DA 75M x 50	3.00 (76,0)	0.75 (19,0)	9.58 (245)	13.75 (348)	.765 (19,4)	3.38 (86,0)	2.00 (51,0)	1.500 (38,0)	.81 (21,0)	1.50 (38,0)	.75 (19,0)	2 (50,0)
DA 75 x 4 DA 75M x 100	3.00 (76,0)	0.75 (19,0)	11.58 (295)	15.75 (398)	.765 (19,4)	3.38 (86,0)	2.00 (51,0)	1.500 (38,0)	.81 (21,0)	1.50 (38,0)	.75 (19,0)	4 (100,0)

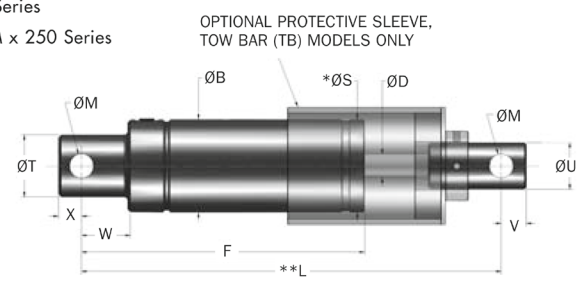
Notes: 1. DA Models will function at 10% of their maximum rated energy per cycle. If less than 10%, a smaller model should be specified.
2. Provide a positive stop 12 in. before end of stroke in tension and compression to prevent internal bottoming.
3. For optimal performance in vertical applications using compression, mount the rate control with the piston rod down.
4. * ØS indicates outside diameter of optional protective sleeve for TB models.
5. ** Dimension L is controlled by a 2.0 in. stroke limiter.

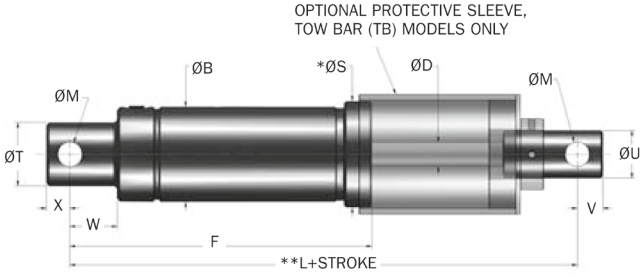
ENDINE

Rate Controls
DA Series

Technical Data

DA 75 x 6 → TB 100 x 6 Series
DA 75M x 150 → DA 75M x 250 Series





Catalog No./ Model	Damping Direction	Bore Size in. (mm)	(S) Stroke in. (mm)	(F_D) Max. Propelling Force lbs. (N)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TC) Max. in-lbs/hr (Nm/cycle)	Model Weight lbs. (Kg)
DA 75 x 6 DA 75M x 100	T, C or T and C	1.50 (38,0)	6 (150,0)	5,000 (22 250)	30,000 (3 360)	3,600,000 (406 000)	33.0 (15,0)
DA 75 x 8 DA 75M x 150	T, C or T and C	1.50 (38,0)	8 (200,0)	5,000 (22 250)	40,000 (4 480)	4,100,000 (463 000)	37.0 (16,8)
DA 75 x 10 DA 75M x 250	T, C or T and C	1.50 (38,0)	10 (250,0)	5,000 (22 250)	50,000 (5 600)	4,500,000 (508 000)	41.0 (18,6)
TB 100 x 4	T and C	2.25 (57,2)	4 (100,0)	10,000 (44 482)	40,000 (4 480)	4,400,000 (497 133)	32.0 (14,5)
TB 100 x 6	T and C	2.25 (57,2)	6 (150,0)	10,000 (44 482)	60,000 (6 779)	4,400,000 (497 133)	32.0 (14,5)

Catalog No./ Model	B in. (mm)	D in. (mm)	F in. (mm)	L in. (mm)	M ±.015 (±0,38) in. (mm)	S in. (mm)	T ±.015 (±0,38) in. (mm)	U ±.010 (±0,25) in. (mm)	V in. (mm)	W in. (mm)	X in. (mm)	(S) Stroke in. (mm)
DA 75 x 6 DA 75M x 100	3.00 (76,0)	0.75 (19,0)	13.58 (345)	17.75 (448)	.765 (19,4)	3.38 (86,0)	2.00 (51,0)	1.500 (38,0)	.81 (21,0)	1.50 (38,0)	.75 (19,0)	6 (150,0)
DA 75 x 8 DA 75M x 150	3.00 (76,0)	0.75 (19,0)	15.58 (395)	19.75 (498)	.765 (19,4)	3.38 (86,0)	2.00 (51,0)	1.500 (38,0)	.81 (21,0)	1.50 (38,0)	.75 (19,0)	8 (200,0)
DA 75 x 10 DA 75M x 250	3.00 (76,0)	0.75 (19,0)	17.58 (445)	21.75 (548)	.765 (19,4)	3.38 (86,0)	2.00 (51,0)	1.500 (38,0)	.81 (21,0)	1.50 (38,0)	.75 (19,0)	10 (250,0)
TB 100 x 4	2.75 (70,0)	1.00 (25,4)	18.88 (480)	24.25** (616)	.750 (19,1)	3.25* (82,6)	2.50 (63,5)	1.500 (38,0)	.75 (19,1)	1.75 (38,0)	.75 (19,0)	4 (100,0)
TB 100 x 6	2.75 (70,0)	1.00 (25,4)	18.88 (480)	22.25** (565)	.750 (19,1)	3.25* (82,6)	2.50 (63,5)	1.500 (38,0)	.75 (19,1)	1.75 (38,0)	.75 (19,0)	6 (150,0)

Notes: 1. DA Models will function at 10% of their maximum rated energy per cycle. If less than 10%, a smaller model should be specified.
2. Provide a positive stop 12 in. before end of stroke in tension and compression to prevent internal bottoming.
3. For optimal performance in vertical applications using compression, mount the rate control with the piston rod down.
4. * ØS indicates outside diameter of optional protective sleeve for TB models.
5. ** Dimension L is controlled by a 2.0 in. stroke limiter.

Machine Equipments & Accessories

elesa+GANTER®

General index

1

Operating elements

Spoked handwheels
Solid handwheels
Arm handwheels
Crank handles

2

Clamping knobs

Lobe knobs
Star knobs
Grip knobs
Wing knobs

3

Clamping levers

Adjustable handles
Lever handles

4

U-Handles

Bridge and pull handles
Safety handles
Flush pull handles
Tubular handles

9

Machine elements

Grub screws and thrust pads
T-nuts
Rings and washers
Ball transfear units
Cam locking levers
Clamps

10

Joints

Universal joints
Ball joints
Angled ball joints

11

Levelling elements

Plastic bases
Metal bases
End caps
Flexible automation components
Connecting clamps and angles

12

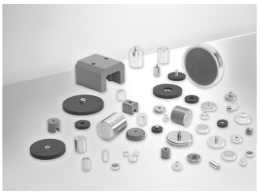
Hinges

Plastic hinges
Metal hinges

17

Castors an wheels

Injected polyurethane wheels
Mold-on polyurethane wheels
Monolithic wheels
Rubber wheels



18

Retaining magnets

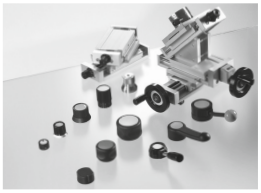
Flat gripper
Rod gripper
Button-type/U-Magnets

ELESA

5

Fixed, revolving and fold-away handles

T-handles
Ball knobs
Fixed handles
Revolving handles
Fold-away handles



6

Control elements

Control knobs
Control levers
Adjustable slide units

7

Rotary controls

Gravity indicators
Positive drive indicators
Handwheels/handknobs
Direct drive indicators

8

Indexing elements

Indexing plungers
Cam action indexing plungers
Side thrust pins
Spring plungers
Lock pins

13

Latches

Locks
Latches with handles
Latches with key
Latches with key and handles

14

Toggle, power and hook clamps

Toggle clamps
Clamping bolts
Power clamps
Hook clamps

15

Accessories for hydraulic systems

Plugs
Breather caps
Oil level indicators
Column level indicators

16

Tube clamp connectors/ Clamp mountings

Two way connector clamps
Swivel clamp connector joints
Linear actuators

High performing items

STAINLESS STEEL PRODUCTS

The high corrosion resistance of stainless steel have made it into one of the most sought-after materials in many sectors of industry. Elesa+Ganter's product range includes a wide assortment of rustproof products, spread over all product groups. It covers both all-stainless steel standard elements as well as stainless steel and plastic composites.
The materials used are AISI303, AISI304 and AISI316, resistant to rust, acid and heat depending on alloys.

Designed for:
- Food industry, chemical industry, medical engineering, demanding climatic conditions and atmospheres or aggressive substances

ANTIMICROBIAL PROTECTION

The products of the Elesa+Ganter SAN LINE stop the deposit of any undesired organisms such as microbes, bacteria, mildew and fungi which are the major causes of unpleasant odours, discoloration, degradation and the formation of biofilm on surfaces and prevent them from reproducing. Hence a hygienic and precautionary action is guaranteed even after several cleaning cycles at high temperatures with soap and solvents in the long term.
A special technopolymer including antimicrobial additives – a mixture of silver ions on an inorganic ceramic base – chemical free without any antibiotic drugs or pesticides which may be released on the operator's hands.

Designed for:
- Medical and hospital equipment
- Disability aids
- Machines for the food processing and pharmaceutical industry
- Equipment for catering services
- Urban and public fittings

ANTISTATIC ACTION

The special conductive technopolymer (ESD-C Electrostatic Discharge Conductive) prevents the transfer of electrostatic discharge between bodies with different electric potential. The new antistatic elements line is suitable for ESD PROTECTED AREAS (EPA) where components which are susceptible to electrostatic discharges are to be handled with the minimum risk of damage. The printed mark ESD-C on the surface of every single element identifies the particular antistatic feature according to EN 100015/1 and IEC 61340-5-1.

Designed for:
- Assembly lines for electronical components
- ESD-Protected Area (EPA)

WHITE AGAINST THE DIRT

Industrial handles, lobe and knurled knobs in RAL 9002 white colour with glossy finish to make cleaning operations easier. AISI 303 stainless steel metal inserts in compliance with the most rigorous sanitary laws. Compact shape and lack of cavities to avoid any deposit of dirt, dust and machining residues.
These are the major functional characteristics of Elesa+Ganter CLEAN line in addition to a modern design and high performance.

Designed for:
- Medical and hospital equipment
- Operating rooms
- Hospital fittings

FOR A SAFER GRIP

Lobe shaped or fluted grip knobs together with two-volume or knurled handles represent the "SOFT" line. Commonly known as Soft-touch, these new elements have been developed by Elesa+Ganter's R&D department for use on machinery and equipment requiring frequent tightening, or for applications subject to severe stress. The major characteristics of "SOFT" products are to ensure a safer and more stable ergonomic grip and to improve the comfort of the operator's hand, increasing adherence to the element and absorbing vibrations even in unfavorable environmental conditions such as humidity, aridity, heat, cold and grease.

Designed for:
- Disability aids
- High-precision instruments
- Fitness machines
- Gardening and unfavorable climatic conditions

OIL LEVEL SIGHT GLASSES FOR SPECIAL APPLICATIONS

Elesa+Ganter's extensive range of oil level sight glasses also provides solutions for highly demanding requirements, for instance high temperatures, high pressure loads or aggressive substances.
The most recent development is an ATEX sight glass for use in explosion hazard atmospheres.

Designed for:
- Industrial products such as gears, used in applications where the components must comply with ATEX guidelines

Ergonomy and Design at their best

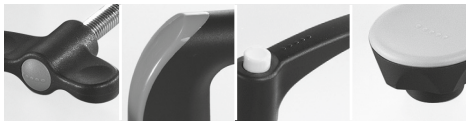
ERGOSTYLE® by ELESA

THE ERGOSTYLE® RANGE

Conceived for a broad spectrum of applications, typical of new market segments, Ergostyle® elements are destined for hospital and medical equipment and laboratory fittings, office furnishings, leisure and sporting equipment, and, generally, wherever aesthetics and user-friendliness are key requirements for the market success of a product.
A basic feature of the new elements, besides a perfect ergonomic function, is that of adding to the quality and value of the equipment for which they have been designed, by fully blending with it.

ERGONOMIC DESIGN

We believe that good design should start with a thorough understanding of the product's functions, which in our case means taking into account the full set of movements inolved in each operation of opening and closing, clamping, adjusting, setting or moving and evaluating for each of them the interplay between man and machine taking place when the control element is being used.
Ergostyle® elements are therefore not just simply designed to look good and provide a comfortable fit for the hand, but also make life easier for the operator every time they are being used and keep doing so throughout the lifespan of the object they have been designed for.
So, it is after all no real wonder that at its very first appearance Ergostyle® should obtain several of the world's most distinguished recognitions.



Be sure to look for them: a small unobtrusive mark, making a world of difference.

Customized Solutions

ELESA+GANTER offer the world's largest range of standard machine elements. On top of that, special customized versions and technical solutions are offered due to an increasing demand of the industry.

Elesa+Ganter's Know-How in manufacturing as well as a flexible, customer orientated organization allow to respond quickly and with ultimate cost effciency to non-standard requirements. This applies especially when special versions and designs are involved thanks to an extraordinarily large number of different production technologies.

This is where you'll find a selection of items to match your requirements.
Contact us – almost everything can be done.

SPECIAL SHAPES

Dimensions, Threads.

SPECIAL COLOURS

Almost all the standard machine elements can be produced in nearly all colours.

SPECIAL SURFACE TREATMENTS

Plastic Powder Coating.

BURNISHING

Zinc-, Nickel- and Chrome-plating, Anodising.

SPECIAL PRODUCT BRANDING*

Logos, Indications, Graphic elements, Signals.

** Tampo-printing and high precision laser engraving allow this kind of personalization.*

1 Operating elements

VRTP.

Spoked handwheels

Material black matte technopolymer, black-oxide steel boss
Versions without handle, with revolving or with fold-away handle
Diameters 80 to 375 mm

VDT.

Solid handwheels

Material black matte technopolymer, coloured caps, black-oxide steel boss
Versions without handle, with revolving or fold-away handle
Diameters 100 to 200 mm

MT-AS

Crank handles

Material black matte technopolymer, black-oxide steel boss
Versions with revolving or fold-away handle
Dimensions 50 to 210 mm

GN 322

Spoked handwheels

Material aluminium, turned and polished
Versions without handle, with revolving or with fold-away handle
Diameters 125 to 250 mm

VD.FP

Solid handwheels

Material black glossy duroplast, black-oxide or stainless steel hub
Versions without handle, with revolving handle
Diameters 50 to 350 mm

MT-AT

Crank handles

Material black matte technopolymer, black-oxide steel boss
Versions with revolving or fold-away handle
Dimensions 50 to 160 mm

DIN 950

Spoked handwheels

Material cast iron or aluminium
Versions without handle, with revolving or with fixed handle
Diameters 80 to 500 mm

VDO.FP

Solid handwheels

Material black glossy duro-plast black-oxide steel hub
Versions without handle, with revolving, with fold-away or safety fold-away handle
Diameters 100 to 250 mm

GN 471

Crank handles

Material aluminium, black plastic coated
Versions with revolving handle, with fold-away handle
Diameters 50 to 160 mm

GN 227.2

Stainless steel spoked handwheels

Material pressed stainless steel, sandblasted finish, welded hub
Versions without handle, with revolving handle
Diameters 160 to 400 mm

EMW

Monospoke handwheels

Material black matte technopolymer, black-oxide steel boss
Versions with revolving or fold-away handle
Diameter 350 mm

GN 472.3

Crank handles

Material aluminium, black plastic coated
Version with fold-away handle (black glossy duroplast)
Diameters 80 to 125 mm

VDS.

Solid handwheels

Material black matte technopolymer, black-oxide steel boss
Versions without handle, with revolving , fold-away or with safety fold-away handle
Diameters 80 to 300 mm

GN 323

Solid handwheels

Material aluminium, black plastic coated
Versions without handle, with revolving handle
Diameters 80 to 250 mm

DIN 468

Crank handles

Material cast iron, black plastic coated
Versions with revolving or fixed handle (steel, polished)
Diameters 63 to 315 mm

ESW+I

Solid handwheels

Material grey-black matte technopolymer, coloured caps, black-oxide steel boss
Versions with revolving or with fold-away handle
Diameters 125 to 175 mm

GN 321.6

Safety solid handwheels

Material aluminium, black plastic coated, polished rim
Versions without handle, with revolving handle
Diameters 140 to 160 mm

EKH.

Crank handles

Material black matte technopolymer, coloured caps, black-oxide steel boss
Versions with revolving or fold-away handle
Dimensions 100 to 125 mm

2 Clamping knobs

VB.639 INOX

Three-arm knobs
Material black matte technopolymer
Assembly black-oxide steel, brass or stainless steel tapped boss; zinc-plated steel threaded stud
Diameters 63 to 130 mm

DIN 6335

Star knobs
Material cast iron or aluminium
Assembly reamed blind or through hole, tapped blind or through hole
Diameters 32 to 100 mm

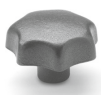
B.193 INOX

Knurled grip knobs
Material black glossy duroplast
Assembly brass or stainless steel threaded boss, zinc-plated or stainless steel threaded stud
Diameters 15 to 50 mm

VCT.

Lobe knobs
Material black matte technopolymer, coloured caps
Assembly black-oxide or brass threaded or plain boss, zinc-plated steel threaded stud
Diameters 25 to 95 mm

DIN 6336



Lobe knobs
Material cast iron or aluminium
Assembly reamed blind or through hole, tapped blind or through hole
Diameters 32 – 80 mm

DIN 466 INOX

Knurled grip knobs
Material steel or stainless steel
Assembly tapped through hole or threaded stud
Diameters 12 to 40 mm

VCT.SOFT SOFT

Lobe knobs
Material technopolymer coated with "soft-touch" black elastomer, coloured caps
Assembly brass tapped boss or zinc-plated steel threaded stud
Diameters 43 to 53 mm

VLS. INOX

Security lobe knobs
Material black matte technopolymer
Assembly brass tapped boss, stainless steel threaded stud
Security key with stainless steel anti-intrusion profile
Diameters 42 to 55 mm

MBT.

Diamond cut knurled knobs
Material black matte technopolymer
Assembly brass boss with plain or tapped hole; zinc-plated steel threaded stud
Diameters 31 to 69 mm

VC.692 INOX

Lobe knobs
Material black matte technopolymer
Assembly brass or stainless steel threaded boss, zinc-plated or stainless steel threaded stud
Diameters 32 to 60 mm

ELK. ERGOSTYLE

Lobe knobs
Material grey-black matte technopolymer, coloured caps
Assembly black-oxide steel or brass boss with hole, zinc-plated steel threaded stud
Diameters 45 to 70 mm

EWN. ERGOSTYLE INOX

Wing nuts
Material grey-black matte technopolymer, coloured caps
Assembly brass or stainless steel tapped boss, zinc-plated or stainless steel threaded stud
Dimensions 32 to 70 mm

VCRT.FM

Fast mounting lobe knobs
Material black matte technopolymer
Assembly square through hole with elastic ring for push-fit assembly
Diameters 50 to 63 mm

VL.640 FP

Lobe knobs
Material black glossy technopolymer
Assembly black-oxide steel hub with blind or tapped hole or not drilled
Diameters 50 to 130 mm

CT.476 INOX

Wing knobs
Material black matte technopolymer
Assembly brass or stainless steel threaded boss, zinc-plated or stainless steel threaded stud
Dimensions 20 to 40 mm

GN 5335 INOX

Lobe knobs
Material sandblasted matte or polished stainless steel
Assembly reamed blind hole, tapped blind or through hole
Diameters 40 to 60 mm

BT. INOX

Fluted grip knobs
Material black matte technopolymer
Assembly brass or stainless steel threaded boss, zinc-plated or stainless steel threaded stud
Diameters 16 to 50 mm

GN 431 INOX

Wing knobs
Material sandblasted matte stainless steel
Assembly blind hole or threaded stud
Dimensions 25 to 36 mm

3 Clamping levers

ERX.

Adjustable handles

Lever body technopolymer
Assembly technopolymer clamping element, brass or stainless steel tapped boss, zinc-plated or stainless steel threaded stud
Dimensions 30 to 108 mm

GN 300.4

Adjustable handles with high tightening clamping force

Lever body zinc alloy die-cast, plastic coated
Assembly nitrided steel, tapped hole or threaded pin
Dimensions 63 to 108 mm

ERF.

Lever handles

Lever body technopolymer
Assembly brass boss with tapped hole or threaded stud, cylindrical or square blind hole, transversal set screw
Dimensions 44 to 95 mm

ERZ.

Adjustable handles

Lever body technopolymer, with zinc alloy insert
Assembly black-oxide or stainless steel clamping element, tapped hole or threaded pin
Dimensions 44 to 95 mm

GN 302

Adjustable handles

Lever body zinc alloy die-cast, plastic coated
Assembly black-oxide steel clamping element, tapped hole or threaded pin
Dimensions 30 to 78 mm

DIN 99

Clamping levers

Material steel or stainless steel
Assembly plain or tapped through hole with straight or 20° inclined arm
Dimensions 50 to 200 mm

ERM.

Adjustable handles

Lever body zinc alloy die-cast, epoxy resin coating
Assembly black-oxide or stainless steel clamping element, tapped hole or threaded pin
Dimensions 44 to 95 mm

MRX.

Adjustable handles

Lever body technopolymer
Assembly technopolymer clamping element, brass or stainless steel tapped boss, zinc-plated or stainless steel threaded stud
Dimensions 40 to 100 mm

GN 99.7

Clamping nuts with double lever

Material steel or stainless steel
Assembly tapped through hole
Dimensions 47 to 118 mm

ERX.AV

Adjustable handles for quick assembly

Lever body technopolymer
Assembly technopolymer clamping element, cavity for quick assembly, brass tapped boss, zinc-plated threaded pin
Dimension 78 mm

MR.

Adjustable handles

Lever body technopolymer
Assembly technopolymer clamping element, black-oxide steel or brass boss with plain or tapped blind hole, zinc-plated threaded stud
Dimensions 40 to 100 mm

GN 212

Handle levers

Material black oxide steel or stainless steel
Assembly tapped hole or plain blind hole, angled lever
Dimensions 22 to 40 mm

GN 300

Adjustable handles

Lever body zinc alloy die-cast, plastic coated
Assembly black-oxide steel or stainless steel clamping element, tapped hole or threaded pin
Dimensions 30 to 108 mm

GN 212.3

Adjustable tension handles

Material black oxide steel or stainless steel
Assembly tapped hole or threaded pin, straight or angled lever
Dimensions 21 to 40 mm

GN 150

Split hubs

Material black oxide sintered steel
Dimensions 24 to 32 mm

GN 300.5

Adjustable handles

Lever body sandblasted matte stainless steel
Assembly stainless steel clamping element, tapped hole or threaded pin
Dimensions 45 to 92 mm

GN 125

Adjustable handles

Material black oxide steel
Assembly tapped hole or threaded pin, straight or 15° inclined arm
Dimensions 32 to 45 mm

GN 316

Ratchet spanner

Material Hardened steel
Versions hole with keyway, with threaded insert or with square insert
Dimensions 12 to 26 mm (diameter of the insert bore)

4 U-Handles

GN 565

Handles

Material aluminium or stainless steel
Assembly tapped blind or through holes
Centre distances
100 to 500 mm

M.443

Handles

Material black, orange, grey or red matte technopolymer
Assembly through holes for cylindrical-,countersunk-, hexagonal-head screws or standard lock nuts
Centre dist. 93.5 to 235 mm

ERB.

Bi-directional flush pull handles

Material grey-black or white matte technopolymer
Assembly 4 zinc-plated steel self-tapping screws
Dimension 130 mm

GN 565.2

Inclined Handles

Material aluminium
Assembly tapped blind holes
Centre distances
112 to 160 mm

GN 425

Handles

Material stainless steel or steel, chrome-plated, black oxide or plastic coated finish
Assembly tapped blind holes
Centre distances
55 to 235 mm

GN 426.1

Cabinet handles

Material aluminium, black or silver plastic coated or natural
Versions double-curved or straight
Centre distances
200 to 500 mm

M.843

Handles

Material glossy technopolymer in six different colours, M.243 in black glossy duroplast
Assembly brass bosses with tapped holes
Centre dist. 86 to 300 mm

GN 425.2

Folding handles

Material steel, chrome-plated finish
Assembly back mounting
Centre distances
100 to 180 mm

GN 333

Tubular handles

Material aluminium, anodised, black or silver plastic coated or natural
Versions straight or inclined shanks
Centre distances
180 to 1000 mm

M.643

Handles

Material black matte technopolymer
Assembly brass die-cast zinc alloy or brass bosses, tapped blind holes or through holes for cylindrical-head screws
Centre dist. 86 to 300 mm

GN 730

Guard safety handles

Material aluminium, anodised, black or silver plastic coated or natural
Assembly tapped blind holes
Centre distances
90 to 120 mm

GN 666

Tubular handles

Material aluminium, anodised or black plastic coated or stainless steel
Versions straight or inclined shanks
Centre distances
200 to 600 mm

GN 559

Handles

Material aluminium, black plastic coated
Versions closed-ended or open-ended handle
Assembly tapped blind holes
Centre distance 128 mm

ESP.

Guard safety handles

Material grey-black matte technopolymer, coloured cover
Assembly through holes for cylindrical- or countersunk-head screws
Centre distance 93.5 mm

M.1066 BM

Tubular handles

Material aluminium tube, epoxy resin white coating. technopolymer shanks
Assembly zinc-plated steel screws with tapped blind holes
Centre dist. 200 to 600 mm

EBP.

Bridge handles

Material standard or animicrobial technopolymer, coloured caps
Assembly through holes for cylindrical-head screws or brass bosses with tapped blind holes
Centre dist. 93.5 to 179 mm

EPR.

Flush pull handles

Material grey-black or white matte technopolymer, coloured screw cover
Assembly snap-in assembly or through holes for stainless steel self-tapping screws
Dimensions 90 to 120 mm

ETH.

Tubular handles

Material aluminium tube, epoxy resin matte coating, technopolymer handle shanks, coloured covers Anti-rotation system
Assembly through holes
Centre dist. 300 – 1000 mm

5 Fixed, revolving and fold-away handles

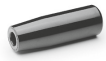
L.652

Handles
Material black, orange or red matte technopolymer
Assembly brass boss with plain or tapped blind hole; zinc-plated steel threaded stud
Dimensions 40 to 94 mm

EBK+x ERGOSTYLE

Two-volume revolving handles
Material black matte technopolymer
Assembly zinc-plated steel threaded stud
Diameter 50 mm

I.280



Handles
Material black glossy duroplast
Assembly tapped blind hole
Dimensions 28 to 116 mm

I.622

Handles
Material glossy technopolymer in six colours, I.222 in duroplalst
Assembly tapped or plain blind hole, or self-locking boss, plain blind hole
Dimensions 25 to 90 mm

EKK. ERGOSTYLE

Knurled knobs
Material matte technopolymer in six colours
Assembly brass boss, tapped blind hole or threaded stud
Diameters 16 to 31 mm

I.601+x INOX

Revolving handles
Material black matte technopolymer
Assembly zinc-plated or stainless steel shank, hexagon socket at threaded end
Dimensions 40 to 90 mm

DIN 319 INOX

Ball knobs
Material technopolymer, duroplast, aluminium, steel or stainless steel
Assembly plain or tapped blind hole
Dimensions 12 to 50 mm

GN 676.5 INOX

Revolving handles
Material aluminium, zinc-plated steel or black matte technopolymer
Assembly threaded or plain zinc-plated pin
Dimensions 21 to 31 mm

I.621+x

Two-volume revolving handles
Material black matte technopolymer
Assembly zinc-plated steel shank, hexagon socket at threaded end
Dimensions 45 to 90 mm

IH.N

Knobs with magnifying lens
Material black matte technopolymer, with magnifying lens for labels
Assembly plain blind hole
Dimensions 40 to 50 mm

I.580 N

Handles
Material black matte technopolymer
Assembly blind hole
Dimensions 40 to 90 mm

DIN 98

Revolving handles
Material aluminium, zinc-plated steel or black matte technopolymer
Assembly threaded or plain zinc-plated pin
Dimensions 54 to 117 mm

IEL-SOFT SOFT

Two-volume handles
Material black matte soft-touch elastomer IEL.N-H with magnifying lens for labels
Assembly plain blind hole
Dimension 65 mm

EGH.SOFT ERGOSTYLE SOFT

Handle
Material technopolymer coated with black "soft-touch" elastomer
Assembly plain blind hole
Dimension 85 mm

IR.620

Two-volume fold-away handles
Material black matte technopolymer; black-oxide steel stud; sintered and oxidised steel flat base for embedded mounting
Dimensions 45 to 90 mm

EBK.SOFT ERGOSTYLE SOFT

Two-volume handles
Material technopolymer coated with "soft-touch" black elastomer, coloured caps
Assembly brass boss with tapped blind hole, zinc-plated steel threaded stud
Diameter 43 to 50 mm

GN 310 INOX

Lever arms
Material black-oxide steel or stainless steel
Versions with ball-, conical-, rounded- or cylindrical knob
Dimensions 63 to 250 mm

GN 598.5 INOX

Fold-away handles
Material black glossy duroplast
Versions black-oxide steel or stainless steel stud
Dimensions 90 to 119 mm

6 Control elements

GN 164

Scale rings

Material matte chrome-plated steel, with or without standard scale
Assembly reamed hole with or without friction ring
Dimensions 30 to 60 mm

GN 729

Control knobs

Material aluminium, black anodised, white laser-engraved index line
Assembly reamed hole
Dimensions 34 or 42 mm

GN 700

Locking and continuous control knobs

Material black-oxide steel with black anodised aluminium knob and scale ring
Dimension 66 mm

GN 726

Knurled control knobs

Material aluminium, black anodised
Assembly with reamed hole or with collet
Dimensions 22 to 42 mm

EGK.SOFT

Grip knobs

Material technopolymer coated with "soft-touch" elastomer, coloured caps
Assembly black-oxide steel boss, reamed hole
Diameters 50 to 63 mm

GN 750

Control levers

Material black-oxide steel with black glossy duroplast handle
Versions reamed through hole with or without keyway, square through hole
Dimensions 32 or 50 mm

GN 726.1

Knurled control knobs

Material aluminium, black anodised
Versions with triangular index, plain surface or precision graduation
Dimensions 22 to 42 mm

GN 736.1

Control handwheels

Material aluminium, black anodised, with or without revolving handle
Assembly reamed hole with or without keyway, with collet and graduated ring
Dimensions 52 or 62 mm

ELC.

Control levers

Material gray-black matte technopolymer, with coloured caps
Assembly black-oxide steel boss, reamed hole
Dimensions 67 to 140 mm

GN 726.2

Knurled control knobs with flange

Material aluminium, black anodised
Versions with triangular index, plain surface or precision graduation
Dimensions 27 to 42 mm

MBT+I

Diamond cut knurled knobs with revolving handle

Material black matte technopolymer
Assembly brass boss, plain blind hole
Diameters 40 to 60 mm

LBR.

Control levers

Technopolymer body, chrome-plated steel arm, Duroplast handle; anodised aluminium plate
Assembly black-oxide steel boss, plain hole with flat face
Dimensions 81 to 170 mm

IZP.

Knurled control knobs

Material black technopolymer; anodised aluminium front plate; laser-engraved triangular index or precision graduation
Assembly plain blind hole
Diameters 27 to 40 mm

GN 727

Control knobs with adjustable spindle

Material matte chrome-plated steel with black anodised aluminium knob
Versions holes parallel or vertical to spindle axis
Dimensions 27 or 34 mm

GN 215

Indexing levers

Material black-oxide steel with black glossy duroplast handle
Assembly reamed hole with keyway
Dimensions 54 or 60 mm

IZN.380

Knurled control knobs

Material technopolymer; anodised aluminium flange with index or precision graduation in black colour
Assembly black-oxide steel boss, reamed hole
Diameters 32 to 80 mm

GN 200

Indexing mechanisms

Material black-oxide steel or stainless steel
Versions knurled surface, matte chrome-plated steel with precision graduations, with 1 or 2 lever arms
Dimensions 44 or 52 mm

GN 900

Adjustable slide units

Material aluminium, natural anodised
Versions with control knob, handwheel, digital position indicator or adjustable spindle
Dimensions 50 to 260 mm

7 Rotary controls

GA01, GA02, GA05

Gravity position indicators

Material zinc-plated steel case, glass window; use on horizontal or max 60° inclined spindle
Standard ratios 6/1 to 100/1
Diameters 50 to 113 mm

GA11 GA12

Gravity position indicators

Material technopolymer case and window. IP 67; use on horizontal or max 60° inclined spindle
Standard ratios 6/1 to 40/1
Diameters 50 to 68 mm

MBT.50-GA11, MBT.70-GA12

Knobs with indicators

Material technopolymer knobs with integral gravity position indicator. IP 67; black-oxide steel boss, reamed blind hole
Standard ratios 6/1 to 40/1
Diameters 51 to 70 mm

GW12

Digital-analogue gravity position indicators

Material technopolymer case and window. IP 67
Std. readings after one turn 0000.2 to 0005.0
Diameter 68 mm

PA11 PA12

Positive drive indicators

Material technopolymer case and window. IP 65
Standard ratios
10/1 to 30/1
Diameters 50 to 68 mm

PW12

Digital-analogue positive drive indicators

Material technopolymer case and window. IP 65
Std. readings after one turn 0000.2 to 0005.0
Diameter 68 mm

IZN.

Knurled knobs for GA indicators

Material black technopolymer
Assembly black-oxide steel boss, reamed blind hole
Diameters 60 to 80 mm

MBT.

Diamond cut knurled knobs for GA or PA indicators

Material black matte technopolymer
Assembly black-oxide steel boss, reamed blind hole
Diameters 60 to 80 mm

VHT. INOX

Lobe knobs for GA or PA indicators

Material black matte technopolymer
Assembly black-oxide steel or stainless steel boss, reamed blind hole
Diameters 85 to 110 mm

VRTP.

Two spoke handwheels for GA indicators

Material black matte technopolymer
Assembly black-oxide steel boss, reamed through hole
Diameters 160 to 250 mm

VDC.

Solid handwheels with or without revolving handle for GA or PA indicators

Material black duroplast
Assembly black-oxide steel boss, reamed through hole
Diameters 125 to 200 mm

VDSC+I

Solid handwheels with revolving handle for GA indicators

Material black matte technopolymer
Assembly black-oxide steel boss, reamed through hole.
Diameters 125 to 200 mm

VAD.

Solid handwheels with or without revolving handle for GA or PA indicators

Material aluminium, epoxy-resin coating, reamed through hole
Diameters 80 to 250 mm

DD50

Direct drive digital position indicators

Material technopolymer case and base ultrasonically welded; black-oxide steel bushing, reamed hole, Colours: orange, grey (anthracite on request)

DD51

Height

DD50: 38,5 mm
DD51: 47 mm
DD52R: 66 mm

Number of digits

DD50: 3 digits
DD51: 4 digits
DD52R: 5 digits

DD52R

Standard readings after one revolution

DD50: 0.10 to 10.0
DD51: 00.50 to 010. 0
DD52R: 000.50 to 0010.0

Special Versions

St. steel bushings, reduction sleeves, special readings

GN 953.6

Clamping plates

for Position indicators DD52R and GN 954.6 for DD51
Material zinc die casting, adjustable hand lever GN 302
Dimensions B8 to B20

DE51

Electronic indicators

Direct drive absolute optical electronic position indicators; absolute multi-turn encoder, LCD display for target and current position
Material technopolymer; black-oxide steel bushing

ELESA

8 Indexing elements

GN 617 INOX

Indexing plungers
Material black-oxide steel or stainless steel
Assembly with or without technopolymer or stainless steel knob, with or without rest position and locking nut
Dimensions M10 to M20

GN 417

Indexing plungers
Material zinc die-casting, black plastic coated
Assembly stainless steel plunger with stainless steel lifting ring or with black technopolymer knob
Dimensions 4 to 8 mm

GN 614 INOX

Smooth ball spring plungers
Material technopolymer, brass or stainless steel
Ball technopolymer or stainless steel
Dimensions 3 to 12 mm

GN 613 INOX

Indexing plungers
Material black-oxide steel or stainless steel
Assembly with or without technopolymer or stainless steel knob and locking nut
Dimensions M10 to M20

GN 7336.7

Knurled knobs with indexing plungers
Material zinc-plated steel
Assembly stainless steel plunger with technopolymer knurled knob
Dimensions M10 to M16

GN 815 INOX

Threaded plungers with screwdriver slotted head
Material black-oxid steel or stainless steel
Dimensions M4 to M12

GN 817 INOX

Indexing plungers
Material black-oxide steel or stainless steel
Assembly with or without black technopolymer knob, with or without rest position and locking nut
Dimensions M8 to M20

GN 612 INOX

Lever indexing plungers with rest position
Material black-oxide steel or stainless steel
Assembly with or without lever cover and locking nut
Dimensions M12 to M20

GN 610

Spring loaded shells
Material nickel-plated steel
Spring stainless steel
Dimensions 2.2 to 5 mm

GN 822

Mini indexing plungers
Material zinc-plated steel
Assembly with black technopolymer knob, with or without rest position
Dimensions M8 or M10

GN 612.1 INOX

Mounting blocks
Material black-oxide steel or stainless steel
Assembly fixing holes parallel or vertical to plunger
Dimensions M12 to M20

GN 715

Side thrust pins
Material aluminium
Pin zinc-plated steel or technopolymer, with or without NBR synthetic rubber gasket
Dimensions 3 to 10 mm

GN 717 INOX

Indexing plungers
Material zinc-plated steel or stainless steel
Assembly with stainless steel lifting ring or with black technopolymer knob, with or without rest position
Dimensions M6 to M12

GN 615 INOX

Threaded ball spring plungers
Material black-oxide steel or stainless steel
Assembly spring with normal or heavy end force
Dimensions M3 to M24

GN 113.5 INOX

Ball lock pins
Material stainless steel 1.4305 or 1.4542 (hardenend)
Assembly technopolymer knob
Dimensions 5 to 16 mm

GN 608

Indexing plungers with flange
Plunger black-oxide steel
Assembly zinc-plated die-cast zinc alloy flange with black technopolymer knob, with or without rest position
Dimensions 6 or 8 mm

PMT. INOX

Indexing plungers
Material technopolymer, plunger black-oxide steel or stainless steel
Versions with or without rest position and locking nut
Dimensions M10 to M20

GN 114.2 INOX

Pins with axial lock
Material zinc-plated steel or stainless steel
Assembly push button operated locking pawls, technopolymer knob or stainless steel knob (GN 114.6)
Dimensions 8 to 20 mm

ELESA

9 Machine elements

GN 913.3 INOX

Grub screws

Material black-oxide steel or stainless steel
Bolt technopolymer or brass
Dimensions M4 to M12
Length 6 to 100 mm

GN 350.3 INOX

Levelling washers

Material zinc-plated steel or stainless steel
Dimensions 25 to 80 mm
Height 8 to 20 mm

GN 707.2 INOX

Split set collars

Material black-oxide steel or stainless steel
Assembly grub screws, cylindrical head with hexagon socket
Dimensions 20 to 65 mm

GN 605 INOX

Grub screws with ball terminal

Material black-oxide steel or stainless steel
Assembly ball, reversible or non-reversible flat-faced ball
Dimensions M4 to M16
Length 6 to 50 mm

GN 350 INOX

Levelling sets

Material zinc-plated steel or stainless steel
Versions with or without locknut
Dimensions 25 to 80 mm
Height 28 to 126 mm

DIN 580 INOX

Lifting eye bolts

Material zinc-plated steel or stainless steel
Versions threaded stud or tapped hole
Dimensions M8 to M36

GN 606 INOX

Set screws with ball terminal

Material black-oxide steel or stainless steel
Assembly ball, reversible or non-reversible flat-faced ball
Dimensions M4 to M16
Length 10 to 80 mm

DIN 6319 INOX

Concave and convex washers

Material case-hardened steel or stainless steel
Dimensions 6.4 to 56 mm
For screws M6 to M48

GN 581 INOX

Lifting eye bolts (rotating)

Material tempered steel, pink plastic coated or stainless steel
Versions with or without spanner
Dimensions M8 to M36

GN 346

Thrust pads with ball joint and threaded hole

Material zinc-plated steel
Dimensions M8 to M16

GN 187.4 INOX

Serrated locking plates

Material sintered steel or stainless steel
Versions with tapped hole or bore in the center
Dimensions 22 to 40 mm
Number of teeth 48 or 60

GN 509

Ball transfer units

Material zinc-plated steel or stainless steel
Balls zinc-plated steel or stainless steel
Dimensions 15 to 30 mm

DIN 444 INOX

Eye screws

Material black-oxide steel or stainless steel
Dimensions M6 to M20
Length 50 to 160 mm

GN 184 INOX

Washers for countersunk head screws

Material black-oxide steel or stainless steel
Dimensions 16 to 52 mm
For screws M4 to M6

GN 918.1 INOX

Cam locking levers

Material black-oxide steel or stainless steel
Versions with ball lever or with hexagon
Dimension 50 mm

DIN 508 INOX

T-Nuts

Material stainless steel or black-oxide steel, class 8 or 10
Dimensions M4 to M24
Width 5 to 28 mm

LAC INOX

Cam levers

Material technopolymer
Assembly rotating pin zinc-plated or stainless steel, with tapped hole or threaded stud
Dimension 79 mm

GN 927

Clamping levers with eccentrical cam

Material zinc alloy die-cast, black plastic coated
Assembly zinc-plated steel with tapped hole or threaded stud
Dimensions 63 to 101 mm

10 Joints

DIN 808 W

Universal joints with needle bearing

Material hardened steel
Assembly with plain hole or with keyway; single or double body
Dimensions 22 to 70 mm

GN 648.1 INOX

Ball joints

Material zinc-plated steel or stainless steel
Assembly with tapped hole or threaded stud
Versions self lubricated or lubrication possible
Dimensions 5 to 25 mm

BJT INOX

Rod ends

Material tecnopolymer, self-lubricating spherical cap
Assembly with threaded hole or threaded pin
Hole dimensions 6 to 14 mm

DIN 808 G INOX

Universal joints with friction bearing

Material hardened steel or stainless steel
Assembly with plain hole or with keyway; single or double body
Dimensions 16 to 58 mm

GN 751 INOX

Fork joints / Fork heads DIN 71752

Material zinc-plated steel or stainless steel
Versions with right-hand, left-hand or fine thread
Dimensions 4 to 20 mm

FJT INOX

Forks

Material tecnopolymer
Assembly with threaded hole, clip pin or pin and seager ring.
Hole dimensions 6 to 14 mm

GN 808.2

Universal joint shafts with friction bearing

Material steel
Assembly with plain hole or with keyway
Dimensions 22 to 58 mm

GN 752 INOX

Joint pieces

Material zinc-plated steel or stainless steel
Applications for combination with fork joints GN 751 / fork heads DIN 71752
Dimensions 6 to 16 mm

GN 808.3

Universal joint shafts with needle bearing

Material steel
Assembly with plain hole or with keyway
Dimensions 22 to 58 mm

GN 782

Axial ball joints

Material zinc-plated steel
Versions with male or female thread
Dimensions M8 or M10

GN 908

Universal joints

Material black-oxide steel
Versions single or double body with friction bearing
Dimensions 13 to 32 mm

DIN 71802 INOX

Angled ball joints

Material zinc-plated steel or stainless steel
Ball shank with threaded or rivet ball shank, with or without safety catch
Dimensions 8 to 19 mm

GN 808.1

Gaiters for universal joints

Material black rubber (neoprene) for single joints or black smooth elastomer for double joints
Dimensions 16 to 58 mm

GN 710

Dust caps for angled ball joints DIN 71802

Material black rubber (neoprene)
Dimensions 12 to 25.5 mm, for angled ball joints DIN 71802: 8 to 19 mm

11 Levelling elements

LS.A

Levelling elements

Material black matte technopolymer, zinc-plated or stainless steel threaded stem (M8 to M16) with regulation hexagon, NBR synthetic rubber no-slip disk
Diameters 25 to 50 mm

LV.A-125-ACV

Levelling elements for heavy duties

Material technopolymer, zinc-plated or st. steel threaded stem (M20 to M30) with regulation hexagon. NBR synthetic rubber no-slip disk
Diameter 125 mm

GC

Connection joints

Material black matte technopolymer, zinc-plated or stainless steel screws, and nuts
Tube assembly holes G1 1/4" to G2"

GN 343.3

Levelling elements

Material technopolymer with zinc-plated steel or stainless steel ball joint
Versions with or without NBR rubber no-slip disk
Diameters 25 to 60 mm, M6 to M16

GN 340

Levelling elements

Material zinc-plated steel or stainless steel with NBR rubber no-slip disk fixed by a screw
Diameters 50 to 120 mm, M8 to M30

MPG

Guide rail clamps

Material black matte technopolymer, stainless steel screw, nut and pin. One or two cavities for round or trapezoidal guides

GN 343.2

Levelling elements

Material zinc-plated steel or stainless steel
Versions with or without gliding or not-gliding plastic cap
Diameters 25 to 60 mm, M8 to M24

GN 341.1

Levelling elements

Material stainless steel with NBR rubber no-slip disk vulcanised to the base
Versions threaded stem with adjustable sleeve
Diameters 60 to 100 mm, M16 to M24

SPR.V

Guide rail brackets

Material technopolymer
Clamping system for linear and angular positioning technopolymer knob with nickel-plated brass insert, stainless steel eye screw, nut, screw and washer

GN 343.1

Levelling elements

Material zinc-plated steel or stainless steel
Versions with or without gliding or not-gliding plastic cap
Diameters 25 to 60 mm, M6 to M16

LW.A

Vibration damping elements

Material Zinc-plated steel with Natural Rubber disk
Assembly zinc-plated stems (M12x1,25 to M20x1,5)
Diameters 80 to 200 mm

DVA

Vibration damping elements

Material natural rubber with zinc-plated or stainless steel base
Assembly threaded holes or threaded studs.
Diameters 8 to 100 mm
Threadings M3 to M16

LV.A

Levelling elements

Material black matte technopolymer, zinc-plated or stainless steel threaded stem (M8 to M24) with regulation hexagon, NBR synthetic rubber no-slip disk
Diameters 60 to 125 mm

NDX.

Square and Round end-caps

Material technopolymer, black matte finish
Assembly nickel-plated brass bushing with tapped hole (from M8 to M24)
Dimensions 20 to 60 mm

TSLB

Side mounting top bracket

Material black matte technopolymer, zinc-plated or stainless steel screw, nut and washer.
Tube assembly hole G1 1/4" to G2"

LV.F

Levelling elements for ground mounting

Material technopolymer, zinc-plated or st. steel threaded stem (M8 to M24) with regulation hexagon. NBR synthetic rubber no-slip disk.
Diameters 80 to 125 mm

BAS3

Support bases

Material technopolymer
Assembly brass bosses, tapped through holes Zinc-plated or stainless steel screws and washers
Tube assembly hole G1 1/4" to G2"

MSR.

Connecting clamps

Material technopolymer base, T-shaped and device clamps; screw-covers in six colours; aluminium profile tubes (100 to 2000 mm)
Assembly cylindrical head screws with hexagon socket

12 Hinges

CFA.

Hinges
Material technopolymer, stainless steel rotation pin
Assembly threaded bushings and studs or through holes
Rotation max 220°
Dimensions 39.5 to 96.5 mm

GN 127

Hinges
Material zinc-alloy die-cast, black plastic coated
Versions horizontally, vertically or to both positions adjustable
Dimension 76 x 60 mm

CFO.

Offset lift-off hinge
Material technopolymer
Assembly through holes; this hinge allows the adjustment of the inclination of the door on the frame
Dimension 64 mm

CFA+ERS

Hinges with friction brake
Material technopolymer, black-oxide steel rotation pin
Assembly through holes, unlimited number of door-stop positions, rotation max 220°
Dimensions 49.5 to 96.5 mm

CFR.

Adjustable hinges
Material technopolymer, stainless steel rotation pin, horizontal and vertical adjustments
Assembly through holes
Rotation angle max 270°
Dimension 60 mm

CFN.

In line lift-off hinge
Material technopolymer
Assembly threaded bushings or studs; this hinge allows the adjustment of the inclination of the door on the frame.
Dimension 64 mm

CFT.

Hinges with screw covers
Material black technopolymer
Assembly through holes
Rotation max 200°
Dimension 49.5 mm

CFD.

Hinges for thin doors
Material technopolymer, stainless steel rotation pin
Assembly threaded bushings or studs
Rotation max 215°.
Dimensions 30.5 to 66 mm

CFP.

Detent position hinges
Material technopolymer
Assembly through holes
Detent positions 0° (closed), 80°, 120° and 170°
Rotation max 180°
Dimension 50 mm

CFM.

Hinges with friction brake
Material technopolymer, stainless steel rotation pin
Assembly threaded studs or through holes
Rotation max 270°.
Dimensions 40 to 60 mm

CFU.

Hinges with adjustable friction
Material technopolymer
Assembly through holes for cylindrical head screws, Stainless steel adjusting screw
Rotation max 275°
Dimension 40 to 60 mm

CFS.

Safety hinges
Material technopolymer, stainless steel rotation pin, built-in safety switch
Assembly threaded studs or through holes
Rotation max 180°
Dimension 52 mm

GN 237 INOX

Hinges
Material zinc-alloy die-cast, stainless steel or aluminium
Rotation pin stainless steel
Dimensions 40 to 60 mm

CFJ.

Tamperproof hinges
Material black technopolymer, moulded in stainless steel rotation pin
Assembly threaded bushings and studs or through holes
Rotation max 270°
Dimension 50 mm

GN 128

Hinges
Material steel with brass washer
Rotation pin steel or brass
Dimensions 40 to 200 mm

GN 238

Hinges
Material zinc-alloy die-cast, black or silver plastic coated with plastic cap
Versions one- or two-sided-adjustable, not adjustable
Dimensions 42 to 60 mm

CFI.

Double hinges for aluminium profiles
Material technopolymer, nickel-plated steel rotation pins; centering inserts for slots (8 or 10 mm)
Assembly through holes
Dimension 36 mm

GN 129

Hinges
Material steel, zinc-plated
Versions with 2 or 3 parts
Rotation pin nickel-plated brass
Dimensions 25.6 to 49 mm

13 Latches

GN 115

Locks

Material zinc alloy die-cast or stainless steel
Versions with triangular or square spindle, slot, double bit, star knob, wrench or T-handle
Latch distance 4 to 50 mm

GN 218

Cam latches

Material sintered steel
Versions with left or right turn clamping direction
Dimensions 35 to 80 mm

CSMT-A

Antirotation locks

Material technopolymer handle and stator; zinc alloy rotor
Versions locks with the same or with different combinations
Dimension 50 mm

CMT.AE-VO

Latches with fold-away knob

Material CMT. self-extinguish technopolymer SBR rubber sealing washer; zinc-plated steel self-tapping screw
Rotation 90°
Dimensions 32 to 35.5 mm

CQT.AE-V0

Door locks

Material self-extinguish technopolymer SBR rubber sealing washer; zinc-plated steel self-tapping screw
Rotation 90°
Dimension 32 mm

CLT.

Latches with handle

Material technopolymer, zinc-alloy handle shank
Versions keys for locks with the same or different combinations or with two-wings profiled insert
Dimension 157 mm

GN 119

Door locks

Material zinc pressure die-cast or stainless steel
Versions with triangular or square spindle, with double bit or with star knob
Clamp range 17 to 65 mm

GN 115.1

Mini-Locks

Material zinc pressure die-cast, chrome-plated
Versions with triangular or square spindle, slot, wrench or loackable wrench with key
Latch distance
7.5 to 19.5 mm

CAR.

Rod controls

Material technopolymer or nickel plated zinc-alloy and zinc-plated rod guides
Accessories rod guides and rod guides extensions
Dimension 347 mm

GN 117

Door locks

Material steel, zinc-plated
Knob technopolymer, DIN 6336
Door thickness
1.5 to 12 mm

VC.308

Door locks

Material technopolymer knob; metal components
Versions clockwise or anticlockwise opening, locks with the same or with different combinations
Diameter 40 mm

GN 123

Sheet metal punch

Material hardened steel, suited for punching holes into sheet metal up to 2 mm thickness
Dimensions
14.1 or 20.1 mm

VCK.

Door locks

Material duroplast knob, steel or stainless steel metal components
Versions clockwise or anticlockwise opening.
Diameters 50 to 70 mm

CS.

Latches with lock

Material metal components, straight or bent closing levers for different door thickness
Versions locks with the same or with different combinations

EBR.

Handle with safety locking device

Material technopolymer handle, stainless steel pin. Technopolymer keys with anti-intrusion-profiled stainless steel insert
Centre distance 132 mm

BOCK.

Door locks

Material technopolymer key, steel or stainless steel metal components
Versions clockwise or anticlockwise opening
Diameter 24 mm

CSMT.

Door locks

Material technopolymer handle and stator, chrome-plated zinc alloy rotor
Versions locks with the same or with different combinations
Dimension 50 mm

CKE.

Locking bolt

Material technopolymer, stainless steel lever. Technopolymer keys with anti-intrusion-profiled stainless steel insert
Dimension 54 mm

14 Toggle, power and hook clamps

GN 810 INOX

Vertical clamps with horizontal base

Material zinc-plated steel or stainless steel
Versions with forked or solid clamping arm
Holding force 900 to 4600 N

GN 851.1 INOX

Latch clamps with pulling action

Material zinc-plated steel or stainless steel
Holding force 1600 to 7000 N

GN 864

Power clamps

Material black-oxide steel
Air pressure max. 10 bar
Holding force 4070 to 13300 N
Piston size 20 to 50 mm

GN 820 INOX

Horizontal clamps with horizontal base

Material zinc-plated steel or stainless steel
Versions with forked or solid clamping arm
Holding force 400 to 6200 N

GN 852 INOX

Latch clamps – Heavy duty type

Material black-oxide forged steel or stainless steel
Versions with fixing holes or for welding
Holding force 14000 to 28000 N

GN 821 INOX

Hook clamps

Material zinc-plated steel or stainless steel
Versions with or without safety catch, for safety with padlock or with lock
Holding force 4000 N

GN 842

Plunger clamps for push-pull clamping

Material zinc-plated steel with brass or black oxide steel base
Holding force 1200 to 45000 N

GN 860

Pneumatically operated clamps

Material zinc-plated steel
Versions with forked or solid clamping arm
Holding force 700 to 3000 N

GN 831 INOX

Hook clamps

Material zinc-plated steel or stainless steel
Versions with or without self-locking safety catch, or for safety with padlock
Holding force 1000 N

GN 844

Plunger clamps for push-pull clamping

Material zinc-plated steel with black oxide brass base
Versions right or left turn clamping action
Holding force 900 to 1300 N

GN 890

Pneumatically operated plunger clamps for push-pull applications

Material black-oxide/ zinc-plated steel
Holding force 1200 to 25000 N

TLA. INOX

Hook clamps

Material zinc-plated or stainless steel
Special Versions unplated or nickel-plated steel, padlock holes or security stop; different catch brackets
Dimension 193.5 mm

GN 850

Hook clamps with pulling action

Material zinc-plated steel
Versions with pulling plunger or pulling hook
Holding force 2000 to 4000 N

GN 807 INOX

Clamping bolts

Material zinc-plated steel or stainless steel
Versions with or without protective cap
Dimensions M4 to M14
Length 23 to 128 mm

TLF. INOX

Adjustable hook clamps

Material zinc-plated or stainless steel
Special Versions unplated or nickel-plated steel; different catch brackets
Dimension 138 to 150 mm

GN 851 INOX

Latch clamps with pulling action

Material zinc-plated steel or stainless steel
Holding force 1600 to 7000 N

GN 708.1 INOX

Clamping bolts

Material zinc-plated steel or stainless steel
Pressure pad neoprene, bonded to the stud
Dimensions M5 to M10
Length 45 to 77 mm

TLI. INOX

Hook clamps

Material zinc-plated or stainless steel
Special Versions unplated steel or nickel-plated steel
Dimension 90 mm

15 Accessories for hydraulic systems

TN.

Plugs

Material black technopolymer, NBR packing ring
Max. temperature 130°C
Threadings G1/8" to G1 1/2", M10x1.5 to M40x1.5

SFP.

Breather caps with splash guard

Material technopolymer, NBR packing ring
Max. temp. 100°C/120°C
Diameters 30 to 70 mm
Threadings G1/4" to G2" M16x1.5 to M22x1.5

HFTX.

Oil level indicators

Material transparent technopolymer, aluminium contrast screen, NBR packing ring
Max. temperature 110°C
Threadings G1/4" to G1 1/4", M16x1.5 to M40x1.5

TCD. TSD.

Plugs

Material black or red technopolymer, NBR packing ring; "Fill" (TCD) or "Drain" (TSD) symbol
Max. temperature 130°C
Threadings G1/8" to G1 1/2", M10x1.5 to M40x1.5

SFV.

Valve breather caps

Material technopolymer, NBR packing ring, Safety valve set at 0.010 or 0.100 bar
Max. temperature 120°C
Threadings G1/4" to G1", M16x1.5 to M22x1.5

GN 743

Oil level indicators

Material aluminium, brass or stainless steel, float-glass or ESG-glass window
Max. temperature 100°C or 180°C
Threadings M16x1.5 to M42x1.5, G3/8" to G1 1/2"

T.440

Plugs

Material black technopolymer, NBR packing ring
Flat dipstick T.440+a
Max. temperature 120°C
Threadings G1/4" to G1 1/2"

SFW.

Double-valve breather caps

Material technopolymer, NBR packing ring, Safety (0.350) and suction (0.030 bar) valves
Max. temperature 100°C
Threadings G3/4 "to G1 1/4"

GN 743.6

ATEX-Level indicators

Material aluminium, ESG-glass window, FPM packing ring
Max. temperature 150°C
Threadings M16x1.5 to M27x2, G3/8" to G3/4"

TMA.

Magnetic plugs

Material aluminium, NBR packing ring
Max. temperature 130°C
Threadings G1/4" to G3/4"

SMW.BA

Double-valve breather caps with basket

Material chrome- and zinc-plated steel Safety (0.350) and suction (0.030 bar) valves
Max. temperature 115°C
Dimension 80 mm

HGFT.HT-PR

Oil level indicators

Material black or red technopolymer, prismatic transparent window, NBR packing ring
Max. temperature 140°C, 7 bar pressure
Threadings G1/2 " to G1"

GN 749

Plugs with hexagon socket for application with high pressures

Material steel, zinc-plated
Max temperature 100°C or 180°C
Threadings M8x1 to M48x2, G 1/8" to G 1 1/2 "

FRF+C FRB+C

Flange

Material technopolymer or in zinc-plated steel flange with technopolymer basket, Threaded (G1 1/4") or with bayonet steel attachment

HCFE.

Oil circulation sights

Material transparent technopolymer, NBR packing ring
Max. temperature 110°C
Threadings G3/8" to G1 1/4"

SFN.

Breather caps

Material technopolymer, NBR packing ring
Max. temperature 120°C (100°C with air filter)
Diameters 30 to 70 mm
Threadings G1/4" to G2"

HGFT.

Oil level indicators

Material black or red technopolymer, transparent window, aluminium contrast screen, NBR packing ring.
Max. temperature 100°C, 3 bar pressure
Threadings G3/8" to G2"

HE.

Oil level indicators push-fit

Material transparent polycarbonate, aluminium contrast screen, NBR packing ring
Max. temperature 100°C
Diameters 18 to 47mm

HCX.

Column level indicators

Transparent technopolymer, NBR or FKM O-rings, aluminium contrast screen, zinc-plated or st. steel screws
Max. temperature 90°C
Centre dist. 76 to 254 mm

HCX/E+STL

Column level indicators

MIN level sensors and temperature electrical probe, transparent technopolymer
Features see HCX
Swivelling two-pin connectors
Centre dist. 127 mm

HCX/VT

Column level indicators

Transparent technopolymer NBR O-rings, aluminium contrast screen, technopolymer screws
Max. temperature 90°C
Centre dist. 76 to 254 mm

HCY/E+ST

Column level indicators

MIN level MAX temperature electrical sensors, transparent technopolymer, nickel-plated brass screws, NBR O-rings
Centre dist. 76 to 254 mm

HCX.INOX-BW

Column level indicators

Hot water resistant transparent technopolymer FKM O-rings, aluminium contrast screen, st. steel screws, max. temp. 80°C
Centre dist. 76 to 254 mm

HCL.

Column level indicators

U shaped protections, transparent tube with lenticular effect in acryl, zinc-plated steel screws, NBR O-rings, max. temp. 70°C
Centre dist. 300 to 500 mm

HCX/AR

Column level indicators

Alcohol resistant transparent technopolymer, NBR O-rings aluminium contrast screen, zinc-plated steel screws
Max. temperature 80°C
Centre dist. 76 to 254 mm

HCZ-P

Level indicators with protection

Transparent technopolymer NBR O-rings, aluminium contrast screen, zinc-plated steel screws
Max. temperature 90°C
Centre dist. 76 to 127 mm

HCX/P

Column level indicators with protection frame

Transparent technopolymer with zinc-alloy protection frame
Features see HCX
Centre dist. 127 mm

HFL-E HFLT-E

Column level indicators with MIN level electrical sensor

Technopolymer, Stainless steel or technopolymer dipstick, NBR float, threaded coupler or flange with holes for screws
Dimension 500 mm

HCX/E

Column level indicators

MIN level electrical sensor, transparent technopolymer
Features see HCX
Swivelling two-pin connector
Centre dist. 127 mm

16 Tube clamp connectors

GN 131 INOX

Two-way connector clamps

Material aluminium blank or black plastic coated or stainless steel
Versions with clamping screws or adjustable levers
Bores B10 to B18

GN 132

Two-way connector clamps

Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores B20 to B50

GN 133

Two-way connector clamps

Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores B12 to B50

GN 134

Two-way connector clamps, multi part

Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores or square bores
B20 to B50 or V20 to V50

GN 145 INOX

Flanged connector clamps

Material aluminium blank or black plastic coated or stainless steel
Versions with clamping screws or adjustable levers
Bores B10 to B50

GN 162 INOX

Base plate connector clamps

Material aluminium blank or black plastic coated or stainless steel
Versions with clamping screws or adjustable levers
Bores B10 to B50

GN 194

T-angle connector clamps, multi part

Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores or Square bores
B20 to B50 or V20 to V50

GN 241

Tube connectors, split assembly

Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores or Square bores
B20 to B50 or V20 to V50

GN 282

Swivel clamp connector joints

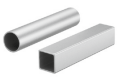
Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores B12 to B50

GN 283

Swivel clamp connector joints

Material aluminium blank or black plastic coated
Versions with clamping screws or adjustable levers
Bores B12 to B50

GN 990 INOX



Construction tubings

Material steel, zinc-plated, aluminium blank or anodised or stainless steel
Round or square diameters
10 to 50 mm or
V10 to V50

GN 992

Threaded tube inserts for Construction tubings GN 990

Material aluminium
For round or square tube diameters 20 to 50 mm or V20 to V50 (ø 10 to 18 available in plastic GN 991)

GN 291

Linear actuators

Material precision steel tube, chrome-plated, stainless steel upon request
Versions right and/or left hand thread
Standard travel lengths
65 to 320 mm

GN 131.1 INOX

Linear actuator connectors

Material aluminium black plastic coated or stainless steel
Versions with clamping screws or adjustable levers
Bores B18 to B50

GN 473

Foot clamp mountings

Material aluminium black anodized or matt ground
Versions with clamping screws or adjustable levers
Bores B8 to B20

GN 475

Twistable two-way clamp mountings

Material aluminium black anodized or matt ground
Versions with clamping screws or adjustable levers
Bores B8 to B16

GN 479

Sensor holders

Material stainless steel, matt shot-blasted
Versions with several bores
Bores B8 to B18

GN 480.1 INOX

Retaing rods/tubings

Material aluminium or stainless steel
Versions rods, tubings or squares with or without scale
Diameters rods, tubings
D8 to D20
Dimension squares V10 to V16

17 Castors and wheels

RE.FF

Injected polyurethane wheels

Cover Injected polyurethane
Centre Technopolymer
Bracket Zinc-plated steel or stainless steel
Diameters 80 to 150 mm
Load* 1200 to 3500 N

RE.F5

Mould-on polyurethane wheels

Cover Mould-on polyurethane
Centre Die-cast aluminium
Bracket Zinc-plated steel
Diameters 80 to 200 mm
Load* 2200 to 8500 N

RE.F8

Monolithic (hard tread) wheels

Cover and Centre Technopolymer
Bracket Zinc-plated steel or stainless steel
Diameters 65 to 150 mm
Load* 200 to 5000 N

RE.G1

Thermoplastic rubber wheels

Cover Grey anti-trace thermoplastic
Centre Technopolymer
Bracket Zinc-plated steel
Diameters 80 to 150 mm
Load* 700 to 1800 N

RE.E2

Vulcanised rubber wheels

Cover Vulcanised rubber NBR
Centre Technopolymer
Bracket Zinc-plated steel
Diameters 80 to 200 mm
Load* 650 to 2250 N

RE.E3

Vulcanised rubber wheels

Cover Vulcanised rubber NBR
Centre Two zinc-plated and riveted disks.
Bracket Zinc-plated steel
Diameters 80 to 200 mm
Load* 650 to 2300 N

RE.C7

Rubber wheels for the general public

Cover Grey anti-trace vulcanised rubber
Centre Technopolymer
Bracket zinc-plated steel
Diameters 50 to 80 mm
Load* 350 to 550 N

18 Retaining magnets

GN 50.1

Retaining magnets without thread

Material Steel
Magnets HF, SC, ND
Adhesive forces 5 to 1300 N
Diameter 6 to 125 mm

GN 58

Pot magnets with bore

Material Steel
Magnets AN
Adhesive forces 30 to 80 N
Diameter 19 to 38 mm

GN 54.1

Retaining magnets smooth finish

Material Steel
Magnets SC, ND
Adhesive forces 8 to 700 N
Diameter 6 to 32 mm

GN 50.3

Retaining magnets with threaded stud

Material Steel
Magnets HF, ND
Adhesive forces 4 to 350 N
Diameter 10 to 63 mm

GN 51.2

Retaining magnets with rubber jacket; with female thread

Material Steel
Magnets ND
Adhesive forces 10 to 420 N
Diameter 12 to 88 mm

GN 52.2

Retaining magnets with female thread

Material Steel
Magnets AN, ND
Adhesive forces 2 to 1300 N
Diameter 6 to 63 mm

GN 50.2

Retaining magnets with female thread

Material Steel
Magnets HF, SC, ND
Adhesive forces 5 to 1300 N
Diameter 6 to 125 mm

GN 51.5

Retaining magnets with rubber jacket with female thread

Material Steel
Magnets ND
Adhesive forces 35 to 420 N
Diameter 22 to 88 mm

GN 52.3

Retaining magnets with female thread

Material Steel
Magnets AN
Adhesive forces 20 to 150 N
Diameter 12,5 to 35 mm

GN 50.25

INOX Stainless Steel

Retaining magnets with female thread

Material Stainless Steel
Magnets HF
Adhesive forces 32 to 280 N
Diameter 25 to 63 mm

GN 51.3

Retaining magnets with rubber jacket with threaded stud

Material Steel
Magnets ND
Adhesive forces 50 to 420 N
Diameter 22 to 88 mm

GN 52.4

Retaining magnets with stud

Material Steel
Magnets AN, ND
Adhesive forces 2 to 1300 N
Diameter 6 to 63 mm

GN 50.4

Retaining magnets with bore

Material Steel
Magnets HF
Adhesive forces 14 to 680 N
Diameter 16 to 100 mm

GN 51.4

Retaining magnets with rubber jacket with bore

Material Steel
Magnets ND
Adhesive forces 35 to 210 N
Diameter 22 to 66 mm

GN 60

Button-type magnets with bore

Material Steel
Magnets AN
Adhesive forces 7 to 66 N
Diameter 13 to 33 mm

GN 50.45

INOX Stainless Steel

Retaining magnets with bore

Material Stainless Steel
Magnets HF
Adhesive forces 22 to 230 N
Diameter 20 to 63 mm

GN 52.1

Retaining magnets smooth finish

Material Steel
Magnets AN, ND
Adhesive forces 2 to 660 N
Diameter 4 to 63 mm

GN 62

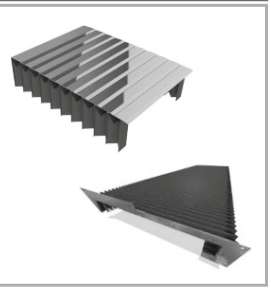
U-Magnets with bore

Material Steel
Magnets AN
Adhesive forces 45 to 470 N
Diameter 22 to 79 mm

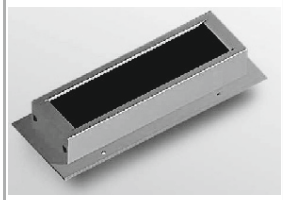
Protection, Clamp & Lighting Systems

HEMA
MASCHINEN- UND APPARATESCHUTZ GMBH

Protection and Wieving Systems



Lighting Systems



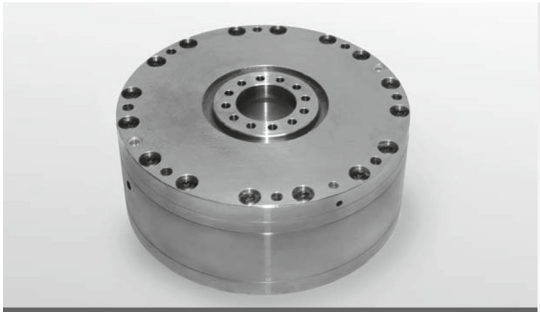
Clamping Systems

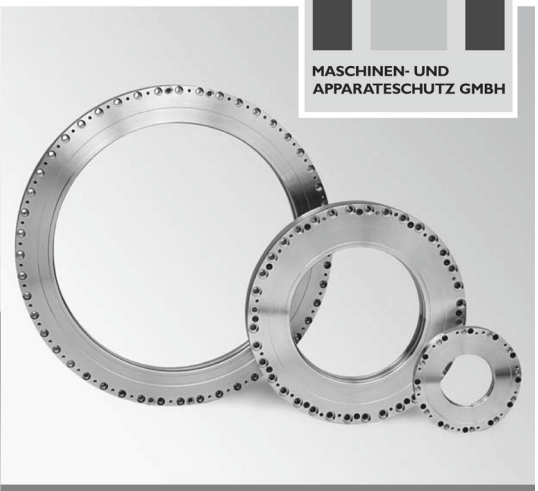
endo

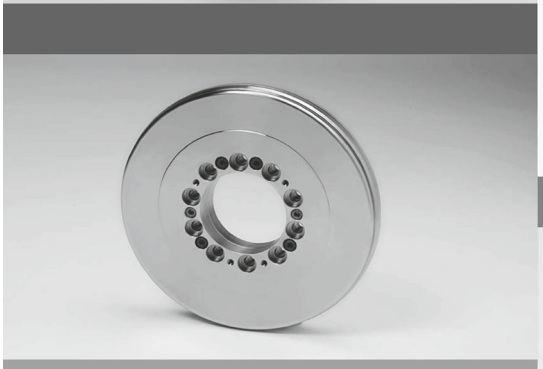
HEMA

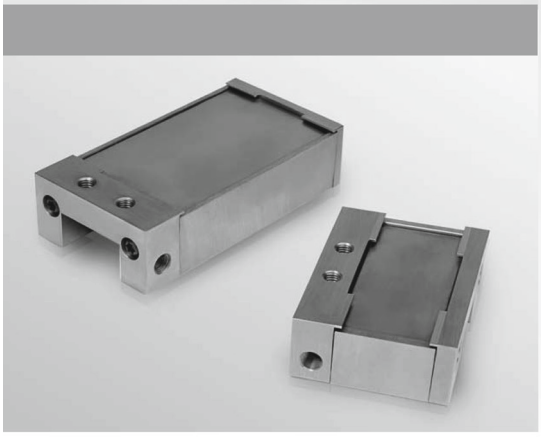
Clamping Systems

HEMA
MASCHINEN- UND APPARATESCHUTZ GMBH





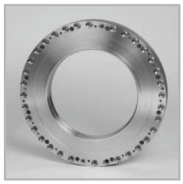




PROTECTION | CLAMPING & BRAKING | VISION | SERVICE

Product finder

RotoClamp/DiskClamp



RotoClamp
Inside
4 or 6 Bar

- RotoClamp A
  Clamping with air
  - RotoClamp
    Single/tandem version
    - RotoClamp SA
    - RotoClamp NA
    - RotoClamp LA
    - RotoClamp YA
- RotoClamp
  Opening with air
  - RotoClamp
    Single/tandem version
    - RotoClamp S
    - RotoClamp N
    - RotoClamp L
    - RotoClamp Y

RotoClamp
Outside
4 or 6 Bar

- RotoClamp A
  Clamping with air
  - RotoClamp
    Single/tandem version
- RotoClamp
  Opening with air
  - RotoClamp
    Single/tandem version

DiskClamp
4 up to 6 Bar

- Clamping with air
- Opening with air

DiskClamp
more than 10 Bar

- Clamping with hydraulic
- Opening with hydraulic

Check list for product selection

Select the solution best suited to you from our wide range of products. The HEMA clamping systems provide an innovative and above all fast and compact solution for the most important applications. When making your selection, please consider whether you want to actively clamp or release using the applied compressed air based on the model. The operating pressure you select decides on the possible clamping force and is important when selecting the model. Tandem versions are available to increase holding forces.

