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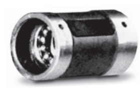
S6513HM...

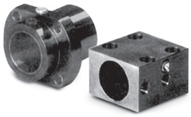
Ball Screws
pg. **9**-3

S6652HM2135...



KM Series Anti-Backlash Ball Nuts
pg. **9**-4

S6652HMF2135...
S6652HMB2135...



KM Series Anti-Backlash Ball Nuts
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A 7C15M0...

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A 7C15M...
A 7Q15M...
A 7Y15M...
A 7W15M...

Steel Tracks with Mounting Holes
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A 7C15M.20
A 7Q15M.20
A 7Y15M.20
A 7W15M.20

Steel Tracks, Plain
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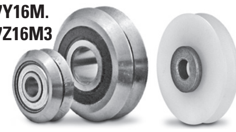
A 7Q16M.
A 7Y16M.
A 7Z16M3



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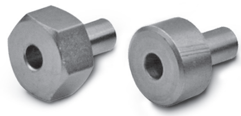
A 7X16M..



Adapter Bushings
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A 7Q17M...

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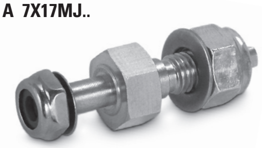
A 7X17MJ..



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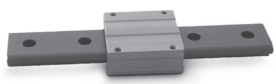
S64AMRM...



Mini-Rail® Linear Guides
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Linear Guide System, Low Profile
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S99GNRM27...
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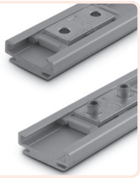

Linear Guide System, Low Profile
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Linear Guide System, Low Profile
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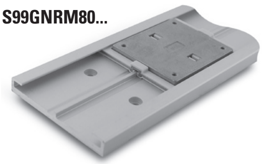
S99GNRM80...



Linear Guide System, Low Profile
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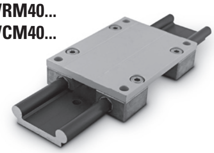
S99GWRM40...
S99GWCM40...



Linear Guide System, Heavy-Duty
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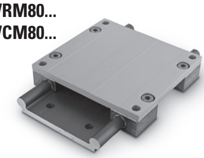
S99GWRM80...
S99GWCM80...



Linear Guide System, Heavy-Duty
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Ball Screws & Ball Nuts - pg. **9**-1
Ball Screws & Ball Nuts, Critical Speed & Load - pg. **9**-2
Industrial “V” Guide Systems & Engineering Notes - pg. **9**-6
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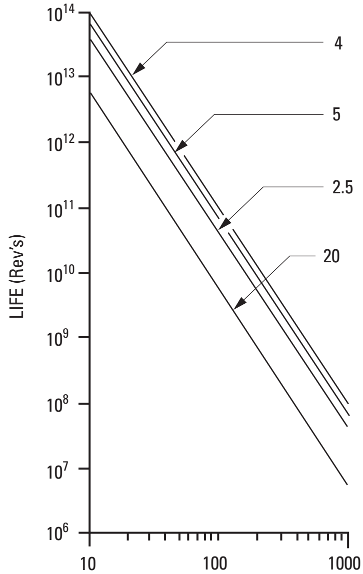
LIFE EXPECTANCY



SPECIFICATIONS

Pitch	Diameter	Number of Ball Circuits	Axial Load (N)	
			Dynamic (C_a)	Static
2.5	2	4	3500	5500
4	2.5	2	2600	4200
5	3.5	2	4600	7200
10	3.5	2	4200	6500
20	3.5	2	1900	2500

$$L = \left[\frac{C_a}{F_m}\right]^3 \times 10^6$$

L = life expectancy expressed in number of revolutions

C_a = dynamic load rating (N), see specifications table

F_m = average axial load (N)

Example: For 10 mm pitch screw, C_a = 4200 N carrying an average axial load, F_m = 200 N (45 lbs.) the expected life is:

$$L = \left[\frac{4200}{200}\right]^3 \times 10^6 = 9.261 \times 10^9 \text{ revolutions.}$$

At an average of 1000 rpm this will result in:

$$\frac{9.261 \times 10^9 \text{ revolutions}}{1000 \text{ rpm}} \times \frac{1 \text{ hour}}{60 \text{ minutes}} = 154{,}000 \text{ hours}$$

of expected operational life. Note that the nature of the motion (jerky, smooth, etc.) will affect the life expectancy.

FORCE / TORQUE

$$M = \frac{F \times p}{2000 \times \pi \times 0.9}$$

M = torque applied to screw (Nm)

p = screw pitch (mm)

F = resulting linear force (N)

Example: For a force of 200 N (45 lbs.) with a 10 mm pitch screw, the required torque is:

$$M = \frac{200 \times 10}{2000 \times \pi \times 0.9} = 0.35 \text{ Nm} \approx 50 \text{ oz. in.}$$

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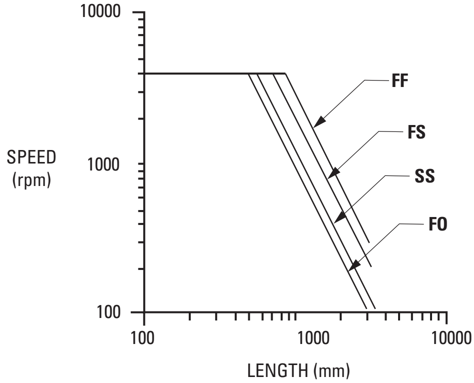
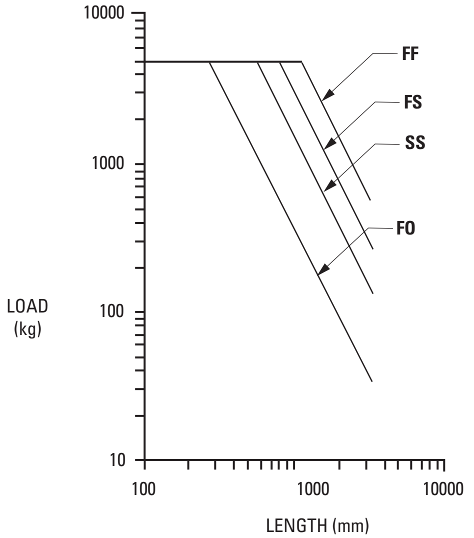
LOAD AND SPEED LIMITS ON 16 mm BALL SCREWS

Metric
0 10

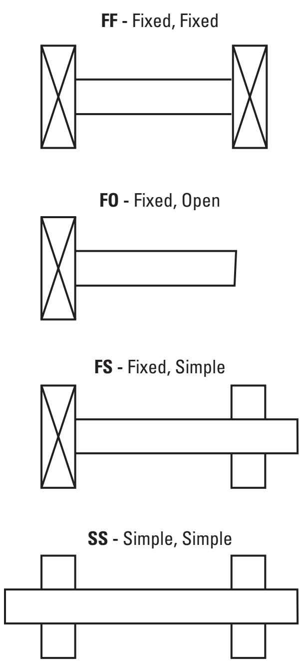
CRITICAL SPEED



CRITICAL LOAD



BEARING SUPPORT TYPES



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HIGH LIFE EXPECTANCY
EXCELLENT COST PERFORMANCE RATIO

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Metric
0 10

MATERIAL:

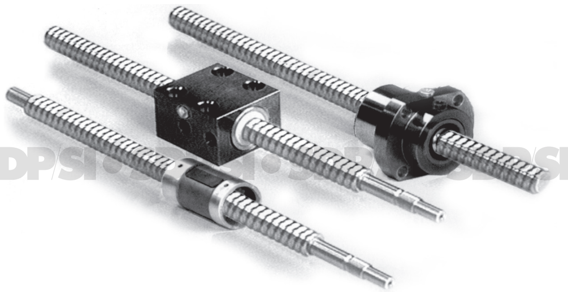
Cf 53 induction-hardened to HRC 62 ± 2

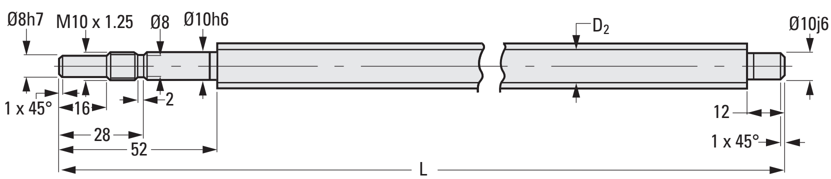
SPECIFICATIONS:

Pitch accuracy ≤ 0.1 mm / 300 mm,
ISO class 7.
Screw pitches of 2.5, 4, 5, 10 and 20 mm.
Available with machined and unmachined ends in lengths up to 3 m.
Ø16 mm, rolled and polished.

Produce greater than 90% efficiency in converting rotary to linear motion.

Machined screws are designed to be held by a double bearing on one side and on the other side by either a floating bearing, or no bearing and a guiding ball nut.





Root Diameter: D_2 = 12.98 for 5, 10, 20 mm Pitch
D_2 = 13.34 for 2.5 mm Pitch

METRIC COMPONENT CATALOG NUMBER

S 6 5 1 3 H M ☐ ☐☐☐ L ☐☐☐ 2

Machining
0 – Unmachined
2 – Machined

Pitch Code (mm)	
025	2.5
040	4
050	5
100	10
200	20

Length Code	**L** Length (mm)**
045	452
*** 055**	552
065	652
*** 075**	752
085	852
*** 095**	952
105	1052

* These lengths are available machined only.

