



Mini-Rail® Miniature Linear Guides

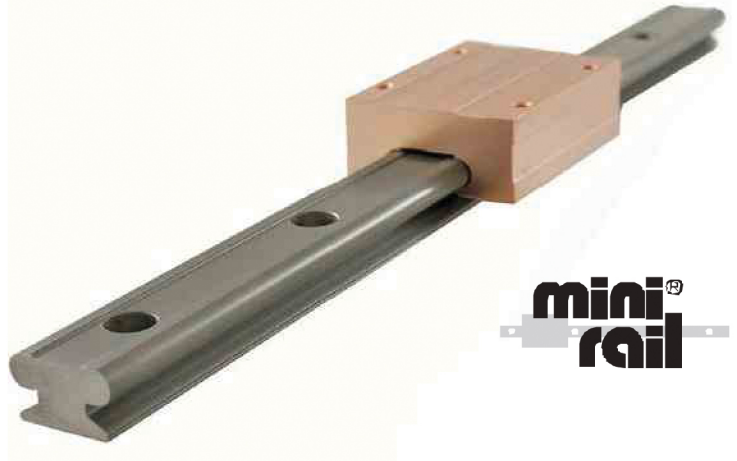
Product Overview

PRODUCT OVERVIEW

An economical alternative to conventional miniature linear guides, Mini-Rail requires no maintenance, is fully interchangeable with industry standard sizes and is maintained in stock for quick delivery.

Mini-Rail miniature linear guides are available in five sizes: 7, 9, 12, 15 and 20mm - in lengths up to 3600mm, meaning no cumbersome butt joints. These guides are precision manufactured out of lightweight aluminum alloys to ensure long life and corrosion resistance.

- No rolling elements
- Self-lubricating Frelon GOLD® Liner
- Withstands vibration and shock
- Corrosion-resistant - ideal in harsh environments
- Ceramic coated, aluminum rail
- Compact design- small footprint

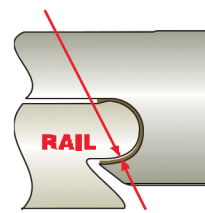


CARRIAGE CONFIGURATIONS

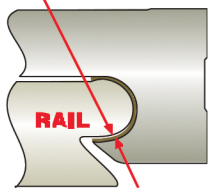
Precision Series: Ceramic coated rails and carriages are corrosion resistant. Frelon GOLD® self-lubricating liner delivers the best overall performance, the highest loads, the best wear life, and speeds. Most precise running clearance for high precision applications.

Compensated Precision Series: Same as Precision Series except with additional clearance provided to tolerate misalignment.

Precision Series
.025 - .051mm
Running Clearance
(CERAMIC COATED)



Compensated Precision Series
.064 - .089mm
Running Clearance
(CERAMIC COATED)

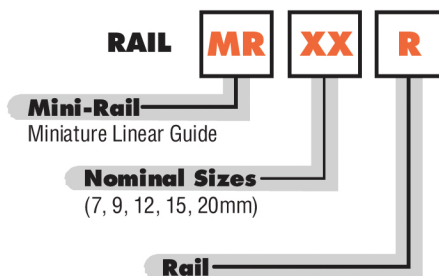
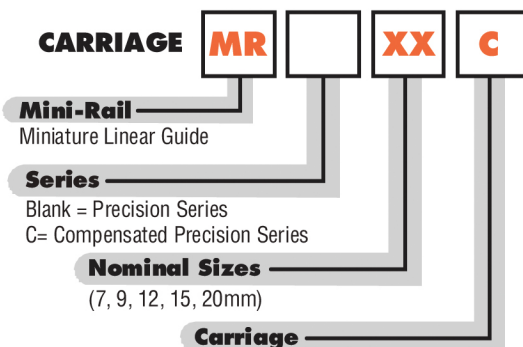


Frelon GOLD® and Frelon® J are Teflon® based materials that are truly self-lubricating. Frelon® materials are bonded to the carriage creating a one-piece unit.