RotoClamp

RotoClamp is ideal for rotary position clamping in axes, tables and swivel heads of machines. Two versions - Inside and Outside - allow various directions of the clamping function.

DiskClamp

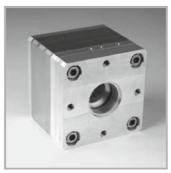
DiskClamp is a security clamping system with emergency brake, to be specified on particular parameters.

Product finder

LinClamp

- LinClamp 4 or 6 Bar
  - LinClamp Clamping with air
    - LinClamp SA Rail clamping
  - LinClamp Opening with air
    - LinClamp Surface or rail clamping
      - LinClamp S Rail clamping
      - LinClamp SK Compact rail clamping
      - LinClamp A Surface clamping 4 Bar

PClamp



- PClamp 4 or 6 Bar
  - PClamp with additional safety device
    - PClamp X in modular design
  - PClamp without additional safety device
    - PClamp N in modular design
    - PClamp ISO in modular design
    - PClamp E

HEMA

LinClamp

For single linear applications in which you do not want to exclude emergency braking, the LinClamp systems with sinter linings are recommended. Of course, you can also use LinClamp for almost all types of linear guide system or for processed surfaces for fast and safe clamping (steel coverings).

PClamp

PClamp clamps and brakes rod loads safely and quickly. It can be adapted to standard systems such as pneumatic cylinders from leading manufacturers (e. g. SMC, Festo) or to individual solutions. Rotary clamping can also be achieved with PClamp. Certified systems from Employer's Liability Insurance Associations can be realised.

RotoClamp/DiskClamp

Advantages

Pneumatic clamping with high forces

**Safety clamping RotoClamp Standard –
If the air supply fails then system clamps**

**The values of hydraulic clamping
are reached and exceeded**

**Low system costs in comparison
to hydraulics**

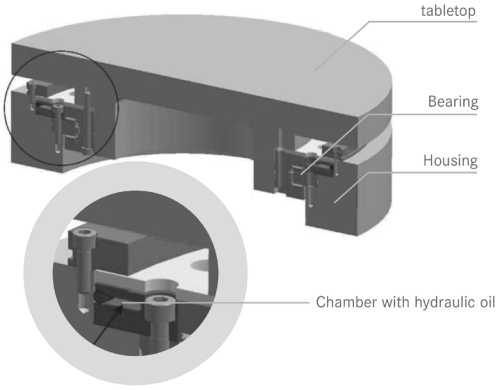
Simple installation

Compact design

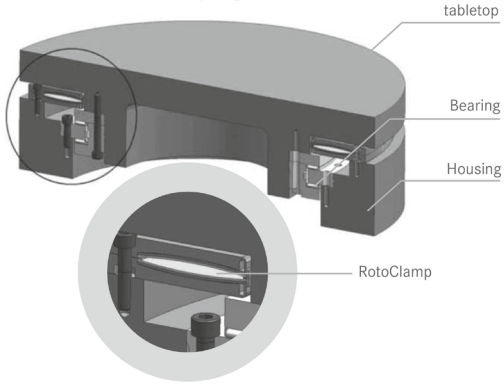
Suitable for all shaft sizes

Comparison of operating principles

Hydraulic clamping



Pneumatic clamping



Operating principle of hydraulic clamping

Function The chamber formed by the expansion ring and the O-ring is supplied with hydraulic oil. The upper ring of the expansion ring is pressed upwards and away elastically and clamps the rotating brake disk between the fixed expansion and counter rings. Standard table sizes with 500 x 500 mm pallets achieve approx. 3000 to 4000 Nm holding torque at 80 to 120 Bar hydraulic pressure.

Safety No safety clamping. If there is a power loss then this axis is no longer clamped.

Reaction times Long and short times with high effort can be achieved.

Costs Precisely manufactured mechanical parts, expensive hydraulic valves, hydraulic piping incl. assembly times, assembly and matching of the mechanical parts; replaceable in part. Safety clamping can only be realised at great effort. Extra material costs of hydraulic vis-à-vis pneumatic. (hydraulic valves, flexible hydraulic lines, piping and screwed joints, relays due to higher rate of power consumption).

Cleanliness hydraulic.

Operating principle of the RotoClamp

Function Clamps with spring actuator. Depressurizing the inner spring diaphragm chamber and ventilating the outer spring diaphragm chamber relaxes the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed elastically in the area of the clamping surface and presses on the shaft. Adding pressurized air to the inner spring diaphragm chamber (4 or 6 Bar) and venting the outer spring diaphragm chamber bends the diaphragm and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is shortened: The clamping surface lifts off from the shaft. You have the optional possibility of increasing the clamping force by extra loading of the outer spring diaphragm chamber with compressed air when clamped (4 or 6 Bar).

Safety Safety clamping by spring actuator. In case of a power loss, the axis is immediately clamped.

Reaction times Very short due to pneumatics. With quick air-vent valve and quick-acting gate valve attached directly to the clamping mechanism, you can realise extremely short clamping times.

Costs Low costs (in comparison to hydraulics), pneumatic valves and pneumatic piping, low installation costs, no cost for matching, easily replaceable, including safety clamp.

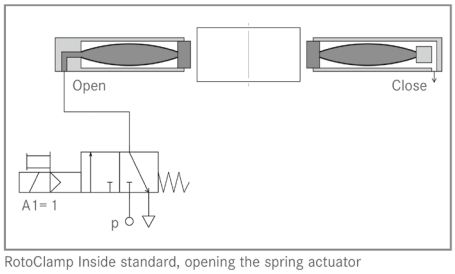
Cleanliness Very clean due to pneumatics.

Materials Clamping-body housing hardened and tempered in tool steel, optional

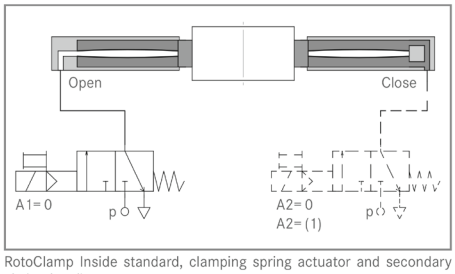
- supported flange joint hardened with case-hardening steel,
- steel coated, alternative lining procedure possible.

Operating principle of the RotoClamp Inside

Function of the RotoClamp Inside



RotoClamp Inside standard, opening the spring actuator



RotoClamp Inside standard, clamping spring actuator and secondary air (optional)

Release RotoClamp Inside

Adding pressurized air to the inner spring diaphragm chamber (open, 4 or 6 Bar) and venting the outer spring diaphragm chamber (close) bends the diaphragm and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is shortened: The clamping element is opened in this state.

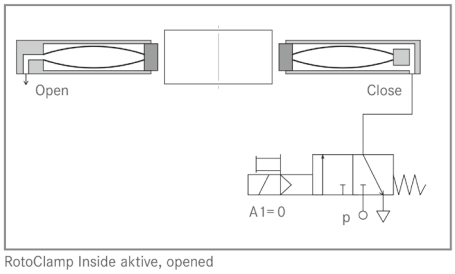
Clamping RotoClamp Inside

Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close) relaxes the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

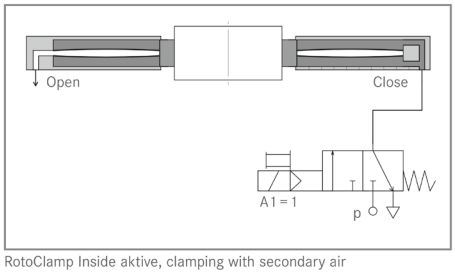
RotoClamp Inside with secondary air

You have the optional possibility of increasing the clamping force by extra loading of the outer spring diaphragm chamber (close) with compressed air (4 or 6 Bar). The clamping element is closed in this state.

Function of the RotoClamp Inside Active



RotoClamp Inside aktive, opened



RotoClamp Inside aktive, clamping with secondary air

Release RotoClamp Inside

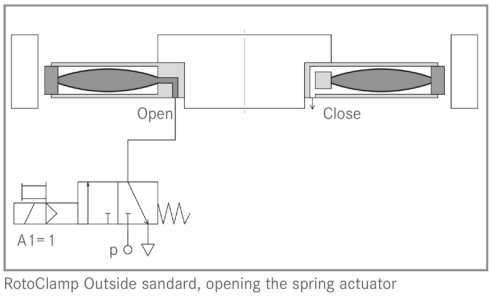
The spring diaphragm is bent on assembly and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is reduced. The clamping element is opened in this state.

Clamping RotoClamp Inside

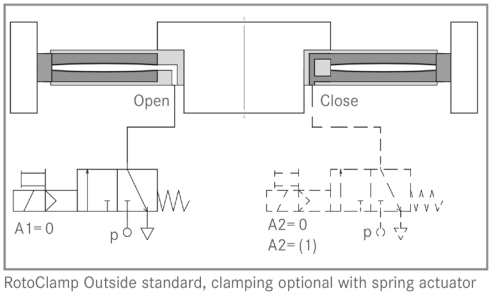
Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close, 4 or 6 Bar) reforms the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

Operating principle of the RotoClamp Outside

Function of the RotoClamp Outside



RotoClamp Outside sandard, opening the spring actuator



RotoClamp Outside standard, clamping optional with spring actuator and secondary air

Release RotoClamp Outside

Adding pressurized air to the inner spring diaphragm chamber (open, 4 or 6 Bar) and venting the outer spring diaphragm chamber (close) bends the diaphragm and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is shortened. The clamping element is opened in this state.

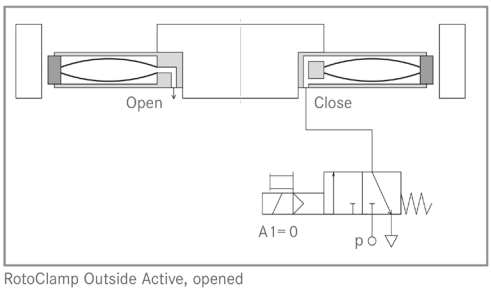
Release (open) RotoClamp Outside

Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close) relaxes the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

Clamping RotoClamp Outside with secondary air

You have the possibility of increasing the clamping force by extra loading of the outer spring diaphragm chamber (close) with compressed air (4 or 6 Bar). The clamping element is closed in this state.

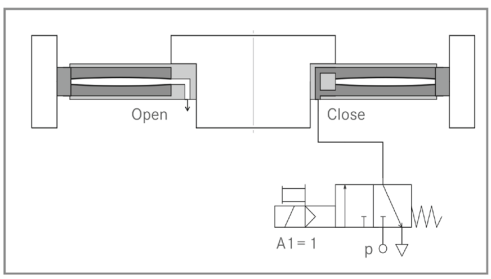
Funktion RotoClamp Outside Active



RotoClamp Outside Active, opened

Release RotoClamp Outside

The spring diaphragm is bent on assembly and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is reduced. The clamping element is opened in this state.



RotoClamp Outside Active, clamping with secondary air

Clamping (close) RotoClamp Outside

Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close) with compressed air (4 or 6 Bar) reforms the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

Compressed air

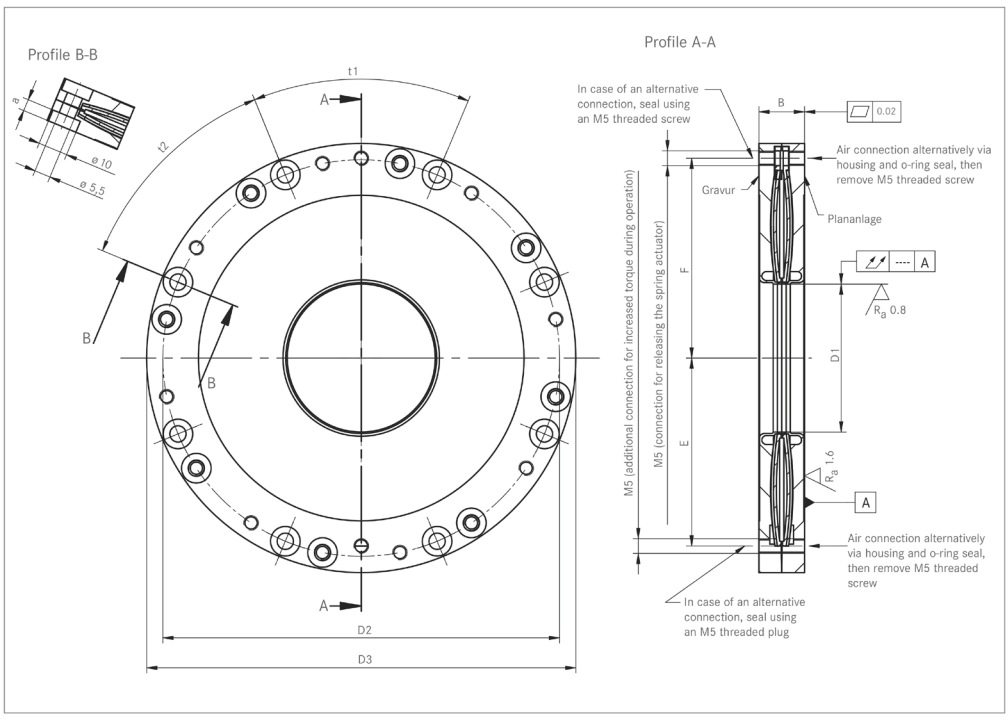
RotoClamp/DiskClamp

Technical Data

Technical Data of the RotoClamp S

Size	D1 opened at rated pressure Pn = 4/6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws M5	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0.03/+0.05	-0.01/-0.025	± 0.1		+0.4												
Roundness	0.01	0,01															
Surface finish	R_a 0.8 µm	R_a 0.8 µm															
RC 50 S	50	50	134	145	15	63.5	67.5	8	4	45	45	60	108	42	76	1.7	20
RC 60 S	60	60	144	155	15	68.5	72.5	8	4	45	45	84	153	59	107	1.9	20
RC 70 S	70	70	154	165	15	73.5	77.5	12	4	30	30	114	210	80	147	2.1	20
RC 80 S	80	80	164	175	15	78.5	82.5	12	4	30	30	150	270	105	189	2.3	20
RC 90 S	90	90	174	185	15	83.5	87.5	12	4	30	30	189	342	132	239	2.5	20

This technical data applies to the RotoClamp S Standard. Data for the RotoClamp S Active is available on request. Data for tandem versions calculable by factor 1.8.

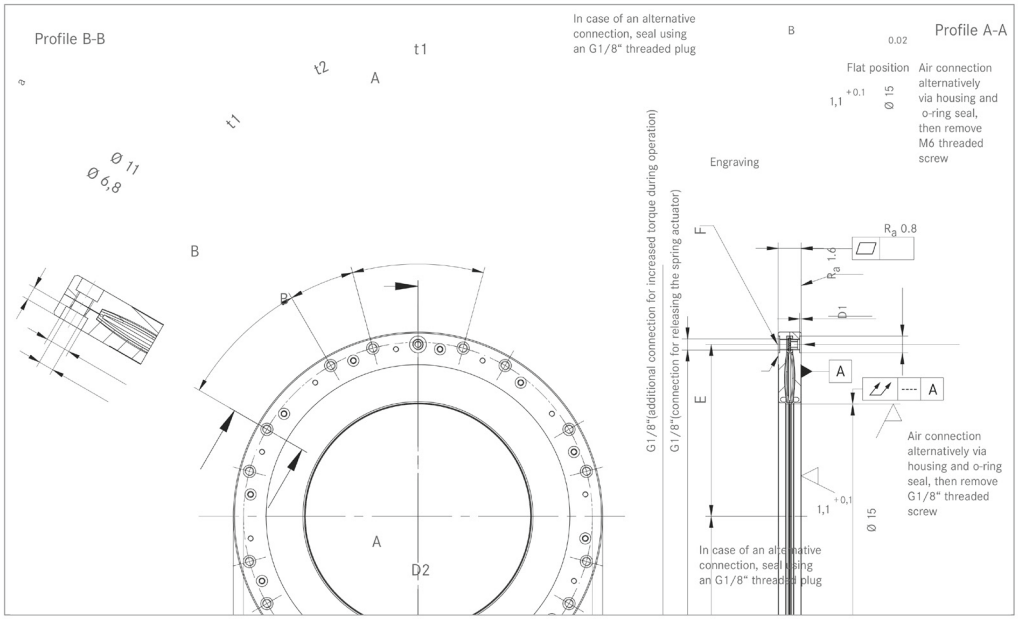


Technical Data

Technical Data of the RotoClamp N

Size	D1 opened at rated pressure Pn = 4/ 6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws M6	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0.04/+0.06	-0.01/-0.025	± 0.1		+0.4												
Roundness	0.01	0.01															
Surface finish	R_a 0.8 µm	R_a 0.8 µm															
RC 100 N	100	100	210	228	16	103	103	12	4	40	20	240	420	168	294	4.1	60
RC 120 N	120	120	230	248	16	113	113	12	4	40	20	336	600	235	420	4.6	60
RC 140 N	140	140	250	268	16	123	123	12	4	40	20	456	840	319	588	5.1	60
RC 160 N	160	160	270	288	16	133	133	12	4	40	20	600	1080	420	756	5.6	60
RC 180 N	180	180	290	308	20	137	143	16	6	30	15	750	1380	525	966	7.7	90
Tolerance	+0.05/+0.07	-0.01/-0.03	± 0.2		+0.4												
Roundness	0.015	0.015															
RC 200 N	200	200	310	328	20	147	153	16	6	30	15	930	1680	651	1176	8,3	90
RC 220 N	220	220	330	348	20	157	163	16	6	30	15	1110	2040	777	1428	8.9	90
RC 240 N	240	240	350	368	20	167	173	24	6	20	10	1350	2400	945	1680	9.5	90
RC 260 N	260	260	370	388	22	177	183	24	6	20	10	1560	2820	1092	1974	11.2	120
RC 280 N	280	280	390	408	22	187	193	24	6	20	10	1800	3240	1260	2268	11.9	120
RC 300 N	300	300	410	428	22	197	203	24	6	20	10	2100	3720	1470	2604	12.6	120
RC 320 N	320	320	430	448	22	207	213	24	6	20	10	2340	4200	1638	2940	13.3	120
RC 340 N	340	340	450	468	22	217	223	24	6	20	10	2580	4680	1806	3276	14.0	120

This technical data applies to the RotoClamp N Standard. Data for the RotoClamp N Active is available on request. Data for tandem versions calculable by factor 1.8.



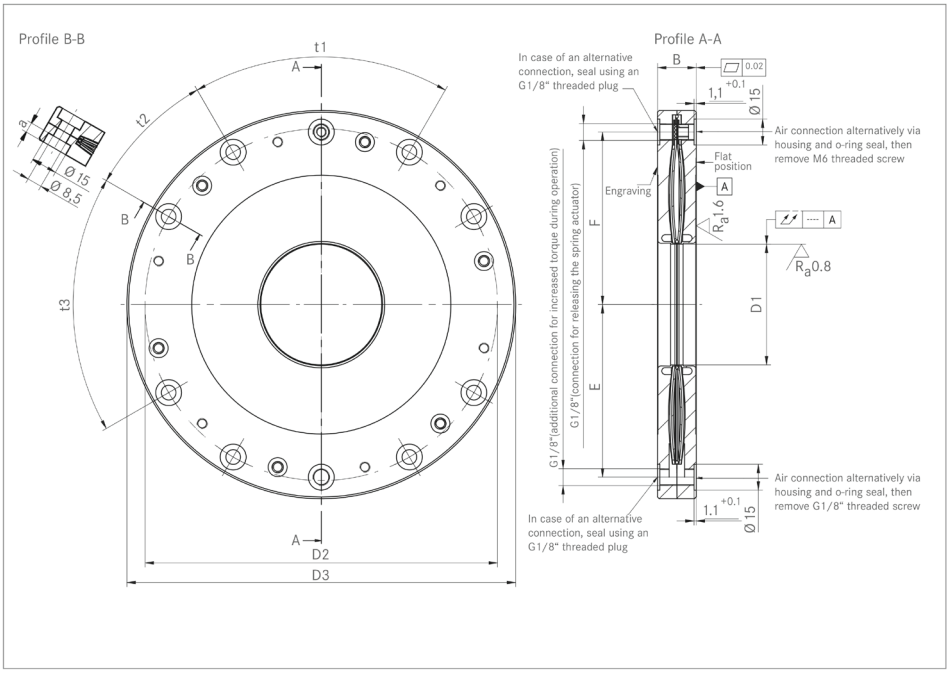
RotoClamp/DiskClamp

Technical Data

Technical Data of the RotoClamp L

Size	D1 opened at rated pressure Pn = 4 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws M8	a	t1	t2	t3	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke.
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[°]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0.04/+0.06	-0.01/-0.025	± 0.1		+0.4											
Roundness	0.01	0.01														
Surface finish	R_a 0.8 µm	R_a 0.8 µm														
RC 70 L	70	70	204	225	22	100	100	8	6	60	30	60	114	210	6.2	50
RC 140 L	140	140	274	295	22	135	135	16	6	30	15	30	456	840	9.1	100
RC 180 L	180	180	314	335	22	155	155	22	6	30	15	15	750	1380	10,8	100
Tolerance	+0.05/+0.07	-0.01/-0.03	± 0.2		+0.4											
Roundness	0.015	0.015														
RC 200 L	200	200	334	355	22	165	165	22	6	30	15	15	930	1680	11.7	100
RC 240 L	240	240	374	395	22	185	185	34	6	20	10	10	1350	2400	13.3	150
RC 280 L	280	280	414	435	22	205	205	34	6	20	10	10	1800	3240	14.9	150
RC 320 L	320	320	454	475	22	225	225	34	6	20	10	10	2340	4200	16.7	150
RC 340 L	340	340	474	495	22	235	235	34	6	20	10	10	2580	4680	17.5	150

This technical data applies to the RotoClamp L Standard. Data for the RotoClamp L Active is available on request. Data for tandem versions calculable by factor 1.8.



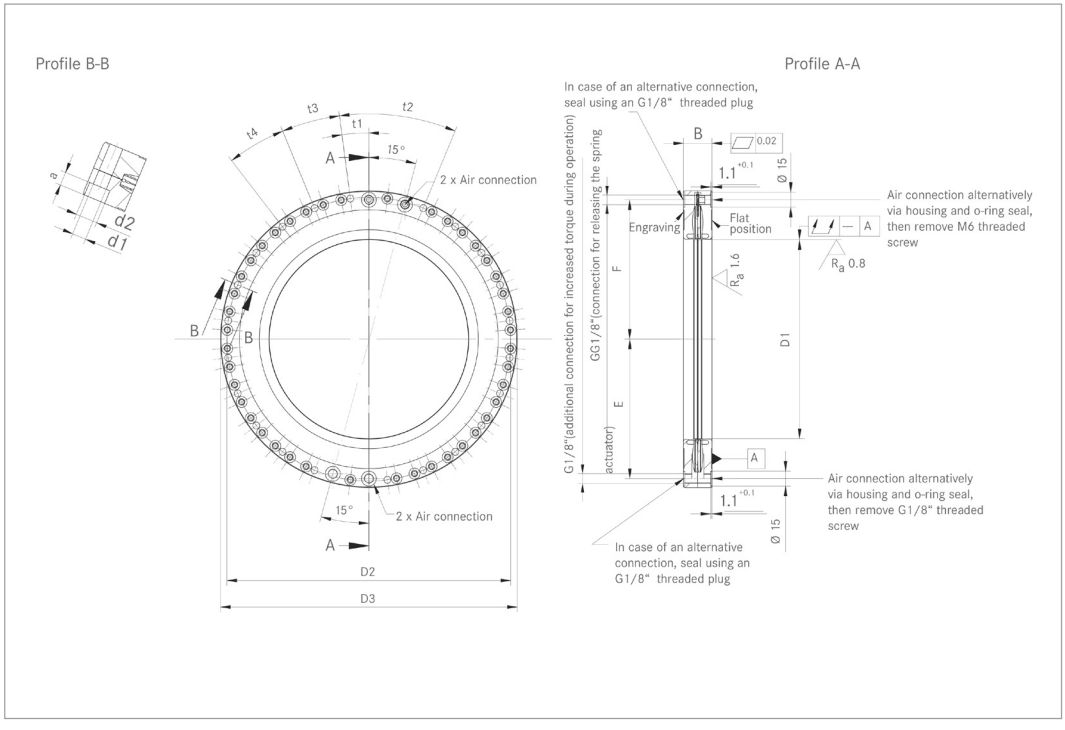
HEMA

Technical Data

Technical Data of the RotoClamp Y

Size	D1 opened at rated pressure Pn = 4 / 6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws	a	d1	d2	t1	t2	t3	t4	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[mm]	[mm]	[°]	[°]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0.05/+0.07	-0.01/-0.03	± 0.2		+0.4																
Roundness	0.015	0.015																			
Surface finish	R_a 0.8 µm	R_a 0.8 µm																			
RC 200 Y	200	200	285	298	28	140	140	22 x M6	6.8	7	11	7.5	30	15	15	600	1000	420	700	8.5	100
RC 260 Y	260	260	365	383	30	183	183	24 x M8	9.0	9	15	5	10	20	10	1600	2900	1120	2030	14.5	100
RC 325 Y	325	325	430	448	30	215	215	24 x M8	9.0	9	15	5	10	20	10	2300	4100	1610	2870	17.5	120
Tolerance	+0.05/+0.07	-0.01/-0.03	± 0.2		+0.4																
Roundness	0.020	0.015																			
RC 395 Y	395	395	505	523	36	252.5	252.5	48 x M8	9	9	15	3.75	7.5	7.5	7.5	3300	6100	2310	4270	26	160
Tolerance	+0.06/+0.08	-0.01/-0.03	± 0.2		+0.4																
Roundness	0.020	0.015																			
RC 460 Y	460	460	580	598	36	290	290	48 x M8	9	9	15	3.75	7.5	7.5	7.5	4600	8400	3220	5880	32	240

This technical data applies to the RotoClamp Y Standard. Data for the RotoClamp Y Active is available on request. Data for tandem versions calculable by factor 1.8.



HEMA

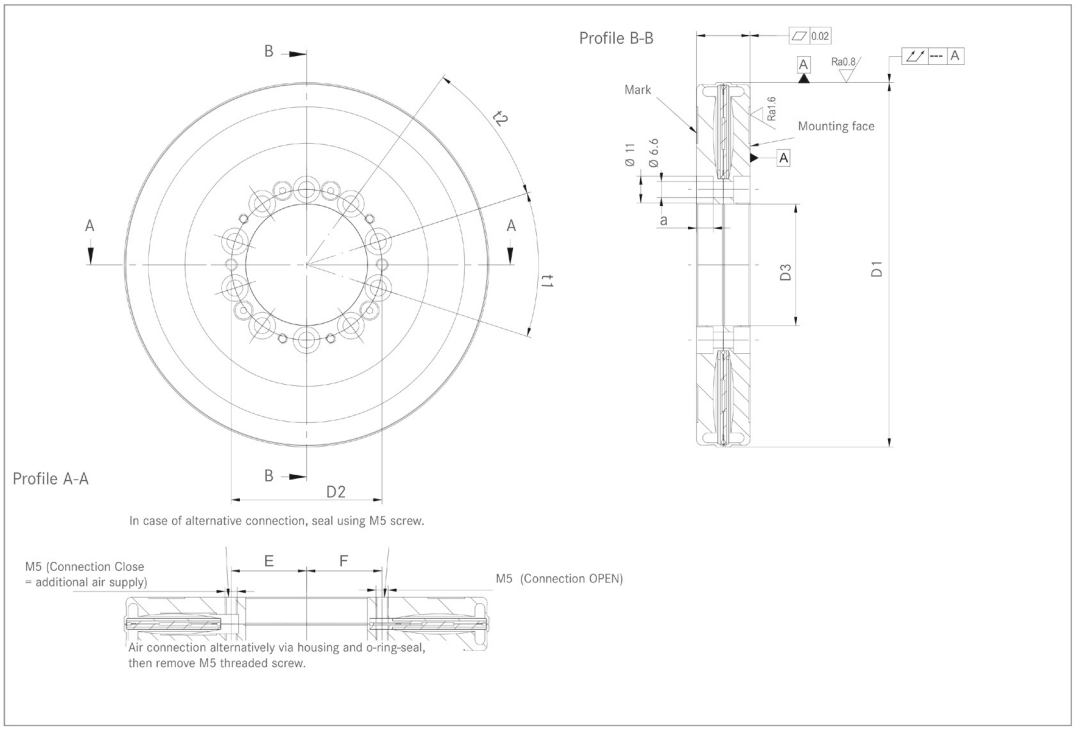
RotoClamp/DiskClamp

Technical Data

Technical Data of the RotoClamp Outside S

Size	D1 opened at rated pressure Pn = 4/6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	max. Mass	Air requirements per max stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	-0.035/-0.05	+0.01/+0.025	± 0.1		+0.4												
Roundness	0,01	0,01															
Surface finish	R_a 0.8 µm	R_a 0.8 µm															
RCO 150 S	150	150	62	50	22	31	31	10 x M6	6.8	36	36	250	460	170	320	2	20
RCO 170 S	170	170	82	20	22	41	41	12 x M6	6.8	30	30	359	650	251	454	2.2	25

This technical data applies to the RotoClamp S Standard. Data for the RotoClamp S Active is available on request.Data for tandem versions calculable by factor 1.8.



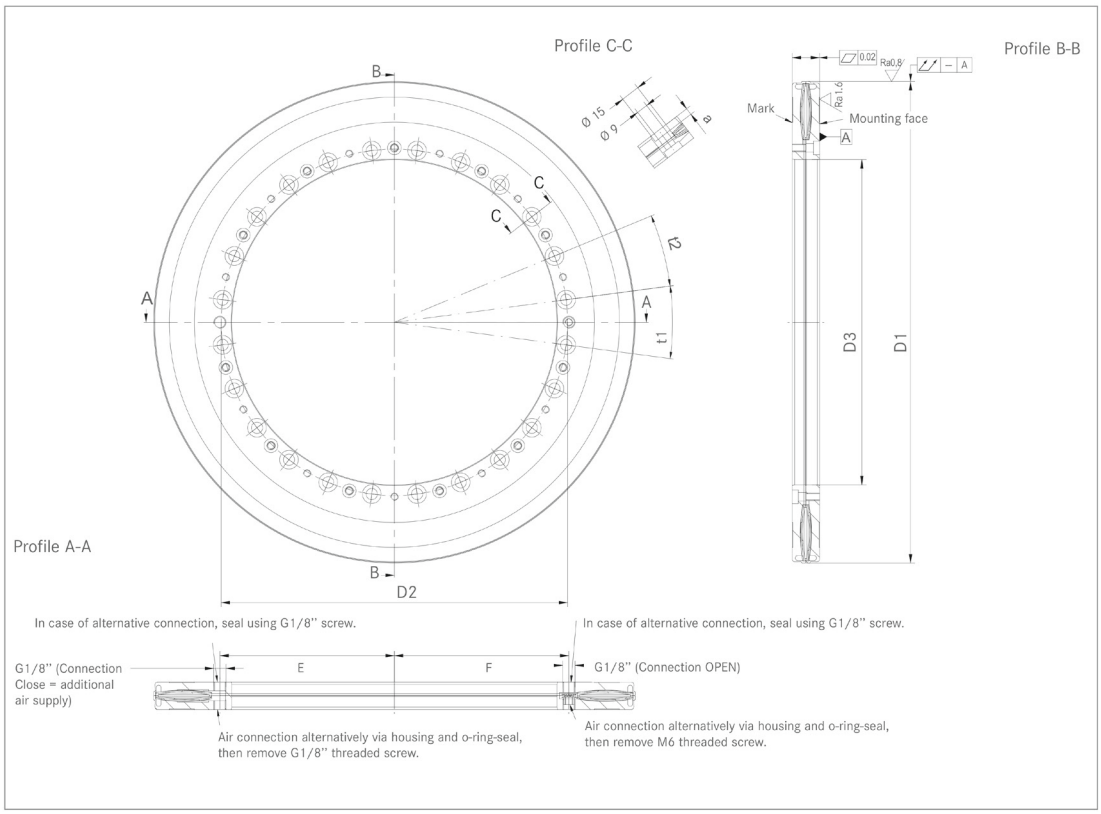
HEMA

Technical Data

Technical Data of the RotoClamp Outside N

Size	D1 opened at rated pressure Pn = 4/6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Mase max.	Air require-ments per max stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	-0.045/-0.065	+0.01/+0.03	± 0.1		+0.4												
Round-ness	0.015	0.015															
Surface-finish	R_a 0.8 µm	R_a 0.8 µm															
RCO 195 N	195	195	87	70	22	44.5	44.5	10 x M8	5.5	36	36	456	819	328	573	3.1	60
RCO 255 N	255	255	147	130	22	74.5	74.5	16 x M8	5.5	22.5	22.5	1080	1944	756	1361	4.5	80
RCO 315 N	315	315	207	190	22	104.5	104.5	18 x M8	5.5	20	20	1887	3468	1321	2428	6.1	100
RCO 385 N	385	385	277	260	22	139.5	139.5	24 x M8	5.5	15	15	3100	5500	2100	3800	7	120

This technical data applies to the RotoClamp N Standard. Data for the RotoClamp N Active is available on request. Data for tandem versions calculable by factor 1.8.



HEMA

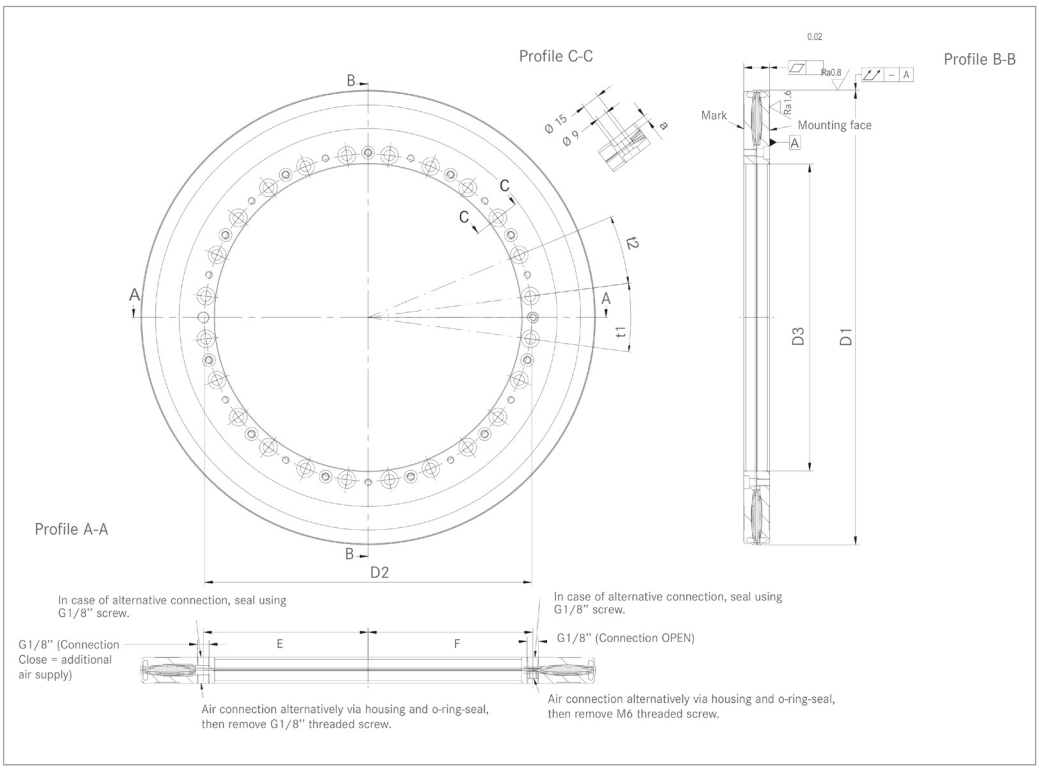
RotoClamp/DiskClamp

Technical Data

Technical Data of the RotoClamp Outside XL

Size	D1 opened at rated pressure Pn = 4 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws	a	t1	t2	Elastic holding torque at 0 Bar Pn = 4Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Mass max.	Air require-ments per max stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	-0.04/-0.055	+0.01/+0.03	± 0.1		+0.4										
Round-ness	0,02	0,02													
Surface finish	R_a 0.8 µm	R_a 0.8 µm													
RCO 520 XL	520	520	365	340	30	182.5	182.5	24 x M10	8	15	15	3900	6500	22	30

This technical data applies to the RotoClamp XL Standard. Data for the RotoClamp XL Active is available on request. Data for tandem versions calculable by factor 1.8.



HEMA

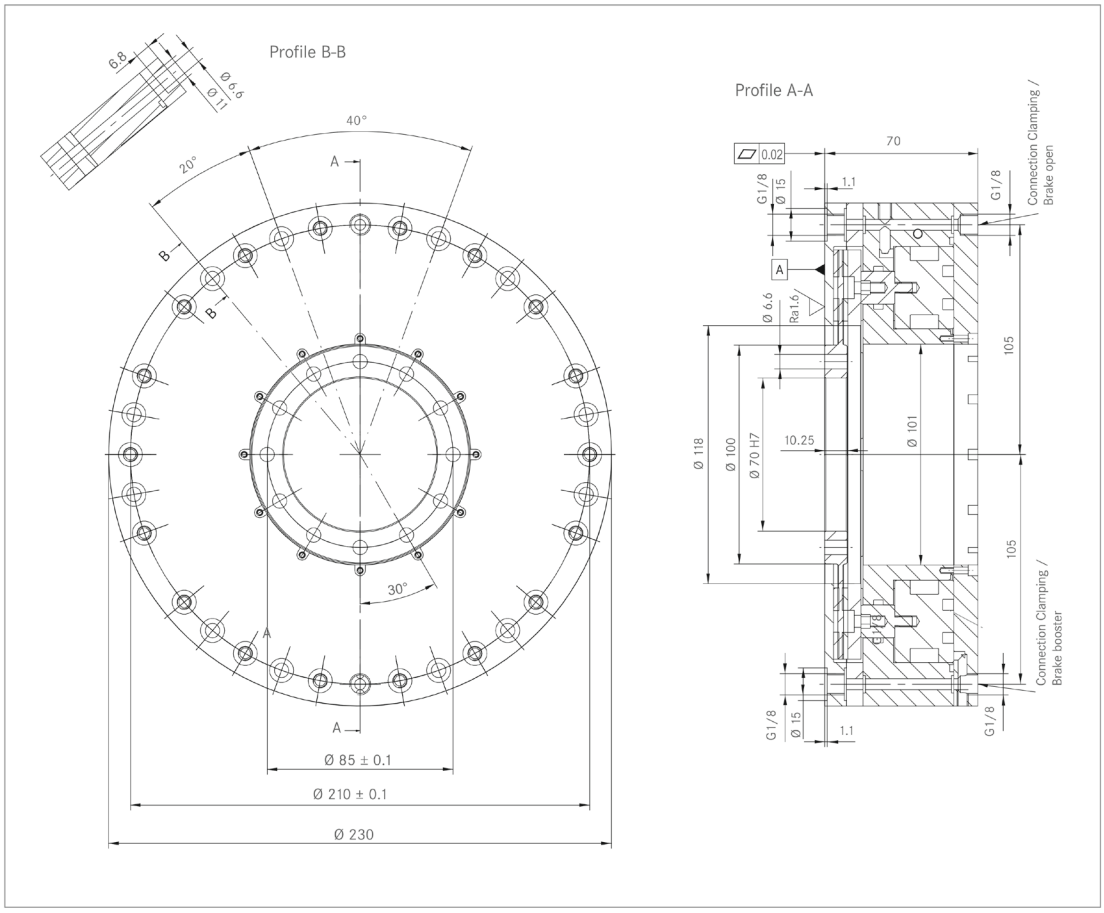
Technical Data

DiskClamp - Security clamping system with Emergency brake

Technical Data of the DiskClamp

Size	Brake clamping torque at 0 Bar Pn = 6 Bar	Brake clamping torque with booster at 6 Bar Pn = 6 Bar	Brake clamping torque at 0 Bar Pn = 4 Bar	Brake clamping torque with booster at 4 Bar Pn = 4 Bar	Mass Brake disk	Mass max.	Air requirements per max stroke
Unit	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[kg]	[mL]
DC 100	240	420	160	290	0.65	15	60

This technical data applies to the DiskClamp clamping with air. Data for hydraulic systems on request.

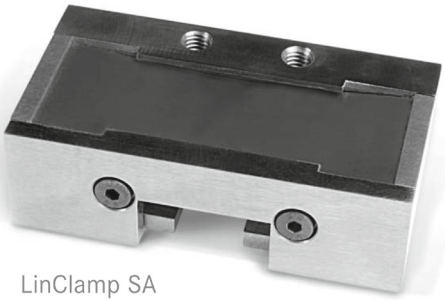


HEMA

LinClamp

LinClamp S

LinClamp S flat



LinClamp SA

LinClamp SK

LinClamp A

LinClamp

Advantages

Suitable for almost all sizes and manufacturers of linear guide systems as well as for surfaces (LinClamp A)

Compact design, suitable for high and low carriages, simple installation

Compatible to other rail clamping systems

Pneumatic clamping or braking of the highest forces

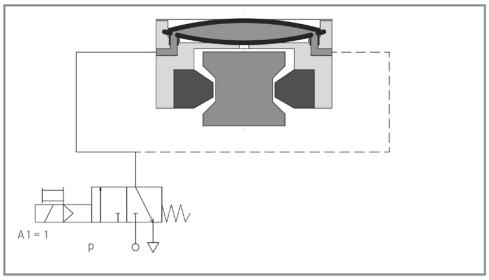
Optimum safety clamping, failure of pneumatics results in clamping

Low system costs in comparison to hydraulics and electronic solutions

Special linings for clamping without loss of holding power for linear guides with grease lubrication.

Operating principle of the LinClamp

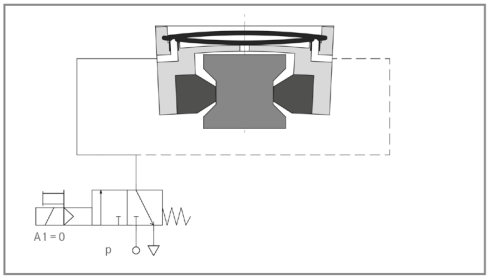
Function of the LinClamp S/SK



LinClamp S/ SK, opening with spring air

LinClamp S/SK released

Compressed air is applied to the chamber between the two spring steel diaphragms. This deforms the spring steel sheets elastically and shortens them in the horizontal direction. The clamp body is deformed in such a way that it contacts at the top with the spring steel sheets and expands at the bottom around the brake shoes. This lifts the brake shoes from the rail and it can be moved freely.

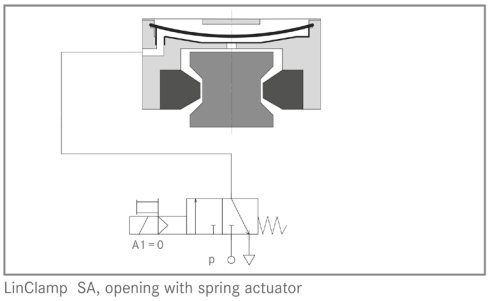


LinClamp S/SK, clamping with spring actuator

LinClamp S/SK clamped

The chamber between the two spring steel diaphragms is vented. The spring steel sheets spring back to their normal position and expand the upper part of the clamping body. However, this expansion at the top simultaneously leads to a narrowing at the bottom. This narrowing causes the brake shoes to press against the rail and to clamp it.

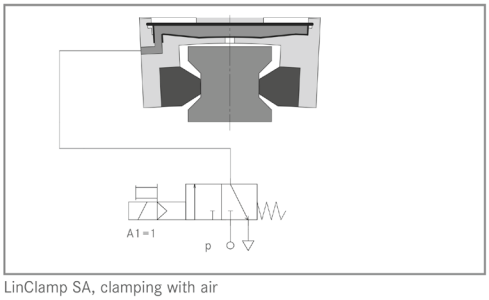
Function of the LinClamp SA



LinClamp SA, opening with spring actuator

LinClamp SA released

Venting causes the sheet to spring back and splays out the clamping body below the slide way. The base plate, which has previously been reformed elastically, now springs back to its starting position. It is thereby narrower above the cross web and wider beneath it. The brake shoes lift off from the rail. Operating pressure 4 to 6 Bar.



LinClamp SA, clamping with air

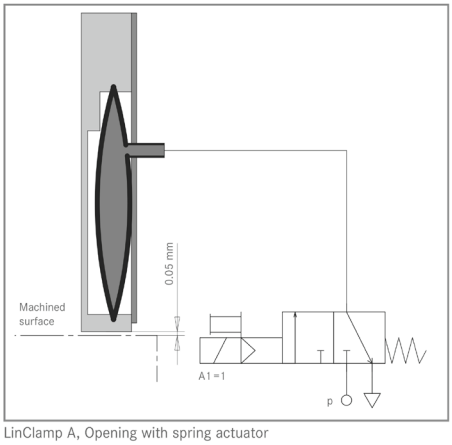
LinClamp SA clamped

To activate the clamping mechanism, the chamber below the spring steel sheet is filled with compressed air. The prestressed spring steel sheet is thereby pressed upwards and simultaneously stretched. Simultaneously, the lower part of the clamping body is narrower over the cross web as pivot point. This presses the brake shoes against the rail.

Compressed air

Operating principle of the LinClamp

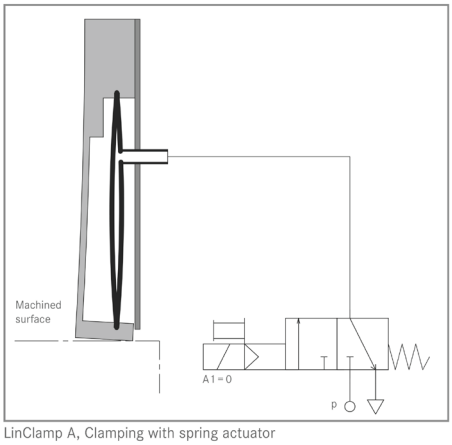
Function of the LinClamp A



LinClamp A, Opening with spring actuator

LinClamp A released

Compressed air is applied to the chamber between the two spring steel diaphragms. This elastically deforms the spring steel sheets and the entire system contracts. This contraction causes the clamping jaw to lift from the base frame - the carriage can now be moved freely. The gap between the clamping jaws and the frame at an operating pressure of 4 Bar is 0.05 mm. The distance between the carriages and the frame remains constant due to the high accuracy of the precision rails; the gap of 0.05 mm is therefore not a problem.



LinClamp A, Clamping with spring actuator

LinClamp A clamped

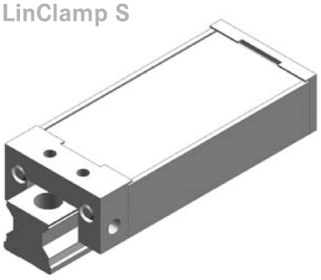
The chamber between the two spring steel diaphragms is vented. The energy stored in the spring steel sheets causes the clamping element to expand towards the machine frame. When the clamping jaws touch the machine frame, a large part of the energy is still within the spring actuator - the carriage is clamped.

HEMA

Compressed air

Product overview

LinClamp S

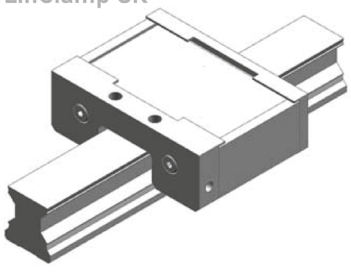


Applications directly over linear guides. Long, slender design, passive.

Consisting of a single-piece clamping body and two spring plates including air chamber, any adaptations on linear guide rails. Available as a clamp or brake for high or low linear guide carriages, for 4 or 6 Bar.

Sizes 15-65, retaining forces 540-10,000 N, special solutions like air connection from above or special screw attachment points on request.

LinClamp SK

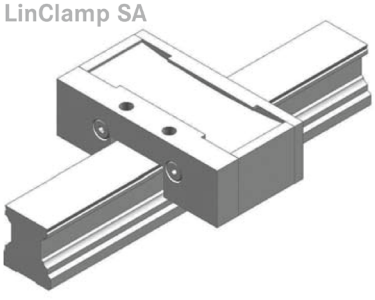


Applications directly over linear guides. Wide, short design, passive.

Consisting of a single-piece clamping body and two spring plates including air chamber, any adaptations on linear guide rails. Available as a clamp or brake for high or low linear guide carriages, for 4 or 6 Bar.

Sizes 15-55, retaining forces 300-2100 N, special solutions like air connection from above or special screw attachment points on request.

LinClamp SA



Applications directly over linear guides. Wide, short design, active.

Consisting of a single-piece clamping body and a spring plate including airbag, any adaptations on linear guide rails, available as a clamp or brake for high or low linear guide carriages, for 4 or 6 Bar.

Sizes 20, 25, and 35, retaining forces 390-1250 N. Special solutions like air connection from above or special screw attachment points on request.

LinClamp A

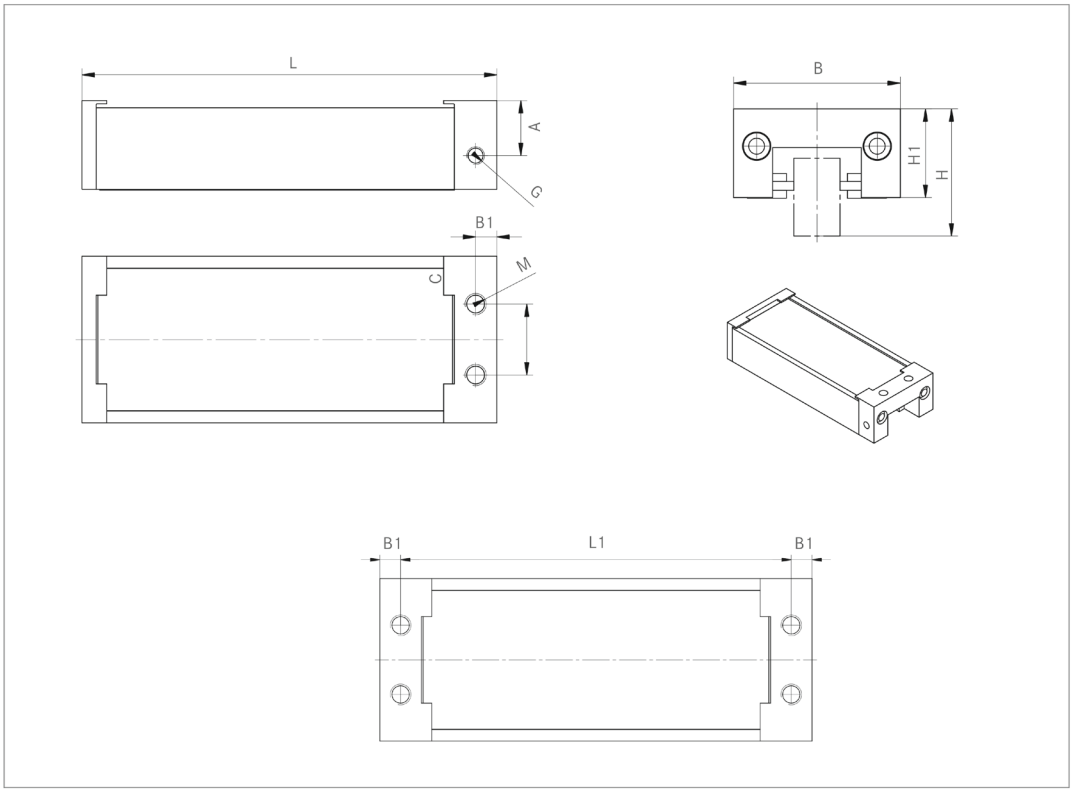
Applications on surfaces next to linear guides, e.g. machine frame, passive.

Consisting of a single-piece clamping body and two spring plates including airbag and lined clamping area, for installation on separate surfaces next to the linear guide on the carriage. Available exclusively as a clamp for 4 Bar. Sizes 25 and 35, retaining forces 1100-2200 N.

Technical Data

Technical Data of the LinClamp S

	2 fixing holes	4 fixing holes			Low carriage			High carriage									
Rail size	L	L	L1	B	H	H1	A	H	H1	A	B1	C	G	M	Holding force at 6 Bar	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			[N]	[N]	[kg]
20	97.2	105.2	93.2	43	30	19.5	13.5	-	-	-	6	15	M5	M5	900	540	0.32
25	117	125	113	47	36	25	15.5	40	29	19,5	6	20	M5	M6	1200	780	0.5
30	126	141	121	59	42	29.5	17	45	32,5	20	10	24	M5	M8	1800	1100	0.9
35	156.2	171.2	151.2	69	48	35	22.5	55	42	29.5	10	24	G1/8	M8	2800	1800	1.26
45	176.2	191.2	171.2	80	60	42	26.5	70	52	36.5	10	26	G1/8	M10	4000	2400	2.3
55	202.2	221.2	196.2	98	70	49	28	80	59	38	12.5	30	G1/8	M12	6000	3600	3.9
65	259.2	281.2	251.2	120	90	64	38	100	74	48	15	40	G1/4	M12	10000	6000	5
25 flat	117	125	113	47	25	20	15.5	-	-	-	6	20	M5	M6	1200	780	0.45
20/40 wide 27 wide	-	159.2	145.2	69	27	23	18.5	-	-	-	7	24	M5	M8	1500	900	0.91
25/70 wide, 35 wide	-	221.2	196.2	98	35	31	23	-	-	-	12.5	30	G 1/8	M12	2000	1200	2.2



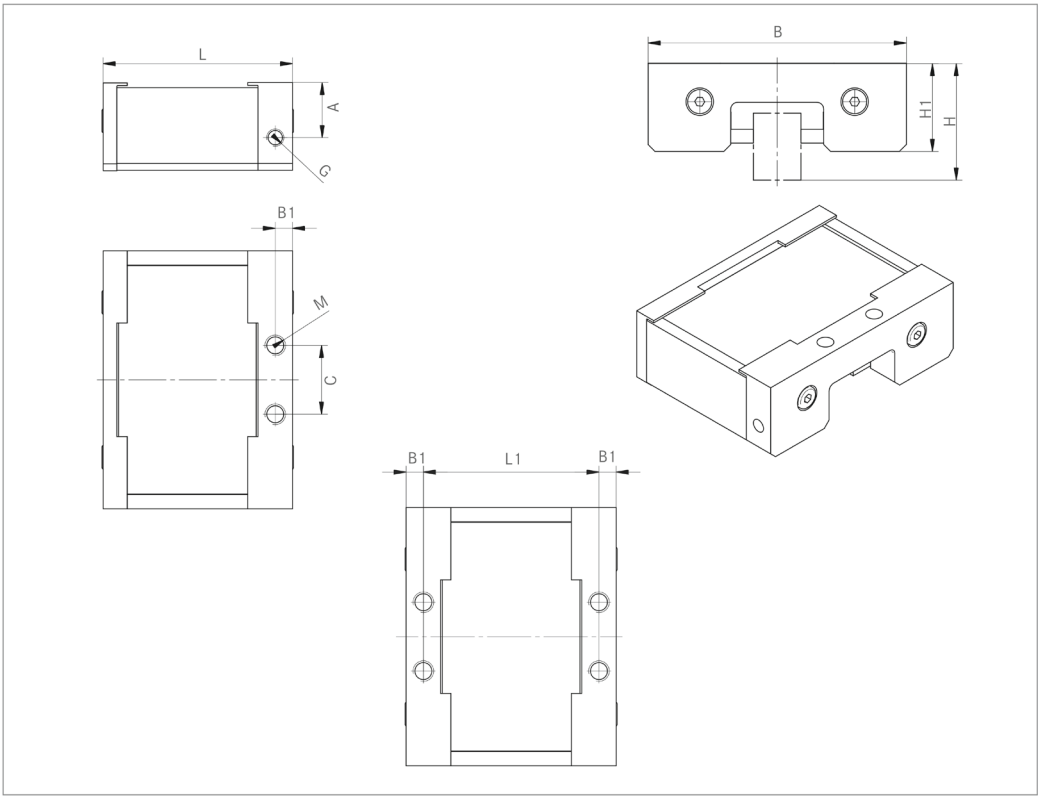
HEMA

LinClamp

Technical Data

Technical data of the LinClamp SK

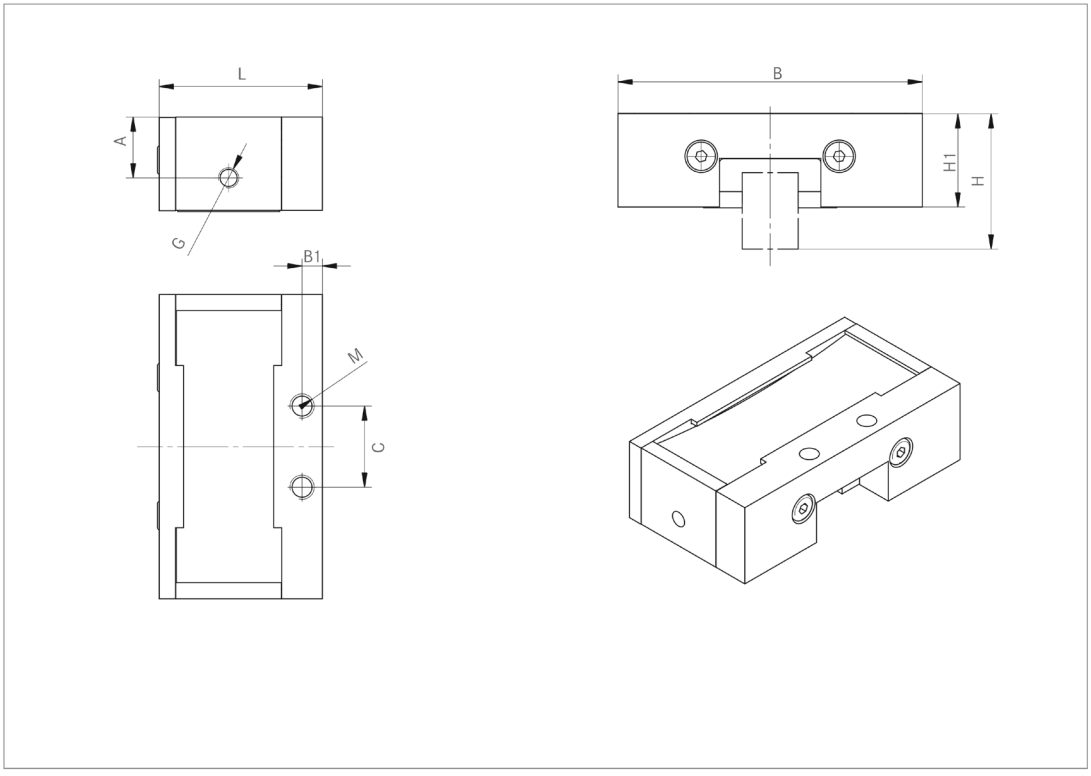
	2 fixing holes	4 fixing holes			Low carriage			High carriage									
Rail size	L	L	L1	B	H	H1	A	H	H1	A	B1	C	G	M	Holding force at 6 Bar	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			[N]	[N]	[kg]
15	55	61	51	45	24	18	14	-	-	14	5	15	M5	M4	450	300	0.5
20	55	61	51	54	30	22	16	-	-	16	5	20	M5	M6	650	430	0.6
25	55	61	51	75	36	25.5	16	40	29.5	20	5	20	M5	M6	800	530	0.7
30	66.5	76	58.5	82	42	30	21	45	33	24	8.75	22	M5	M8	1150	750	0.9
35	66.5	76	58.5	96	48	35	21.2	55	42	28.2	8.75	24	G 1/8	M8	1250	820	1,27
45	80	92	72	116	60	45	27.5	70	55	37.5	10	26	G 1/8	M10	1500	950	2
55	100	112	92	136	70	49	30.5	80	59	40.5	10	30	G 1/8	M10	2100	1300	2.8



Technical Data

Technical data of the LinClamp SA

	2 fixing holes		Low carriage			High carriage									
Rail size	L	B	H	H1	A	H	H1	A	B1	C	G	M	Holding force at 6 Bar	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[N]	[N]	[kg]
20	40	75	30	23	15	-	-	15	5	20	M5	M6	650	390	0.53
25	40	75	36	23	15	40	27	15	5	20	M5	M6	800	480	0.53
35	67	96	48	35	20	55	42	20	9	20	G1/8	M8	1250	750	1.14

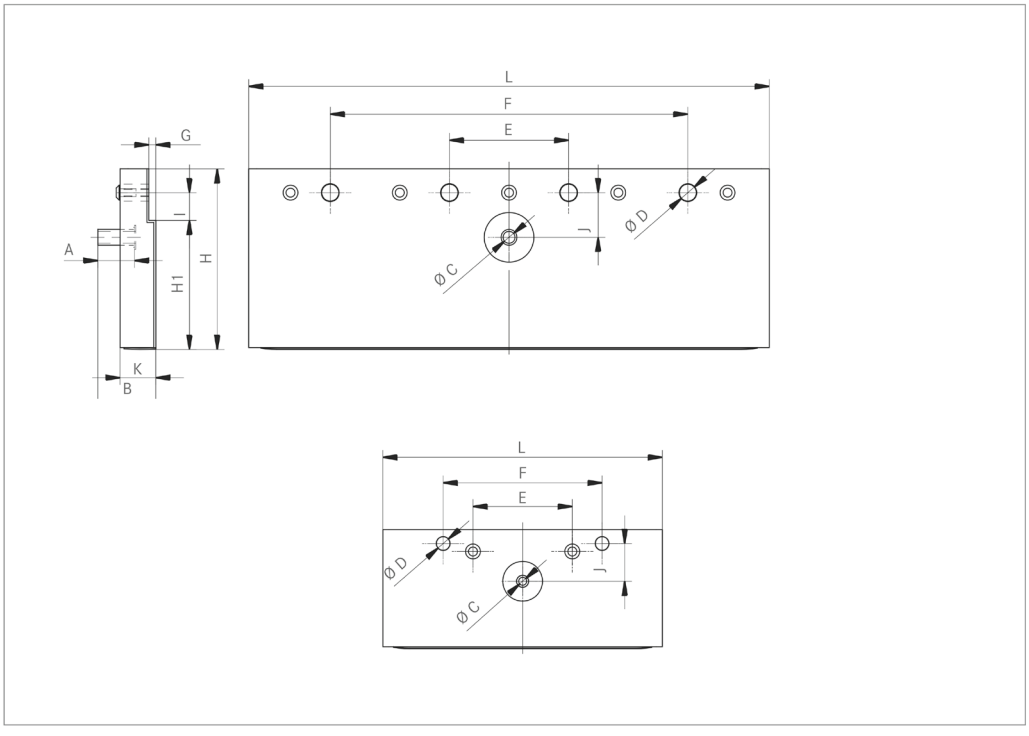


HEMA

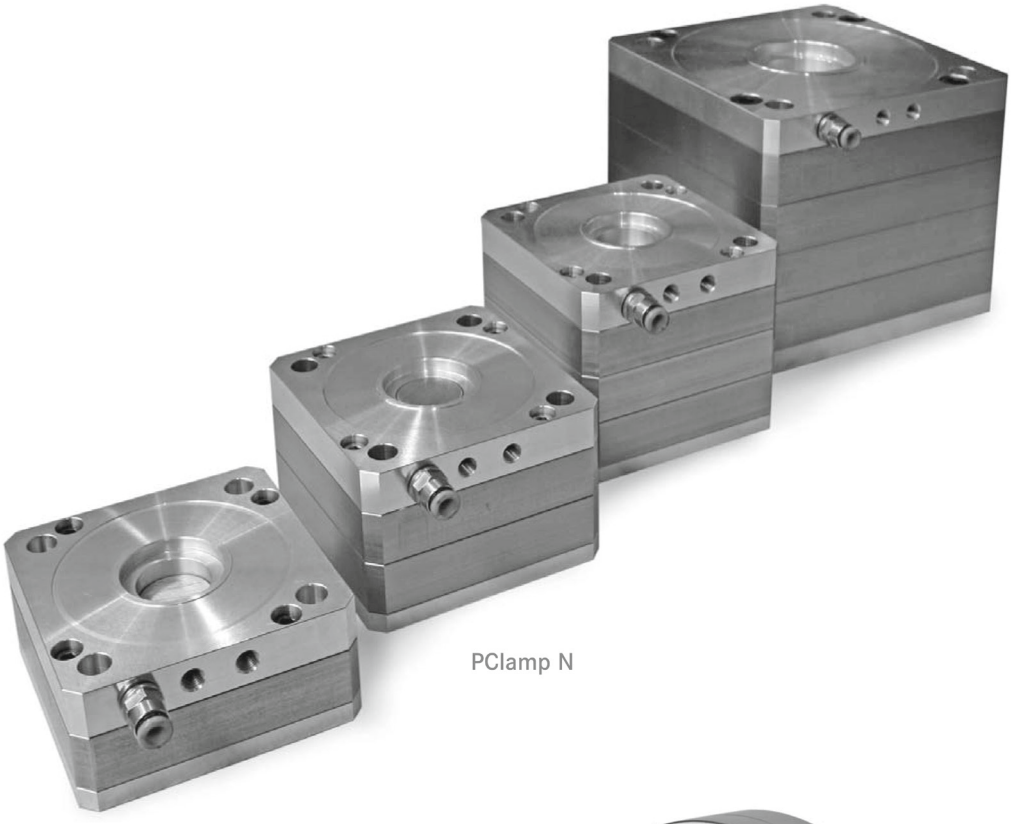
TECHNICAL DATA

Technical data of the LinClamp A

Rail size	L	B	H	H1	A	C	D	E	F	G	I	J	K	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[kg]
25	140	28.15	60	36	17	4	6.8	50	80	3.5	17	19	18	1100	0.53
35	212	29.45	81	55	19	8	6.8	50	150	3.5	14	22	18	2200	1.15



PCLAMP



PClamp N

PClamp E

PCLAMP

ADVANTAGES

Pneumatic clamping with high forces

Optimum safety clamping –
pneumatic failure locks the system

The performance of hydraulic clamps
will be achieved and exceeded

Low system costs in
comparison to hydraulics

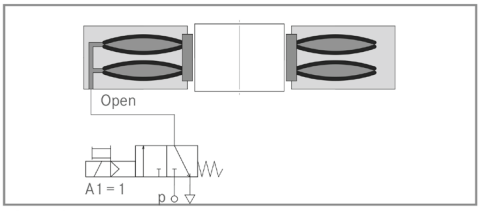
Simple installation

Compact design

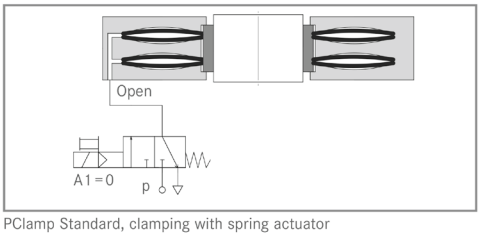
Wide range for many shaft
sizes can be delivered

Operating principle of the PClamp

Funktion PClamp N



PClamp Standard, opening the spring actuator



PClamp Standard, clamping with spring actuator

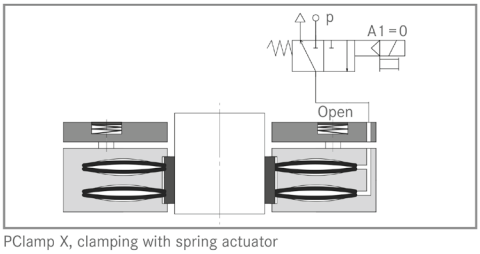
PClamp N released

Pressure is applied to the air chambers between the spring steel sheets. The spring steel sheets bend outwards, reducing their radial width. The clamping collet can therefore expand, releasing the rod.