** Longer ball screws available on special request.

KM SERIES ANTI-BACKLASH BALL NUTS

SDP/SI

PATENTED

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Metric
0 10

› MATERIAL:

Ball Nut - Steel, Cf 53, ground, polished and hardened to HRC 62 ± 2

› SPECIFICATIONS:

Ball nut is 50 mm long by 28 mm diameter.
2 optional mounting brackets allow for flange mounting or base mounting. Both feature standard lubrication ports and are made of steel with a black oxide finish.
Available in 2.5, 5, 10 and 20 mm pitch.
Repeatability < 0.01 mm, accuracy < 0.1 mm / 300 mm when used with our sleeve.
Optional wipers available.
Compatible with 16 mm diameter ball screws.
See index under **Ball Screws.**

Produce greater than 90% efficiency in converting rotary to linear or linear to rotary motion.

Fig. 1

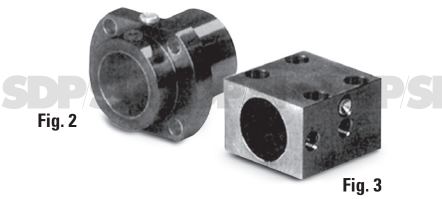

Fig. 2

Fig. 3

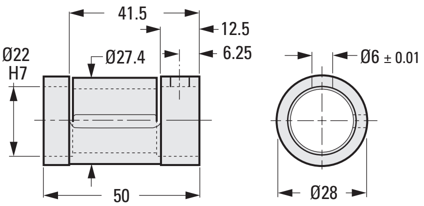

Fig. 1

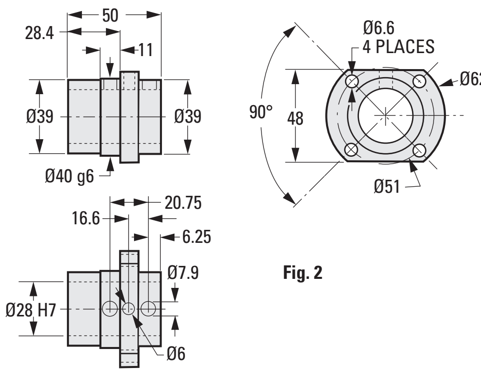

Fig. 2

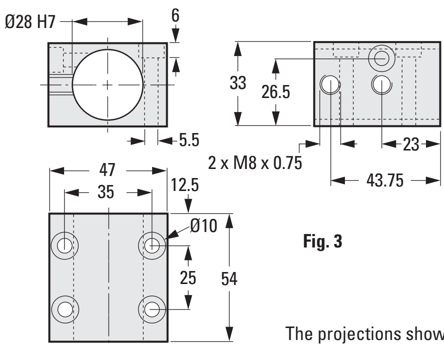

Fig. 3

The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number Fig. 1	Pitch
S6652HM2135025	2.5
S6652HM2135050	5
S6652HM2135100	10
S6652HM2135200	20

Catalog Number
FLANGE MOUNTING BLOCK **(Fig. 2)** **S6652HMF2135**
BASE MOUNTING BLOCK **(Fig. 3)** **S6652HMB2135**
WIPERS (not shown) **S6652HMW6135**

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Metric
0 10

THIS ISEL BALL NUT IS A PATENTED ANTI-BACKLASH DESIGN

› MATERIAL:

Balls - Hardened Steel HRC 63 ± 2
Ball Nut - Steel, Cf 53, ground, polished and hardened to HRC 62 ± 2

› SPECIFICATIONS:

Repeatability of 0.01 mm and accuracy of 0.1 mm/300 mm when used with our ball screws. Blank shaft is used to retain balls during shipment. Can be used with 16 mm ball screws; see index. Available in 2 heights of 25.3 mm and 28.5 mm.

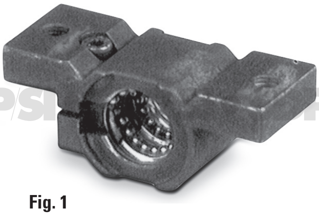


Fig. 1

Fig. 2

Photographed with blank shaft to retain balls.

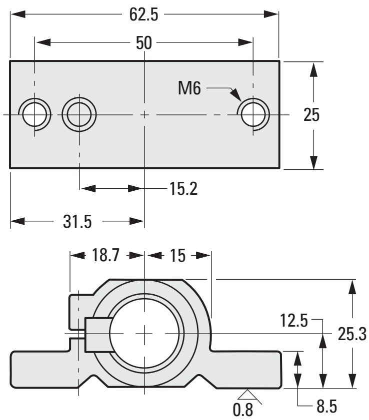


Fig. 1

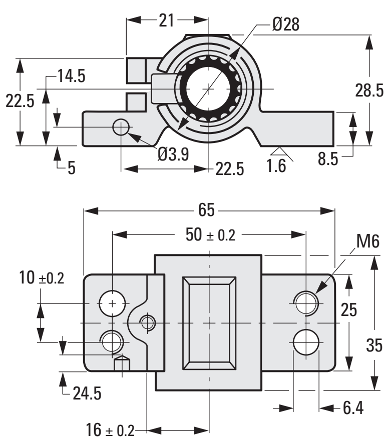


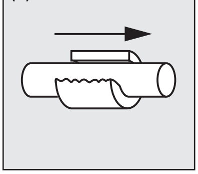
Fig. 2

METRIC COMPONENT

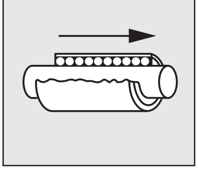
Catalog Number	Fig. No.	Pitch
S6653HM2130040	1	4
S6653HM2130050		5
S6653HM2130100	2	10
S6653HM2130200		20

I R T 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A

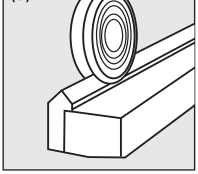
(a)



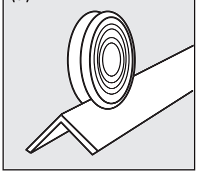
(b)



(c)



(d)



GENERAL INFORMATION

Linear motion devices find application in many designs related to machines in general and mechanisms in particular. The simplest known sliding pair used consists of a bushing and shaft. Due to friction and the resulting wear, loss of alignment will occur which will, in turn, cause binding and chatter. Because of vertical loading, the lubricant will accumulate where it is not needed and will not be available where it could do some good. The presence of lubrication may also cause accumulation of dust and dirt and create gumming and grit.

The above disadvantages led to the development of Ball Bushings with recirculating balls. These have the disadvantage that they are captive on the shafts or have complicated mounting arrangements if they are of the "open type".

The wheel and track components offered in this catalog have the following advantages:

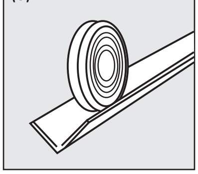
a. **Easy mounting** to machined surfaces which are in most cases part of the existing structure.
b. **Self-cleaning** feature due to the circumference being greater at the edge than it is on the bottom of the "V" groove, and there is a constant wiping action present.
c. **Eccentric bushings** provide means to take out "slack" and compensate for any inaccuracy or accumulation of tolerances.
d. **Low cost** in comparison with other alternatives, in particular, for low speeds and loads where the "economy series" guide wheels can be used.
e. **Available Selection** of different guide wheel and track sizes and materials enables economical choice depending on loads and other requirements.

The accuracy of the system depends on the parallelism of the mounting surfaces; therefore, it cannot be stressed too strongly that reasonable care should be taken when bolting track to the mounting surfaces to assure proper alignment. And, as a matter of good engineering practice, the wheels should be so spaced that leverage from overhanging loads does not cause stresses exceeding the load capacity of the wheel.

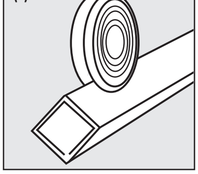
For Mounting Instructions and Engineering Notes see the following pages:

Name of Product	Page No.
Double-Edged Steel Tracks (Size 0)	9-9
Steel Tracks with Mounting Holes	9-10
Steel Tracks, Plain	9-11
Guide Wheels (Precision & Economy Series)	9-12
Adapter Bushings (Adjustable & Stationary)	9-13
Studded Guide Wheels (Adjustable & Stationary)	9-14
Guide Wheel Journal Assemblies	9-15

(e)



(f)



(g)

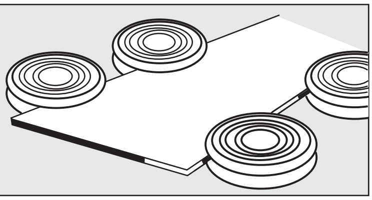


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Fig. 1

When necessary to carry outboard loads, use setup as shown or similar. Keep ratio of X to D as low as possible. Approximation of Max. Load is given by the Formula:

$$R_1 = \frac{D}{X} F \qquad R_2 = -\frac{D}{X} F$$

Where: R_1 = Max. Axial Load per Guide Wheel
D = Center Distance
X = Outboard Distance
F = Radial Load

NOTES: 1. Rigidity decreases as X increases.
2. Max. Load not to exceed Radial Load.

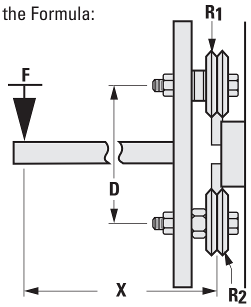


Fig. 2

Rotating motion in large plates can be accomplished as shown in **Fig. 2.** A valuable feature of the guide system is that excellent stability of the plate with maximum available working area unencumbered by shafts and spindle bearings is possible.