APPLICATIONS

- Medical Precision
- Food Processing
- Automation
- Electronics
- Mobile Home Components
- Packaging
- Product Movement
- Printing
- Semi-conductor

ORDERING INFORMATION

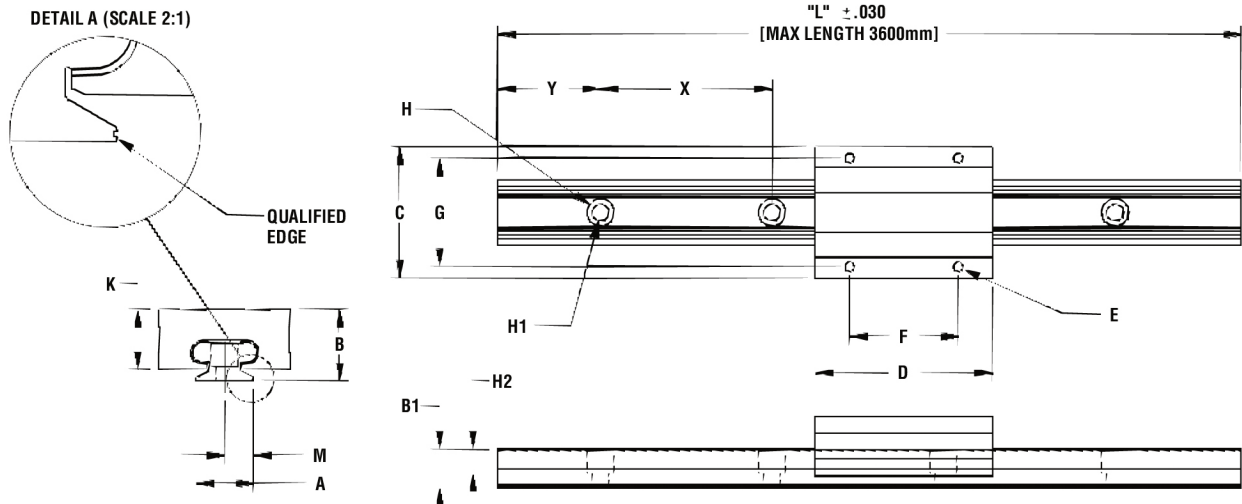


EXAMPLE: MRC20C
MR20R

See following page for Mini-Rail full assembly ordering.



MINI-RAIL - MR



(Maximum Length 3600mm)

Materials: 6061-T6 aluminum rail and carriage, Frelon GOLD® or Frelon® J liner

Max V: 300 sfm for Frelon GOLD, 140 sfm for Frelon J

Max P: 3000 psi for Frelon GOLD, 1500 psi for Frelon J

PART NUMBER	RUNNING CLEARANCE	A	B	B1	C	D	E		F	G	H	H ₁	H ₂	K	M	Y	X	RAIL WT. (gram/mm)	CARRIAGE WT. (gram)	
		BASE WIDTH (mm)	OVERALL HEIGHT	RAIL HEIGHT	CARRIAGE WIDTH	CARRIAGE LENGTH	CARRIAGE MTG. HOLE SIZE	CARRIAGE MTG. HOLE DEPTH	CARRIAGE MTG. HOLE CTR. TO CTR.	RAIL HOLE SIZE			CARRIAGE HEIGHT	RAIL MTG. HOLE TO QUALIFIED EDGE	RAIL HOLE TO END	RAIL HOLE CTR. TO CTR.				
MR7-XXX	.025 - .051	7	8	6.1	17	24	M2 x 0.4	THRU	8	12	4.2	2.4	2.3	6.2	3.5	5	15	0.10	5.7	
MRC7-XXX	.064 - .089																			
MR9-XXX	.025 - .051	9	10	7.1	20	30	M3 x 0.5		13	15	4.5	2.6	3	8.0	4.5	7.5	20	0.16	8.5	
MRC9-XXX	.064 - .089																			
MR12-XXX	.025 - .051	12	13	8.0	27	34	M3 x 0.5		15	20	6	3.5	10.7	6	10	25	0.22	20.0		
MRC12-XXX	.064 - .089																			
MR15-XXX	.025 - .051	15	16	9.2	32	42	M3 x 0.5		20	25	6	3.5	14.1	7.5	15	40	0.38	34.0		
MRC15-XXX	.064 - .089																			
MR20-XXX	.025 - .051	20	25	13.4	46	62	M4 x 0.7		12.5	38	38	9.5	6	8.5	21.2	10	20	60	0.48	127.9
MRC20-XXX	.064 - .089																			

NOTES: Cut-to-length rails are available up to 3600mm.

