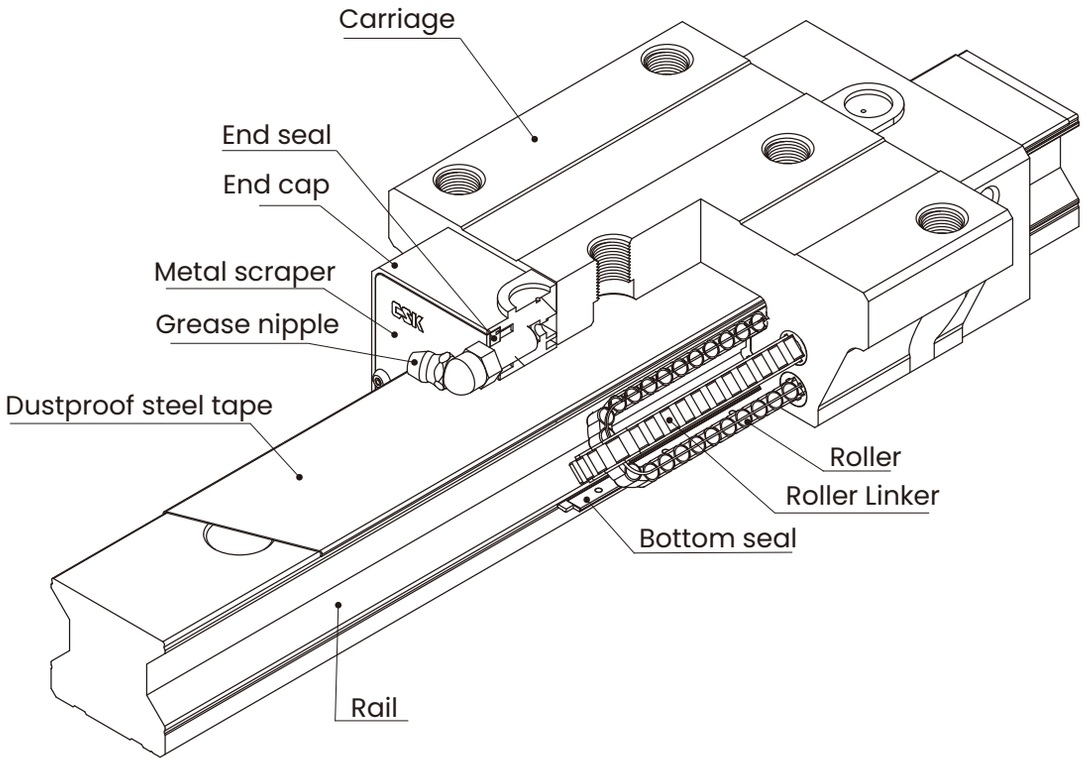
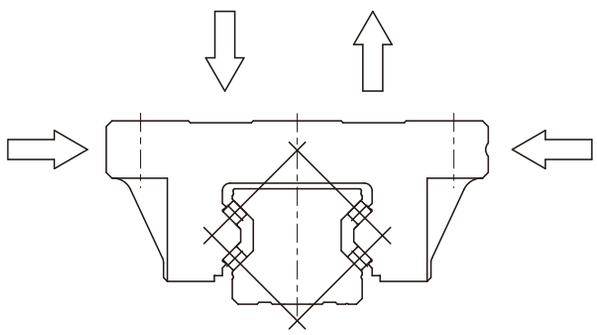
Roller-type Linear Guide

LMR series





Note：For reference only.

Characteristics

The LMR series linear guides utilize cylindrical rolling elements to replace traditional steel ball rolling elements. The transition from point contact to line contact significantly enhances load capacity. When subjected to high loads, the cylindrical rolling elements exhibit minimal elastic deformation. Additionally, the use of a 45° contact angle DB design across four rolling element rows ensures high rigidity and load-bearing performance. These guides can withstand radial, reverse radial, and lateral loads in all four directions. Furthermore, they feature a specially designed rolling element synchronizer internally, which eliminates gear effects caused by mutual friction during rolling. This greatly reduces travel resistance, improves operational smoothness, and lowers noise levels. Years of validated preload settings have achieved a perfect balance between travel resistance, rigidity, and lifespan. The LMR series fully meets the requirements of high-end precision equipment for high precision, high load capacity, high reliability, low noise, and smooth and stable linear motion.

- **Ultra-High Rigidity and Heavy Load Capacity**
- **DB Design Across Four Rolling Element**
- **Ultra-High Precision with Optional Grades**
- **Smooth Travel**
- **High Speed and Low Noise**
- **Interchangeable Blocks**
- **Comprehensive Lubrication Design**
- **Sealed and Configurable**
- **Dust-Resistant Steel Belt Design**
- **Manufactured to International Standards**

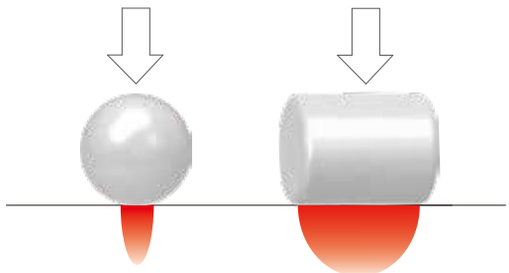
Applications

Machine Tool (Machine canter, Large gantry, Precision Lathe)
Industrial Automation (Heavy gantry robot, Cantilever cartesian robot, Robot ground track)

Characteristics

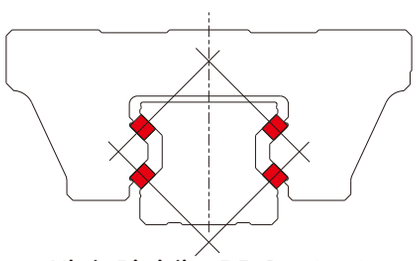
Heavy Load Capacity

The LMR series linear guides utilize cylindrical rolling elements to replace traditional steel ball rolling elements. The transition from point contact to line contact significantly enhances load capacity.



Ultra-High Rigidity

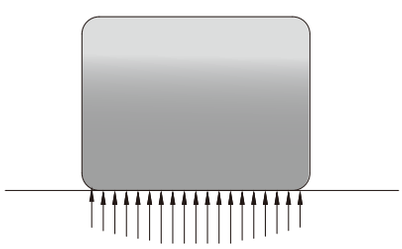
By utilizing modern digital technology, we analyze and optimize the contact position of the rolling column to maximize its resistance torque load capacity.



High Rigidity DB·Contact

Motion Accuracy

Smooth and precise walking accuracy achieved through exclusive fine control specifically developed for the rolling contact surface of the cylindrical component.



Stress distribution

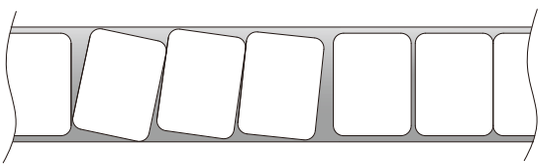
Creative Lubrication

The block features a built-in self-lubricating module that guides lubricating oil to the surface of the linear guide using engineered fibers. The rolling friction guide requires only an extremely thin oil film for effective lubrication. By incorporating an internally self-built self-lubricating module, the lubrication cycle can be extended to some extent, thereby prolonging the service life.

