

Precision Linear Rail

PMI Group

THE DYNAMICS OF MOVEMENT



PMI GROUP, LINEAR MOTION TECHNOLOGY:
Partners with Matara for over 20 years, PMI specialise in manufacturing high quality linear rail and carriages, supplying multiple industries worldwide.

Cut To Specification In-House Large UK Stock

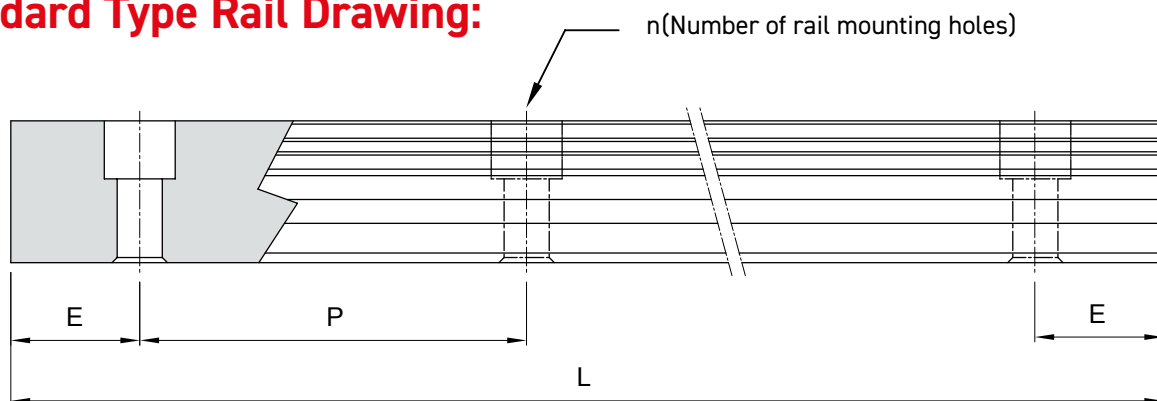
PMI Linear Rail Order Example

Code: **MSA 25 A 2 SS FO** **+R 1200 -20 /40 P** **II**
Options: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

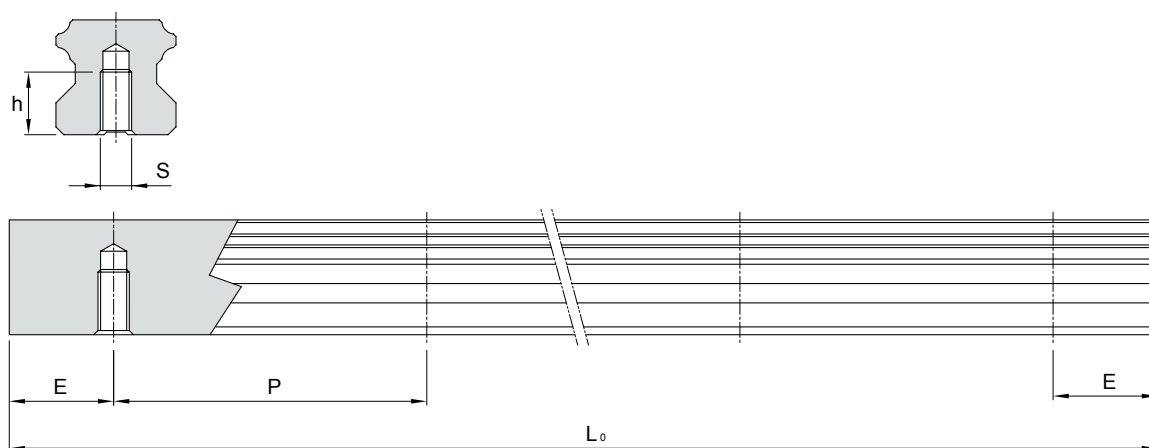
Options		Linear Rail Series						
1		MSA	MSB	MSC/ MSD	MSG	SME	SMR	MSR
2	Size	15, 20, 25, 30, 35, 45, 55, 65	15, 20, 25, 30, 35	7, 9, 12, 15	21, 27, 35	15, 20, 25, 30, 35, 45	20, 25, 30, 35, 45, 55, 65	20, 25, 30, 35, 45, 55, 65
3	Carriage Type	E, S	TE, TS, E, S, LE, LS	M, LM	E, S	EA, EB, SA SB/SV, LEA, LEB, LSA, LSB/LSV	E, S, LE, LS	E, S, LE, LS
4	No. Carriage Per Rail	1, 2, 3,...						
5	Carriage dust protection	No symbol, UU, SS, ZZ, DD, KK, LL, RR, HD Please see Dust Proof table (p.41)						
6	Pre-Load *	FC, F0, F1		FC, F0	FC, F0, F1	FC, F0	F0, F1, F2	
7	Code of Special carriage	No symbol, A, B						
8	Rail Type	R, T	R, U, T	R	R	R, T	R, T	R, T
9	Rail Length (mm)	Please see Rail Dimensions table (p.4-5)						
10	Rail hole pitch from start side (E1)	Please see Rail Dimensions table (p.4-5)						
11	Rail hole pitch from end side (E2)	Please see Rail Dimensions table (p.4-5)						
12	Accuracy Grade	N, H, P, SP, UP	N, H, P, SP, UP	N, H, P	N, H, P, SP, UP	N, H, P	H, P, SP, UP	H, P, SP, UP
13	Code of Special Rail	No symbol, A, B ...						
14	Dust Protection Option Of Rail	Refer to Code of Contamination table (p.38)						
15	Number Of Rails Per Axis	No symbol, II, III, IV ...						

* FC (Light Pre-Load),
F0 (Medium Pre-Load),
F1 (Heavy Pre-Load)
F2 (Ultra Heavy Pre-Load)

Standard Type Rail Drawing:



Tapped Hole Type Rail Drawing:



$$L = (n-1) \times P + 2 \times E$$

L : Total Length of rail (mm)

n : Number of mounting holes

P : Distance between any two holes (mm)

E : Distance from the centre of the last hole to the edge (mm)

Standard & Tapped Type Dimensions:

Model No.	Standard Pitch (P)	Standard (Estd.)	Minimum ($E_{min.}$)	Max ($L_0 \text{ max.}$)	S (Tapped Only)	h (mm) (Tapped Only)
MSA 15	60	20	5	4000	M5	8
MSA 20	60	20	6	4000	M6	10
MSA 25	60	20	7	4000	M6	12
MSA 30	80	20	8	4000	M8	15
MSA 35	80	20	8	4000	M8	17
MSA 45	105	22.5	11	4000	M12	24
MSA 55	120	30	13	4000	M14	24
MSA 65	150	35	14	4000	M20	30

Model No.	Standard Pitch (P)	Standard (Estd.)	Minimum (E _{min.})	Standard Max (L _{0 max.})	S (Tapped Only)	h (mm) (Tapped Only)
MSB 15	60	20	5	4000	M5	7
MSB 20	60	20	6	4000	M6	9
MSB 25	60	20	7	4000	M6	10
MSB 30	80	20	7	4000	M8	14
MSB 35	80	20	8	4000	M8	16
MSC 7	15	5	3	1000	Tapped Type Not Available	
MSC 9	20	7.5	4	1000	Tapped Type Not Available	
MSC 12	25	10	4	1000	Tapped Type Not Available	
MSC 15	40	15	4	1000	Tapped Type Not Available	
MSD 7	30	10	3	1000	Tapped Type Not Available	
MSD 9	30	10	4	1000	Tapped Type Not Available	
MSD 12	40	15	4	1000	Tapped Type Not Available	
MSD 15	40	15	4	1000	Tapped Type Not Available	
MSG 21	50	15	5	3000	Tapped Type Not Available	
MSG 27	60	20	5	3000	Tapped Type Not Available	
MSG 35	80	20	7	3000	Tapped Type Not Available	
SME 15	60	20	5	4000	M5	8
SME 20	60	20	6	4000	M6	10
SME 25	60	20	7	4000	M6	12
SME 30	80	20	8	4000	M8	15
SME 35	80	20	8	4000	M8	17
SME 45	105	22.5	11	4000	M12	24
MSR 20	30	20	6	4000	M6	11
MSR 25	30	20	7	4000	M6	12
MSR 30	40	20	8	4000	M8	15
MSR 35	40	20	8	4000	M8	17
MSR 45	52.5	22.5	11	4000	M12	24
MSR 55	60	30	13	4000	M14	24
MSR 65	75	35	14	4000	M20	30
SMR 25	30	20	7	4000	M6	12
SMR 30	40	20	8	4000	M8	15
SMR 35	40	20	8	4000	M8	17
SMR 45	52.5	22.5	11	4000	M12	24
SMR 55	60	30	13	4000	M14	24
SMR 65	75	35	14	4000	M20	30

Linear Rail
MSA
MSB
MSC
MSD
MSG
SME
SMR
MSR
Options
Rollscrews
Power
End
Couplings
Range

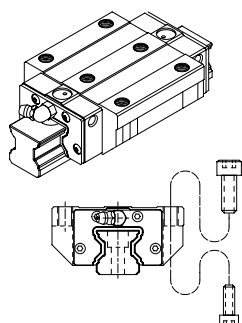
MSR Series Full Roller Type Linear Rail

Carriage Types:

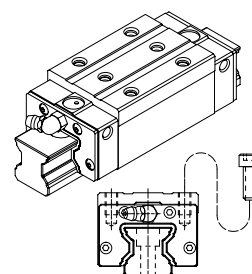
MSR-E Type

Heavy Load

MSR-S Type



This type allows for installation of the bolt from either the bottom or top side of the carriage.

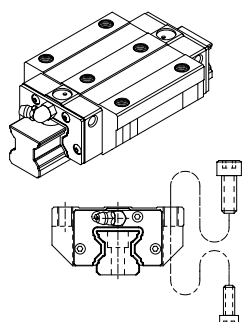


Square type with smaller width and can be installed from the top side of the carriage.

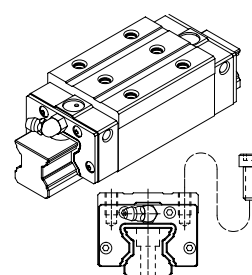
MSR-LE Type

Ultra Heavy Load

MSR-LS Type



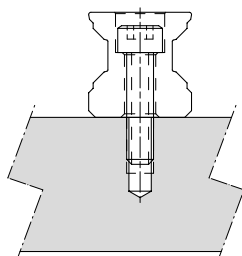
All dimensions are same as MSR-E except the length is longer, which makes it more rigid.