Standard and cut-to-length rail ends are NOT coated. Fully coated rails are available upon request.

All carriage mounting holes are through tapped except MR20 12.5mm of thread.

The "Y" dimension will remain constant at one end unless requested otherwise.

Add the overall length of the rail to the part number (EX:"MR12-0220" for a Precision Series assembly with a 220mm rail)

ORDERING INFORMATION

ASSEMBLY

MR

XX

XXXX

XX

EXAMPLE: MR12-0220-2

Mini-Rail
Miniature Linear Guide

Series
Blank = Precision Series
C= Compensated Precision Series

FrelonGOLD® bearing material on RC70 ceramic-coated rail

of Carriages

Length of Rail in mm

EX: 50mm = 0050

Nominal Sizes
(7, 9, 12, 15, 20mm)



Mini-Rail® - MR

Technical Information

STATIC LOAD DATA

The numbers below are for rails in a static condition. Refer to the calculations below to establish dynamic parameters.

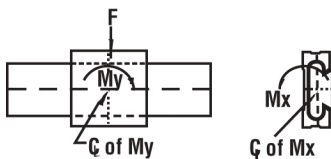
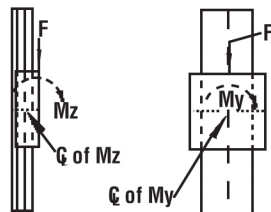
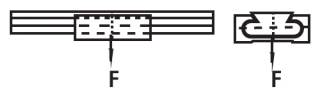
SIZE	F (N)	MSL (N)*
7	445	734
9	667	1557
12	1334	1957
15	2224	3114
20	3559	6005

*Max static load in Newtons.

SIZE	F (N)
7	89
9	125
12	222
15	356
20	578

SIZE	My (N-m)	Mx (N-m)	Mz (N-m)
7	2.3	1.8	1.8
9	5.0	3.2	3.2
12	9.0	5.6	5.6
15	15.1	9.0	9.0
20	24.9	14.7	14.7

SIZE	F (N)	My (N-m)	Mx (N-m)	Mz (N-m)
7	133	2.3	1.8	1.8
9	222	5.0	3.2	3.2
12	400	9.0	5.6	5.6
15	667	15.1	9.0	9.0
20	1112	24.9	14.7	14.7



PERFORMANCE RATINGS FOR LINEAR MOTION

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)
Frelon GOLD®	20,000 (psi x ft./min.) or 0.7 N/mm ² x m/s	3000 psi or 20.68 N/mm ²	300 sfm or 1.524 m/s
Frelon® J	10,000 (psi x ft./min.) or 0.35 N/mm ² x m/s	1500 psi or 10.34 N/mm ²	140 sfm or 0.711 m/s

PV = The performance measurement of plane bearings.

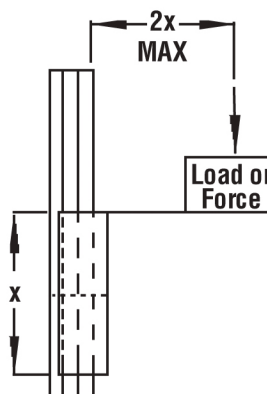
PV = P x V, where P = pressure (load) in psi (kgf/cm²)

V = velocity (speed) in sfm (m/min.)

NOTE: All three parameters must be met by an application for the bearing to perform properly.

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. Contact factory or website for additional information.



