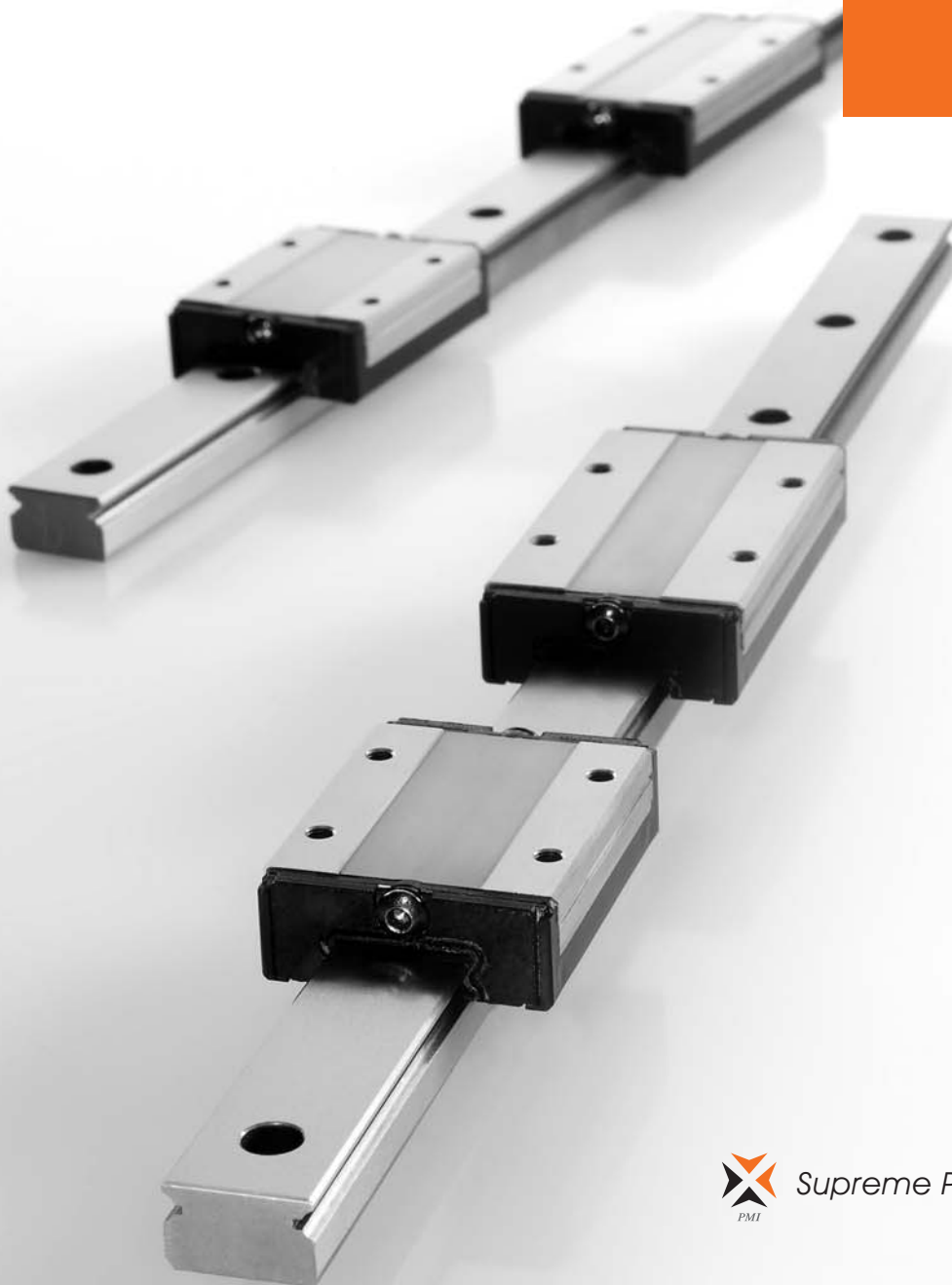
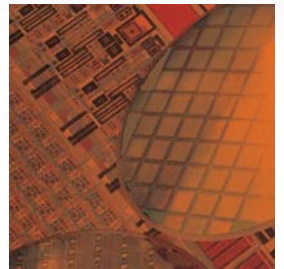
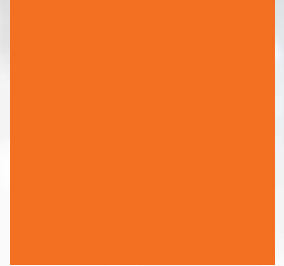