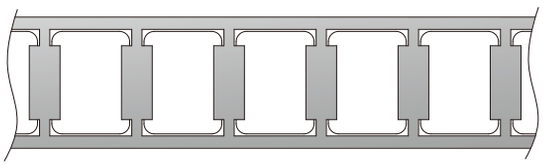
Characteristics

Smooth Motion

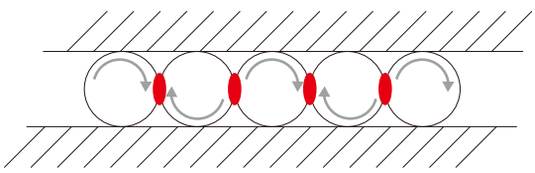
Optimization extends to each component, achieving uniform arrangement of cylindrical rolling elements through a rolling element synchronizer. This addresses the inherent rolling tilt issue and eliminates gear effects within the rolling elements, significantly reducing rolling resistance. The result is an optimal operational feel.



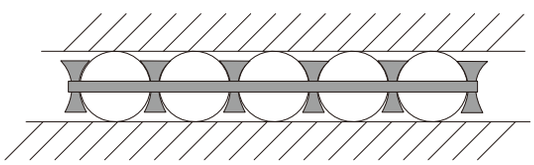
Cylindrical Rolling Element Tilt Illustration



Linker Array of Rolling Elements

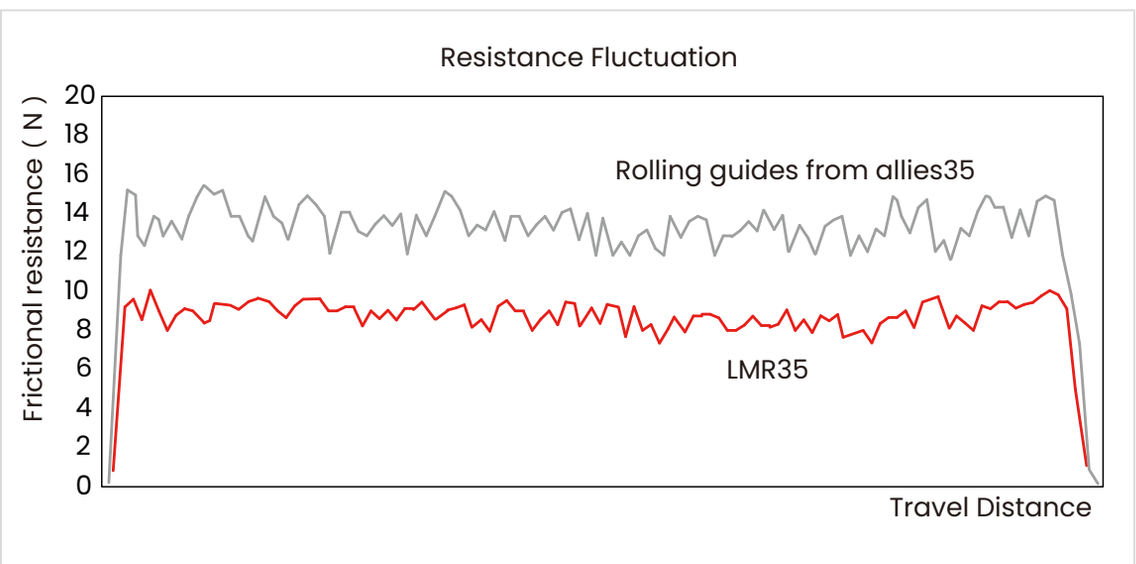


Gear Friction Effect Illustration



Linker Structure Illustration

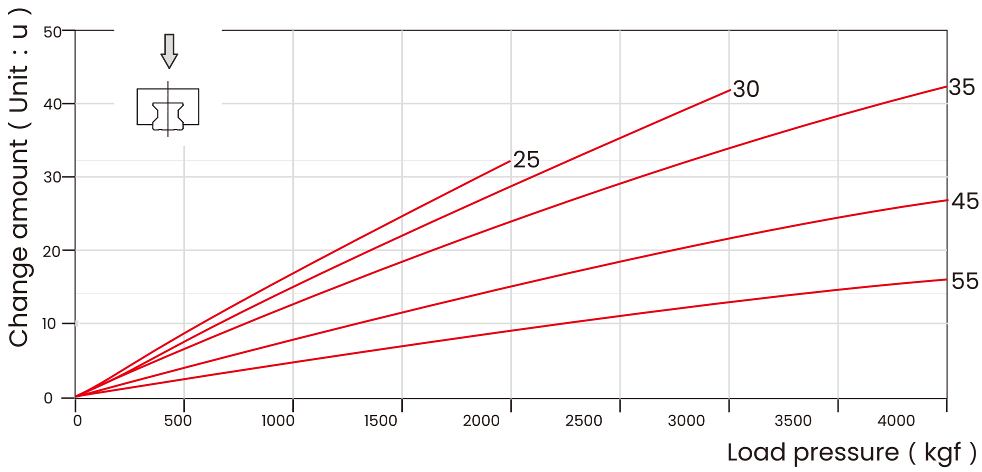
Resistance Fluctuation Test Report

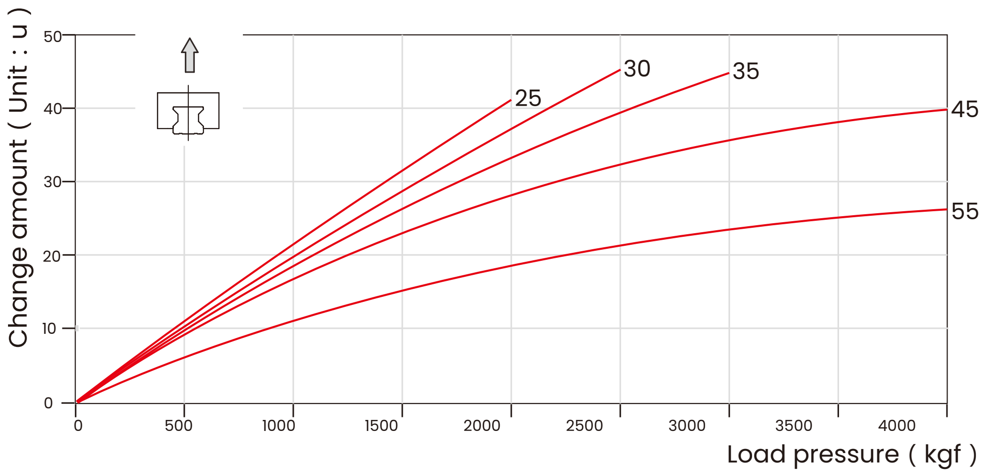


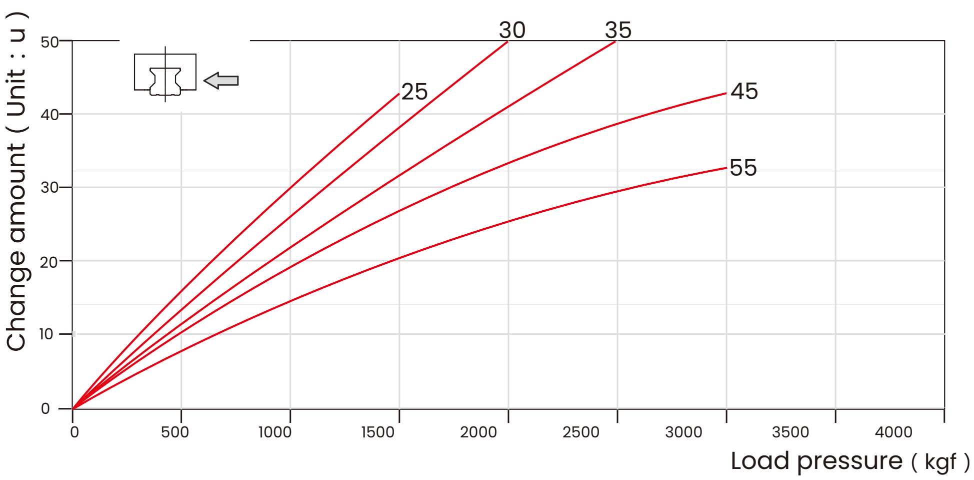
Characteristics

Rigidity

When the preload is P1，Roller guide rail rigidity.