LOAD/MOMENT CONVERSION

$$N = 4.45 \times (\text{lbs.})$$

$$N\cdot m = 0.113 \times (\text{in.-lbs.})$$



Low Profile Mini-Rail® - LPM

Miniature Guide/Slide Motion Systems

LOW PROFILE MINI-RAIL® - LPM

- Low profile for small spaces
- Low cost polymer slider
- Molded SS threaded Inserts
- Double rail track
- Ideal in harsh environments
- Available in four sizes



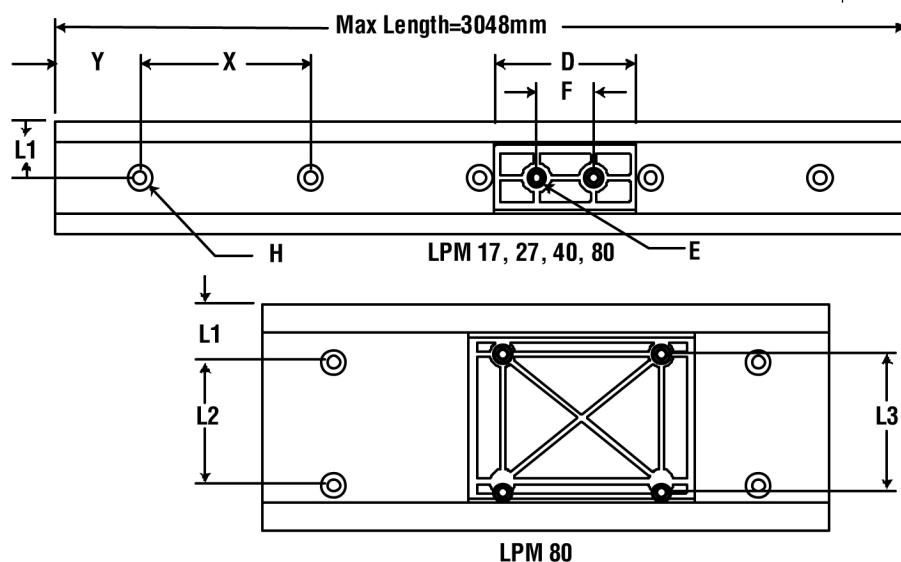
Materials: SimGlide™-J Polymer slider (UL 94 HB flammability rating)
Molded-in stainless steel thread inserts
Anodized aluminum rails

Operating Temperatures: -35C to 65C (-30F to 150F)

Chemical Resistance: Resistant to lubricants, fuels, dyes, weak acids

Maximum Velocity: 10 m/s

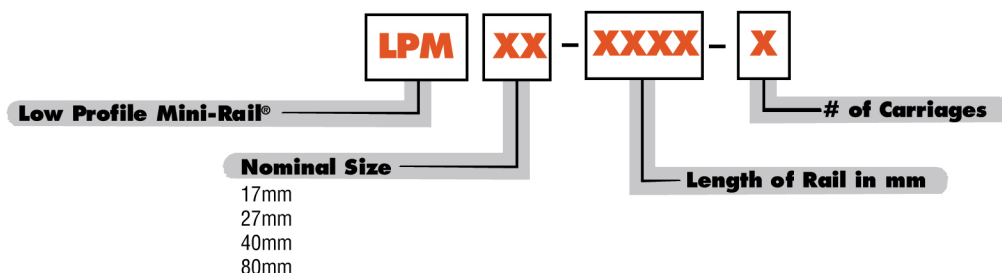
Load Reduction Factor: 0.7-1.0 for low speed application; 0.4-0.7 for medium speed application; 0.1-0.4 for high speed application



PART NUMBER	A1 (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	H (C'BORE) (mm)	L1 (mm)	L2 (mm)	L3 (mm)	Y (mm)	X (mm)	CAR- RIAGE WT. (g)	RAIL UNIT WT. (g/mm)	LOAD CAPACITY									
																Fy		Fz		Mx		My		Mz	
																(N)	(lbs.)	(N)	(lbs.)	(N-m)	(lbs.- in.)	(N-m)	(lbs.- in.)	(N-m)	(lbs.- in.)
LPM17	14.6	17	6	9.6	25	M3 x 0.5	14	M3 SBHCS	8.5	N/A	N/A	20	60	1.1	0.15	35	8	10	2.5	0.2	1.5	0.3	2.5	0.2	1.5
LPM27	24	27	9.5	14	40	M4 x 0.7	20	M4 SBHCS	13.5	N/A	N/A	20	60	4.8	0.33	130	30	85	20	1	10	2.5	20	1	10
LPM40	36	40	9.5	23	50	M4 x 0.7	20	M4 SBHCS	20	N/A	N/A	20	60	9.8	0.38	270	60	150	35	2.5	25	5	50	2.5	25
LPM80	75.2	80	12.0	57	80	M4 x 0.7	56	M4 SBHCS	20	40	45	25	150	32.3	1.07	515	120	250	55	7	60	14	125	7	60