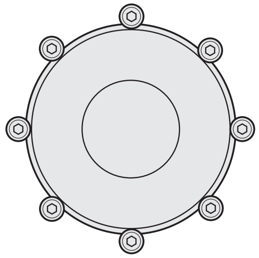


Fig. 3

Shows use of Guide Wheels to guide strip stock into punch press dies or roll forming machines. Use of all adjustable mounting bushings gives axial as well as longitudinal adjustment.

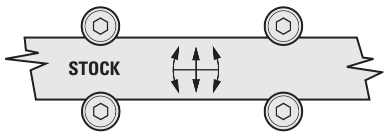
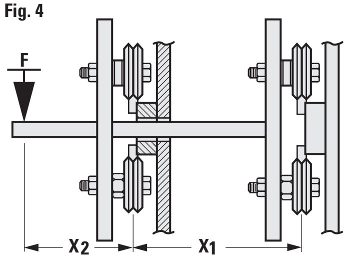


Fig. 4



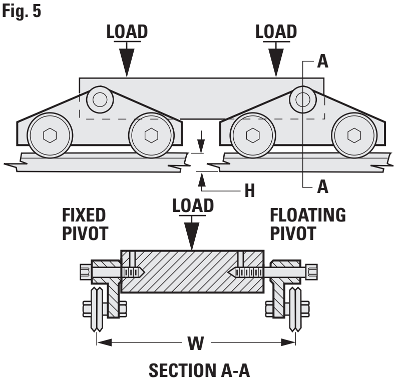
Overhanging loads are mostly radial in nature. Use this formula for approximate Max. Load.

$$R = \frac{X_1}{X_2 + X_2} F$$

Where: R = Max. Axial Load per Guide Wheel
X_1 = Center Distance
X_2 = Outboard Distance
F = Radial Load

Max. Load not to exceed Radial Load.

Fig. 5



In practical application, on long fabricated equipment, it is difficult to hold track mounts to close tolerances. We recommend use of more than two wheels to support a heavy load, with construction approximately as shown in **Fig. 5.** This system will compensate for small differences in track alignment both height (H) and width (W).

LOAD FACTOR CALCULATION

Calculate the load factor for the most heavily loaded bearing

$$L_F = \frac{F_A}{F_{A(max)}} + \frac{F_R}{F_{R(max)}}$$

Where: L_F = Load Factor
F_A = Resultant axial load on the guide wheel
$F_{A(max)}$ = The maximum axial working load capacity of the guide wheel
F_R = Resultant radial load on the guide wheel
$F_{R(max)}$ = The maximum radial working load capacity of the guide wheel

- Bearings should be sized such that $L_F \leq 1$
- The most heavily loaded bearing will have the highest load factor

LIFE CALCULATION

Calculate life by applying the load factor to the load/life equation below:

Due to varying application load and speed parameters and environmental conditions, the appropriate adjustment factor must be applied to the life equation.

Adjustment Factor (A_F)	Application Conditions
1.0-0.7	Clean, low speed, low shock, low duty
0.7-0.4	Moderate contaminants, medium duty, medium shock, low to medium vibration, moderate speed
0.4-0.1	Heavy contamination, high acceleration, high speed, medium to high shock, high vibration, high duty cycle

DualVee Size	Life Constant L_C	
	Inches of Travel Life	Kilometers of Travel Life
0	1.65×10^6	41
1	2.19×10^6	55
2	3.47×10^6	87
3	5.19×10^6	130
4	6.84×10^6	151
4XL	8.58×10^6	215

$$\text{Life} = \left(\frac{L_C}{(L_F)^3}\right) AF$$

Where: L_F = Load Factor
L_C = Life Constant
A_F = Adjustment Factor

Calculate loads on each bearing. Given below are force equations for some common configurations.

F_A = Axial Force, F_R = Radial Force

Scenario 1

$$F_{A1} = \frac{F(x-a)}{x}$$

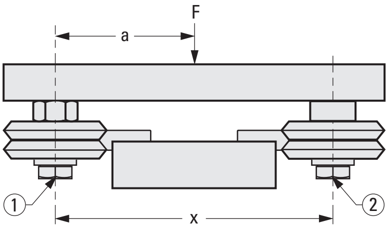
$$F_{A2} = \frac{Fa}{x}$$

Scenario 2

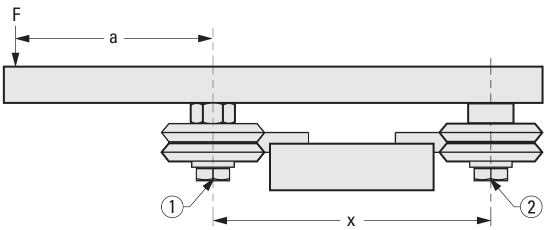
$$F_{A1} = \frac{F(x+a)}{x}$$

$$F_{A2} = \frac{-Fa}{x}$$

NOTE: Since carriages use 4 wheels, 2 wheels absorb the load at both points 1 & 2, divide the calculated load by 2 to obtain the load on each wheel.



Scenario 1



Scenario 2

DOUBLE-EDGED SIZE 0 STEEL TRACKS

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STEEL
HARDENED
UNHARDENED
DRILLED
UNDRILLED

Metric
0 10

DUALVEE®

› MATERIAL:

Fig. 1 Undrilled -
Steel - Hardened - AISI 1045 Carbon Steel (HRC 58...60), Polished and Oiled
Unhardened - AISI 1045 Carbon Steel (HRC 22...25) as Formed, Oiled

› MATERIAL CODE:

Fig. 2 Drilled -
C AISI 1045 Carbon Steel, Unhardened (HRC 22...25)
Q AISI 1045 Carbon Steel, Hardened (HRC 58...60)

*To complete the Catalog Number please specify Material Code from above.

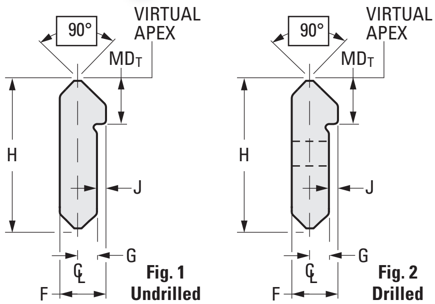


Fig. 1 Undrilled **Fig. 2 Drilled**

Fig. 1 Undrilled

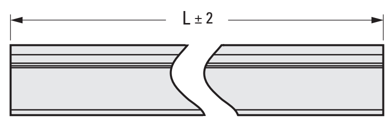
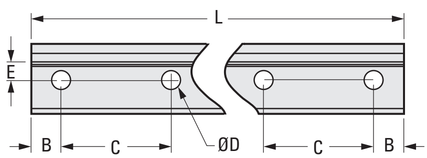


Fig. 2 Drilled



METRIC COMPONENT

Catalog Number Hardened	Catalog Number Unhardened	H	F	G	MD_T	J	L Length m
Fig. 1 Undrilled							
A 7Q15M00305	**A 7C15M00305**	13.11	3.89	1.52	4.01	0.84	0.305
A 7Q15M00610	**A 7C15M00610**						0.61
A 7Q15M01220	**A 7C15M01220**						1.22
A 7Q15M01830	**A 7C15M01830**						1.83

NOTES: 1. Except for length, dimensions are in mm.
2. Maximum length available: Hardened - 6.1 meters Unhardened - 6.7 meters

METRIC COMPONENT

Catalog Number *	Num. of Holes	L ± 0.38	B ± 0.13	C ± 0.13	D ± 0.13	E ± 0.13	F	G	H	J	MD_T
Fig. 2 Drilled											
A 7 ☐ 15M00650	4	165.1	6.35	50.8	3.96	3.51	3.89	1.52	13.11	0.84	4.01
A 7 ☐ 15M01250	7	317.5									
A 7 ☐ 15M01850	10	469.9									
A 7 ☐ 15M02450	13	622.3									
A 7 ☐ 15M03050	16	774.7									
A 7 ☐ 15M03650	19	927.1									

NOTES: 1. Dimensions are in mm.
2. Other track sizes available on special order.

STEEL TRACKS WITH MOUNTING HOLES

SDP/SI

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STEEL
STAINLESS STEEL
HARDENED
UNHARDENED

Metric
0 10

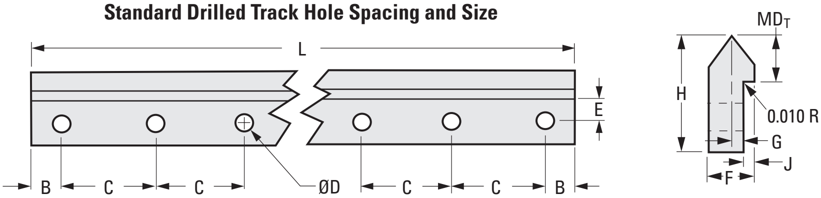
DUALVEE®

› MATERIAL CODE:

- **C** AISI 1045 Carbon Steel, Unhardened
- **Q** AISI 1045 Carbon Steel, Hardened to HRC 58...60
- **Y** AISI 420 Stainless Steel, Unhardened
- **W** AISI 420 Stainless Steel, Hardened to HRC 48...50

*To complete the Catalog Number please specify Material Code from above.