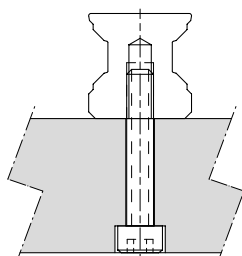
All dimensions are same as MSR-S except the length is longer, which makes it more rigid.

MSR Linear Rail Types

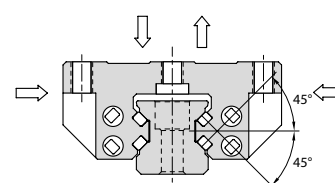
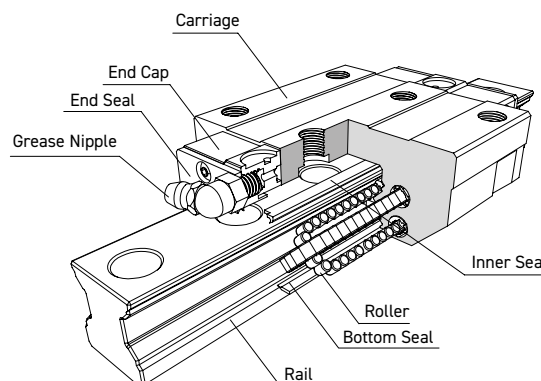
Counter Bore (R Type)



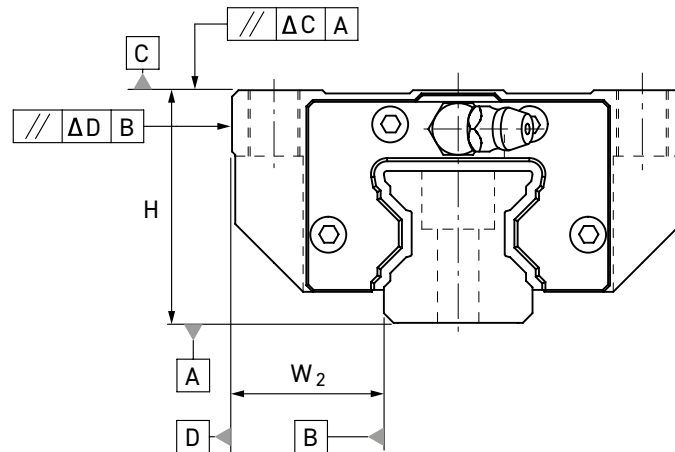
Tapped Hole (T Type)



MSR Carriage Construction



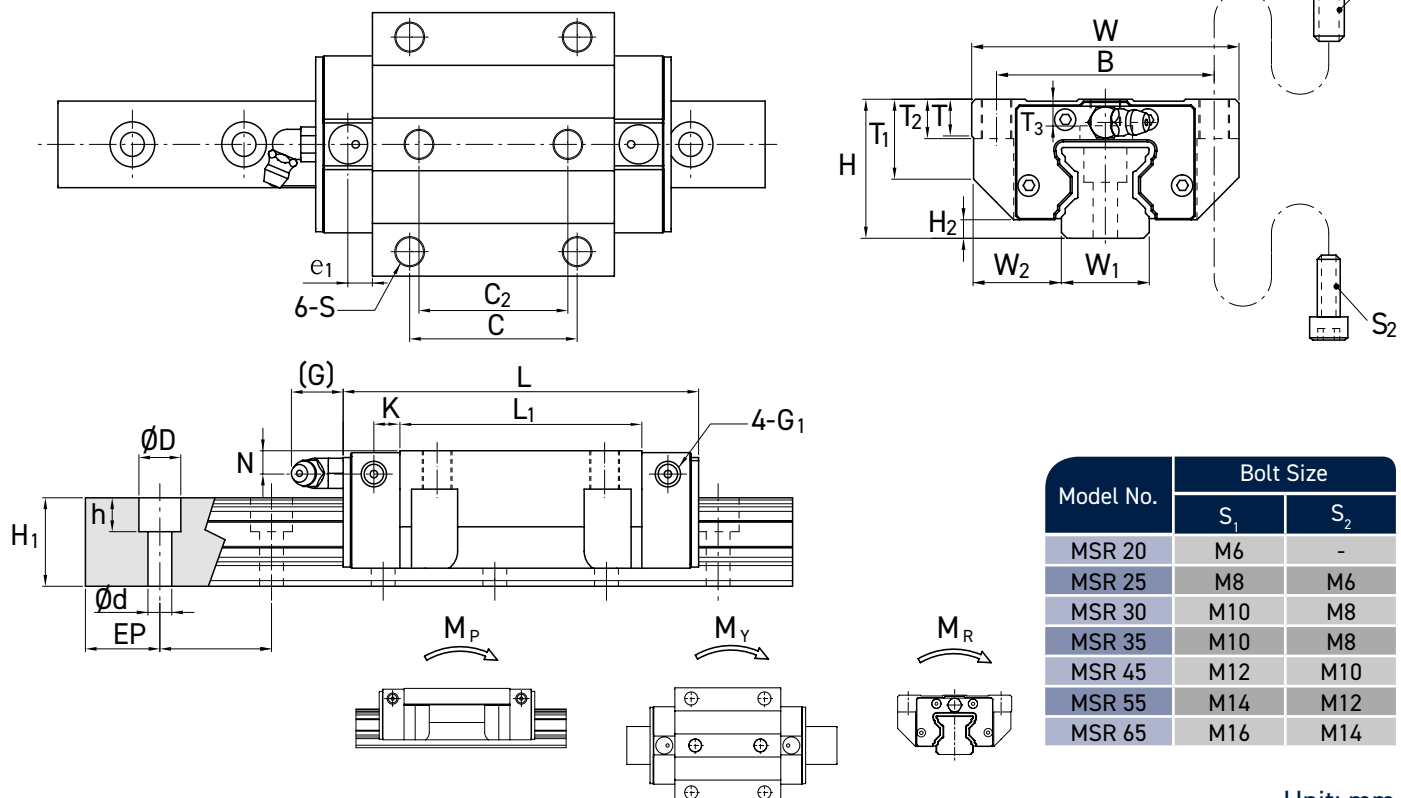
MSR Accuracy Grade



Rail Length (mm)		Running Parallelism Values (μm)			
Above	Or less (incl.)	H	P	SP	UP
0	315	6	3	2	1.5
315	400	8	4	2	1.5
400	500	9	5	2	1.5
500	630	11	6	2.5	1.5
630	800	12	7	3	2
800	1000	14	8	4	2
1000	1250	16	10	5	2.5
1250	1600	18	11	6	3
1600	2000	20	13	7	3.5
2000	2500	22	15	8	4
2500	3000	24	16	9	4.5
3000	3500	25	17	11	5
3500	4000	26	18	12	6

Model No.	Item	Running Parallelism Values (μm)				
		Normal N	High H	Precision P	Super Precision SP	Ultra Precision UP
15 20	Tolerance for height H	±0.04	0 -0.04	0 -0.02	0 -0.01	0 -0.008
	Height difference ΔH	0.015	0.007	0.005	0.003	0.003
	Tolerance for distance W ₂	±0.04	0 -0.04	0 -0.02	0 -0.01	0 -0.008
	Difference in distance W ₂ (ΔW ₂)	0.015	0.007	0.005	0.003	0.003
	Running parallelism of surface C with surface A	ΔC (see the Table Above)				
	Running parallelism of surface D with surface B	ΔD (see the Table Above)				
24 30 35	Tolerance for height H	±0.05	0 -0.05	0 -0.03	0 -0.02	0 -0.01
	Height difference ΔH	0.015	0.007	0.005	0.003	0.003
	Tolerance for distance W ₂	±0.05	0 -0.05	0 -0.03	0 -0.02	0 -0.01
	Difference in distance W ₂ (ΔW ₂)	0.02	0.01	0.007	0.005	0.003
	Running parallelism of surface C with surface A	ΔC (see the Table Above)				
	Running parallelism of surface D with surface B	ΔD (see the Table Above)				
24 30 35	Tolerance for height H	±0.07	0 -0.07	0 -0.05	0 -0.02	0 -0.01
	Height difference ΔH	0.02	0.01	0.007	0.005	0.003
	Tolerance for distance W ₂	±0.07	0 -0.07	0 -0.05	0 -0.02	0 -0.01
	Difference in distance W ₂ (ΔW ₂)	0.025	0.015	0.01	0.005	0.003
	Running parallelism of surface C with surface A	ΔC (see the Table Above)				
	Running parallelism of surface D with surface B	ΔD (see the Table Above)				