Miniature Linear Guideway

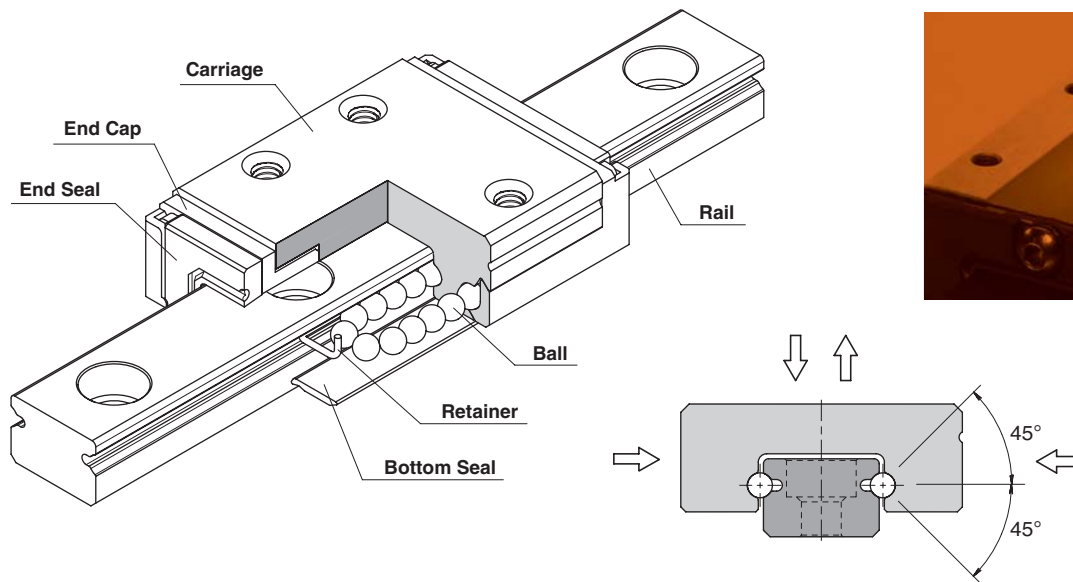
MSC Stainless Steel Series



Miniature Linear Guideway

MSC Stainless Steel Series

1 Construction



2 Characteristics

MSC stainless steel series are applied two rows with Gothic-arch groove and designed to contact angle of 45° which enables it to bear an equal load in radial, reversed radial and lateral directions. Furthermore, ultra compact and low friction resistance design is suit to compact equipment. The lubrication route makes the lubricant evenly distribute in each circulation loop. Therefore, the optimum lubrication can be achieved in any installation direction, and this promotes the performance in running accuracy, service life, and reliability.

Four-way Equal Load

The two trains of balls are allocated to a Gothic-arch groove contact angle at 45° , thus each train of balls can take up an equal rated load in all four directions.

Smooth Movement with Low Noise

The simplified design of circulating system with strengthened synthetic resin accessories makes the movement smooth and quiet.

Ultra Compact

The ultra compact design is suit to the compact application with limited in space.

Ball Retainer

Design with ball retainer can prevent ball form dropping.

Interchangeability

For interchangeable type of linear guideway, the dimensional tolerances are strictly maintained within a reasonable range, and this has made the random matching of the same size of rails and carriages possible. Therefore, the similar preload and accuracy can be obtained even under the random matching condition, As a result of this advantage, the linear guideway can be stocked as standard parts, the installation and maintenance become more convenient. Moreover, this is also beneficial for shortening the delivery time.