Standard Drilled Track Hole Spacing and Size



The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number *	Size	L	No. of Holes	B ± 0.13	C ± 0.13	D ± 0.13	E ± 0.13	F	G	H	J	MD_T
A 7 ☐ 15M11250	1	317.5	7	6.35	50.8	3.96	3.96	4.75	0.79	11.1	1.57	3.18
A 7 ☐ 15M12450		622.3	13									
A 7 ☐ 15M13650		927.1	19									
A 7 ☐ 15M14850		1231.9	25									
A 7 ☐ 15M16050		1536.7	31									
A 7 ☐ 15M17250		1841.5	37									
A 7 ☐ 15M21263	2	320.8	5	7.87	76.2	5.16	5.56	6.35	0.79	15.9	2.39	4.75
A 7 ☐ 15M22463		625.6	9									
A 7 ☐ 15M23663		930.4	13									
A 7 ☐ 15M24863		1235.2	17									
A 7 ☐ 15M26063		1540	21									
A 7 ☐ 15M27263		1844.8	25									
A 7 ☐ 15M31275	3	323.9	5	9.65	76.2	7.14	7.95	8.71	1.57	22.2	2.77	6.35
A 7 ☐ 15M32475		628.7	9									
A 7 ☐ 15M33675		933.5	13									
A 7 ☐ 15M34875		1238.3	17									
A 7 ☐ 15M36075		1543.1	21									
A 7 ☐ 15M37275		1847.9	25									
A 7 ☐ 15M41300	4	330.2	4	12.7	101.6	8.74	9.53	11.1	2.36	27	3.18	7.93
A 7 ☐ 15M42500		635	7									
A 7 ☐ 15M43700		939.8	10									
A 7 ☐ 15M44900		1244.6	13									
A 7 ☐ 15M46100		1549.4	16									
A 7 ☐ 15M47300		1854.2	19									

SDP/SI

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Metric
0 10

DUALVEE®

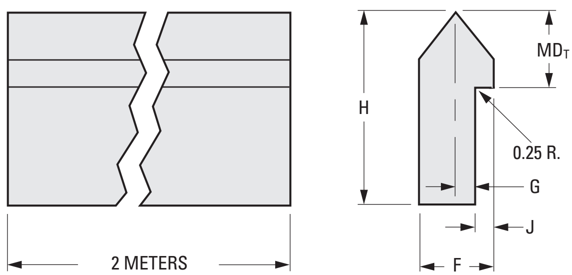
STEEL
STAINLESS STEEL
HARDENED
UNHARDENED

MATERIAL:

Hardened - Steel - AISI 1045 Cold Formed, Induction-Hardened to HRC 58...60
Stainless Steel - AISI 420 Cold Formed, Hardened and Polished on the Top Contact Surfaces

Unhardened - Steel - AISI 1045 Unhardened (as formed)
Stainless Steel - AISI 420 Series Unhardened (as formed)

Except for length, all dimensions are in mm.



The projections shown are per ISO convention.

METRIC COMPONENT								
Catalog Number		Size	H	F	G	MD_T	J
Steel	Stainless						
Hardened - Maximum length: 6.1 meters (on special order)							
A 7Q15M120	**A 7W15M120**	1	11.1	4.75	0.79	3.18	1.57
A 7Q15M220	**A 7W15M220**	2	15.9	6.35		4.75	2.39
A 7Q15M320	**A 7W15M320**	3	22.2	8.71	1.57	6.35	2.77
A 7Q15M420	**A 7W15M420**	4	27	11.1	2.36	7.93	3.18
Unhardened - Maximum length: 6.7 meters (on special order)							
A 7C15M120	**A 7Y15M120**	1	11.1	4.75	0.79	3.18	1.57
A 7C15M220	**A 7Y15M220**	2	15.9	6.35		4.75	2.39
A 7C15M320	**A 7Y15M320**	3	22.2	8.71	1.57	6.35	2.77
A 7C15M420	**A 7Y15M420**	4	27	11.1	2.36	7.93	3.18

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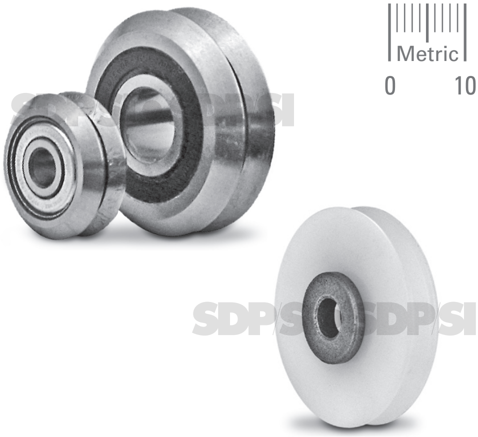
A

PRECISION SERIES
ABEC 5 BEARINGS
ECONOMY SERIES

Metric
0 10



› **MATERIAL:**

Fig. 1 - Wheels - Steel SAE 52100 HRC 60…62
or 440C Stainless Steel HRC 58…60
With Ground Contact Edges
Bearings - Prelubricated;
Steel - Shielded, Stainless - Sealed
Bearing Retainer - Nylon 66
Fig. 2 - Wheel - Acetal
Bearing - Sintered Bronze

Low or high temperature wheels available on special request.

For engineering assistance for all SDP components, call on our application engineers.

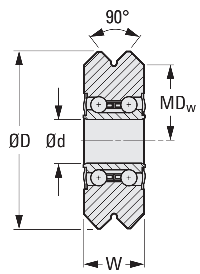


Fig. 1
Precision Series

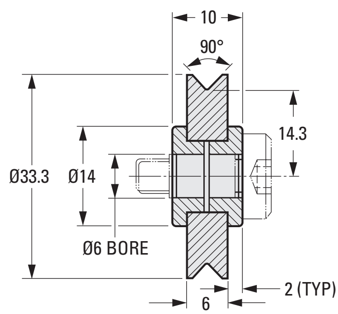


Fig. 2
Economy Series

METRIC COMPONENT

Catalog Number: Steel	Catalog Number: Stainless	Size	D Dia. Clear.	D Dia. Ref.	W	d Bore	MD_W	Radial Working Load Capacity N	Axial Working Load Capacity N
Fig. 1 Precision Series									
A 7Q16M0	—	0	14.83	—	6.35	4	5.94	650	123
ΔA 7Q16M1	**ΔA 7Y16M1**	1	19.8	19.6	7.87	4.76	7.95	1220	252
ΔA 7Q16M2	**ΔA 7Y16M2**	2	31.8	30.7	11.13	9.53	12.7	2650	625
A 7Q16M3	**A 7Y16M3**	3	45.3	45.8	15.88	12	19.05	5900	1701
A 7Q16M4	**A 7Y16M4**	4	60.3	59.9	19.05	15	25.4	9700	4001

ΔBores conform to inch sizes.

See the next page for adapter bushings to use in metric designs.

METRIC COMPONENT

Catalog Number	Bore
Fig. 2 Economy Series	
A 7Z16M3	6 mm

ADAPTER BUSHINGS

ADJUSTABLE OR STATIONARY

Metric
0 10
DUALVEE®

› MATERIAL:
303 Stainless Steel

For Use With Steel Guide Wheels.

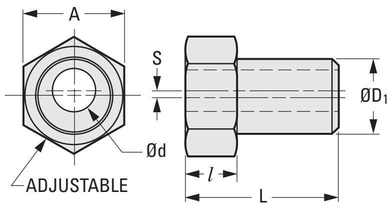


Fig. 1

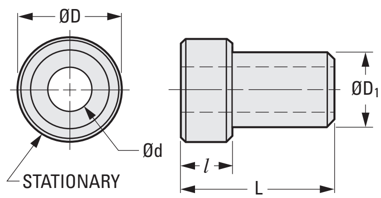


Fig. 2

The projections shown are per ISO convention.

METRIC COMPONENT

Catalog Number	Size	L Ref.	l ± 0.03	D_1 Dia. 0 -0.03	A or D	d Dia. +0.05 0	d Bolt Size	S
Fig. 1 Adjustable Bushings								
A 7X16M1A	1	13.8	6.22	4.76	12	4.01	M4	0.18
A 7X16M2A	2	17.9	6.65	9.52	14	6.1	M6	0.61
A 7X16M3A	3	25.1	9.47	11.99	19	8.1	M8	1.07
A 7X16M4A	4	29.9	11.1	15	22	10.11	M10	1.52
Fig. 2 Stationary Bushings								
A 7X16M1F	1	13.8	6.22	4.76	11.2	4.01	M4	—
A 7X16M2F	2	17.9	6.65	9.52	14.2	6.1	M6	
A 7X16M3F	3	25.1	9.47	11.99	19.1	8.1	M8	
A 7X16M4F	4	29.9	11.1	15	22.4	10.11	M10	

NOTE: M1A and M1F bushings have a small shoulder to support the inner race of the guide wheel's bearing.