MSR-E / MSR-LE Carriage and Rail Dimensions



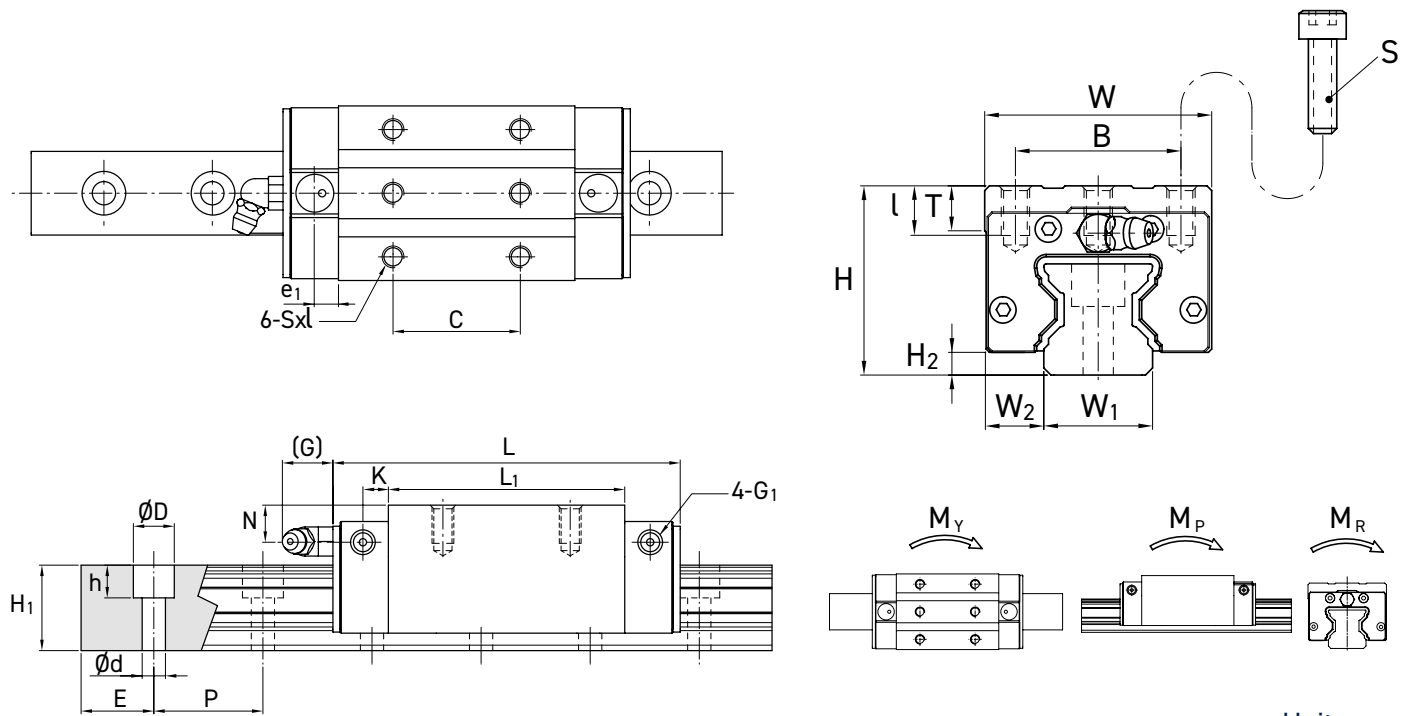
Unit: mm

Model No.	External Dimension					Carriage Dimensions														
	H	W	L	W ₂	H ₂	B	C	C2	S	L1	T	T ₁	T ₂	T ₃	N	G	K	e1	G1	Grease Nipple
MSR 20 E	30	63	89.8	21.5	4.6	53	40	35	M6	57.8	10	25.4	10	7.95	5	5.15	4	6.5	M4	G-M4
MSR 25 E MSR 25 LE	36	70	97.5 115.5	23.5	4.8	57	45	40	M8	65.5 83.5	9.5	20.2	10	5.8	6	12	6.6	6.5	M6	G-M6
MSR 30 E MSR 30 LE	42	90	112.4 135.2	31	6	72	52	44	M10	75.9 98.7	10	21.6	13	6.7	7	12	8	7	M6	G-M6
MSR 35 E MSR 35 LE	48	100	125.3 153.5	33	6.5	82	62	52	M10	82.3 110.5	12	27.5	15	9.5	8	12	8	7	M6	G-M6
MSR 45 E MSR 45 LE	60	120	154.2 189.4	37.5	8	100	80	60	M12	106.5 141.7	14.5	35.5	15	12.5	10	13.5	10	8	M6	G-PT 1/8
MSR 55 E MSR 55 LE	70	140	185.4 235.4	43.5	10	116	95	70	M14	129.5 179.5	17.5	41	18	15.5	11	13.5	12	7.95	M6	G-PT 1/8
MSR 65 LE	90	170	300.4	53.5	12	142	110	82	M16	230	19.5	56	20	26	16.5	13.5	12	8	M6	G-PT 1/8

Model No.	Rail Dimension					Basic Load Rating		Rail					Weight	
	W ₁	H ₁	P	E std.	D x h x d	Dynamic C kN	Static C ₀ kN	M _p kN-m		M _y kN-m		M _R kN-m	Carriage kg	Rail kg/m
								Single*	Double*	Single*	Double*			
MSR 20 E	20	20	30	20	9.5×8.5×6	22.8	60.8	0.51	2.85	0.51	2.85	0.62	0.54	2.6
MSR 25 E	23	23.5	30	20	11×9×7	29.6	63.8	0.65	3.82	0.65	3.82	0.73	0.75	3.5
MSR 25 LE						36.3	82.9	1.08	5.94	1.08	5.94	0.95	0.95	
MSR 30 E	28	27.5	40	20	14×12×9	42.8	91.9	1.09	6.38	1.09	6.38	1.27	1.4	5
MSR 30 LE						54.0	124.0	1.96	10.60	1.96	10.60	1.75	1.72	
MSR 35 E	34	30.5	40	20	14×12×9	57.9	123.5	1.59	9.56	1.59	9.56	2.09	1.95	7
MSR 35 LE						73.9	169.0	2.94	16.18	2.94	16.18	2.85	2.45	
MSR 45 E	45	37	52.5	22.5	20×17×14	92.8	193.8	3.28	18.76	3.28	18.76	4.40	3.9	11.2
MSR 45 LE						117.2	261.6	5.90	31.32	5.90	31.32	5.94	4.5	
MSR 55 E	53	43	60	30	23×20×16	132.8	270.0	5.49	31.18	5.49	31.18	7.33	6	15.6
MSR 55 LE						172.5	378.0	10.60	55.58	10.60	55.58	10.28	7.9	
MSR 65 LE	63	52	75	35	26×22×18	277.0	624.0	22.50	117.87	22.50	117.87	20.02	17.6	22.4

Note*: Single: Single carriage/ Double: Two carriages in close proximity to one another.

MSR-S / MSR-LS Carriage and Rail Dimensions



Unit: mm

Model No.	External Dimension					Carriage Dimensions											
	H	W	L	W ₂	H ₂	B	C	C2	S	L1	T	N	G	K	e1	G1	Grease Nipple
MSR 20 S	30	44	89.8	12	4.6	32	36	M5	7	57.8	8	5	5.15	4	6.5	M4	G-M4
MSR 25 S	40	48	97.5	12.5	4.8	35	35	M6	9	65.5	9.5	10	12	6.6	6.5	M6	G-M6
MSR 25 LS			115.5			50				83.5							
MSR 30 S	45	60	112.4	16	6	40	40	M8	12	75.9	10	10	12	8	7	M6	G-M6
MSR 30 LS			135.2			60				98.7							
MSR 35 S	55	70	125.3	18	6.5	50	50	M8	14	82.3	12	15	12	8	7	M6	G-M6
MSR 35 LS			153.5			72				110.5							
MSR 45 S	70	86	154.2	20.5	8	60	60	M10	19	106.5	17	20	13.5	10	8	M6	G-PT 1/8
MSR 45 LS			189.4			80				141.7							
MSR 55 S	80	100	185.4	23.5	10	75	75	M12	19	129.5	18	21	13.5	12	7.95	M6	G-PT 1/8
MSR 55 LS			235.4			95				179.5							
MSR 65 LS	90	126	300.4	31.5	12	76	120	M16	20	230	19.5	16.5	13.5	12	8	M6	G-PT 1/8

Model No.	Rail Dimension					Basic Load Rating		Static Moment Rating					Weight	
	W ₁	H ₁	P	E std.	D x h x d	Dynamic C kN	Static C ₀ kN	M _p kN-m		M _y kN-m		M _R kN-m	Carriage kg	Rail kg/m
								Single*	Double*	Single*	Double*			
MSR 20 S	20	20	30	20	9.5×8.5×6	22.8	60.8	0.51	2.85	0.51	2.85	0.62	0.34	2.6
MSR 25 S	23	23.5	30	20	11×9×7	29.6	63.8	0.65	3.82	0.65	3.82	0.73	0.65	3.5
MSR 25 LS						36.3	82.9	1.08	5.94	1.08	5.94	0.95	0.85	
MSR 30 S	28	27.5	40	20	14×12×9	42.8	91.9	1.09	6.38	1.09	6.38	1.27	1	5
MSR 30 LS						54.0	124.0	1.96	10.60	1.96	10.60	1.72	1.22	
MSR 35 S	34	30.5	40	20	14×12×9	57.9	123.5	1.59	9.56	1.59	9.56	2.09	1.65	7
MSR 35 LS						73.9	169.0	2.94	16.18	2.94	16.18	2.85	2.15	
MSR 45 S	45	37	52.5	22.5	20×17×14	92.8	193.8	3.28	18.76	3.28	18.76	4.40	3.2	11.2
MSR 45 LS						117.2	261.6	5.90	31.32	5.90	31.32	5.94	4.1	
MSR 55 S	53	43	60	30	23×20×16	132.8	270.0	5.49	31.18	5.49	31.18	7.33	5.1	15.6
MSR 55 LS						172.5	378.0	10.60	55.58	10.60	55.58	10.26	7	
MSR 65 LE	63	52	75	35	26×22×18	277.0	624.0	22.50	117.87	22.50	117.87	20.02	17.6	22.4

Note*: Single: Single carriage/ Double: Two carriages in close proximity to one another.

The Recommended Tightening Torque For Rails

The improper tightening torque could affect the mounting accuracy, so tightening the bolts by torque wrench to specified torque is highly recommended. Different types of mounting surface should have different torque value for applications.

Model No.	Torque Value		
	Iron	Cast iron	Aluminum
M2	0.6	0.4	0.3
M3	2	1.3	1
M4	4	2.7	2
M5	8.8	5.9	4.4
M6	13.7	9.2	6.8
M8	30	20	15
M10	68	45	33
M12	120	78	58
M14	157	105	78
M16	196	131	98
M20	382	255	191

Note: 1 N-m = 0.738 lbf-ft

Dust Proof Code Of Contamination Protection

For: MSA, MSB Series

Code	Contamination Protection
no symbol	Scraper (both ends)
UU	Bidirectional end seal (both ends)
SS	Bidirectional end seal+Bottom seal
ZZ	SS+Scraper
DD	Double bidirectional end seal+Bottom seal
KK	DD+Scraper
LL	Low friction end seal
HD	High dust end seal+high dust inner and bottom seal (supply MSA15S~35S , MSB15S~20S)

For: MSC, MSD Series

Code	Contamination Protection
LL	Low friction end seal
RR	LL+Bottom seal

For: MSA, MSB, MSG, MSR, SMR, SME Series

Code	Contamination Protection
/CC	Cover strip
/CB	Cover strip (Buckle Type)
/MC	Copper bolt cap
/MD	Stainless bolt cap

Note: There are two metallic bolt caps of copper and stainless that could be supplied by customer's choice.