3 Description of Specification

(1) Non-interchangeable Type

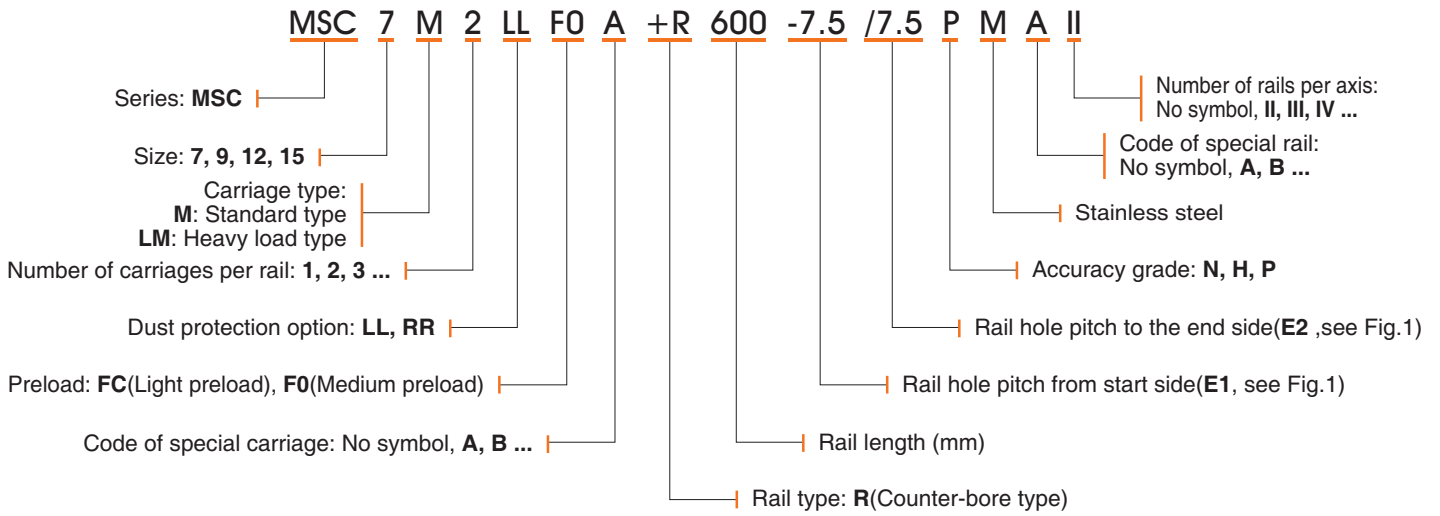
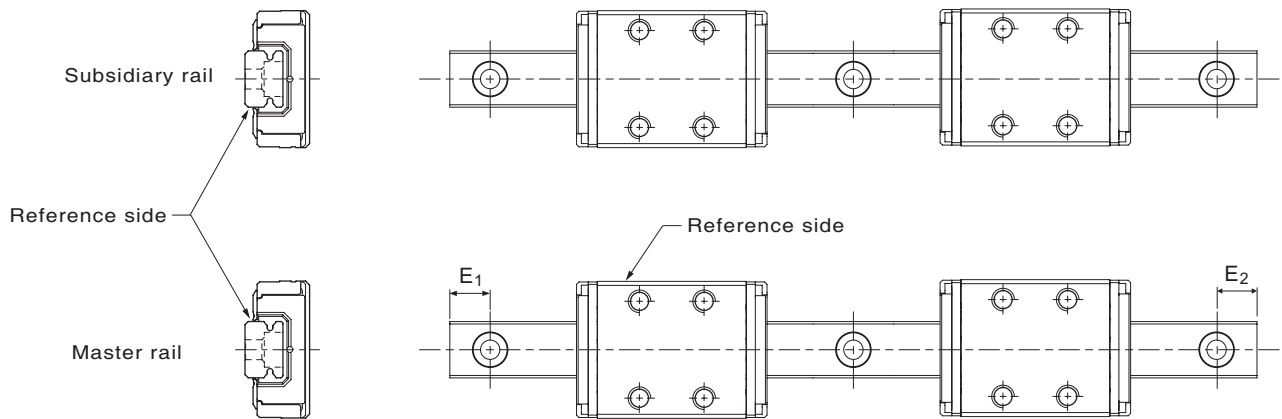
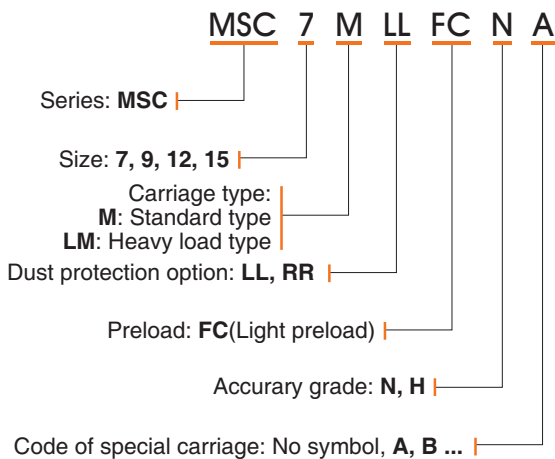