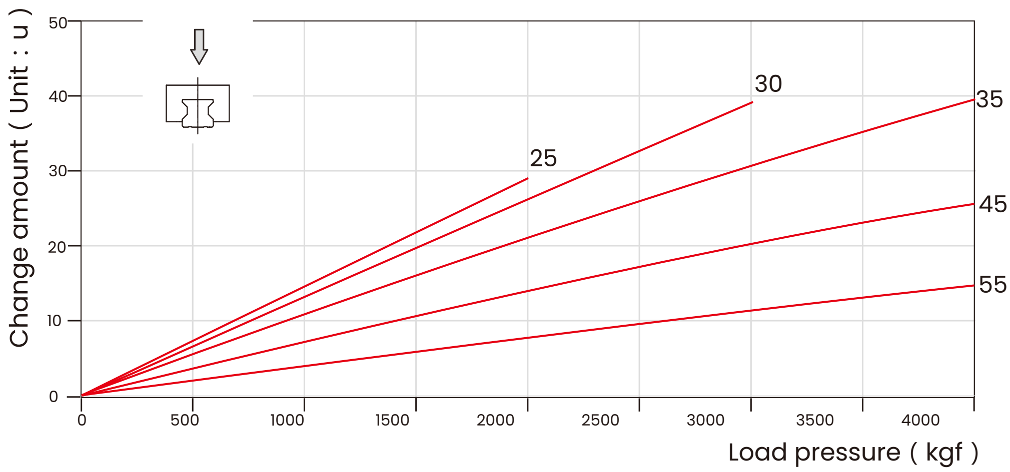


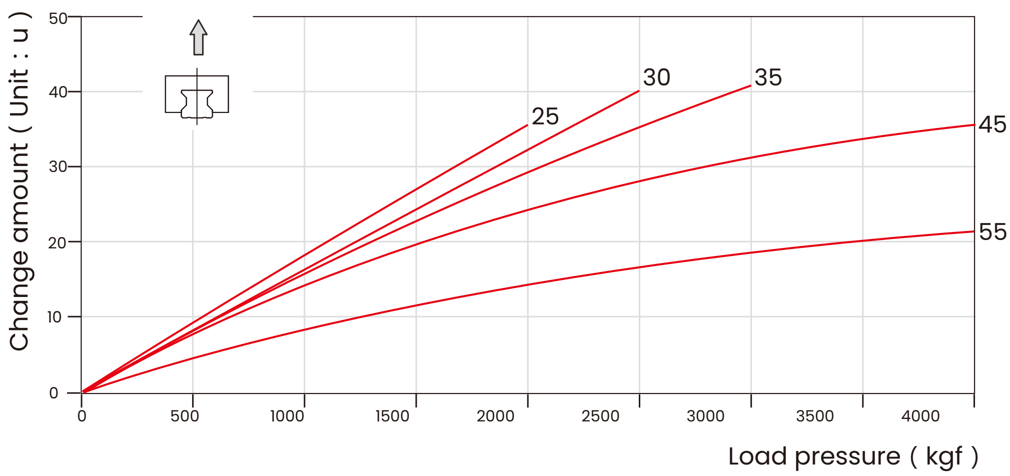


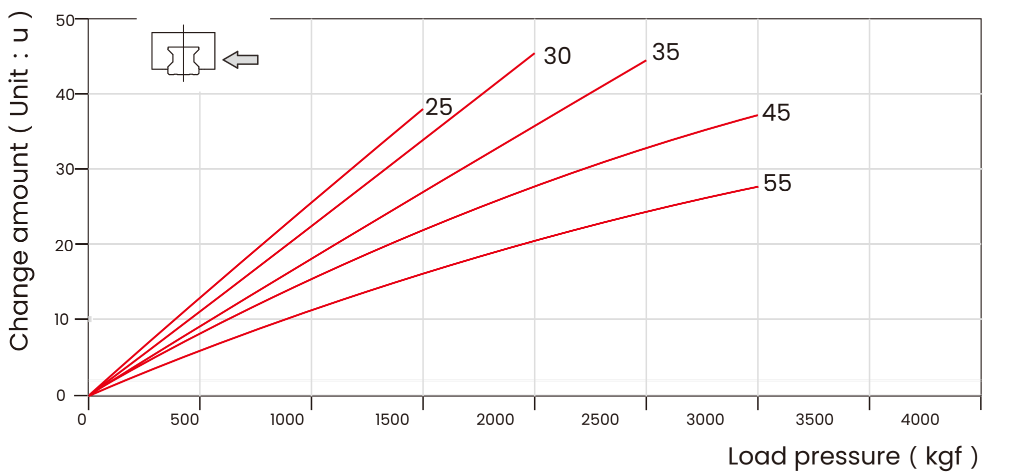
Characteristics

Rigidity

When the preload is P2，Roller guide rail rigidity.







Characteristics

Heavy Load Capacity

In harsh environments, metal scrapers serve as the first layer of protection, effectively protecting the sealing plate from the risk of being damaged by metal debris. The slide rail is equipped with steel strips for overall rail protection, which not only improves ssembly efficiency but also avoids the problem of foreign object intrusion caused by traditional bolt cover wear.