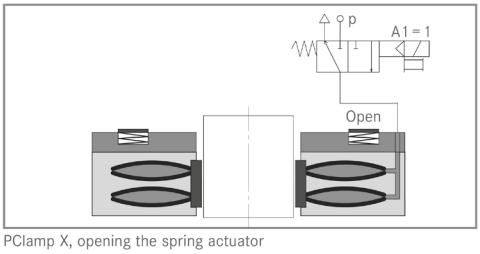
PClamp N clamped

The air chambers between the spring steel sheets are vented, the elastic spring steel sheets return to their original position, thereby clamping the collet against the rod. In this condition, the PClamp N is able to hold both rotary motion as well axial forces.

Function of the PClamp X



PClamp X, clamping with spring actuator



PClamp X, opening the spring actuator

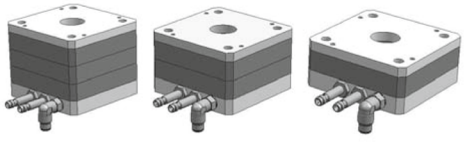
PClamp X clamped

PClamp X offers an additional safety feature: In case of emergency clamping, an air escape channel opens, and the PClamp X cannot be released in this state.

PClamp X released

The clamping can only be unlocked after lifting the load.

Increasing power



The building block system – more power by stacking up to four PClamp modules

Intelligent modular concept PClamp stacking

The easiest method of increasing the clamping force by stacking several clamping units. The clamping forces can be increased by arranging up to three clamping units between the base plate and the surface plate.

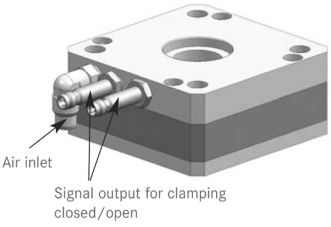
PClamp is suitable for clamping rods with diameters of 12 mm to 40 mm. The flange dimension as well as the outside dimensions are matched to those of standard cylinders ISO 6431. The lengths vary depending on the clamping force required. Additional data for special solutions are available on request.

Compressed air

PClamp

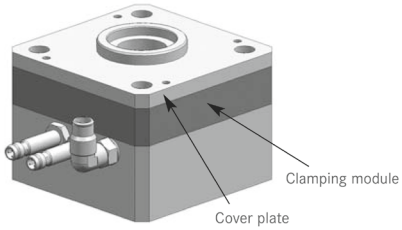
Product overview

PClamp N



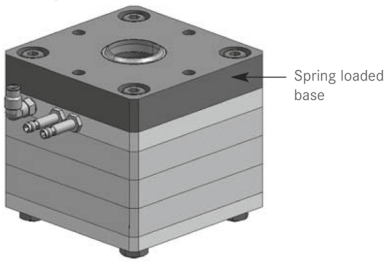
Standard version
Comprising the standard cover plate, one to four clamping units and base plate with connections for initiators as well as air inlet. Suitable for linear and rotary loads.

PClamp ISO



Version for ISO pneumatic cylinder
Cover plate and base plate are matched to the flange dimension of the ISO cylinder. Due to the integrated attachments in the housing, the ISO version is ideal for use with standard cylinders. The clamping unit is identical to versions N and X.

PClamp X



Version with additional safety mechanism for highest safety standards for vertical axes
Models with improved safety for vertical axes. After clamping the piston rod, the clamping mechanism can only be released when the axis is moved upwards. The clamping unit is identical to the versions N and ISO.

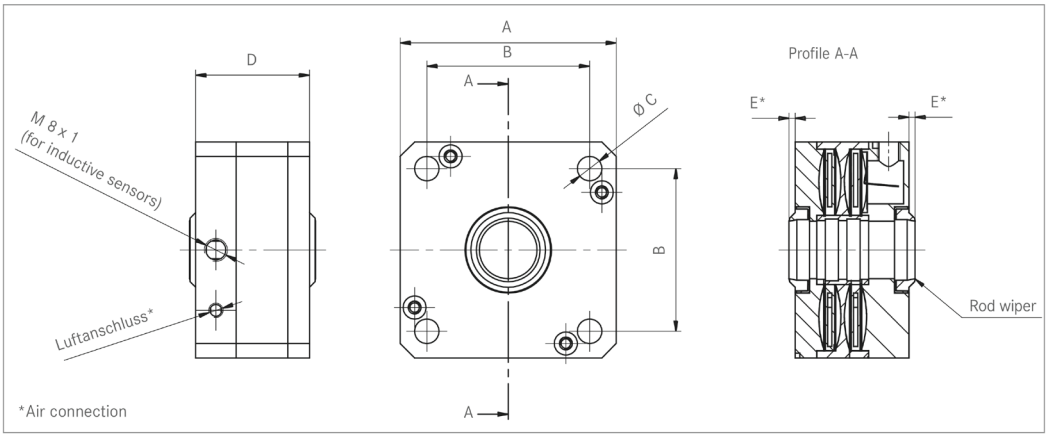
PClamp E

Compact version for lower clamping forces
PClamp E has a lower overall height - ideal for applications with limited installation space or operating ranges in which lower holding forces are required. Sensors can not be used. The clamping unit has a different outward appearance than Version N, X and ISO, although the active principle is identical.

Technical Data

Technical Data of the PClamp N

Size	A	B	C	D	E	Air connection	Holding force Version 4 Bar	Holding force Version 6 Bar	Holding torque Version 4 Bar	Holding torque Version 6 Bar	Standard rod	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]		[N]	[N]	[Nm]	[Nm]	[mm]	[kg]
PC 63-20-1	75	56.5	8.5	41.5	2.1	M5	1400	2000	15	20	20	0.7
PC 63-20-2	75	56.5	8.5	59.5	2.1	M5	2520	3600	25	35	20	1.13
PC 63-20-3	75	56.5	8.5	77.5	2.1	M5	3780	5400	35	50	20	1.56
PC 80-25-1	96	72	10.5	43.5	2.14	G 1/8	2100	3000	25	35	25	1.3
PC 80-25-2	96	72	10.5	63.5	2.14	G 1/8	3780	5400	40	60	25	2.2
PC 80-25-3	96	72	10.5	83.5	2.14	G 1/8	5670	8100	65	95	25	3.1
PC 125-40-1	145	110	13	51.6	3	G 1/8	7000	10000	140	200	40	3.65
PC 125-40-2	145	110	13	75.2	3	G 1/8	12600	18000	250	360	40	5.85
PC 125-40-3	145	110	13	98.8	3	G 1/8	18900	27000	375	540	40	8.05
PC 125-40-4	145	110	13	122.4	3	G 1/8	25200	36000	500	720	40	10.25



Example of tabulation

- PC 63-20-1: PClamp suitable for ISO cylinders, size 63, rod diameter 20 mm, one clamping module.
- Sizes A, B, C, D and E are geometric data (refer to the drawing).
- Air connection M5: Connecting thread for hose connector.
- Holding force Version 4 Bar: 1400N/holding force Version 6 Bar: 2000 N. The versions for various pressure ranges achieve different holding forces.
- Holding torque Version 4 Bar: 15 Nm/holding torque version 6 Bar: 20 Nm. Like before, there are different holding torques at different pressures.
- Standard rod diameter starting from the standard value, you can get versions with reduced diameter. Available diameter and corresponding holding forces on request.

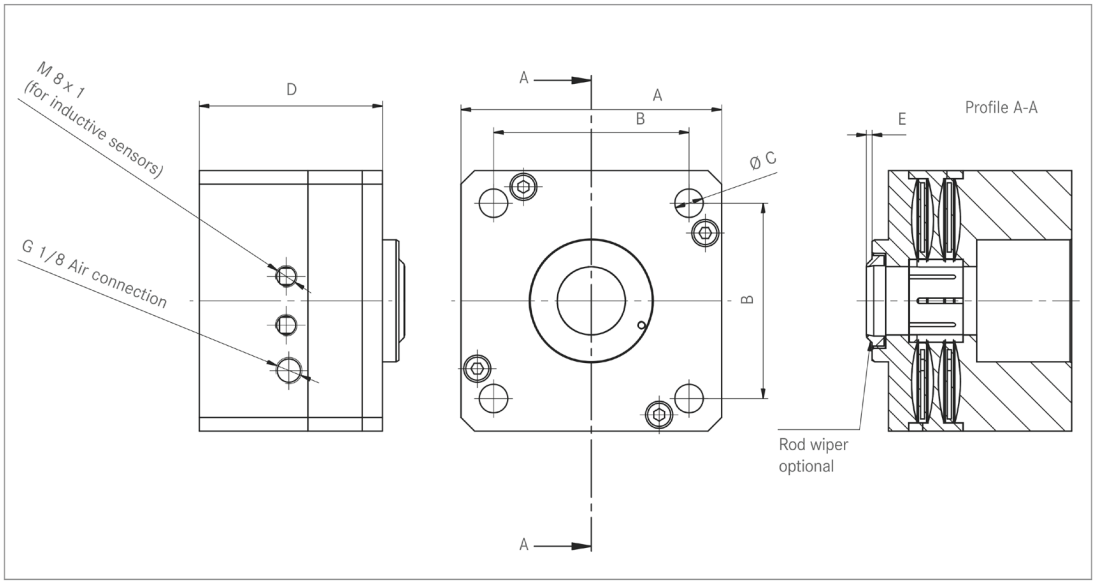
Safety note for construction

The holding forces specified can be achieved under optimal conditions; we recommend a safety factor of >10%. Please consider that the surface, material, and cleanliness of the rod as well as wear and the use of wipers leads to changed holding forces. For new or safety applications, check the clamp by testing it in its environment and measure the actual values. Plan regular functional checks and functional monitoring. Please indicate these intervals as safety instructions for the end user. The axis/shaft must be designed at least with an h9 fit. Expect reduced holding forces if using the entire range of tolerances. To achieve optimum holding force, machine the fit as closely as possible to the nominal size.

TECHNICAL DATA

Technical Data of the PClamp ISO

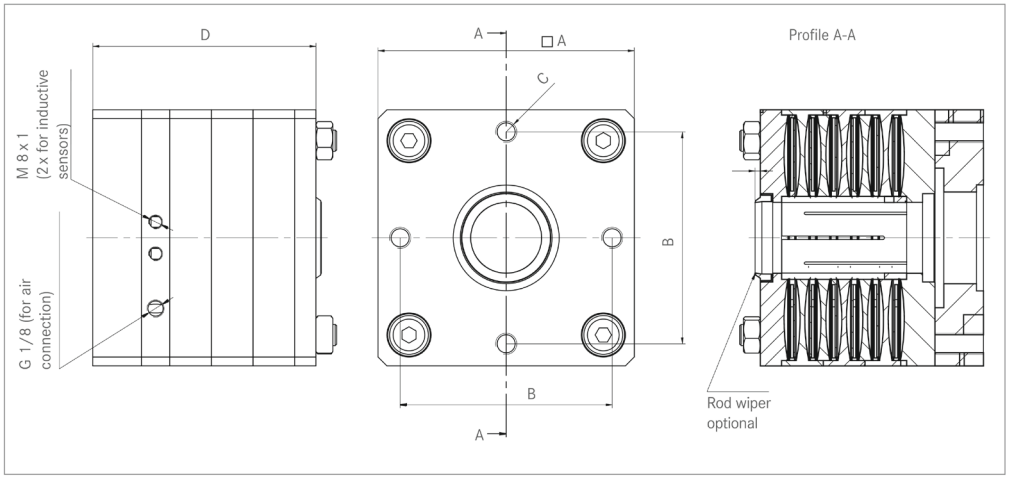
Size	A	B	C	D	E	Air connectio	Holding force Version 4 Bar	Holding force Version 6 Bar	Holding torque Version 4 Bar	Holding torque Version 6 Bar	Standard rod	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]		[N]	[N]	[Nm]	[Nm]	[mm]	[kg]
PC 63-20-1	75	56.5	8.5	69.5	2.1	M5	1400	2000	15	20	20	1
PC 63-20-2	75	56.5	8.5	87.5	2.1	M5	2520	3600	25	35	20	1.43
PC 63-20-3	75	56.5	8.5	105.5	2.1	M5	3780	5400	35	50	20	1.86
PC 80-25-1	96	72	10.5	67.5	2.14	G 1/8	2100	3000	25	35	25	1.8
PC 80-25-2	96	72	10.5	87.5	2.14	G 1/8	3780	5400	40	60	25	2.7
PC 80-25-3	96	72	10.5	107.5	2.14	G 1/8	5670	8100	65	95	25	5.6
PC 125-40-1	145	110	13	95,6	3	G 1/8	7000	10000	140	200	40	5.65
PC 125-40-2	145	110	13	119,2	3	G 1/8	12600	18000	250	360	40	7.85
PC 125-40-3	145	110	13	142,8	3	G 1/8	18900	27000	375	540	40	10.05
PC 125-40-4	145	110	13	166,4	3	G 1/8	25200	36000	500	720	40	12.25



Technical Data

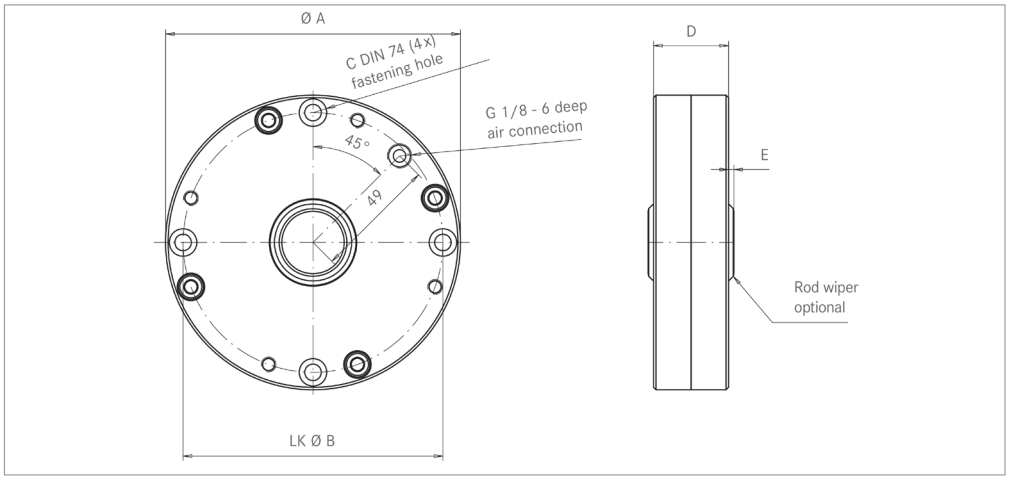
Technical Data of the PClamp X

Größe	A	B	C	D	E	Air connection	Holding force Version 4 Bar	Holding force Version 6 Bar	Standard rod	Mass
Einheit	[mm]	[mm]		[mm]	[mm]		[N]	N]	[mm]	[kg]
PC 125-40-1	145	120	M12	90.8	3	G 1/8	7000	10000	40	5.3
PC 125-40-2	145	120	M12	114.4	3	G 1/8	12600	18000	40	7.55
PC 125-40-3	145	120	M12	138	3	G 1/8	18900	27000	40	9.8



Technical Data of the PClamp E

Size	A	B	C	D	E	Air connection	Holding force Version 4 Bar	Holding force Version 6 Bar	Holding torque Version 4 Bar	Holding torque Version 6 Bar	Standard rod	Mass
Unit	[mm]	[mm]		[mm]	[mm]		[N]	[N]	[Nm]	[Nm]	[mm]	[kg]
PC 63-20 E	92	80	M5	28	2.1	G 1/8	700	1000	7	10	20	1.15
PC 80-25 E	118	104	M6	30	2.14	G 1/8	1050	1500	12	17	25	2.1
PC 125-40 E	168	152	M6	34	3	G 1/8	3500	5000	70	100	40	4.9

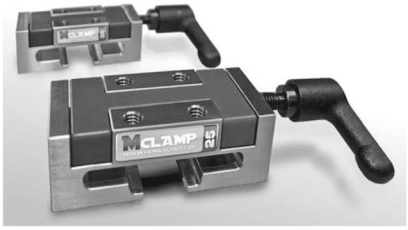


HEMA

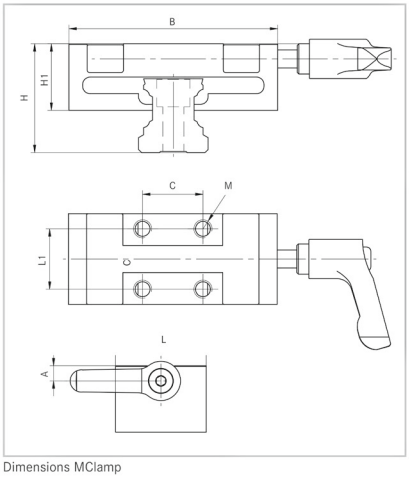
HEMA

MClamp Manual Clamping System

MClamp Clamping System



HEMA MClamp in rail sizes 20 and 25



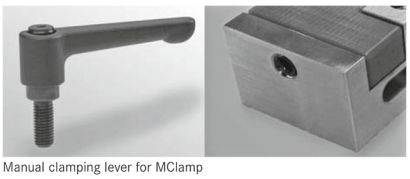
Dimensions MClamp

The MClamp supplements the HEMA pneumatic rail clamps with a manually operated clamping element with high retaining forces.
The H shaped cross section of the clamping body corresponds to the body of the HEMA LinClamp elements, i.e. the clamping function and the automatic return on release are based on the same principles as the LinClamp Series that has been tried and tested thousands of times. Four tapped holes enable easy fitting and universal compatibility.

NEW

Advantages of MClamp

- low cost entry level rail clamp version
- **4 tapped holes for easy fitting, universally compatible**
- high axial stiffness
- reliable clamping with max retaining forces of 1100 N
- suitable for all manual clamping jobs, e.g. for positioning against stops, transport locks, securing working positions at jigs and assembly stations, etc.
- precise positioning without affecting longitudinal or transverse forces on the rail; the clamping forces always act vertically to the rail axis and are transferred symmetrically
- extremely flexible applications - for virtually all rail and guide carriage types
- compact design, easy to install, easy to operate
- operated with Allen key and torque wrench or alternatively with a manual clamping lever



Manual clamping lever for MClamp

Rail size	B	L	H*	H1	A	L1	C	M	max. tightening torque [Nm]	holding force [N]
MClamp 20	59	24	30	19	4	15	15	M6	5,5	1000
MClamp 25	69	30	36	22	5	20	20	M6	7,5	1100

* H corresponds to the rail manufacturer's low carriage; when higher ones are used, spacer plates must be provided.

BEST PRICES - ATTRACTIVE QUANTITY DISCOUNTS

All dimensions in mm if not marked otherwise. Errors and omissions excepted.

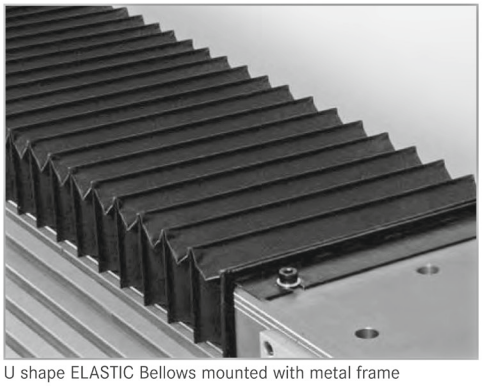
240513

PROTECTION
CLAMPING & BRAKING
VISION
SERVICE

HEMA Maschinen- und Apparateschutz GmbH
Seligenstädter Straße 82, D-63500 Seligenstadt
Telefon: +49(0)6182/773-0, Telefax: +49(0)6182/773-35
info@hema-schutz.de, www.hema-schutz.de

ELASTIC Bellows

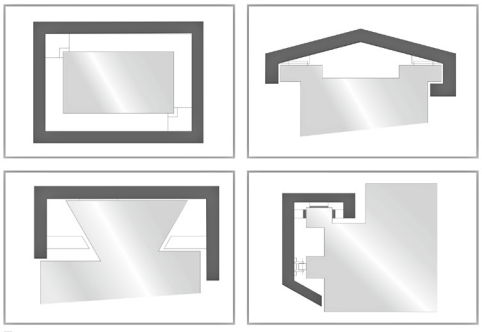
ELASTIC Bellows are commonly used for protecting machines and devices against debris and chips. They are also used in many variations for safety at work.
The experience resulting from the production of many thousands of ELASTIC Bellows and their use in working applications has been converted directly into product improvements, new developments, and enhanced product lifetime.



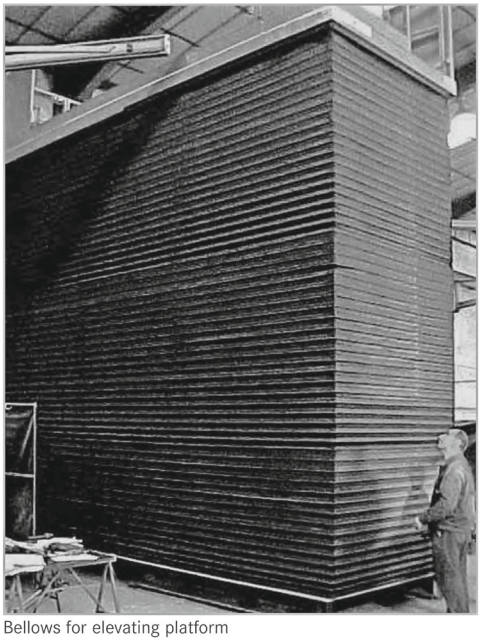
U shape ELASTIC Bellows mounted with metal frame

Constantly growing demands for ever greater machine speeds and ever lower noise emissions are consistently implemented by our engineers.

- Optimal use of space
- Machine size reduced with special materials and space saving designs
- Complete systems - bellows integrated in the machine's rear wall covering, complete with guides and mounting devices
- High temperature resistant materials up to 600°C for laser, plasma and welding applications
- Special designs with antistatic surfaces for medical technology and clean room conditions
- Special designs for HSC applications
- Impermeability to coolants



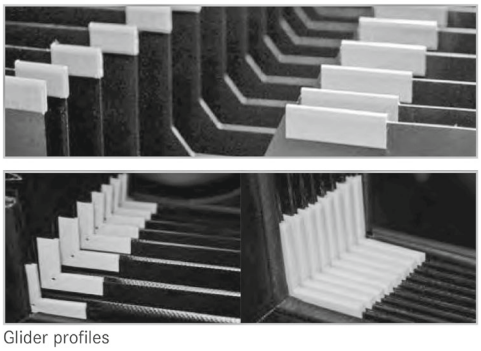
Types



Bellows for elevating platform

Design

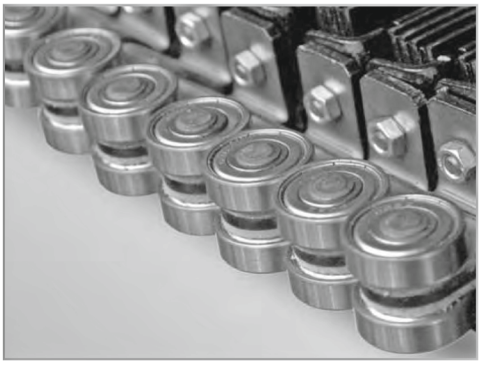
ELASTIC Bellows are a series of products with many combinations and options. Their basic components, materials, forms, processing methods, and dimensions are easily adaptable.
For applications such as elevating platforms, bellows can be produced with up to 30 square meters. All ELASTIC Bellows may be deployed horizontally or vertically.
They can be easily attached to the machine with metal frames or Velcro tapes.
Efficient glider profiles and roller or ball bearings improve quiet running and also serve to extend life cycles and minimise friction during HSC applications as well.



Glider profiles

All dimensions in mm if not marked otherwise. Errors and omissions excepted.

ELASTIC Bellows



Roller bearing

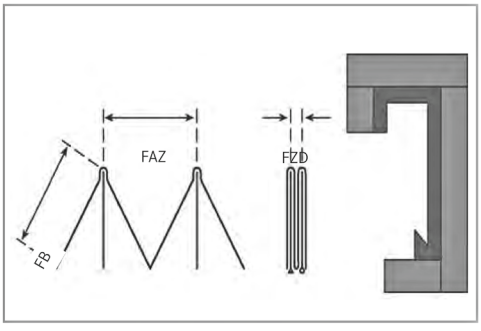
During high starting accelerations extension limiters help to reduce the load on the first folds, even out the extension, and stabilise travelling.

Material

Standard materials are black, but also signal colours such as yellow or white materials for medical applications are available.
The material is selected from a large range of products to match the intended use of the ELASTIC Bellows.
Also self extinguishing heat resisting materials under the UL 94 standard are available.

Design of ELASTIC Bellows

The essential component of the ELASTIC Bellows is a stabilising PVC frame inside every fold that lends the ELASTIC Bellows high dimensional stability. Reversion to the original shape is therefore assured after direct impacts.
Beside PVC frames PP and Polyamide can be offered as an alternative material for the support frames.



Bellows construction with stabilising PVC frame

ELASTIC bellows are available in the following versions depending on how their frames are permanently joined to the outer fold material:

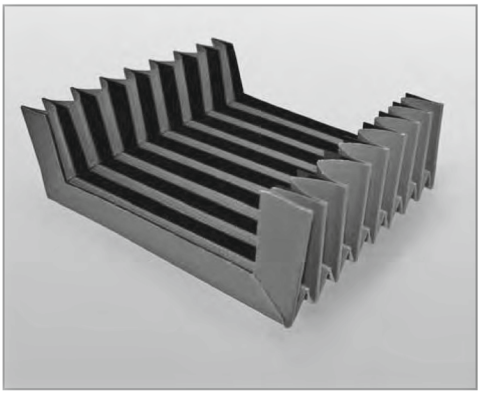
- thermal bonded version
- HF welded version
- sewn version

Thermal bonded version

Under the action of heat and a specially developed flux permanent bonding is achieved between the inner PVC frame and the outer fold material.
Thermal bonded ELASTIC Bellows are maintenance free, water and dust proof as well as oil resistant and, to a certain extent, acid resistant.

HF welded version

This type is used particularly for the production of large, shutter type ELASTIC Bellows.
High frequency welding is used to join the PVC frames with the outer bellow material for a perfect shape and a regular overall appearance.



U shape Bellows with stabilising PVC frame

Sewn version

The sewn version consists primarily of high temperature materials. Strong fabrics therefore assure a long lasting solution even under extreme loads.

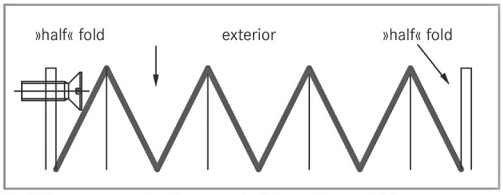
Mounting

ELASTIC Bellows can be easily mounted on machines and devices with components such as:

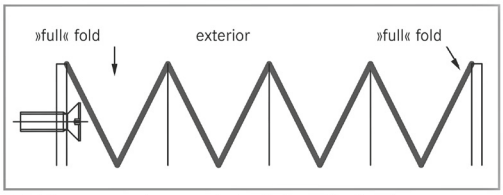
- frames of metal or synthetic material attached to both ends and designed to customer specifications
- Velcro tape, easy and fast, maintenance friendly
- clip fasteners combined with metal frames

Order and request forms available at: www.hema-schutz.de

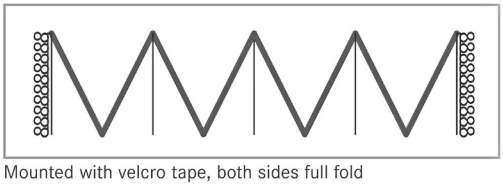
ELASTIC BELLOWS

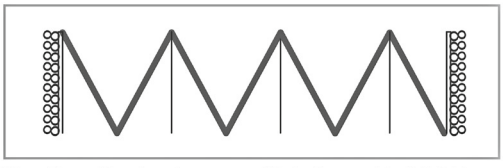


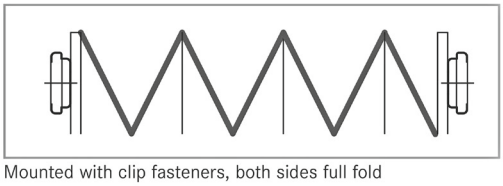
End flanges can also be mounted from the outside

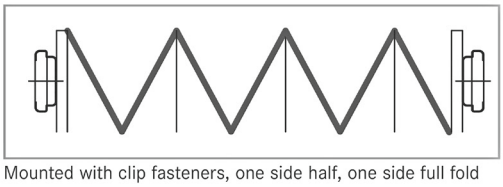


aEnd flanges can be mounted only from the inside


Mounted with velcro tape, both sides full fold


Mounting with velcro tape, one side half, one side full fold


Mounted with clip fasteners, both sides full fold


Mounted with clip fasteners, one side half, one side full fold

Legend and formulae for calculation	
FB	Width of the fold
FZ	Number of folds
FZD	Compression per fold
FAZ	Extension per fold
BE	Width of the terminal fixture
AZ	Maximum extension
ZD	Minimum compression

Formulae for calculation

ZD	AZ-Hub
FZ	$\frac{AZ}{FAZ}$
ZD	$\frac{(AZ \times FZD) + BE}{FAZ}$
AZ	$\frac{(ZD - BE) \times FAZ}{FZD}$

FB (mm)	FAZ (mm)	FZD*(mm)
15	22	3 - 5
17,5	24	3 - 5
20	30	3 - 5
25	38	3 - 5
30	48	3 - 5
35	55	3 - 5
40	65	3 - 5
45	75	3 - 5
50	85	3 - 5

* depending on material

Rear view of complete solution, ELASTIC Bellows used for X axis

Circular-Stitched Bellows

The circular-stitched bellows consist of punched disks stitched inside and outside.
Stitching achieves particularly good shape stability and high transverse stiffness.

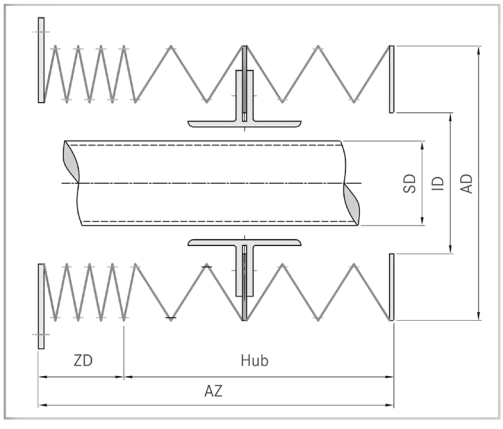
Circular stitched bellows

Material

Standard applications require material GN 807, and high temperature applications aluminium/glass fibre.
Circular-stitched bellows are extremely resistant and can even withstand impact from sharp edged chips, also in the smaller versions. They are suitable only to a limited extent as protection against liquids and oils.

Mounting position

Circular-stitched bellows can be used horizontally or vertically. Additional support and guide rings made of synthetics assure a uniform distance from the spindle and so increase operating life.
When with large extensions the stability of the bellows can be increased when a wire ring is installed in every fold.



Sectional view: Circular stitched bellows

The usual connecting and mounting elements are metal frames, but sleeves are an alternative.

Design information

The correct bellow diameter should be about 10 mm larger than the part they are to protect. Use the following formula for measurements.

Design and Legend	
Extension	**= (Stroke / FStroke) x FAZ + 5**
AD	Outside diameter
FB	Fold width
ID	Inside diameter
FAZ	Fold extension
FZD	Fold compression
FStroke	Stroke per fold
SD	Diameter of spindle

HEMA Type	AD	ID	FB	FAZ	FZD	FStroke
RF 50	52	25	12.5	10	2.5	7.5
RF 72	72	33	19.5	18	2.5	15.5
RF 85	85	45	20	18	2.5	15.5
RF 95	95	53	21	18	2.5	15.5
RF 100	100	63	18.5	18	2.5	15.5
RF 120	120	82	19	18	2.5	15.5
RF 122	122	76	23	15	2.5	12.5
RF 130	130	90	20	18	2.5	15.5
RF 135	135	85	25	15	2.5	12.5
RF 140	140	100	19	18	2.5	15.5
RF 145/1	145	93	26	15	2.5	12.5
RF 145/2	145	105	20	18	2.5	15.5
RF 150	150	110	20	18	2.5	15.5
RF 160	160	112	24	18	2.5	15.5
RF 170	170	125	22.5	18	2.5	15.5
RF 180/1	180	132	24	20	2.5	17.5
RF 180/2	180	141	19.5	18	2.5	15.5
RF 190	190	150	20	18	2.5	15.5
RF 200	200	152	24	18	2.5	15.5
RF 220	220	170	25	18	2.5	15.5
RF 235	235	190	22.5	18	2.5	15.5
RF 245	245	200	22.5	20	2.5	17.5
RF 260	260	202	29	18	2.5	15.5
RF 266	266	216	25	20	2.5	17.5
RF 300	300	250	25	18	2.5	15.5
RF 365	365	320	22.5	18	2.5	15.5
RF 400	400	340	30	20	2.5	17.5

Bellows for jet cutting machines

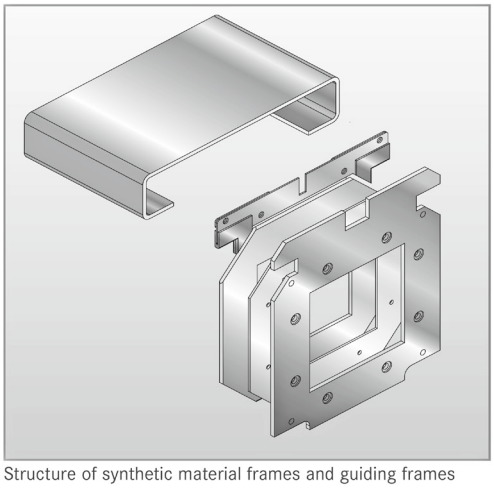
Modern jet cutting machines (with lasers, plasma or water) are fitted with bellows to protect the jet channel and the mechanical components such as spindles and guides.

Guided bellows for laser cutting

These types of bellows require a high level of tightness and long life.
Bellows for jet cutting machines are primarily made of self extinguishing materials such as Preotex.
The materials selected have been extensively tested with various impact cycles.

At all stages from production to packaging and shipment our bellows are maintained in a particularly clean state and free of dust, e.g. with special packing.

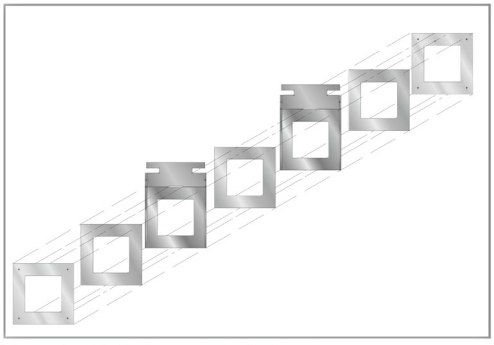
Bellows in operation



Structure of synthetic material frames and guiding frames

- High temperature resistance of bellow material
- No outgassing of materials
- Gas-tight for minimised flushing gas losses
- Superior clean state during production and shipment

Construction
For better stability the bellows used for jet cutting machines are fitted with stabilizing synthetic material frames.
These frames are customized to each guidance type, e.g guiding bars. Normally these bellows are mounted with metal end frames.
Especially important is a separate guiding system that keeps the bellows material intact.



External guide for laser cutting bellows

SAMURAI Bellows

SAMURAI Bellows are an advancement of the ELASTIC Bellows product line. Characteristic for this type of bellows are their lamellas.

The lamellas are fixed at the upper edge of the bellows, which also reinforces them. They provide excellent protection against fast, very hot and sharp chips.

SAMURAI Bellow

SAMURAI Bellows are ideal for HSC applications. Solutions for machining centres with speeds greater than 100 m/min and accelerations greater than 2 g have been successful realized.

Type of bellow	heavy swarf impact	X/Y axis	Z axis	less space
ELASTIC		■		■
FASTAF	■	■	■	
FASTAM			■	■
FASTAC	■			
Vector C²	■	■		
FASTLAP			■	■

Design

Similar the ELASTIC range of products, all materials, shapes, processing methods, and measurements for the SAMURAI Bellows can be combined in any variation. Also a PVC frame is built into each fold of this bellow for assured stability.

Lamellas

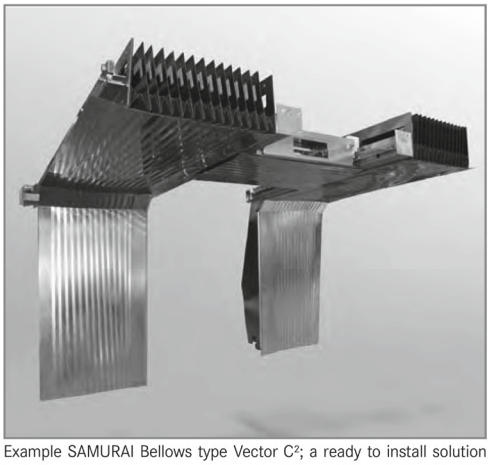
The position of each lamella can be individually chosen. The lamellas can be fixed to the front of the bellows, each side, or in any combination.

In addition, our in house production of lamellas means we can provide them in nearly all forms, such as inclined or roof types. Stainless steel is used for the material.

Excellent closing and sealing on the top side

Usually the basic lamella type is flat with its end formed into a wiper profile, for excellent contact and sealing on the top side of the SAMURAI Bellow.

There is a high contact pressure across the whole lamella area. With their efficient wiper edge the lamellas prevent debris from entering the interior.



Example SAMURAI Bellows type Vector C²; a ready to install solution including interlocking system for loading through the roof. Combination with optional mechatronics system »CoverShutter« possible.

SAMURAI Bellows

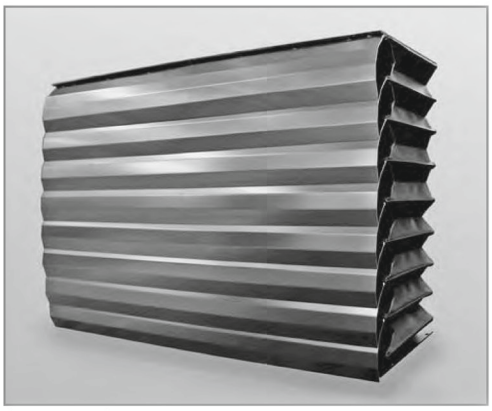
Application of lamella bellows

When in use the lamellas develop a regular formation of stripes on their surfaces. This is normal and caused by their edges and has no effect on their functionality or service life.

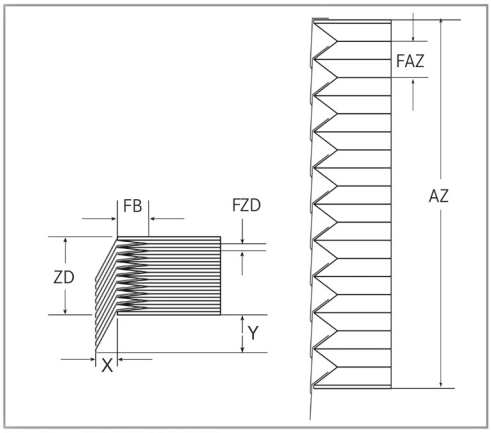
The lamellas are corrosion and acid proof, but not accessible.

SAMURAI Bellows are available in three basic types.
These main types are based on how the lamellas are fixed:

- FASTAF - fixed lamellas
- FASTAC - fixed telescopic lamellas
- FASTAM - flexible lamellas
- FASTAF Vector C^2 - special type for multi axis protection



SAMURAI FASTAM



Drawing of FASTAF/FASTAC

Legend	
FB	Width of fold
FZD	Compression per fold
2FZD	Compression per two folds
FAZ	Extension per fold
2FAZ	One sheet of lamella protects two folds
FHub	Stroke per fold
AZ	Maximum extension
ZD	Minimum compression
X	Horizontal space required for the lamellas
Y	Vertical space required for the lamellas

FB	FAZ	FZD	X	Y
17,5	20	5	20	40
20	25	5	20	45
25	32	5	25	50
30	40	5	25	65
35	45	5	30	75
40	60	5	35	80
45	65	5	35 - 40	85
50	75	5	45 - 50	95

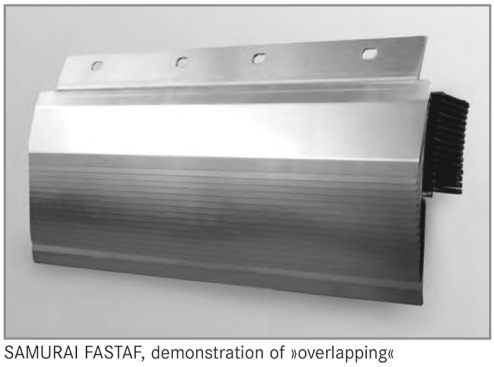
FASTAF/FASTAC

FB	2FAZ	2FZD	Y
15	40	5-10	65
17,5	45	5-10	75
20	55	5-10	75
25	70	5-10	90
30	85	5-10	105
35	100	5-10	120
40	125	5-10	155

FASTAF 2-folds (one sheet of lamella protects two folds)

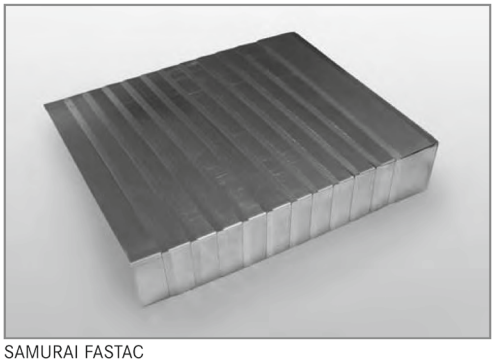
SAMURAI Bellows

FASTAF
FASTAF types are SAMURAI Bellows with fixed lamellas. Owing to this design the lamellas overlap. The lamellas are hinged or clipped. When damaged they can be replaced.

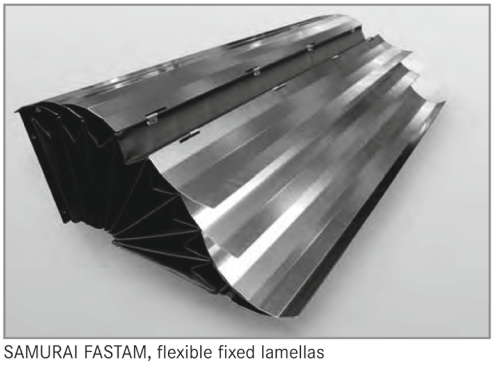

SAMURAI FASTAF, demonstration of »overlapping«

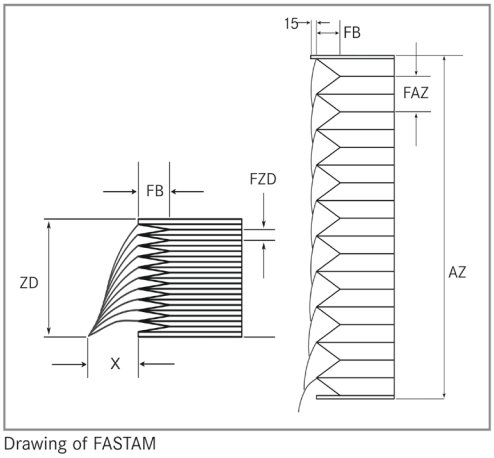
FASTAC
FASTAC types are SAMURAI Bellows with fixed telescopic lamellas (boxes).

The lamellas cover the front and also the side parts of the bellows, forming an enclosed surface. These »closed« FASTAC lamella bellows are primarily used in a vertical operating position as an alternative to telescopic steel covers.


SAMURAI FASTAC

FASTAM
SAMURAI Bellows of the FASTAM type are equipped with flexible fixed lamellas, so lamella projection must be taken into consideration. The lamellas "stack" when the cover is compressed.
The lamellas are hinged or clipped. When damaged they can be replaced.


SAMURAI FASTAM, flexible fixed lamellas



Drawing of FASTAM

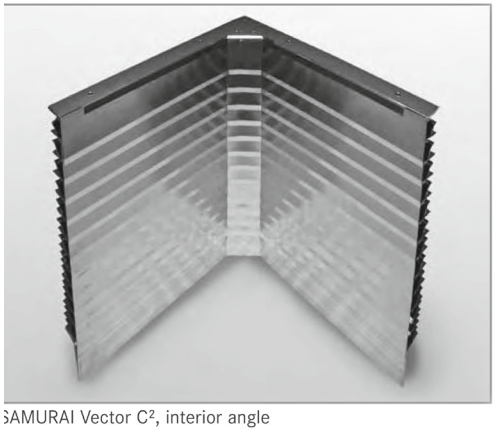
Legend	
FB	Width of fold
FZD	Compression per fold
FAZ	Extension per fold
ZD	Minimum compression
AZ	Maximum extension
X	Horizontal space required for the lamellas

FB	FAZ	FZD	X
17,5	22	5	50
20	30	5	50
25	38	5	65
30	48	5	75
35	55	5	85
40	65	5	85
45	75	5	100
50	85	5	110

SAMURAI Bellows

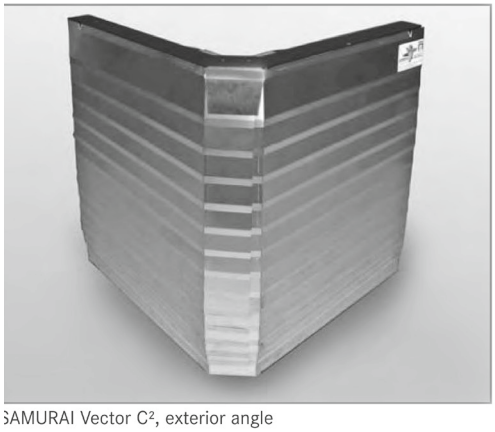
VECTOR C² type

The FASTAF type VECTOR C² is a special type for machining centres where continuous covering of the working space (e.g. rear wall, upper roof area) is required.



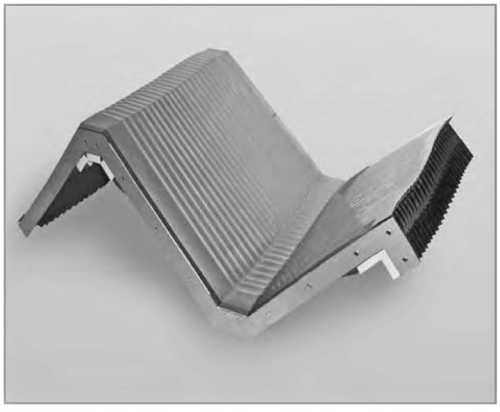
SAMURAI Vector C², interior angle

With its unique design of fixed mounted lamellas only one bellow unit is needed to cover the corner areas.
The space allocated to the covering can be used very efficiently, and machining dust is significantly reduced.
For swarf protection the VECTOR C² type is equipped with two overlapping, bended metal sheets mounted securely on each fold.



SAMURAI Vector C², exterior angle

The VECTOR C² corner lamella is available as a bended or rounded version providing both a stable structure and reliable functionality.
Even at high operating speeds and accelerations this stable and reliable concept responds flexibly to all interior and exterior angles and combinations of angles.



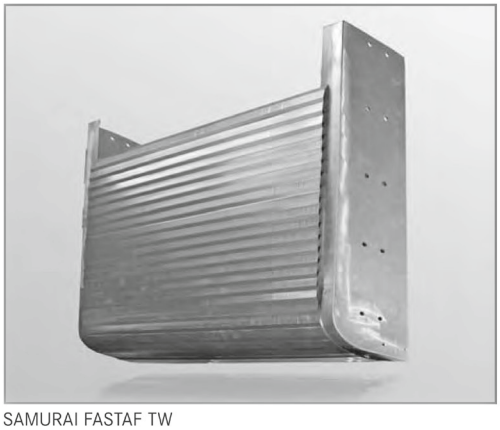
SAMURAI Vector C², combination of interior and exterior angle

The lamellas for this type of SAMURAI Bellows are available in four shapes:

- Outside
- Inside
- Inside round
- Inside Outside

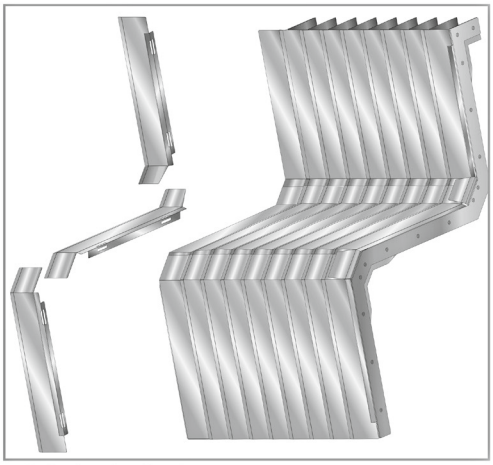
SAMURAI FASTAF TW for limited space

The SAMURAI FASTAF TW has been developed as an alternative to the classic design of protective covers.
This lamella cover »bends around the corner« and is therefore perfectly suited to machines with limited space below the cover.
The compressed cover is turned through 90° allowing more design opportunities. The preload of the lamella's in the area of the radius is maintained through innovative design.

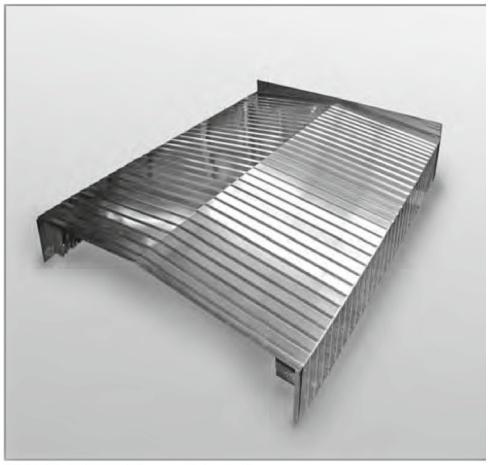


SAMURAI FASTAF TW

SAMURAI Bellows



VECTOR C² Inside Outside



SAMURAI FASTAC, special solution

Legend	
FB	Width of fold
FZD	Compression per fold
FAZ	Extension per fold
X	Horizontal space required for the lamellas
Y	Vertical space required for the lamellas

FB	FAZ	FZD	X	Y
17,5	20	5	20	40
20	25	5	20	45
25	32	5	25	50
30	40	5	25	65
35	45	5	30	75
40	60	5	35	80
45	65	5	35 - 40	85
50	75	5	45 - 50	95

Vector C²

SAMURAI FASTAF TW for limited space

View into operating machining centre. Result: SAMURAI FASTAF proves reliable even with large chip volumes.

SAMURAI Lamella Aprons

SAMURAI FASTLAP lamella aprons are a variation of the SAMURAI bellows. They were designed for Z axis covers in machining centres.
The substructure does not consist of ELASTIC bellows but only a carrier material to which the lamellas are fixed.

SAMURAI lamella apron

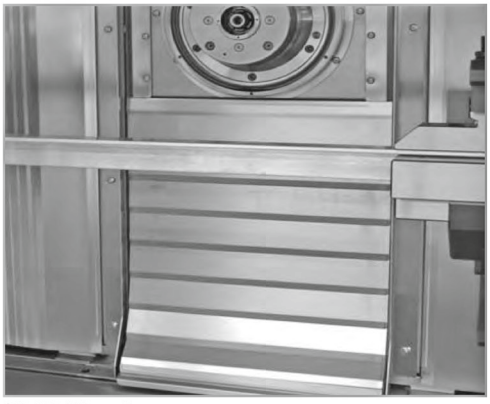
These cover types are called FASTLAP, and the product line consists of three models. They vary according to how their lamellas are fixed to the carrier material. Special types are available on request.

FASTLAP

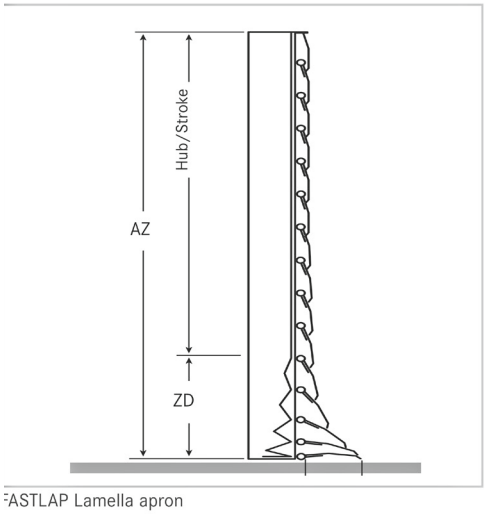
The SAMURAI FASTLAP lamella apron is available in two variants:

- lamellas clipped
- lamellas secured with or without preloading

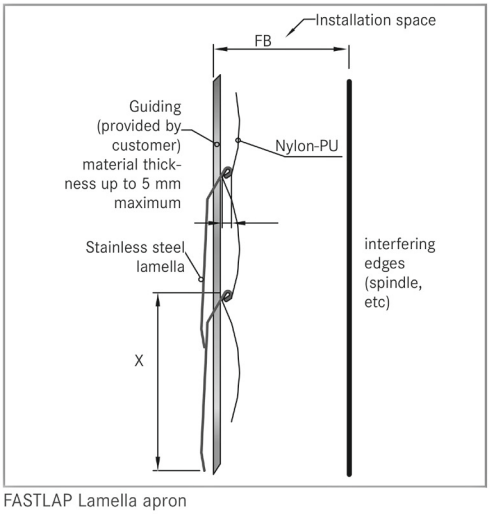
The lamellas are made of stainless steel of 0.5 mm thickness up to a maximum width of 4,000 mm, and mounting is simple. The compression per fold is about 4 mm.
The lamella apron requires a guide on both sides that must allow for a side length of 25 mm.
The lamella apron is secured to a tear-proof Nylon-PU material selected specifically for each application.



SAMURAI Lamella apron



FASTLAP Lamella apron



FASTLAP Lamella apron

Rubber Disk Bellows

Rubber disk bellows are of the highest quality and visually the most attractive protective covers for pistons and spindles. They are completely leak proof. Since each rubber disk lies flat on the other, excellent compression dimensions are achieved.
The production of rubber parts depends directly upon the control and monitoring of the production processes. Each process step, from mixing up to rolling out the material, from punching the disks up to the vulcanization process, is performed under the most accurate observation and attention. Stringent quality criteria leads to high process reliability. After vulcanizing, the rubber disk bellows are ground on the outside, so that they have an absolutely smooth surface when closed.

Material

Good resistance to light and atmospheric conditions and are well suited to outside use. If emphasis is on oil or coolant protection in your area of application, then we recommend the use of NBR rubber foil. Alternative materials are available for high temperature requirements.

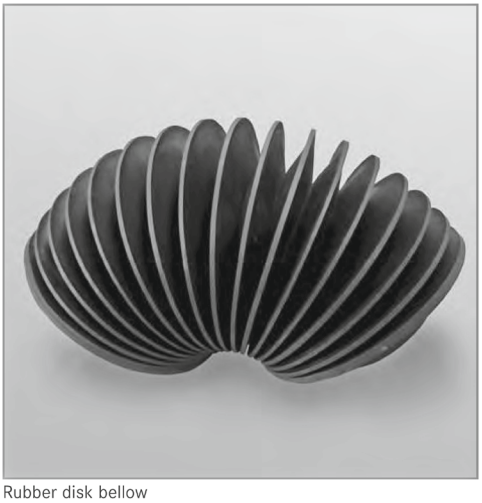
Compression of Rubber disk bellow

Types

For standard types of this bellow round profiles will be used. As an alternative, square, rectangular or oval profiles can also be produced.

Dimensions

Rubber disk bellows are supplied in standard sizes with inside diameters of 20 to 400 mm and outside diameters of 40 to 480 mm.



Rubber disk bellow

We supply the bellows in 5 mm graduation up to a diameter of 200 mm and in 10 mm graduation above this.
The extended length of the rubber disk bellows can be up to 10 metres.

Mounting

Rubber disk bellows are fastened the same as other bellow types with sleeve or metal flange.

Design

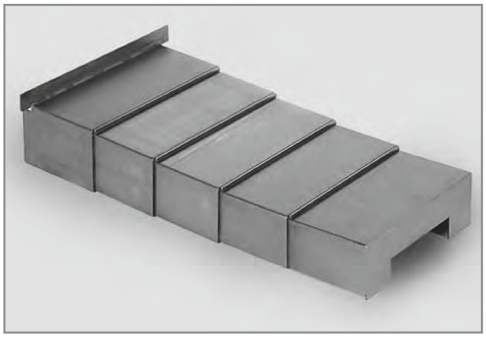
With large extension length and horizontal installation, it is usually necessary to use additional guide elements. In the most simple case, the bellows are stabilized by internal wire rings.
In more complex applications, guiding systems with rods or cables can be incorporated internally externally to the bellows.
When mounting these bellows please pay attention to sufficient aeration.

Construction	
Calculation formulae	
L_{max}	FZ x FB
L_{min}	FZ x 2,5
FB	$\frac{(AD - ID)}{2}$
FZ	$\frac{L_{max}}{FB}$
FZ	$\frac{Hub}{(FB - 2,5)}$

GLADIATOR Telescopic Steel Covers

Telescopic steel covers are used to protect slideways in certain machine tool applications. They offer effective protection against swarf and other debris.
Liquid or coolant ingress can be effectively reduced by feature design and the use of suitable wiper systems.

The benefits:
- Cost efficient production
- Efficient wiper systems
- High quality production
- Repair service and spare parts ex stock
- Fast design and delivery times

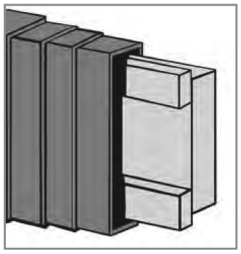


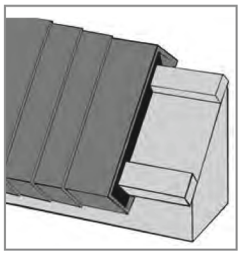
Design
- The depth of one individual box section should not be larger than 750 mm
- The cover height should not be larger than the length of the cover because of the danger of it falling over.
- The relation of box depth to box width should not exceed 1:6
- Principally use only graded types where each wiper rests on the adjacent box section. Designs where wiper overhang can result in swarf ingress.
- With coolant, the top of the covers should be inclined at an angle of 5°
- In principal, allow space for an underside return of the box sections, as this will stiffen the structure and will provide a constant pretension
- The minimum distance of the smallest box to the guiding position should be 12 mm
- For calculating the travel of the cover, add 5 mm of reserve per box to the travel of the machine
- For covers used in vertical position, gliders should be used for the underside return, which should be screwed on at least to one side for later (dis)mounting
- As a general rule is: maximum extension and minimum compression should be at maximum in the ratio 10:1

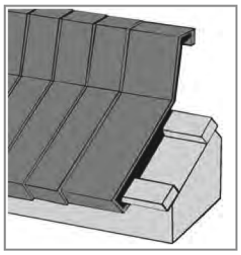
Material
The steel covers are produced from high quality cold-worked sheet steel in material thickness from 1.5 to 3 mm, or if required in stainless steel.
For all common types of machines a suitable type of cover (e.g. horizontal, vertical, inclined; transversed) together with the corresponding guide way solutions is available.

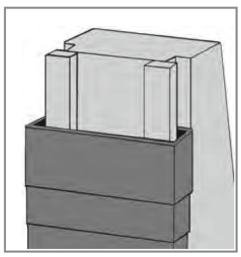
Samples of cover type

Horizontal


Transversed


Inclined


Inclined, folded


Vertical

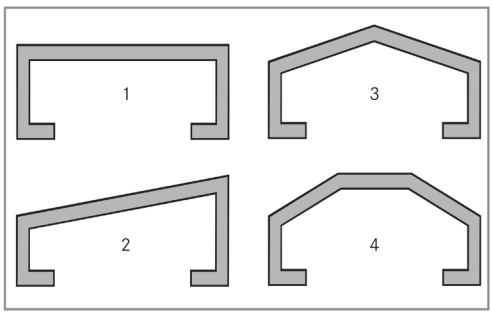
Impermeability of telescopic steel covers to coolant
Due to the design of steel covers a complete sealing against fluids cannot be guaranteed.
The standard types generally provide sufficient coolant protection. For high coolant flow rates, additional internal drainage channels, or a thermally bonded ELASTIC bellow underneath can offer additional protection.

GLADIATOR Designs

Designs

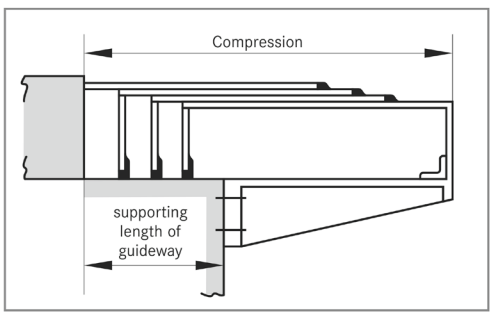
Telescopic steel covers can be produced in different designs:

- Standard design (1): cost-efficient, suitable for most standard applications. It can be used without problem up to a width of 900 mm
- Inclined shape (2): provides optimal drainage of liquids
- Roof shape with single edges (3): for larger widths, additional returns are required to increase the cover stiffness. Provides optimal drainage of coolants.
- Roof shape with double edges (4): for larger widths, additional returns to increase the cover stiffness, optimal drainage of fluids.



If the compression exceeds the available supporting length, a support box section has to be added.

For the opposite case, the largest front box section may be extended by a plate. The problem here is that chips and dirt may accumulate impairing the functioning of the cover.

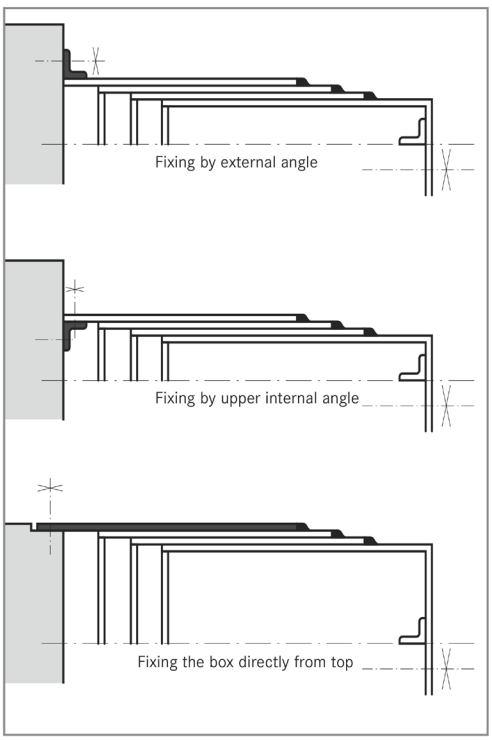


Pay attention to a smooth transition from the guideway to the machine bed extension.
Extensions are required only in the area of the support gliders. They can be manufactured from common steel (i.e. St37K).

Mounting

For mounting and fixing of the steel covers we offer you solutions specifically to the customer's individual requirement. The covers are fixed either directly to the corresponding first or final box section or by additional fixing brackets which may be attached internally or externally.

- Fixing by lateral external angle (recommended)
- Fixing by upper internal angle.
- Fixing the box directly from the top - high positional accuracy is required.



Transport

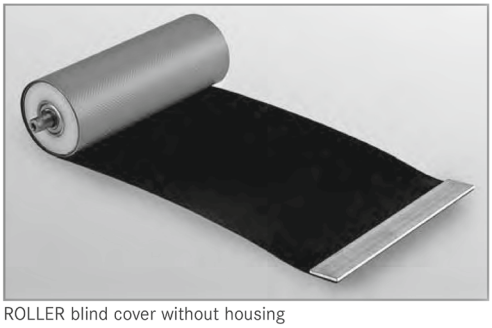
The covers are transported in the closed position; additionally they should be stored in an environment without humidity.
Before shipping, the telescopic steel covers are sprayed with an anti-corrosion oil and wrapped into plastic foil.
This will protect the steel cover against corrosion during transport and longer storage periods.
Please lubricate the entire steel cover from the outside before operation.

ROLLER Covers

ROLLER cover systems are a possible substitute for bellow covers in very narrow spaces when only general sealing is required.

Two different types are available:

- ROLLER blind without housing - this type needs less space, best used with smaller diameters and short extensions
- ROLLER blind with housing - we recommend this type for safety reasons when longer extensions are used and especially when steel is used for the band material. They are available in many variants.