Fig.1

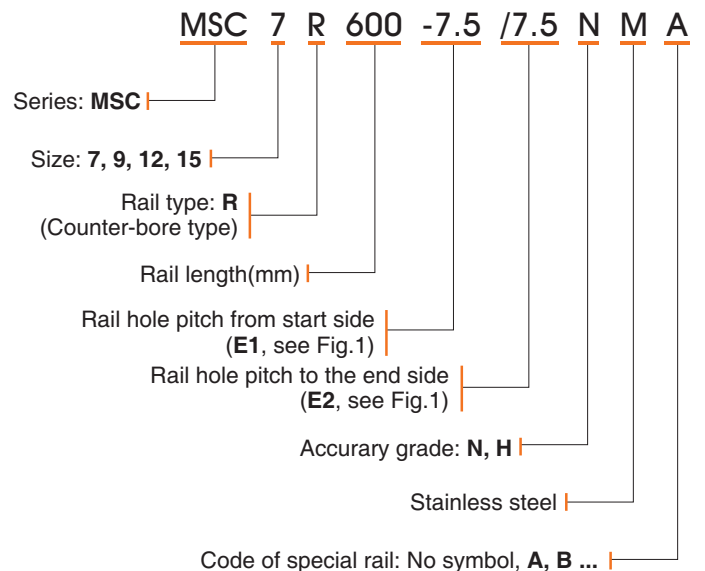


(2) Interchangeable Type

Code of Carriage



Code of Rail



4 Accuracy

The accuracy of MSC series is divided into 3 classes, normal grade(N), high precision(H) and precision(P), as shown in Table 1.

Table 1 Accuracy Grade

Unit: mm

Model No.	Item	Accuracy Grade		
		Normal N	High H	Precision P
MSC 7	Tolerance for height H	±0.04	±0.02	±0.01
	Height difference (ΔH)	0.03	0.015	0.007
MSC 9	Tolerance for distance W ₂	±0.04	±0.025	±0.015
MSC 12	Difference in distance W ₂ (ΔW ₂)	0.03	0.02	0.01
MSC 15	Running parallelism of surface C with surface A	ΔC (see Fig.2)		
	Running parallelism of surface D with surface B	ΔD (see Fig.2)		

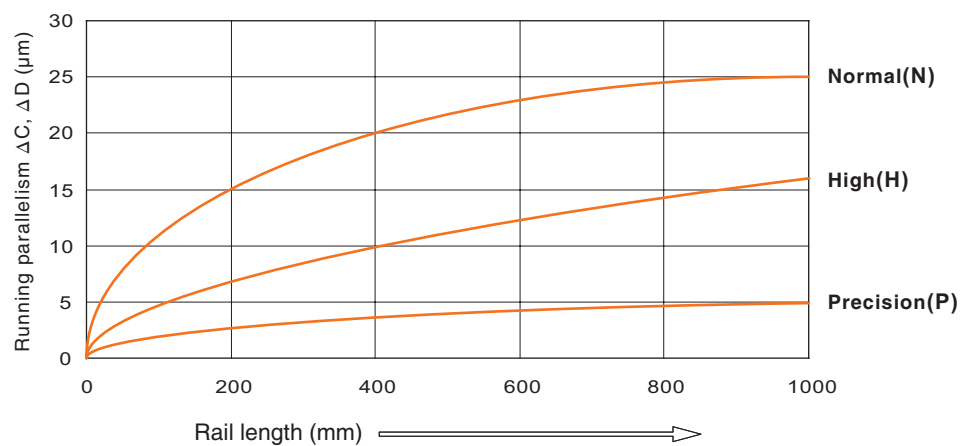
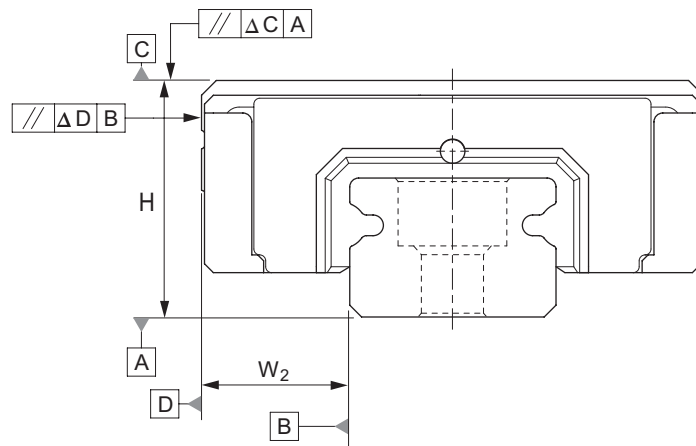