Dust test

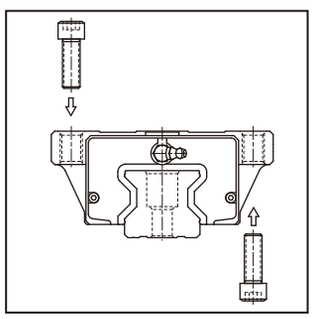
Model No.	Test conditions
specifications	LMR30H1ZZP1+R1000-20/20H
speed	1m/s
Stroke	800mm
Environment	Aluminum chip covering

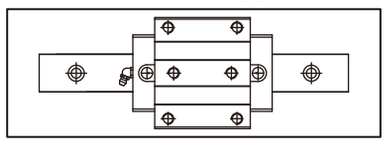
Dust testing machine	Using bolt caps	Dustproof steel tape
		
		

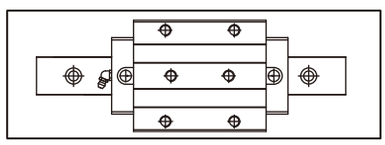
Dust prevention method for guide rails	Operating mileage	Test result
Bolt cover	10000km	There are aluminum chips inside the slider
Dustproof steel tape	10000km	There is no abnormal inside the slider

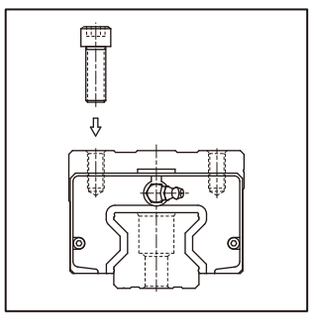
Carriage Type

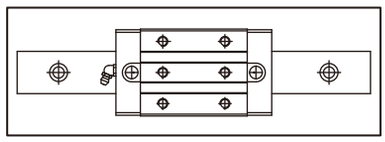
Contour	Length	Spec Code
Flange type	Standard type	C
	Extended	LC
Square high type	Standard type	H
	Extended	LH

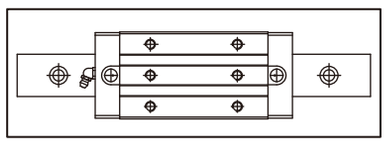






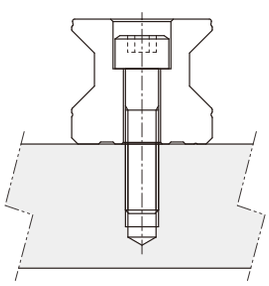


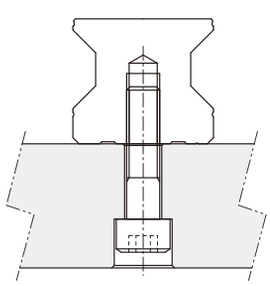




Rail Type

Counter bore (R type)	Tapped hole (T type)



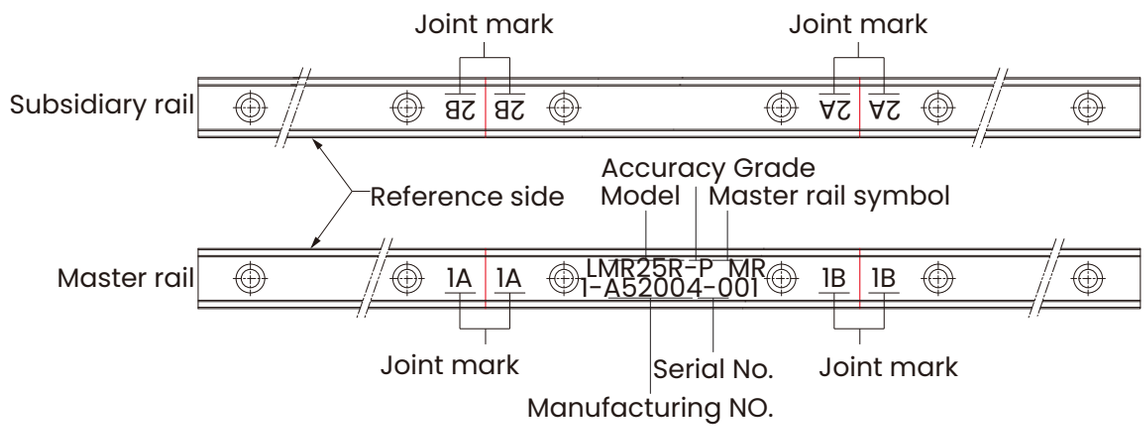


Butt-Joint

（1）For Butt-joint Rail

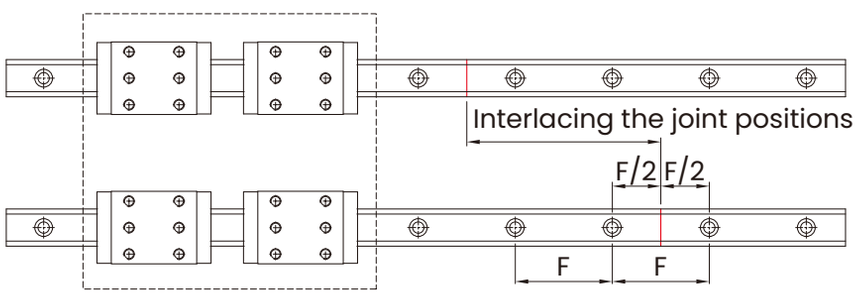
When applied length of rail longer than specified max. length, the rails can be connected to one another. For this situation, the joint marks indicate the matching position. Accuracy may deviate at joints when carriages pass the joint simultaneously. Therefore, the joints should be interlaced for avoiding such accuracy problem.

- Dentification of butt-joint rail



(A)

- Staggering the joint position



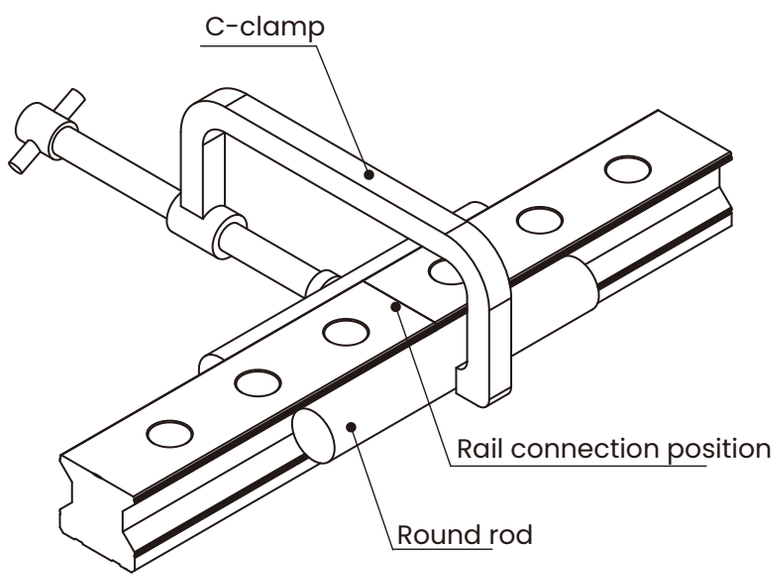
(B)

Rail Type

Method of continuous installation

As shown in the schematic diagram, connect the two ends of the guide rail to be spliced together, take two standard round rods and press them against the groove of the guide rail, and use C-clamp.