NOTE: Apply a load reduction factor 0.25 on Fy rating if the system is used inverted.

ORDERING INFORMATION



EXAMPLE: LPMXX-XXXX-X



Mini-Rail® - LS

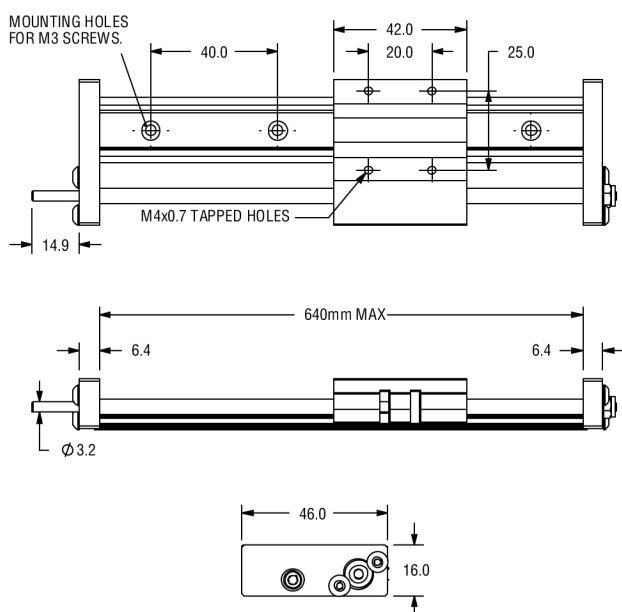
Miniature Lead Screw - Driven Slides

MINI-RAIL® LS - LEAD SCREW DRIVEN

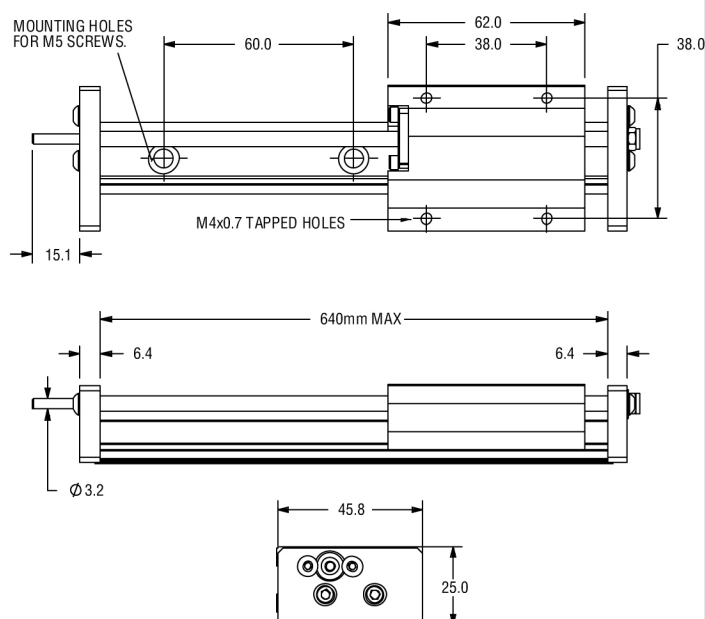
- Right hand rolled thread
- 303 stainless steel screw with TFE coating
- Self-lubricating Polyacetal, anti-backlash nut
- Lengths up to 640mm
- Three (3) leads available
- Optional hand brake