Fig.2 Running Parallelism of Carriage

5 Preload Grade

Preload grade and radial clearance

The preload of **MSC** series is represented by radial clearance which is divided into two grades, light (FC) and medium (F0), as shown in Table 2.

Unit: μm

Table 2
Preload grade and radial clearance

Preload Model No.	Light	Medium
	FC	F0
MSC 7	-2 ~ +2	-3 ~ 0
MSC 9	-2 ~ +2	-4 ~ 0
MSC 12	-3 ~ +3	-6 ~ 0
MSC 15	-5 ~ +5	-10 ~ 0

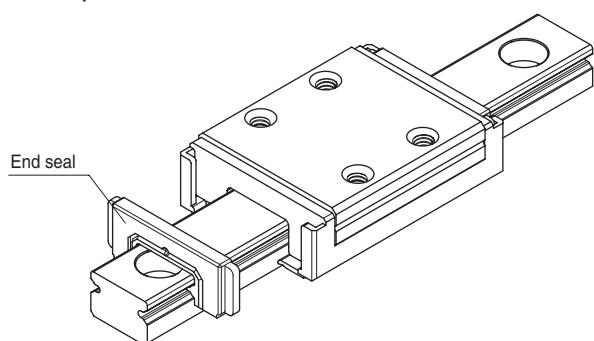
6 Dust proof

(1) Contamination protection

MSC series of linear guideway offers various kinds of dust protection accessory to keep the foreign matters from entering into the carriage.

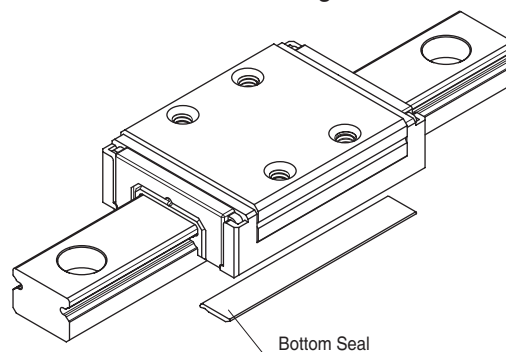
· End seal

Monodirectional seal for low frictional resistance required.



· Bottom Seal

Preventing the inclusion of foreign matters from bottom of carriage.



(2) Code of contamination protection

The codes for selection of dust protection accessory are shown as Table 3.

Table 3 Code of contamination protection

Code	Contamination protection
LL	Low frictional end seal (both end)
RR	Low frictional end seal + Bottom seal

(3) Resistance value of Seal

The maximum resistance value of seals type LL when it is applied with grease is shown as Table 4.

Table 4 Seal resistance value

Unit: N

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

(4) Caps for rail mounting hole

A special designed of cap is used to cover the bolt hole to prevent the foreign matters from entering the carriage. The cap is mounted by using a plastic hammer with a flat pad placed on the top, until the top of cap is flush to the top surface of rail (see Fig. 3).

The dimension of caps for different sizes of rail is shown as Table 5.