Model No.	Standard round bar size
LMR 25	Ø15
LMR 30	Ø20
LMR 35	Ø22
LMR 45	Ø25
LMR 55	Ø28



Guide rail connection installation diagram

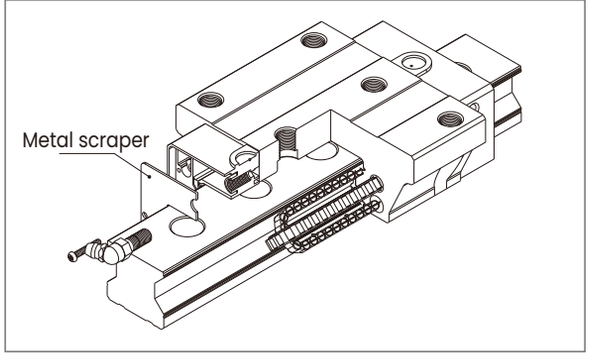
Dust Proof

(1) Code of contamination protection for carriage

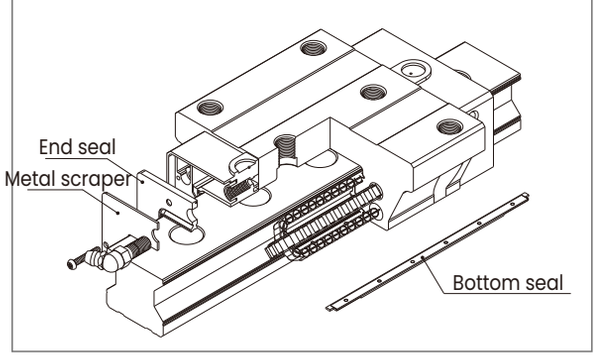
Contamination protection

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

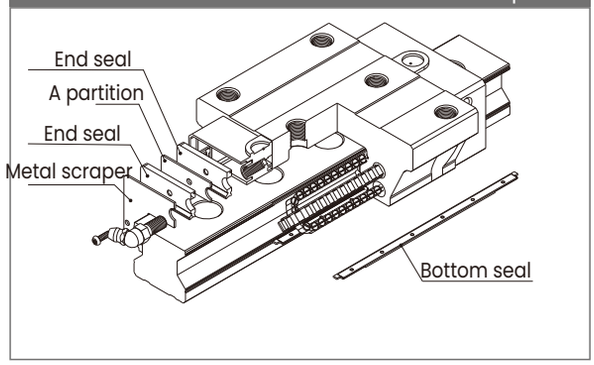
● No symbol Metal scrapers



● ZZ End seals + Bottom seals + metal scrapers

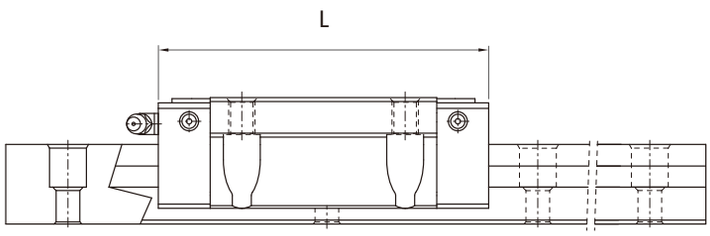


● KK Double End seals + Bottom seals + metal scrapers



Types of dust proof accessories, and the increment to be added to the carriage overall length The increment to be added to the length of carriage with different applications of dust proof accessory is shown below.

Model No.	No symbol	ZZ	KK
LMR 25	-	-	6
LMR 30	-	-	6
LMR 35	-	-	8
LMR 45	-	-	6
LMR 55	-	-	6



Dust Proof

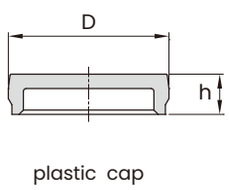
（2）Code of contamination protection for rail

Caps for rail mounting hole

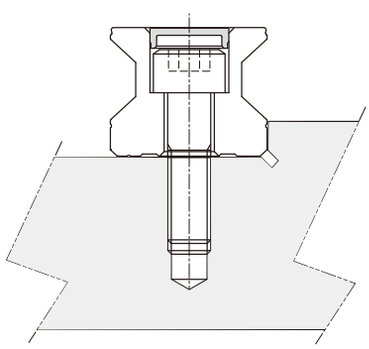
A special designed of cap is used to cover the bolt hole to prevent the foreign matters from entering the carriage.

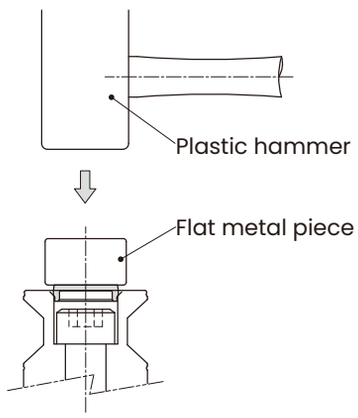
Installation of plastic cap

Put the plate on the cap,then pound it into the bolt of rail with rubber hammer vertically. Continue pounding the cap until the cap is on the same plane with the top surface of rail.



plastic cap





Plastic Cap

Code of Plastic Cap	Bolt Size	D (mm)	h (mm)	Rail Model
L6	M6	11.2	2.8	LMR25R
L8	M8	14.2	3.3	LMR30R，LMR35R
L12	M12	20.2	4.5	LMR45R
L14	M14	23.2	5.5	LMR55R

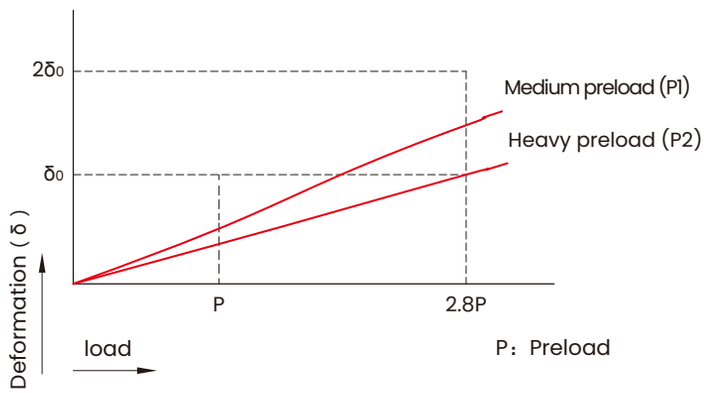
* For details on the dust-proof steel strip, please refer to the details page-C26

Preload

Since the radial chearance of the linear guideway greatly affects the running accuracy, load carrying capacity and rigidity of the linear guideway,it is important to select an appropriate clearance according to the application. in general,selecting a negative clearance while taking into account possible vibrations and impact generated from reciprocating motion favorably affects the service life and the accuracy.

Preload and Rigidity

Selecting appropriate preload to adapt the rigidity of machiney and equipment. The rigidity of a linear guideway could be enhanced by increasing the preload. As shown as below figure, the load could be raised up to 2.8 times the preload applied.



Preload and Service life

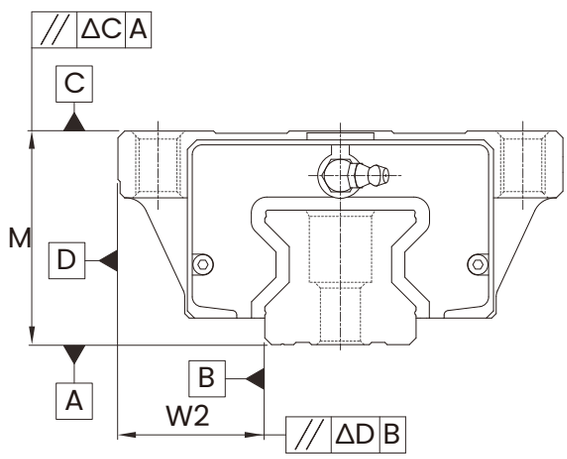
The preload is represented by negative clearance resulting from the increase of rolling element diameter. Therefore, the preload should be considered in calculation service life.

Preload grade	Code	Preload	Operating Condition
Medium preload	P1	0.07~0.09C	● Overhang application with a moment load. ● Applied in one-axis configuration ● The need of light preload and high precision.
Heavy preload	P2	0.12~0.14C	● Machine is subjected to vibration and impact, and high rigidity required. ● Application of heavy load or heavy cutting.