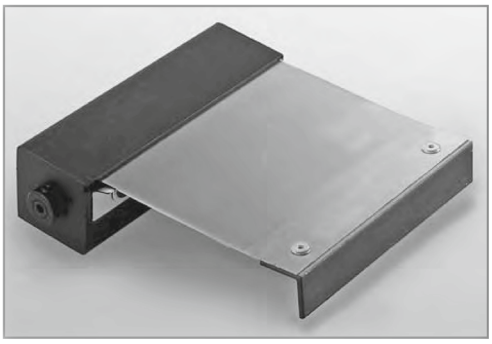


ROLLER blind cover without housing

Drives

The ROLLER systems come with different drive concepts:

- Torsion springs TF: Drive separate to cover band
- Steel band drives SA: Cover band forms drive
- Steel band spring drive FM: Drive separate to cover band
- Electrical drive: to customers specifications (see page 62)



ROLLER blind cover with steel band and housing

Torsion springs TF

Torsions springs are very well suited for a long working life performance at low loads. We recommend torsion spring drives primarily with synthetic material covers.
The torsion springs are manufactured from a high quality alloyed wire. This wire material has been proved to reach ten times the service life of a conventional wire spring.

Steel band drive SA

For higher tension forces we recommend SA steel band drives. The steel band for the outer cover also serves as a spring motor. Steel is selected for the band.

Steel band spring drive FM

Also suitable for higher tension forces are the FM steel band spring drives.

Design option	ROLLER with TF drive	ROLLER with SA drive	ROLLER with FM drive
Housing available	■	■	■
Side mount available	■		■
Link Apron available	■ (limited)		■
Outer band synthetic material	■		■
Outer band stainless steel	■ (limited)		■
Outer band normal steel		■	■
Maximum band width in mm	1,500*	300	1,500*
Maximum band extension in mm	3,000	7,500	6,000*
Maximum travelling speed	60 m/min	30 m/min	40 m/min
Rapid change of direction	■	■	limited
Continous load	very high	average	high
Resistance to dust/dirt	low	average	low
Tension forces	slightly increased when fully extended	increased when fully extended	slightly increased when fully extended
Product costs	low	low	average

*other dimensions on request

ROLLER Covers

Dimensions of housings

The measurements for the ROLLER System housings must take into account the band width, length of extension and also type of drive.

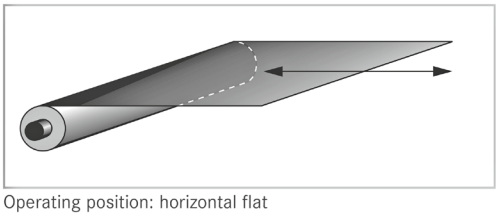
Design data for calculation

For the design of the ROLLER covers the following factors should be considered:

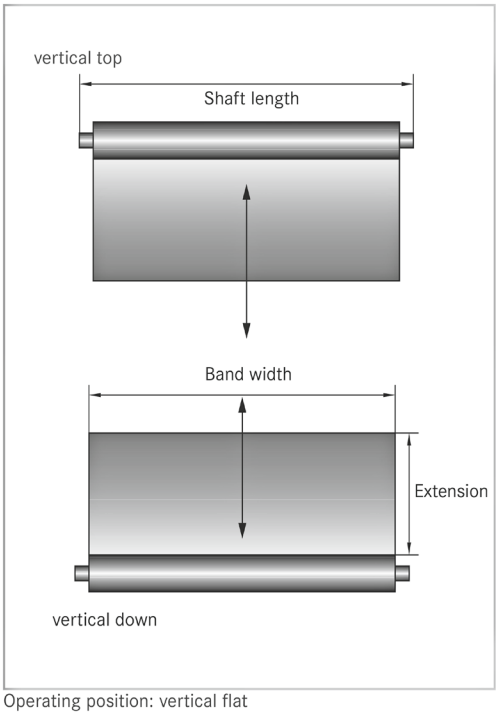
- speed of travel
- intended total number of cycles, working life
- frequency and speed of changes in travel direction
- mounting position, direction of swarf

Operating position

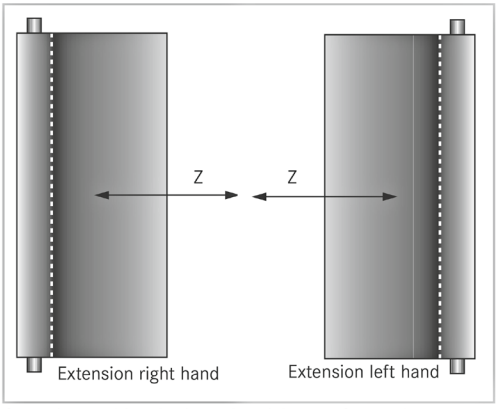
The operating position can be vertical, horizontal or transverse, with an extension to the left, right, top or bottom side.



Operating position: horizontal flat



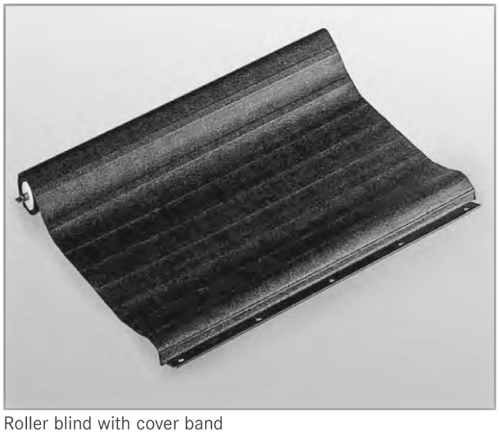
Operating position: vertical flat



Operating position: horizontal upright, e.g. for X axis covers

Pre-loading

- ROLLER systems with housing are pre-loaded at the factory to customer or HEMA specifications and are ready to install.
- ROLLER systems without housing are not pre-loaded.



Roller blind with cover band

Cover material

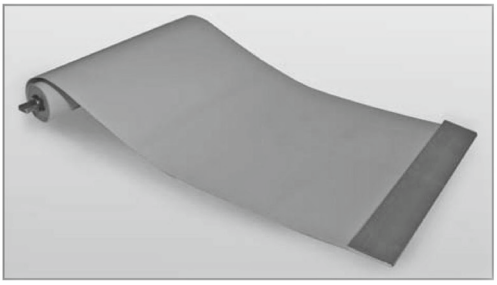
The outer band is subjected to a wide variety of stresses; the material chosen depends on the field of application:

- Steel bands with rounded edges (standard and stainless steel): Protection from cold and hot chips, coolants. Maximum width of steel band standard 300 mm, steel band stainless 1000 mm
- Synthetic bands, e.g. Preotex, awning cloth, Neoprene, etc., Protection from dust, coolants, contact guard
- Link aprons: Protection from large chips, coolants: Recommended for applications requiring additional lateral stability

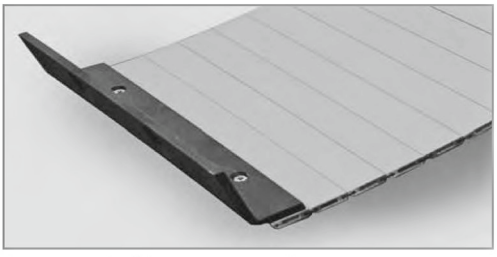
ROLLER Covers

Fixing the band

The band is fixed to your requirements with flat or angular steel brackets bonded or riveted to the band on one or both sides.

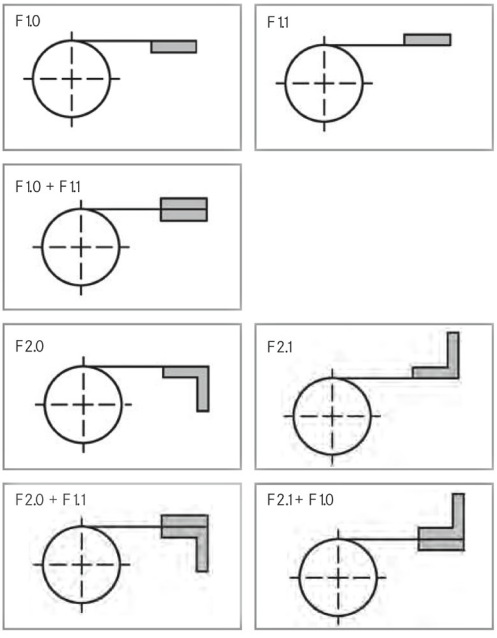


ROLLER with bonded fixing bracket F1.1



Link Apron with fixing bracket F2.1, riveted

Variety of band fixing types



Wiper

In order to keep the case as clean as possible, we use wiper systems as a standard feature.
For special applications we offer wipers for guideways and telescopic covers and brush wipers.

Replacement

When ordering replacement rollers please quote the serial number for the ROLLER cover.
This number can be found either on the roller blind itself or on a label on the housing.

Rollo with housing and HEMA serial number

Security information

Please observe the mounting and maintenance information supplied with each ROLLER cover.

Mounting and maintenance information for ROLLER

DURASPRING Spiral Springs

Spiral Springs are commonly used for the durable protection of ballscrews and shafts. DURASPRING Spiral Springs are produced using spring steel. The steel strip is roll formed to produce the spiral spring.
The advantages of DURASPRING are:

- High quality spring steel
- Tandem installation of multiple springs is possible
- Retrofit possible
- Special oil for enhanced life
- Production certified according to ISO 9000:2008
- Anti-corrosive packaging

DURASPRING in standard and stainless steel

DURASPRING Spiral Springs are available in two versions:

- **DURASPRING BLUE** - standard spring, blue steel
- **DURASPRING SILVER** - stainless steel version

If the spiral springs are exposed regularly to coolants with a high proportion of water, then stainless steel band should be used. Stainless spiral springs have lower spring forces and therefore cannot be manufactured in all sizes. We use spring band steel of extreme hardness (55-58 Rockwell) with chamfered edges and a strength of up to 1800 N/mm² for our standard spiral springs. Band steel in thicknesses from 0.2 to 1.0 mm will be selected in accordance to size and application. Since this is docucumented within our quality system, reproducibility is also guaranteed when re-ordering.

DURASPRING lable with article number

Testing of DURASPRING Spiral Springs

Dimensions

The standard range now comprises springs in dimensions from 15 mm up to 160 mm internal diameter. Special dimensions are available on request. Spiral springs for vertical use can be produced up to an extended length of 4500 mm.

Speed

DURASPRING is designed as standard for speeds up to 40 metres/minute. Special solutions with almost twice the speed are achieved in individual robotics applications.
The optimum operating conditions for DURASPRING is in applications with oil. Bellows should be used alternatively for fine particles and dust.

Maintenance/Cleaning

Decisive factors in assessing the quality of spiral springs are the smoothness of travel, and even consistency of the overlapping turns. The quality of each DURASPRING is assured with the aid of our testing machines. Each spring is tested for its running properties prior to despatch.
Maintenance of the springs is necessary. Cleaning the springs according to the degree of contamination and then applying a light oil film is recommended. Available for this purpose is DURASPRING LONGLIFE special oil.

Please pay attention to the mounting and maintenance information supplied with each shipment.

DURASPRING Spiral Springs

Installation/operating position

DURASPRING Spiral springs can be installed in both, horizontal and vertical applications:

- Horizontal installation
- Vertical installation

Our DURASPRING Spiral Springs are manufactured specifically to suit horizontal or vertical operation.
For horizontal applications, the extension is reduced (see tabulations).

Horizontal installation

Springs used horizontally are formed for particularly for uniform running in that the overlap between coils is increased. In this way »sagging« is reduced, particularly for longer extension lengths, and transverse stability is significantly improved.
In the case of horizontal installation of the springs, placing the larger diameter adjacent to the area of swarf production is recommended.

Vertical installation

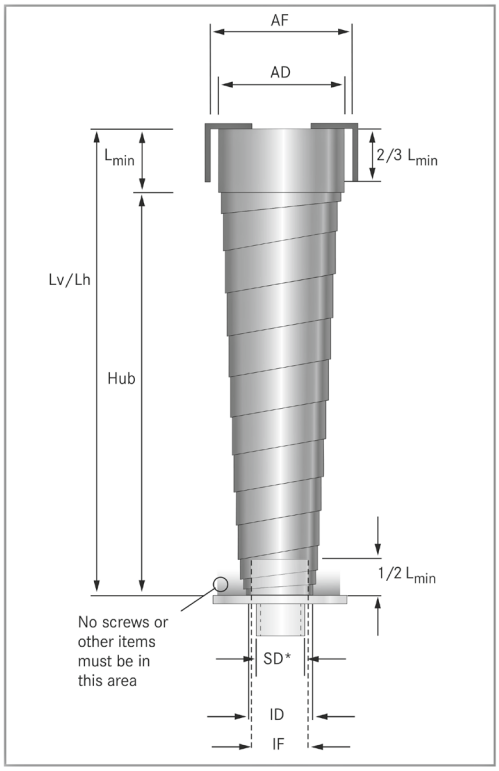
As a matter of principle, vertically installed DURASPRING achieve larger extension lengths than horizontal types.
The critical design factor for this type is the force produced, as the springs must also work against gravity.
Vertical types therefore have a high starting force, guaranteeing that the DURASPRING draws out rapidly when starting/ extending with the machine movement.
For efficient protection and optimum operation, vertical spirals should be mounted with the large diameter at the top.

Flanges (optional)

Simple centring flanges are required at both ends of the DURASPRING for installation (see order sheet).
These flanges must permit rotary movements of the spring that may occur, in order to prevent damage to the springs. The springs must be guided so that they can move freely. It is not permitted to screw and/or rivet them.

When using flanges, the spindle diameter SD is reduced by 6 mm compared to the values given on the following pages.

DURASPRING Silver in stainless steel



Legend	
SD	Maximum outside diameter of the part to be covered *value is reduced by 6 mm when using flanges
ID	Inside diameter of spiral spring (±1 mm)
AD	Outside diameter of spiral spring (±2 mm)
Lh	Maximum extension length for horizontal installation position
Lv	Maximum extension length for vertical installation position
BB	Band width, corresponds to L_{min}
SILVER	sizes also in **DURASPRING Silver available**
na	not available

Caculae for flanges	
Centering flange (deliverable on demand):	
AF	Interior diameter of the larger centering flange AD + 4mm
IF	Outer diameter of the smaller centering flange ID - 2mm
Option	through-boring of the flange SD + 2mm

HEMA

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
15-70-20	11	15	22	na	70	20
15-100-20	11	15	22	60	100	20
15-120-20	11	15	22	90	120	20
15-150-20	11	15	28	110	150	20
15-200-20	11	15	31	160	200	20
15-300-20	11	15	32	260	300	20
20-100-20 SILVER	16	20	30	60	100	20
20-150-20 SILVER	16	20	33	110	150	20
20-200-20 SILVER	16	20	36	160	200	20
20-250-20 SILVER	16	20	39	210	250	20
20-300-20 SILVER	16	20	41	260	300	20
20-250-30	16	20	36	210	250	30
20-300-30 SILVER	16	20	39	260	300	30
20-350-30 SILVER	16	20	41	310	350	30
20-400-30 SILVER	16	20	43	360	400	30
20-400-40	16	20	35	360	400	40
20-450-40	16	20	41	410	450	40
20-500-40 SILVER	16	20	48	460	500	40
25-100-20 SILVER	21	25	36	60	100	20
25-150-20 SILVER	21	25	38	110	150	20
25-200-20 SILVER	21	25	40	160	200	20
25-250-20 SILVER	21	25	44	210	250	20
25-300-20	21	25	46	260	300	20
25-300-30 SILVER	21	25	42	240	300	30
25-350-30 SILVER	21	25	45	290	350	30
25-400-30	21	25	48	340	400	30
25-450-30 SILVER	21	25	49	390	450	30
25-450-40 SILVER	21	25	48	370	450	40
25-500-40 SILVER	21	25	49	420	500	40
25-450-50	21	25	41	390	450	50
25-550-50 SILVER	21	25	43	490	550	50
25-600-50	21	25	44	540	600	50
25-650-50 SILVER	21	25	45	590	650	50
25-750-50	21	25	47	690	750	50
25-900-50 SILVER	21	25	57	840	900	50
30-150-30	26	30	39	90	150	30
30-200-30 SILVER	26	30	42	140	200	30
30-250-30 SILVER	26	30	44	190	250	30
30-300-30 SILVER	26	30	46	240	300	30
30-350-30 SILVER	26	30	49	290	350	30
30-400-30 SILVER	26	30	50	340	400	30

DURASPRING	SD*	ID	AD	Lh	Lv	BB
30-450-30 SILVER	26	30	53	390	450	30
30-450-40	26	30	53	370	450	40
30-500-40 SILVER	26	30	55	440	500	40
30-550-40 SILVER	26	30	58	490	550	40
30-600-40	26	30	58	540	600	40
30-650-40	26	30	60	590	650	40
30-700-40 SILVER	26	30	64	640	700	40
30-150-50 SILVER	26	30	40	90	150	50
30-250-50 SILVER	26	30	42	190	250	50
30-350-50	26	30	45	290	350	50
30-450-50 SILVER	26	30	46	390	450	50
30-550-50 SILVER	26	30	48	490	550	50
30-650-50 SILVER	26	30	55	590	650	50
30-750-50 SILVER	26	30	58	690	750	50
30-650-60	26	30	58	590	650	60
30-750-60 SILVER	26	30	55	690	750	60
30-900-60	26	30	58	840	900	60
30-1000-60	26	30	60	940	1000	60
35-100-20	31	35	45	60	100	20
35-100-30	31	35	44	60	100	30
35-150-30 SILVER	31	35	48	90	150	30
35-200-30 SILVER	31	35	50	140	200	30
35-250-30	31	35	52	190	250	30
35-300-30 SILVER	31	35	55	240	300	30
35-350-30 SILVER	31	35	61	290	350	30
35-400-30 SILVER	31	35	63	340	400	30
35-300-40 SILVER	31	35	48	240	300	40
35-350-40 SILVER	31	35	50	290	350	40
35-400-40 SILVER	31	35	54	340	400	40
35-450-40 SILVER	31	35	58	390	450	40
35-500-40	31	35	60	440	500	40
35-550-40	31	35	62	490	550	40
35-350-50	31	35	51	290	350	50
35-400-50 SILVER	31	35	52	340	400	50
35-450-50	31	35	54	390	450	50
35-500-50 SILVER	31	35	55	440	500	50
35-550-50 SILVER	31	35	57	na	550	50
35-650-50 SILVER	31	35	60	590	650	50
35-750-50 SILVER	31	35	64	690	750	50
35-850-50	31	35	65	790	850	50
35-450-60	31	35	53	390	450	60

Standard sizes, other sizes on request. All dimension in mm.

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
35-550-60	31	35	56	490	550	60
35-650-60 SILVER	31	35	59	590	650	60
35-750-60	31	35	60	690	750	60
35-850-60 SILVER	31	35	65	790	850	60
35-550-75	31	35	54	490	550	75
35-650-75	31	35	55	590	650	75
35-750-75	31	35	57	690	750	75
35-850-75 SILVER	31	35	59	790	850	75
40-150-30 SILVER	36	40	51	90	150	30
40-250-30 SILVER	36	40	56	190	250	30
40-350-30 SILVER	36	40	60	290	350	30
40-450-30 SILVER	36	40	64	390	450	30
40-350-40	36	40	61	290	350	40
40-400-40	36	40	63	340	400	40
40-450-40 SILVER	36	40	64	390	450	40
40-500-40 SILVER	36	40	65	440	500	40
40-550-40 SILVER	36	40	68	490	550	40
40-350-50 SILVER	36	40	56	250	350	50
40-450-50 SILVER	36	40	59	350	450	50
40-550-50 SILVER	36	40	61	450	550	50
40-650-50 SILVER	36	40	65	550	650	50
40-750-50 SILVER	36	40	69	650	750	50
40-850-50 SILVER	36	40	71	750	850	50
40-350-60 SILVER	36	40	55	230	350	60
40-450-60 SILVER	36	40	58	450	450	60
40-550-60 SILVER	36	40	59	430	550	60
40-650-60 SILVER	36	40	62	530	650	60
40-750-60 SILVER	36	40	66	630	750	60
40-900-60 SILVER	36	40	70	780	900	60
40-650-75	36	40	63	500	650	75
40-750-75 SILVER	36	40	66	600	750	75
40-900-75 SILVER	36	40	71	750	900	75
40-1100-75 SILVER	36	40	78	950	1100	75
40-1300-75 SILVER	36	40	84	1150	1300	75
40-1500-75 SILVER	36	40	90	na	1500	75
40-1000-100 SILVER	36	40	68	800	1000	100
40-1200-100 SILVER	36	40	71	1000	1200	100
40-1300-100	36	40	75	1100	1300	100
40-1400-100	36	40	76	1200	1400	100
40-1500-100 SILVER	36	40	78	1300	1500	100
40-1600-100	36	40	81	1400	1600	100

Standard sizes, other sizes on request. All dimension in mm.

DURASPRING	SD*	ID	AD	Lh	Lv	BB
40-1800-100 SILVER	36	40	82	1600	1800	100
40-1800-120	36	40	82	1560	1800	120
40-2000-120	36	40	86	1760	2000	120
40-2200-120	36	40	90	na	2200	120
45-150-30 SILVER	41	45	56	90	150	30
45-250-30 SILVER	41	45	61	190	250	30
45-350-30 SILVER	41	45	65	290	350	30
45-400-30 SILVER	41	45	66	340	400	30
45-350-40	41	45	65	290	350	40
45-400-40	41	45	68	340	400	40
45-450-40 SILVER	41	45	69	390	450	40
45-450-50 SILVER	41	45	66	350	450	50
45-550-50 SILVER	41	45	68	450	550	50
45-650-50 SILVER	41	45	75	550	650	50
45-350-60	41	45	63	230	350	60
45-450-60 SILVER	41	45	65	330	450	60
45-550-60	41	45	65	430	550	60
45-650-60	41	45	69	530	650	60
45-700-60 SILVER	41	45	70	630	700	60
45-650-75 SILVER	41	45	67	500	650	75
45-750-75 SILVER	41	45	76	600	750	75
45-900-75 SILVER	41	45	78	750	900	75
45-1100-75 SILVER	41	45	84	950	1100	75
45-1200-75	41	45	86	1150	1200	75
45-1300-75	41	45	89	na	1300	75
45-1000-100	41	45	71	800	1000	100
45-1200-100	41	45	75	1000	1200	100
45-1300-100	41	45	79	1100	1300	100
45-1400-100	41	45	81	1200	1400	100
45-1500-100	41	45	83	1300	1500	100

Legend	
SD	Maximum outside diameter of the part to be covered *value is reduced by 6 mm when using flanges
ID	Inside diameter of spiral spring (±1 mm)
AD	Outside diameter of spiral spring (±2 mm)
Lh	Maximum extension length for horizontal installation position
Lv	Maximum extension length for vertical installation position
BB	Band width, corresponds to L_{min}
SILVER	sizes also in **DURASPRING Silver available**
na	not available

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
45-1600-100	41	45	87	1400	1600	100
45-1800-100	41	45	87	na	1800	100
45-1800-120	41	45	87	1560	1800	120
45-2000-120	41	45	91	1760	2000	120
45-2200-120 SILVER	41	45	100	na	2200	120
50-150-30 SILVER	46	50	63	90	150	30
50-250-30 SILVER	46	50	68	190	250	30
50-350-30 SILVER	46	50	73	290	350	30
50-250-50 SILVER	46	50	62	150	250	50
50-350-50 SILVER	46	50	66	250	350	50
50-450-50 SILVER	46	50	70	350	450	50
50-550-50 SILVER	46	50	73	450	550	50
50-650-50 SILVER	46	50	76	550	650	50
50-350-60 SILVER	46	50	66	230	350	60
50-450-60	46	50	65	330	450	60
50-550-60 SILVER	46	50	68	430	550	60
50-600-60 SILVER	46	50	72	480	600	60
50-650-60 SILVER	46	50	73	530	650	60
50-750-60 SILVER	46	50	80	630	750	60
50-900-60 SILVER	46	50	81	780	900	60
50-750-75 SILVER	46	50	78	600	750	75
50-900-75 SILVER	46	50	84	750	900	75
50-1100-75	46	50	90	950	1100	75
50-1200-75	46	50	94	1050	1200	75
50-1100-100 SILVER	46	50	77	900	1100	100
50-1300-100 SILVER	46	50	80	1100	1300	100
50-1500-100 SILVER	46	50	88	1300	1500	100
50-1600-100	46	50	89	1400	1600	100
50-1700-100	46	50	91	na	1700	100
50-1800-100 SILVER	46	50	94	na	1800	100
50-1700-120	46	50	91	1460	1700	120
50-1900-120 SILVER	46	50	96	1660	1900	120
50-2100-120 SILVER	46	50	100	1860	2100	120
50-2300-120	46	50	105	na	2300	120
50-2500-120	46	50	115	na	2500	120
50-2800-120	46	50	118	na	2800	120
50-2500-150	46	50	116	2200	2500	150
50-2800-150	46	50	118	2500	2800	150
50-3000-150	46	50	123	2500	3000	150
50-3000-180	46	50	123	2640	3000	180
50-3250-180	46	50	128	na	3250	180

DURASPRING	SD*	ID	AD	Lh	Lv	BB
50-3250-200	46	50	128	2850	3250	200
50-3500-200	46	50	134	na	3500	200
55-150-30 SILVER	51	55	67	90	150	30
55-250-30 SILVER	51	55	73	190	250	30
55-300-40	51	55	71	220	300	40
55-450-40 SILVER	51	55	76	370	450	40
55-250-50 SILVER	51	55	66	150	250	50
55-350-50 SILVER	51	55	71	250	350	50
55-450-50 SILVER	51	55	74	350	450	50
55-550-50 SILVER	51	55	78	450	550	50
55-650-50	51	55	80	450	650	50
55-550-60 SILVER	51	55	75	430	550	60
55-650-60 SILVER	51	55	79	530	650	60
55-750-60 SILVER	51	55	83	630	750	60
55-800-60	51	55	86	680	800	60
55-900-60 SILVER	51	55	89	780	900	60
55-1000-60 SILVER	51	55	92	na	1000	60
55-600-75 SILVER	51	55	80	450	600	75
55-750-75 SILVER	51	55	83	600	750	75
55-900-75 SILVER	51	55	89	750	900	75
55-1100-75 SILVER	51	55	94	950	1100	75
55-1100-100 SILVER	51	55	85	900	1100	100
55-1300-100	51	55	89	1100	1300	100
55-1500-100	51	55	94	1300	1500	100
55-1800-100 SILVER	51	55	102	1600	1800	100
55-1300-120	51	55	92	1060	1300	120
55-1500-120	51	55	94	1260	1500	120
55-1700-120	51	55	96	1460	1700	120
55-1900-120	51	55	100	1660	1900	120
55-2100-120	51	55	105	1860	2100	120
55-2300-120 SILVER	51	55	110	2060	2300	120
55-2500-120	51	55	116	2200	2500	120
55-2800-120	51	55	123	2500	2800	120
55-2500-150	51	55	118	2200	2500	150
55-2800-150	51	55	121	2500	2800	150
55-3000-150	51	55	126	na	3000	150
55-3500-150	51	55	130	2500	3500	150
55-2800-180	51	55	114	2500	2800	180
55-3000-180	51	55	126	2640	3000	180
55-3250-180	51	55	130	2500	3250	180
55-3500-200	51	55	137	na	3500	180

Standard sizes, other sizes on request. All dimension in mm.

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
60-150-30 SILVER	56	60	73	90	150	30
60-250-30 SILVER	56	60	78	190	250	30
60-250-50 SILVER	56	60	73	150	250	50
60-350-50 SILVER	56	60	78	250	350	50
60-450-50 SILVER	56	60	82	350	450	50
60-550-50	56	60	85	450	550	50
60-450-60 SILVER	56	60	78	430	450	60
60-550-60 SILVER	56	60	81	430	550	60
60-650-60 SILVER	56	60	85	530	650	60
60-750-60 SILVER	56	60	89	630	750	60
60-800-60 SILVER	56	60	96	680	800	60
60-900-60 SILVER	56	60	98	na	900	60
60-750-75 SILVER	56	60	89	600	750	75
60-900-75 SILVER	56	60	95	750	900	75
60-1100-75 SILVER	56	60	102	950	1100	75
60-1300-75	56	60	104	1150	1300	75
60-900-100	56	60	85	700	900	100
60-1100-100 SILVER	56	60	90	900	1100	100
60-1300-100 SILVER	56	60	94	1100	1300	100
60-1500-100 SILVER	56	60	100	1300	1500	100
60-1800-100 SILVER	56	60	109	1600	1800	100
60-1700-120	56	60	101	1460	1700	120
60-1900-120 SILVER	56	60	104	1660	1900	120
60-2100-120 SILVER	56	60	108	1860	2100	120
60-2300-120	56	60	114	2060	2300	120
60-2500-120 SILVER	56	60	118	2300	2500	120
60-2800-120	56	60	126	2500	2800	120
60-2500-150 SILVER	56	60	118	2300	2500	150
60-2800-150	56	60	123	2500	2800	150
60-3000-150	56	60	128	na	3000	150
60-3500-150	56	60	138	na	3500	150
60-3000-180	56	60	126	2640	3000	180
60-3250-180	56	60	132	na	3250	180
60-3250-200	56	60	132	2850	3250	200
60-3500-200	56	60	139	na	3500	200
65-100-30	61	65	76	90	100	30
65-150-30 SILVER	61	65	78	90	150	30
65-250-30 SILVER	61	65	85	190	250	30
65-250-50 SILVER	61	65	76	150	250	50
65-350-50 SILVER	61	65	84	250	350	50
65-450-50 SILVER	61	65	88	350	450	50

DURASPRING	SD*	ID	AD	Lh	Lv	BB
65-550-50 SILVER	61	65	92	450	550	50
65-500-60 SILVER	61	65	86	380	500	60
65-550-60 SILVER	61	65	88	430	550	60
65-650-60 SILVER	61	65	93	530	650	60
65-700-60 SILVER	61	65	94	580	700	60
65-750-60 SILVER	61	65	95	630	750	60
65-800-60 SILVER	61	65	98	680	800	60
65-900-60	61	65	103	780	900	60
65-750-75 SILVER	61	65	93	600	750	75
65-800-75 SILVER	61	65	96	650	800	75
65-900-75 SILVER	61	65	99	750	900	75
65-1100-75 SILVER	61	65	107	900	1100	75
65-1300-75	61	65	111	1100	1300	75
65-1500-75 SILVER	61	65	115	na	1500	75
65-1000-100 SILVER	61	65	91	800	1000	100
65-1100-100 SILVER	61	65	95	900	1100	100
65-1300-100 SILVER	61	65	99	1100	1300	100
65-1500-100 SILVER	61	65	108	1300	1500	100
65-1700-100 SILVER	61	65	113	na	1700	100
65-1800-100 SILVER	61	65	119	1600	1800	100
65-1500-120 SILVER	61	65	100	1260	1500	120
65-1700-120	61	65	106	1460	1700	120
65-1900-120 SILVER	61	65	109	1660	1900	120
65-2100-120 SILVER	61	65	113	1860	2100	120
65-2300-120	61	65	118	2060	2300	120
65-2500-120 SILVER	61	65	128	2300	2500	120
65-2800-120 SILVER	61	65	134	2500	2800	120
65-2400-150 SILVER	61	65	120	2100	2400	150
65-2800-150	61	65	132	2500	2800	150
65-3000-150	61	65	142	2500	3000	150

Standard sizes, other sizes on request. All dimension in mm.

Legend	
SD	Maximum outside diameter of the part to be covered *value is reduced by 6 mm when using flanges
ID	Inside diameter of spiral spring (±1 mm)
AD	Outside diameter of spiral spring (±2 mm)
Lh	Maximum extension length for horizontal installation position
Lv	Maximum extension length for vertical installation position
BB	Band width, corresponds to L_{min}
SILVER	sizes also in **DURASPRING Silver available**
na	not available

HEMA

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
65-3000-180	61	65	136	2640	3000	180
65-3250-180	61	65	145	na	3250	180
65-3250-200	61	65	138	2850	3250	200
65-3500-200	61	65	148	na	3500	200
70-150-30 SILVER	66	70	85	90	150	30
70-250-30 SILVER	66	70	93	190	250	30
70-350-30	66	70	99	290	350	30
70-250-50 SILVER	66	70	85	150	250	50
70-350-50 SILVER	66	70	89	250	350	50
70-450-50 SILVER	66	70	94	350	450	50
70-550-50 SILVER	66	70	97	450	550	50
70-650-50	66	70	100	na	650	50
70-550-60 SILVER	66	70	94	430	550	60
70-650-60 SILVER	66	70	97	530	650	60
70-750-60 SILVER	66	70	102	630	750	60
70-900-60	66	70	113	800	900	60
70-500-75 SILVER	66	70	91	350	500	75
70-600-75	66	70	94	450	600	75
70-700-75	66	70	98	550	700	75
70-750-75 SILVER	66	70	98	550	700	75
70-800-75 SILVER	66	70	102	650	800	75
70-900-75 SILVER	66	70	104	750	900	75
70-1100-75 SILVER	66	70	113	900	1100	75
70-700-100 SILVER	66	70	88	700	700	100
70-900-100 SILVER	66	70	98	900	900	100
70-1100-100 SILVER	66	70	102	900	1100	100
70-1300-100 SILVER	66	70	106	1100	1300	100
70-1500-100 SILVER	66	70	115	1300	1500	100
70-1800-100 SILVER	66	70	124	1700	1800	100
70-1500-120 SILVER	66	70	110	1260	1500	120
70-1800-120 SILVER	66	70	118	1560	1800	120
70-2000-120 SILVER	66	70	125	1760	2000	120
70-2200-120	66	70	129	1960	2200	120
70-2400-120	66	70	136	2200	2400	120
70-2600-120	66	70	143	na	2600	120
70-3000-120	66	70	147	na	3000	120
70-2000-150	66	70	129	1700	2000	150
70-2400-150	66	70	135	2100	2400	150
70-2800-150	66	70	139	na	2800	150
70-3000-150	66	70	149	na	3000	150
70-2800-180	66	70	138	2440	2800	180

DURASPRING	SD*	ID	AD	Lh	Lv	BB
70-3000-180	66	70	141	na	3000	180
70-3250-180	66	70	152	2500	3250	180
70-3250-200	66	70	144	2500	3250	200
70-3500-200	66	70	155	2500	3500	200
75-150-30 SILVER	71	75	92	90	150	30
75-250-30 SILVER	71	75	98	190	250	30
75-250-50 SILVER	71	75	89	150	250	50
75-350-50 SILVER	71	75	94	250	350	50
75-450-50 SILVER	71	75	101	350	450	50
75-500-50 SILVER	71	75	105	400	500	50
75-550-60 SILVER	71	75	100	430	550	60
75-650-60 SILVER	71	75	103	530	650	60
75-750-60 SILVER	71	75	109	630	750	60
75-650-75 SILVER	71	75	99	500	650	75
75-750-75 SILVER	71	75	104	600	750	75
75-900-75 SILVER	71	75	111	750	900	75
75-1000-75 SILVER	71	75	114	850	1000	75
75-1100-75 SILVER	71	75	118	950	1100	75
75-900-100 SILVER	71	75	102	na	900	100
75-1100-100 SILVER	71	75	108	900	1100	100
75-1200-100 SILVER	71	75	112	1000	1200	100
75-1300-100 SILVER	71	75	112	1100	1300	100
75-1500-100 SILVER	71	75	120	1300	1500	100
75-1700-100 SILVER	71	75	126	1500	1700	100
75-1800-100	71	75	128	1600	1800	100
75-2000-100	71	75	133	1700	2000	100
75-2200-100	71	75	136	1900	2200	100
75-1500-120 SILVER	71	75	115	1260	1500	120
75-1800-120	71	75	122	1560	1800	120
75-2000-120 SILVER	71	75	127	1760	2000	120
75-2200-120 SILVER	71	75	132	1900	2200	120
75-2400-120	71	75	137	na	2400	120
75-2600-120	71	75	142	2200	2600	120
75-2800-120	71	75	147	na	2800	120
75-2000-150	71	75	135	1700	2000	150
75-2400-150	71	75	140	2100	2400	150
75-2600-150	71	75	144	2300	2600	150
75-2800-150 SILVER	71	75	145	2500	2800	150
75-3000-150	71	75	152	na	3000	150
75-2800-180	71	75	143	2440	2800	180
75-3000-180	71	75	148	na	3000	180

Standard sizes, other sizes on request. All dimension in mm.

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
75-3250-180	71	75	156	2500	3250	180
75-3250-200	71	75	148	2850	3250	200
75-3500-200	71	75	158	na	3500	200
80-150-30 SILVER	76	80	98	90	150	30
80-250-30 SILVER	76	80	106	190	250	30
80-250-50 SILVER	76	80	96	150	250	50
80-450-50 SILVER	76	80	111	350	450	50
80-550-50 SILVER	76	80	114	450	550	50
80-450-60	76	80	102	330	450	60
80-550-60	76	80	105	430	550	60
80-650-60 SILVER	76	80	110	530	650	60
80-750-60	76	80	115	630	750	60
80-550-75 SILVER	76	80	99	400	550	75
80-600-75	76	80	102	450	600	75
80-650-75	76	80	105	500	650	75
80-750-75 SILVER	76	80	108	600	750	75
80-900-75	76	80	119	750	900	75
80-1000-75 SILVER	76	80	123	850	1000	75
80-1200-75 SILVER	76	80	128	1000	1200	75
80-900-100 SILVER	76	80	119	900	900	100
80-1100-100	76	80	115	900	1100	100
80-1300-100 SILVER	76	80	120	1100	1300	100
80-1500-100	76	80	126	1300	1500	100
80-1800-100	76	80	134	1600	1800	100
80-1300-120	76	80	115	1060	1300	120
80-1500-120	76	80	121	1260	1500	120
80-1800-120	76	80	128	1560	1800	120
80-2000-120 SILVER	76	80	133	1700	2000	120
80-2200-120	76	80	137	1700	2200	120
80-2400-120	76	80	142	na	2400	120
80-2800-120	76	80	145	na	2800	120
80-2000-150	76	80	139	1700	2000	150
80-2200-150	76	80	142	1900	2200	150
80-2400-150	76	80	146	2100	2400	150
80-2600-150	76	80	148	2300	2600	150
80-2800-150 SILVER	76	80	152	na	2800	150
80-3000-150	76	80	157	na	3000	150
80-2800-180	76	80	148	2440	2800	180
80-3000-180 SILVER	76	80	154	na	3000	180
80-3250-180	76	80	157	na	3250	180
80-3000-200	76	80	154	2600	3000	200

Standard sizes, other sizes on request. All dimension in mm.

DURASPRING	SD*	ID	AD	Lh	Lv	BB
80-3250-200 SILVER	76	80	160	na	3250	200
80-3500-200	76	80	163	2500	3500	200
85-150-30	81	85	103	90	150	30
85-250-30	81	85	111	190	250	30
85-250-50	81	85	105	150	250	50
85-350-50	81	85	109	250	350	50
85-450-50	81	85	116	350	450	50
85-550-50	81	85	119	450	550	50
85-650-60	81	85	115	530	650	60
85-550-75	81	85	108	400	550	75
85-900-75	81	85	125	750	900	75
85-1500-100	81	85	127	1300	1500	100
85-1500-120	81	85	126	1260	1500	120
85-2000-120	81	85	138	1700	2000	120
85-2400-150 SILVER	81	85	151	2100	2400	150
85-3500-200	81	85	168	na	3500	200
90-150-30 SILVER	86	90	110	90	150	30
90-250-30	86	90	116	190	250	30
90-150-50	86	90	112	50	150	50
90-250-50 SILVER	86	90	116	150	250	50
90-350-50 SILVER	86	90	121	250	350	50
90-450-50 SILVER	86	90	125	350	450	50
90-350-60 SILVER	86	90	112	230	350	60
90-450-60 SILVER	86	90	114	330	450	60
90-450-75	86	90	115	300	450	75
90-550-75 SILVER	86	90	119	400	550	75
90-650-75 SILVER	86	90	124	500	650	75
90-750-75	86	90	128	600	750	75
90-900-75	86	90	133	750	900	75
90-750-100	86	90	115	550	750	100

Legend	
SD	Maximum outside diameter of the part to be covered *value is reduced by 6 mm when using flanges
ID	Inside diameter of spiral spring (±1 mm)
AD	Outside diameter of spiral spring (±2 mm)
Lh	Maximum extension length for horizontal installation position
Lv	Maximum extension length for vertical installation position
BB	Band width, corresponds to L_{min}
SILVER	sizes also in **DURASPRING Silver available**
na	not available

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
90-900-100 SILVER	86	90	120	700	900	100
90-1100-100 SILVER	86	90	126	900	1100	100
90-1300-100 SILVER	86	90	132	1100	1300	100
90-1500-100 SILVER	86	90	144	1300	1500	100
90-1300-120 SILVER	86	90	126	1060	1300	120
90-1500-120 SILVER	86	90	131	1260	1500	120
90-1800-120	86	90	138	1600	1800	120
90-2000-120	86	90	148	na	2000	120
90-1800-150	86	90	144	1500	1800	150
90-2000-150 SILVER	86	90	149	1700	2000	150
90-2300-150	86	90	154	na	2300	150
90-2600-150	86	90	159	na	2600	150
90-2800-150	86	90	160	na	2800	150
90-3000-150	86	90	166	na	3000	150
90-2600-180	86	90	152	2240	2600	180
90-2800-180	86	90	158	na	2800	180
90-3000-180	86	90	164	na	3000	180
90-2600-200 SILVER	86	90	153	2400	2600	200
90-3000-200	86	90	162	2500	3000	200
90-3250-200	86	90	166	2500	3250	200
90-3500-200	86	90	170	na	3500	200
90-3700-200	86	90	173	2500	3700	200
90-4000-200	86	90	182	na	4000	200
90-4200-200 SILVER	86	90	185	na	4200	200
90-4500-200	86	90	194	na	4500	200
100-250-60 SILVER	96	100	121	130	250	60
100-350-60 SILVER	96	100	126	230	350	60
100-350-75 SILVER	96	100	119	200	350	75
100-450-75	96	100	124	300	450	75
100-600-75 SILVER	96	100	129	450	600	75
100-800-75 SILVER	96	100	138	650	800	75
100-800-100 SILVER	96	100	126	600	800	100
100-1000-100 SILVER	96	100	132	800	1000	100
100-1200-100	96	100	137	1000	1200	100
100-1500-100	96	100	146	1300	1500	100
100-1100-120 SILVER	96	100	129	860	1100	120
100-1300-120 SILVER	96	100	136	1060	1300	120
100-1500-120	96	100	144	na	1500	120
100-1800-120 SILVER	96	100	148	na	1800	120
100-1500-150	96	100	147	1200	1500	150
100-1800-150	96	100	151	1500	1800	150

DURASPRING	SD*	ID	AD	Lh	Lv	BB
100-2000-150 SILVER	96	100	157	1700	2000	150
100-2500-150	96	100	164	na	2500	150
100-3000-150	96	100	188	na	3000	150
100-2500-180	96	100	162	2140	2500	180
100-2800-180	96	100	168	na	2800	180
100-2800-200	96	100	165	na	2800	200
100-3000-200	96	100	170	na	3000	200
110-250-50 SILVER	106	110	130	na	250	50
110-250-60 SILVER	106	110	130	130	250	60
110-350-60 SILVER	106	110	135	230	350	60
110-450-60 SILVER	106	110	139	330	450	60
110-350-75 SILVER	106	110	130	200	350	75
110-450-75	106	110	134	300	450	75
110-600-75 SILVER	106	110	140	450	600	75
110-800-75 SILVER	106	110	154	650	800	75
110-650-100 SILVER	106	110	129	450	650	100
110-750-100 SILVER	106	110	134	560	750	100
110-900-100 SILVER	106	110	139	700	900	100
110-1100-120	106	110	139	860	1100	120
110-1300-120 SILVER	106	110	145	1060	1300	120
110-1500-120 SILVER	106	110	155	1260	1500	120
110-1500-150	106	110	155	1200	1500	150
110-1800-150	106	110	157	1500	1800	150
110-2000-150	106	110	160	1700	2000	150
110-2200-180	106	110	165	1840	2200	180
110-2400-180 SILVER	106	110	170	na	2400	180
110-2400-200	106	110	162	2000	2400	200
110-2800-200	106	110	172	2500	2800	200
110-3000-200	106	110	176	na	3000	200
110-3500-200	106	110	189	na	3500	200
120-250-50	116	120	141	na	250	50
120-350-50 SILVER	116	120	143	na	350	50
120-250-60 SILVER	116	120	141	130	250	60
120-350-60 SILVER	116	120	145	230	350	60
120-450-60 SILVER	116	120	150	330	450	60
120-350-75	116	120	140	200	350	75
120-450-75 SILVER	116	120	145	300	450	75
120-600-75	116	120	153	450	600	75
120-650-100 SILVER	116	120	142	450	650	100
120-750-100 SILVER	116	120	147	550	750	100
120-900-100 SILVER	116	120	150	700	900	100

Standard sizes, other sizes on request. All dimension in mm.

DURASPRING Spiral Springs

DURASPRING	SD*	ID	AD	Lh	Lv	BB
120-900-120 SILVER	116	120	148	660	900	120
120-1100-120 SILVER	116	120	153	860	1100	120
120-1300-120	116	120	158	1100	1300	120
120-1500-120 SILVER	116	120	162	1300	1500	120
120-1300-150 SILVER	116	120	156	1000	1300	150
120-1500-150	116	120	163	1200	1500	150
120-1800-150	116	120	167	1500	1800	150
120-2000-150	116	120	177	1600	2000	150
120-1600-180	116	120	158	1240	1600	180
120-1800-180	116	120	161	1440	1800	180
120-2000-180 SILVER	116	120	169	1640	2000	180
120-2200-180	116	120	174	na	2200	180
120-2200-200 SILVER	116	120	165	1800	2200	200
120-2400-200	116	120	170	2100	2400	200
120-2600-200	116	120	174	na	2600	200
130-170-50	126	130	150	na	170	50
130-250-60 SILVER	126	130	145	210	250	60
130-350-60	126	130	155	na	350	60
130-450-60	126	130	156	410	450	60
130-250-75 SILVER	126	130	145	220	250	75
130-350-75	126	130	150	310	350	75
130-450-75	126	130	156	410	450	75
130-650-100	126	130	157	600	650	100
130-800-100	126	130	164	na	800	100
130-600-120	126	130	158	360	600	120
130-800-120 SILVER	126	130	161	560	800	120
130-1000-120 SILVER	126	130	164	760	1000	120
130-1100-120	126	130	163	na	1100	120
130-900-150	126	130	163	500	900	150
130-1300-150	126	130	170	1000	1300	150
130-1500-150	126	130	174	1200	1500	150
130-1800-150	126	130	185	na	1800	150
130-1650-180	126	130	170	1650	1650	180
130-2000-200	126	130	180	2000	2000	200
140-250-75	136	140	158	150	250	75
140-350-75	136	140	162	250	350	75
140-450-75	136	140	165	350	450	75
140-600-75	136	140	175	na	600	75
140-350-100	136	140	153	250	350	100
140-450-100	136	140	162	350	450	100
140-600-100	136	140	172	500	600	100

DURASPRING	SD*	ID	AD	Lh	Lv	BB
140-700-120	136	140	170	460	700	120
140-1000-120	136	140	192	na	1000	120
140-1000-150	136	140	180	700	1000	150
140-1300-150	136	140	187	1000	1300	150
140-1500-150 SILVER	136	140	190	na	1500	150
140-1900-200	136	140	185	1500	1900	200
140-2000-200	136	140	193	1600	2000	200
140-2400-200	136	140	204	na	2400	200
150-350-60	146	150	172	300	350	60
150-450-75	146	150	188	na	450	75
150-500-75	146	150	190	na	500	75
150-600-75	146	150	194	na	600	75
150-750-150	146	150	180	na	750	150
150-1100-150	146	150	187	na	1100	150
150-1300-150	146	150	197	na	1300	150
160-250-60	156	160	178	na	250	60
160-250-75	156	160	180	na	250	75
160-450-75	156	160	189	na	450	75
160-450-100	156	160	182	350	450	100
160-650-120	156	160	191	550	650	120
160-750-120	156	160	193	600	750	120
160-800-150	156	160	197	na	800	150
160-950-150	156	160	200	na	950	150
160-1000-150	156	160	202	na	1000	150
160-1200-150 SILVER	156	160	204	na	1200	150
160-1200-200	156	160	193	na	1200	200
160-1300-200	156	160	200	na	1300	200
160-1400-200	156	160	212	na	1400	200
160-2000-200	156	160	222	na	2000	200

Standard sizes, other sizes on request. All dimension in mm.

Legend	
SD	Maximum outside diameter of the part to be covered *value is reduced by 6 mm when using flanges
ID	Inside diameter of spiral spring (±1 mm)
AD	Outside diameter of spiral spring (±2 mm)
Lh	Maximum extension length for horizontal installation position
Lv	Maximum extension length for vertical installation position
BB	Band width, corresponds to L_{min}
SILVER	sizes also in **DURASPRING Silver available**
na	not available

Machine Safety Windows

Safety glass is a restraining protective device on machining centres. It prevents tools, machined parts and broken particles from being ejected out of the machine's working space and protects people from injuries.
Industrial accident statistics show that workers are still the frequent victims of flying objects ejected by machine tools. Viewing panes in machining centres, ideally combined with a spin window system, provide a good view for the operator and transparency of the manufacturing process.
Viewing panes within the trajectory path of parts must exhibit adequate strength. According to the latest empirical tests polycarbonate is the material best suited for safety glass owing to its high energy absorption.
The restraining capacity of a polycarbonate pane of 8 mm thickness is about the same as of a 3 mm St 12.03 sheet.

Application	Protection against
Turning	■ broken chuck components ■ broken tools ■ machine parts
Milling	■ hot chips ■ broken tools ■ machine parts
Grinding	■ Pieces of broken grinding disks

Application areas of safety windows

A disadvantage of polycarbonate is its sensitivity to scratching and it will be damaged by the impact of hot chips and sparks.
Furthermore it has low resistance to the effects of coolants, grease and oil and will embrittle as a result. This can reduce the restraining capacity within just a few years.

The safety glass provided by HEMA is encapsulated and sealed for permanent and efficient protection against these external influences.
Any safety glass showing damage from external mechanical impact, for example cracks, deep scratches or deterioration resulting from exposure to chemicals, must be replaced if it is to continue functioning properly.

At present there are three technical standards for metal cutting tools: DIN EN 23125 (for lathes), DIN EN 13128 and DIN EN 12417 (for milling machines and machining centres). These standards form the basis of our safety glass and spin window systems. You may determine the relevant safety classification and the corresponding minimum thickness of the polycarbonate from the tables on the following pages. The influential factors are the mass of the tool and of the machined part and the speed of rotation.

Machine safety window with stainless steel frame, including mounted VISIPORT® with »Golden Eye« spin disk

The restraining capacity of safety glass depends not only on the thickness of the polycarbonate but also on the sheet metal design of its enclosure. Clamps or bonding or an adequate frame is the best solution for the mounting.

The joints should be well covered to prevent the screen from being pushed through the frame when impacted by parts.

Machine safety window, standard design

Machine Safety Windows

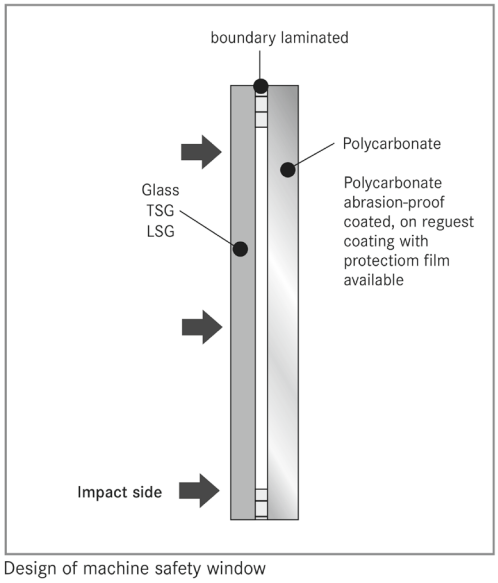
The increasing imports of machining centres from low-cost-countries always mean a safety risk, and the legal requirements are not always being met by these products.
Safe operation can be achieved though when these low cost machines are retrofitted in accordance with the required European safety standards.

Recommendation for replacement of panes
According to the recommendations of the German Berufsgenossenschaft BIA (Accident Prevention & Insurance Association), the Werkzeugmaschinenverband VDW, and the IWF/TU Berlin, Fachgebiet Werkzeugmaschinen und Fertigungstechnik, we recommend that protective panes are replaced after 5 years of use.
All buyers of new or second-hand machine tools must be informed of polycarbonate deterioration (e.g. in the manual). It is also recommended to mark the installation date of the polycarbonate pane on the pane itself. Replacing and servicing protection panes must observe all of the instructions from the manufacturer.

We recommend replacing the pane immediately when there is:
- deformation and/or cracks from impacts
- damage to the sealing
- infiltration of cooling fluid
- damage or destruction to the protection pane (or the scratch-resistant protection film) on the operator or machine side

HEMA safety windows
- Only certified quality panes of polycarbonate are used with an efficient surface coating providing protection against chemicals, abrasion and scratching, film on option
- Polycarbonate panes from renowned manufactures
- Polycarbonate panes can be provided with any of the usual thicknesses. The basic versions range from 5 to 15 mm in thickness.
- PC panes are protected on the machine side by an additional single or multiple layer safety glass pane.
- The design may consist of polycarbonate with abrasion-proof coating and glass depending on customer requirements.
- Splinter proof laminated glass with a low risk of injury and for shorter cleaning and machine downtimes.
- The edges of the panes are completely sealed and resistant to coolants. In addition they can be fitted with stainless steel frame for optimal mounting.
- The panes and their components are tested by the IWF institute in Berlin according to DIN EN 23125, restraint categories A1 to C3, and to safety standards CEN/TC 143/WG3
- The customer receives a 5-year warranty on the encapsulated and sealed safety pane (according to our warranty conditions).
- The integration of modern spin window solutions such as VISIPORT® is possible without any safety risk or additional mounting work.

Design of machine safety windows
»HEMA WINDOW« machine safety windows are suitable for most applications. They can be produced with optional graduation, protection films, steel frames. Also the integration of LED lighting is possible (see page 74).



Design of machine safety window

The thickness of polycarbonate and the design of the multi-layer machine safety window is based on the individual requirements and safety classifications. The HEMA charge number system assures traceability and convenient re-ordering.

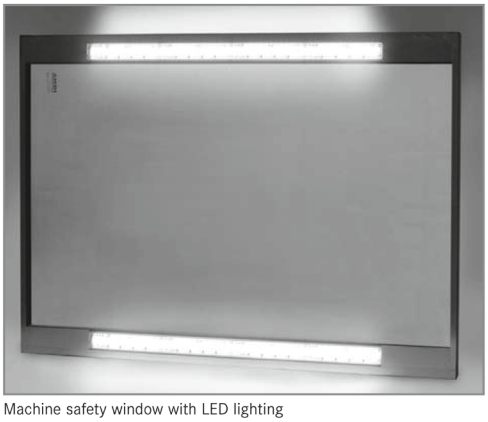
Label inside window

Machine safety window with integrated lighting

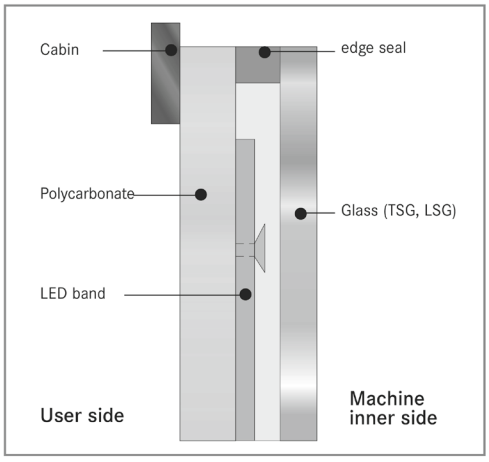
Machine safety windows permit safe viewing of machining operations inside the machine tool. Most often there is a need for additional lighting.
Depending on available space and position, conventional lights can become dulled by accumulation of swarf and contamination by coolant.

Machine safety window with LED lighting

The optimum solution combines a clear view into the machine with suitable lighting. This solution is available in the form of illuminated HEMA Windows - the integration of LED technology in a machine safety window. These illuminated safety windows combine the advantages of two established systems in one compact solution. The variable position of the LED lighting rails - vertical or horizontal - enables a flexible fitting to requirements of the machine interior. Problems of swarf and coolant contamination of internally mounted lamps will be eliminated.
The well proven perimeter seal design ensures the LED's and internal surfaces are protected from ingress of contamination and moisture.



Machine safety window with LED lighting

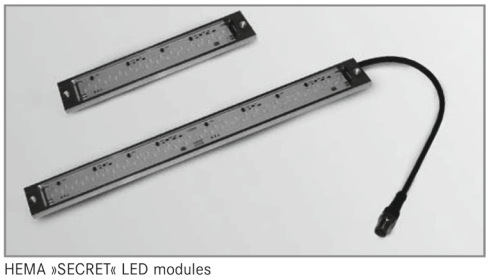


Layout of the safety window with integrated lighting

The advantages of HEMA windows with integrated lighting:
- Compact system solution
- Flexible illumination of the machine interior
- Tried and tested LED technology
- Elimination of lamp contamination
- Power supply from the mains or the machine
- Retrofit option on machines

Types	
Power supply	24 VDC
Current	270 mA, 540 mA, 800 mA, 1100 mA, 2160mA
Operating voltage	6 W / 12 W / 18 W / 24 W / 48 W
Lens	ca. 120°
Light temperature	5700 K
Connection	M12

Due to the complex plug-in system the LED modules can be reused when the machine window is damaged.
The »SECRET« LED modules are also **available individually for other applications**. Our service will be happy to assist you.



HEMA »SECRET« LED modules

VISIPORT® 220C2

VISIPORT® 220C2

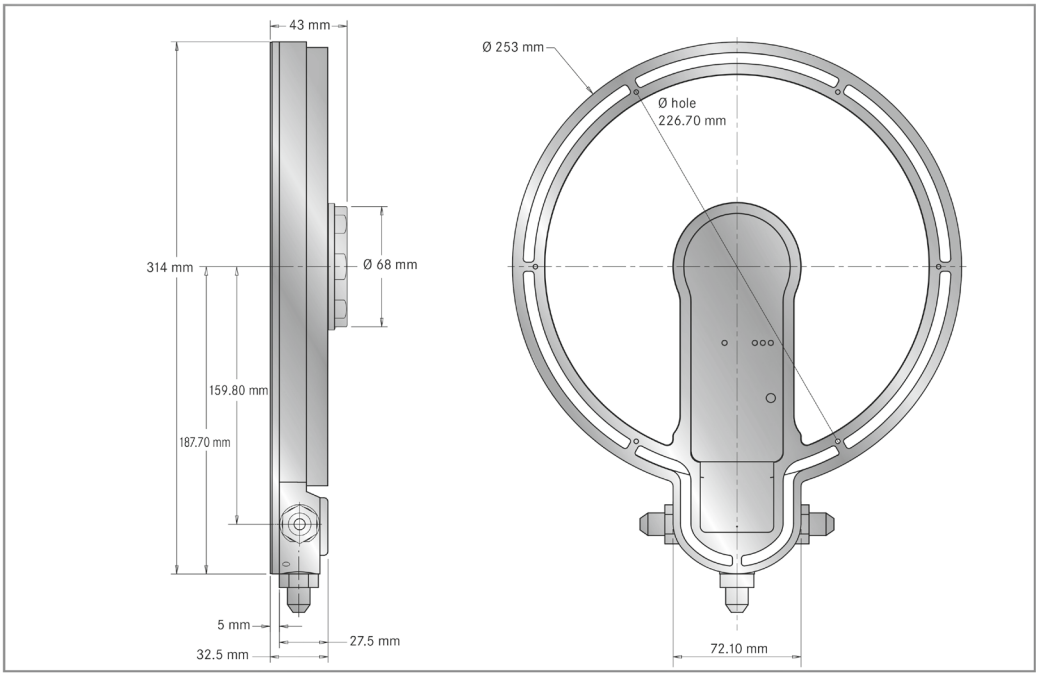
- Spinning disk mounted in the machine side, providing a clear view of the process through its high rotary speed (> 2,235 rpm)
- Integrated, protected electronic control unit providing protection against reverse and overvoltage, thermo circuit protecting against overheating (150°C)
- Driven by integrated brushless DC motor; power supply
- Fulfils CE standards for low tension voltage
- low weight, only about 2.1 kg
- built-in chip protection with specially designed base and disc ring
- Balanced rotating disc made of hardened glass 3 mm thick
- Optional plasma coated »Golden Eye« version

Connection

The VISIPORT® 220C2 provides a three-way connection on its base plate:

- Connection fitting for FLEX metal hose
- FESTO fast connection fitting for FESTO tubes 8 x 1.25 mm
- EO fitting for Ø 8, 10 or 12 mm metal pipes
- Connection fitting EH-PG09 for plastic cable tube EW-PA-M12/P9

Variations of VISIPORT® 220C2	
FDX	Basic model, direct screw coupling on polycarbonate panes
FMX	Basic model, with VHB adhesive tape on basic device
FVX	Basic model, VHB adhesive tape on extra mounting plate for easy replacement
HM	Basic model, separate terminal box, VHB adhesive tape on basic device
HV	Basic model with terminal box and VHB adhesive tape on separate mounting plate for easy replacement

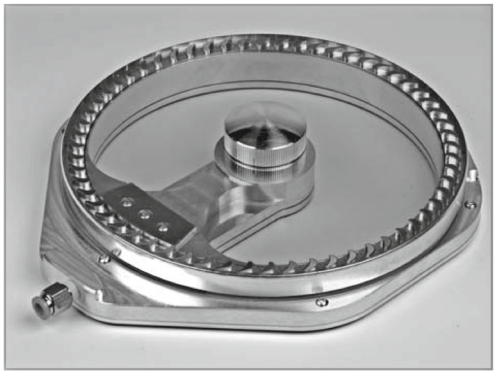


HEMA

VISIPORT® DiscAir 180 Turbo

VISIPORT® DiscAir 180 Turbo

- Spin disk located on the machine side, providing clear view of machining through its high rotating speed (> 4000 rpm)
- Driven by purified compressed air, no electrical connection required
- Suitable for use with intermittent coolant spraying
- Rotor mounted on precision ball bearing
- Balanced rotating disc made of hardened glass 2 mm thick
- Plasma coated »Golden Eye« disk as standard
- Air hose connected at plug-in socket
- Patented high efficient turbine ring
- Air consumption 38 l/min



Connection

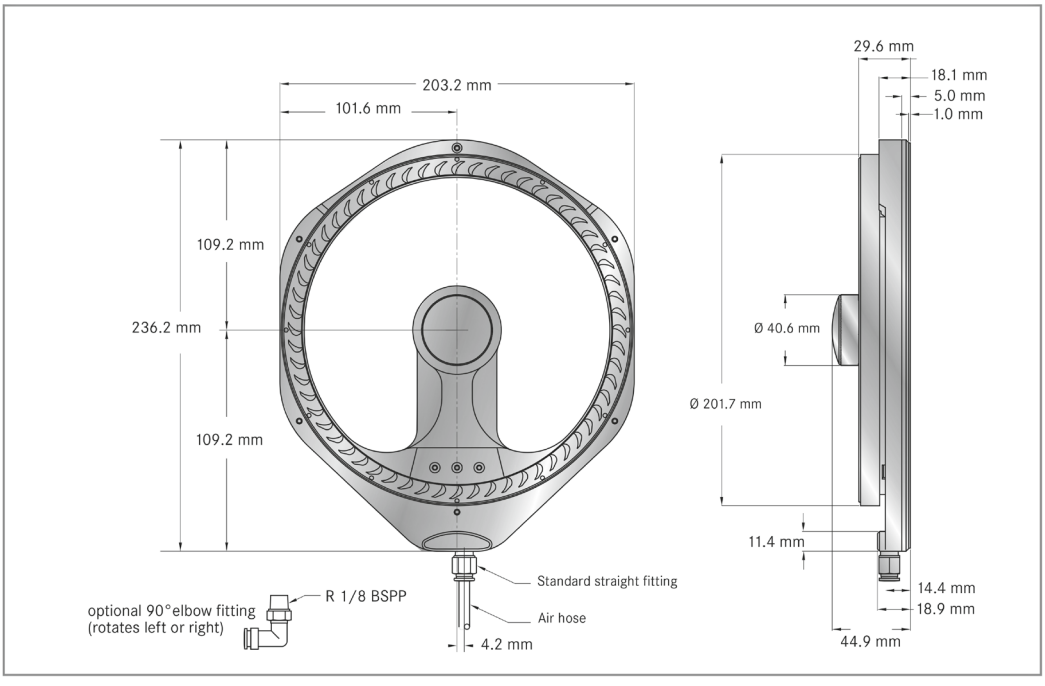
The DiscAir model is driven with compressed air available at almost every machine or at every workshop: simply connect the VISIPORT® DiscAir to the compressed air supply - without costly electric wiring.
It is secured in place on the machine pane with simple fasteners, similarly to the electric VISIPORT®.

Due to its design and drive the DiscAir model generates more noise than the extremely low noise electrical VISIPORT®Model. Owing to its optimised air circulation system and high precision manufacturing process the DiscAir model is nevertheless quite and fulfils the legal directives.

So there is very little difference to the machine's own noise levels when the cabin door is closed.

The air outlet has been designed to provide additional protection against the intrusion of coolant and chips.

The VISIPORT® DiscAir model rounds off the VISIPORT® line and represents an excellent price to performance ratio.
It enables every CNC machine operator to adopt the spin window technology at a price considerably lower than that of electrical models.



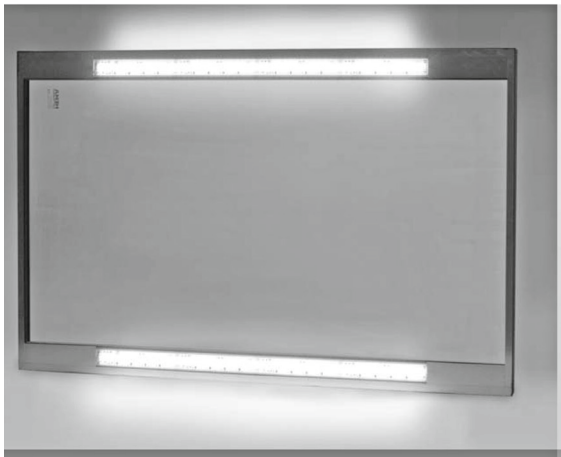
HEMA

endo

HEMA

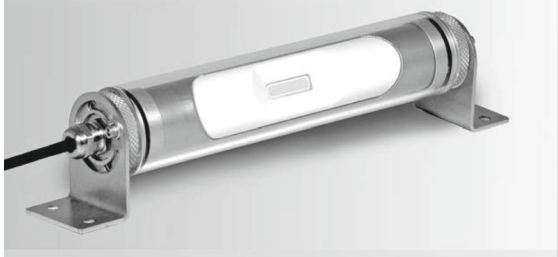
LIGHTING SYSTEMS

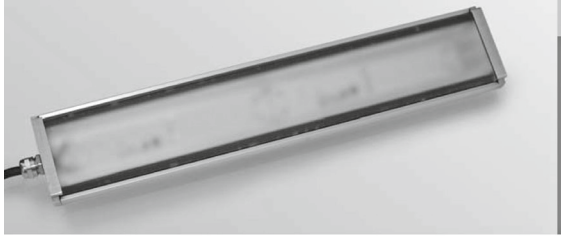
HEMA
MASCHINEN- UND APPARATESCHUTZ GMBH



INTEGRATED LED LIGHTING SYSTEMS

LED LAMPS FOR THE WORKPLACE





LED LAMPS FOR MACHINE INTERIORS

PROTECTION | CLAMPING & BRAKING | VISION | SERVICE

HEMA

WORKPLACE LIGHTING

The optimal lighting at the workplace or inside the machine not only raises safety, but also enhances well being and counteracts work fatigue.
The decisive factor here is the choice of light source. Lamps fitted with modern LED technology emit an optimal and unvarying level of neutral colour light that does not flicker or contain UV or IR components.