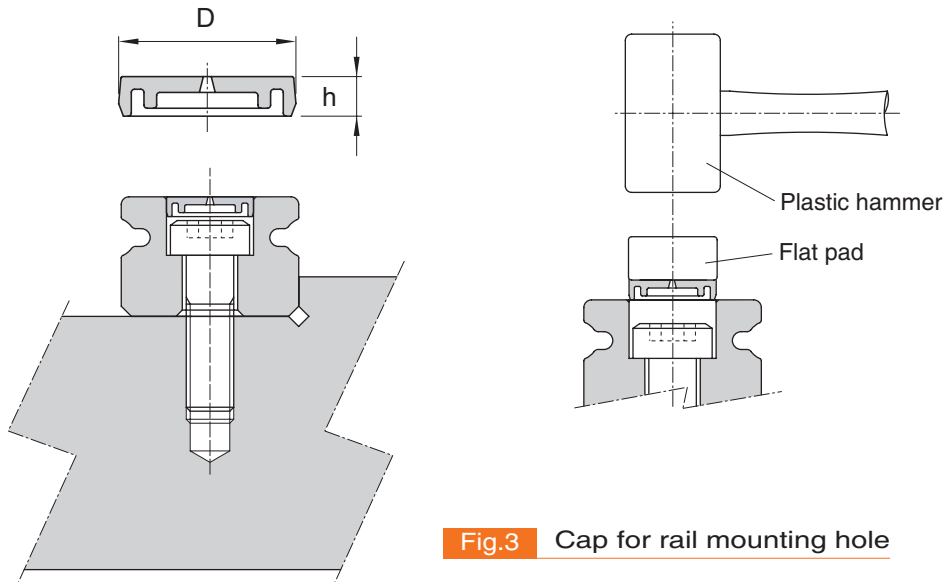


Fig.3 Cap for rail mounting hole

Table 5 Dimension of caps

Model No.	Code of Cap	Bolt size	D(mm)	h(mm)
MSC 7	-	M2	-	-
MSC 9	-	M3	-	-
MSC 12	M3C	M4	6.3	1.0
MSC 15	M3C	M4	6.3	1.0



7 The Shoulder Height and Corner Radius for Installation

The mounting surface of rails and carriages are machined precisely for aiding in positioning and assemble with high accuracy. The shoulder height and corner radius providing enough mounting space for not to interfere with chamfers made on rails and carriages.

The dimensions of shoulder height and corner radius are shown as Table 6 and with bottom seal are shown as Table 7.

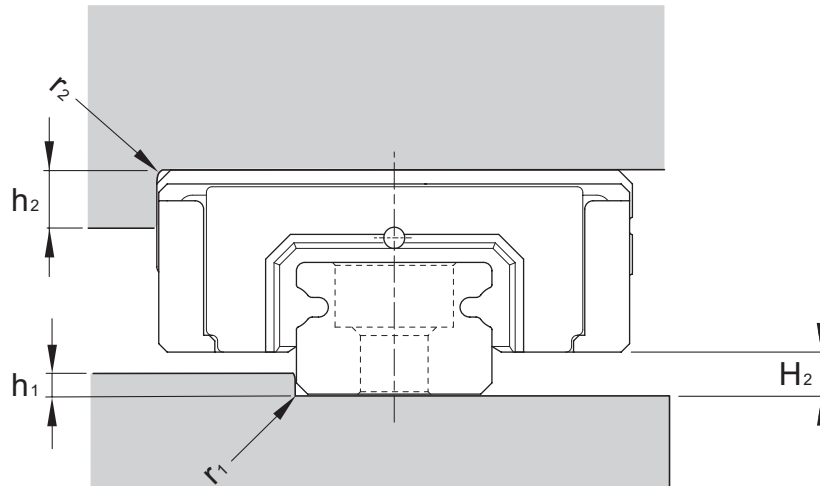


Table 6 Shoulder height and corner radius of mounting surface

Unit:mm

Model No.	r ₁ (max.)	r ₂ (max.)	h ₁	h ₂	H ₂
MSC 7	0.2	0.2	1.0	3	1.5
MSC 9	0.2	0.3	1.7	3	2.2
MSC 12	0.3	0.4	2.5	4	3.0
MSC 15	0.5	0.5	3.5	5	4

Table 7 Shoulder height and corner radius of mounting surface with bottom seal

Unit:mm

Model No.	h ₁	H ₂
MSC 7	0.9	1.0
MSC 9	1.6	1.7
MSC 12	2.4	2.5
MSC 15	3.4	3.5



8 Dimensional Tolerance of Mounting Surface

The tolerances of parallelism between two axes are shown as below.