Note：The preload is the percentage of basic dynamic load rating (C).

Accuracy Grade

The accuracy of LMR series is divided into five classes, High accuracy grade (H), Precision grade (P), Super precision grade (SP) and Ultra precision grade (UP).

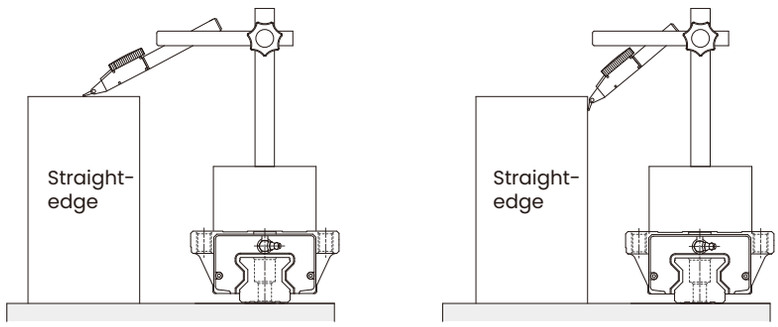


Unit (mm)

Model No.	Item	Accuracy Grade			
		High H	Precision P	Super Precision SP	Ultra Precision UP
LMR 25 LMR 30 LMR 35	Tolerance for height M	±0.04	0 -0.04	0 -0.02	0 -0.01
	Height difference ΔM	0.015	0.007	0.005	0.003
	Tolerance for distance W2	±0.04	0 -0.04	0 -0.02	0 -0.01
	Difference in distance W2 (ΔW2)	0.015	0.007	0.005	0.003
	Running parallelism of surface C with surface A	ΔC (see Running parallelism of carriage)			
	Running parallelism of surface D with surface B	ΔD (see Running parallelism of carriage)			
LMR 45 LMR 55	Tolerance for height M	±0.05	0 -0.05	0 -0.03	0 -0.02
	Height difference ΔM	0.015	0.007	0.005	0.003
	Tolerance for distance W2	±0.05	0 -0.05	0 -0.03	0 -0.02
	Difference in distance W2 (ΔW2)	0.02	0.01	0.007	0.005
	Running parallelism of surface C with surface A	ΔC (see Running parallelism of carriage)			
	Running parallelism of surface D with surface B	ΔD (see Running parallelism of carriage)			

Running Parallelism

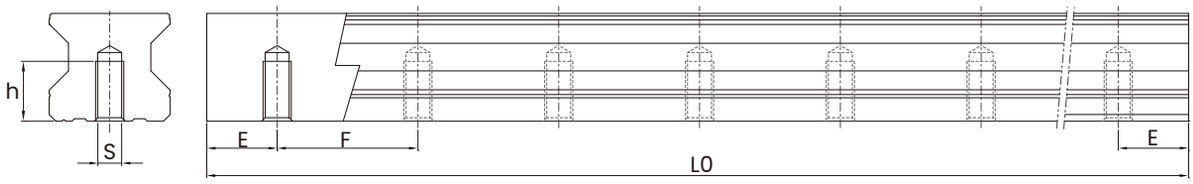
The running accuracy is the deviation of parallelism between the reference surface of carriage and reference surface of rail when carriage moving over the entire length of rail.



Measurement of running parallelism

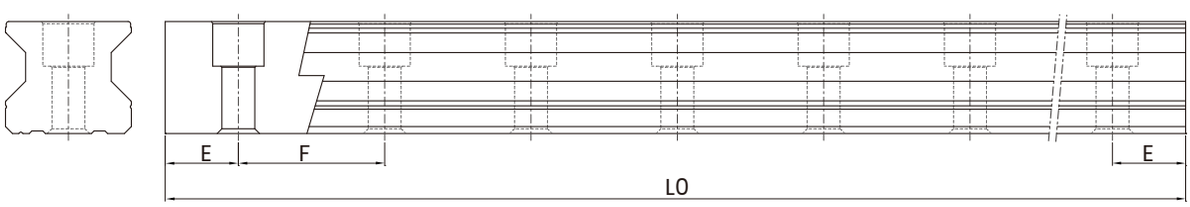
Rail length (mm)		Running Parallelism Values (μm)			
Above	Or less (incl.)	High H	Precision P	Super Precision SP	Ultra Precision UP
0	315	6	3	2	1.5
315	400	8	4	2	1.5
400	500	9	5	2	1.5
500	630	11	6	2.5	1.5
630	800	12	7	3	2
800	1000	14	8	4	2
1000	1250	16	10	5	2.5
1250	1600	18	11	6	3
1600	2000	20	13	7	3.5
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

Tapped Hole Rail Dimensions



Model	S	h (mm)
LMR 25T	M6	12
LMR 30T	M8	15
LMR 35T	M8	17
LMR 45T	M12	24
LMR 55T	M14	24

Rail Maximum Length and Standard



Unit (mm)

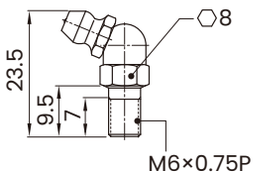
Size	LMR 25	LMR 30	LMR 35	LMR 45	LMR 55
Standard Pitch (F)	30	40	40	52.5	60
Standard (Estd.)	20	40	40	40	30
Minimum (Emin.)	7	8	8	11	12.5
Maximum Length (L0)	4000	4000	4000	4000	4000

Lubrication

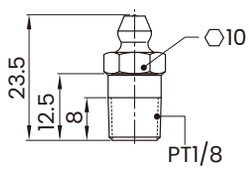
Grease nipples and oil piping joint

(1) Grease nipples

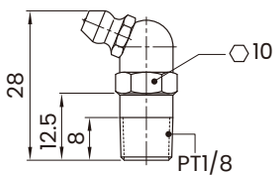
GC - M6M



GS - 7M



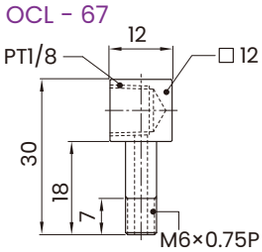
GC - 7M



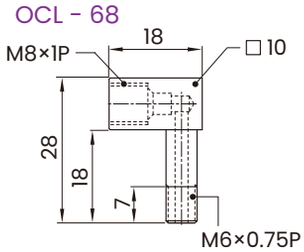
(2) Oil piping joint

- OC

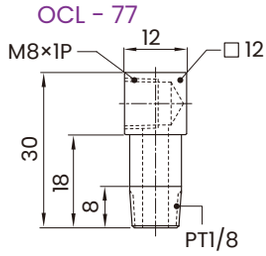
OCL - 67



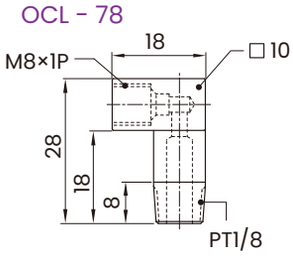
OCL - 68



OCL - 77

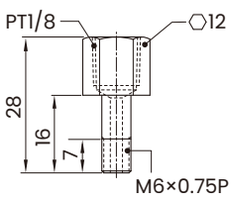


OCL - 78

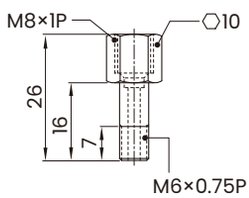


- OS

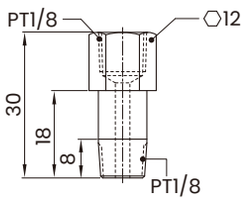
OSL - 67



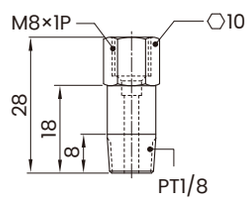
OSL - 68



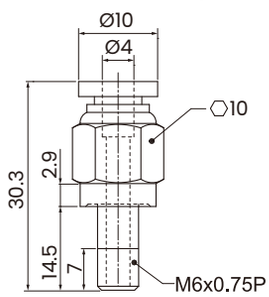
OSL- 77



OSL - 78



OSL - 64 (Fast joint)