Note: Buckle Type: Apply to MSR, SMR Series

For: MSG, MSR, SMR, SME Series

Code	Contamination Protection
no symbol	Scraper(both ends)
UU	Bidirectional end seal(both ends)
SS	Bidirectional end seal+Bottom seal+Inner seal
ZZ	SS+Scraper
DD	Double bidirectional end seal+Bottom seal +Inner seal
KK	DD+Scraper

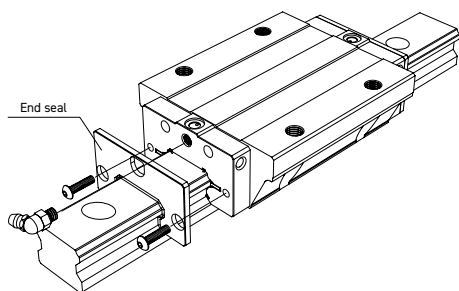
Seals Material Choice:

As well as the standard NBR seal, we also offer FKM (Fluorocarbon Rubber) and HNBR (Hydrogenated Nitrile Butadiene Rubber) seals as per every customer's requirements.

Contamination Protection

Each series of linear guideway offers various kinds of dust protection accessory to keep contaminants from entering into the carriage.

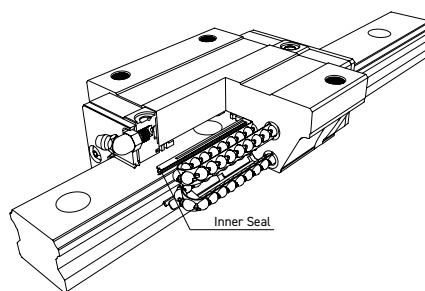
End Seal



Two types sealing are available:

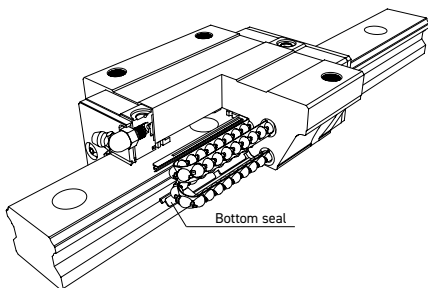
1. Bidirectional seal for high dust protection required.
2. Unidirectional seal for low frictional resistance required.

Inner Seal



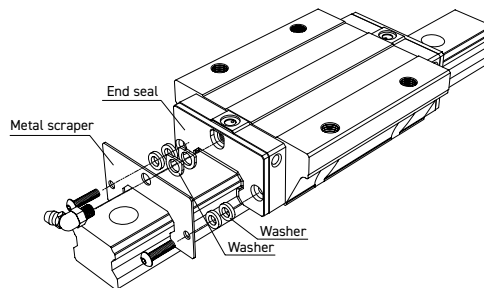
All dimensions are same as MSR-E except the length is longer, which makes it more rigid.

Bottom Seal



Prevents contaminants from becoming lodged in the bolt hole.

Metal Scraper



Removing spatters, iron chips, and large foreign matters as well as protecting the end seals.

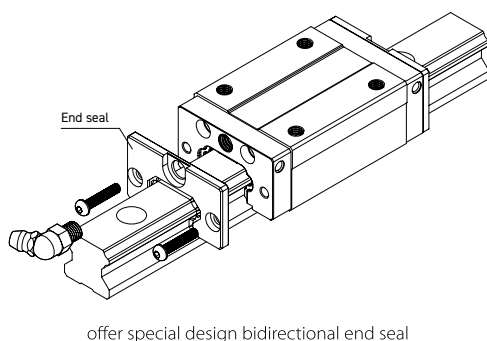
Linear Rail	MSA	MSB	MSC	MSD	MSG	SME	SMR	MSR	Linear Rail Options	Roller Ballscrews	Power Leadscrews	End Supports	Couplings Range
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HD-Enhanced Dust-Proof

Construction:

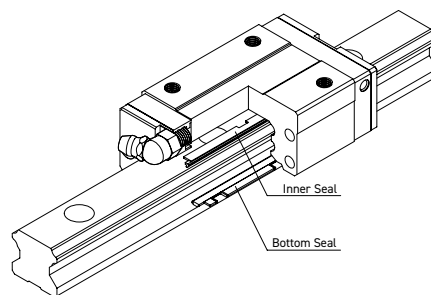
We can also offer, upon customer request, a carriage with enhanced contamination protection to prevent dust and other common contaminants from entering it.

High Dust End Seal



Prevents the inclusion of foreign matters from the bolt hole.

High Dust Inner Bottom Seal



Prevents the foreign matters enter the carriage from the bolt hole.

Features:

- Inner seal attached, having better seal effect than normal dust-proof attachment.
- Bidirectional end seal design strengthens the contact of rails with dust-proof end seal and high dust-proof inner & bottom seal.
- Enhanced dust-proof carriages have the same size and length as standard ones, however they have double the dust-proofing capability.

Application Examples:

- Applicable to carpentry industry.
- Other high-dust environments.

Test Conditions:

Specification: **MSA25SHD**

Running Length	500mm (per cycle)
Test Distance	150Km
Feed Rate	1.7m/min
Particle Amount	Spray continuously

Result:

After running 150 KM in a saw dust test environment, the carriage is still moving smoothly and the steel balls are also glossy. The end seal and inner seal protect against saw dust from entering the carriage. Overall running smoothness is not effected.



Dust Protection

Shown in the tables below, the change in overall length of a series carriage depending on the dust protection option chosen:

MSA Series

Unit: mm

Model No.	No Symbol	UU	SS	LL	RR	ZZ	DD	KK	HD
15	2	-	-	-	-	6	5	11	3
20	1.4	-	-	-	-	7	5.6	12.6	0.4
25	1.4	-	-	-	-	7	5.6	12.6	0.4
30	1.4	-	-	-	-	7	5.6	12.6	0.4
35	0.6	-	-	-	-	7.8	7.2	15	-
45	0.6	-	-	-	-	7.8	7.2	15	-
55	-	-	-	-	-	7.8	7.8	15.6	-
65	-	-	-	-	-	7.8	7.8	15.6	-

MSB Series

Unit: mm

Model No.	No Symbol	UU	SS	LL	RR	ZZ	DD	KK	HD
15	-	-	-	-	-	5	5	10	1
20	1	-	-	-	-	7	6	13	-
25	1	-	-	-	-	7	6	13	-
30	1	-	-	-	-	7	6	13	-
35	1.2	-	-	0.6	0.6	7.8	6.6	14.4	-

MSG Series

Unit: mm

Model No.	No Symbol	UU	SS	ZZ	DD	KK
21	1	-	-	7	6	13
27	1	-	-	7	6	13
35	1.8	-	-	7.8	6	13.8

MSR, SMR Series

Unit: mm

Model No.	No Symbol	UU	SS	ZZ	DD	KK
MSR 20	-	2	-	6	6	12
MSR 25	SMR 25	2	-	6	6	12
MSR 30	SMR 30	2	-	7	6	13
MSR 35	SMR 35	2	-	7	6	13
MSR 45	SMR 45	1.6	-	7	6.4	13.4
MSR 55	SMR 55	0.8	-	7.8	7.2	15
MSR 65	SMR 65	0.8	-	7.8	7.8	15.6

SME Series

Unit: mm

Model No.	No Symbol	UU	SS	ZZ	DD	KK
MSR 20	-	2	-	6	6	12
MSR 25	SMR 25	2	-	6	6	12
MSR 30	SMR 30	2	-	7	6	13
MSR 35	SMR 35	2	-	7	6	13
MSR 45	SMR 45	1.6	-	7	6.4	13.4
MSR 55	SMR 55	0.8	-	7.8	7.2	15
MSR 65	SMR 65	0.8	-	7.8	7.8	15.6

Resistance Value Of Seal

MSA series

The maximum resistance value of MSA series with seals type UU when it is applied with grease is shown below.

Model No.	Resistance	
	UU	HD
15	2	18
20	3.5	19
25	4	30
30	6	23
35	10	25
45	12	-
55	18	-
65	30	-

MSB series

The maximum resistance value of MSB series with seals type UU when it is applied with grease is shown below.

Model No.	Resistance	
	UU	HD
15	2	18
20	3.5	19
25	4	-
30	6	-
35	10	-

MSC, MSD series

The maximum resistance value of MSC series with seals type LL when it is applied with grease is shown below.

MSC series

Model No.	Resistance
7	0.08
9	0.1
12	0.4
15	0.8

MSC series

Model No.	Resistance
7	0.4
9	0.8
12	1.1
15	1.3

MSR, SMR series

The maximum resistance value of MSR and SMR series with seals type UU when it is applied with grease is shown below.

Model No.		Resistance
MSR 20	-	3.5
MSR 25	SMR 25	4.5
MSR 30	SMR 30	8
MSR 35	SMR 35	12
MSR 45	SMR 45	18
MSR 55	SMR 55	20
MSR 65	SMR 65	35

SME series

The maximum resistance value of SME series with seals type UU when it is applied with grease is shown below.

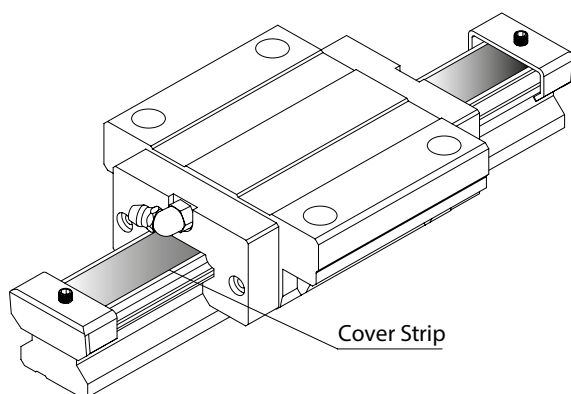
Model No.	Resistance
15	2
20	3.5
25	4
30	6
35	10
45	12

Cover Strip

A special design of cover strip is used to cover the bolt hole to prevent the foreign matters from entering the carriage. Indicate that the cover strip is required when ordering the guideway. Please refer to page 40 for the "Code of Contamination Protection for Rail" for the ordering code.