STUDDED GUIDE WHEELS

SDP/SI

PHONE: 516.328.3300 • FAX: 516.326.8827 • WWW.SDP-SI.COM

Metric

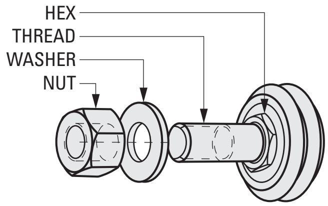
0 10

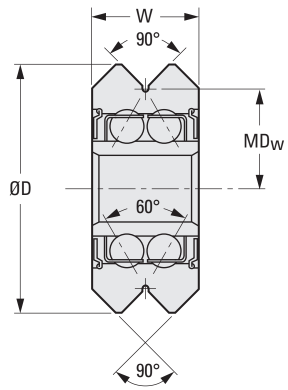
DUALVEE®

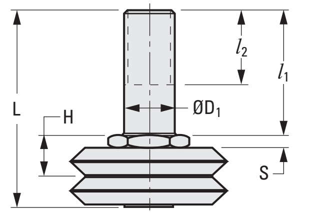
SIZES 0, 1, 2
EASY INSTALLATION
ADJUSTABLE OR STATIONARY

MATERIAL:

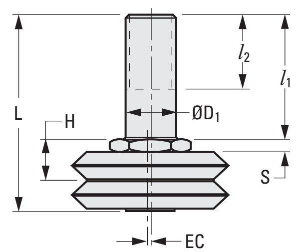
Wheel - Steel SAE 52100
Bearing - Prelubricated - Sealed (Size 0)
Shielded (Size 1 & 2)
Nuts - DIN 934 (18-8 Stainless Steel)
Washer - DIN 125 (18-8 Stainless Steel)







Stationary Stud



Adjustable Stud

METRIC COMPONENT

Catalog Number	Size	EC Offset ± 0.13	L Overall Length	D_1 Journal Dia. 0 -0.02	l_1 Journal Length	l_2 Thread Length	Thread	S Shoulder Thick. ± 0.03	H Vee Height ± 0.05
A 7Q17M0STA	0	—	18.8	3.98	9.9	6.1	M4 x 0.7	2	5.2
A 7Q17M0ADJ		0.3							
A 7Q17M1STA	1	—	25.4	5.97	15	8.9	M6 x 1	2.1	6
A 7Q17M1ADJ		0.4							
A 7Q17M2STA	2	—	39.1	9.97	24.9	15	M10 x 1.5	2.6	8.2
A 7Q17M2ADJ		0.6							

Catalog Number (Ref.)	Hex Size	Nut and Washer	D Dia.	W 0 -0.12	MDw	Static Radial Load Rating N	Dynamic Radial Load Rating N	Static Axial Load Rating N	Dynamic Axial Load Rating N
A 7Q17M0STA	11	M4	14.83	6.35	5.94	500	1050	470	530
A 7Q17M0ADJ									
A 7Q17M1STA	12	M6	19.68	7.87	7.95	1110	2180	1040	1090
A 7Q17M1ADJ									
A 7Q17M2STA	14	M10	30.73	11.13	12.7	2780	4700	2630	2380
A 7Q17M2ADJ									

NOTE: Load ratings are according to AFBMA STD9-1990.

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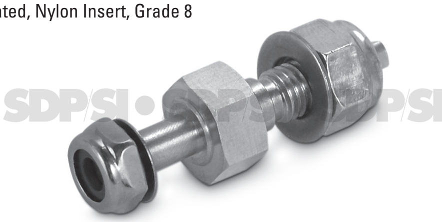
Metric
0 10
DUALVEE®

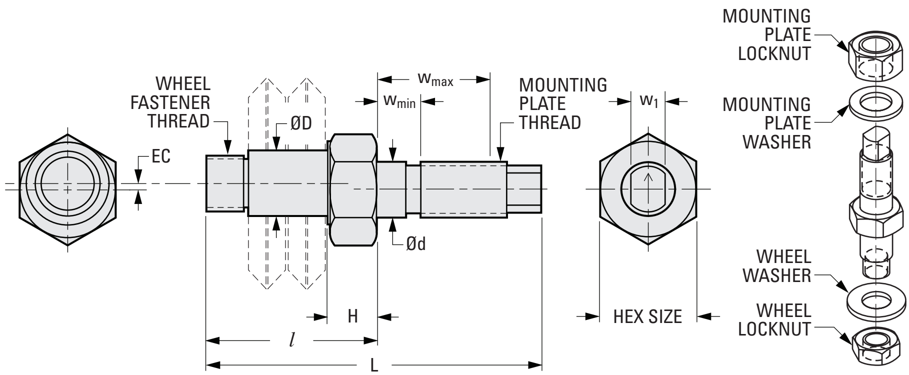
MATERIAL:

Journal - Stainless Steel
Washers - Stainless Steel
Wheel Locknut - Steel, Zinc Plated, Nylon Insert, Grade 2
Mounting Plate Locknut - Steel, Zinc Plated, Nylon Insert, Grade 8

SPECIFICATION:

Metric equivalent of Inch Component
A 7X17-...





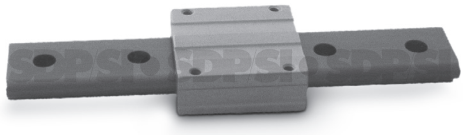
METRIC COMPONENT

Catalog Number	Size	EC Offset	H Head Height	*l* Clearance Length	L Overall Length	D* Outside Dia. 0 -0.018	d Journal Dia. 0 -0.05	Mounting Plate Thread◊	Wheel Fastener Thread◊	W1 Adjustment Flat Width
A 7X17MJA0*	0	0.254	6.35	16.13	35.05	3.99	6.35	1/4-28	#8-32	3.18
A 7X17MJF0*		—								
A 7X17MJA1	1	0.305	6.35	17.65	36.58	4.76	6.35	1/4-28	#10-32	3.18
A 7X17MJF1		—								
A 7X17MJA2	2	0.61	7.14	24.54	51.56	9.52	9.53	3/8-24	5/16-24	6.35
A 7X17MJF2		—								
A 7X17MJA3	3	1.067	9.53	32.39	64.26	11.99	11.1	7/16-20	7/16-20	6.35
A 7X17MJF3		—								
A 7X17MJA4	4	1.524	11.1	39.04	77.22	15	12.7	1/2-20	1/2-20	7.92
A 7X17MJF4		—								

Catalog Number (Ref.)	Size	Hex Size	Mounting Plate Width		Weight g	Hardware Supplied◊			
			Wmax	Wmin		Wheel Washer	Wheel Locknut	Mounting Plate Washer	Mounting Plate Locknut
A 7X17MJA0	0	3/8	9.53	3.18	14	—	#8	1/4 Flat Washer	1/4
A 7X17MJF0									
A 7X17MJA1	1	7/16	9.53	3.18	16.1	#8 Flat Washer	#10	1/4 Flat Washer	1/4
A 7X17MJF1									
A 7X17MJA2	2	9/16	12.7	4.75	45.7	5/16 Flat Washer	5/16	3/8 Flat Washer	3/8
A 7X17MJF2									
A 7X17MJA3	3	3/4	15.88	6.35	78	7/16 Flat Washer	7/16	7/16 Flat Washer	7/16
A 7X17MJF3									
A 7X17MJA4	4	7/8	19.05	9.53	133.1	1/2 Flat Washer	1/2	1/2 Flat Washer	1/2
A 7X17MJF4									

* Diameter Tolerance: 0/-0.013
◊ Inch Designation.

QUIET RUNNING
SELF-LUBRICATING
TOLERATES SHOCK LOADS
CORROSION-RESISTANT
DAMPENS VIBRATION



Metric
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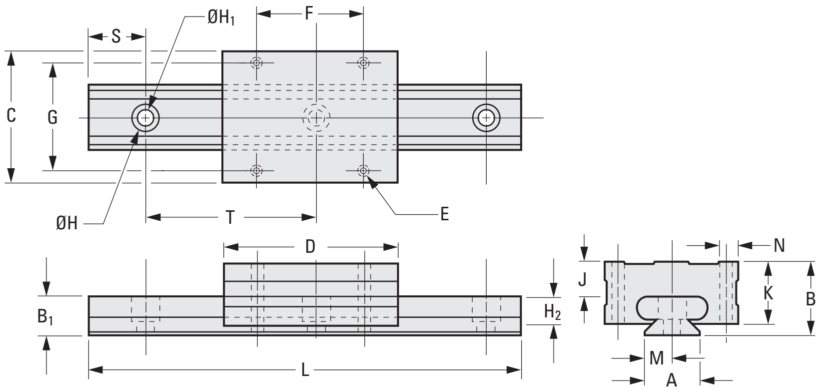


METRIC COMPONENT CATALOG NUMBER

S 6 4 A M R M □ □□ □□□

Type **Size Code** **Length Code**

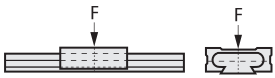
A – Precision 0.025 – 0.051 running clearance. FrelonGOLD® material on HRC70 ceramic-coated aluminum
B – Compensated Precision 0.064 – 0.089 running clearance. FrelonGOLD® material on HRC70 ceramic-coated aluminum

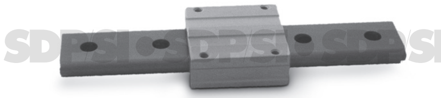
Size Code	**Length Code** (Length in mm)						
07	**040** 40	**070** 70	**085** 85	**100** 100	**130** 130	—	—
09	**055** 55	**075** 75	**095** 95	**115** 115	**155** 155	**195** 195	**275** 275
12	**120** 120	**170** 170	**220** 220	**270** 270	**320** 320	**370** 370	**470** 470
15	**150** 150	**230** 230	**310** 310	**430** 430	**470** 470	**670** 670	—
20	**220** 220	**280** 280	**340** 340	**460** 460	**640** 640	**880** 880	—

Size Code (Ref.)	**A**	**B**	**B_1**	**C**	**D**	**E**	**F**	**G**	**H**	**H_1**	**H_2**	**K**	**J**	**M**	**N**	**S**	**T**
07	7	8	6.1	17	24	M2	8	12	4.2	2.4	2.3	6.2	1.7	3.5	2.3	5	15
09	9	10	7.1	20	30		13	15	4.5	2.6	3	8	2.4	4.5	2.5	7.5	20
12	12	13	8	27	34	M3	15	20	6	3.5	3.5	10.7	4.6	6	3.5	10	25
15	15	16	9.2	32	42		20	25			4.5	14.1	6.3	7.5		15	40
20	20	25	13.4	46	62	M4	38	38	9.5	6	8.5	21.2	11.2	10	4	20	60

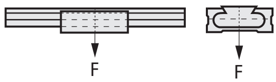
NOTES: 1. Longer lengths are available on special order (maximum length 3600 mm)
2. If more than one carriage is needed per track, contact our engineering department.