Model No.	Grease Nipples		Oil Piping Joint
	Standard	Option	Option
LMR 25	GC - M6M	GS - M6M	OCL - 67、OCL - 68、OSL - 67、OSL- 68、OSL - 64
LMR 30			
LMR 35			
LMR 45	GC - 7M	GS - 7M	OCL - 77、OCL - 78、OSL - 77、OSL - 78
LMR 55			

Lubrication

A well lubrication is important for maintaining the function of the 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 the 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 environment requirement.

Grease lubrication

The grease feeding interval will be varied with different operating conditions and environments. Under normal operating condition, the grease should be replenished every 100km of travel. The standard pre-filled grease is lithium-based grease No.2. Moving the carriage back and forth with minimum stroke length of three carriages after the carriages been greased. To assure the grease is evenly distributed inside of carriage, the mentioned process should be repeated twice at least.

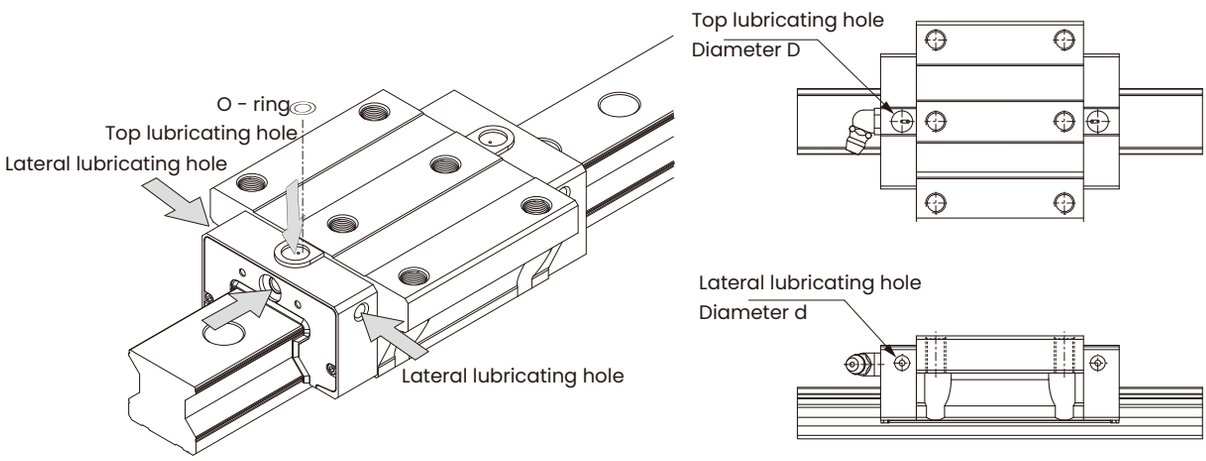
Oil lubrication

The recommended viscosity of oil is 30~150 cst, and the recommended feeding rate per hour. The nstallation other than horizontal may caused the oil unable to reach raceway area, so please specify the installed direction of your linear guideway applied.

Lubrication

Lubrication position

The standard lubricating position of carriage is at the center of both ends, as shown below. As for lateral and top application, please specify when ordering.



Unit (mm)

Model No.	Center Lubricating	Lateral Lubricating			Top Lubricating		
	Grease Nipple	Diameter d	Grease Nipple	Drilling size	Diameter D	O - ring	Drilling size
LMR 25	M6×0.75P	5.2	M6×0.75P	2	7.4	P4	1
LMR 30				2.5			1.5
LMR 35				2			1
LMR 45	PT1/8			2.5	10.2	P7	2
LMR 55				2			

* When the travel distance is less than the total length of two sliders, grease fittings or oil pipe connectors must be installed at both ends of the sliders, and regular lubrication is required. If the travel distance is less than half the total length of a slider, in addition to the aforementioned method, the slider must be moved back and forth over a lubrication distance of at least two slider lengths during lubrication.

Specifications

(1) Non-Interchangeable type

LMR 25 C 2 ZZ P1 +R C 1000 -20 /20 P II

Series：LMR

Size：25 , 30 , 35 , 45 , 55

Carriage type

(1) Heavy load

C：Flange type, mounting either from top or bottom

H：Square high type

(2) Ultra heavy load

LC：Flange type, mounting either from top or bottom

LH：Square high type

Number of carriages per rail：1 , 2 , 3 ...

Dust protection option：No symbol , ZZ , KK

Preload：P1 (Medium preload) , P2 (Heavy preload)

Code of special carriage：A , B ... (Standard rail is no symbol)

Rail type：R , T (Tapped hole type)

Dustproof steel tape：No symbol , C

Rail length (mm)

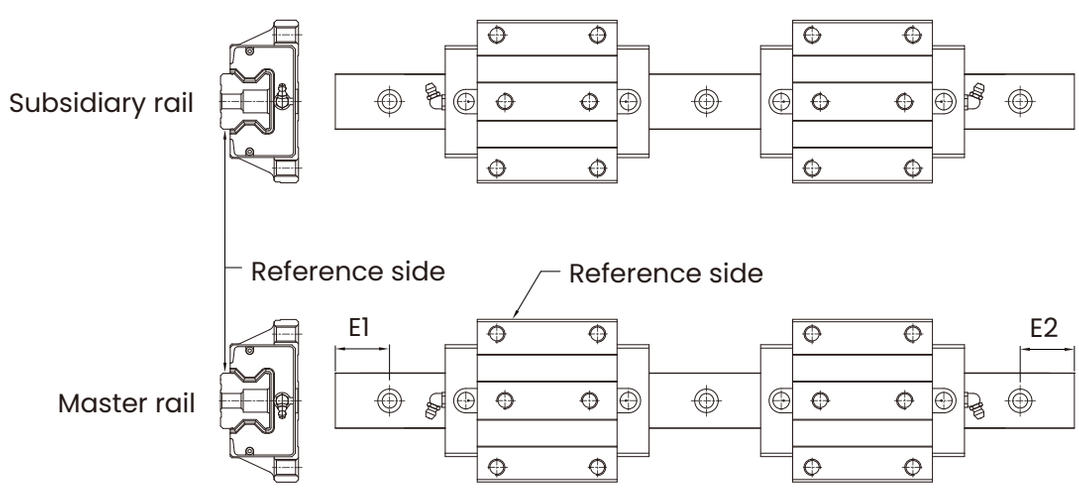
Rail hole pitch from start side (E1, see Figure below)

Rail hole pitch to the end side (E2, see Figure below)

Accuracy grade：H , P , SP , UP

Code of special rail：A , B ... (Standard rail is no symbol)

Number of rails per axis：No symbol , II , III , IV ...