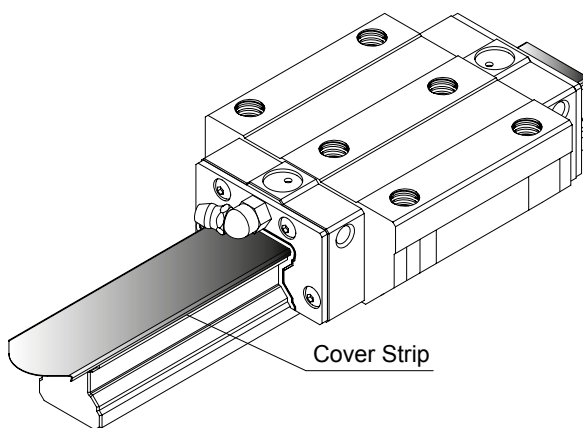
Standard Type (Applicable to MSA, MSB, SME, MSR & SMR Series)

Note: When mounting the cover strip, the rail needs to be machined. The cover strip does not increase the height of rail.



Buckle Type (Apply to MSR, SMR Series)

For the customer application, PMI design the buckle type of cover strip. The cover strip is fixed on the rail, and that will increase the assembly height of rail.



Series		Increment (mm)	Assembly Height of Rail(mm)
MSR 25	SMR 25	0.3	23.8
MSR 30	SMR 30	0.3	27.8
MSR 35	SMR 35	0.3	30.8
MSR 45	SMR 45	0.3	37.3
MSR 55	SMR 55	0.3	43.3
MSR 65	SMR 65	0.3	52.3

Note: Due to the increased cover strip thickness, the pre-load will increase after mounting.

Caps For Rail Mounting Hole

Features:

A special design of cap is used to cover the bolt hole to prevent the foreign matters from entering the carriage. Application dependant, we can provide two kind of caps for selection, standard plastic or metallic type. When ordering, if required, please specify the metallic type.

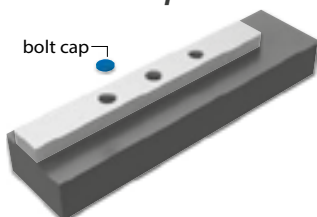
The plastic cap is mounted by using a plastic hammer with a pad placed on the top, until the top of cap is flush to the top surface of rail. The dimensions of the caps for different sizes of rail are shown below.

Installation of plastic and metal cap:

When specifying either the plastic or metallic caps, please refer to the cap sizes, seen in the table on p.43.

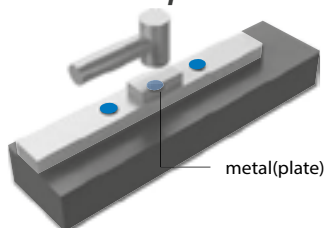
The steps of installing bolt cap with rail by below indicated figures:

Step 1



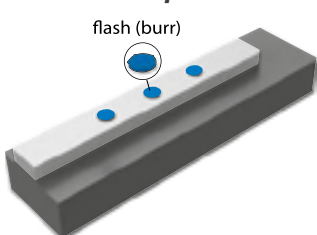
Put the cap into the bolt hole of rail.

Step 2



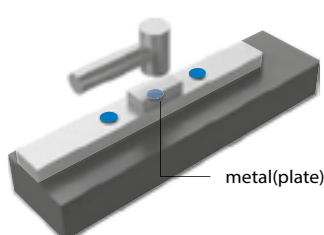
Put the plate on the cap, then pound it into the bolt hole of the rail with a rubber hammer, vertically.

Step 3



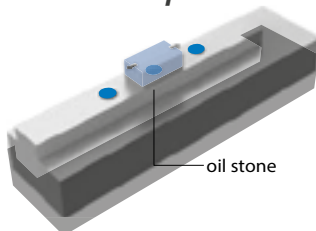
De-burr from the side of bolt hole.

Step 4



Hammer the plate until the cap is on the same plane with the top surface of rail.

Step 5



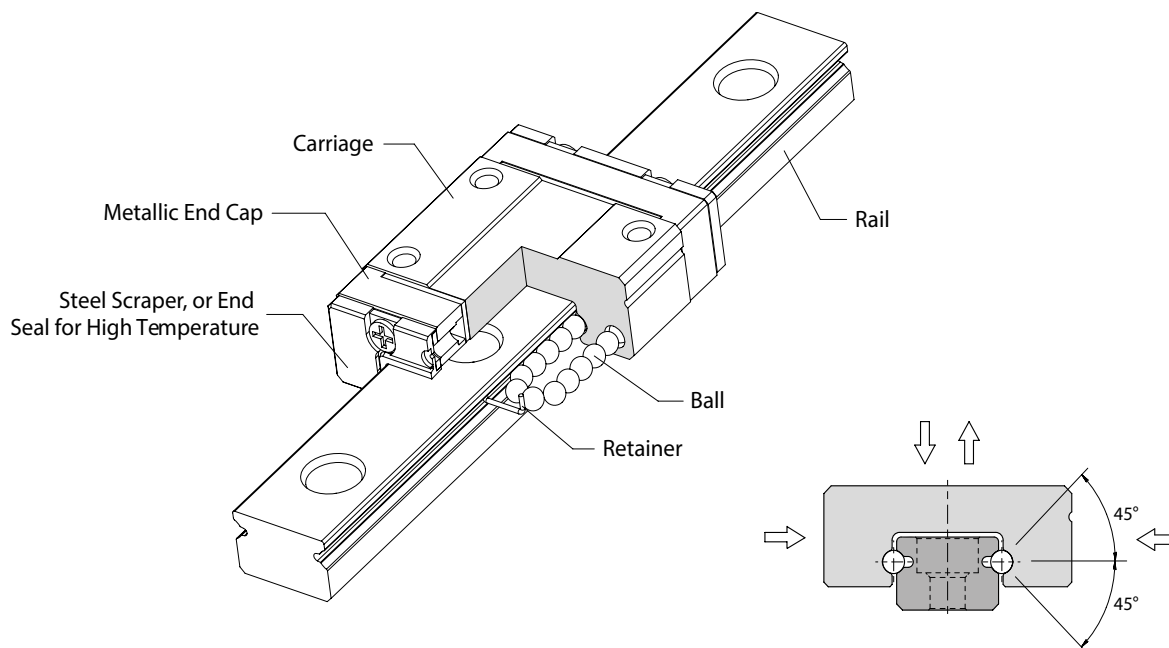
Use oil stone to polish the surface of caps and mop them with clean cloth. Finally, check the installation is perfectly flush with the rail.

Code of Plastic Cap	Bolt Size	Rail Model					
M3C	M3		MSB15R				
M4C	M4	MSA15R	MSB15U		SME15R		MSG21R MSG27R
M5C	M5	MSA20R	MSB20R	MSR20R	SME20R		
M6C	M6	MSA25R	MSB25R MSB30R	MSR25R	SME25R	SMR25R	MSG35R
M8C	M8	MSA30R MSA35R	MSB30U MSB35R	MSR30R MSR35R	SME30R SME35R	SMR30R SMR35R	
M12C	M12	MSA45R		MSR45R	SME45R	SMR45R	
M14C	M14	MSA55R		MSR55R		SMR55R	
M16C	M16	MSA65R		MSR65R		SMR65R	

Code of Plastic Cap	Bolt Size	Rail Model					
M4MC	M4	MSA15R	MSB15U		SME15R		MSG21R MSG27R
M5MC	M5	MSA20R	MSB20R	MSR20R	SME20R		
M6MC	M6	MSA25R	MSB25R MSB30R	MSR25R	SME25R	SMR25R	MSG35R
M8MC	M8	MSA30R MSA35R	MSB30U MSB35R	MSR30R MSR35R	SME30R SME35R	SMR30R SMR35R	
M12MC	M12	MSA45R		MSR45R	SME45R	SMR45R	
M14MC	M14	MSA55R		MSR55R		SMR55R	
M16	MSA65R		MSR65R		SMR65R		
M16C	M16	MSA65R		MSR65R		SMR65R	

ME Type- Metallic End Cap Linear Guideway

Construction and Characteristics:



Features:

- Use of metallic parts.
- Excellent temperature resistance; service temperature under 140°C
- If the end seal is needed, the high-temperature rubber (FKM) in end seal is available.

Applications:

- Welding equipment.
- Heat treatment equipment.
- Applications using vacuums (no vapour dispersion from plastic or rubber).

Lubrication

Lubrication is important for maintaining the function of linear guideway. If the lubrication is not sufficient, the frictional resistance at rolling area will increase and the service life will be shortened as a result of wear of rolling parts.

Two primary lubricants are both grease and oil used for linear motion system, and the lubrication methods are categorized into manual and forced oiling. The selection of lubricant and its method should be based on the consideration of operating speed and environmental operation conditions.

Grease lubrication

- Use of metallic parts.
- Excellent temperature resistance; service temperature under 140°C
- If the end seal is needed, the high-temperature rubber (FKM) in end seal is available.

Note: Carriages are supplied with assembly grease only.



Code of Plastic Cap	Initial Feeding Amount (cm³)	Amount for Replenishing (cm³)
MSA 15	1.1	0.4
MSA 20	2.1	0.7
MSA 25	3.5	1.2
MSA 30	5.8	1.9
MSA 35	8.2	2.7
MSA 45	16.1	5.4
MSA 55	27.1	9.0
MSA 65	51.6	17.2
MSA 20L	3.1	1.0
MSA 25L	5.1	1.7
MSA 30L	8.2	2.7
MSA 35L	11.8	3.9
MSA 45L	23.0	7.7
MSA 55L	38.8	12.9
MSA 65L	77.8	25.9
MSB 15	1.0	0.3
MSB 20	1.5	0.5
MSB 25	2.8	0.9
MSB 30	4.5	1.5
MSB 35	8.2	2.7
MSB 15T	0.4	0.1
MSB 20T	0.7	0.2
MSB 25T	1.5	0.5
MSB 30T	2.2	0.7
MSB 35L	11.8	3.9
MSG 21	1.2	0.4
MSG 27	2.1	0.7
MSG 35	5.6	1.9
MSC 7	0.06	0.02
MSC 9	0.16	0.05
MSC 12	0.25	0.08
MSC 15	0.49	0.16
MSC 7L	0.11	0.04
MSC 9L	0.24	0.08
MSC 12L	0.42	0.14
MSC 15L	0.80	0.27
MSD 7	0.19	0.06
MSD 9	0.42	0.14
MSD 12	0.73	0.24