HE-BC - short lamp arm with ball joint

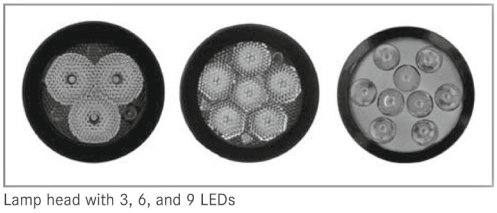
The temperature near the lamp is constantly low, which is important for maintenance work. Unlike halogen or neon lamps, this does not have a filament and so makes work possible even under difficult conditions.

The average life of the LEDs is 50,000 hours, equivalent to six years of continuous duty. Compared with the conventional filament bulb, this reduces operating costs by 50%, without replacements or maintenance work. A 700 mA LED consumes 3 W.

There are three housing variants available for installation at the workplace, all with the ON/OFF switch directly on the lamp head:

- HE-BC - short lamp arm with ball joint
- HE-BF - long lamp arm, flexible
- HE-BL - long lamp arm, rigid

All lamp types have an anodised aluminium head and are secured with screws through their base.



Lamp head with 3, 6, and 9 LEDs

HE-BF - long lamp arm, flexible

The ON/OFF switch is placed directly on the lamp head. The lamp base can be screwed in position at the workplace or inside the machine. Alternative fasteners are a clip foot and magnetic base for more flexible solutions.

For the perfect illumination and brightness control, every one of these lamp types can be fitted with three, six, or nine LEDs and with an 8°, 25°, or 40° lens.

HE-BL - long lamp arm, rigid

CE III F IP65 LED TEC

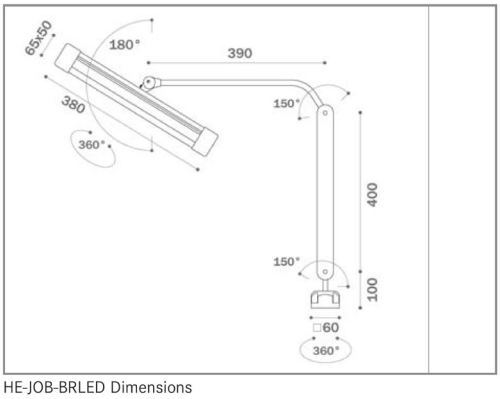
HEMA

Workplace lighting HE-JOB-BRLED

The HE-JOB-BRLED is an adjustable workplace lamp featuring the latest LED technology. Thanks to the highly flexible jointed arm, lighting at the workplace can be set with ease to the optimal effect.
The lamp head of aluminium complies with protection class IP 65, and the entire unit IP 40. The ON/OFF switch is fitted directly on the lamp head for ease of use.

The advantages of the HE-JOB-HRLED workplace lamps:
- Jointed arm for great flexibility
- ON/OFF switch fitted directly on the lamp head
- Integrated ballast
- Optional dimmer

CE IP40 LED TEC

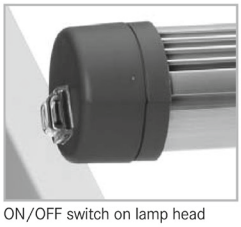


HE-JOB-BRLED Dimensions

	HE-JOB-BRLED
Operating voltage	230 VAC
IEC marking	II
Cabel length	1.5 m
LED Type	Cree MC
LED life	50 000 h
No of LEDs	24
Light temperatur	5000 K
Fasteners	4 drilled holes or optional mounting devices) (optional component parts)
Colour	Aluminium
Protection class	IP40 lamp IP65 lamp head

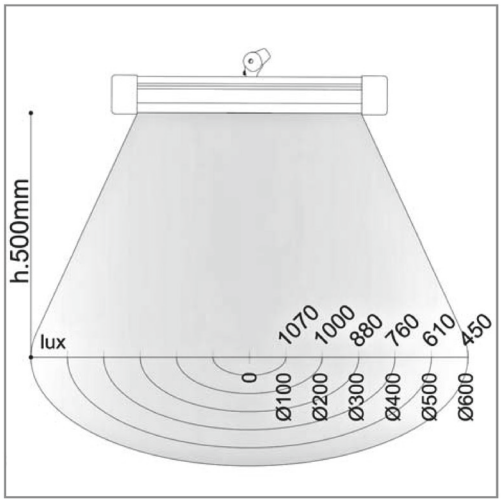
HE-JOB-BRLED Workplace lighting for benches

Optional mounting


ON/OFF switch on lamp head

Illumination distribution chart

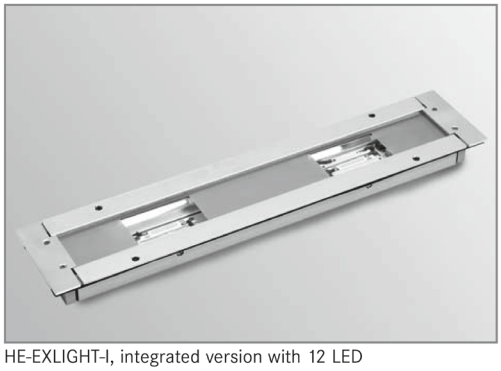
HE-JOB-BRLED



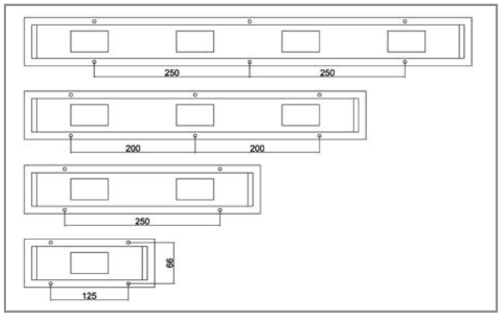
HEMA

HE-EXLIGHT-LED Machine lighting

HE-EXLIGHT-E, external version with 6 LED



HE-EXLIGHT-I, integrated version with 12 LED



The compact measurements and the flat, robust housing of the HE-EXLIGHT-LED machine lamps make them the ideal solution in small and mid sized machines.

The HE-EXLIGHT-LED machine lamp is available in two versions for the best possible configuration in the machine, also as a retrofit. The housings of both versions are of robust, anodised aluminium with a safety pane 4 mm thick.

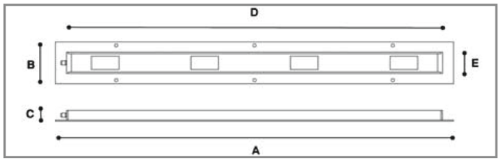
The lamps are impact resistant, impervious to vibrations, and can also operate in environments with coolants and lubricants. The HE-EXLIGHT-LED machine lamps are extremely low maintenance. This LED technology exhibits a long service life of 50,000 operating hours, so the lamp is virtually replacement free, eliminating the cost for new parts and repairs.

The lamps are fitted with a direct 24 V connector that does not require any additional components.

CE III F **IP67** LED TEC

Light cone Ø (mm)	lux
100	1280
1000	880
2000	320

Example for light cone HE-EXLIGHT-E 24, height 1000 mm



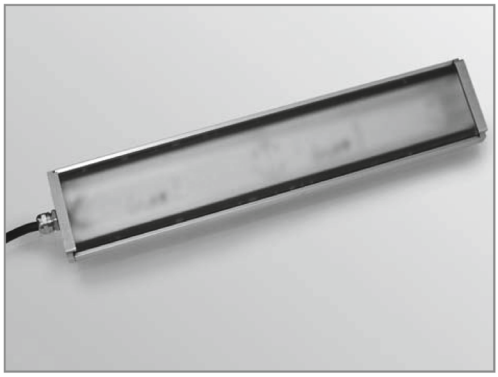
Version	A	B	C	D	E
HE-EXLIGHT, 6 LED	210	78	25	186	54
HE-EXLIGHT, 12 LED	380	78	25	356	54
HE-EXLIGHT, 18 LED	550	78	25	526	54
HE-EXLIGHT, 24 LED	720	78	25	696	54

Dimensions for integrated and external versions

Version	Power supply	No of LEDs	Operating voltage	Light temperature	Lens	Mounting
HE-EXLIGHT-E 6	24 VDC	1	6 W	5000K	120°	external version
HE-EXLIGHT-E 12	24 VDC	2	12 W	5000K	120°	external version
HE-EXLIGHT-E 18	24 VDC	3	18 W	5000K	120°	external version
HE-EXLIGHT-E 24	24 VDC	4	24 W	5000K	120°	external version
HE-EXLIGHT-I 6	24 VDC	1	6 W	5000K	120°	integrated version
HE-EXLIGHT-I 12	24 VDC	2	12 W	5000K	120°	integrated version
HE-EXLIGHT-I 18	24 VDC	3	18 W	5000K	120°	integrated version
HE-EXLIGHT-I 24	24 VDC	4	24 W	5000K	120°	integrated version

Delivered with cable lengths from 1.5 to 6 m. 230 Vac and 12-24 Vdc cable ends of bare wires. Accessory equipment for connection to mains voltage sources.

HE-TRACK-LED Machine lighting



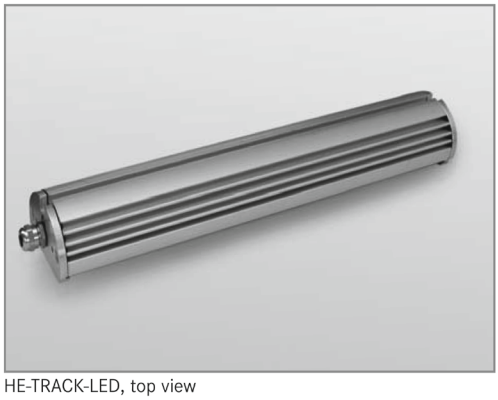
HE-TRACK-LED, diffuse lighting for glare-free working

The HE-TRACK-LED machine lamps are designed for small and mid sized machine tools.
The housing is of robust, silver anodised aluminium. The 5 mm thick, hardened safety pane presents a matt surface for diffuse, dazzle free lighting.

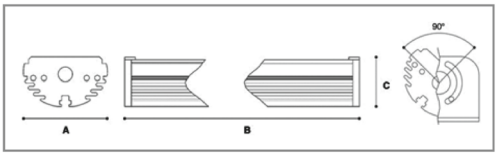
The lamps can be fitted with optional mounting plates for both horizontal and vertical installations. The lamps are impact resistant, impervious to vibrations, and can also operate in environments with coolants and lubricants.

In addition, the HE-TRACK-LED machine lamps are extremely low maintenance. This LED technology exhibits a long service life of 50,000 operating hours, so the lamp is virtually replacement free, eliminating the cost for new parts and repairs.

- Flexible machine lamp
- Adjustable lighting angle
- Direct 24 V connector without additional components
- Resistant to many coolants and lubricants



HE-TRACK-LED, top view

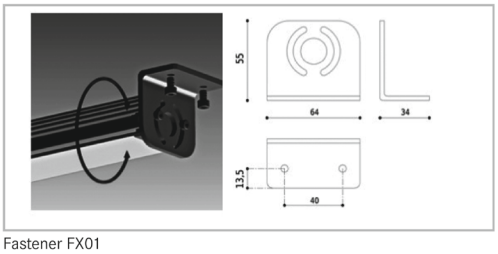


Version	A	B	C
HE-TRACKLED, 24 LED	63	340	37
HE-TRACKLED, 48 LED	63	640	37
HE-TRACKLED, 72 LED	63	940	37
HE-TRACKLED, 96 LED	63	1240	37

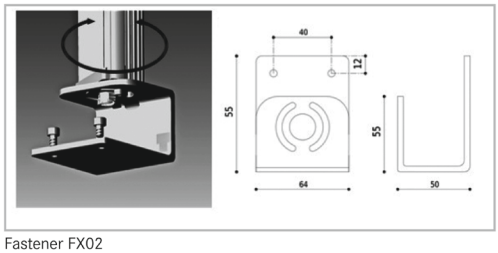
Dimensions in mm

Version	Power supply	LED no	Operating voltage	Light temperature	Lens	Mounting
HE-TRACKLED 24	24 VDC	24	13 W	5000K	120°	external
HE-TRACKLED 48	24 VDC	48	26 W	5000K	120°	external
HE-TRACKLED 72	24 VDC	72	39 W	5000K	120°	external
HE-TRACKLED 96	24 VDC	96	52 W	5000K	120°	external

Delivered with cable lengths from 1.5 to 6 m. 230 Vac and 12–24 Vdc cable ends of bare wires. Accessory equipment for connection to mains voltage sources.



Fastener FX01

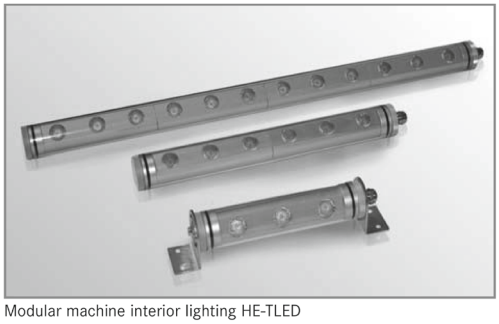


Fastener FX02

HEMA

HE-TLED Machine lighting

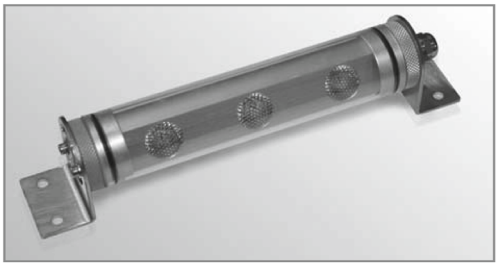
For constant illumination inside the machine, the HE-TLED lighting system was developed on a modular basis.
As a result, the light provided by this system in the interior can be adapted specifically to actual needs. Units with three, six, nine, or twelve LEDs are available.



Modular machine interior lighting HE-TLED

The housing of the HE-TLED is of aluminium and polycarbonate and is ideal for dusty or wet environmental conditions e.g. inside machines. Also a scratchproof glass variant is available as an option for use in machining production areas. All HE-TLED versions fulfil the protective requirements for IP 68. The encapsulated design is an effective barrier against foreign particles and moisture for a constant high quality lighting at all times.

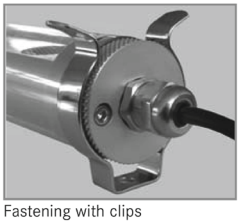
An LED has a max life of 50,000 hours, reducing maintenance work to a considerable degree. This long life and high lighting quality also help to reduce maintenance and energy consumption.



Machine interior lighting HE-TLED with three LED

Advantages of using HETLED lamps

- Compact measurements with maximum illumination
- Robust design for demanding applications
- Adjustable lighting angle, high flexibility
- Innovative fastening modes for max. installation convenience
- Resistant to most coolants and lubricants
- High IP rating, energy efficient
- LED technology for up to 50,000 hours of operation



Fastening with clips

Screw union with mount, see page 18

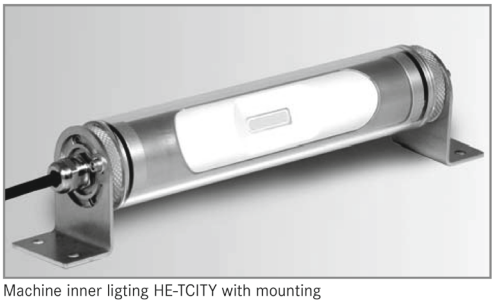
CE III F IP68 LED TEC

	HE-TLED 3	HE-TLED 6	HE-TLED 9	HE-TLED 12
Operating voltage 350 mA	3 W	6 W	9 W	12 W
Operating voltage 500 mA	6 W	12 W	18 W	24 W
Operating voltage 700 mA	9 W	-	-	-
Current	11.4 V DC	22.8 V DC	34.2 V DC	45.6 V DC
IEC marking	III	III	III	III
cable length	1.5 m	1.5 m	1.5 m	1.5 m
LED type	Cree XR-E	Cree XR-E	Cree XR-E	Cree XR-E
LED life	50 000 h	50 000 h	50 000 h	50 000 h
LED no	3	6	9	12
Light temperature	5300 °K	5300 °K	5300 °K	5300 °K
Lens	8° - 25° - 40°	8° - 25° - 40°	8° - 25° - 40°	8° - 25° - 40°
Dimensions (mm)	Ø 36x167	Ø 36x302	Ø 36x437	Ø 36x572
Fasteners	2 metal clips	2 metal clips	2 metal clips	2 metal clips
Colour	alloy	alloy	alloy	alloy
IP rating	IP68	IP68	IP68	IP68

HEMA also supplies an adapter matching the ordered illuminant type. Solely the operating voltage must be specified on the order (see table above). Delivered with cable lengths from 1.5 to 6 m. 230 Vac cables fitted with two-pin plug, 12–24 Vdc cable ends of bare wires.

HE-TCITY Machine lighting

Like the HE-TLED Series, also HE-TCITY is perfect for the permanent illumination of machine interiors. HE-TCITY is available in four sizes: 6 W, 12 W, 18 W, and 24 W. The HE-TCITY housing is made of aluminium encased in borosilicate glass. All HE-TCITY versions fulfil the protective requirements for IP 68.

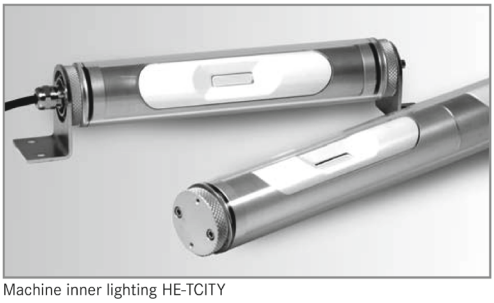


Machine inner ligting HE-TCITY with mounting

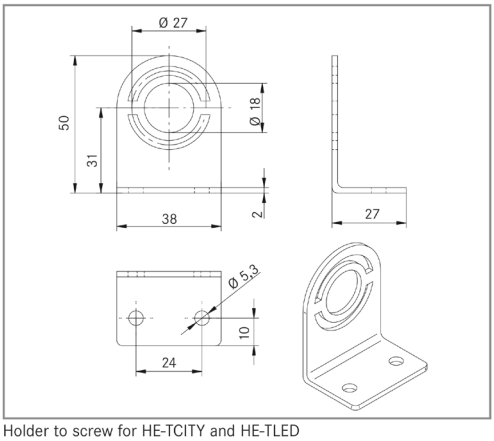
The encapsulated design is an effective barrier against foreign particles and moisture for a maintained high quality of lighting. The LEDs are designed for a long service life and high light quality, reducing maintenance work and energy costs to a considerable degree.

Advantages of using HE-TCITY lamps

- Compact measurements with maximum illumination
- Robust design for demanding applications
- 120° lighting angle
- Direct 24 V connector, integrated adapter
- Innovative fastening modes for maximised installation convenience
- Resistant to most coolants and lubricants
- High IP 68 rating
- LED technology for up to 50,000 hours of operation



Machine inner lighting HE-TCITY



Holder to screw for HE-TCITY and HE-TLED

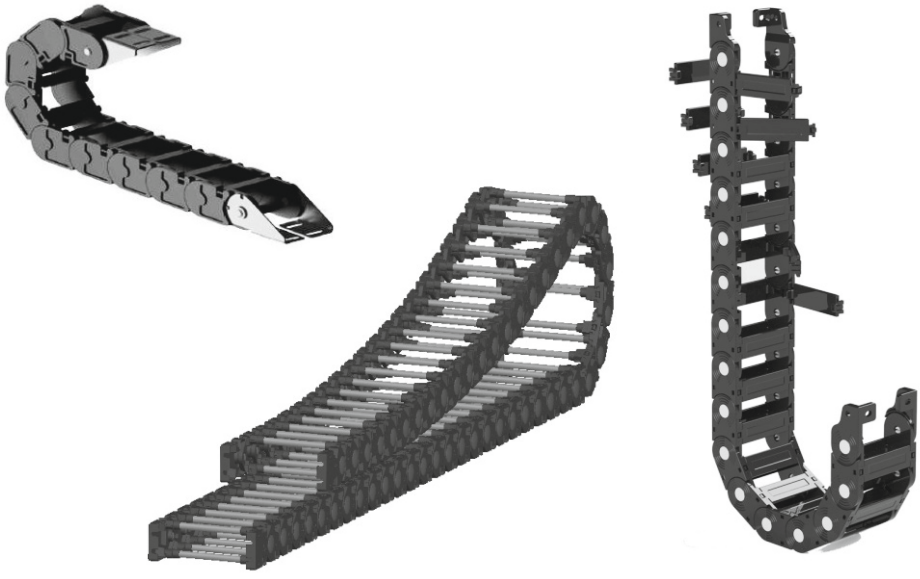
CE III F IP68 LED TEC

	HE-TCITY6	HE-TCITY12	HE-TCITY18	HE-TCITY24
Current 700 mA	6 W	12 W	-	-
Current 1,400 mA	-	-	18 W	24 W
Operating voltage	24 VDC	24 VDC	24 VDC	24 VDC
IEC marking	III	III	III	III
Cable length standard	1.5 m	1.5 m	1.5 m	1.5 m
LED Type	CITILED	CITILED	CITILED	CITILED
LED Lebensdauer	ca. 50,000 h	ca. 50,000 h	ca. 50,000 h	ca. 50,000 h
Number of LEDs	1	2	3	4
Light temperature	5000 K Ra65	5000 K Ra65	5000 K Ra65	5000 K Ra65
Lens	120°	120°	120°	120°
Dimensions (mm)	Ø 38x202	Ø 38x372	Ø 38x542	Ø 38x712
Fasteners	Holder / Clips	Holder / Clips	Holder / Clips	Holder / Clips
Colour	Aluminium/Glass	Aluminium/Glass	Aluminium/Glass	Aluminium/Glass
IP Class	IP68	IP68	IP68	IP68

Delivery with cable lengths from 1.5 to 6 m on option. 230 Vac cables fitted with two-pin plug, 12-24 Vdc cable ends of bare wires.

Cable Protection Systems

C.E.A



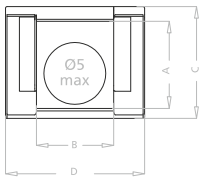
SA0

CABLE CARRIERS LIGHT SERIES

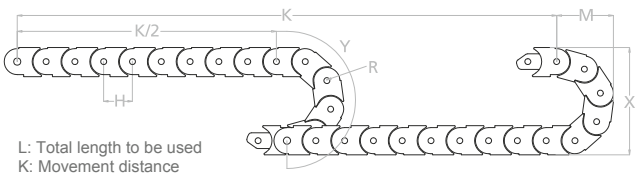
Inner Height (A) 8mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• No cover (cap) on top and bottom sides • Should be used in supporting trays • Suitable for short movement lengths	SA0 08 R_01	18-25-35-48	8	8	12	12	0.112 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SA0 08 R25**



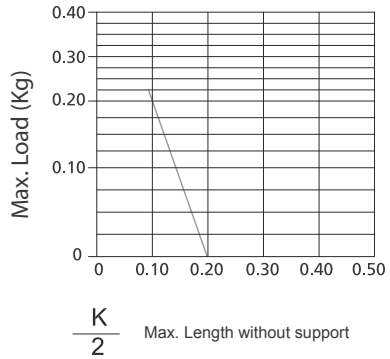
R mm	H mm	X mm	M mm	Y mm
18	17	48	41	91
25	17	62	48	113
35	17	82	58	144
48	17	108	71	185



L: Total length to be used
K: Movement distance
Y: Radius

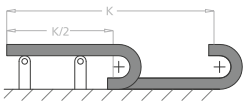
$$L: \frac{K}{2} + Y$$

IMPORTANT POINTS

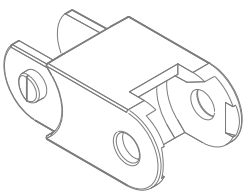


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



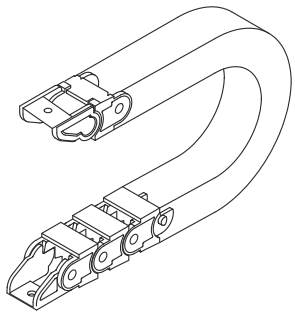
How to use support rollers:
- Support rollers should be used after 0.5 meter
- End brackets are metal



How to choose end bracket

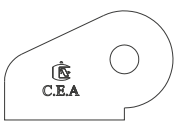
End bracket

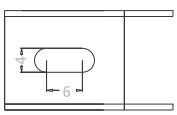
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SA0 08 **R01**	**SA0** B01	X	X





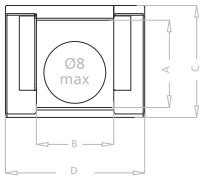
SA1

CABLE CARRIERS LIGHT SERIES

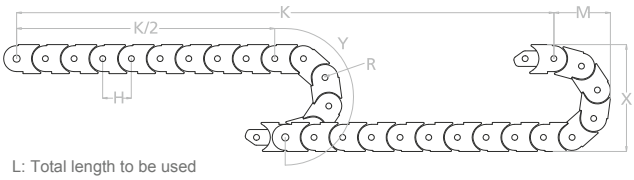
Inner Height (A) 10 mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
No cover (cap) on top and bottom sides • Should be used in supporting trays • Suitable for short movement lengths	SA1 010 R_01	18-25-35-48	10	10	14	14	0.112 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SA1 010 R35**



R mm	H mm	X mm	M mm	Y mm
18	17	50	42	91
25	17	64	49	113
35	17	84	59	144
48	17	110	72	185

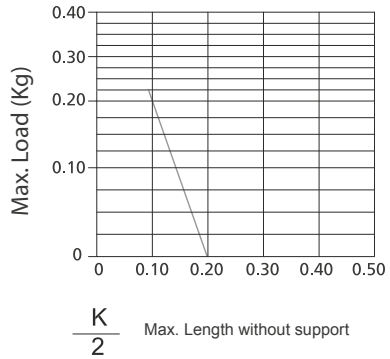


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

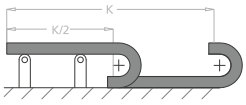
CEA

IMPORTANT POINTS

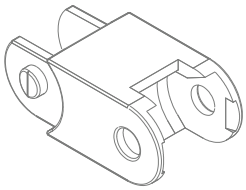


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



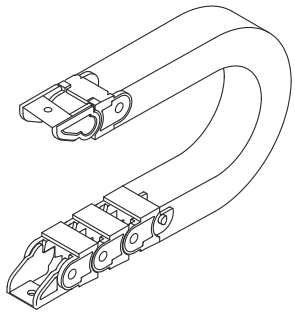
How to use support rollers:
- Support rollers should be used after 0.5 meter
- End brackets are metal



How to choose end bracket

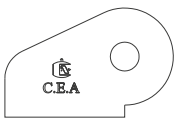
End bracket

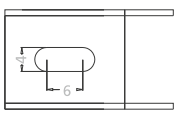
End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SA1 10 **R01**	**SA1** B01	X	X





CEA

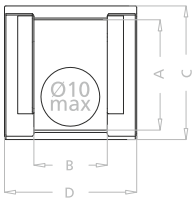
SA2

CABLE CARRIERS LIGHT SERIES

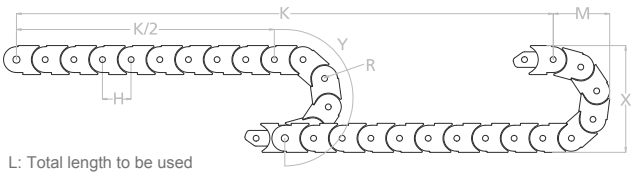
Inner Height (A) 12mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• No cover (cap) on top and bottom sides • Should be used in supporting trays • Suitable for short movement lengths	SA2 012 R_01	18-25-35-48	12	12	15	18	0.168 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SA2 012 R18**



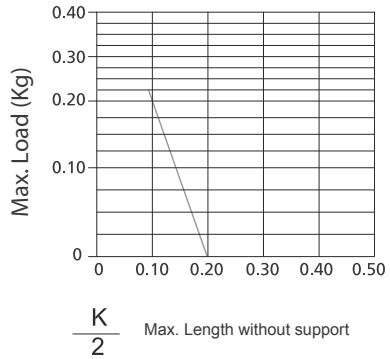
R mm	H mm	X mm	M mm	Y mm
18	17	52	43	91
25	17	66	50	113
35	17	86	60	144
48	17	112	73	185



L: Total length to be used
K: Movement distance
Y: Radius

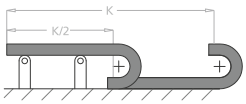
$$L: \frac{K}{2} + Y$$

IMPORTANT POINTS

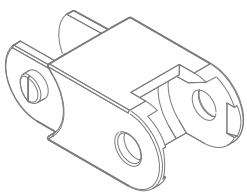


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



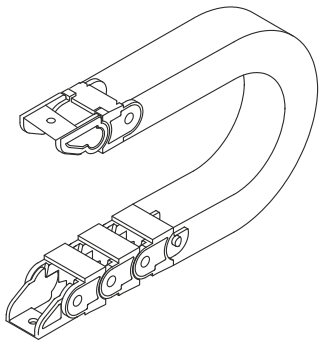
How to use support rollers:
- Support rollers should be used after 0.5 meter
- End brackets are metal



How to choose end bracket

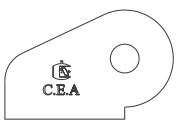
End bracket

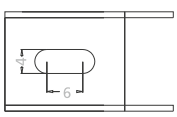
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SA2 12 **R01**	**SA2** B01	X	X





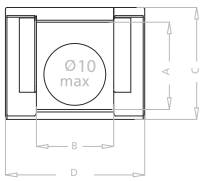
SA3

CABLE CARRIERS LIGHT SERIES

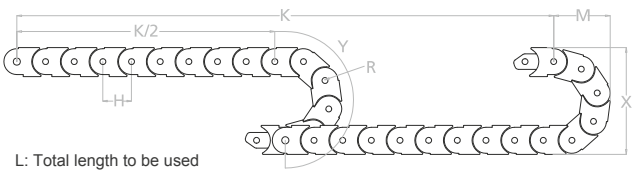
Inner Height (A) 15mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• No cover (cap) on top and bottom sides • Should be used in supporting trays • Suitable for short movement lengths	SA3 010 R_01	48	15	10	18	18	0.196 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example:	SA3 15 R48



R mm	H mm	X mm	M mm	Y mm
48	18	110	75	187

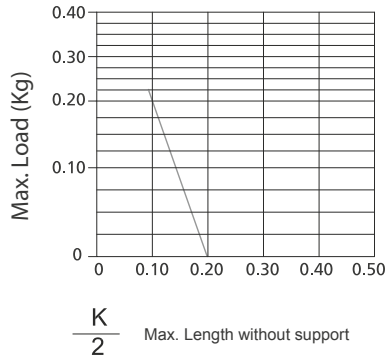


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

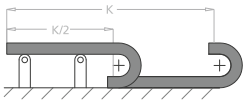
CEA

IMPORTANT POINTS

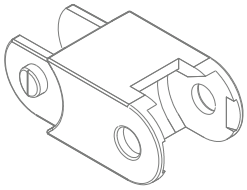


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



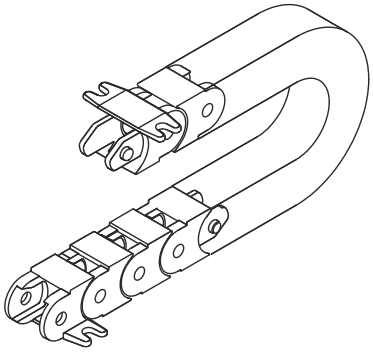
How to use support rollers:
• Support rollers should be used after 0.5 meter



How to choose end bracket

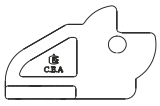
End bracket

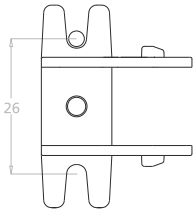
End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SA3 15 **R48**	**SA3** B01	X	X





CEA

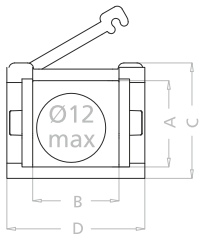
SA4

CABLE CARRIERS LIGHT SERIES

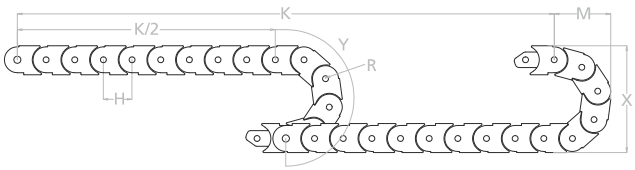
Inner Height (A) 15mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other side is openable • Should be used in supporting trays • Suitable for short movement lengths	SA4 015 R_01	40	15	15	20	24	0.224 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SA4 015 R40**

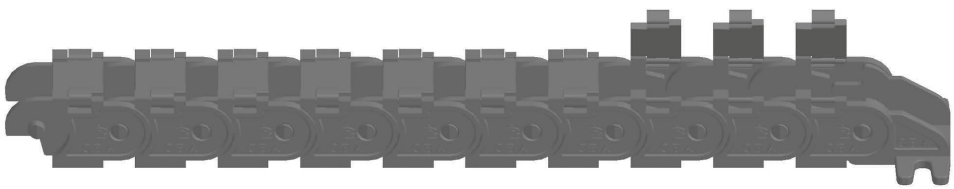


R mm	H mm	X mm	M mm	Y mm
40	20	103	69,5	186



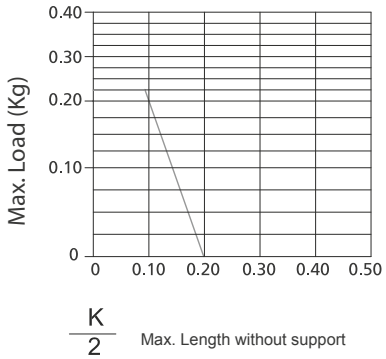
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



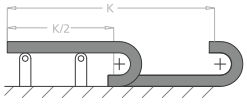
CEA

IMPORTANT POINTS

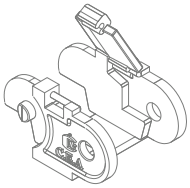


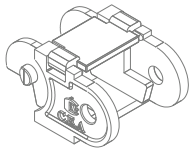
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 0.5 meter
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)

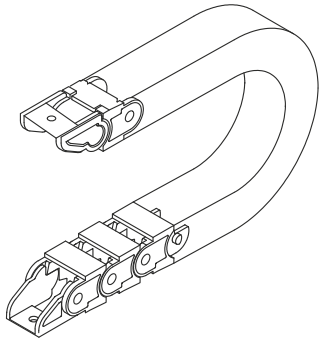




How to choose end bracket

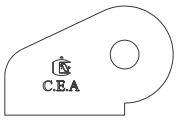
End bracket

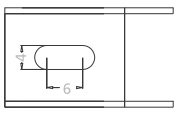
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SA4 015 **R40**	**SA4** B01	X	X





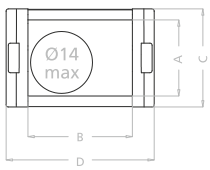
SB0

CABLE CARRIERS LIGHT SERIES

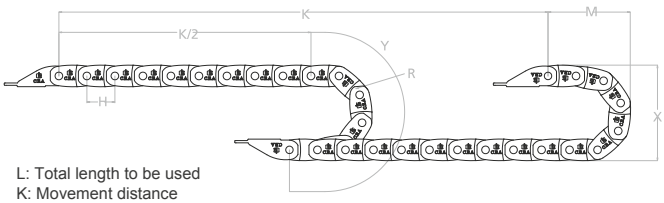
Inner Height (A) 18mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• No cover (cap) on top and bottom sides • Should be used in supporting trays • Suitable for short movement lengths.	SB0 025 R_01	40	18	25	27	35	0.224 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SB0 025 R40**



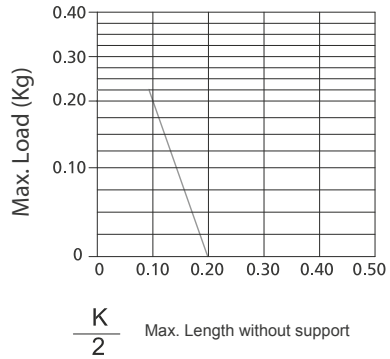
R mm	H mm	X mm	M mm	Y mm
40	30	103	81,5	186



L: Total length to be used
K: Movement distance
Y: Radius

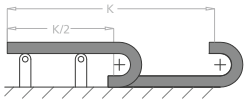
$$L: \frac{K}{2} + Y$$

IMPORTANT POINTS

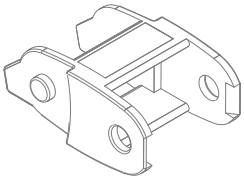


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



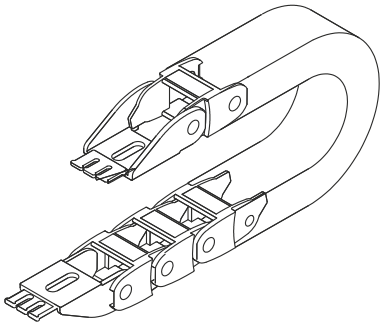
How to use support rollers:
• Support rollers should be used after 0.5 meter



AYAK SETİNİN SEÇİLMESİ VE KULLANIMI

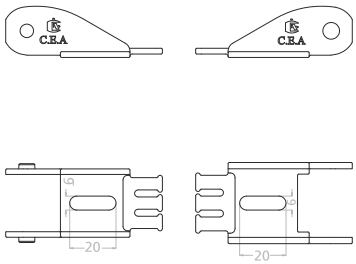
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SB0 025	**SB0** B025	X	X



CEA

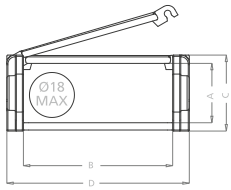
SB1

CABLE CARRIERS MEDIUM SERIES

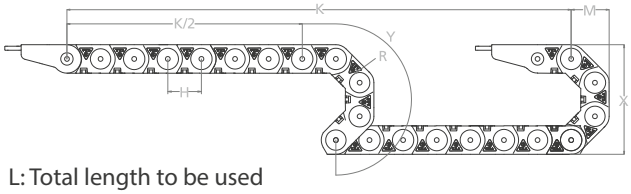
Inner Height (A) 20mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed and closed, other (radius) side is openable • Should be used in supporting trays • SB1 025 – SB1 065 open (no caps) models • SB1 040 – SB1 050 bottom side is closed (complete cover) upper side open (no caps) models	SB1 025 R_01	40-75-100-125	20	25	27	37	0.441 Kg
	SB1 040 R_01	40-75-100-125	20	40	27	52	0.488 Kg
	SB1 050 R_01	40-75-100-125	20	50	27	62	0.653 Kg
	SB1 065 R_01	40-75-100-125	20	65	27	77	0.565 Kg

Maximum working speed :7M/S

Radius MUST be given in your orders. Example:	**SB1 050 R75**

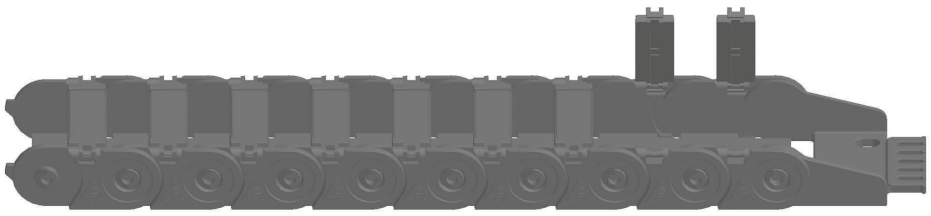


R mm	H mm	X mm	M mm	Y mm
40	33	107	86.5	192
75	33	177	121.5	302
100	33	227-	146.5	380
125	33	277	171.5	459



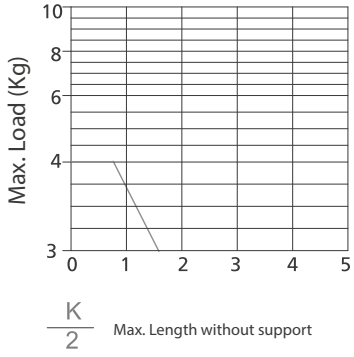
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



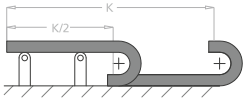
CEA

IMPORTANT POINTS

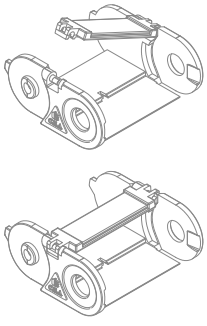


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



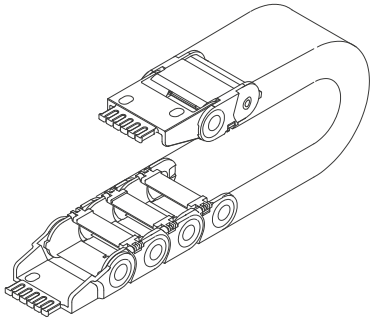
How to use support rollers:
- Support rollers should be used after 1 meter
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

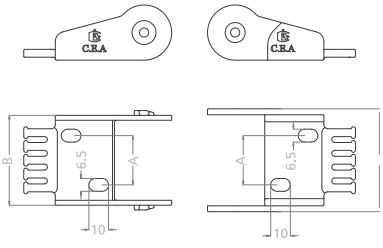
End bracke

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SB1 025 **R_01**	**SB1** B025	**10**	**37**
SB1 040 **R_01**	**SB1** B040	**25**	**52**
SB1 050 **R_01**	**SB1** B050	**35**	**62**
SB1 065 **R_01**	**SB1** B065	**50**	**77**



CEA

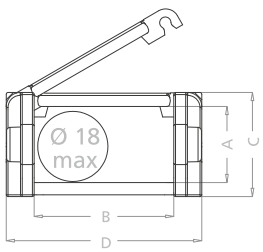
SB1.1

CABLE CARRIERS MEDIUM SERIES

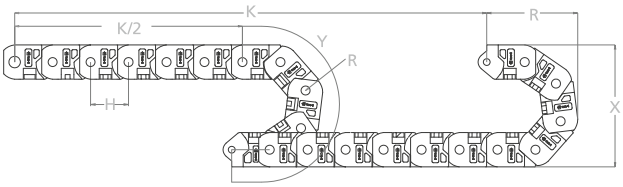
Inner Height (A) 21mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long movement lengths	SB1.1 040 R_01	40-75-100	21	40	30	56	0.700 Kg
	SB1.1 060 R_01	40-75-100	21	60	30	76	0.800 Kg
	SB1.1 080 R_01	40-75-100	21	80	30	96	0.850 Kg

Maximum working speed :8M/S

Radius MUST be given in your orders. Example:	**SB1.1 060 R75**

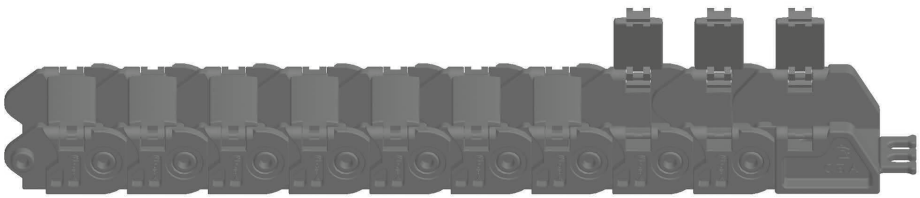


R mm	H mm	X mm	M mm	Y mm
40	33	110	80	132
75	33	180	130	264
100	33	230	150	330

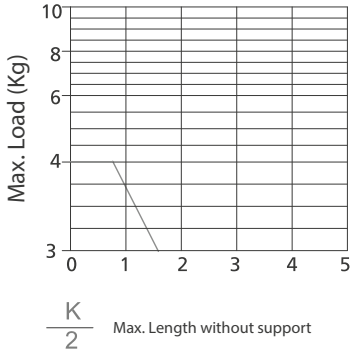


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

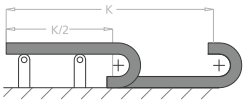


IMPORTANT POINTS

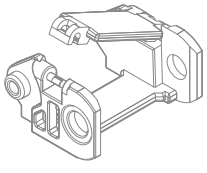


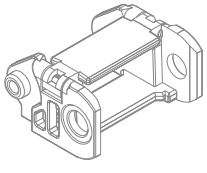
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 2 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)

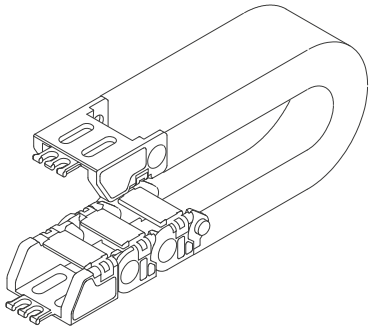




How to choose end bracket

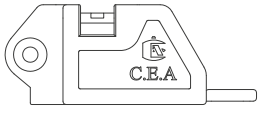
End bracket

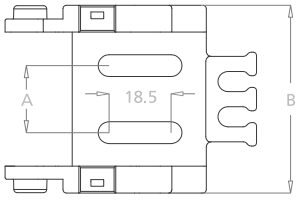
End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SB1.1 040 **R_01**	**SB1.1** B040	**20**	**56**
SB1.1 060 **R_01**	**SB1.1** B060	**35**	**76**
SB1.1 080 **R_01**	**SB1.1** B080	**55**	**96**





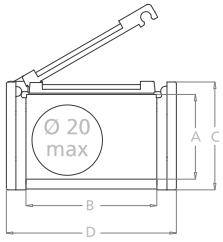
SB2

CABLE CARRIERS MEDIUM SERIES

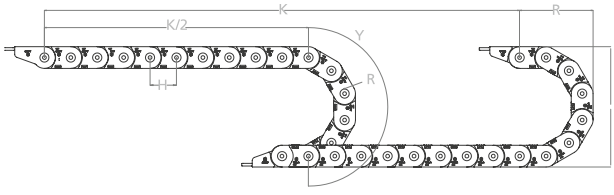
Inner Height (A) 25mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long movement lengths	SB2 040 R_01	40-75-100-125	25	40	33	52	0.545 Kg
	SB2 065 R_01	40-75-100-125	25	65	33	77	0.607 Kg

Maximum working speed :7M/S

Radius MUST be given in your orders.Example:	SB2 065 R75

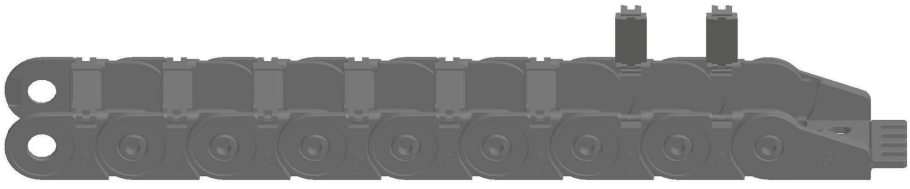


R mm	H mm	X mm	M mm	Y mm
40	40	113	95.5	204
75	40	183	130.5	314
100	40	233	155.5	392
125	40	283	180.5	471



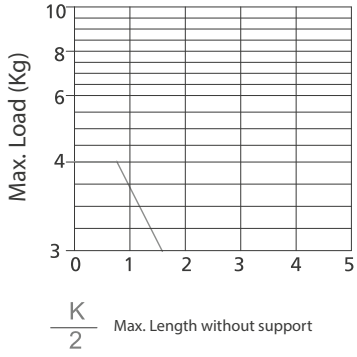
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



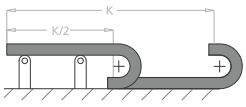
CEA

IMPORTANT POINTS

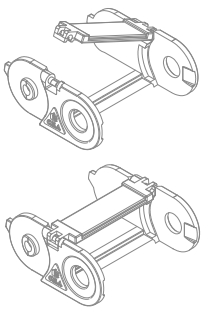


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



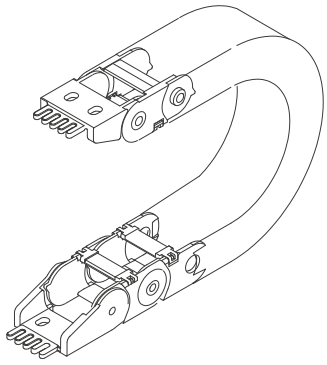
How to use support rollers:
- Support rollers should be used after 2 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

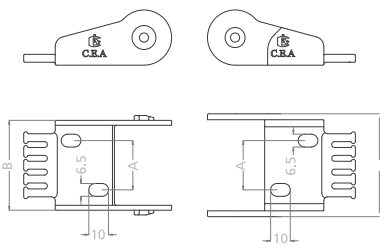
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SB2 040 **R_01**	**SB2** B040	**24**	**52**
SB2 065 **R_01**	**SB2** B065	**49**	**77**



CEA

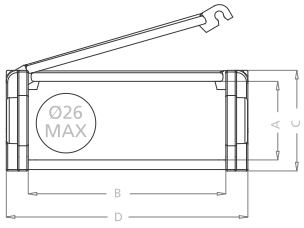
SC1K

CABLE CARRIERS MEDIUM SERIES

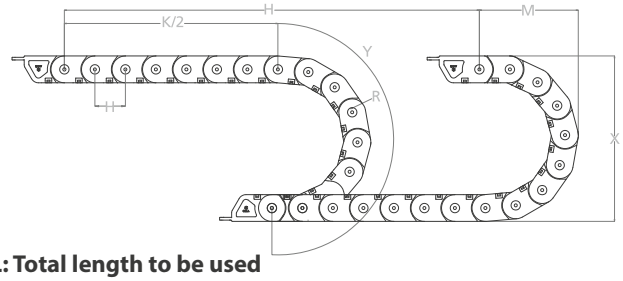
Inner Height (A) 30mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and bottom sides have complete covers (caps), openable caps on the radius side • Should be used in supporting trays • Both sides have complete covers (caps)	SC1K 040 R_01	75-100-150-200	30	40	40	56	0.958 Kg
	SC1K 060 R_01	75-100-150-200	30	60	40	76	1.106 Kg
	SC1K 080 R_01	75-100-150-200	30	80	40	96	1.236 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders.Example:	SC1K 060 R75

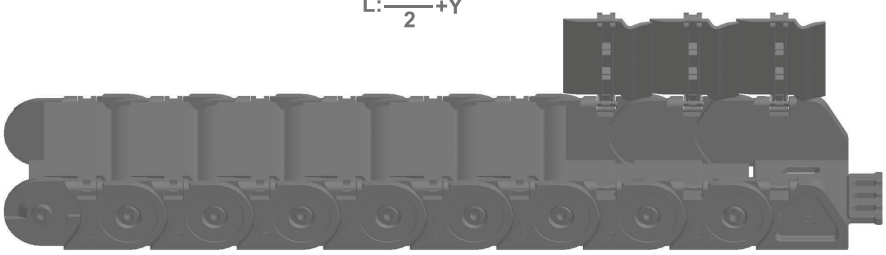


R mm	H mm	X mm	M mm	Y mm
75	45	190	140.5	328
100	45	240	165.5	406
150	45	340	215.5	563
200	45	440	265.5	720



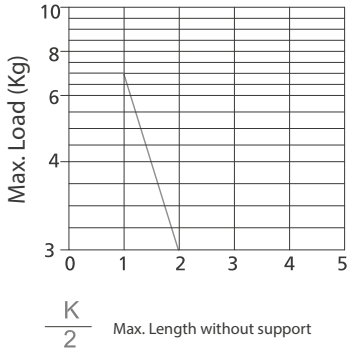
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



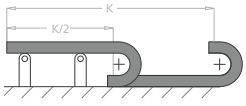
CEA

IMPORTANT POINTS

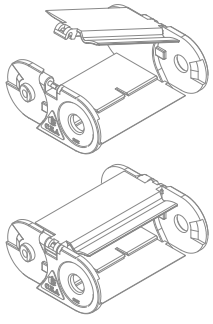


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



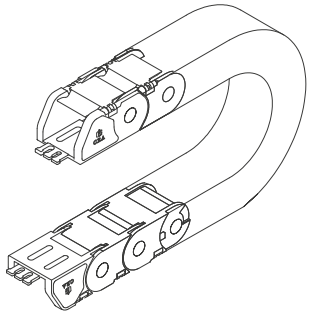
How to use support rollers:
- Support rollers should be used after 2,5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover).



How to choose end bracket

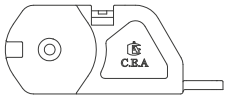
End bracket

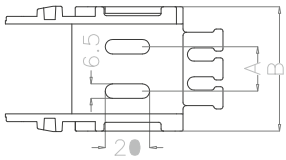
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC1K 040 **R_01**	**SC1K** B040	**20**	**56**
SC1K 060 **R_01**	**SC1K** B060	**40**	**76**
SC1K 080 **R_01**	**SC1K** B080	**60**	**96**





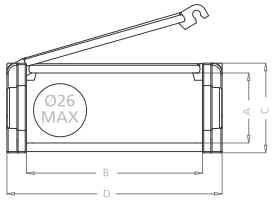
SC1YK

CABLE CARRIERS MEDIUM SERIES

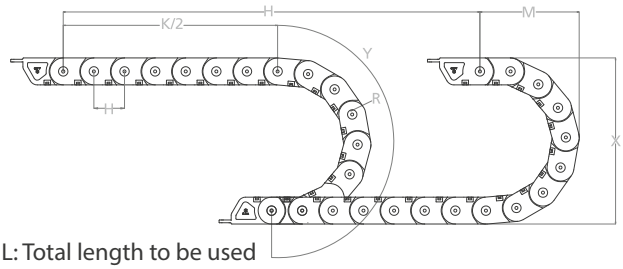
Inner Height (A) 30mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side has fixed and complete cover, other side (radius side) has openable cover (cap) • Bottom side is completely closed, upside is open • Semi-open model • Should be used in supporting trays	SC1YK 040 R_01	75-100-150-200	30	40	40	56	0.955 Kg
	SC1YK 060 R_01	75-100-150-200	30	60	40	76	1.105 Kg
	SC1YK 080 R_01	75-100-150-200	30	80	40	96	1.198 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders. Example:	SC1YK 060 R75

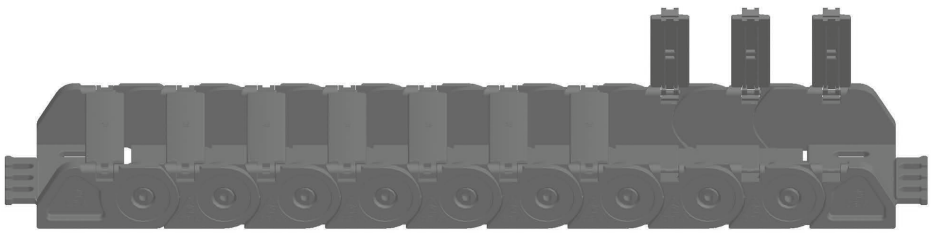


R mm	H mm	X mm	M mm	Y mm
75	45	190	140.5	328
100	45	240	165.5	406
150	45	340	215.5	563
200	45	440	265.5	720



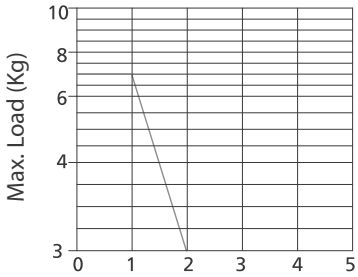
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



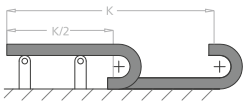
CEA

IMPORTANT POINTS

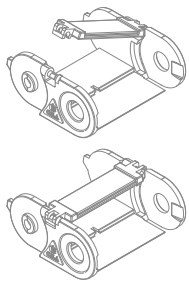


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



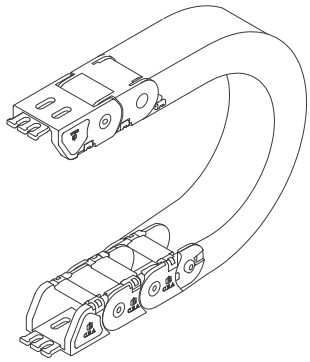
How to use support rollers:
- Support rollers should be used after 2,5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

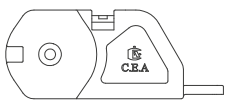
End bracket

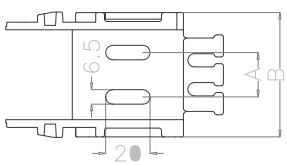
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC1YK 040 **R_01**	**SC1** B040	**20**	**56**
SC1YK 060 **R_01**	**SC1** B060	**40**	**76**
SC1YK 080 **R_01**	**SC1** B080	**60**	**96**





SC1.1

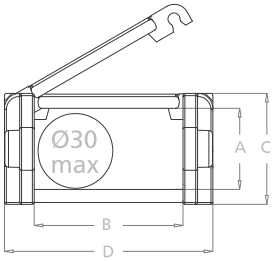
CABLE CARRIERS MEDIUM SERIES

Inner Height (A) 32mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • No complete cover (on both sides) • Suitable to use vertical separators	SC1.1 022 R_01	50-100-150-200	32	22	41	36	0.600 Kg
	SC1.1 040 R_01	50-100-150-200	32	40	41	56	0.750 Kg
	SC1.1 060 R_01	50-100-150-200	32	60	41	76	0.820 Kg
	SC1.1 080 R_01	50-100-150-200	32	80	41	96	0.880 Kg

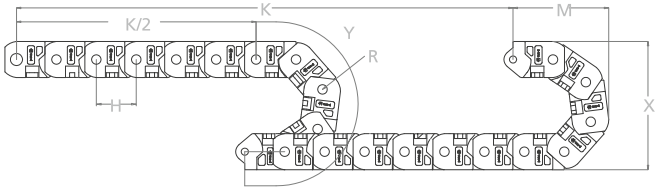
Maximum working speed :7M/S

Radius MUST be given in your orders. Example:	SC1.1 060 R100

$$L:\frac{K}{2}+Y$$

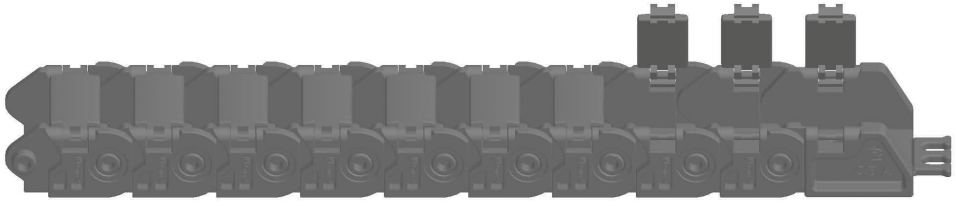


R mm	H mm	X mm	M mm	Y mm
50	50	141	70	257
100	50	241	120	414
150	50	341	170	571
200	50	441	220	728



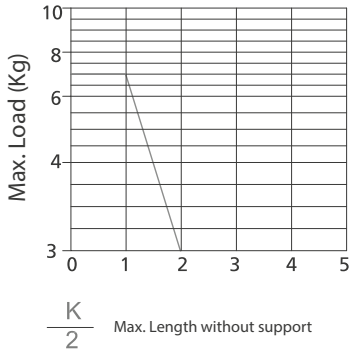
L: Total length to be used
K: Movement distance
Y: Radius

$$L:\frac{K}{2}+Y$$



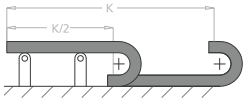
CEA

IMPORTANT POINTS

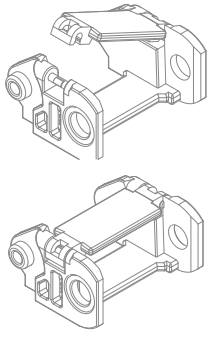


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



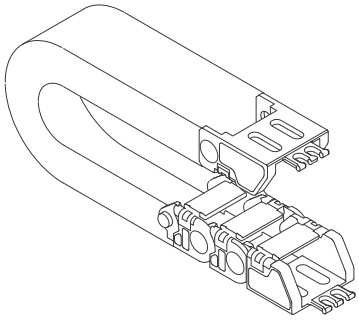
How to use support rollers:
- Support rollers should be used after 2,5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

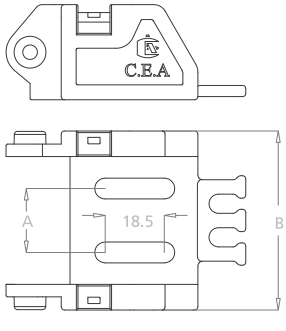
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC1.1 022 **R_01**	**SC1.1** B022	**10**	**36**
SC1.1 040 **R_01**	**SC1.1** B040	**20**	**56**
SC1.1 060 **R_01**	**SC1.1** B060	**40**	**76**
SC1.1 080 **R_01**	**SC1.1** B080	**60**	**96**



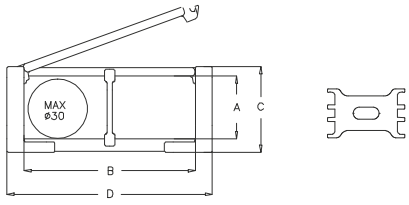
SC1.3

CABLE CARRIERS MEDIUM SERIES

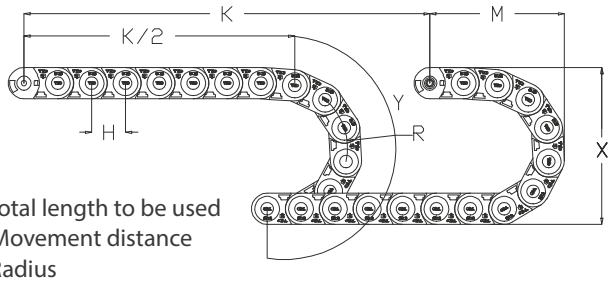
Inner Height (A) 33mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • No complete cover (on both sides) • Suitable to use vertical separators	SC1.3 040 R_01	50-75-100-150-200	33	40	50	60	1.535 Kg
	SC1.3 060 R_01	50-75-100-150-200	33	60	50	80	1.670 Kg
	SC1.3 080 R_01	50-75-100-150-200	33	80	50	100	1.805 Kg
	SC1.3 100 R_01	50-75-100-150-200	33	100	50	120	1.940 Kg
	SC1.3 120 R_01	50-75-100-150-200	33	120	50	140	2.075 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SC1.3 060 R100**

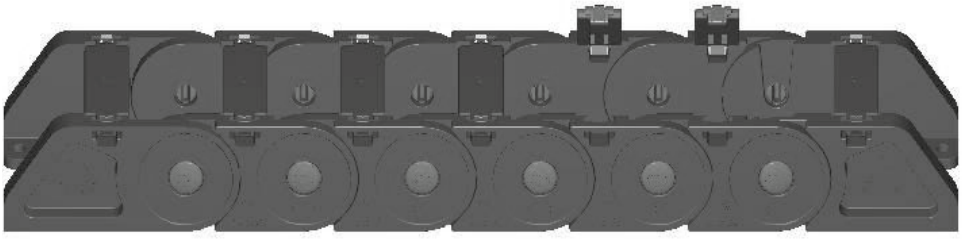


R mm	H mm	X mm	M mm	Y mm
50	54	150	106	265
75	54	200	156	343
100	54	250	206	422
150	54	350	306	579
200	54	450	406	617



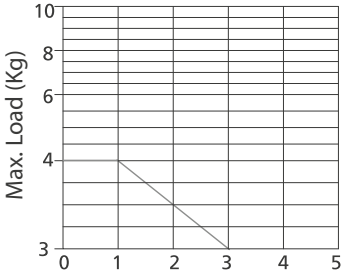
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



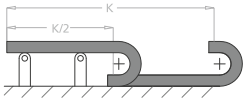
CEA

IMPORTANT POINTS

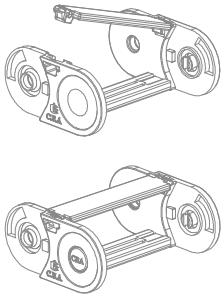


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



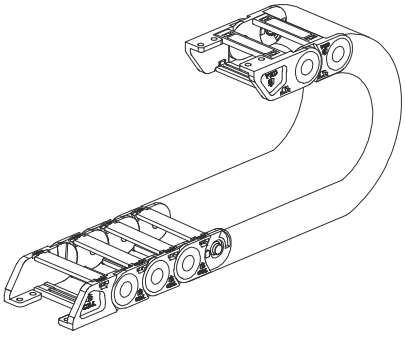
How to use support rollers:
- Support rollers should be used after 3 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

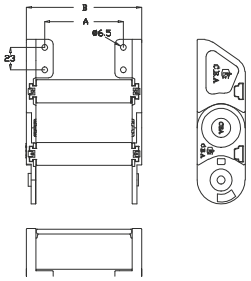
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC1.3 040 **R_01**	**SC1.3** B040	**22**	**60**
SC1.3 060 **R_01**	**SC1.3** B060	**42**	**80**
SC1.3 080 **R_01**	**SC1.3** B080	**62**	**100**
SC1.3 100 **R_01**	**SC1.3** B100	**82**	**120**
SC1.3 120 **R_01**	**SC1.3** B120	**102**	**140**



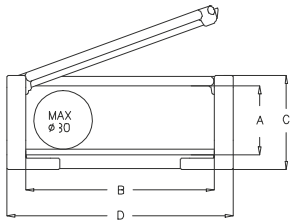
SC1.3K

CABLE CARRIERS MEDIUM SERIES

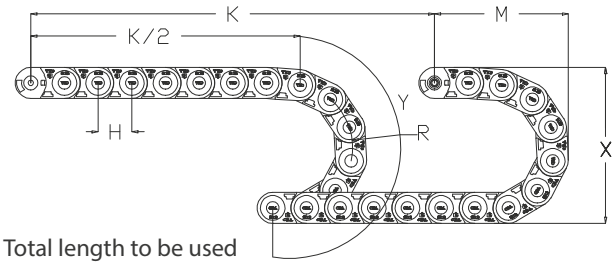
Inner Height (A) 33mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) is openable • Should be used in supporting trays • Suitable for long distances • Both sides have openable covers (ca	SC1.3K 040 R_01	75-100-150-200	33	40	50	60	1.620 Kg
	SC1.3K 060 R_01	75-100-150-200	33	60	50	80	1.792 Kg
	SC1.3K 080 R_01	75-100-150-200	33	80	50	100	1.964 Kg
	SC1.3K 100 R_01	75-100-150-200	33	100	50	120	2.136 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	SC1.3K 100 R100

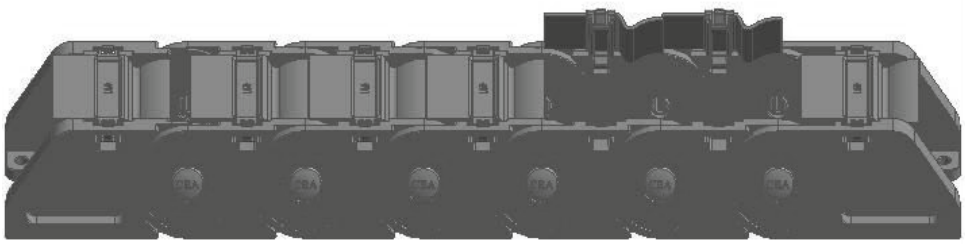


R mm	H mm	X mm	M mm	Y mm
75	54	200	176	343
100	54	250	176	422
150	54	350	214	579
200	54	450	215	632

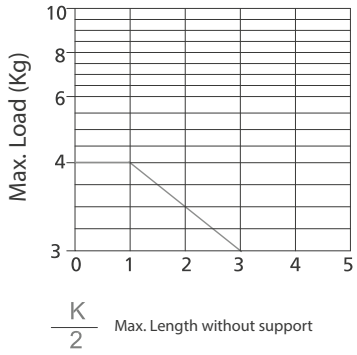


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

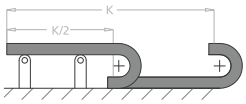


IMPORTANT POINTS

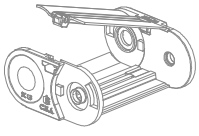


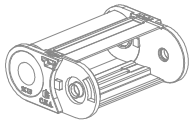
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 3 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)

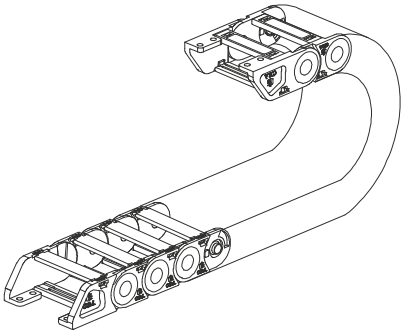




How to choose end bracket

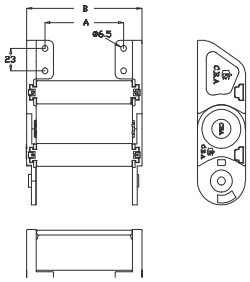
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC1.3K 040 **R_01**	**SC1.3K** B040	**22**	**60**
SC1.3K 060 **R_01**	**SC1.3K** B060	**42**	**80**
SC1.3K 080 **R_01**	**SC1.3K** B080	**62**	**100**
SC1.3K 100 **R_01**	**SC1.3K** B100	**82**	**120**



CEA

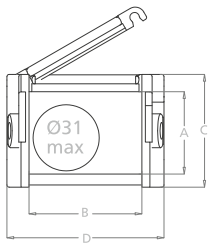
SC2

CABLE CARRIERS MEDIUM SERIES

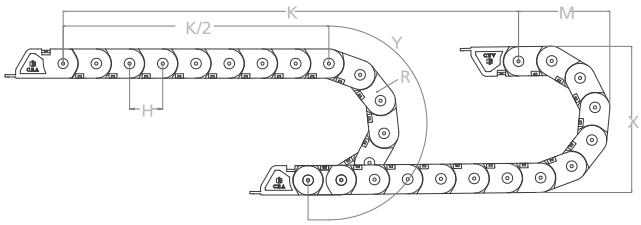
Inner Height (A) 35mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • Both sides have openable covers (caps) • SC2SP 080 R_01 is self-separated model • Suitable to use vertical separators	SC2 050 R_01	55-100-150-200	35	50	50	70	1.244 Kg
	SC2SP 080 R_01	55-100-150-200	35	80	50	99	1.580 Kg
	SC2 100 R_01	55-100-150-200	35	100	50	120	1.515 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders.Example:	SC2 50 R55

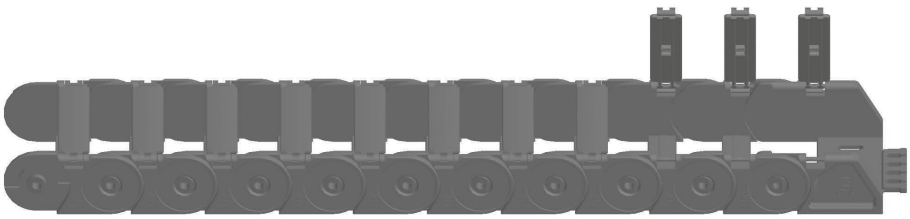


R mm	H mm	X mm	M mm	Y mm
50	54	150	106	265
75	54	250	176.6	343
100	54	250	176.8	422
150	54	350	214.8	579
200	54	450	215.1	632



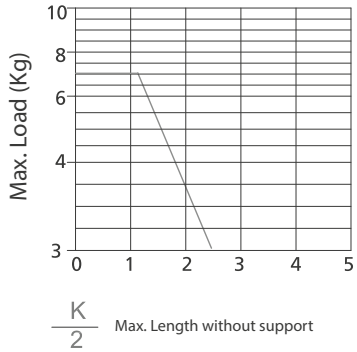
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



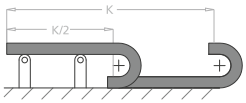
CEA

IMPORTANT POINTS

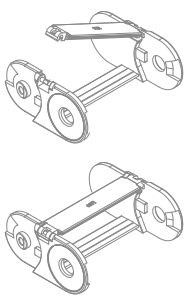


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



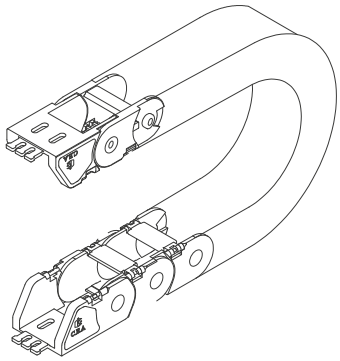
How to use support rollers:
- Support rollers should be used after 3 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

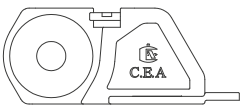
End bracket

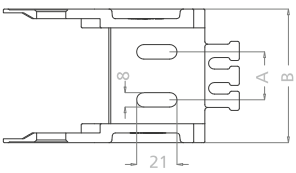
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC2 050 **R_01**	**SC2** B050	**20**	**66**
SC2SP 080 **R_01**	**SC2** B080	**50**	**99**
SC2 100 **R_01**	**SC2** B100	**70**	**120**





CEA

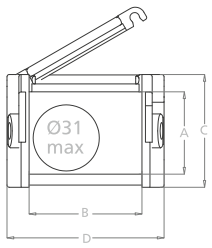
SC2K

CABLE CARRIERS MEDIUM SERIES

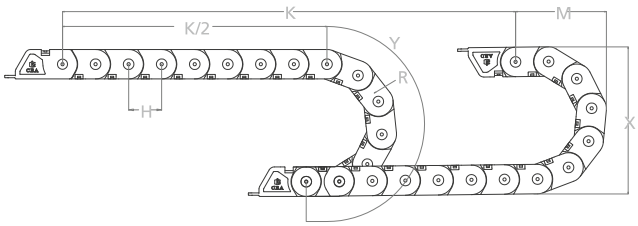
Inner Height (A) 35mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • Both sides have openable covers (caps)	SC2K 100 R_01	100-150-200	35	100	50	120	1.987 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders.Example:	SC2K 100 R100

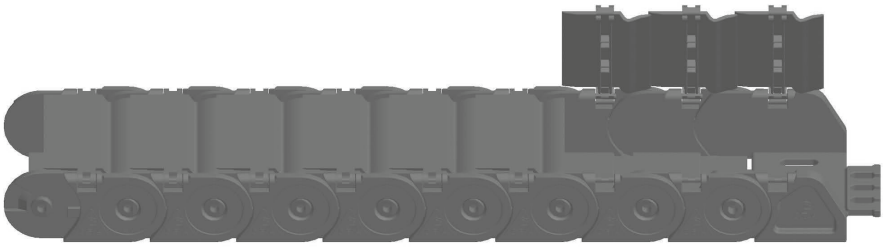


R mm	H mm	X mm	M mm	Y mm
100	56	250	181	426
150	56	350	228	562
200	56	450	288	712



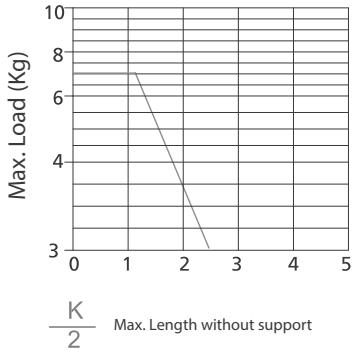
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



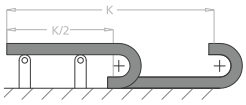
CEA

IMPORTANT POINTS

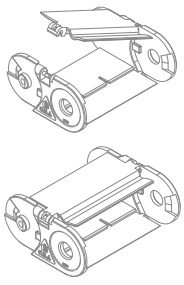


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



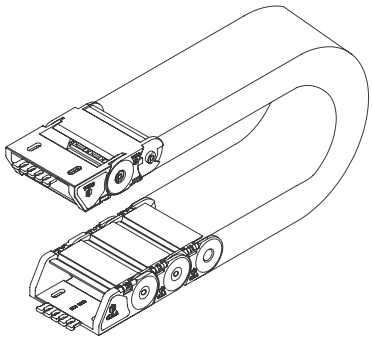
How to use support rollers:
- Support rollers should be used after 3 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover).