Size	Force N (lb.)	Max. Static Load N (lb.)
7	445 (100.04)	734 (165.00)
9	667 (149.94)	1557 (350.01)
12	1334 (299.88)	1957 (439.93)
15	2224 (499.96)	3114 (700.03)
20	3559 (800.06)	6005 (1349.92)

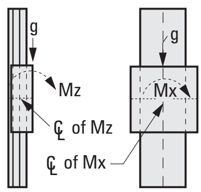




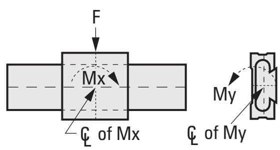
Size	Force N (lb.)
7	89 (20.01)
9	125 (28.10)
12	222 (49.91)
15	356 (80.03)
20	578 (129.93)



Size	Mx N•m (lb. in.)	My N•m (lb. in.)	Mz N•m (lb. in.)
7	2.3 (20.36)	1.8 (15.93)	1.8 (15.93)
9	5 (44.25)	3.2 (28.32)	3.2 (28.32)
12	9 (79.66)	5.6 (49.56)	5.6 (49.56)
15	15.1 (133.65)	9 (79.66)	9 (79.66)
20	24.9 (220.38)	14.7 (130.11)	14.7 (130.11)



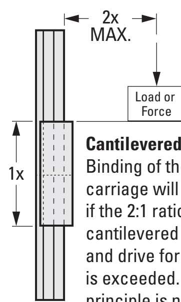
Size	Force N (lb.)	Mx N•m (lb. in.)	My N•m (lb. in.)	Mz N•m (lb. in.)
7	133 (29.90)	2.3 (20.36)	1.8 (15.93)	1.8 (15.93)
9	222 (49.91)	5 (44.25)	3.2 (28.32)	3.2 (28.32)
12	400 (89.92)	9 (79.66)	5.6 (49.56)	5.6 (49.56)
15	667 (149.94)	15.1 (133.65)	9 (79.66)	9 (79.66)
20	1112 (249.98)	24.9 (220.38)	14.7 (130.11)	14.7 (130.11)



Plane bearings are rated by their limiting PV, which is a combination of load over a given surface area and the velocity.

Bearing Material	Max. "PV"	Max. "P"	Max. "V" (No Lubrication)
FrelonGOLD®	20000 (psi x ft./min) or 430 (kgf/cm² x m/min)	3000 psi or 210.9 kgf/cm²	300 ft./min. or 91.44 m/min.
FrelonJ™	10000 (psi x ft./min) or 215 (kgf/cm² x m/min)	1500 psi or 105.45 kgf/cm²	140 ft./min. or 42.66 m/min.

PV = The performance measurement of plane bearings
PV = P x V where P = pressure (load) in psi (kgf/cm²), V = velocity (speed) in ft./min. (m/min.)
NOTES: 1. All three parameters must be met by an application for the bearing to perform properly.
2. Dimensions in ( ) are inch.



Cantilevered Loads
Binding of the carriage will occur if the 2:1 ratio for cantilevered loads and drive forces is exceeded. This principle is not load or force dependent. It is a product of the coefficient of frictions associated with plane bearings.

I R T 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A

Linear Guide System – Low Profile

Carriage glides smoothly on anodized aluminum rails without the need for lubricants. Their low profile design is ideal when space constraints are tight. The rails are offered in 4 widths.

Unique features include:

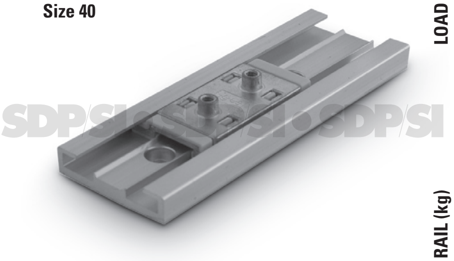
- Low friction without lubrication
- Resistance to dirt and dust
- Small mounting height and width
- Lightweight
- Replaceable polymer sliding elements
- Low-cost alternative to miniature ball bearing systems.

MAXIMUM LOAD PER CARRIAGE

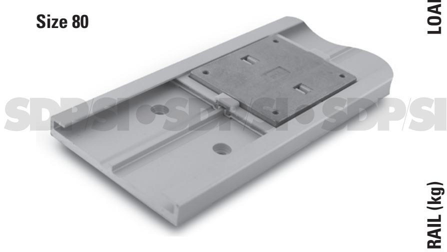
Size 17	5 kg
Size 27	50 kg
Size 40	70 kg
Size 80	100 kg

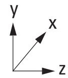
APPLICATION HINT: The mounting surface for rails and bearings should have a very flat surface (e.g. milled surface) in order to enhance performance.

Size 40



Size 80

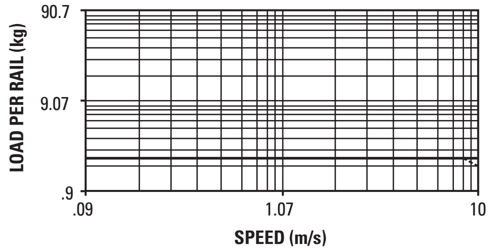




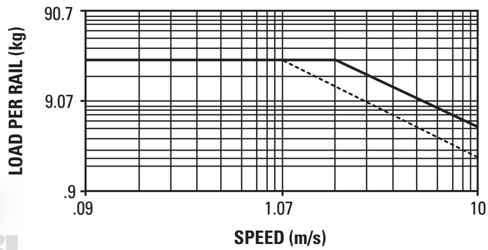
MAXIMUM PERMISSIBLE DYNAMIC LOADS

NOTE: Dotted lines are Z direction.

SIZE 17



SIZE 27



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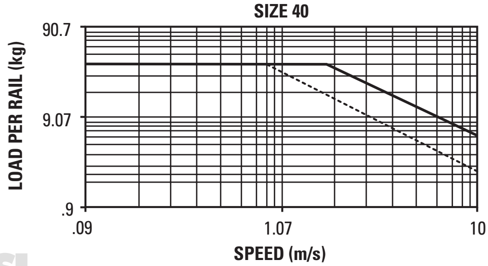
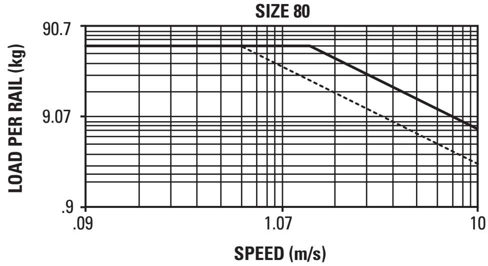


SIZE 80



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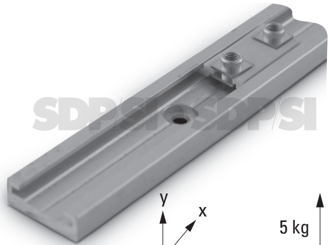
Metric
0 10

LOW-LOAD APPLICATIONS
REPLACEABLE GLIDE PADS
SELF-LUBRICATING
CORROSION-RESISTANT
LOW FRICTION



› MATERIAL:

Rails - Anodized Aluminum
Carriage Assembly - Plastic with Brass threaded inserts and J® Polymer Pads

› OPERATING TEMPERATURE:

-40°C to +90°C

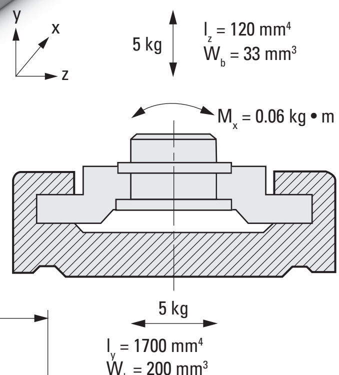
› SPECIFICATIONS:

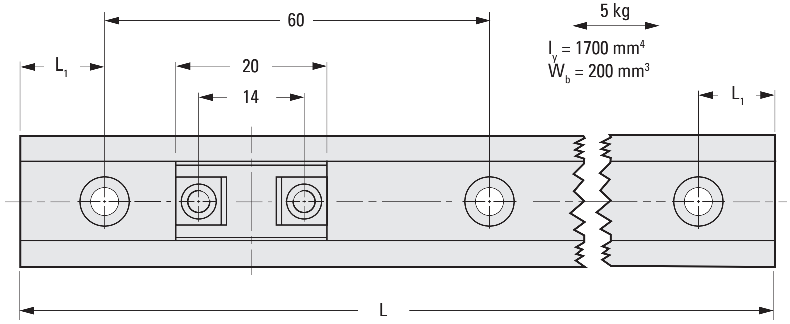
Maximum Load: 50 N
Maximum Speed: 15 m/s

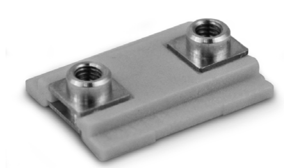
LOAD DATA

I = Moment of Inertia
W_b = Section Modulus
M = Max. Torque

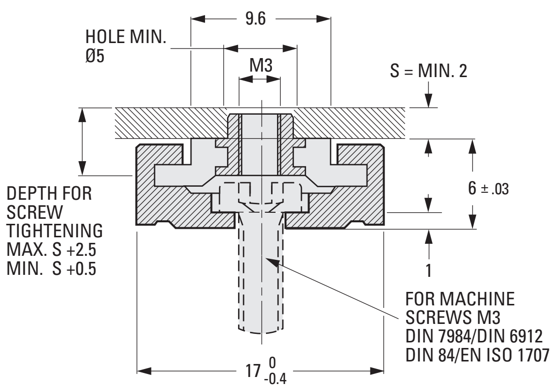
M_y = 0.01 kg • m
M_z = 0.01 kg • m







Carriage Assembly
S99GNCM17202



METRIC COMPONENT

Catalog Number	L Length mm	L_1	Weight g
Rails			
S99GNRM170490	490	35	73.5
S99GNRM170980	980	40	147
S99GNRM171470	1470	45	220.5
S99GNRM171960	1960	20	294
Carriage Assembly			
S99GNCM17202	—	—	1.7