Code of Plastic Cap	Initial Feeding Amount (cm³)	Amount for Replenishing (cm³)
MSD 15	1.51	0.50
MSD 7L	0.28	0.09
MSD 9L	0.60	0.20
MSD 12L	1.07	0.36
MSD 15L	2.18	0.73
MSR 20	3.0	1.0
MSR 25	4.5	1.5
MSR 30	7.0	2.3
MSR 35	9.6	3.2
MSR 45	17.1	5.7
MSR 55	26.0	8.7
MSR 25L	5.5	1.8
MSR 30L	8.7	2.9
MSR 35L	12.3	4.1
MSR 45L	22.0	7.3
MSR 55L	34.3	11.4
MSR 65L	64.8	21.6
SMR 25	5.9	2.0
SMR 30	8.8	2.9
SMR 35	12.6	4.2
SMR 45	21.0	7.0
SMR 55	32.1	10.7
SMR 25L	7.2	2.4
SMR 30L	11.0	3.7
SMR 35L	16.0	5.3
SMR 45L	26.5	8.8
SMR 55L	42.6	14.2
SMR 65L	76.1	25.4
SME 15	1.6	0.5
SME 20	2.6	0.9
SME 25	4.1	1.4
SME 30	6.0	2.0
SME 35	9.7	3.2
SME 45	13.2	4.4
SME 20L	3.6	1.2
SME 25L	5.2	1.7
SME 30L	8.1	2.7
SME 35L	13.0	4.3
SME 45L	18.5	6.2

	MSA	MSB	MSC	MSD	MSG	SME	SMR	MSR	Linear Rail Options	Rolled Ballscrews	Power Leadscrews	End Supports	Couplings Range
Linear Rail	Linear Rail	Linear Rail	Linear Rail	Linear Rail	Linear Rail	Linear Rail	Linear Rail	Linear Rail					

Oil Lubrication

The recommended viscosity of oil is 30~150 Centistokes, and the recommended feeding rate per hour is shown in the table below.

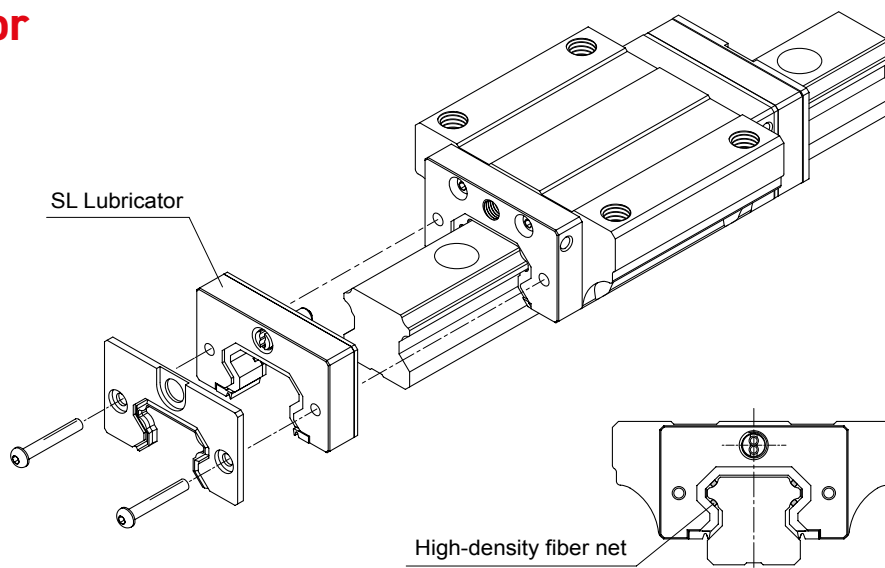
Note: Installation other than horizontal may result in the oil being unable to reach the raceway area.

Oil lubrication feeding rate:

Code of Plastic Cap	Initial Feeding Amount (cm ³)	Amount for Replenishing (cm ³)
15	0.6	0.4
20	0.6	0.7
25	0.9	1.2
30	0.9	1.9
35	0.9	2.7
45	1.2	5.4
55	1.5	9.0
65	1.8	17.2
MSG 21	0.6	1.0
MSG 27	0.9	1.7
MSG 35	0.9	2.7

Note: When the operating stroke length is less than the sum of the length of two carriages, the lubrication fitting should be applied on both ends of carriage for adequacy. Moreover, if the stroke length is less than a half of the length of a carriage, the carriage should be moved back and forth up to the length of two carriages while lubricating.

SL Lubricator



Characteristics:

The PMI SL lubricator unit is designed with an oil reservoir which equipped with a high-density fibre net. Through the fibre net the lubricant can be steadily fed onto the surface of raceway to satisfy the required lubricating function.

- **Lengthening the interval between maintenance works**

The SL Lubricator, unlike ordinary lubrication methods, effectively and evenly distributes the correct amount of oil to the raceway. This allows for a greater interval between maintenance.

- **Environmentally Friendly**

Through the use of SL lubricator, only the needed amount of oil will be fed for the purpose of lubrication, thereby the oil is almost nothing to lose in application. As a result, the environment will not be contaminated by waste oil.

• Cost reduction

The SL Lubricator, unlike ordinary lubrication methods, effectively and evenly distributes the correct amount of oil to the raceway. This allows for a greater interval between maintenance.

• Enables the most suitable oil for the purpose of use to be selected

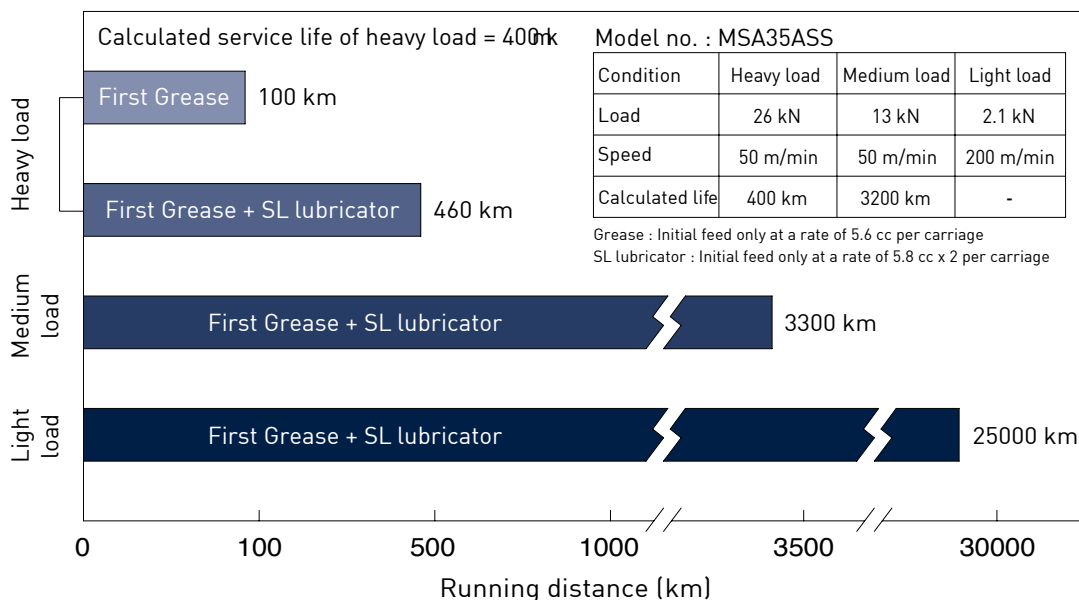
The SL lubricator makes it possible to select the most proper lubricant for your application of linear guideway.

Performance:

• Lengthening the interval between maintenance works

By using the SL lubricator, the time between carriage maintenance can be increased further, regardless of whether the load rating is dynamic or static.

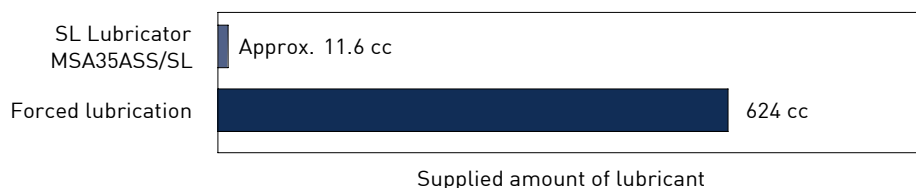
• Running Test without Replenishment of Lubricant:



• Effective use of lubricant

The SL Lubricator uses oil effectively as it only applies the correct amount to the rail. This results in a lower amount of waste in the long run.

• Annual Lubricant Consumption per Carriage



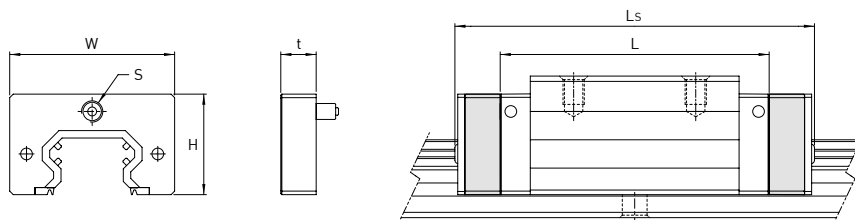
Amount of oil contained in SL Lubricator
5.8 cc x 2 / carriage
= 11.6 cc

Compared

Forced lubrication
0.3 cc/hr x 8 hrs/day x 260 days/year
= 624 cc

SL Lubricator Dimensions

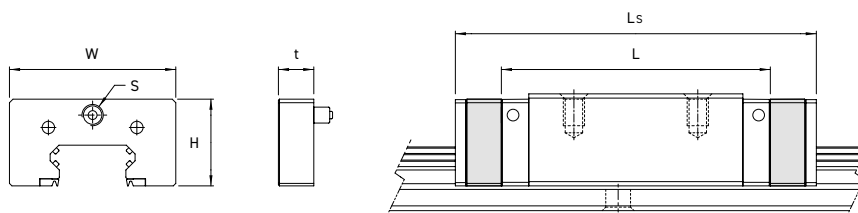
MSA Series



Model No.		Height H	Width W	Thickness t	Tapped Hole S	Carriage dimension (mm)	
						Standard length L	SL Lubricator Overall Length Ls
MSA 15SL	E/S	19	31.2	10	M4	56.3	81.3
MSA 20SL	E/S	21.2	42.8	10	M6	67.3	92.9
	LE/LS					83.2	108.8
MSA 25SL	E/S	28.5	46.8	10	M6	76	101.6
	LE/LS					95	120.6
MSA 30SL	A/E/S	32	57	10	M6	91.4	117
	LE/LS					113.6	139.2
MSA 35SL	A/E/S	36.5	68	10	M6	104	131.2
	LE/LS					129.4	156.6
MSA 45SL	A/E/S	49	83.6	15	1/8PT	130.5	167.7
	LE/LS					162.3	199.5
MSA 55SL	A/E/S	53	97	15	1/8PT	153.7	191.5
	LE/LS					191.7	229.5
MSA 65SL	A/E/S	67	120	15	1/8PT	191.2	229
	LE/LS					245.2	283