How to choose end bracket

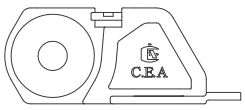
End bracket

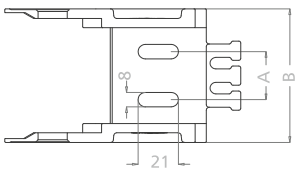
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC2K 100 **R_01**	**SC2** B100	**70**	**120**





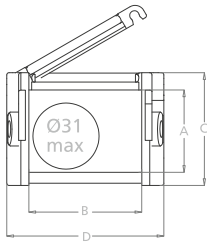
SC2YK

CABLE CARRIERS MEDIUM SERIES

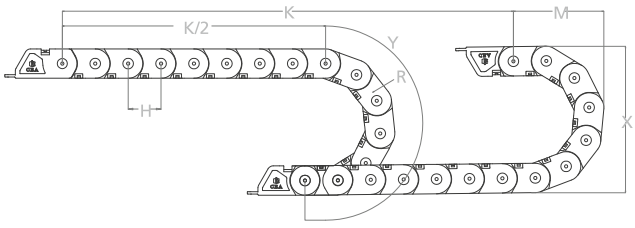
Inner Height (A) 35mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side has fixed and complete cover, other side (radius side) has openable cover (cap) • Bottom side is completely closed, up side is open • Semi-open model • Should be used in supporting trays	SC2AK 100 R_01	100-150-200	35	100	50	120	1.835 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders.Example:	**SC2YK 100 R100**

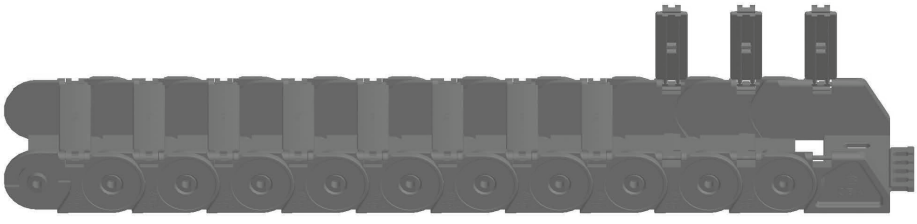


R mm	H mm	X mm	M mm	Y mm
100	56	250	181	426
150	56	350	228	562
200	56	450	278	712



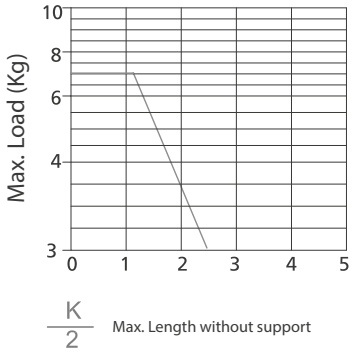
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



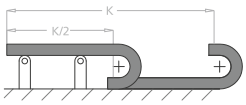
CEA

IMPORTANT POINTS

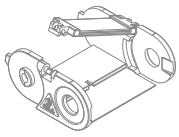


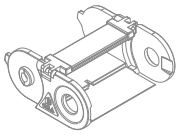
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 3 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)

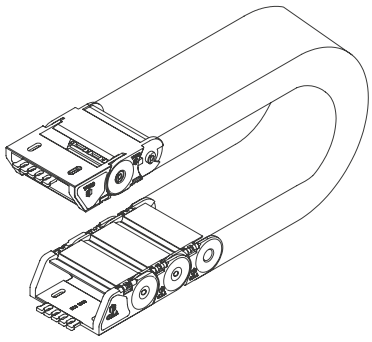




How to choose end bracket

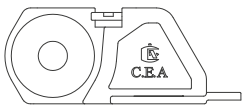
End bracket

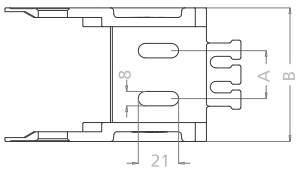
End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SC2YK 100 **R_01**	**SC2** B100	**70**	**120**





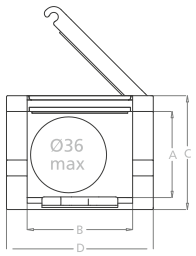
SD1K

CABLE CARRIERS MEDIUM SERIES

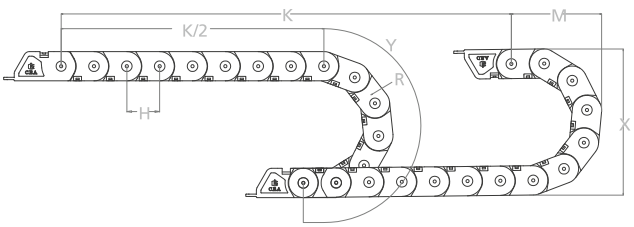
Inner Height (A) 40mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • Both sides have openable covers (caps)	SD1K 050 R_01	100-150-200-250	40	50	55	70	1.670 Kg
	SD1K 080 R_01	100-150-200-250	40	80	55	100	1.845 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders.Example:	SD1K 050 R100

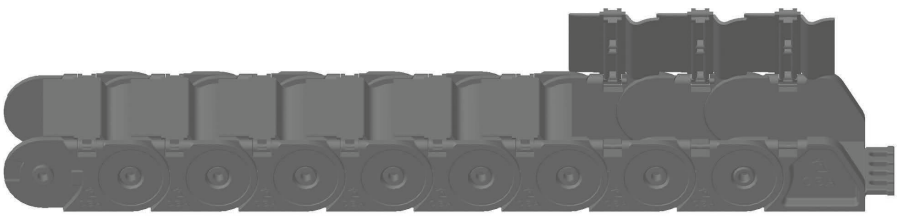


R mm	H mm	X mm	M mm	Y mm
100	60	250	187	426
150	60	350	237	583
200	60	450	287	740
250	60	550	338	890



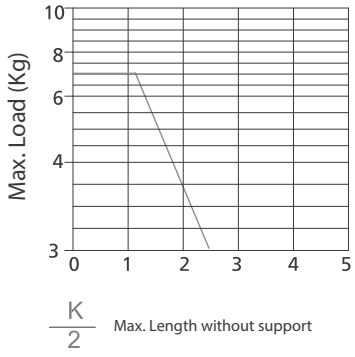
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



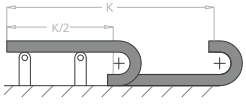
CEA

IMPORTANT POINTS

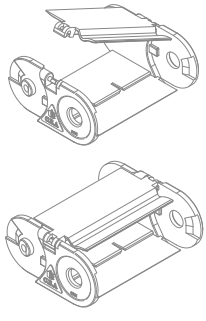


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



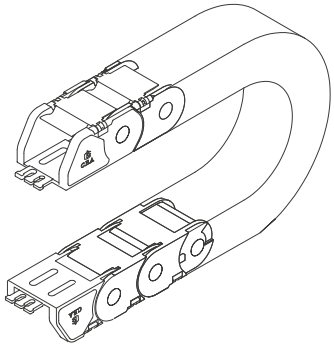
How to use support rollers:
- Support rollers should be used after 3.5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)



How to choose end bracket

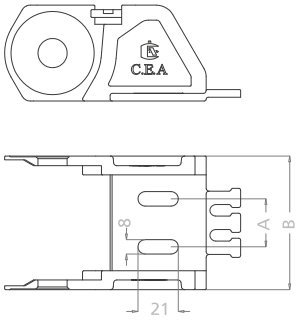
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD1K 050 **R_01**	**SD1K** B050	**26**	**70**
SD1K 080 **R_01**	**SD1K** B080	**50**	**100**



CEA

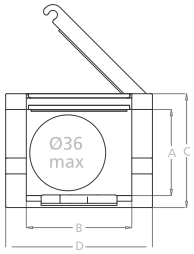
SD1YK

CABLE CARRIERS MEDIUM SERIES

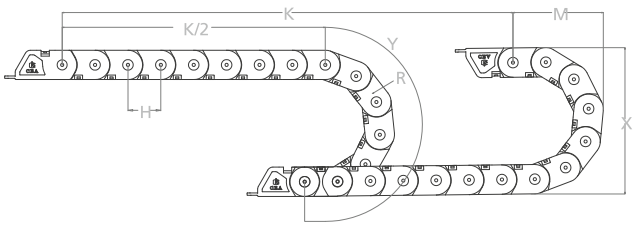
Inner Height (A) 40mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side has fixed and complete cover, other side (radius side) has openable cover (cap) • Bottom side is completely closed, upside is open • Semi-open model • Should be used in supporting trays	SD1YK 050 R_01	100-150-200-250	40	50	55	70	1.670 Kg
	SD1YK 080 R_01	100-150-200-250	40	80	55	100	1.845 Kg

Maximum working speed :6M/S

Radius MUST be given in your orders.Example:	**SD1YK 050 R100**

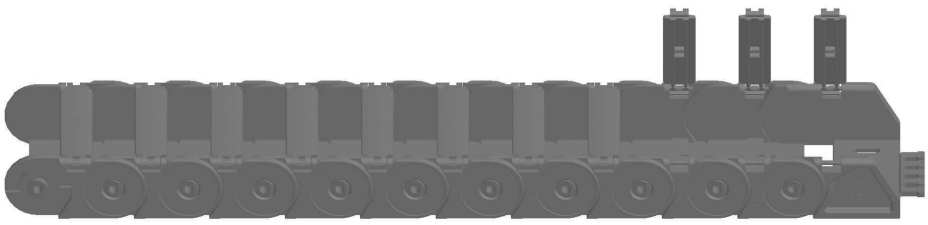


R mm	H mm	X mm	M mm	Y mm
100	60	250	187	426
150	60	350	237	583
200	60	450	287	740
250	60	550	338	890



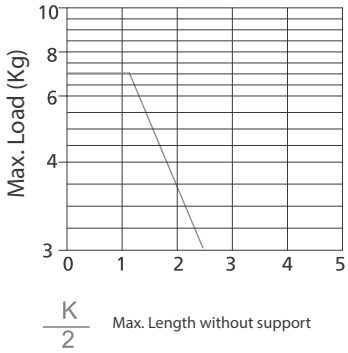
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



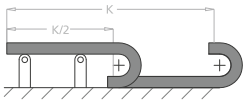
CEA

IMPORTANT POINTS

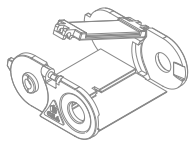


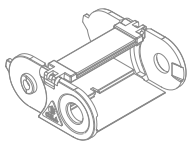
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 3,5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover

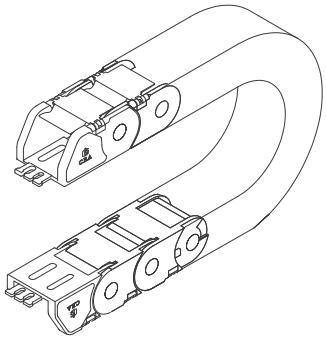




How to choose end bracket

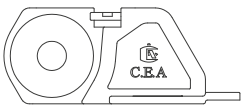
End bracket

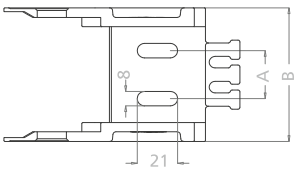
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD1YK 050 **R_01**	**SD1K** B050	**26**	**70**
SD1YK 080 **R_01**	**SD1K** B080	**50**	**100**





CEA

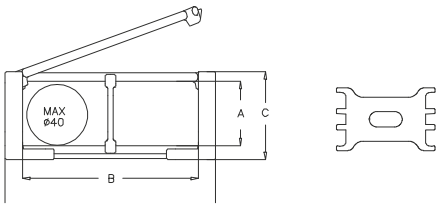
SD1.3

CABLE CARRIERS MEDIUM SERIES

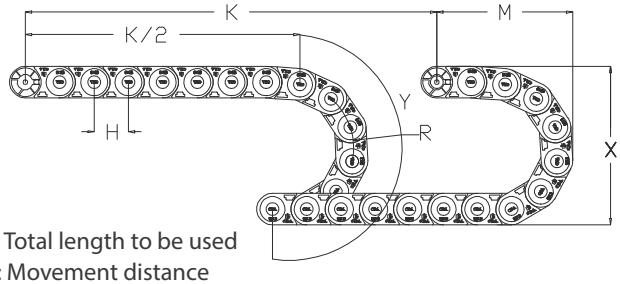
Inner Height (A) 43mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • No complete cover (on both sides) • Suitable to use vertical separators	SD1.3 040 R_01	75-100-150-200-250	43	40	58	64	1.835 Kg
	SD1.3 060 R_01	75-100-150-200-250	43	60	58	84	1.944 Kg
	SD1.3 080 R_01	75-100-150-200-250	43	80	58	104	12.503 Kg
	SD1.3 100 R_01	75-100-150-200-250	43	100	58	124	2.612 Kg
	SD1.3 120 R_01	75-100-150-200-250	43	120	58	144	2.721 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SD1.3 100 R100**

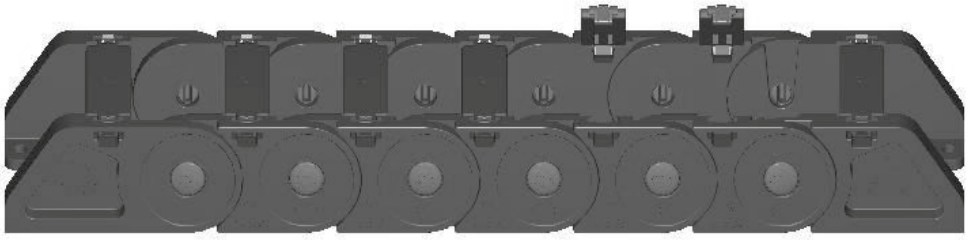


R mm	H mm	X mm	M mm	Y mm
75	63	208	158	352
100	63	258	168	430
150	63	358	243	587
200	63	458	259	774
250	63	558	289	885



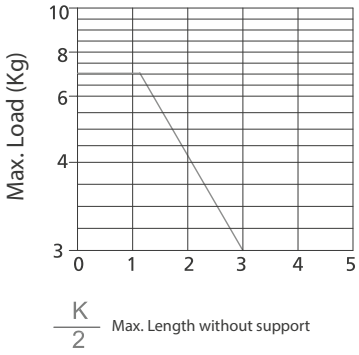
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



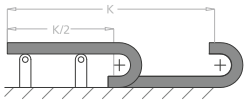
CEA

IMPORTANT POINTS

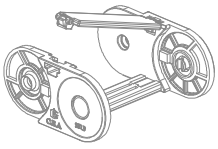


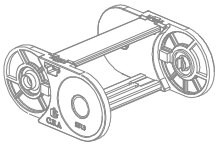
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 3,5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)

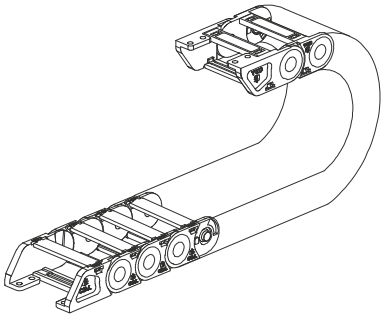




How to choose end bracket

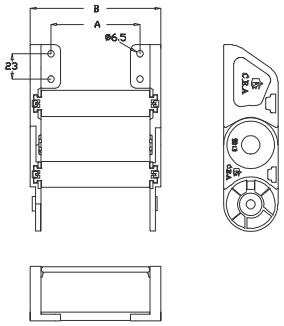
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD1.3 040 **R_01**	**SD1.3** B040	**22**	**64**
SD1.3 060 **R_01**	**SD1.3** B060	**42**	**84**
SD1.3 080 **R_01**	**SD1.3** B080	**62**	**104**
SD1.3 100 **R_01**	**SD1.3** B100	**82**	**124**
SD1.3 120 **R_01**	**SD1.3** B120	**102**	**144**



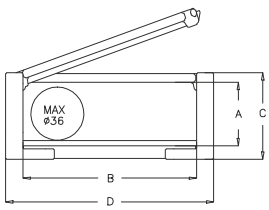
SD1.3K

CABLE CARRIERS MEDIUM SERIES

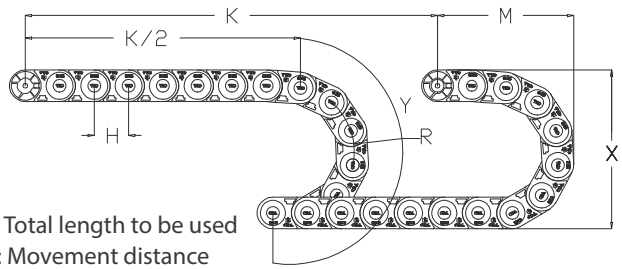
Inner Height (A) 43mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side • Should be used in supporting trays • Suitable for long distances • Both sides have openable covers (caps)	SD1.3K 040 R_01	100-150-200-250	43	40	58	64	1.991 Kg
	SD1.3K 060 R_01	100-150-200-250	43	60	58	84	2.329 Kg
	SD1.3K 080 R_01	100-150-200-250	43	80	58	104	2.667 Kg
	SD1.3K 100 R_01	100-150-200-250	43	100	58	124	3.005 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	SD1.3K 100 R100

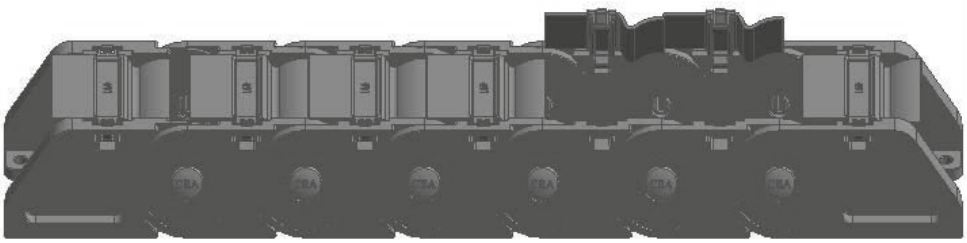


R mm	H mm	X mm	M mm	Y mm
100	63	258	168	430
150	63	358	243	587
200	63	458	259	774
250	63	558	359	874

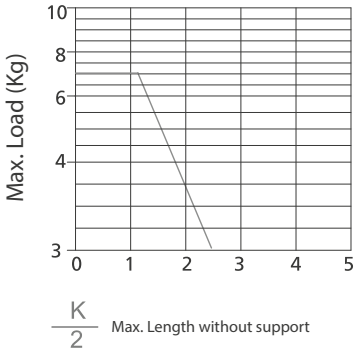


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

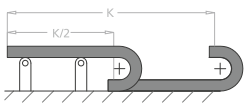


IMPORTANT POINTS

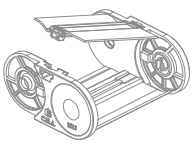


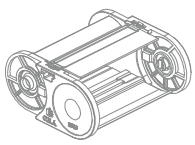
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 3,5 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)

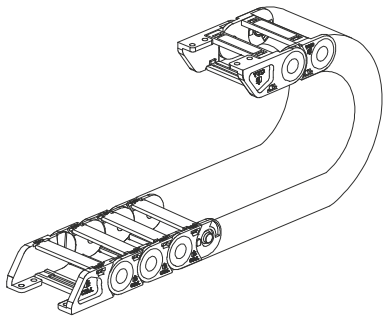




How to choose end bracket

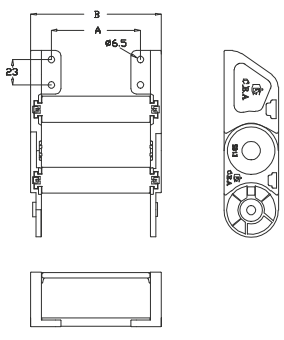
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment .



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD1.3K 040 **R_01**	**SD1.3K** B040	**22**	**64**
SD1.3K 060 **R_01**	**SD1.3K** B060	**42**	**84**
SD1.3K 080 **R_01**	**SD1.3K** B080	**62**	**104**
SD1.3K 100 **R_01**	**SD1.3K** B100	**82**	**124**



S045

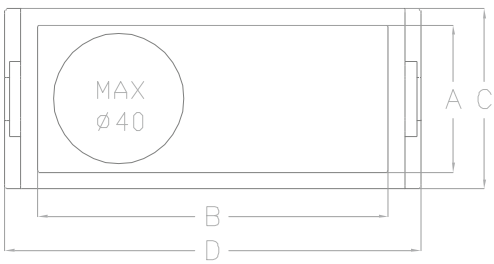
CABLE CARRIERS MEDIUM SERIES

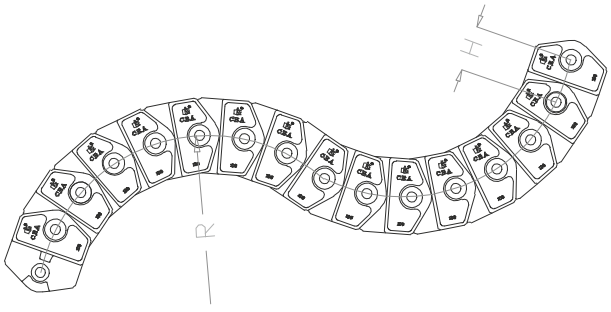
Inner Height(A) 43mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• No cover (cap) on top and bottom sides0 • Has radius to both sides.	S045 110 R_01	70	43	110	45	130	760 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example:	**S045 110 R70**

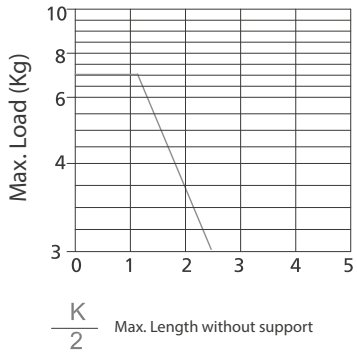
R mm	H mm	X mm	M mm	Y mm
70	25	133	91.5	150





CEA

IMPORTANT POINTS



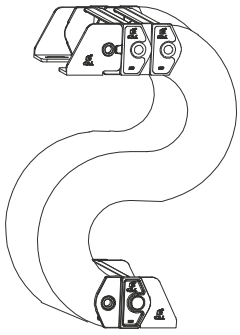
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

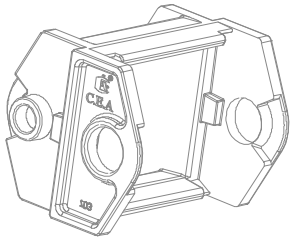
How to choose end bracket

End bracket

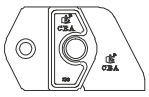
End brackets are the parts to be used to fix the cable carrier to the machine or equipment .

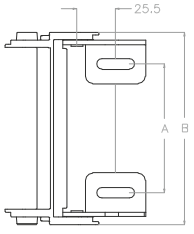


Should be attached to the both ends of the cable carrier.



CABLE CARRIER CODE	END BRACKET CODE	A	B
S045 110 **R_01**	**S045** B110	X	X





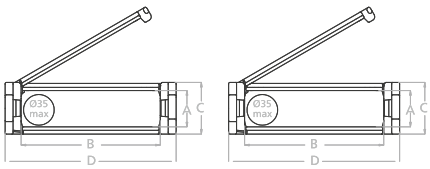
SD0

CABLE CARRIERS HEAVY SERIES

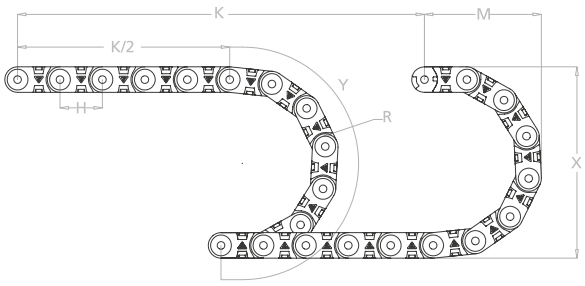
Inner Height (A) 40mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides are openable • Suitable for long distances • No complete covers (caps)(on both sides) • Should be used in supporting tray • Suitable to use both vertical and horizontal separators	SD0 080 R_01	125-150-170-200-220-285-350	40	080	60	120	2.120 Kg
	SD0 100 R_01	125-150-170-200-220-285-350	40	100	60	140	2.200 Kg
	SD0 120 R_01	125-150-170-200-220-285-350	40	120	60	160	2.300 Kg
	SD0 140 R_01	125-150-170-200-220-285-350	40	140	60	180	2.400 Kg
	SD0 175 R_01	125-150-170-200-220-285-350	40	175	60	215	2.560 Kg
	SD0 200 R_01	125-150-170-200-220-285-350	40	200	60	240	2.680 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	SD0 100 R150

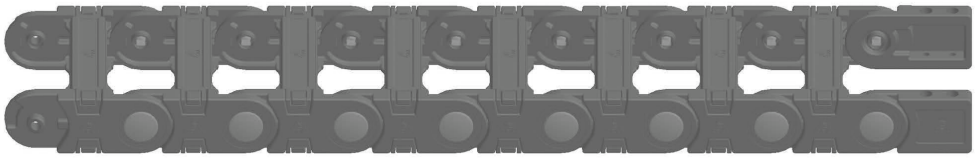


R mm	H mm	X mm	M mm	Y mm
125	100	320	270	590
150	100	360	290	630
170	100	400	310	730
200	100	460	360	820
220	100	500	390	891
285	100	630	425	1095
350	100	760	490	1299



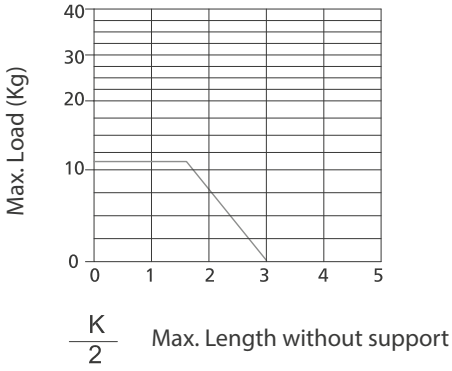
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



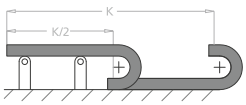
CEA

IMPORTANT POINTS

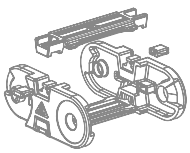


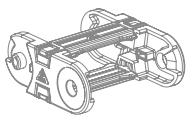
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

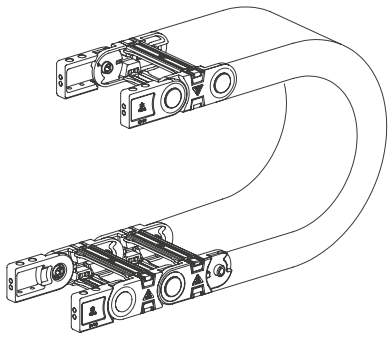




How to choose end bracket

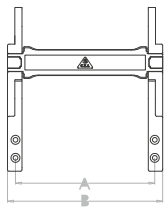
End bracket

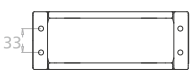
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD0 080 **R01**	**SD0** B01	**100**	**120**
SD0 100 **R01**	**SD0** B01	**120**	**140**
SD0 120 **R01**	**SD0** B01	**140**	**160**
SD0 140 **R01**	**SD0** B01	**160**	**180**
SD0 175 **R01**	**SD0** B01	**195**	**215**
SD0 200 **R01**	**SD0** B01	**220**	**240**





CEA

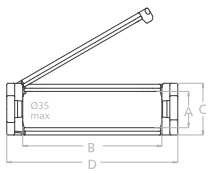
SD0K

CABLE CARRIERS HEAVY SERIES

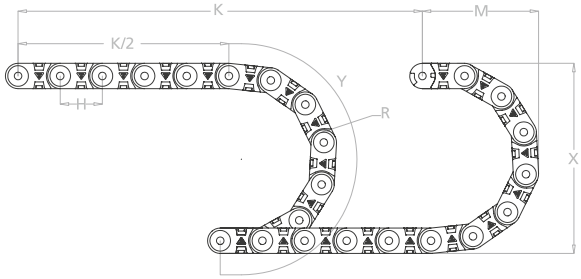
Inner Height (A) 40mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides are openable • Suitable for long distances • Both up and down sides have complete covers (caps) • Should be used in supporting tray	SD0K 100 R_01	125-150-170-200-220-285-350	40	100	60	140	2.500 Kg
	SD0K 140 R_01	125-150-170-200-220-285-350	40	140	60	180	2.900 Kg
	SD0K 200 R_01	125-150-170-200-220-285-350	40	200	60	240	3.500 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	**SD0K 100 R150**

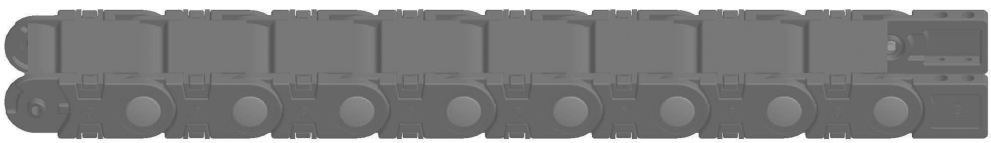


R mm	H mm	X mm	M mm	Y mm
125	100	320	270	590
150	100	360	290	630
170	100	400	310	730
200	100	460	360	820
220	100	500	390	891
285	100	630	425	1095
350	100	760	490	1299

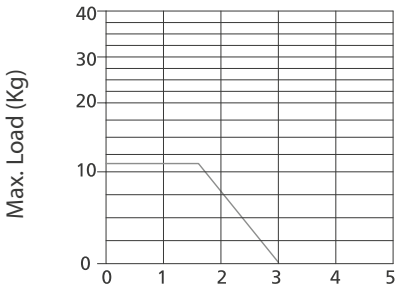


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



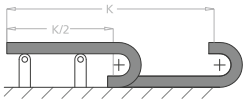
IMPORTANT POINTS



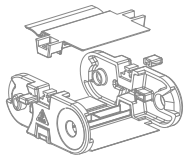
$\frac{K}{2}$ Max. Length without support

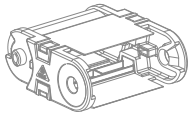
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

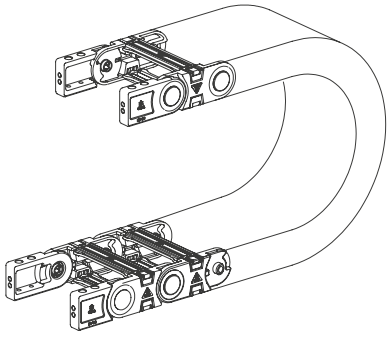




How to choose end bracket

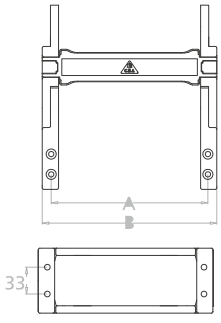
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD0K 100 **R01**	**SD0** B01	**100**	**140**
SD0K 140 **R01**	**SD0** B01	**160**	**180**
SD0K 200 **R01**	**SD0** B01	**220**	**240**



CEA

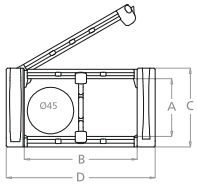
SD5

CABLE CARRIERS HEAVY SERIES

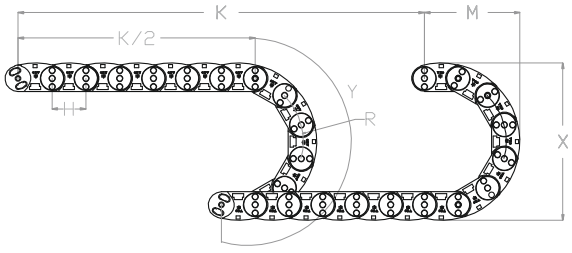
Inner Height (A) 50mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides are openable • Suitable for long distances • No complete covers (caps)(on both sides) • Suitable to use vertical separators.	SD5 50 R_01	100-150-200-250-300	50	50	70	82	2.070 Kg
	SD5 100 R_01	100-150-200-250-300	50	100	70	132	2.364 Kg
	SD5 150 R_01	100-150-200-250-300	50	150	70	182	2.640 Kg
	SD5 200 R_01	100-150-200-250-300	50	200	70	232	2.934 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example	SD5 100 R150

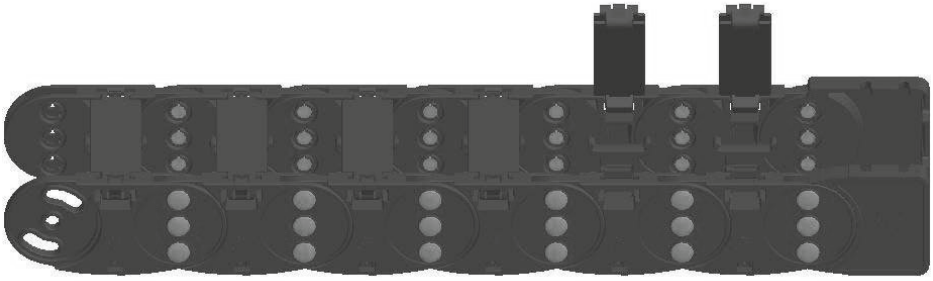


R mm	H mm	X mm	M mm	Y mm
100	83	270	218	480
150	83	370	268	637
200	83	470	318	794
250	83	570	368	951
300	83	670	418	1108



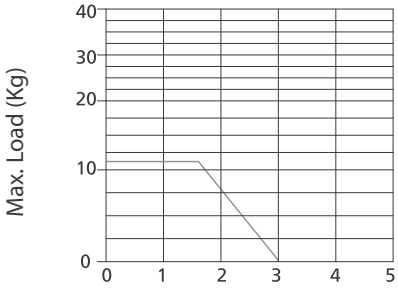
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



CEA

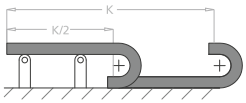
IMPORTANT POINTS



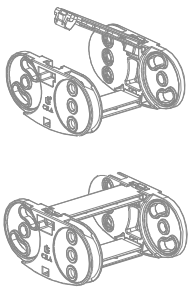
$\frac{K}{2}$ Max. Length without support

Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



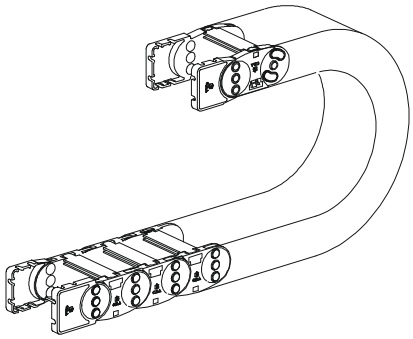
How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly



How to choose end bracket

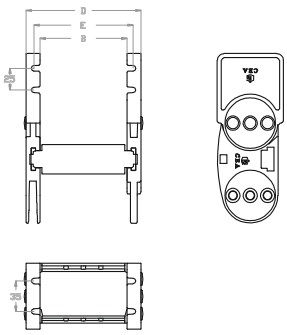
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD5 050 **R01**	**SD5** B050	**64**	**82**
SD5 100 **R01**	**SD5** B100	**114**	**132**
SD5 150 **R01**	**SD5** B150	**164**	**182**
SD5 200 **R01**	**SD5** B200	**214**	**232**



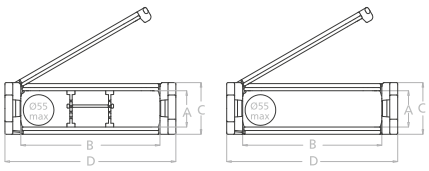
SD9

CABLE CARRIERS HEAVY SERIES

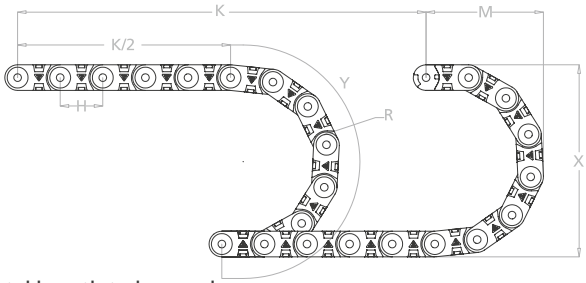
Inner Height (A) 60mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides are openable • Suitable for long distances • No complete covers (caps)(on both sides) • Should be used in supporting tray • Suitable to use vertical separators	SD9 080 R_01	150-170-200-220-285-350	60	80	80	120	2.220 Kg
	SD9 100 R_01	150-170-200-220-285-350	60	100	80	140	2.300 Kg
	SD9 120 R_01	150-170-200-220-285-350	60	120	80	160	3.400 Kg
	SD9 140 R_01	150-170-200-220-285-350	60	140	80	180	3.500 Kg
	SD9 175 R_01	150-170-200-220-285-350	60	175	80	215	3.660 Kg
	SD9 200 R_01	150-170-200-220-285-350	60	200	80	240	3.780 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example:	SD9 100 R170

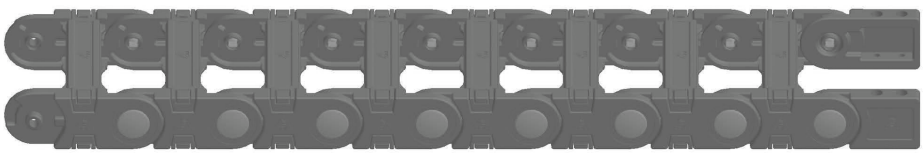


R mm	H mm	X mm	M mm	Y mm
150	100	380	290	630
170	100	420	310	730
200	100	480	360	820
220	100	520	390	891
285	100	650	425	1095
350	100	780	490	1299



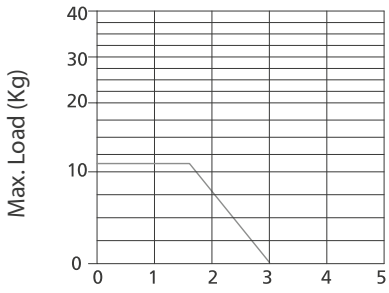
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



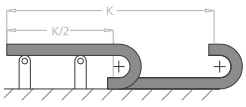
CEA

IMPORTANT POINTS

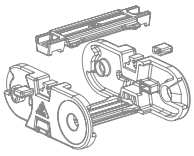


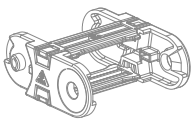
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

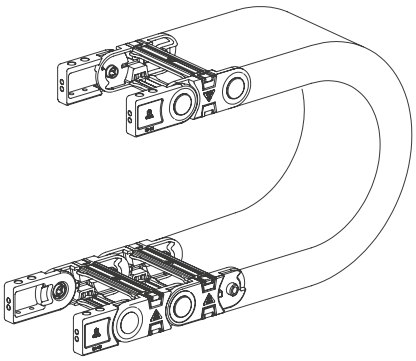




How to choose end bracket

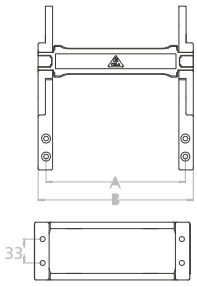
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD9 080 **R01**	**SD9** B01	**100**	**120**
SD9 100 **R01**	**SD9** B01	**120**	**140**
SD9 120 **R01**	**SD9** B01	**140**	**160**
SD9 140 **R01**	**SD9** B01	**160**	**180**
SD9 175 **R01**	**SD9** B01	**195**	**215**
SD9 200 **R01**	**SD9** B01	**220**	**240**



CEA

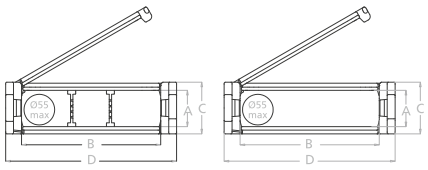
SD9K

CABLE CARRIERS HEAVY SERIES

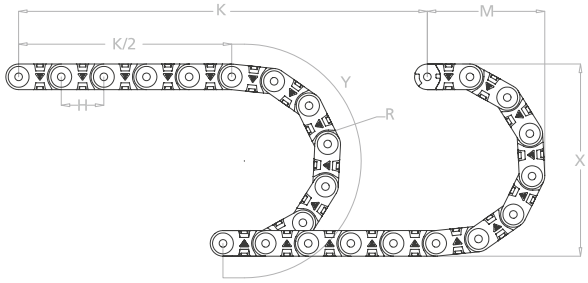
Inner Height (A) 60mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides are openable • Suitable for long distances • Both up and down sides have complete covers (caps) • Should be used in supporting tray	SD9K 100 R_01	150-170-200-220-285-350	60	100	80	140	2.600 Kg
	SD9K 140 R_01	150-170-200-220-285-350	60	140	80	180	3.000 Kg
	SD9K 200 R_01	150-170-200-220-285-350	60	200	80	240	3.600 Kg

Maximum working speed hızı :5M/S

Radius MUST be given in your orders. Example:	**SD9K 100 R170**



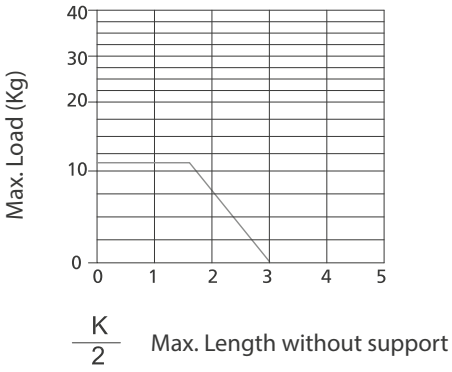
R mm	H mm	X mm	M mm	Y mm
150	100	380	290	630
170	100	420	310	730
200	100	480	360	820
220	100	520	390	891
285	100	650	425	1095
350	100	780	490	1299



L: Total length to be used
K: Movement distance
Y: Radius

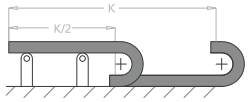
$$L: \frac{K}{2} + Y$$

IMPORTANT POINTS

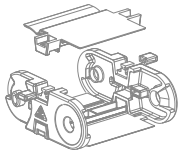


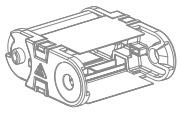
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

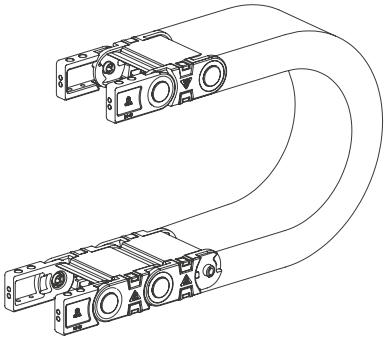




How to choose end bracket

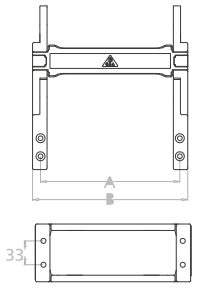
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD9K 100 **R01**	**SD9** B01	**120**	**140**
SD9K 140 **R01**	**SD9** B01	**160**	**180**
SD9K 200 **R01**	**SD9** B01	**220**	**240**



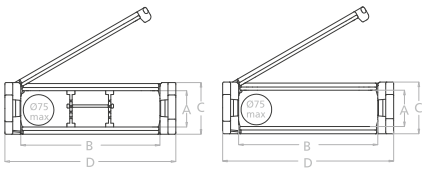
SE9

CABLE CARRIERS HEAVY SERIES

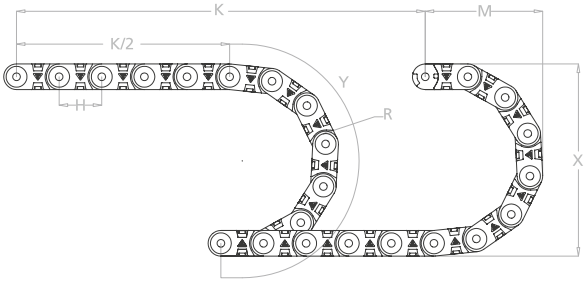
Inner Height (A) 80mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides are openable • Suitable for long distances • No complete covers (caps) (on both sides) • Should be used in supporting tray	SE9 080 R_01	200-250-300-350	80	80	100	120	3.360 Kg
	SE9 100 R_01	200-250-300-350	80	100	100	140	3.440 Kg
	SE9 120 R_01	200-250-300-350	80	120	100	160	3.540 Kg
	SE9 140 R_01	200-250-300-350	80	140	100	180	3.640 Kg
	SE9 175 R_01	200-250-300-350	80	175	100	215	3.800 Kg
	SE9 200 R_01	200-250-300-350	80	200	100	240	3.920 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SE9 100 R 200**

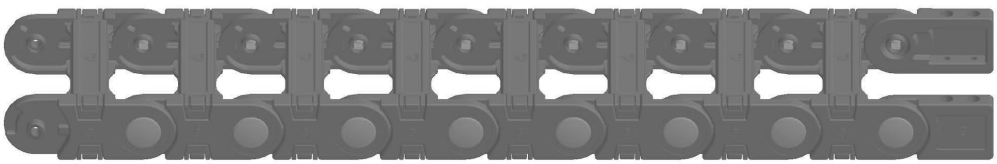


R mm	H mm	X mm	M mm	Y mm
200	100	500	350	828
250	100	600	400	985
300	100	700	450	1142
350	100	800	500	1299

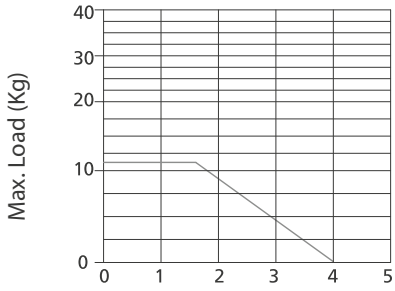


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



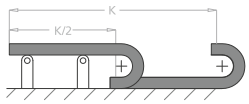
IMPORTANT POINTS



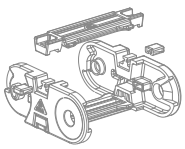
$\frac{K}{2}$ Max. Length without support

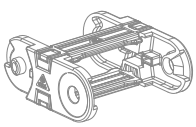
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

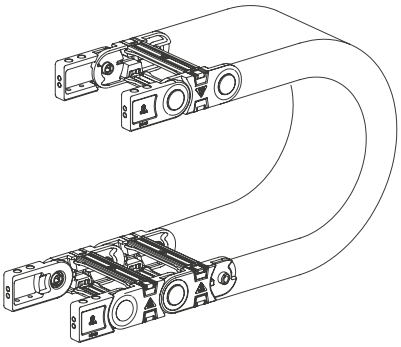




How to choose end bracket

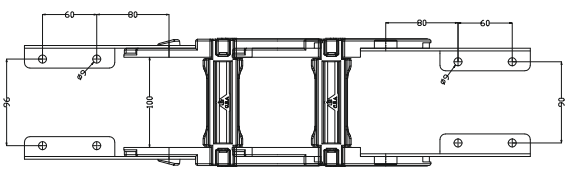
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SE9 080 **R01**	**SE9** B01	**100**	**120**
SE9 100 **R01**	**SE9** B01	**120**	**140**
SE9 120 **R01**	**SE9** B01	**140**	**160**
SE9 140 **R01**	**SE9** B01	**160**	**180**
SE9 175 **R01**	**SE9** B01	**195**	**215**
SE9 200 **R01**	**SE9** B01	**220**	**240**



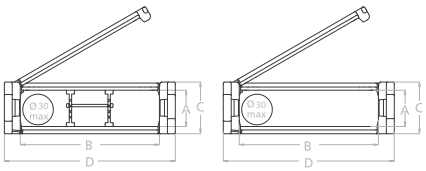
SD0 AL

HEAVY SERIES WITH ALUMINUM BAR

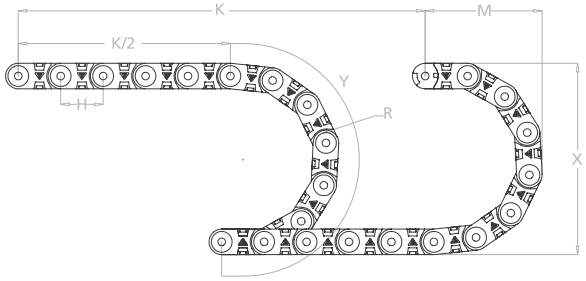
Inner Height (A) 32mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides have openable aluminum bars • Suitable for long distances • No complete covers (caps) (on both sides) • Should be used in supporting tray • Suitable to use with vertical separators	SD0 AL 250 R_01	125-150-170-200-220-285-350	32	250	60	290	3.360 Kg
	SD0 AL 300 R_01	125-150-170-200-220-285-350	32	300	60	340	3.440 Kg
	SD0 AL 400 R_01	125-150-170-200-220-285-350	32	400	60	440	3.540 Kg
	SD0 AL 500 R_01	125-150-170-200-220-285-350	32	500	60	540	3.640 Kg
	SD0 AL 600 R_01	125-150-170-200-220-285-350	32	600	60	640	3.800 Kg
	SD0 AL 700 R_01	125-150-170-200-220-285-350	32	700	60	740	3.920 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SD0 AL 250 R150**

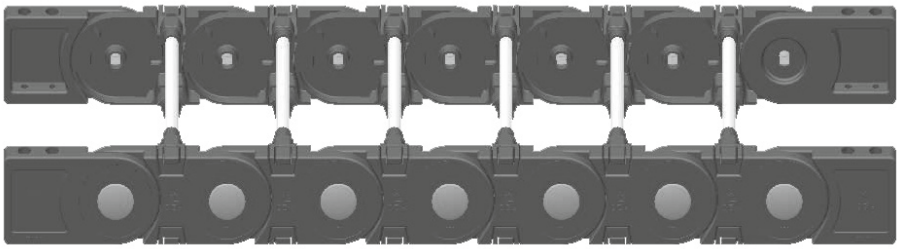


R mm	H mm	X mm	M mm	Y mm
125	100	320	270	590
150	100	360	290	630
170	100	400	310	730
200	100	460	360	820
220	100	500	390	891
285	100	630	425	1095
350	100	760	490	1299



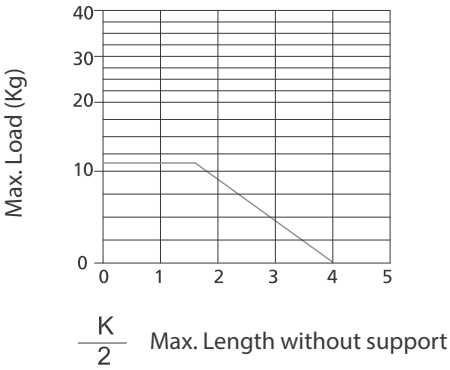
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



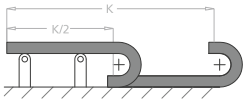
CEA

IMPORTANT POINTS



Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

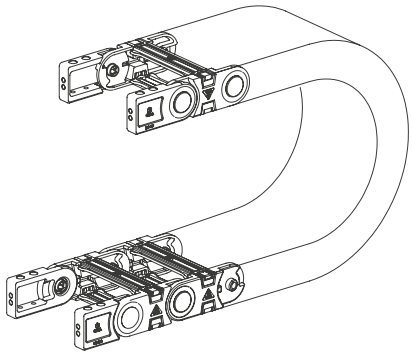


How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

How to choose end bracketl

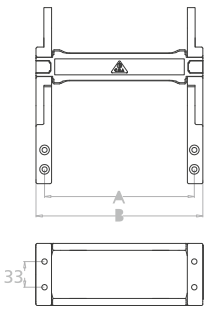
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD0 AL 250 **R01**	**SD0** B01	X	X



CEA

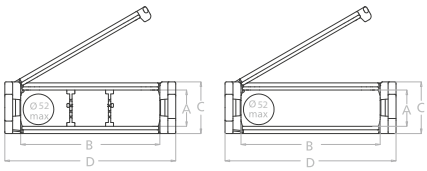
SD9 AL

HEAVY SERIES WITH ALUMINUM BAR

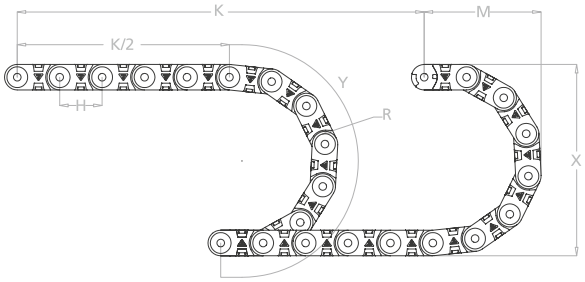
Inner Height (A) 52mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides have openable aluminum bars • Suitable for long distances • No complete covers (caps) (on both sides) • Should be used in supporting tray • Suitable to use with vertical separators	SD9 AL 250 R_01	150-170-200-220-285-350	52	250	80	290	2.688 Kg
	SD9 AL 300 R_01	150-170-200-220-285-350	52	300	80	340	2.934 Kg
	SD9 AL 400 R_01	150-170-200-220-285-350	52	400	80	440	3.245 Kg
	SD9 AL 500 R_01	150-170-200-220-285-350	52	500	80	540	3.617 Kg
	SD9 AL 600 R_01	150-170-200-220-285-350	52	600	80	640	3.717 Kg
	SD9 AL 700 R_01	150-170-200-220-285-350	52	700	80	740	3.817 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders.Example:	SD9 AL 500 R 150

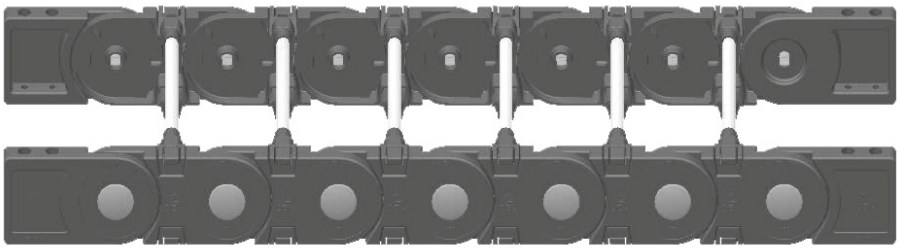


R mm	H mm	X mm	M mm	Y mm
150	100	380	290	630
170	100	420	310	730
200	100	480	360	820
220	100	520	390	891
285	100	650	425	1095



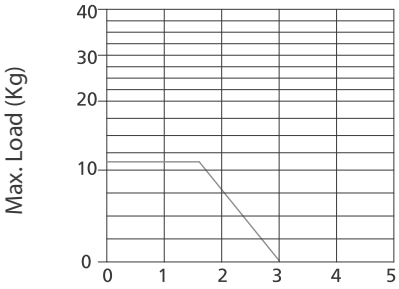
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



CEA

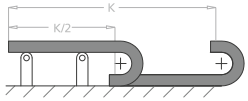
IMPORTANT POINTS



$\frac{K}{2}$ Max. Length without support

Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

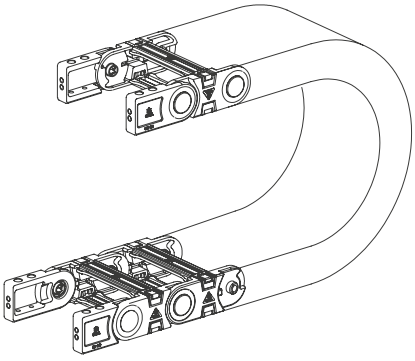


How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

AYAK SETİNİN SEÇİLMESİ VE KULLANIMI

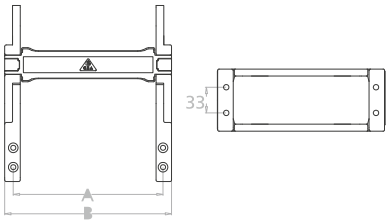
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrierr.

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD9 AL 250 **R01**	**SD9** B01	X	X



CEA

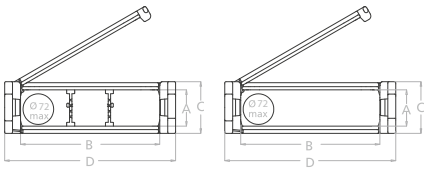
SE9 AL

HEAVY SERIES WITH ALUMINUM BAR

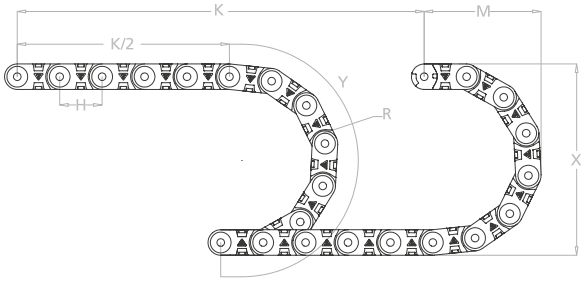
Inner Height (A) 72mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides have openable aluminum bars • Suitable for long distances • No complete covers (caps) (on both sides) • Should be used in supporting tray • Suitable to use with vertical separators	SE9 AL 250 R_01	200-250-300-350-420	72	250	100	290	3.725 Kg
	SE9 AL 300 R_01	200-250-300-350-420	72	300	100	340	3.964 Kg
	SE9 AL 400 R_01	200-250-300-350-420	72	400	100	440	4.085 Kg
	SE9 AL 500 R_01	200-250-300-350-420	72	500	100	540	4.273 Kg
	SE9 AL 600 R_01	200-250-300-350-420	72	600	100	640	4.573 Kg
	SE9 AL 700 R_01	200-250-300-350-420	72	700	100	740	4.673 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SE9 AL 500 R200**

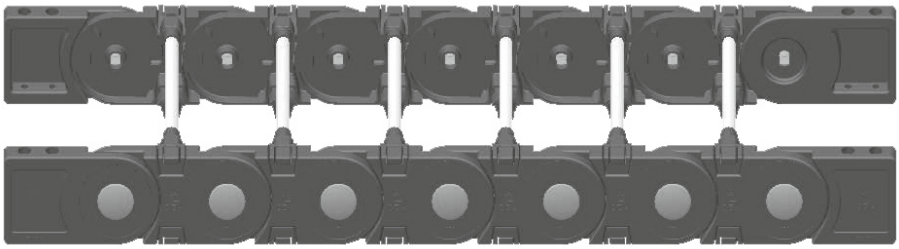


R mm	H mm	X mm	M mm	Y mm
200	100	500	350	828
250	100	600	400	985
300	100	700	450	1142
350	100	800	500	1299
420	100	940	560	1350



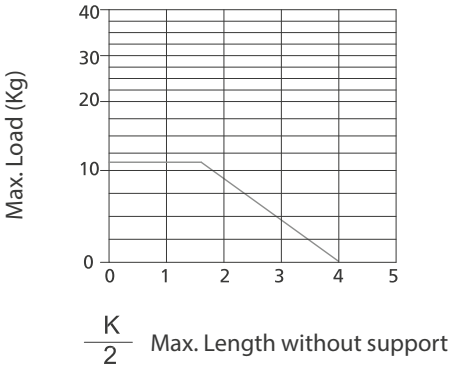
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



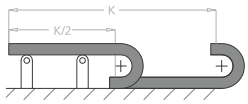
CEA

IMPORTANT POINTS



Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

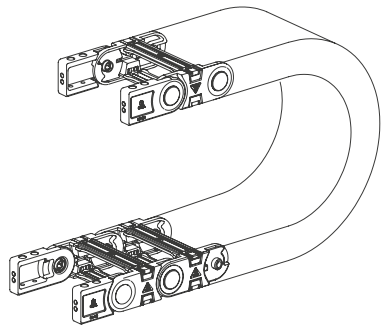


How to use support rollers:
- Support rollers should be used after 4 meters
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

How to choose end bracket

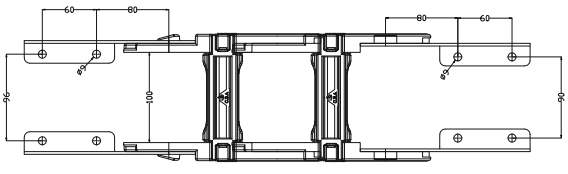
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SE9 AL 250 **R01**	**SE9** B01	X	X



CEA

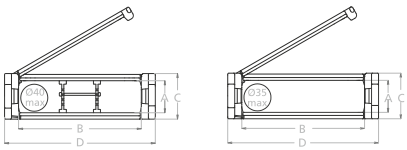
SD2S

CABLE CARRIERS SLIDING SERIES

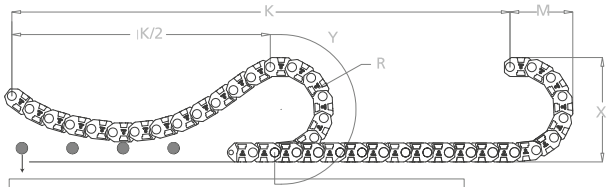
Inner Height (A) 45mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances, over 4 meters • No complete cover (on both sides) • Suitable to use vertical separators	SD2S 080 R_01	150-200-250	45	080	65	120	1.925 Kg
	SD2S 100 R_01	150-200-250	45	100	65	140	2.030 Kg
	SD2S 120 R_01	150-200-250	45	120	65	160	2.160 Kg
	SD2S 140 R_01	150-200-250	45	140	65	180	2.290 Kg
	SD2S 175 R_01	150-200-250	45	175	65	215	2.495 Kg
	SD2S 200 R_01	150-200-250	45	200	65	240	2.650 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SD2S 080 R_150**



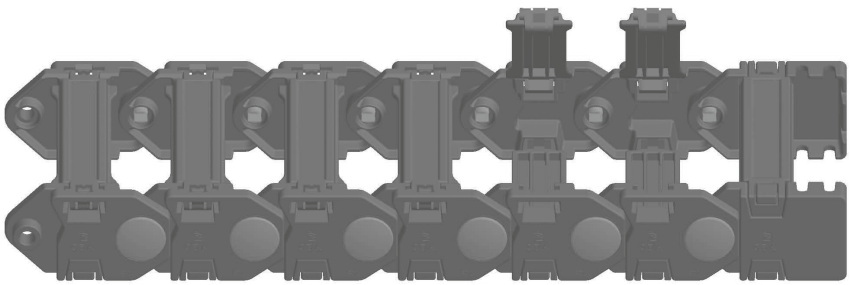
R mm	H mm	X mm	M mm	Y mm
150	75	360	257	621
200	75	460	307	778
250	75	560	357	935



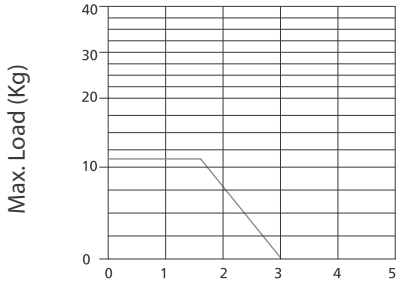
Should be used with supporting tray and rollers.
Code of support roller is ST01

L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

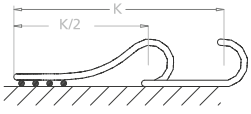


IMPORTANT POINTS

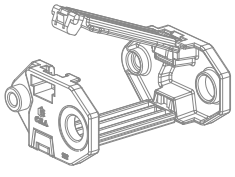


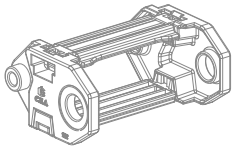
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

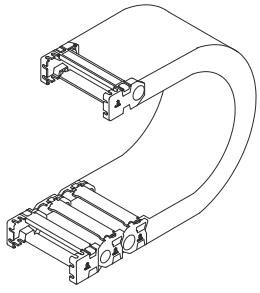




How to choose end bracket

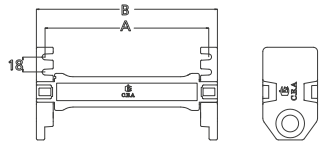
End bracket

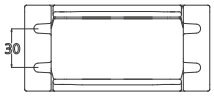
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD2S 080 **R01**	**SD2** B080	**100**	**120**
SD2S 100 **R01**	**SD2** B100	**120**	**140**
SD2S 120 **R01**	**SD2** B120	**140**	**160**
SD2S 140 **R01**	**SD2** B140	**160**	**180**
SD2S 175 **R01**	**SD2** B175	**195**	**215**
SD2S 200 **R01**	**SD2** B200	**220**	**240**





CEA

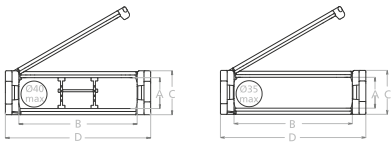
SD2SK

CABLE CARRIERS SLIDING SERIES

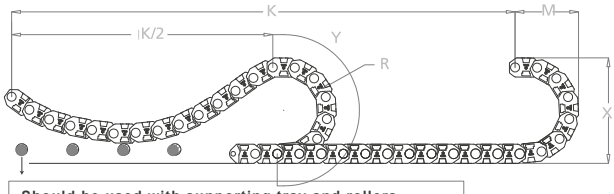
Inner Height (A) 45mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances • Both sides have openable covers (caps).	SD2SK 100 R_01	150-200-250	45	100	65	140	2.230 Kg
	SD2SK 200 R_01	150-200-250	45	200	65	240	3.050 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example:	**SD2SK 100 R150**



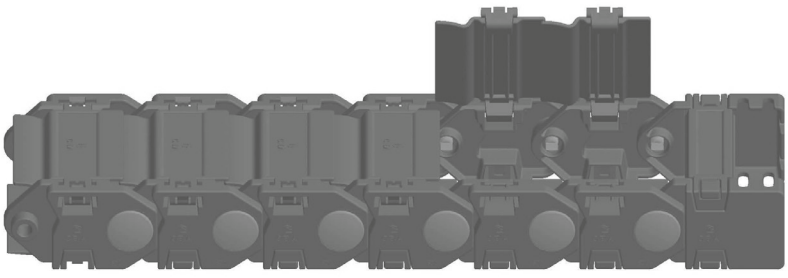
R mm	H mm	X mm	M mm	Y mm
150	75	360	257	621
200	75	460	307	778
250	75	560	357	935



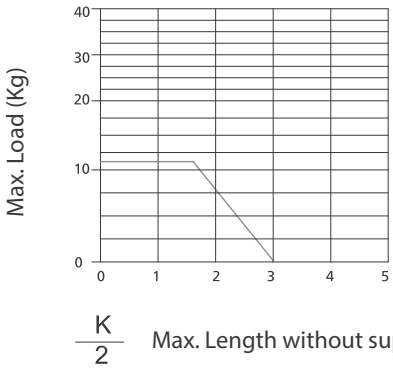
Should be used with supporting tray and rollers.
Code of support roller is ST01

L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

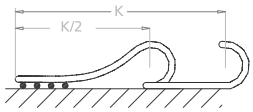


IMPORTANT POINTS

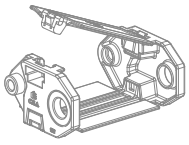


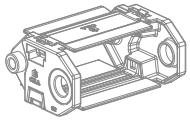
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly.