MR15LS

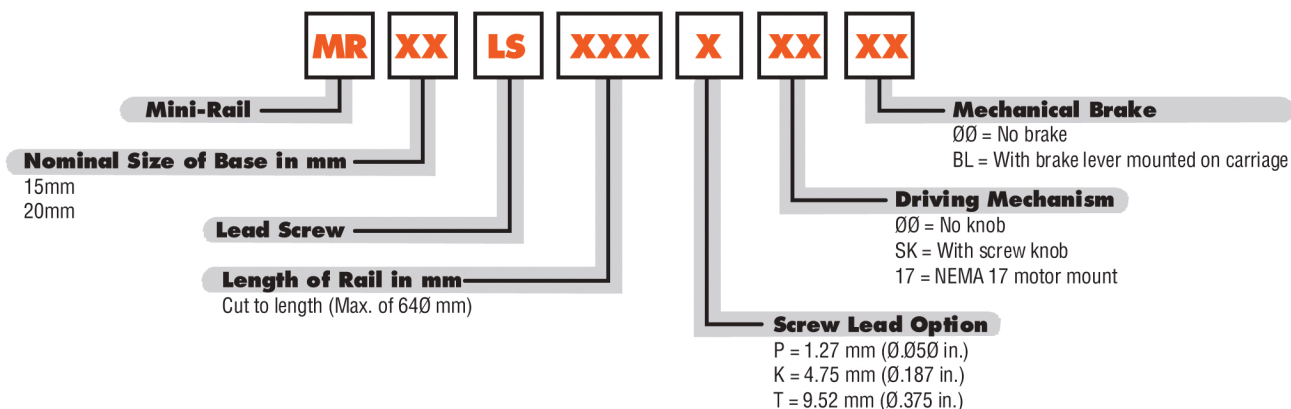


MR20LS



NOTES: Maximum length for lead screw driven MR is 640mm.
Standard and cut-to-length rail ends are NOT coated. Fully coated rails are available upon request.

ORDERING INFORMATION





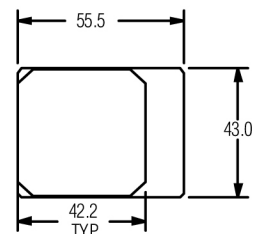
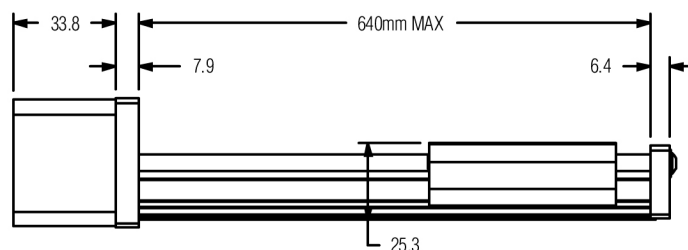
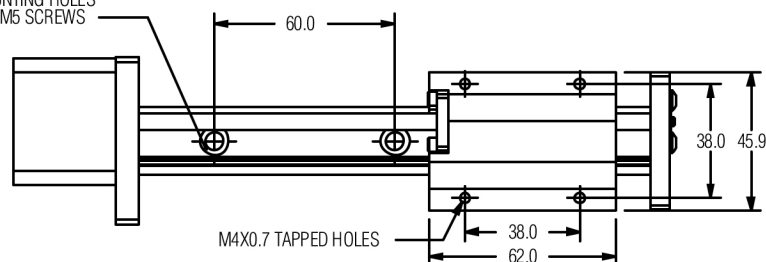
MINI-RAIL® MS - LEAD SCREW DRIVEN

- Robust design - outstanding reliability
- Fewer parts - less maintenance
- Preloaded drive nut - eliminates backlash
- High torque stepper motor (NEMA 17)
- Low cost
- Lengths up to 640 mm
- Ball bearing supports
- Integral screw
- Three (3) leads available