● The parallel deviation between two axes (e_1)

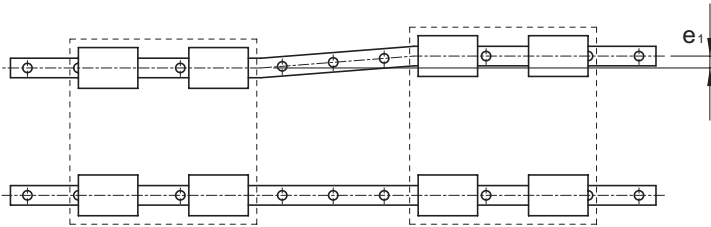


Table 8 Parallel deviation (e_1)

Unit: μm

Model No.	Preload Grade	
	FC	F0
MSC 7	3	3
MSC 9	4	3
MSC 12	9	5
MSC 15	10	6

● Level difference between two axes (e_2)

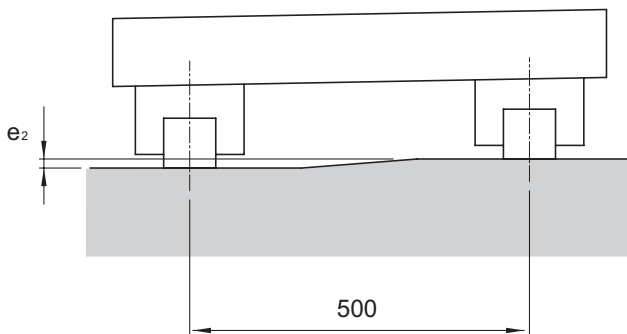


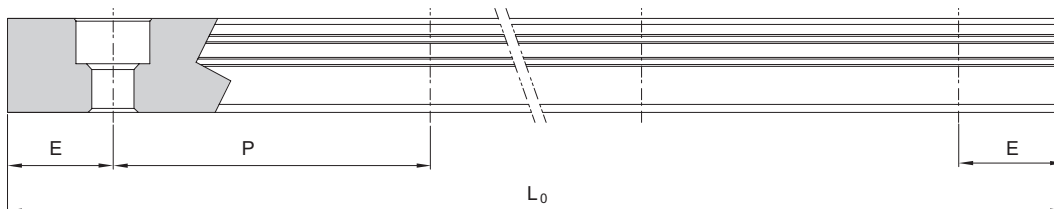
Table 9 Level difference between two axes (e_2)

Unit: μm

Model No.	Preload Grade	
	FC	F0
MSC 7	25	6
MSC 9	35	6
MSC 12	50	12
MSC 15	60	20

Note: The permissible values in table are applicable when the span is 500mm wide.