LINEAR GUIDE SYSTEM • LOW PROFILE SIZE 27

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LOW- TO MEDIUM-LOAD APPLICATIONS
REPLACEABLE GLIDE PADS
LOW FRICTION
MOUNTING THROUGH HOLES OR THREADED ADJUSTING STUDS FOR MOUNTING

Metric 0 10

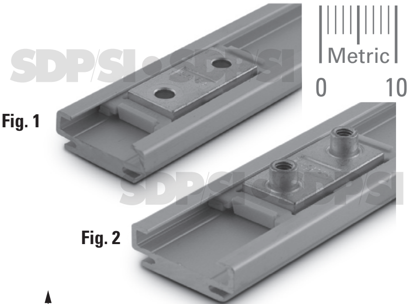


Fig. 1

Fig. 2

MATERIAL:

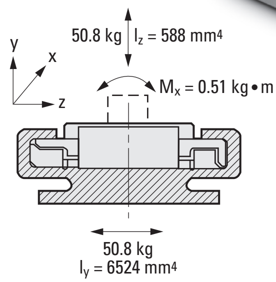
Rails - Anodized Aluminum
Carriage Assembly - Zinc, Chromated and J® Polymer Pads

OPERATING TEMPERATURE:

-40°C to +90°C

SPECIFICATIONS:

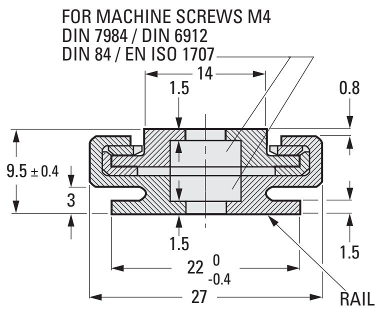
Maximum Load: 500 N
Maximum Speed: 15 m/s



LOAD DATA:
WITH AND WITHOUT MOUNTING STUDS

I = Moment of Inertia
M = Max. Torque

M_y = 0.25 kg • m
M_z = 0.25 kg • m



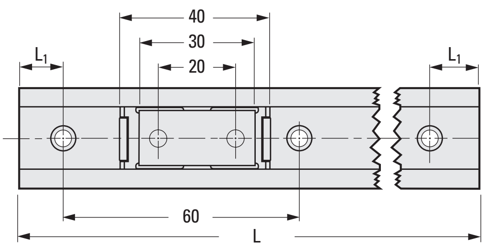
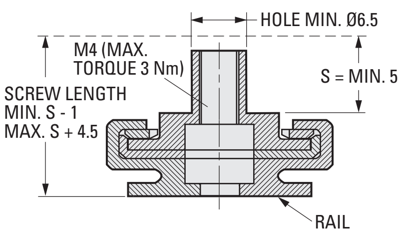


Fig. 1
Without Mounting Studs



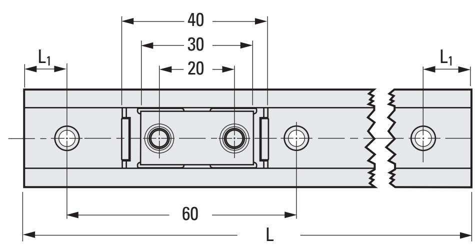


Fig. 2
With Mounting Studs

METRIC COMPONENT

Catalog Number	Fig. No.	L Length mm	L_1	Weight g
Rails				
S99GNRM271000	—	1000	20	290
S99GNRM272000		2000	40	580
S99GNRM273000		3000	30	870
Carriage Assembly				
S99GNCM27A401	1	—	—	10.8
S99GNCM27B402	2			12.5

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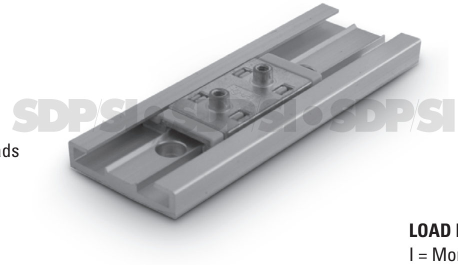
MEDIUM- TO HIGH-LOAD APPLICATIONS
REPLACEABLE GLIDE PADS
LOW FRICTION

Metric
0 10



› MATERIAL:

Rails - Anodized Aluminum
Carriage Assembly - Zinc, Chromated and J® Polymer Pads

› OPERATING TEMPERATURE:

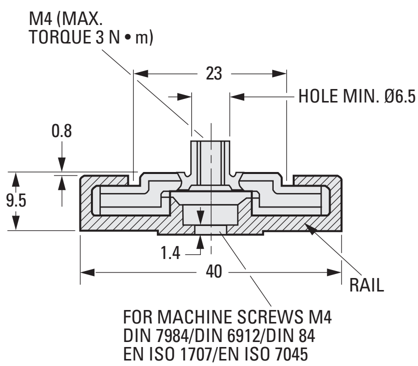
-40°C to +90°C

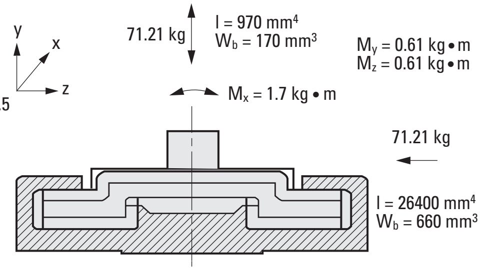
› SPECIFICATIONS:

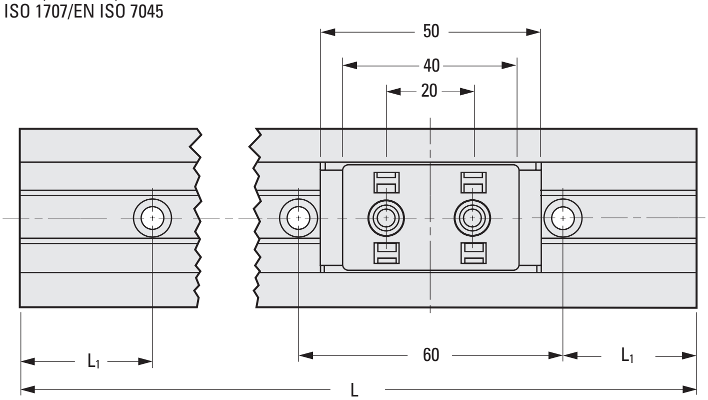
Maximum Load: 700 N
Maximum Speed: 15 m/s

LOAD DATA

I = Moment of Inertia
W_b = Section Modulus
M = Max. Torque







METRIC COMPONENT

Catalog Number	L Length mm	L_1	Weight g
Rails			
S99GNRM401000	1000	20	450
S99GNRM402000	2000	40	900
S99GNRM403000	3000	30	1350
Carriage Assembly			
S99GNCM40502	—	—	30

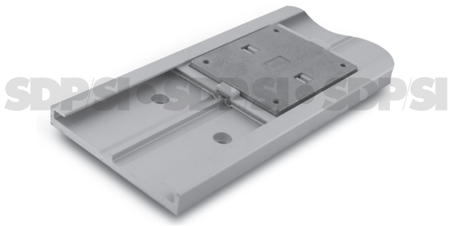
I R T 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A

HIGH-LOAD APPLICATIONS
REPLACEABLE GLIDE PADS
LOW FRICTION

Metric
0 10

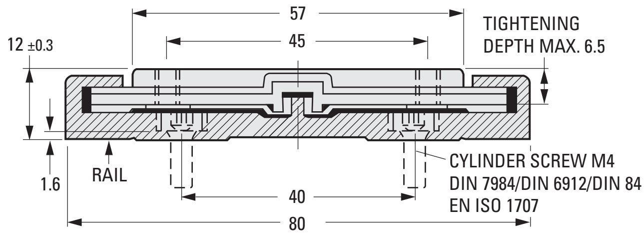
› MATERIAL:

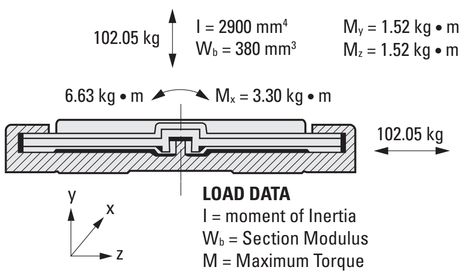
Rails - Anodized Aluminum
Carriage Assembly - Zinc, Chromated and J® Polymer Pads



› SPECIFICATIONS:

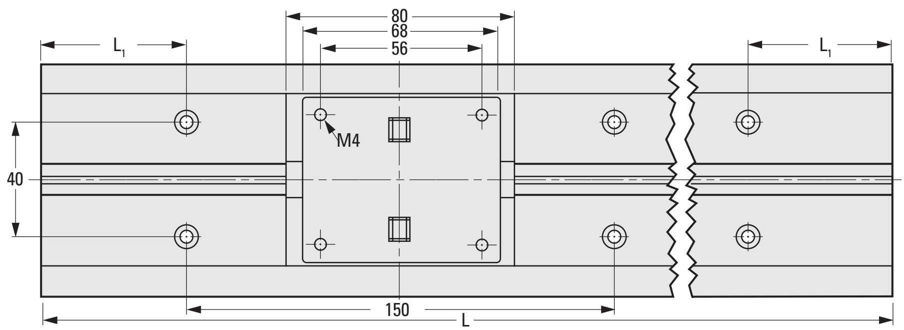
Maximum Load - 50 N
Maximum Speed - 15 m/s
Operating Temperature: -40°C to +90°C