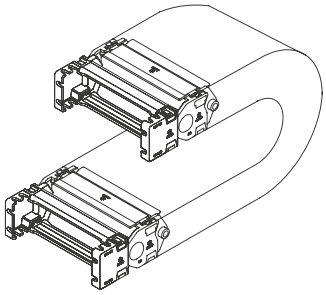




How to choose end bracket

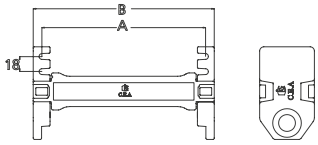
End bracket

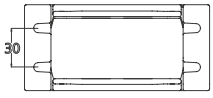
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD2SK 100 **R01**	**SD2** B100	**120**	**140**
SD2SK 200 **R01**	**SD2** B200	**220**	**240**





CEA

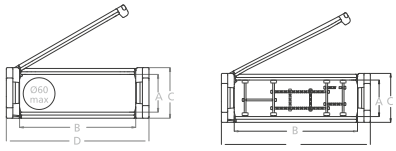
SE1S

CABLE CARRIERS SLIDING SERIES

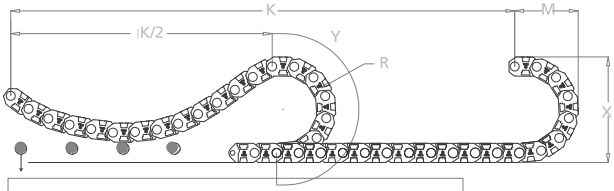
Inner Height (A) 65mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances, over 4 meters • No complete cover (on both sides) •Suitable to use with separators	SE1S 080 R_01	150-200-250	65	80	85	120	2.340 Kg
	SE1S 100 R_01	150-200-250	65	100	85	140	2.445 Kg
	SE1S 120 R_01	150-200-250	65	120	85	160	2.575 Kg
	SE1S 140 R_01	150-200-250	65	140	85	180	2.715 Kg
	SE1S 175 R_01	150-200-250	65	175	85	215	2.915 Kg
	SE1S 200 R_01	150-200-250	65	200	85	240	3.070 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SE1S 100 R150**



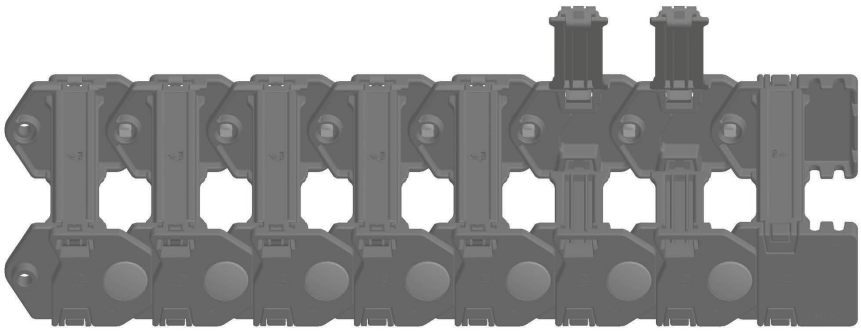
R mm	H mm	X mm	M mm	Y mm
150	75	380	257	621
200	75	480	307	778
250	75	580	357	935



Should be used with supporting tray and rollers.
Code of support roller is ST01

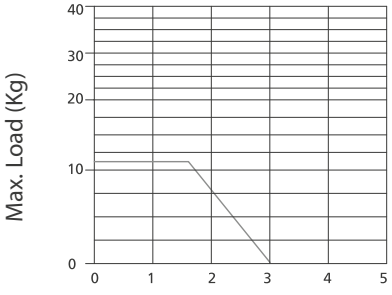
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



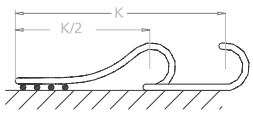
CEA

IMPORTANT POINTS

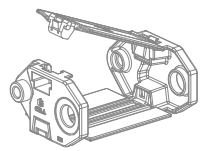


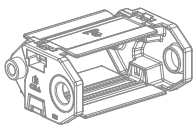
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

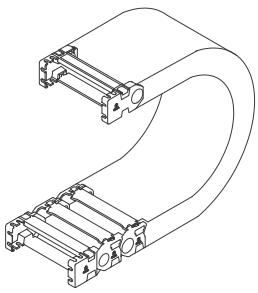




How to choose end bracket

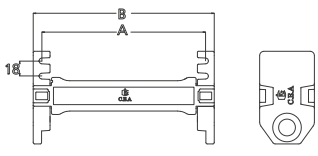
End bracket

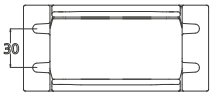
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SE1S 080 **R01**	**SE1** B080	**100**	**120**
SE1S 100 **R01**	**SE1** B100	**120**	**140**
SE1S 120 **R01**	**SE1** B120	**140**	**160**
SE1S 140 **R01**	**SE1** B140	**160**	**180**
SE1S 175 **R01**	**SE1** B175	**195**	**215**
SE1S 200 **R01**	**SE1** B200	**220**	**240**





CEA

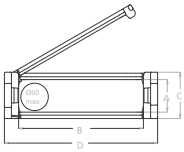
SE1SK

CABLE CARRIERS SLIDING SERIES

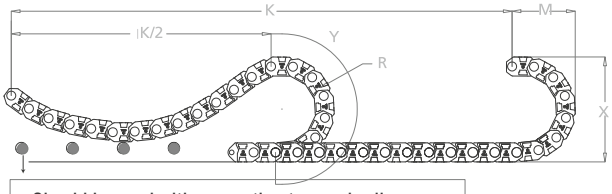
Inner Height (A) 65mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances, over 4 meters • Both sides have complete covers (caps) • Suitable to use with separators	SE1SK 100 R_01	150-200-250	65	100	85	140	2.575 Kg
	SE1SK 200 R_01	150-200-250	65	200	85	240	3.471 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example:	SE1SK 100 R150



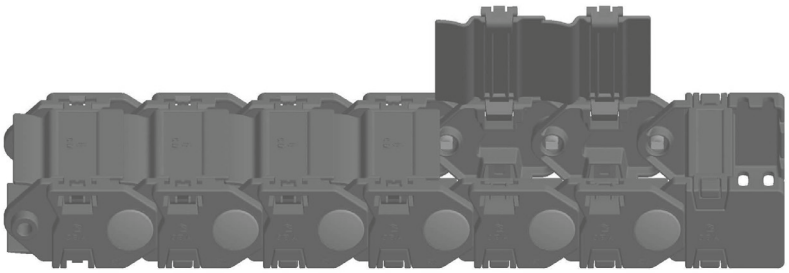
mm	H mm	X mm	M mm	Y mm
150	75	380	257	621
200	75	480	307	778
250	75	580	357	935



Should be used with supporting tray and rollers.
Code of support roller is ST01

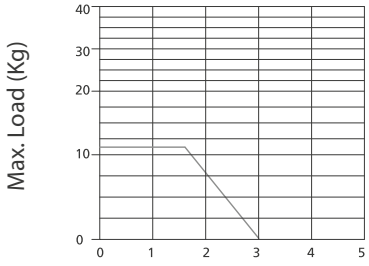
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



CEA

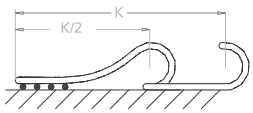
IMPORTANT POINTS



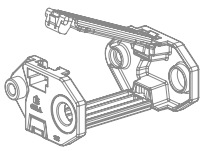
$\frac{K}{2}$ Max. Length without support

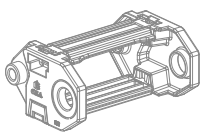
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

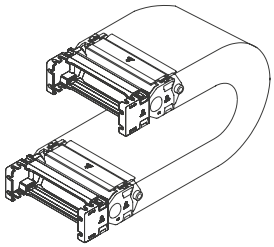




How to choose end bracket

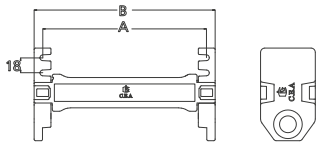
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SE1S 080 **R01**	**SE1** B080	**100**	**120**
SE1S 100 **R01**	**SE1** B100	**120**	**140**
SE1S 120 **R01**	**SE1** B120	**140**	**160**
SE1S 140 **R01**	**SE1** B140	**160**	**180**
SE1S 175 **R01**	**SE1** B175	**195**	**215**
SE1S 200 **R01**	**SE1** B200	**220**	**240**



CEA

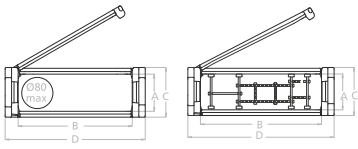
SF1S

CABLE CARRIERS SLIDING SERIES

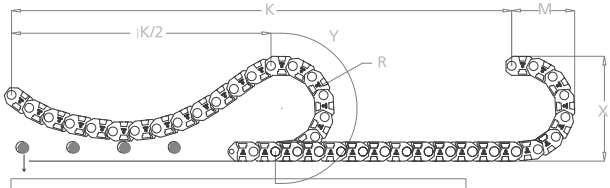
Inner Height (A) 85mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances, over 4 meters • No complete cover (on both sides) • Suitable to use with separators.	SF1S 080 R_01	150-200-250	85	080	105	120	2.625 Kg
	SF1S 100 R_01	150-200-250	85	100	105	140	2.730 Kg
	SF1S 120 R_01	150-200-250	85	120	105	160	2.860 Kg
	SF1S 140 R_01	150-200-250	85	140	105	180	2.990 Kg
	SF1S 175 R_01	150-200-250	85	175	105	215	3.198 Kg
	SF1S 200 R_01	150-200-250	85	200	105	240	3.355 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SF1S 100 R_150**



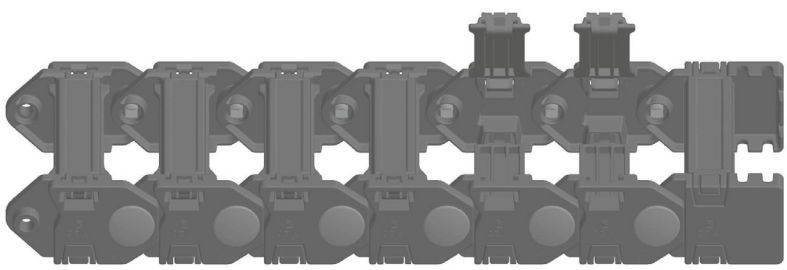
mm	H mm	X mm	M mm	Y mm
150	75	400	257	621
200	75	500	307	778
250	75	600	357	935



Should be used with supporting tray and rollers.
Code of support roller is ST01

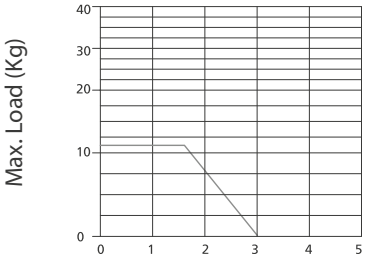
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



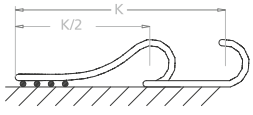
CEA

IMPORTANT POINTS

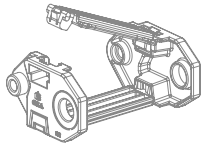


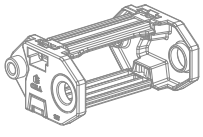
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

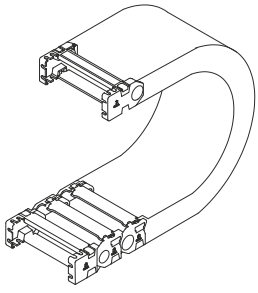




How to choose end bracket

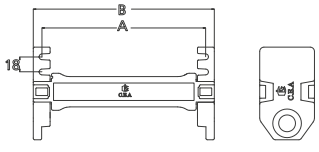
End bracket

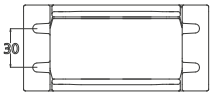
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrie

CABLE CARRIER CODE	END BRACKET CODE	A	B
SF1S 080 **R01**	**SF1** B080	**100**	**120**
SF1S 100 **R01**	**SF1** B100	**120**	**140**
SF1S 120 **R01**	**SF1** B120	**140**	**160**
SF1S 140 **R01**	**SF1** B140	**160**	**180**
SF1S 175 **R01**	**SF1** B175	**195**	**215**
SF1S 200 **R01**	**SF1** B200	**220**	**240**





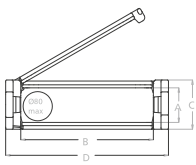
SF1SK

CABLE CARRIERS SLIDING SERIES

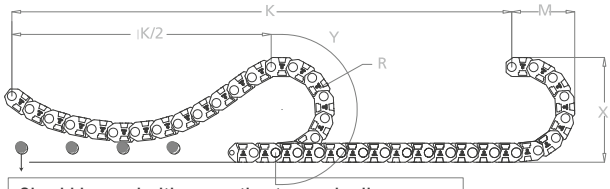
Inner Height (A) 85mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• One side is fixed, other (radius) side is openable • Should be used in supporting trays • Suitable for long distances, over 4 meters • Both sides have complete covers (caps)	SF1SK 100 R_01	150-200-250	85	100	105	120	2.990 Kg
	SF1SK 200 R_01	150-200-250-	85	200	105	240	4.160 Kg

Maximum working speed hızı :5M/S

Radius MUST be given in your orders. Example: **SF1SK 100 R150**



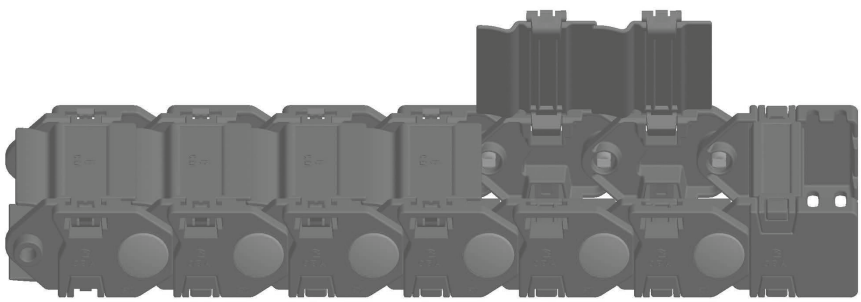
R mm	H mm	X mm	M mm	Y mm
150	75	400	257	621
200	75	500	307	778
250	75	600	357	935



Should be used with supporting tray and rollers.
Code of support roller is ST01

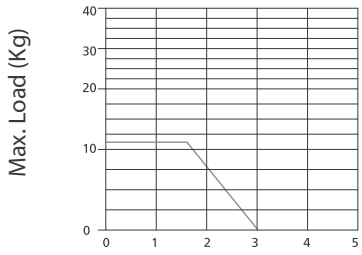
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



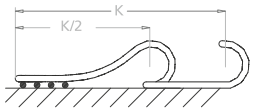
CEA

IMPORTANT POINTS

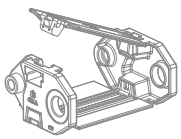


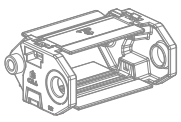
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

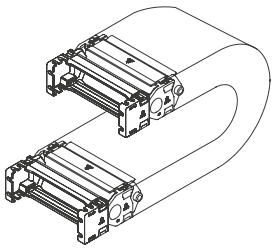




How to choose end bracket

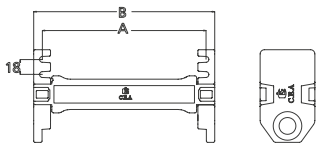
End bracket

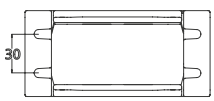
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SF1SK 100 **R01**	**SF1** B100	**120**	**140**
SF1SK 200 **R01**	**SF1** B200	**220**	**240**





CEA

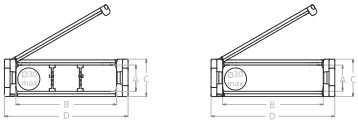
SD2SAL

CABLE CARRIERS SLIDING SERIES WITH ALUMINUM BAR

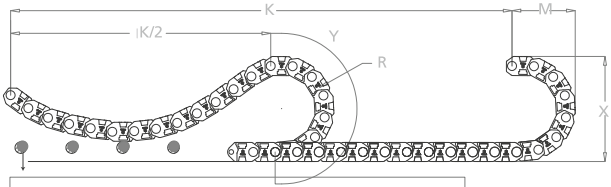
Inner Height (A) 35mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides have openable aluminum bars • Suitable for long distances • No complete covers (caps)(on both sides) • Should be used in supporting tray • Suitable to use with separators	SD2S AL 250 R_01	150-200-250	35	250	65	290	2.325 Kg
	SD2S AL 300 R_01	150-200-250	35	300	65	340	2.630 Kg
	SD2S AL 400 R_01	150-200-250	35	400	65	440	2.960 Kg
	SD2S AL 500 R_01	150-200-250	35	500	65	540	2.390 Kg
	SD2S AL 600 R_01	150-200-250	35	600	65	640	2.490 Kg
	SD2S AL 700 R_01	150-200-250	35	700	65	740	2.490 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SD2S AL 250 R150**



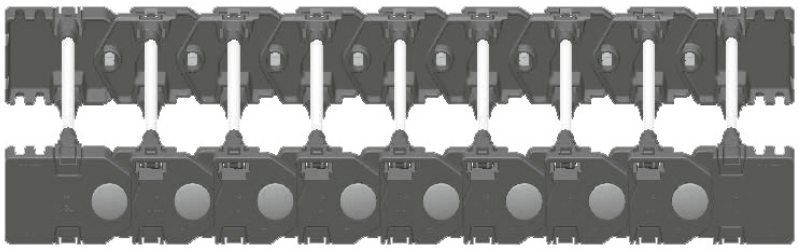
R mm	H mm	X mm	M mm	Y mm
150	75	360	257	621
200	75	460	307	778
250	75	560	357	935



Should be used with supporting tray and rollers.
Code of support roller is ST01

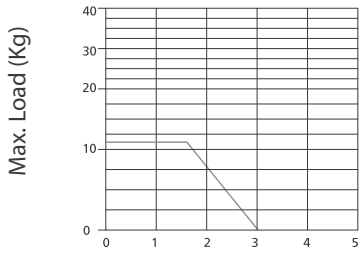
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



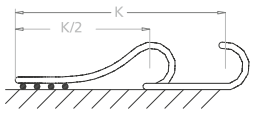
CEA

IMPORTANT POINTS



Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

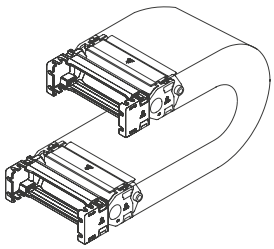


How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

How to choose end bracket

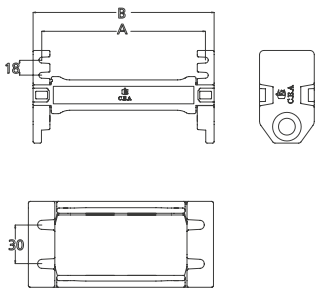
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SD2S AL 250	**SD2S AL B**250	**270**	**290**
SD2S AL 300	**SD2S AL B**300	**320**	**340**
SD2S AL 400	**SD2S AL B**400	**420**	**440**
SD2S AL 500	**SD2S AL B**500	**520**	**540**



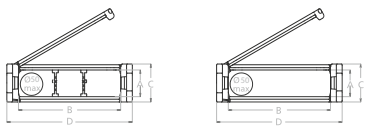
SE1S AL

CABLE CARRIERS SLIDING SERIES WITH ALUMINUM BAR

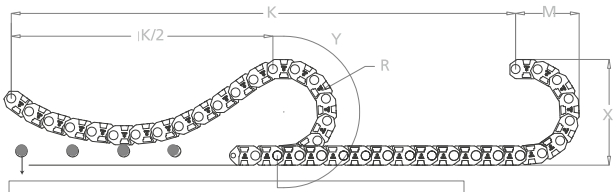
Inner Height (A) 55mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides have openable aluminum bars • Suitable for long distances • No complete covers (caps) (on both sides) • Should be used in supporting tray • Suitable to use with separators	SE1S AL 250 R_01	150-200-250	55	250	85	290	2.325 Kg
	SE1S AL 300 R_01	150-200-250	55	300	85	340	2.630 Kg
	SE1S AL 400 R_01	150-200-250	55	400	85	440	2.960 Kg
	SE1S AL 500 R_01	150-200-250	55	500	85	540	2.390 Kg
	SE1S AL 600 R_01	150-200-250	55	600	85	640	2.490 Kg
	SE1S AL 700 R_01	150-200-250	55	700	85	740	2.590 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SE1S AL 250 R150**



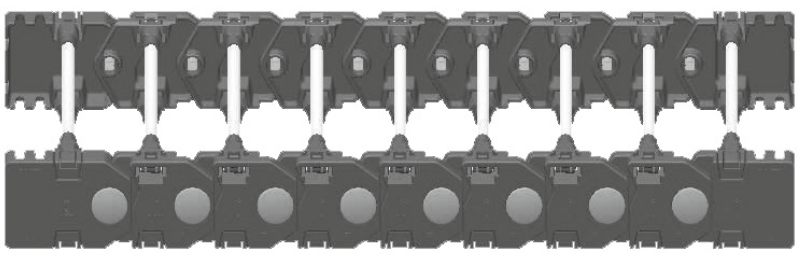
R mm	H mm	X mm	M mm	Y mm
150	75	380	257	621
200	75	480	307	778
250	75	580	357	935



ShShould be used with supporting tray and rollers.
Code of support roller is ST01

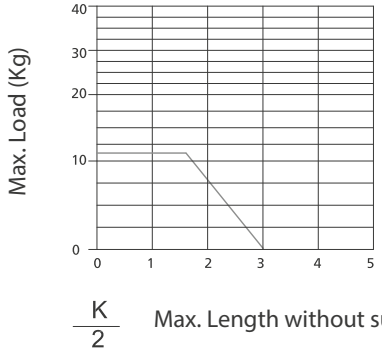
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



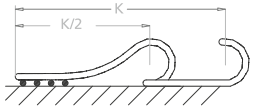
CEA

IMPORTANT POINTS



Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

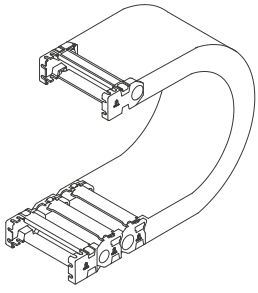


-How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly

How to choose end bracket

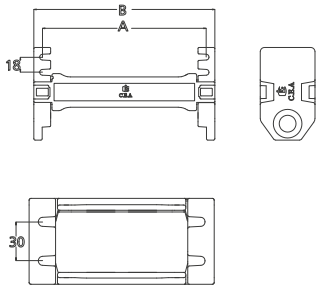
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SE1S AL 250	**SE1 B250**	270	290
SE1S AL 300	**SE1 B300**	320	340
SE1S AL 400	**SE1 B400**	420	440
SE1S AL 500	**SE1 B500**	520	540



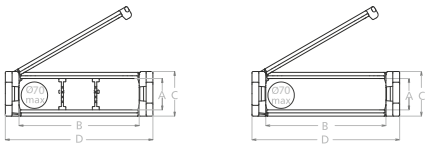
SF1SAL

CABLE CARRIERS SLIDING SERIES WITH ALUMINUM BAR

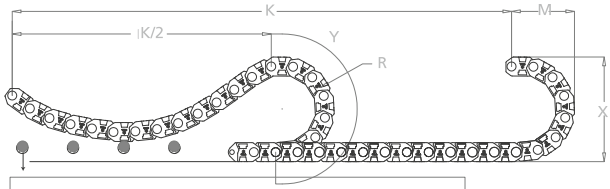
Inner Height (A) 75mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm	Weight Kg/Mt
• Both up and down sides have openable aluminum bars • Suitable for long distances • No complete covers (caps) (on both sides) • Should be used in supporting tray • Suitable to use with separators	SF1S AL 250 R_01	150-200-250	75	250	105	290	2.425 Kg
	SF1S AL 300 R_01	150-200-250	75	300	105	340	2.730 Kg
	SF1S AL 400 R_01	150-200-250	75	400	105	440	3.660 Kg
	SF1S AL 500 R_01	150-200-250	75	500	105	540	3.390 Kg
	SF1S AL 600 R_01	150-200-250	75	600	105	640	3.490 Kg
	SF1S AL 700 R_01	150-200-250	75	700	105	740	3.590 Kg

Maximum working speed :5M/S

Radius MUST be given in your orders. Example: **SF1S AL 250 R150**



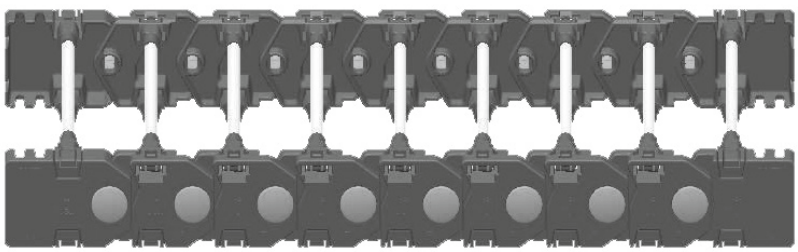
R mm	H mm	X mm	M mm	Y mm
150	75	405	257	621
200	75	505	307	778
250	75	605	357	935



Should be used with supporting tray and rollers.
Code of support roller is ST01

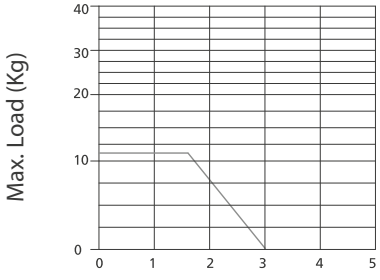
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



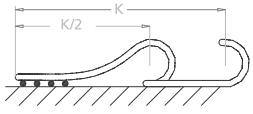
CEA

IMPORTANT POINTS



Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$

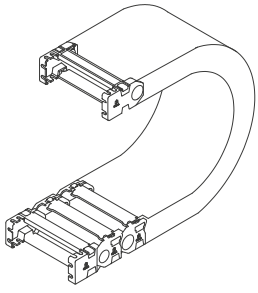


How to use support rollers:
- Make sure that the cap (cover) is fixed properly
- Use an appropriate hand tool (screw driver) to open the cap
- Be careful not to damage the fixing nail of the cap (cover)
- Be sure that side stoppers, used to fix end brackets are fixed properly.

How to choose end bracket

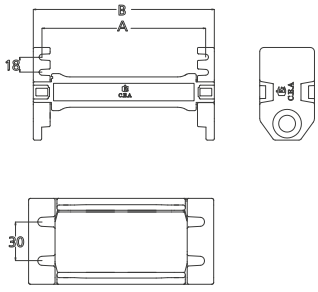
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
SF1S AL 250	**SF1S AL B**250	**270**	**290**
SF1S AL 300	**SF1S AL B**300	**320**	**340**
SF1S AL 400	**SF1S AL B**400	**420**	**440**
SF1S AL 500	**SF1S AL B**500	**520**	**540**



CEA

PURPOSE OF USING SLIDING SERIES

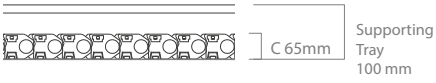
After longer than 4 meters movement distance, mostly bending (dropping) is occurred on the cable carriers. In order to prevent this bending (dropping), it is recommended to use Sliding Series...

Sliding Series should be used with an appropriate supporting tray and with supporting rollers...

How to use Supporting Tray

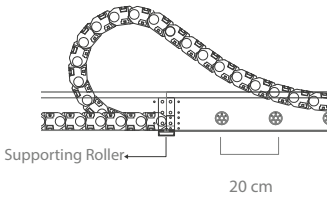
Relation between cable carrier and supporting tray is shown below. Depth of the supporting tray should me minimum 1.5 times bigger than outer height of the cable carrier.

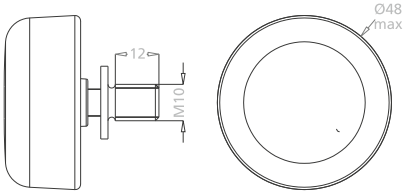
Example: If C (outer height of cable carrier) is 65 mm, depth of the supporting tray should be minimum 100 mm.



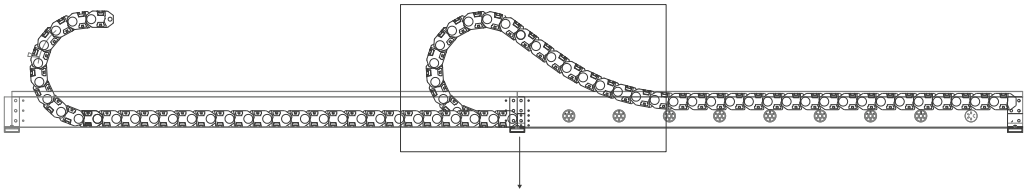
How to use Supporting Roller

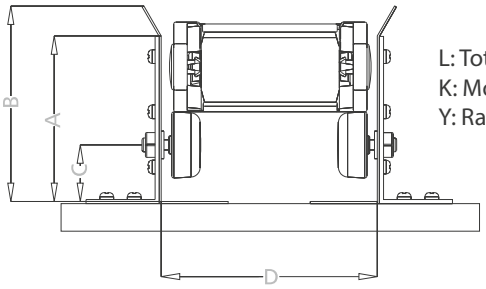
As it is shown on below diagram, supporting rollers should be assembled in each 20 cm after the fixed end of the cable carrier.





Supporting Roller | Product Code ST01





L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

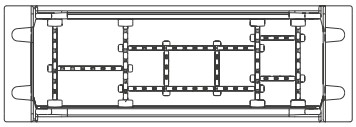
Product Code	A mm	B mm	C mm	D mm
SD2S 080 R 01	120	142	41	137
SD2S 100 R 01	120	142	41	157
SD2S 120 R 01	120	142	41	177
SD2S 140 R 01	120	142	41	197
SD2S 175 R 01	120	142	41	232
SD2S 200 R 01	120	142	41	257

Product Code	A mm	B mm	C mm	D mm
SE1S 080 R 01	140	162	61	137
SE1S 100 R 01	140	162	61	157
SE1S 120 R 01	140	162	61	177
SE1S 140 R 01	120	162	61	197
SE1S 175 R 01	140	162	61	232
SE1S 200 R 01	140	162	61	257

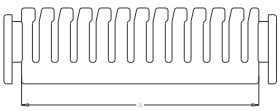
Ürün Kod	A mm	B mm	C mm	D mm
SF1S 080 R 01	160	182	81	137
SF1S 100 R 01	160	182	81	157
SF1S 120 R 01	160	182	81	177
SF1S 140 R 01	160	182	81	197
SF1S 175 R 01	160	182	81	232
SF1S 200 R 01	160	182	81	257

SEPARATOR

Separators are used to divide the inner part of cable carries as desired.



Horizantal Separators

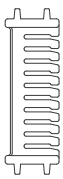


To be used for horizontal divisions

Cable Carrier code	Product Code		
	A	A	A
SD0	SDEF SP 25	SDEF SP 25	SDEF SP 90
SD2S	SDEF SP 25	SDEF SP 25	SDEF SP 90
SD9	SDEF SP 25	SDEF SP 25	SDEF SP 90
SE1S	SDEF SP 25	SDEF SP 25	SDEF SP 90

Vertical Separators

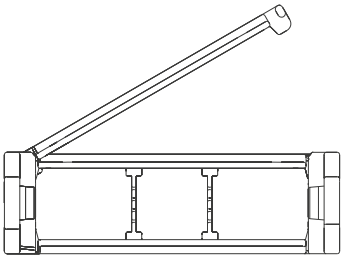
To be used for vertical divisions



Cable Carrier code	Product Code
SD0	**SD0** SP02
SD2S	**SD2S** SP02
SD9	**SD9** SP02
SE1S	**SE1S** SP02
SF1S	**SF1S** SP02

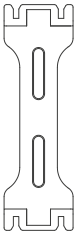
SEPARATOR

Separators are used to divide the inner part of cable carries as desired.



Horizantal Separators

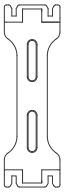
To be used for horizontal divisions



Cable Carrier code	Product Code
SD0	**SD0** SP01
SD9	**SD9** SP01

Vertical Separators

To be used for vertical divisions



Cable Carrier code	Product Code
SD2S	**SD2S** SP01
SE1S	**SD2S** SP01

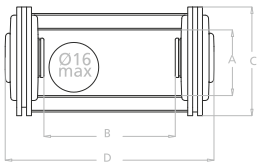
CS020

CABLE CARRIERS STEEL SERIES

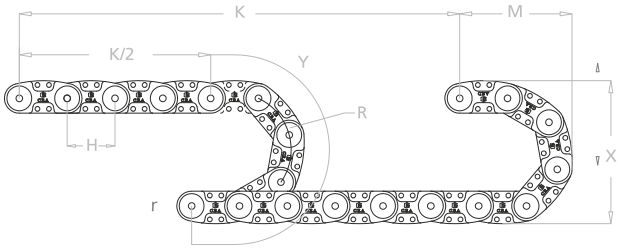
Inner Height (A) 20mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 020 040 R	50-250	20	40	34	64
	CS 020 050 R	50-250	20	50	34	74
	CS 020 060 R	50-250	20	60	34	84
	CS 020 070 R	50-250	20	70	34	94
	CS 020 080 R	50-250	20	80	34	104
	CS 020 100 R	50-250	20	100	34	124

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example:	**CS 020 040 R50**



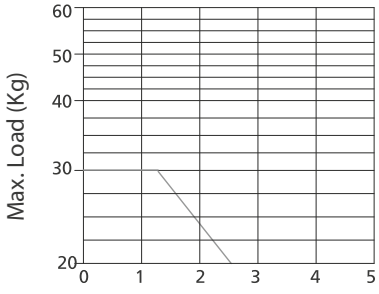
R mm	H mm	X mm	M mm	Y mm
50	50	134	67	257
250	50	534	267	885



L: Total length to be used
K: Movement distance
Y: Radius

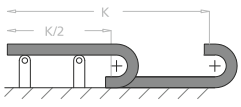
$$L: \frac{K}{2} + Y$$

IMPORTANT POINTS

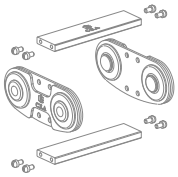


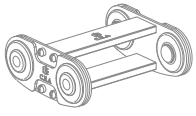
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 16 mm.

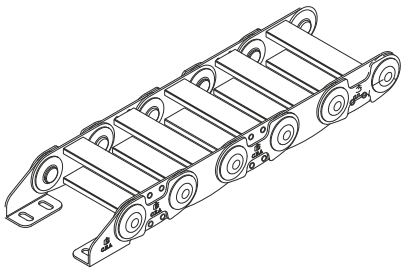




How to choose end bracket

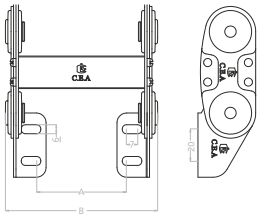
End bracket

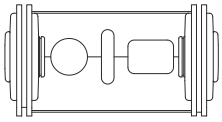
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 020 040 **R**	**CS 020** 040 **B01**	**25**	**64**
CS 020 050 **R**	**CS 020** 050 **B01**	**35**	**74**
CS 020 060 **R**	**CS 020** 060 **B01**	**45**	**84**
CS 020 070 **R**	**CS 020** 070 **B01**	**55**	**94**
CS 020 080 **R**	**CS 020** 080 **B01**	**65**	**104**
CS 020 100 **R**	**CS 020** 100 **B01**	**85**	**124**





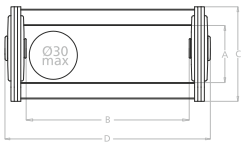
CS035

CABLE CARRIERS STEEL SERIES

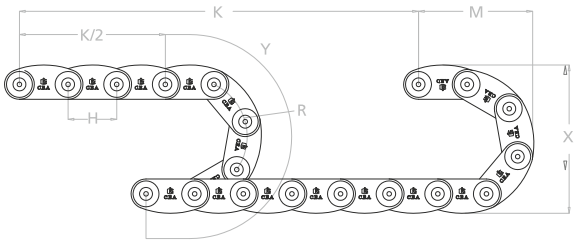
Inner Height (A) 35mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 035 040 R	75-300	35	40	58	66
	CS 035 060 R	75-300	35	60	58	86
	CS 035 080 R	75-300	35	80	58	106
	CS 035 100 R	75-300	35	100	58	126
	CS 035 125 R	75-300	35	125	58	151
	CS 035 150 R	75-300	35	150	58	176

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example: **CS 035 040 R75**



R mm	H mm	X mm	M mm	Y mm
50	50	134	67	257
250	50	534	267	885

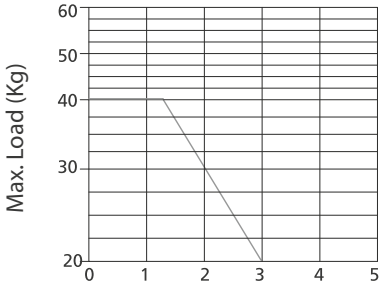


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

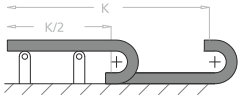
CEA

IMPORTANT POINTS

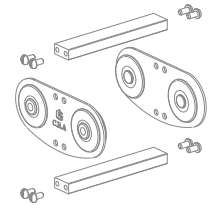


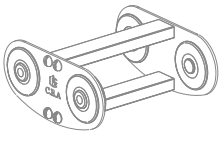
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 30 mm.

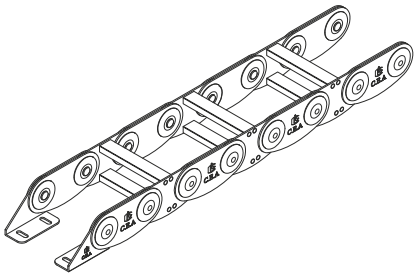




How to choose end bracket

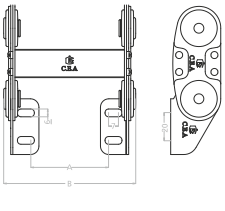
End bracket

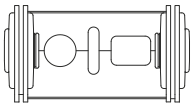
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 035 040 **R**	**CS 035** 040 **B01**	**25**	**64**
CS 035 050 **R**	**CS 035** 050 **B01**	**35**	**74**
CS 035 060 **R**	**CS 035** 060 **B01**	**45**	**84**
CS 035 070 **R**	**CS 035** 070 **B01**	**55**	**94**
CS 035 080 **R**	**CS 035** 080 **B01**	**65**	**104**
CS 035 100 **R**	**CS 035** 100 **B01**	**85**	**124**





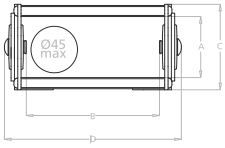
CS050

CABLE CARRIERS STEEL SERIES

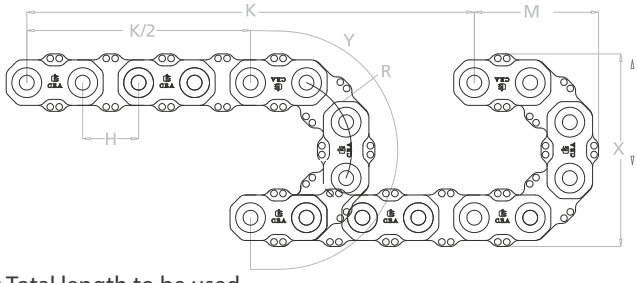
Inner Height (A) 50mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 050 040 R	75-300	50	40	70	80
	CS 050 060 R	75-300	50	60	70	100
	CS 050 080 R	75-300	50	80	70	120
	CS 050 100 R	75-300	50	100	70	140
	CS 050 125 R	75-300	50	125	70	165
	CS 050 150 R	75-300	50	150	70	190

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example: **CS 050 040 R75**



R mm	H mm	X mm	M mm	Y mm
75	75	220	110	385
300	75	670	335	1092

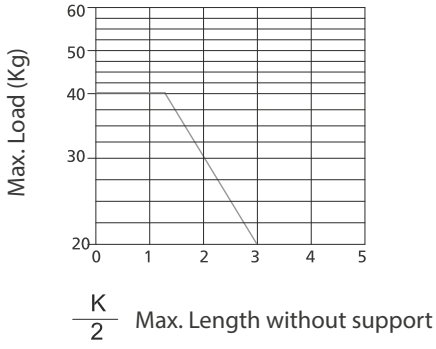


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

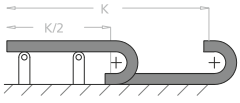
CEA

IMPORTANT POINTS

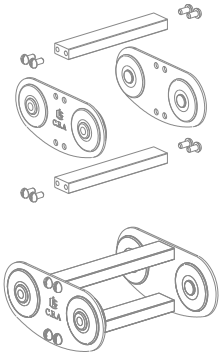


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



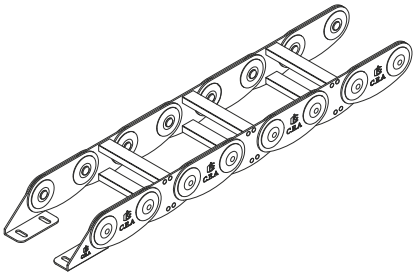
How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 45 mm.



How to choose end bracket

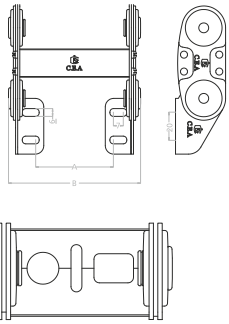
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 050 040 **R**	**CS 050** 040 **B01**	**10**	**80**
CS 050 060 **R**	**CS 050** 050 **B01**	**30**	**100**
CS 050 060 **R**	**CS 050** 060 **B01**	**50**	**120**
CS 050 100 **R**	**CS 050** 070 **B01**	**70**	**140**
CS 050 125 **R**	**CS 050** 080 **B01**	**95**	**165**
CS 050 150 **R**	**CS 050** 100 **B01**	**120**	**190**



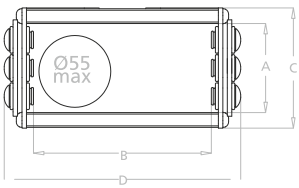
CS060

CABLE CARRIERS STEEL SERIES

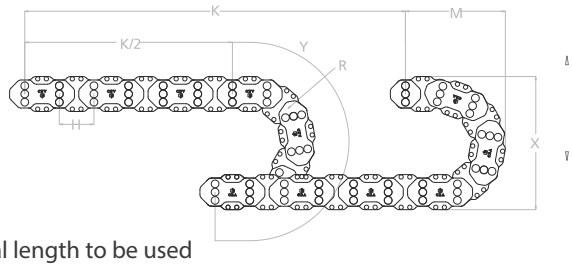
Inner Height (A) 60mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 060 080 R	80-400	60	80	80	100
	CS 060 100 R	80-400	60	100	80	140
	CS 060 125 R	80-400	60	125	80	165
	CS 060 150 R	80-400	60	150	80	190
	CS 060 200 R	80-400	60	200	80	240
	CS 060 250 R	80-400	60	250	80	290

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example: **CS 060 100 R100**



R mm	H mm	X mm	M mm	Y mm
80	80	240	120	411
400	80	880	440	1416

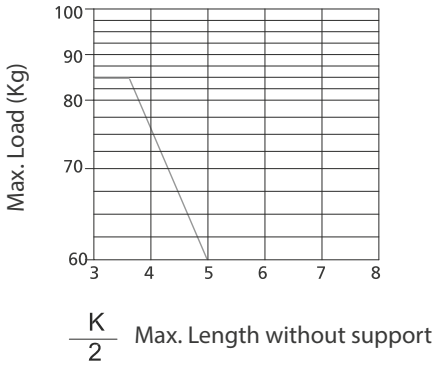


L: Total length to be used
K: Movement distance
Y: Radius

$$L:\frac{K}{2}+Y$$

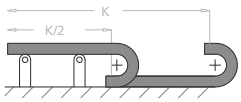
CEA

IMPORTANT POINTS

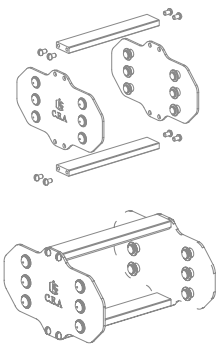


Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



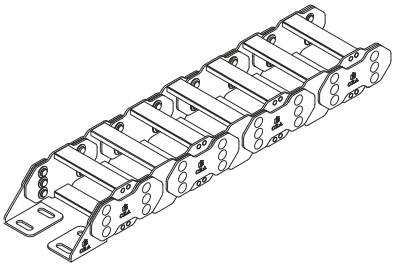
How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 55 mm..



How to choose end bracket

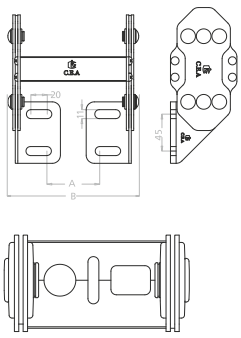
End bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 060 080 **R**	**CS 060** 080 **B01**	**10**	**80**
CS 060 100 **R**	**CS 060** 100 **B01**	**30**	**100**
CS 060 125 **R**	**CS 060** 125 **B01**	**50**	**120**
CS 060 150 **R**	**CS 060** 150 **B01**	**70**	**140**
CS 060 200 **R**	**CS 060** 200 **B01**	**95**	**165**
CS 060 250 **R**	**CS 060** 250 **B01**	**120**	**190**



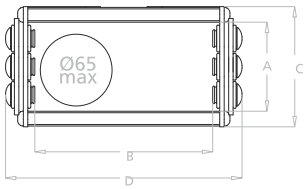
CS075

CABLE CARRIERS STEEL SERIES

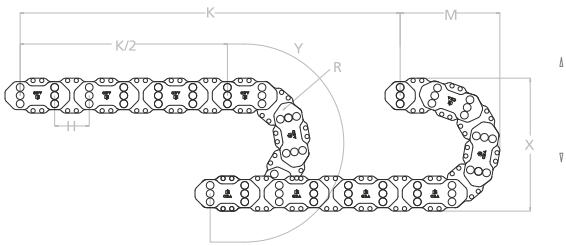
Inner Height(A) 75mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 075 100 R	100-500	75	100	98	140
	CS 075 125 R	100-500	75	125	98	165
	CS 075 150 R	100-500	75	150	98	190
	CS 075 200 R	100-500	75	200	98	240
	CS 075 250 R	100-500	75	250	98	290
	CS 075 300 R	100-500	75	300	98	340

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example: **CS 075 100 R100**



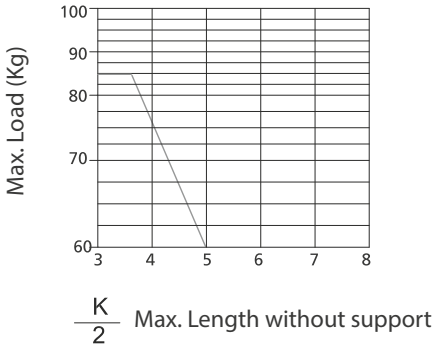
R mm	H mm	X mm	M mm	Y mm
100	90	298	149	494
500	90	1098	549	1750



L: Total length to be used
K: Movement distance
Y: Radius

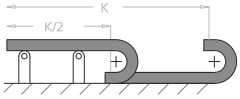
$$L: \frac{K}{2} + Y$$

IMPORTANT POINTS

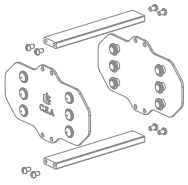


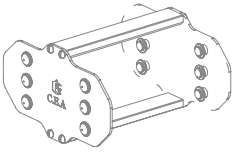
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 65 mm.

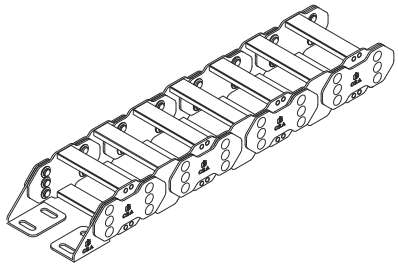




How to choose end bracket

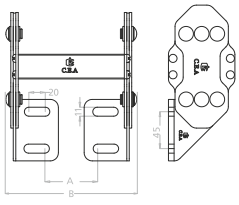
End bracket

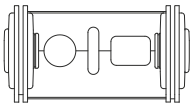
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 075 100 **R**	**CS 075** 100 **B01**	**48**	**140**
CS 075 125 **R**	**CS 075** 125 **B01**	**73**	**165**
CS 075 150 **R**	**CS 075** 150 **B01**	**98**	**190**
CS 075 200 **R**	**CS 075** 200 **B01**	**148**	**240**
CS 075 250 **R**	**CS 075** 250 **B01**	**198**	**290**
CS 075 300 **R**	**CS 075** 300 **B01**	**248**	**340**





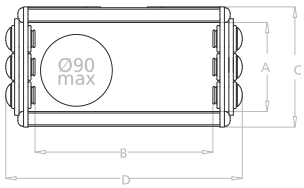
CS100

CABLE CARRIERS STEEL SERIES

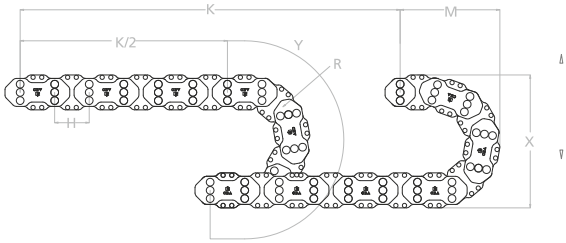
Inner Height (A) 100mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 100 125 R	125-500	100	125	120	175
	CS 100 150 R	125-500	100	150	120	200
	CS 100 200 R	125-500	100	200	120	250
	CS 100 250 R	125-500	100	250	120	300
	CS 100 300 R	125-500	100	300	120	350
	CS 100 350 R	125-500	100	350	120	400

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example:	**CS 100 150 R 125**



R mm	H mm	X mm	M mm	Y mm
100	90	298	149	494
500	90	1098	549	1750

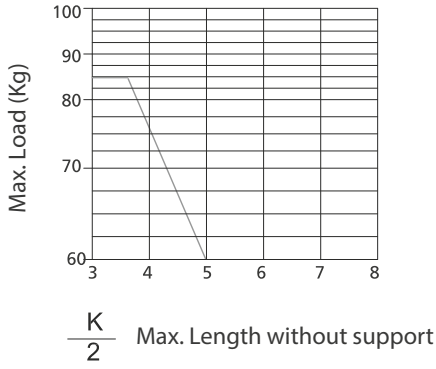


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

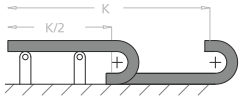
CEA

MPORTANT POINTS

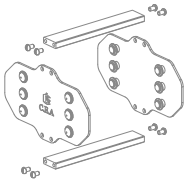


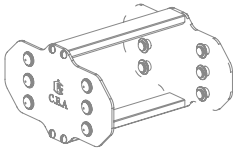
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 90 mm.

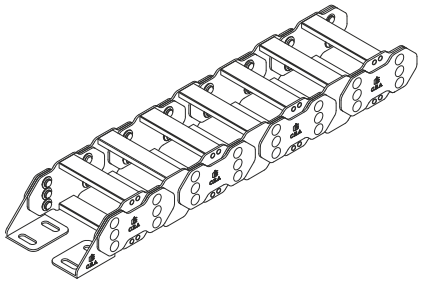




How to choose end bracket

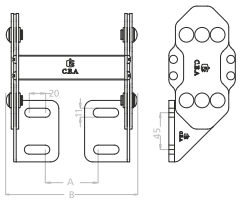
End bracket

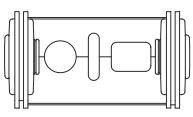
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS100 125 **R**	**CS 100** 125 **B01**	**60**	**175**
CS 100 150 **R**	**CS 100** 150 **B01**	**85**	**200**
CS 100 200 **R**	**CS 100** 200 **B01**	**135**	**250**
CS 100 250 **R**	**CS 100** 250 **B01**	**185**	**300**
CS 100 300 **R**	**CS 100** 300 **B01**	**235**	**350**
CS 100 350 **R**	**CS 100** 350 **B01**	**285**	**400**





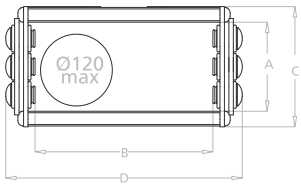
ÇS150

CABLE CARRIERS STEEL SERIES

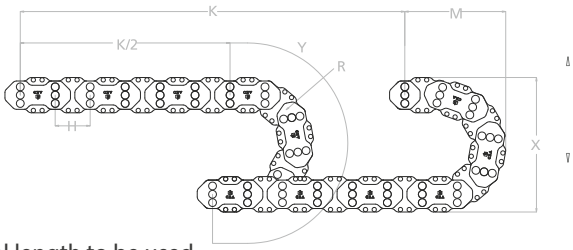
Inner Height (A) 150mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 150 200 R	250-1000	150	200	187	260
	CS 150 250 R	250-1000	150	250	187	310
	CS 150 300 R	250-1000	150	300	187	360
	CS 150 350 R	250-1000	150	350	187	410
	CS 150 400 R	250-1000	150	400	187	460
	CS 150 500 R	250-1000	150	500	187	500

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example:	**CS 150 200 R250**

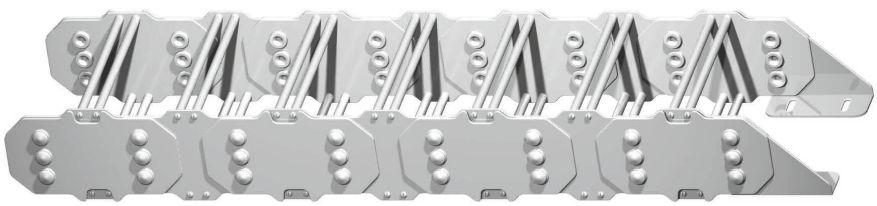


R mm	H mm	X mm	M mm	Y mm
250	180	688	344	1145
1000	180	2188	1094	3500



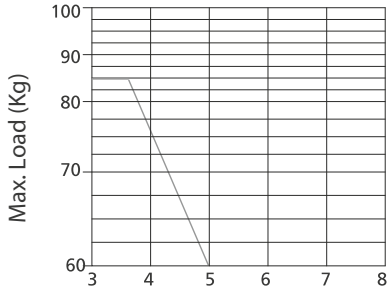
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



CEA

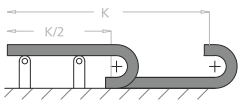
IMPORTANT POINTS



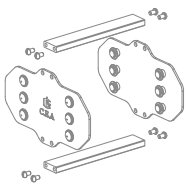
$\frac{K}{2}$ Max. Length without support

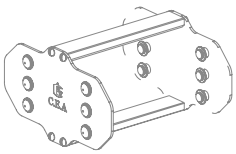
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 120 mm.

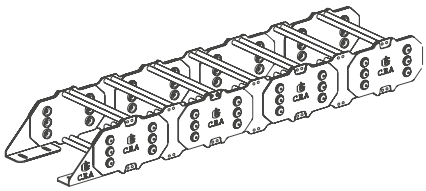




How to choose end bracket

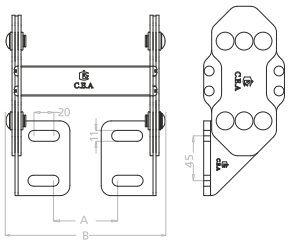
End bracket

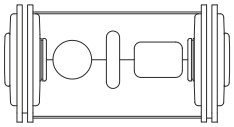
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 150 200 **R**	**CS 150** 200 **B01**	**126**	**260**
CS 150 250 **R**	**CS 150** 250 **B01**	**176**	**310**
CS 150 300 **R**	**CS 150** 300 **B01**	**226**	**360**
CS 150 350 **R**	**CS 150** 350 **B01**	**276**	**410**
CS 150 400 **R**	**CS 150** 400 **B01**	**326**	**460**
CS 150 500 **R**	**CS 150** 500 **B01**	**426**	**560**





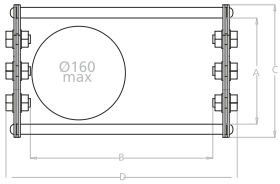
ÇS200

CABLE CARRIERS STEEL SERIES

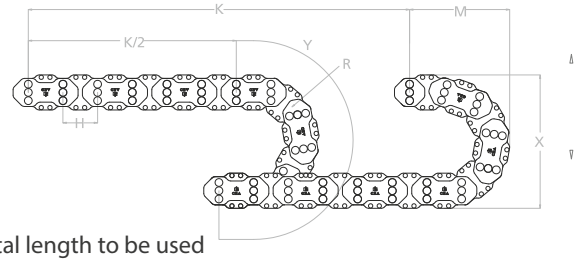
Inner Height (A) 200mm	Code	Radius	(A)mm	(B)mm	(C)mm	(D)mm
• Both up and bottom parts (bars) are openable • Should be used in supporting tray • Suitable for low speeds	CS 200 200 R	300-1000	200	200	250	280
	CS 200 250 R	300-1000	200	250	250	330
	CS 200 300 R	300-1000	200	300	250	380
	CS 200 350 R	300-1000	200	350	250	430
	CS 200 400 R	300-1000	200	400	250	480
	CS 200 500 R	300-1000	200	500	250	500

Maximum working speed :0.5M/S

Radius MUST be given in your orders. Example: **CS 200 200 R300**

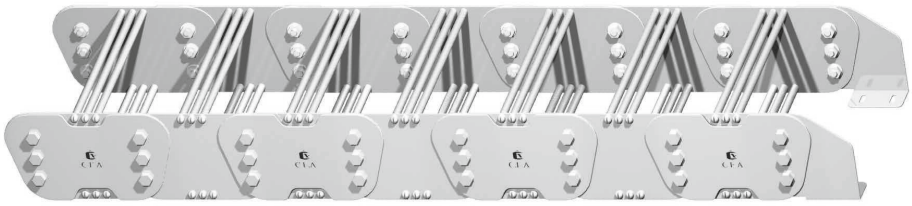


R mm	H mm	X mm	M mm	Y mm
300	280	850	425	1502
1000	280	2250	1125	3700



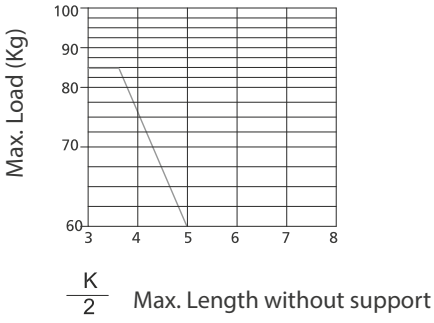
L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$



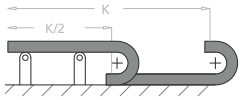
CEA

IMPORTANT POINTS

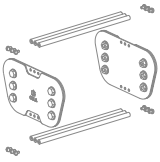


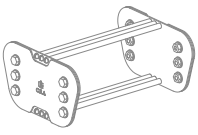
Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses $\frac{K}{2}$



How to use support rollers:
- Special separators can be made upon request
- Can be made by stainless steel material upon request
- Should be used in supporting tray
- Be careful against strong knocks
- Be sure that diameter of hydraulic pipe is max 160 mm.

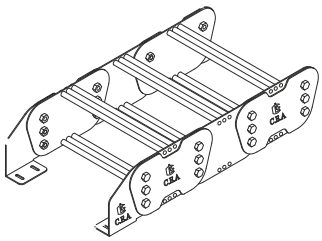




How to choose end bracket

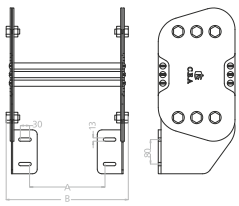
End bracket

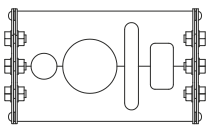
End brackets are the parts to be used to fix the cable carrier to the machine or equipment



Should be attached to the both ends of the cable carrier

CABLE CARRIER CODE	END BRACKET CODE	A	B
CS 200 200 **R**	**CS 200** 200 **B01**	**126**	**260**
CS 200 250 **R**	**CS 200** 250 **B01**	**176**	**310**
CS 200 300 **R**	**CS 200** 300 **B01**	**226**	**360**
CS 200 350 **R**	**CS 200** 350 **B01**	**276**	**410**
CS 200 400 **R**	**CS 200** 400 **B01**	**326**	**460**
CS 200 500 **R**	**CS 200** 500 **B01**	**426**	**560**





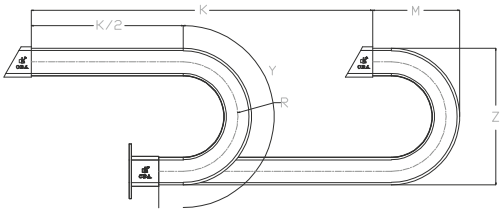
CST

CABLE CARRIERS TUBUFLEX

Inner Height (A) 22 – 25 – 35 – 38 – 40 – 52 – 60 – 72 mm
Fully enclosed steel series. Should be used with supporting tray.

AXB	(CXD)	E	F	G	H	I	L	J	K	N	P	S	X	T	Q	R	(KG/M)
CSK 22 X 32	27.5 X 36.7	38	18	25	22	10	23	60	20	40	78	60	55	38	5.5	70	1.3
CSK 25 X 50	31.5 X 54.5	58	30	35	25	10	33	70	25	50	90	75	60	45	5.5	90	1.75
CSK 35 X 60	40.1 X 64.4	69	40	45	25	10	44	70	30	50	100	80	70	52	5.5	100	2.1
CSK 38 X 73	43.7 X 77.8	82	50	55	35	10	47	90	35	55	110	85	82	62	6.5	110	2.36
CSK 40 X 80	45.4 X 84.7	89	50	65	50	15	49	120	40	60	120	100	90	68	9	120	2.5
CSK 52 X 102	57.5 X 107.8	113	65	80	50	15	63	130	45	60	140	120	100	80	9	140	2.85
CSK 60 X 120	67.5 X 127.7	132	90	90	80	20	71	150	45	70	170	146	110	84	9	180	3.15
CSK 60 X 130	65.1 X 134.4	141	95	100	90	20	71	160	50	75	180	150	120	90	9	180	3.25
CSK 72 X 162	78.4 X 168.2	184	120	120	100	20	82	180	60	80	180	180	130	100	9	210	4.5

AXB mm	R mm	Z mm	M mm	Y mm
CSK 22X32	70	167.5	84	220
CSK 25X50	90	211.5	106	283
CSK 35X60	100	240	120	314
CSK 38X73	110	264	132	345
CSK 40X80	120	285.5	143	377
CSK 52X102	140	337.5	169	440
CSK 60X120	180	427.5	214	565
CSK 60X130	180	425	212.5	565
CSK 60X162	210	498.5	249	660

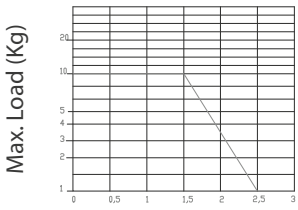


L: Total length to be used
K: Movement distance
Y: Radius

$$L: \frac{K}{2} + Y$$

CEA

IMPORTANT POINTS

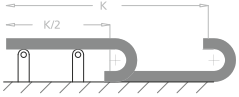


SÇK040

Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses

$$\frac{K}{2}$$



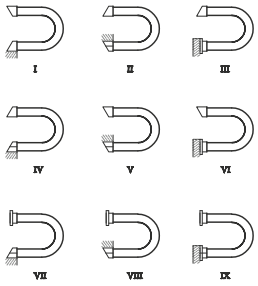
How to use the supporting rollers

$$\frac{K}{2}$$

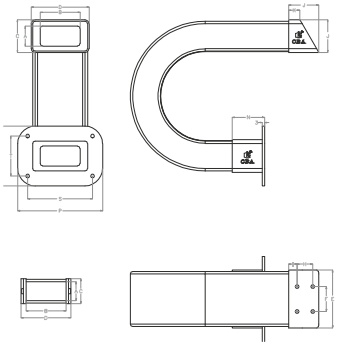
Should be used when the conditions of K/2 self supporting conditions are exceeded.