Note: Supply the Dust proof series (UU, SS, ZZ, LL, RR)

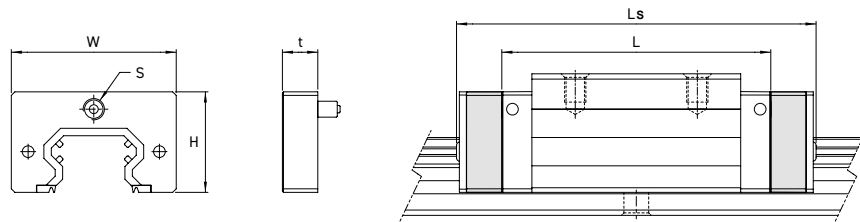
MSB Series



Model No.		Height H	Width W	Thickness t	Tapped Hole S	Carriage dimension (mm)	
						Standard length L	SL Lubricator Overall Length Ls
MSB 15SL	TE/TS	18.5	33	10	M4	65	35
	E/S					82	52
MSB 20SL	TE/TS	21.2	40.8	10	M6	68	42
	E/S					87	61
MSB 25SL	TE/TS	24.5	47	10	M6	80.2	54.2
	E/S					102	76
MSB 30SL	TE/TS	30.8	57	10	M6	88	62
	E/S					116.7	90.7
MSB 35SL	TE/TS	37	68.5	10	M6	98	70.8
	E/S					132	104.8
	LE/LS					157.5	130.3

Note: Supply the Dust proof series (UU, SS, ZZ, LL, RR)

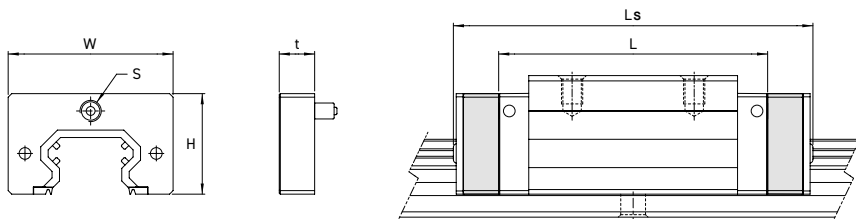
MSR Series



Model No.						Carriage dimension (mm)	
		Height H	Width W	Thickness t	Tapped Hole S	Standard length L	SL Lubricator Overall Length Ls
MSR 25SL	E/S	30.2	47	10	M6	91.5	117.5
	LE/LS					109.5	135.5
MSR 30SL	E/S	34.5	58.6	10	M6	106.4	132.4
	LE/LS					129.2	155.2
MSR 35SL	E/S	40.5	69	10.3	M6	119.3	145.9
	LE/LS					147.5	174.1
MSR 45SL	E/S	50.9	84	15.3	1/8PT	147.8	184.8
	LE/LS					183	220
MSR 55SL	E/S	58.5	98	15.3	1/8PT	178.2	216
	LE/LS					228.2	266
MSR 65SL	LE/LS	76.5	122	15	1/8PT	294.2	332

Note: Supply the Dust proof series (UU, SS, ZZ)

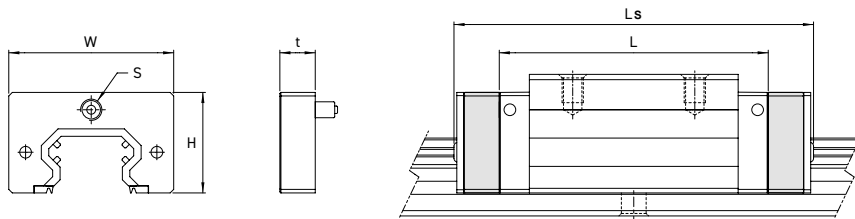
SMR series



Model No.						Carriage dimension (mm)	
		Height H	Width W	Thickness t	Tapped Hole S	Standard length L	SL Lubricator Overall Length Ls
SMR 25SL	E/S	30.2	47	10	M6	91.5	117.5
	LE/LS					109.5	135.5
SMR 30SL	E/S	34.5	58.6	10	M6	106.4	132.4
	LE/LS					129.2	155.2
SMR 35SL	E/S	40.5	69	10.3	M6	119.3	145.9
	LE/LS					147.5	174.1
SMR 45SL	E/S	50.9	84	15.3	1/8PT	147.8	184.8
	LE/LS					183	220
SMR 55SL	E/S	58.5	98	15.3	1/8PT	178.2	216
	LE/LS					228.2	266
SMR 65SL	LE/LS	76.5	122	15	1/8PT	294.2	332

Note: Supply the Dust proof series (UU, SS, ZZ)

SME series



Model No.		Height H	Width W	Thickness t	Tapped Hole S	Carriage dimension (mm)	
						Standard length L	SL Lubricator Overall Length Ls
SME 15SL	E/S	20.1	33.2	10	M4	59	84.4
	LE/LS					22.8	41.4
SME 20SL	E/S	22.8	41.4	10	M6	72.5	98.5
	LE/LS					33.5	58.5
SME 25SL	E/S	26.1	47.2	10	M6	86	112
	LE/LS					49	83.6
SME 30SL	E/S	33.5	58.5	10	M6	102	127.6
	LE/LS					127	152.6
SME 35SL	E/S	38.5	68	10	M6	113.8	140.6
	LE/LS					143.8	170.6
SME 45SL	E/S	49	83.6	15	1/8PT	132.8	170
	LE/LS					167.3	204.5

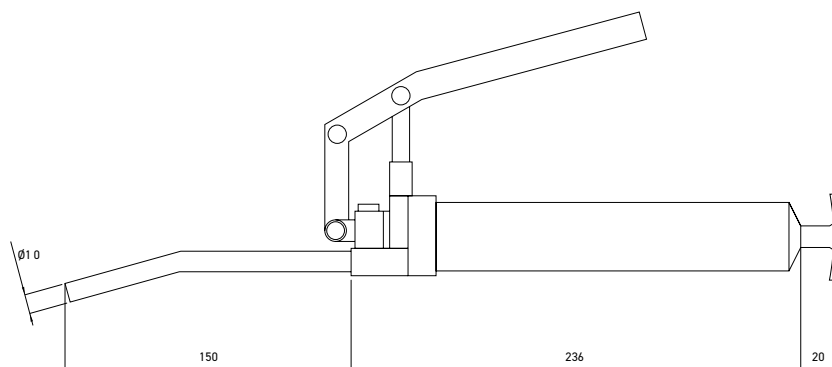
Note: Supply the Dust proof series (UU, SS, ZZ)

Lubrication Equipment - Grease Gun

Note: Different nozzles are required for different greases and oils.

Size and working condition:

Discharge pressure: 15MPa
Discharge rate: 0.35g/stroke
Weight (excluding the grease): 680g
Overall length: about 400mm
Width: about 120mm
Outside diameter of nozzle: Ø10mm



Greasing Information For Standard Applications.

Load Ratio: Max. 15% Of
Dynamic Basic Load Rating
Temperature Range: -10 ~ 80 °C
Speed: < 1 M/S
Speed Co-Efficient: < 120,000

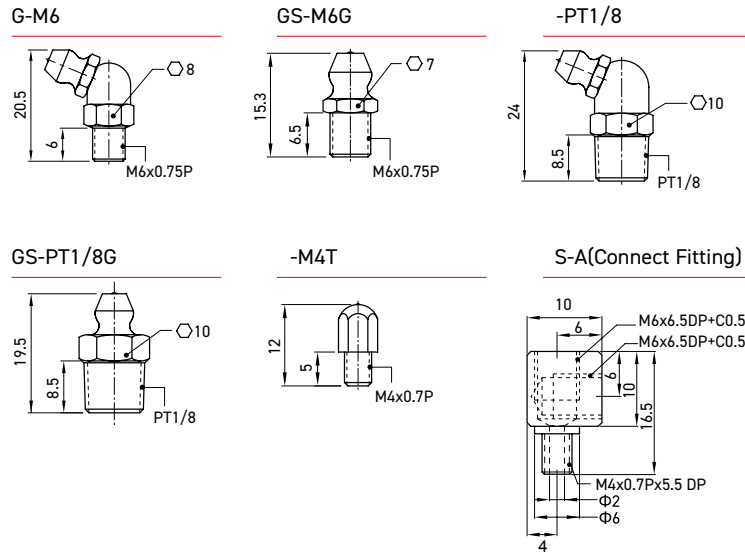
Load Ratio: Max. 50% Of
Dynamic Basic Load Rating
Temperature Range: -10 ~ 80 °C
Speed: < 1 M/S
Speed Co-Efficient: < 120,000

Manufacturer	Part Number
Kluber	Kluberlub GL-261.4
Mobil	Mobilux EP1
Fuch Lubritech	Lagermeister BF2
Lubcon	Turmogrease CAK 25002

Manufacturer	Part Number
Kluber	Kluberlub BE 71-501
Fuch Lubritech	Lagermeister EP2
Lubcon	Turmogrease Li 802EP