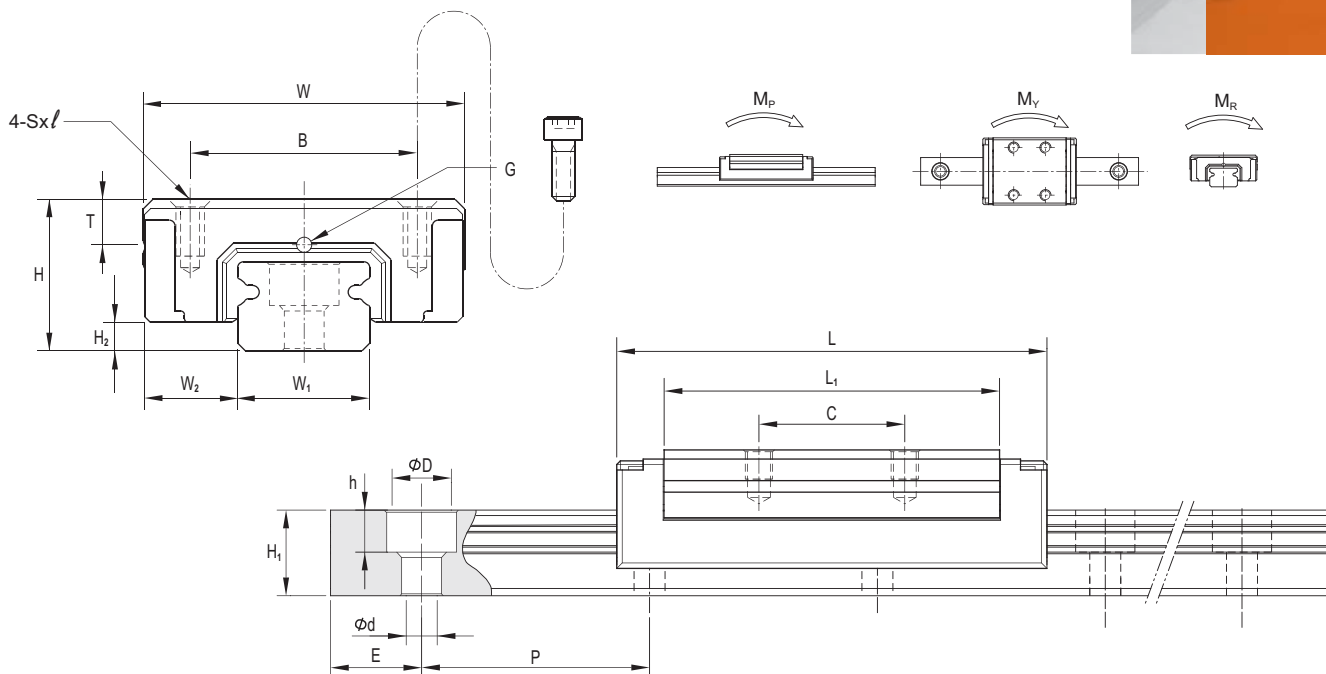
9 Rail Standard and Maximum Length



Unit: mm

Model No.	MSC 7	MSC 9	MSC 12	MSC 15
Rail Standard Length (L_0)	40	55	70	70
	55	75	95	110
	70	95	120	150
	85	115	145	190
	100	135	170	230
	130	155	195	270
		175	220	310
		195	245	350
		275	270	390
		375	320	430
		370	470	
		470	550	
		570	670	
			870	
Standard Pitch (P)	15	20	25	40
Standard E	5	7.5	10	15
Max. Length (L_0)	600	1000	1000	1000

Dimensions of MSC-M / MSC-LM



Unit: mm

Model No.	External dimension					Carriage dimension					
	Height H	Width W	Length L	W₂	H₂	B	C	S x l	L₁	T	G
MSC 7 M MSC 7 LM	8	17	23.6 33.4	5	1	12	8 13	M2x2.5	18.4 27.9	3.4	φ0.8
MSC 9 M MSC 9 LM	10	20	31.1 41.3	5.5	2.2	15	10 16	M3x3	25.8 36	4.4	φ1
MSC 12 M MSC 12 LM	13	27	34.6 47.6	7.5	3	20	15 20	M3x3.6	28 41	5	φ1.5
MSC 15 M MSC 15 LM	16	32	42.5 59.5	8.5	3.7	25	20 25	M3x4.2	36.1 53.1	6	G-M3

Model No.	Rail dimension					Basic load rating		Static moment rating			Weight	
	Width W₁	Height H₁	Pitch P	E std.	D x h x d	Dynamic C kN	Static C₀ kN	M_P N-m	M_Y N-m	M_R N-m	Carriage g	Rail kg/m
MSC 7 M MSC 7 LM	7	4.7	15	5	4.2x2.3x2.4	1.15 1.64	1.57 2.62	3.6 9.3	3.6 9.3	5.8 9.7	13 18	0.22
MSC 9 M MSC 9 LM	9	5.5	20	7.5	6x3.3x3.5	2.28 3.03	3.11 4.66	10.2 22.0	10.2 22.0	14.9 22.4	29 39	0.33
MSC 12 M MSC 12 LM	12	7.5	25	10	6x4.5x3.5	2.84 4.19	3.52 6.16	11.4 32.5	11.4 32.5	22.2 38.8	40 60	0.63
MSC 15 M MSC 15 LM	15	9.5	40	15	6x4.5x3.5	5.24 7.36	6.26 10.17	27.1 67.1	27.1 67.1	48.8 79.3	71 100	1.02

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