How to choose end bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipmen



Should be attached to the both ends of the cable carrier



Please refer to the next page for the dimensions

CEA

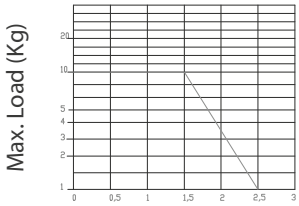
CSC

CABLE CARRIERS CONDUFLEX

Inner Height (A) 22 – 25 – 35 – 38 – 40 – 52 – 60 – 72 mm
Fully enclosed steel series. Should be used with supporting tray.

PRODUCT COD	AXB	CXD	R (RADIUS)	SELF-SUPPOING DISTANCE (MT)	TOTEL WEIGHT
CSC 25	25X45	39X62	60	1,5	3
CSC 38	38X73	53X91	100	2,0	4
CSC 45	45X90	61X108	120	2,3	5
CSC 52	52X102	70X122	140	2,5	8
CSC 60	60X120	81X144	160	2,7	10
CSC 62	60X150	81X184	165	2,9	14
CSC 72	72X162	93X186	185	3,0	20

IMPORTANT POINTS

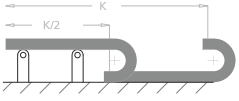


CSC 040

Self-supporting Capacity Diagram

Self-supporting capacity of the cable carrier according to weight of the cables and hoses

$$\frac{K}{2}$$



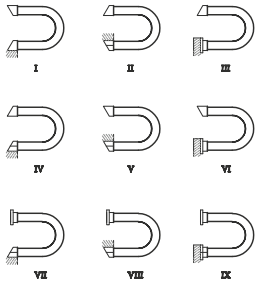
How to use the supporting rollers

$$\frac{K}{2}$$

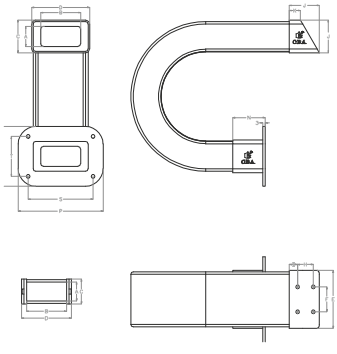
Should be used when the conditions of K/2 self supporting conditions are exceeded.

How to choose end bracket

End brackets are the parts to be used to fix the cable carrier to the machine or equipmen



Should be attached to the both ends of the cable carrier



Please refer to the next page for the dimensions

CEA

NOTES:

Rotary Unions & Rotary Joints

DEUBLIN®

Plane & Self-Aligning Swivels

SpindleShield Unions

Rotary Unions and Rotary Joints

DEUBLIN

Rotating Unions 57 Series with Silicon Carbide Seals for Water Service, DN 10 - 50

- monoflow and duoflow design
- self-supported rotating union
- radial housing connection
- balanced mechanical seal
- pinned rotor seal
- easy and quick replacement of sealing components (rotor seal, floating seal)
- ball bearings lubricated for life
- for poor water quality
- 3 vent holes
- forged brass housing
- stainless steel rotor
- special options: threaded vent holes, bearings splash proof, nickel-plated versions

For further information please contact ***DEUBLIN*** or your local representative.

Operating Data

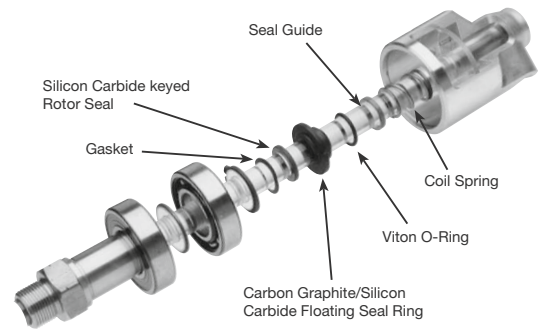
Max. Water Pressure			150 PSI	10 bar
Max. Speed, Rotor with Straight Threads:	Model	57-257	3,500 RPM	3.500 min^{-1}
		357	3,000 RPM	3.000 min^{-1}
		527-557	2,500 RPM	2.500 min^{-1}
		657	750 RPM	750 min^{-1}
Max. Temperature		90 °C	> 90 °C consult *DEUBLIN*	

Torque Ratings 57 Series		
DN	**ft.lbs**	**Nm**
10	0.18	0.25
15	0.37	0.50
20	0.74	1.00
25	1.48	2.00
32	1.62	2.20
40	2.14	2.90
50	3.32	4.50

Seal Combination - Standard
- Carbon Graphite/Silicon Carbide
- long service life

Seal Combination - E.L.S. (Extended Life Sealing)
- Silicon Carbide/Silicon Carbide for severe conditions (poor water quality)

All 54, 55 and 57 Series Rotating Unions are available for use in a potentially explosive atmospheres defined by "ATEX".



Union Repair

The 57 Series is designed for quick, easy replacement of both Floating Seal and the Rotor Seal.

The "57's" seal is seated in a keyed counter bore at the rotor's end. The worn seal simply lifts out and the new one drops right in. Since the entire rotor does not need to be replaced or relapped, the repair is fast, easy and on the spot. As you only replace the seals, the repair cost is very economical.

For Ordering Number of Repair Kit see page 5.

DEUBLIN

Rotating Unions 55 Series for General Purposes, DN 10 - 50

- monoflow and duoflow design
- self-supported rotating union
- radial housing connection
- balanced mechanical seal
- 3 vent holes
- forged brass housing
- stainless steel rotor
- special options:
  threaded vent holes,
  splash-proof bearings,
  nickel-plated
  and/or low torque design
- Lubrication Guide page 52

For further information please contact ***DEUBLIN*** or your local representative.

Operating Data

Max. Water Pressure	Model 55 -555	750 PSI	50 bar	
Max. Water Pressure	Model 655	200 PSI	14 bar	
Max. Saturated Steam Pressure (Intermittent)		14 PSI	1 bar	
Max. Hot Oil Pressure		100 PSI	6,6 bar	
Max. Speed, Rotors with Straight Threads:	Model 55 -255	3,500 RPM	3.500 min^{-1}	
	355	3,000 RPM	3.000 min^{-1}	
	525 -555	2,500 RPM	2.500 min^{-1}	
	655	750 RPM	750 min^{-1}	
Max. Temperature	120 °C	> 120 °C consult *DEUBLIN*		

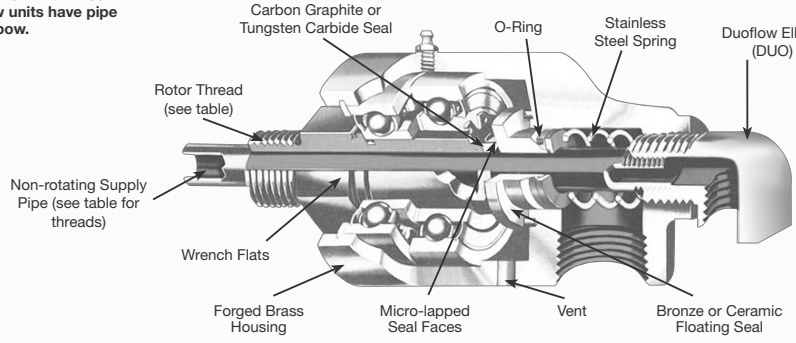
Torque Ratings 55 Series		
DN	**ft.lbs**	**Nm**
10	0.25	0.34
15	0.35	0.50
20	0.50	0.68
25	1.25	1.80
32	1.25	1.80
40	2.50	3.40
50	3.00	4.07

Seal Combinations - Standard
- Carbon Graphite/Bronze for water
- multi-purpose applications
  optional:
- Carbon Graphite/Ceramic for hot oil, hot water and saturated steam

Seal Combination - E.L.S. (Extended Life Sealing)
- Tungsten Carbide/Ceramic for severe conditions (poor water quality), max. temperature 90°C

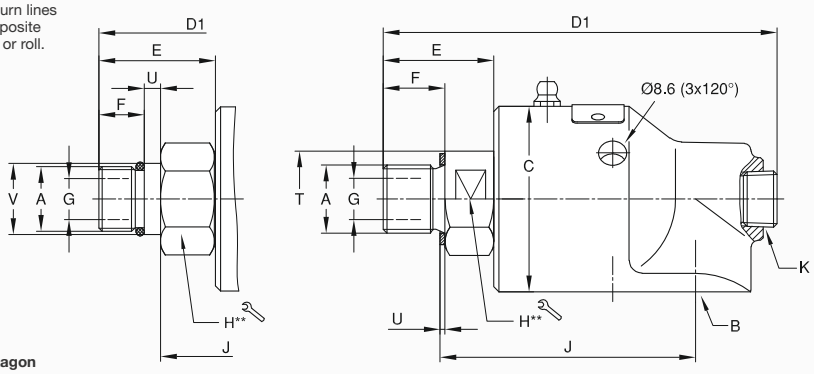
All 54, 55 and 57 Series Rotating Unions are available for use in a potentially explosive atmospheres defined by "ATEX".

Illustration shows duoflow with fixed supply pipe. Monoflow units have pipe plugs instead of an elbow.



57 and 55 Series - Monoflow Rotating Unions DN 10 - 50

Monoflow unions are used when supply and return lines are connected to opposite sides of the cylinder or roll.



Pilot Type Rotor

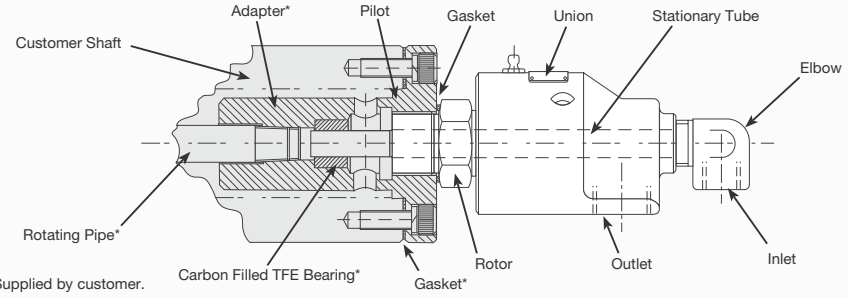
** DN 10 - 20 = hexagon
DN 25 - 50 = two wrench flats

DN	B	Ordering No. (Basic Models)				A		C	D1	E	F	G	H	J	K	T	U	V	
		Model 57 STD	Model 57 E.L.S.	Model 55 STD	Model 55 E.L.S.	Rotor Connections		ø				ø	⌓		NPT			ø	kg
10	G 3/8	57-130-094	57-145-094	55-655-094	55-842-192	G 3/8	RH	45	100	26	16	9,5	22	64	1/4	-	1,5	-	0,6
	G 3/8	57-130-095	57-145-095	55-655-095	55-842-193	G 3/8	LH	45	100	26	16	9,5	22	64	1/4	-	1,5	-	0,6
	3/8 NPT	57-000-094	57-050-094	55-000-094	55-147-192	G 3/8	RH	45	100	26	16	9,5	22	64	1/4	-	1,5	-	0,6
	3/8 NPT	57-000-095	57-050-095	55-000-095	55-147-193	G 3/8	LH	45	100	26	16	9,5	22	64	1/4	-	1,5	-	0,6
15	G 1/2	157-130-151	157-145-151	155-122-151	155-754-252	G 1/2	RH	57	119	35	19	12,7	30	79	3/8	-	1,5	-	1,2
	G 1/2	157-130-152	157-145-152	155-122-152	155-754-253	G 1/2	LH	57	119	35	19	12,7	30	79	3/8	-	1,5	-	1,2
	G 1/2	157-130-738	157-145-738	155-122-738	155-754-739	M 20 x 1,5	RH	57	121	37	14	12,7	30	79	3/8	-	5	22g6	1,2
	G 1/2	157-130-835	157-145-835	155-122-835	155-754-833	M 20 x 1,5	LH	57	121	37	14	12,7	30	79	3/8	-	5	22g6	1,2
	1/2 NPT	157-000-151	157-050-151	155-000-151	155-208-252	G 1/2	RH	57	119	35	19	12,7	30	79	3/8	-	1,5	-	1,2
	1/2 NPT	157-000-152	157-050-152	155-000-152	155-208-253	G 1/2	LH	57	119	35	19	12,7	30	79	3/8	-	1,5	-	1,2
20	G 3/4	257-130-284	257-145-284	255-269-284	255-421-445	G 3/4	RH	73	136	34	19	17,5	36	95	1/2	-	2	-	2,1
	G 3/4	257-130-285	257-145-285	255-269-285	255-421-446	G 3/4	LH	73	136	34	19	17,5	36	95	1/2	-	2	-	2,1
	G 3/4	257-130-014	257-145-014	255-269-014	255-421-469	M 35 x 1,5	RH	73	140	38	15	17,5	41	102	1/2	-	2	-	2,2
	G 3/4	257-130-015	257-145-015	255-269-015	255-421-470	M 35 x 1,5	LH	73	140	38	15	17,5	41	102	1/2	-	2	-	2,2
	G 3/4	257-130-048	257-145-048	255-269-458	255-421-936	M 27 x 1,5	RH	73	137	35	15	17,5	36	92	1/2	-	6	28g6	2,1
	G 3/4	257-130-104	257-145-104	255-269-459	255-421-937	M 27 x 1,5	LH	73	137	35	15	17,5	36	92	1/2	-	6	28g6	2,1
	3/4 NPT	257-000-284	257-050-284	255-000-284	255-052-445	G 3/4	RH	73	136	34	19	17,5	36	95	1/2	-	2	-	2,1
	3/4 NPT	257-000-285	257-050-285	255-000-285	255-052-446	G 3/4	LH	73	136	34	19	17,5	36	95	1/2	-	2	-	2,1
25	G 1	357-130-222	357-145-222	355-204-222	355-215-378	G 1	RH	83	163	42	22	25	36	108	3/4	45	2	-	3,1
	G 1	357-130-223	357-145-223	355-204-223	355-215-379	G 1	LH	83	163	42	22	25	36	108	3/4	45	2	-	3,1
	G 1	357-130-235	357-145-235	355-204-235	355-215-381	M 35 x 1,5	RH	83	157	36	15	25	36	108	3/4	45	2	-	3,1
	G 1	357-130-236	357-145-236	355-204-236	355-215-382	M 35 x 1,5	LH	83	157	36	15	25	36	108	3/4	45	2	-	3,1
	1 NPT	357-000-222	357-050-222	355-000-222	355-064-378	G 1	RH	83	163	42	22	25	36	108	3/4	45	2	-	3,1
	1 NPT	357-000-223	357-050-223	355-000-223	355-064-379	G 1	LH	83	163	42	22	25	36	108	3/4	45	2	-	3,1
32	G 1 1/4	527-130-054	527-145-054	525-301-054	525-398-122	G 1 1/4	RH	91	189	54	28	31,8	46	119	1	58	2	-	4,1
	G 1 1/4	527-130-055	527-145-055	525-301-055	525-398-123	G 1 1/4	LH	91	189	54	28	31,8	46	119	1	58	2	-	4,1
	1 1/4 NPT	527-000-054	527-050-054	525-000-054	525-097-122	G 1 1/4	RH	91	189	54	28	31,8	46	119	1	58	2	-	4,1
	1 1/4 NPT	527-000-055	527-050-055	525-000-055	525-097-123	G 1 1/4	LH	91	189	54	28	31,8	46	119	1	58	2	-	4,1
40	G 1 1/2	557-130-198	557-145-198	555-385-198	555-378-288	G 1 1/2	RH	108	228	72	29	38	55	149	1 1/4	65	2	-	6,7
	G 1 1/2	557-130-199	557-145-199	555-385-199	555-378-289	G 1 1/2	LH	108	228	72	29	38	55	149	1 1/4	65	2	-	6,7
	G 1 1/2	557-130-200	557-145-200	555-385-200	555-378-418	M 50 x 1,5	RH	108	222	66	23	38	55	149	1 1/4	65	2	-	6,5
	G 1 1/2	557-130-201	557-145-201	555-385-201	555-378-419	M 50 x 1,5	LH	108	222	66	23	38	55	149	1 1/4	65	2	-	6,5
	1 1/2 NPT	557-000-198	557-050-198	555-000-198	555-033-288	G 1 1/2	RH	108	228	72	29	38	55	149	1 1/4	65	2	-	6,7
	1 1/2 NPT	557-000-199	557-050-199	555-000-199	555-033-289	G 1 1/2	LH	108	228	72	29	38	55	149	1 1/4	65	2	-	6,7
50	G 2	657-130-124	657-145-124	655-527-124	655-930-124	G 2	RH	118	248	65	29	47,6	60	165	1 1/4	70	2,5	-	7,6
	G 2	657-130-125	657-145-125	655-527-125	655-930-125	G 2	LH	118	248	65	29	47,6	60	165	1 1/4	70	2,5	-	7,6
	2 NPT	657-000-124	657-050-124	655-500-124	655-502-124	G 2	RH	118	248	65	29	47,6	60	165	1 1/4	70	2,5	-	7,6
	2 NPT	657-000-125	657-050-125	655-500-125	655-502-125	G 2	LH	118	248	65	29	47,6	60	165	1 1/4	70	2,5	-	7,6

Duoflow Supply Pipe Installations

DEUBLIN water service unions can be adapted for Duoflow applications where a single media is circulated through and around the supply pipe. Duoflow elbows are available in 3 styles to accept a variety of different supply systems. The guidelines shown below should be carefully considered. A poorly designed supply system can contribute to premature union failure.

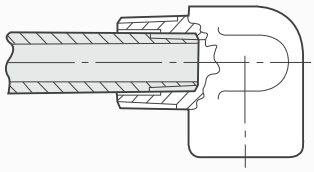
Where long pipes or high speeds are required, an adapter should be used to avoid transmitting stresses from heavy pipes, cascading water or vibrations to the union. A typical adapter is illustrated.



* Supplied by customer.

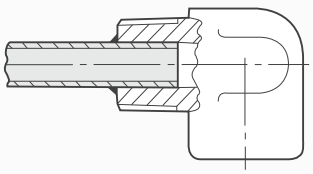
Threaded Pipe

The largest threaded supply pipe achieves the maximum flow rates available for a particular size union. Stresses at the pipe thread can cause breakage allowing the pipe to fall into the roll. For this reason pipe lengths longer than 4 union lengths (4 x D1) and rotational speeds above 1,000 RPM should be avoided.



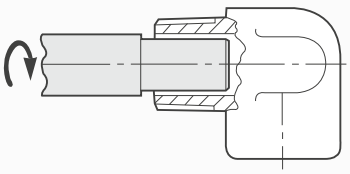
Fixed Tube

Thin wall stainless steel tube silver soldered into the Duoflow elbow produces the strongest, lightest weight assembly. The thinner wall sections allow greater flow rates than the threaded pipe. Maximum flow rates are obtained with the largest tube available for a given size union. Tube lengths is usually limited to 6 union lengths (6 x D1). Speeds to 3,500 RPM are possible.



Rotating Pipe

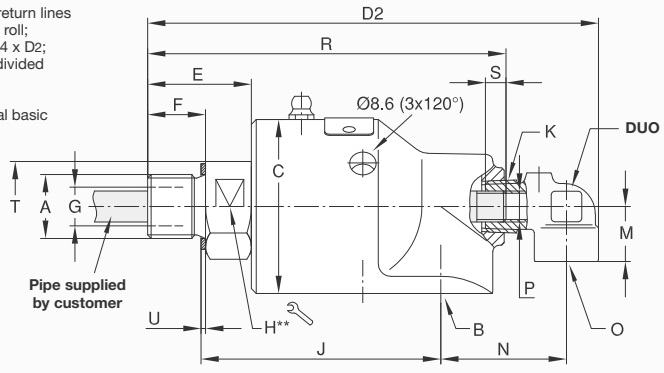
Rotating pipes are fastened internally to rotate with the roll. The Duoflow elbow helps to support the pipe and restrict crosstalk between passages. The pipe must be straight and concentric to the center line to avoid excessive loading of the union. The union must also have a rotor with a straight thread (Example 1" - 14" UNS) rather than a tapered pipe thread to assure concentricity. Rotational speeds above 1,000 RPM should be avoided.



57 and 55 Series – Elbows DN 10 - 50 for Fixed, Threaded Supply Pipe

Duoflow unions are used when supply and return lines are connected to one side of the cylinder or roll; non-supported pipe lengths no longer than 4 x D2; max. speed 1,000 RPM; for higher speeds divided supply pipes must be used.

For rotating unions with pilot rotor, additional basic models and weight refer to page 8.



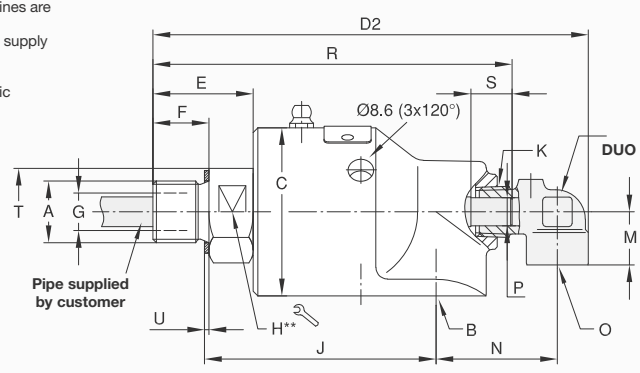
** DN 10 - 20 = hexagon
DN 25 - 50 = two wrench flats

DN	O	fixed, threaded				rotating				divided	+ self-centering	L	P	Q	S	D_2	M	N
		Ordering No. DUO	P Pipe	R	S	Ordering No. DUO	P Pipe Ød11	R	S	Ordering No. DUO	Ordering No. DUO		P Ø H9					
10	G 1/4	55-121	M 6	99	8	55-807	5.8	103	20	55-843	- - -	171	6	5	55	124	18	36
	G 1/4	55-121	M 6	99	8	55-807	5.8	103	20	55-843	- - -	171	6	5	55	124	18	36
	1/4 NPT	55-120	M 6	99	8	55-446	5.8	103	20	55-445	- - -	171	6	5	55	124	18	36
	1/4 NPT	55-120	M 6	99	8	55-446	5.8	103	20	55-445	- - -	171	6	5	55	124	18	36
15	G 3/8	155-581	G 1/8	118	8	155-709	9.8	124	30	150-232	155-981	201	10	8	60	147	18	40
	G 3/8	155-581	G 1/8	118	8	155-709	9.8	124	30	150-232	155-981	201	10	8	60	147	18	40
	G 3/8	155-581	G 1/8	120	8	155-709	9.8	124	30	150-232	155-981	201	10	8	60	149	18	40
	G 3/8	155-581	G 1/8	120	8	155-709	9.8	124	30	150-232	155-981	201	10	8	60	149	18	40
	3/8 NPT	155-199	G 1/8	118	8	155-471	9.8	124	30	155-470	155-797	201	10	8	60	147	18	40
	3/8 NPT	155-199	G 1/8	118	8	155-471	9.8	124	30	155-470	155-797	201	10	8	60	147	18	40
20	G 1/2	251-351	G 1/4	137	12	251-352	12.8	143	32	251-551	251-371	208	13	11	60	171	26	46
	G 1/2	251-351	G 1/4	137	12	251-352	12.8	143	32	251-551	251-371	208	13	11	60	171	26	46
	G 1/2	251-351	G 1/4	141	12	251-352	12.8	146	32	251-551	251-371	208	13	11	60	174	26	46
	G 1/2	251-351	G 1/4	141	12	251-352	12.8	146	32	251-551	251-371	208	13	11	60	174	26	46
	G 1/2	251-351	G 1/4	137	12	251-352	12.8	143	32	251-551	251-371	208	13	11	60	172	26	46
	G 1/2	251-351	G 1/4	137	12	251-352	12.8	143	32	251-551	251-371	208	13	11	60	172	26	46
	1/2 NPT	250-368	G 1/4	137	12	250-681	12.8	143	32	250-680	250-994	208	13	11	60	171	26	46
	1/2 NPT	250-368	G 1/4	137	12	250-681	12.8	143	32	250-680	250-994	208	13	11	60	171	26	46
25	G 1/2	350-912	G 3/8	161	12	350-772	15.8	171	35	350-990	351-173	272	16	14	60	200	28	59
	G 1/2	350-912	G 3/8	161	12	350-772	15.8	171	35	350-990	351-173	272	16	14	60	200	28	59
	G 1/2	350-912	G 3/8	155	12	350-772	15.8	165	35	350-990	351-173	272	16	14	60	194	28	59
	G 1/2	350-912	G 3/8	155	12	350-772	15.8	165	35	350-990	351-173	272	16	14	60	194	28	59
	1/2 NPT	350-255	G 3/8	161	12	350-347	15.8	171	35	350-366	350-974	272	16	14	60	200	28	59
	1/2 NPT	350-255	G 3/8	161	12	350-347	15.8	171	35	350-366	350-974	272	16	14	60	200	28	59
32	G 3/4	525-594	G 1/2	186	14	525-480	21.8	196	40	525-931	525-926	285	22	20	60	234	35	72
	G 3/4	525-594	G 1/2	186	14	525-480	21.8	196	40	525-931	525-926	285	22	20	60	234	35	72
	3/4 NPT	525-079	G 1/2	186	14	525-237	21.8	196	40	525-236	525-592	285	22	20	60	234	35	72
	3/4 NPT	525-079	G 1/2	186	14	525-237	21.8	196	40	525-236	525-592	285	22	20	60	234	35	72
40	G 3/4	451-171	G 3/4	223	16	451-173	25.8	238	44	451-274	451-175	319	26	24	60	270	38	76
	G 3/4	451-171	G 3/4	223	16	451-173	25.8	238	44	451-274	451-175	319	26	24	60	270	38	76
	G 3/4	451-171	G 3/4	216	16	451-173	25.8	232	44	451-274	451-175	319	26	24	60	264	38	76
	G 3/4	451-171	G 3/4	216	16	451-173	25.8	232	44	451-274	451-175	319	26	24	60	264	38	76
	3/4 NPT	450-221	G 3/4	223	16	450-468	25.8	238	44	450-467	451-162	319	26	24	60	270	38	76
	3/4 NPT	450-221	G 3/4	223	16	450-468	25.8	238	44	450-467	451-162	319	26	24	60	270	38	76
50	G 1 1/4	450-534	G 1	252	26	450-612	32.1	253	50	655-174	655-707	382	34	31	60	312	45	96
	G 1 1/4	450-534	G 1	252	26	450-612	32.1	253	50	655-174	655-707	382	34	31	60	312	45	96
	1 1/4 NPT	451-242	G 1	252	26	450-625	31.8	253	50	655-966	655-968	382	34	31	60	312	45	96
	1 1/4 NPT	451-242	G 1	252	26	450-625	31.8	253	50	655-966	655-968	382	34	31	60	312	45	96

57 and 55 Series – Elbows DN 10 - 50 for Rotating Supply Pipe

Duoflow unions are used when supply and return lines are connected to one side of the cylinder or roll; max. speed 1,000 RPM; for higher speeds divided supply pipes must be used.

For rotating unions with pilot rotor, additional basic models and weight refer to page 8.

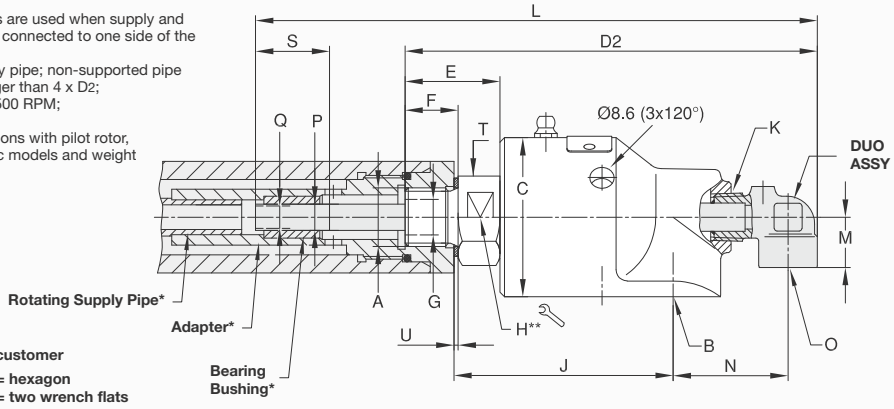


** DN 10 - 20 = hexagon
DN 25 - 50 = two wrench flats

57 and 55 Series – Elbows DN 10 - 50 with Divided Siphon Pipe (soldered)

Duoflow unions are used when supply and return lines are connected to one side of the cylinder or roll; soldered supply pipe; non-supported pipe lengths no longer than 4 x D2; max. speed 3,500 RPM;

For rotating unions with pilot rotor, additional basic models and weight refer to page 8.

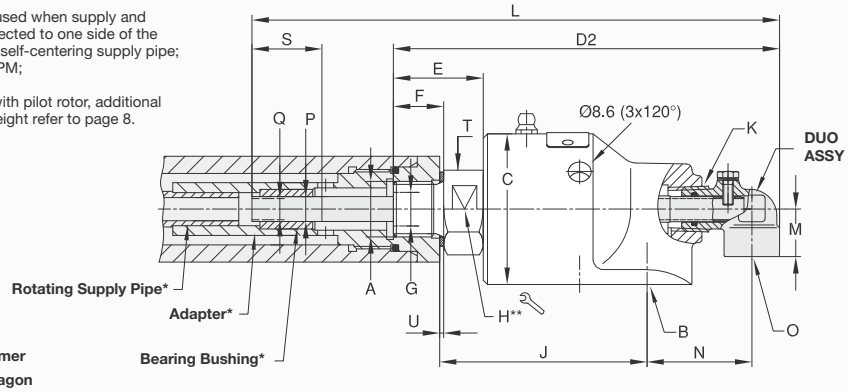


* supplied by customer
** DN 10 - 20 = hexagon
DN 25 - 50 = two wrench flats

57 and 55 Series – Elbows DN 10 - 50 with Flexible, Self-Centering Supply Pipe

Duoflow unions are used when supply and return lines are connected to one side of the cylinder or roll; fixed self-centering supply pipe; max. speed 3,500 RPM;

For rotating unions with pilot rotor, additional basic models and weight refer to page 8.



* supplied by customer
** DN 10 - 20 = hexagon
DN 25 - 50 = two wrench flats

DEUBLIN

DEUBLIN

Rotating Union 54 Series
Stainless Steel, DN 10 - 40

- monoflow and duoflow design
- self-supported rotating union
- radial or axial housing connection
- media contacting parts made of stainless steel (from 1.4571)
- full-media flow
- available for use in potentially explosive atmosphere defined by “ATEX”

For further information please contact ***DEUBLIN*** or your local representative.

Operating Data

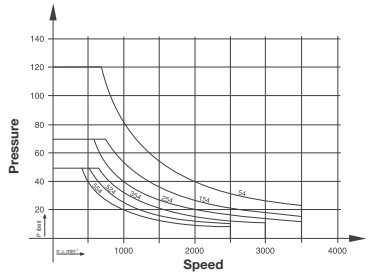
Max. Pressure and max. Speed see Diagram

Max. Temperature 71 °C > 71 °C consult *DEUBLIN*

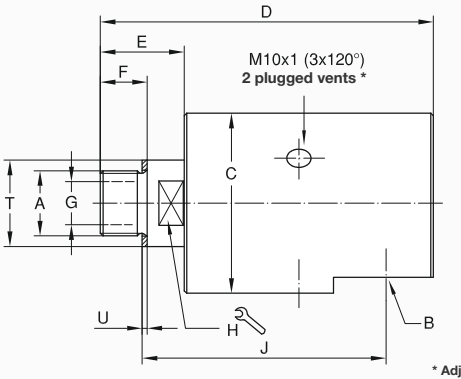
Temperature > 71°C - max. 90 °C only if max. pressure ≦ 10 bar (150 PSI)

At temperatures > 71 °C (160 °F) media must be liquid (not vaporous)

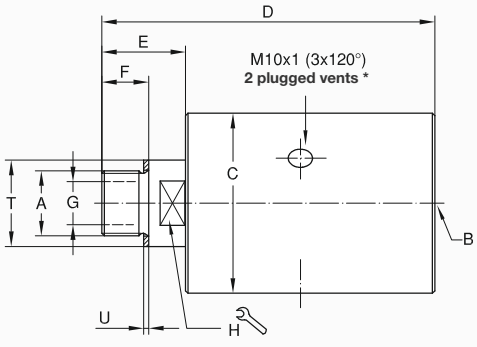
Seals are Tungsten Carbide/Ceramic



Monoflow Rotating Union with Radial Thread



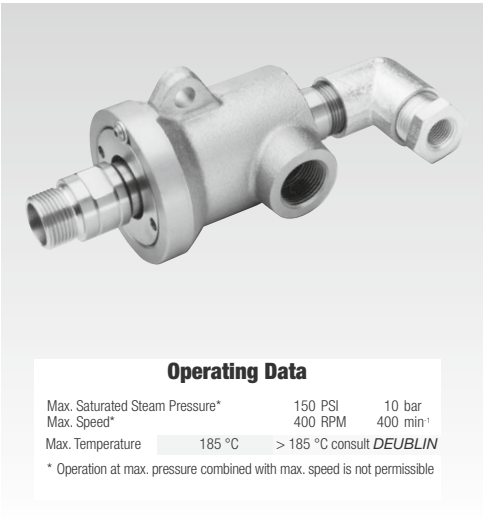
Monoflow Rotating Union with Axial Thread



* Adjust open vent downwards, or change one plug respectively

Monoflow Rotating Union

DN	B	Ordering No.		A		C	D	E	F	G	H	J	T	U	
	G	Radial	Axial	Rotor Connections		ø				ø			ø h11		kg
10	G 3/8	54-000-110	54-010-110	G 3/8	RH	49	101	26	16	9,5	19	71,5	22	1,5	1,1
	G 3/8	54-000-111	54-010-111	G 3/8	LH	49	101	26	16	9,5	19	71,5	22	1,5	1,1
15	G 1/2	154-000-110	154-010-110	G 1/2	RH	64	123	34	19	12,7	24	89	30	1,5	1,8
	G 1/2	154-000-111	154-010-111	G 1/2	LH	64	123	34	19	12,7	24	89	30	1,5	1,8
20	G 3/4	254-000-110	254-010-110	G 3/4	RH	73	137	36	19	17,5	30	100	35	2	2,6
	G 3/4	254-000-111	254-010-111	G 3/4	LH	73	137	36	19	17,5	30	100	35	2	2,6
25	G 1	354-000-110	354-010-110	G 1	RH	94	161	43	22	25	36	117	45	2	5,1
	G 1	354-000-111	354-010-111	G 1	LH	94	161	43	22	25	36	117	45	2	5,1
32	G 1 1/4	524-000-110	524-010-110	G 1 1/4	RH	99	182	54	27	31,8	41	127	50	2	6
	G 1 1/4	524-000-111	524-010-111	G 1 1/4	LH	99	182	54	27	31,8	41	127	50	2	6
40	G 1 1/2	554-000-110	554-010-110	G 1 1/2	RH	108	200	58	29	38	50	138	60	2	8,2
	G 1 1/2	554-000-111	554-010-111	G 1 1/2	LH	108	200	58	29	38	50	138	60	2	8,2



DEUBLIN

Rotating Union 9000 Series for Steam, DN 20 - 50

- monoflow and duoflow design
- self-supported rotating union
- spherical seal; lapped Carbon Graphite Rings
- seal wear indicator allows preventive maintenance
- 2 torque lugs on the housing
- nickel-plated cast iron housing
- steel rotor, nickel-plated for steam service

For hot oil applications please refer to models of our H-series on pages 27 - 30; Models with threaded rotor optionally available.

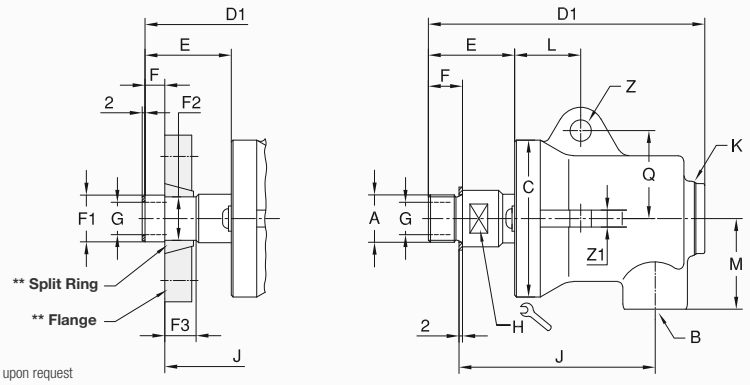
For further information please contact ***DEUBLIN*** or your local representative.

Operating Data

Max. Saturated Steam Pressure*	150 PSI	10 bar
Max. Speed*	400 RPM	400 min^{-1}
Max. Temperature	185 °C	> 185 °C consult *DEUBLIN*

* Operation at max. pressure combined with max. speed is not permissible

Monoflow Rotating Union for Steam

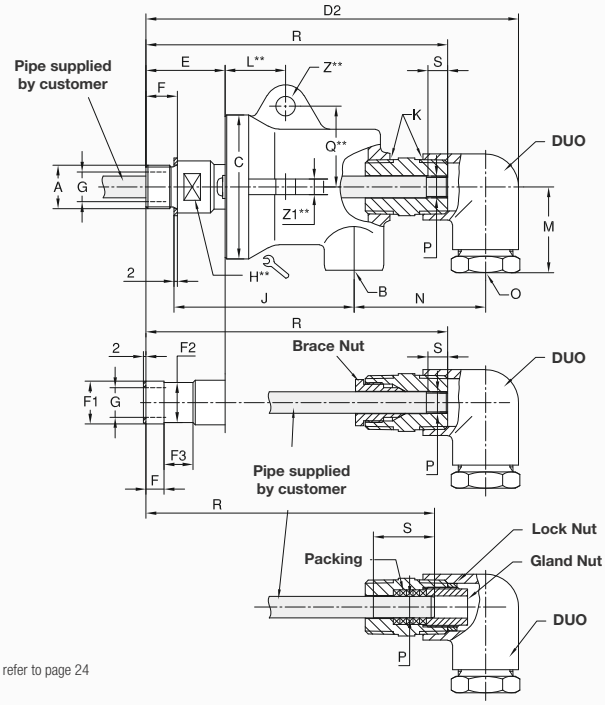


** supplied by customer, data sheet available upon request

Monoflow Rotating Union

DN	B	Ordering No. Steam	A Rotor Connections	C Ø	D1	E	F	F1 Ø PT	F2 Ø	F3	G Ø	H	J	K	L	M	Q	Z Ø	Z1	kg
20	G 3/4	9075-008-110	G 3/4 RH	87	155	48	19	-	-	-	18	27	109	G 1	37	51	49	12	13	2.4
	G 3/4	9075-008-111	G 3/4 LH	87	155	48	19	-	-	-	18	27	109	G 1	37	51	49	12	13	2.4
	G 3/4	9075-008-117	For Quick Connect Flange	87	155	48	11.1	26.0 25.9	24.25 24.15	17.5	18	-	115	G 1	37	51	49	12	13	2.4
25	G 1	9100-008-113	G 1 RH	97	184	60	22	-	-	-	25.4	32	129	G 1	38	54	54	13	13	3.7
	G 1	9100-008-112	G 1 LH	97	184	60	22	-	-	-	25.4	32	129	G 1	38	54	54	13	13	3.7
	G 1	9100-008-121	For Quick Connect Flange	97	184	60	11.1	32.36 32.23	30.89 30.76	17.5	25.4	-	138	G 1	38	54	54	13	13	3.7
32	G 1 1/4	9125-008-118	G 1 1/4 RH	112	206	65	25.4	-	-	-	32	41	140	G 1 1/2	42	66	60	13.5	13	6.3
	G 1 1/4	9125-008-119	G 1 1/4 LH	112	206	65	25.4	-	-	-	32	41	140	G 1 1/2	42	66	60	13.5	13	6.3
	G 1 1/4	9125-008-126	For Quick Connect Flange	112	206	65	12.7	41.0 40.9	39.65 39.55	19	32	-	150	G 1 1/2	42	66	60	13.5	13	6.3
40	G 1 1/2	9150-008-113	G 1 1/2 RH	136	230	62	28.5	-	-	-	38	46	153	G 1 1/2	55	79	73	16	19	8.7
	G 1 1/2	9150-008-114	G 1 1/2 LH	136	230	62	28.5	-	-	-	38	46	153	G 1 1/2	55	79	73	16	19	8.7
	G 1 1/2	9150-008-117	For Quick Connect Flange	136	230	62	12.7	47.37 47.27	45.09 44.99	22.2	38	-	167	G 1 1/2	55	79	73	16	19	8.7
50	G 2	9200-008-117	G 2 RH	155	252	68	30	-	-	-	49	60	168	G 1 1/2	62	86	87	16	25.4	13.5
	G 2	9200-008-118	G 2 LH	155	252	68	30	-	-	-	49	60	168	G 1 1/2	62	86	87	16	25.4	13.5
	G 2	9200-008-121	For Quick Connect Flange	155	252	77	15.9	58.93 58.80	56.64 56.51	28.5	49	-	189	G 1 1/2	62	86	87	16	25.4	13.5

Duoflow Rotating Union for Steam



Type A
for short threaded supply pipe

Type B
for long threaded supply pipe
With additional brace nut for supply pipe. Use pipes as per DIN 2440 only.

Type C
for rotating supply pipe
with packing seals to avoid interpassage leakage.

** Dimensions refer to page 24

Duoflow Rotating Union with Elbow for Steam

DN	B	O	Ordering No.	DUO *	Type	A Rotor Connections	C ø	D2	E	F	F1 ø PT	F2 ø	F3	G ø	J	K	M	N	P Pipe	Pipe DIN 2440	R	S	kg
20	G 3/4	Rp 1/2	9075-008-110	-600	A	G 3/4 RH	87	220	48	19	-	-	-	18	109	R 1	51	75	G 1/4	DN 8	181	12	2,8
			9075-008-111	-610	B	G 3/4 LH				19	-	-	-		109				G 1/4	DN 8	181	12	
			9075-008-117	-620	C	For Quick Connect Flange				11,1	26,0 25,9	24,25 24,15	17,5		115				ø 13 h9	DN 8	175	37	
25	G 1	Rp 1/2	9100-008-113	-600	A	G 1 RH	97	251	60	22	-	-	-	25,4	129	R 1	54	82	G 1/4	DN 8	210	12	4,1
				-601	A														G 3/8	DN 10	210	12	
			9100-008-112	-610	B	G 1 LH				22	-	-	-		129				G 1/4	DN 8	210	12	
				-611	B														G 3/8	DN 10	210	12	
			9100-008-121	-621	C	For Quick Connect Flange				11,1	32,36 32,23	30,89 30,76	17,5		138				ø 16 h9	DN 10	206	32	
32	G 1 1/4	Rp 3/4	9125-008-118	-600	A	G 1 1/4 RH	112	298	65	25,4	-	-	-	32	140	R 1 1/2	66	107	G 1/2	DN 15	238	14	7
				-601	A														G 3/4	DN 20	238	16	
			9125-008-119	-610	B	G 1 1/4 LH				25,4	-	-	-		140				G 1/2	DN 15	238	14	
				-611	B														G 3/4	DN 20	238	16	
			9125-008-126	-621	C	For Quick Connect Flange				12,7	41,0 40,9	39,65 39,55	19		150				ø 20 h9	DN 15	230	40	
40	G 1 1/2	Rp 3/4	9150-008-113	-600	A	G 1 1/2 RH	136	322	62	28,5	-	-	-	38	153	R 1 1/2	79	114	G 1/2	DN 15	262	14	9,5
				-601	A														G 3/4	DN 20	262	16	
			9150-008-114	-610	B	G 1 1/2 LH				28,5	-	-	-		153				G 1/2	DN 15	262	14	
				-611	B														G 3/4	DN 20	262	16	
			9150-008-117	-621	C	For Quick Connect Flange				12,7	47,37 47,27	45,09 44,97	22,5		167				ø 26 h9	DN 20	255	35	
50	G 2	Rp 3/4	9200-008-117	-600	A	G 2 RH	155	345	68	30	-	-	-	49	168	R 1 1/2	87	121	G 1/2	DN 15	284	14	14,3
				-601	A														G 3/4	DN 20	284	16	
			9200-008-118	-610	B	G 2 LH				30	-	-	-		168				G 1/2	DN 15	284	14	
				-611	B														G 3/4	DN 20	284	16	
			9200-008-121 **	-621	C	For Quick Connect Flange		354	77	15,9	58,93 58,80	56,64 56,51	22,2		189				ø 26 h9	DN 20	276	35	

* Adhering to the same DN size, all unions can be combined with their respective elbows

** R dimension add 9 mm each

DEUBLIN

Rotating Union 14000 Series for Air and Hydraulic Oil Service, DN 10 - 50

Operating Data

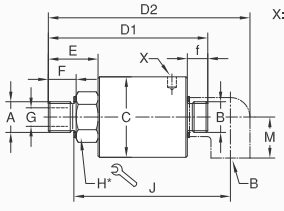
Max. Air Pressure		150 PSI	10 bar
Max. Vacuum		2" Hg	7 kPa
Max. Hydraulic Pressure*	(DN 10-20)	870 PSI	60 bar
	(DN 25-40)	580 PSI	40 bar
Max. Speed*	(DN 10-40)	1,500 RPM	1.500 min^{-1}
	(DN 50)	750 RPM	750 min^{-1}
Max. Temperature	120 °C	> 120 °C consult *DEUBLIN*	

Recommended filtration of Hydraulic Oil: 5 µm
* Operation at max. pressure combined with max. speed is not permissible

- monoflow design
- self-supported rotating union or in-the-shaft mounted
- balanced mechanical seal
  Carbon Graphite/Ceramic - for air service;
  Tungsten Carbide/Ceramic - for hydraulic service
- axial or radial housing connection by means of elbow
- lubrication storage within the seal cavity for air service
- heavy-duty design
- steel housing
- stainless steel rotor
- full-media flow

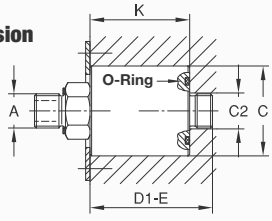
For further information please contact ***DEUBLIN*** or your local representative.

Axial Version



X: Hole for Spanner Wrench as per DIN 1810, for sizes see table below.

In-the-Shaft Mounted Version



How to Order: **Type a:** 14037-03-094, straight-through version
Type b: 14037-03-094-118, with elbow
Type c: 14037-03-094-120, in-the-shaft mounted version
Type d: 14037-03-094-121, with elbow and O-ring.

* **DN 10 - 20 = hexagon**
DN 25 - 50 = two wrench flats

DN	B	Ordering No.		Type			A	C^{E}_{h9}	C_2	D_1	D_2	E	F	f	G	H	J	K	M	X	
		Type a for Air CG/C with lubricator	Type a for Hydr. Oil TC/C	b	c	d	Rotor Connections	ø	ø						ø			-0,25		Ø Size	kg
10	G 3/8	14037-03-094	14037-04-192	-118	-120	-121	G 3/8 RH	42	18	93	119	26	16	12	9,5	22	93	54,5	25	4 40/42	0,5
	G 3/8	14037-03-095	14037-04-193				G 3/8 LH	42	18	93	119	26	16	12	9,5	22	93	54,5	25	4 40/42	0,5
15	G 1/2	14050-03-151	14050-04-154	-118	-120	-121	G 1/2 RH	55	22	109	138	34	19	14	12,7	30	107	60,5	28	6 52/55	1
	G 1/2	14050-03-152	14050-04-160				G 1/2 LH	55	22	109	138	34	19	14	12,7	30	107	60,5	28	6 52/55	1
20	G 3/4	14075-03-284	14075-04-447	-118	-120	-121	G 3/4 RH	63	28	122	158	34	19	16	17,5	36	124	71,5	33	6 58/62	1,7
	G 3/4	14075-03-285	14075-04-448				G 3/4 LH	63	28	122	158	34	19	16	17,5	36	124	71,5	33	6 58/62	1,7
	G 3/4	14075-03-458	14075-04-936	-118	-120	-121	M27 x 1,5 RH	63	28	123	159	35	15	16	17,5	36	121	71,5	33	6 58/62	1,7
	G 3/4	14075-03-459	14075-04-937				M27 x 1,5 LH	63	28	123	159	35	15	16	17,5	36	121	71,5	33	6 58/62	1,7
	G 3/4	14075-03-014	14075-04-451	-118	-120	-121	M 35 x 1,5 RH	63	28	126	161	38	15	16	17,5	41	131	71,5	33	6 58/62	1,7
	G 3/4	14075-03-015	14075-04-452				M 35 x 1,5 LH	63	28	126	161	38	15	16	17,5	41	131	71,5	33	6 58/62	1,7
25	G 1	14100-03-222	14100-04-378	-118	-120	-121	G 1 RH	80	35	138	181	41	22	18	25	36	140	78,5	38	6 80/90	2,4
	G 1	14100-03-223	14100-04-379				G 1 LH	80	35	138	181	41	22	18	25	36	140	78,5	38	6 80/90	2,4
	G 1	14100-03-235	14100-04-381	-118	-120	-121	M 35 x 1,5 RH	80	35	132	175	35	15	18	25	36	141	78,5	38	6 80/90	2,4
	G 1	14100-03-236	14100-04-382				M 35 x 1,5 LH	80	35	132	175	35	15	18	25	36	141	78,5	38	6 80/90	2,4
32	G 1 1/4	14125-03-054	14125-04-128	-118	-120	-121	G 1 1/4 RH	90	43	153	205	55	28	20	31,8	46	155	77,5	45	6 80/90	3,3
	G 1 1/4	14125-03-055	14125-04-129				G 1 1/4 LH	90	43	153	205	55	28	20	31,8	46	155	77,5	45	6 80/90	3,3
40	G 1 1/2	14150-03-198	14150-04-288	-118	-120	-121	G 1 1/2 RH	90	49	184	243	72	29	22	38	55	187	89,5	50	6 80/90	4
	G 1 1/2	14150-03-199	14150-04-289				G 1 1/2 LH	90	49	184	243	72	29	22	38	55	187	89,5	50	6 80/90	4
	G 1 1/2	14150-03-200	14150-04-418	-118	-120	-121	M 50 x 1,5 RH	90	49	177	236	65	23	22	38	55	187	89,5	50	6 80/90	4
	G 1 1/2	14150-03-201	14150-04-419				M 50 x 1,5 LH	90	49	177	236	65	23	22	38	55	187	89,5	50	6 80/90	4
50	G 2	14200-03-124	---	-118	-120	-121	G 2 RH	110	61	205	275	65	29	25	47,6	60	213	114,5	58	10 110/115	6
	G 2	14200-03-125	---				G 2 LH	110	61	205	275	65	29	25	47,6	60	213	114,5	58	10 110/115	6

Operating Data

Max. Air Pressure		150 PSI	10 bar
Max. Vacuum		2" Hg	7 kPa
Max. Hydraulic Pressure*			
Model	1005	1,020 PSI	70 bar
	1102	1,020 PSI	70 bar
	1115	510 PSI	35 bar
	1205	730 PSI	50 bar
	2200	1,020 PSI	70 bar
	250-094	1,020 PSI	70 bar
	355-021	1,020 PSI	70 bar
	452-000	730 PSI	50 bar
Max. Speed Straight Threads*		3,500 RPM	3.500 min^{-1}
Model	250-094	3,500 RPM	3.500 min^{-1}
	355-021	3,000 RPM	3.000 min^{-1}
	452-000	2,500 RPM	2.500 min^{-1}
Max. Temperature	120 °C	> 120 °C consult ***DEUBLIN***	

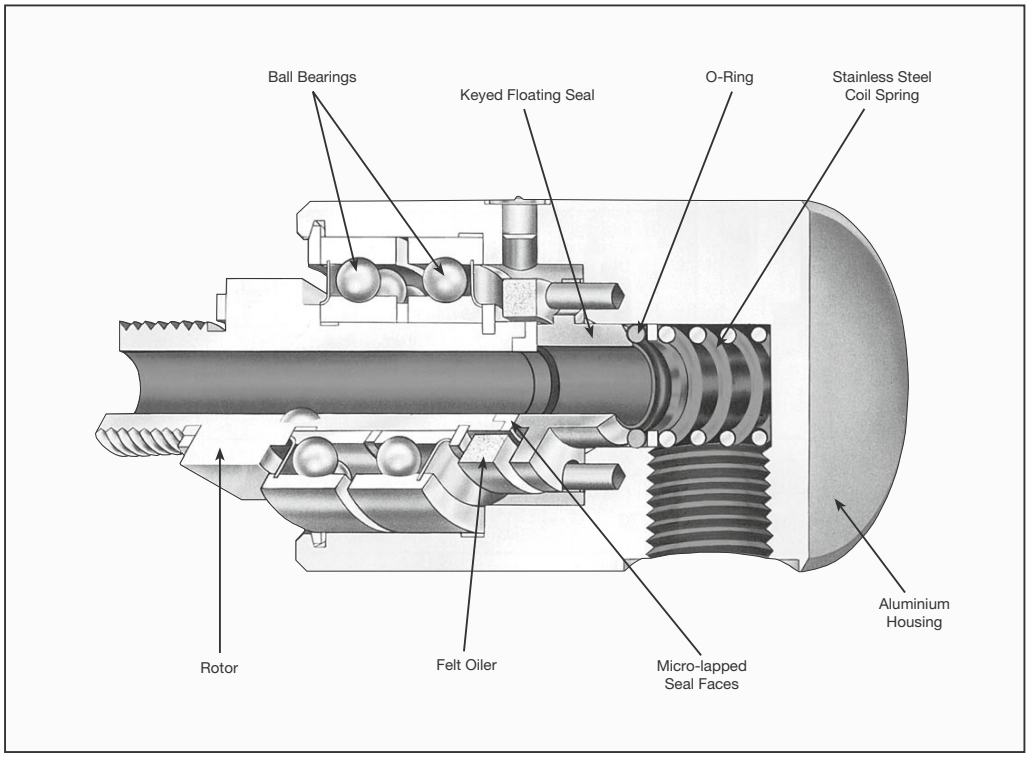
* Operation at max. pressure combined with max. speed is not permissible

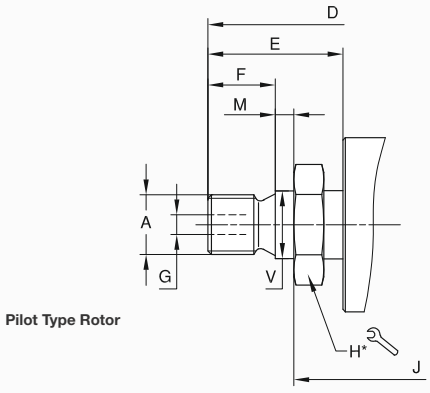
DEUBLIN

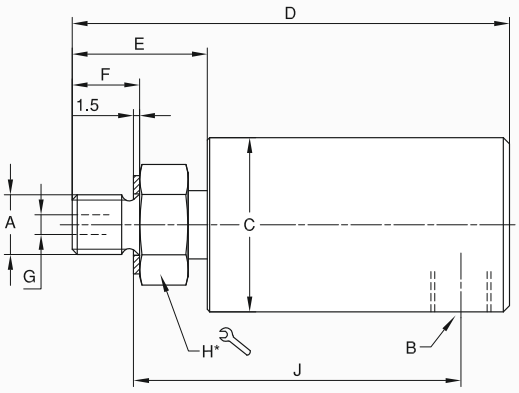
Rotating Union for Air and Hydraulic Oil Service, DN 6 - 40

- monoflow design
- self-supported rotating union
- radial housing connection
- balanced mechanical seal
  Carbon Graphite/hardened Tool Steel or
  Carbon Graphite/Ceramic
- felt oiler in seal cavity for air service
- oiler for relubrication (3 - 5 drops/month)
- low torque
- weight optimised design
- aluminium housing
- stainless steel or steel rotor (respective of model)
- Lubrication guide see Instruction Manual

For further information please contact ***DEUBLIN*** or your local representative.





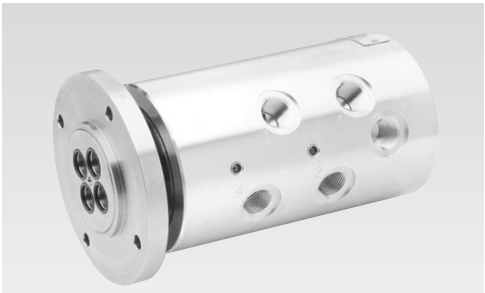


Pilot Type Rotor

* DN 6 - 20 = hexagon
DN 25 - 40 = two wrench flats

Monoflow Rotating Union

DN	B NPT	Ordering No.	A Rotor Connections		C ø	D	E	F	G ø	H*	J	M	V ø	kg
6	1/8	1005-020-037	M 10 x 1	RH	28,5	71	22	11	3,2	17	54	-	-	0,2
	1/8	1005-020-045	M 10 x 1	RH	28,5	71	22	11	3,2	17	50	3	11 h6	0,2
	1/8	1005-020-049	G 1/4	RH	28,5	71	22	13	3,2	17	52	-	-	0,2
8	1/4	1102-070-103	G 1/4	RH	41	81	28	13	6,4	22	58	-	-	0,4
	1/4	1102-070-104	G 1/4	LH	41	81	28	13	6,4	22	58	-	-	0,4
10	3/8	1115-000-205	G 3/8	RH	44	99	26	16	8,7	24	71	-	-	0,7
	3/8	1115-000-200	M 16 x 2	RH	44	99	26	16	8,7	24	71	-	-	0,7
15	1/2	1205-000-151	G 1/2	RH	57	114	35	19	12,7	30	79	-	-	0,7
	1/2	1205-000-152	G 1/2	LH	57	114	35	19	12,7	30	79	-	-	0,7
	1/2	1205-000-170	M 20 x 1,5	RH	57	116	37	14	12,7	30	78	5	22 g6	0,7
	1/2	1205-000-171	M 20 x 1,5	LH	57	116	37	14	12,7	30	78	5	22 g6	0,7
	1/2	2200-000-458	M 27 x 1,5	RH	73	123	35	15	17,5	36	85	6	28 g6	1,4
	1/2	2200-000-459	M 27 x 1,5	LH	73	123	35	15	17,5	36	85	6	28 g6	1,4
	1/2	2200-000-081	M 35 x 1,5	RH	73	125	38	15	17,5	41	96	-	-	1,6
	1/2	2200-000-082	M 35 x 1,5	LH	73	125	38	15	17,5	41	96	-	-	1,6
	1/2	2200-000-102	G 3/4	RH	73	122	34	19	17,5	36	88	-	-	1,4
	1/2	2200-000-103	G 3/4	LH	73	122	34	19	17,5	36	88	-	-	1,4
20	3/4	250-094-284	G 3/4	RH	73	128	34	19	17,5	36	94	-	-	1,6
	3/4	250-094-285	G 3/4	LH	73	128	34	19	17,5	36	94	-	-	1,6
	3/4	250-094-458	M 27 x 1,5	RH	73	129	35	15	17,5	36	91	6	28 g6	1,6
	3/4	250-094-459	M 27 x 1,5	LH	73	129	35	15	17,5	36	91	6	28 g6	1,6
	3/4	250-094-014	M 35 x 1,5	RH	73	131	38	15	17,5	41	101	-	-	1,6
	3/4	250-094-015	M 35 x 1,5	LH	73	131	38	15	17,5	41	101	-	-	1,6
25	1	355-021-222	G 1	RH	83	150	42	22	25	36	108	-	-	2,1
	1	355-021-223	G 1	LH	83	150	42	22	25	36	108	-	-	2,1
	1	355-021-235	M 35 X 1,5	RH	83	144	35	15	25	36	108	-	-	2,1
	1	355-021-236	M 35 X 1,5	LH	83	144	35	15	25	36	108	-	-	2,1
	1	355-021-315	M 35 x 1,5	RH	83	167	59	29	25	36	103	12	40 g6	2,1
	1	355-021-316	M 35 x 1,5	LH	83	167	59	29	25	36	103	12	40 g6	2,1
40	1 1/2	452-000-198	G 1 1/2	RH	108	206	71	29	38	55	147	-	-	4,5
	1 1/2	452-000-199	G 1 1/2	LH	108	206	71	29	38	55	147	-	-	4,5
	1 1/2	452-000-200	M 50 x 1,5	RH	108	200	66	23	38	55	147	-	-	4,5
	1 1/2	452-000-201	M 50 x 1,5	LH	108	200	66	23	38	55	147	-	-	4,5



Operating Data

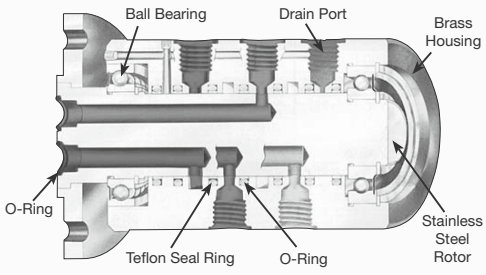
Max. Air Pressure	145 PSI	10 bar
Max. Hydraulic Pressure (rotating)	870 PSI	60 bar
Max. Hydraulic Pressure (very slow rotating)	3.626 PSI	250 bar
Max. Vacuum	2 "Hg	7 kPa
Max. Speed	250 RPM	250 min^{-1}
Max. Flow per Passage		
1379 series	14 GPM	53 l/min
1479 series	28.5 GPM	108 l/min
Max. Temperature	80 °C	> 80 °C consult *DEUBLIN*
Filtration	ISO 4406 Class 17/15/12, max. 60 micron	

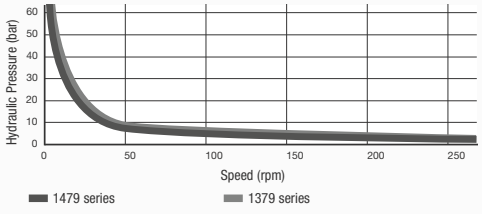
DEUBLIN

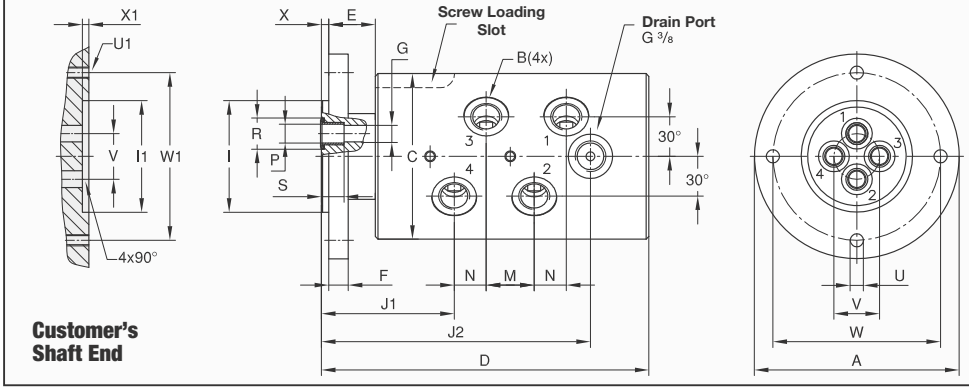
Rotating Union
1379 and 1479 Series 4-Passage for Various Media

- four independent passages for applications such as clamping and unclamping, work piece or tool sensing, and spindle cooling
- vent between passages 2 and 3 allows use of two different media without cross contamination. For example, air in passages 1 and 2 and hydraulic oil in passages 3 and 4
- stainless steel and brass components resist corrosion
- hardened chrome sealing surface and elastomer-energized seals
- dual, widely spaced ball bearings absorb large side loads

For further information please contact ***DEUBLIN*** or your local representative.







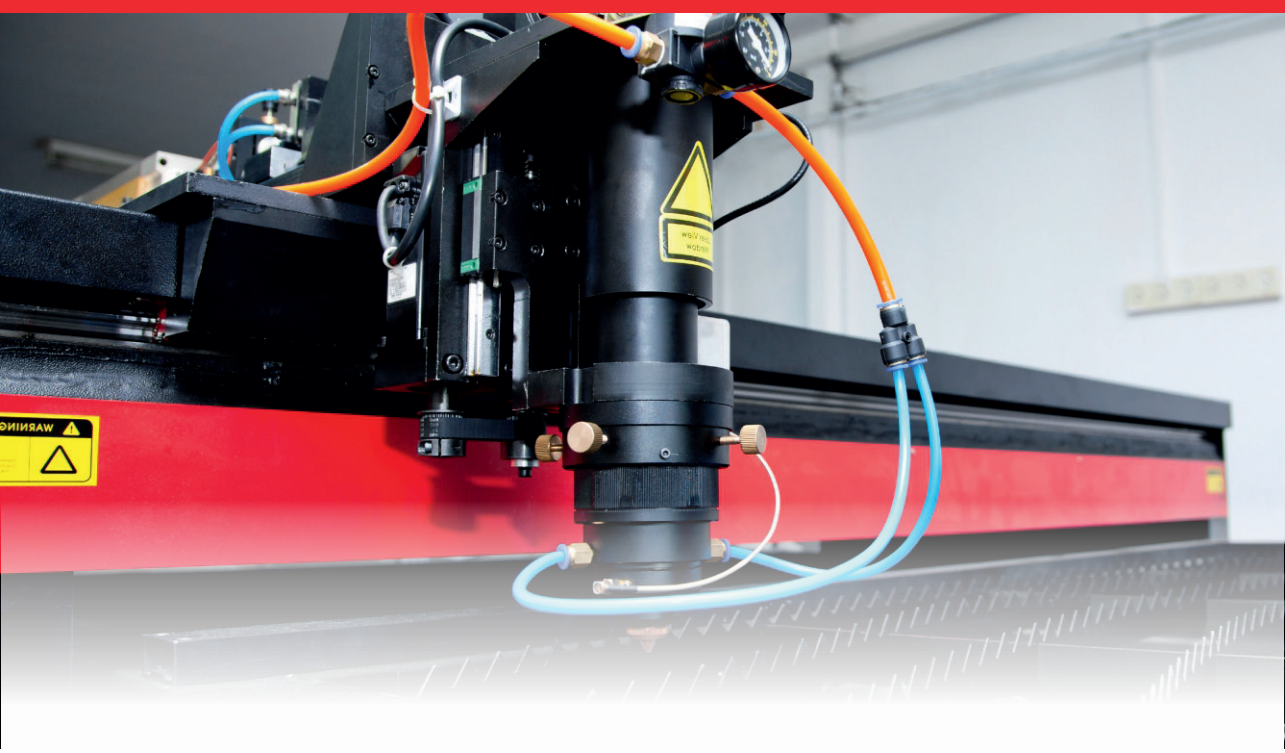
DN	B	Ordering No.	A ø	C ø	D	E	F	G ø	I ø PT	I1 ø PT	J1	J2	M	N	P ø	R ø	S	U ø	U1	V ø	W ø	X	X1	W1 ø	kg
4x 10	4x G 3/8	1379-160	110	88	176	25	10,5	9	60,000 59,981	60,060 60,030	72	144,5	26	17	12,05 12,00	16,7	12	7,2	M6 4x90°	24,5	90	4	3,5	90	7,6
4x 10 + centr. pass.	4x G 3/8	1379-860	110	88	176	25	10,5	9	60,000 59,981	60,060 60,030	72	144,5	26	17	12,05 12,00	16,7	12	7,2	M6 4x90°	24,5	90	4	3,5	90	7,6
4x 15	4x G 1/2	1479-100	130	108	202	25	13,5	13	75,000 74,981	75,060 75,030	81	172	31	23	15,05 15,00	19,7	15	9	M8 4x90°	29	110	4	3,5	110	12,7
4x 15 + centr. pass.	4x G 1/2	1479-800	130	108	202	25	13,5	13	75,000 74,981	75,060 75,030	81	172	31	23	15,05 15,00	19,7	15	9	M8 4x90°	29	110	4	3,5	110	12,7

NOTES:

NOTES:

NOTES:

NOTES:



endüstriyel donanım ve otomasyon sistemleri

10042 Sokak No: 10 A.O.S.B. Çiğli - İZMİR
Tel: 0 232 433 85 15 • **Faks:** 0 232 433 88 81
satis@endo.com.tr • info@endo.com.tr
www.endo.com.tr

V1.3_02202019