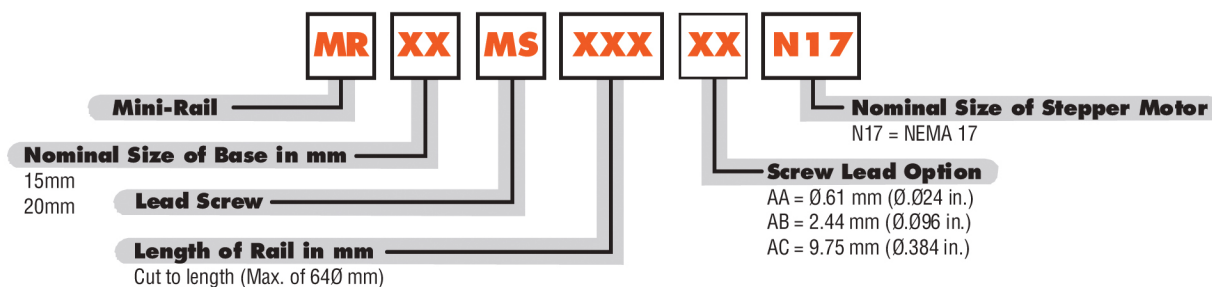
MR20MS

MOUNTING HOLES
FOR M5 SCREWS



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ORDERING INFORMATION





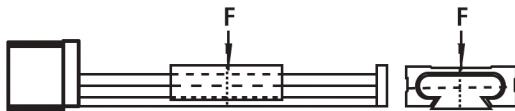
Mini-Rail® LS/MS

Technical Information

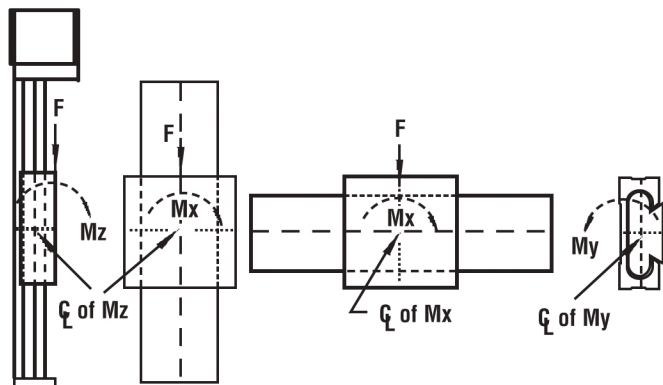
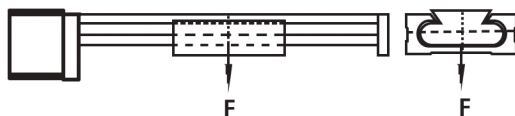
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3559	6005



F (N)
578



F (N)	Mx (N-m)	My (N-m)	Mz (N-m)
1112	24.9	14.7	14.7

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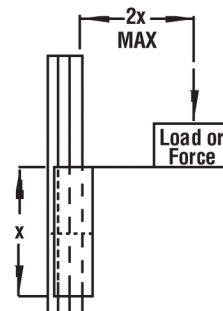
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CANTILEVERED LOADS

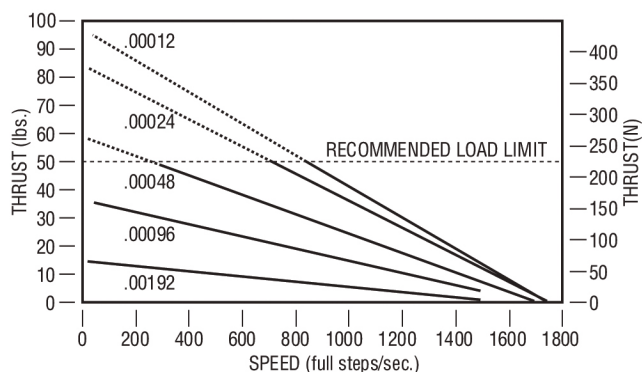
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LOAD/MOMENT CONVERSION

N = 4.45 x (lbs.)

N-m = 0.113 x (in.-lbs.)



Size 17 Stepper Motor with 5.54mm (0.218") Screw

LINEAR TRAVEL PER STEP
.001524 mm (.00006")
.003048 mm (.00012")
.006096 mm (.00024")
.012192 mm (.00048")
.024384 mm (.00096")
.048768 mm (.00192")

NOTES: Rail ends are NOT coated. Fully coated rails are available upon request.