LOAD DATA
I = moment of Inertia
W_b = Section Modulus
M = Maximum Torque

Catalog Number	Weight g
Carriage Assembly	
S99GNCM80802	100



METRIC COMPONENT

Catalog Number	L Length mm	L_1	Weight g
Rails			
S99GNRM800990	990	45	1128.6
S99GNRM801980	1980	90	2257.2
S99GNRM802970	2970	60	3385.8

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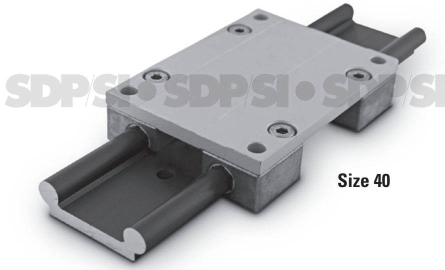
Metric
0 10

Linear Guide System – Heavy-Duty

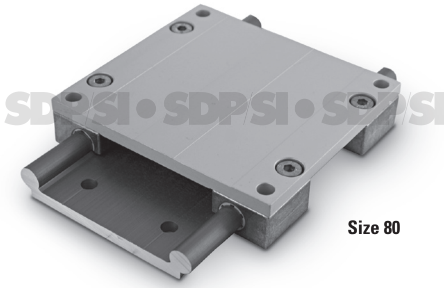
Carriage assembly slides over the specially profiled, hard anodized aluminum rails.
It is available in two sizes.

Unique features include:
- Low friction without lubrication
- Resistance to dirt and dust
- Low weight
- Quiet operation
- Low wear
- Maintenance-free

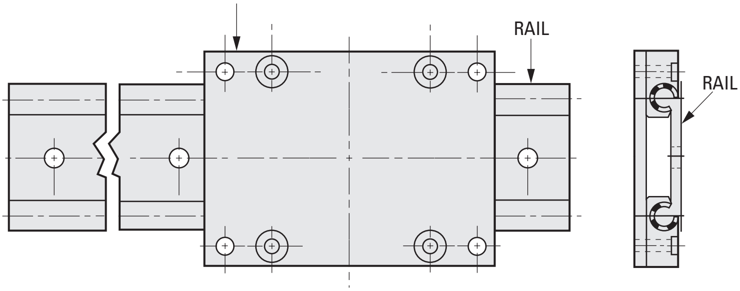
The sliding element is a specially formulated polymer material best suited for hard anodized aluminum rails. This combination results in low abrasion leading to excellent durability. The preconfigured parallel rails eliminate alignment problems and speed assembly. The carriage and rail combination is a compact, space-saving design with easy installation. The low and wide profile withstands high torque.



Size 40



Size 80



OVERVIEW OF GUIDE SYSTEM

LINEAR GUIDE SYSTEM • HEAVY-DUTY • SIZE 40

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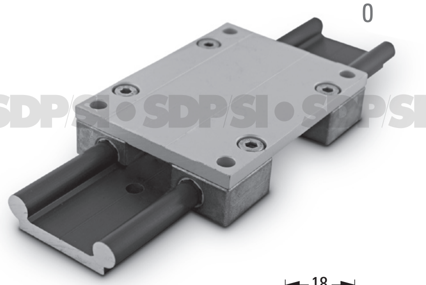
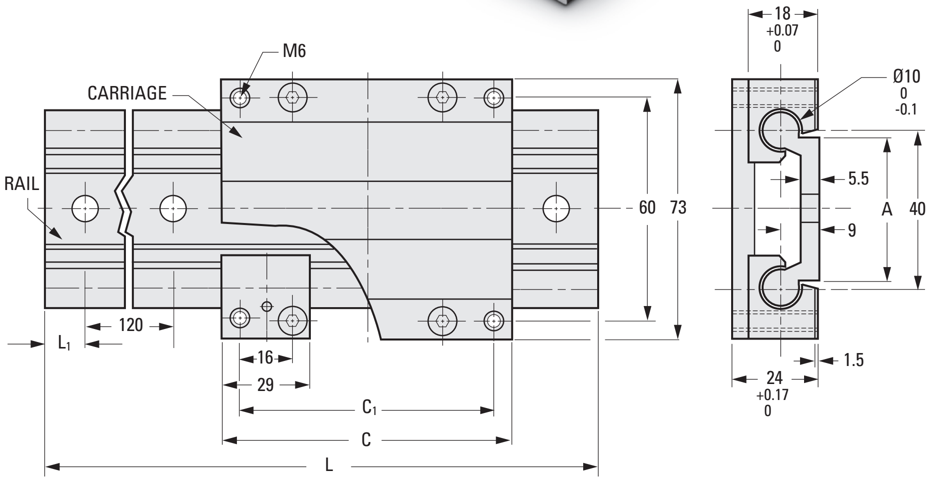
Metric
0 10

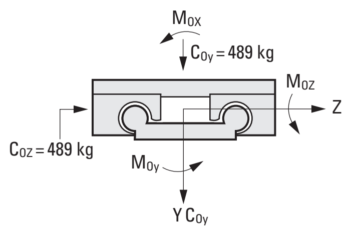
LOW FRICTION
LIGHTWEIGHT
MAINTENANCE-FREE

› MATERIAL:

Rails - Hard Anodized Aluminum
Carriage Assembly - Plate - Aluminum
Blocks - Die Cast Zinc
Bearings - J® Polymer







C= STATIC LOAD CAPACITY

METRIC COMPONENT

Catalog Number	L Length mm	L_1	A 0 -0.3	C	C_1	Moment Load Capacity kg • m			Weight kg
						M_{0X}	M_{0Y}	M_{0Z}	
Rails									
S99GWRM401000	1000	20	40	—	—	—	—	—	1
S99GWRM402000	2000	40							2
S99GWRM404000	4000	20							4
Carriage Assembly									
S99GWCM40100	—	—	—	100	87	9.789	17.323	17.323	0.29
S99GWCM40150				150	137		29.559	29.559	0.34
S99GWCM40200				200	187		41.808	41.808	0.4

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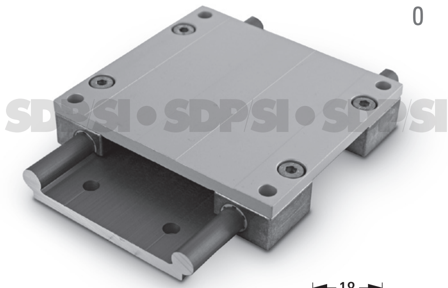
LINEAR GUIDE SYSTEM • HEAVY-DUTY • SIZE 80

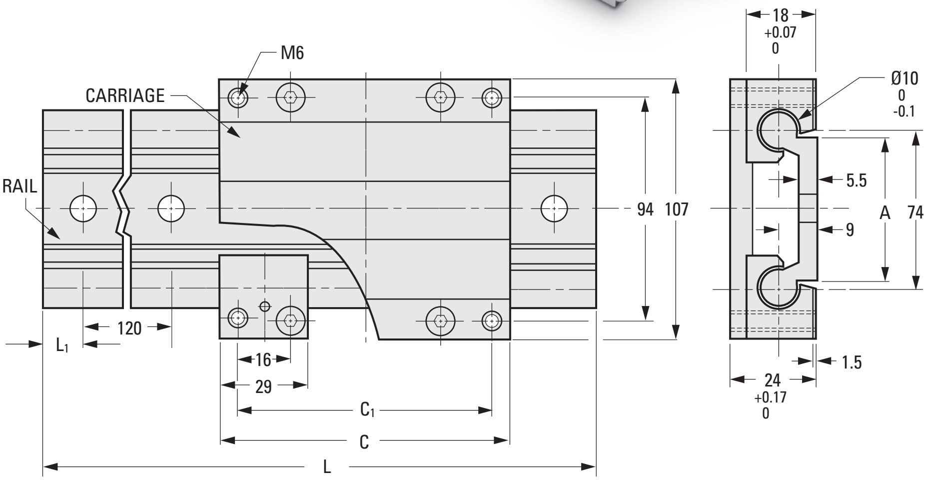
LOW FRICTION
LIGHTWEIGHT
MAINTENANCE-FREE

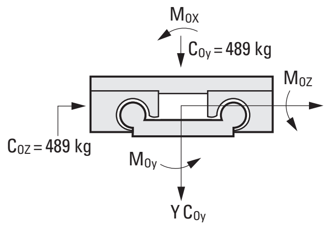
Metric
0 10

› MATERIAL:

Rails - Hard Anodized Aluminum
Carriage Assembly - **Plate** - Aluminum
Blocks - Die Cast Zinc
Bearings - J® Polymer







C= STATIC LOAD CAPACITY

METRIC COMPONENT

Catalog Number	L Length mm	L_1	A 0 -0.3	C	C_1	Moment Load Capacity kg • m M_{OX}	Moment Load Capacity kg • m M_{OY}	Moment Load Capacity kg • m M_{OZ}	Weight kg
Rails									
S99GWRM801000	1000	20							1.5
S99GWRM802000	2000	40	74	—	—	—	—	—	3
S99GWRM804000	4000	20							6
Carriage Assembly									
S99GWCM80100				100	87		17.337	17.337	0.34
S99GWCM80150	—	—	—	150	137	18.139	29.559	29.559	0.42
S99GWCM80200				200	187		41.808	41.808	0.5