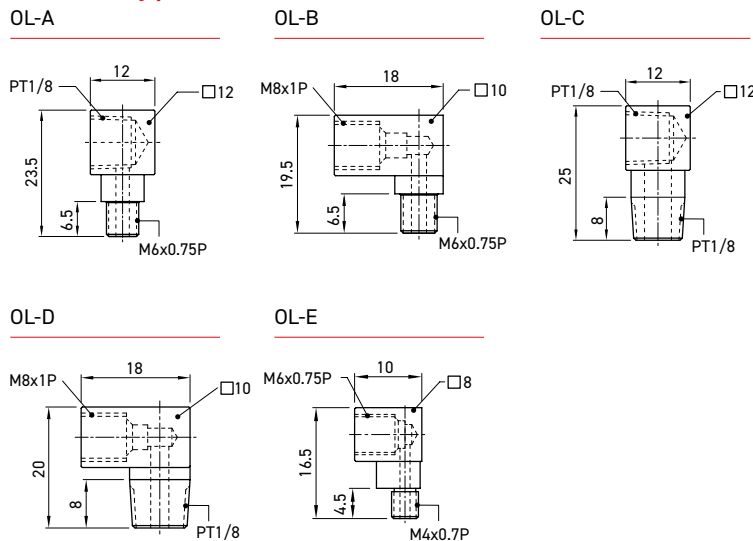
Grease Nipple & Piping Joint

Grease Nipple

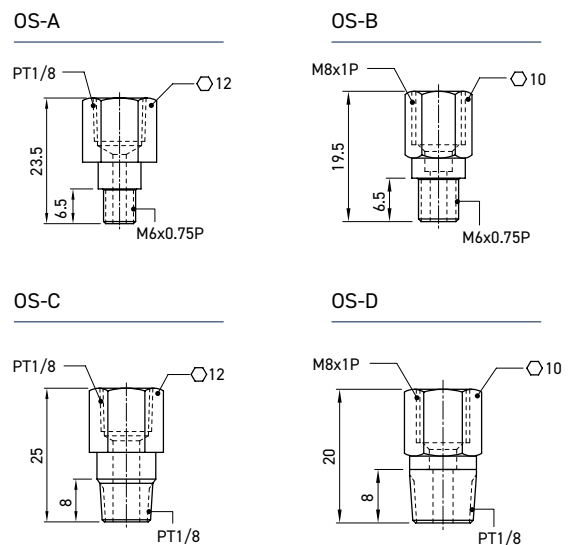


Oil Piping Joint

•OL Type



•OS Type



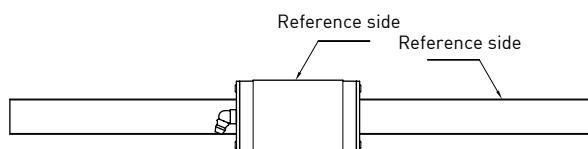
Model No.						Dust Proof Type							
						SS		DD		ZZ		KK	
MSA15	MSB15	SME15		MSR20		G-M4	OL-E	G-M4L	OL-EL	G-M4L	OL-EL	G-M4L	OL-EL
MSA20	MSB20	SME20											
MSA25	MSB25	SME25	SMR25	MSR25	MSG21	G-M6	GS-M6	G-M6M	GS-M6M	G-M6M	GS-M6M	G-M6L	GS-M6L
MSA30	MSB30	SME30	SMR30	MSR30	MSG27	OL-A	OL-B	OL-AL	OL-BLR	OL-AL	OL-BLR	OL-AL	OL-BLR
MSA35	MSB35	SME35	SMR35	MSR35	MSG35	OS-A	OS-B	OS-AL	OS-BL	OS-AL	OS-BL	OS-AL	OS-BL
MSA45		SME45	SMR45	MSR45		G-PT1/8	GS-PT1/8	G-PT1/8L	GS-PT1/8L	G-PT1/8L	GS-PT1/8L	G-PT1/8L	GS-PT1/8L
MSA55			SMR55	MSR55		OL-C	OL-D	OL-CL	OL-DL	OL-CL	OL-DL	OL-CL	OL-DL
MSA65			SMR65	MSR65		OS-C	OS-D	OS-CL	OS-DL	OS-CL	OS-DL	OS-CL	OS-DL

Note: 1. MSA15-ZZ and MSA15-DD use the nipple "G-M4"
2. MSB15 uses the "OL-EL" nipple, rather than "OL-E".

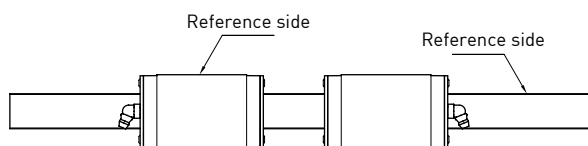
The Relationship Between The Direction Of Lubrication And The Reference Side

The standard lubrication fitting is grease nipple (G-M6, G-PT1/8, G-M4). The codes for different application types for lubrication fittings are shown below. For cases other than specified, please contact us for confirmation.

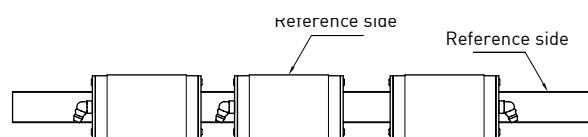
Code: C1R1



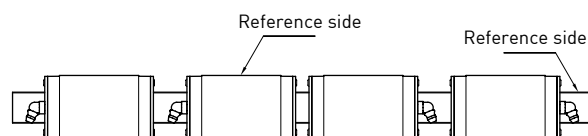
Code: C2R1



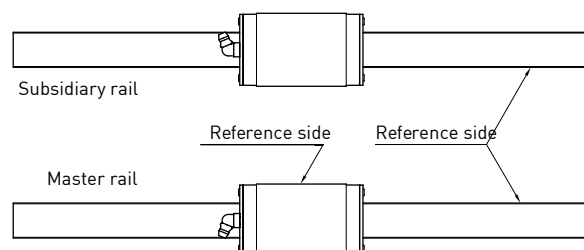
Code: C3R1



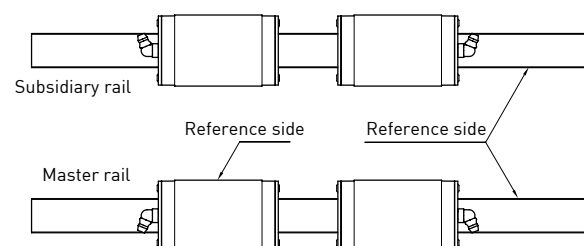
Code: C4R1



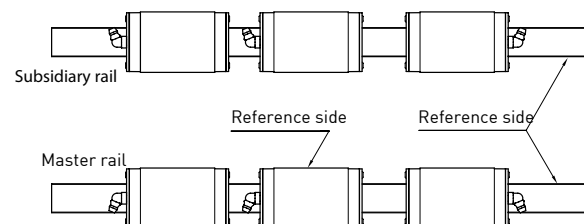
Code: C1R2



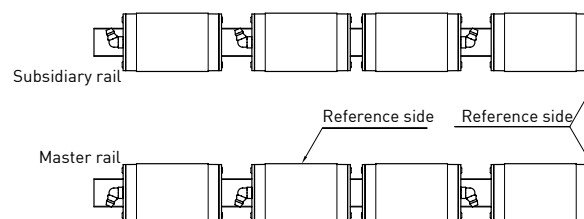
Code: C2R2



Code: C3R2



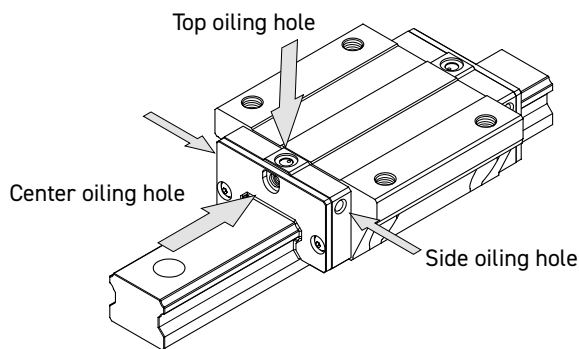
Code: C4R2



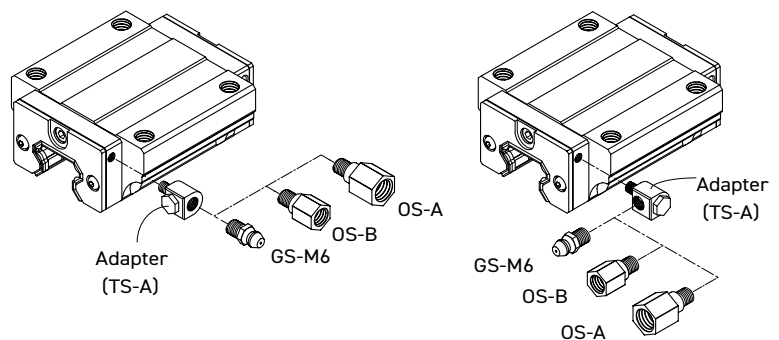
Lubrication Position

The standard mounting location for the lubrication nipples on all types of carriage can be found at the centre of both ends. For lateral and top application, please specify when ordering. As shown below, the lateral application is achieved by using an adapter to connect the grease/oil fitting to the hole on the carriage.

Lubrication Location

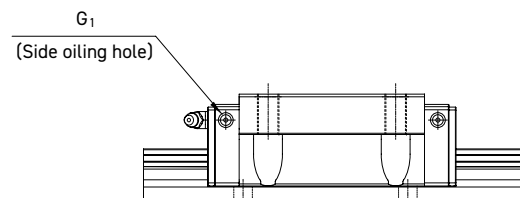
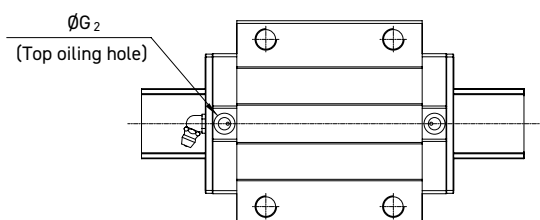


Lateral Usage



Model No.		Center	Side	
		Nipple	G1	Nipple
MSA 15	MSB 15	G-M4	M4×0.7P	G-M4
MSA 20	MSB 20	G-M6	M4×0.7P	G-M4
MSA 25	MSB 25	G-M6	M4×0.7P	G-M4
MSA 30	MSB 30	G-M6	M4×0.7P	G-M4
MSA 35	MSB 35	G-M6	M4×0.7P	G-M4
MSA 45		G-PT1/8	M4×0.7P	G-M4
MSA 55		G-PT1/8	M4×0.7P	G-M4
MSA 65		G-PT1/8	M4×0.7P	G-M4

Note: MSA and MSB series have no top oiling hole option.



Model No.	Center	Side		Top	
	Nipple	G1	Nipple	G2	O-Ring
MSG 21	G-M6	M4×0.7P	G-M4	-	-
MSG 27	G-M6	M4×0.7P	G-M4	6.1	P3
MSG 35	G-M6	M4×0.7P	G-M4	7.3	P4