Specifications

(2) Interchangeable type

- Code of Carriage

LMR 25 C ZZ P1 H

Series：LMR
Size：25，30，35，45，55
Carriage type
（1）Heavy load
C： Flange type, mounting either from top or bottom
H： Square high type
（2）Ultra heavy load
LC：Flange type, mounting either from top or bottom
LH：Square high type
Dust protection option：No symbol，ZZ，KK
Preload：P1（Medium preload），P2（Heavy preload）
Accuracy grade：H
Code of special carriage：A，B ...（Standard carriage is no symbol）

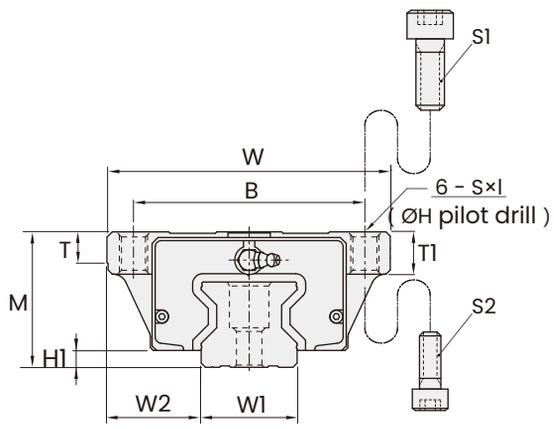
- Code of Rail

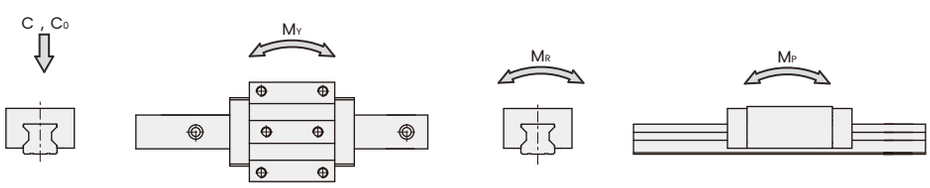
LMR 25 R 1000 -20 /20 H

Series：LMR
Size：25，30，35，45，55
Rail type：R，T（Tapped hole type）
Rail length（mm）
Rail hole pitch from start side（E1, Refer to Figure D-20）
Rail hole pitch to the end side（E2, Refer to Figure D-20）
Accuracy grade：H
Code of special rail：A，B ...（Standard rail is no symbol）

Dimensions of LMR···C / LC

Model No.	Bolt Size		Pilot drill
	S1	S2	H
LMR25	M8	M6	6.9
LMR30	M10	M8	8.6
LMR35	M10	M8	8.6
LMR45	M12	M10	10.4
LMR55	M14	M12	12.5

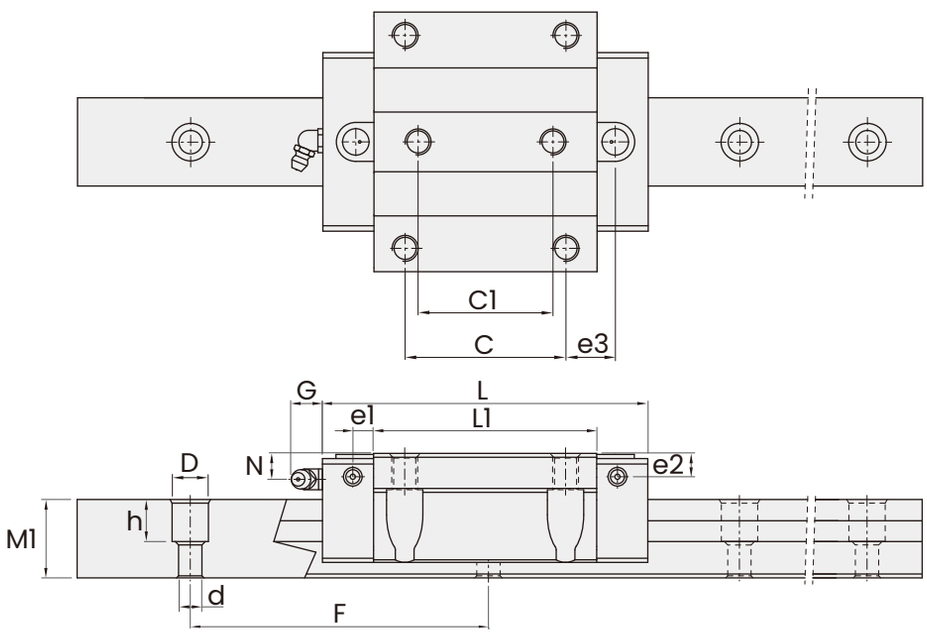




Unit (mm)

Model No.	External dimension			Carriage dimension													
	Height	Width	Length	B	C	C1	Mounting hole S×l	L1	T	T1	H1	N	e1	e2	e3	G	Grease nipple
	M	W	L														
LMR25C	36	70	101.2	57	45	40	M8×10	65.2	9	13	5	6.6	7.5	6.5	17.1	15	M6×0.75
LMR25LC	36	70	117.2	57	45	40	M8×10	81.2	9	13	5	6.6	7.5	6.5	25.1	15	M6×0.75
LMR30 C	42	90	113.1	72	52	44	M10×10	71.5	8	13	5.8	7.2	7.5	7	16.7	15	M6×0.75
LMR30LC	42	90	135.6	72	52	44	M10×10	94	8	13	5.8	7.2	7.5	7	28	15	M6×0.75
LMR35 C	48	100	129	82	62	52	M10×13	86	10	13.5	6.5	9.5	8	9	19	15	M6×0.75
LMR35 LC	48	100	158.4	82	62	52	M10×13	111.8	10	13.5	6.5	9.5	8	9	31.9	15	M6×0.75
LMR45 C	60	120	153	100	80	60	M12×15	107	12	15	7.8	10	8.5	10	20.5	16.5	PT 1/8
LMR45 LC	60	120	184.2	100	80	60	M12×15	138.2	12	15	7.8	10	8.5	10	36.1	16.5	PT 1/8
LMR55 C	70	140	182	116	95	70	M14×18	126.4	12	18	10	12	9	10	22.7	16.5	PT 1/8
LMR55 LC	70	140	231.6	116	95	70	M14×18	176	12	18	10	12	9	10	47.5	16.5	PT 1/8

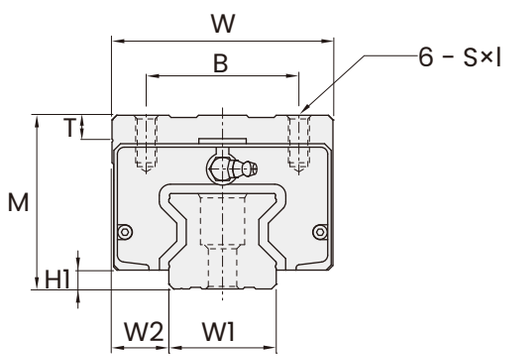
Dimensions of LMR···C / LC

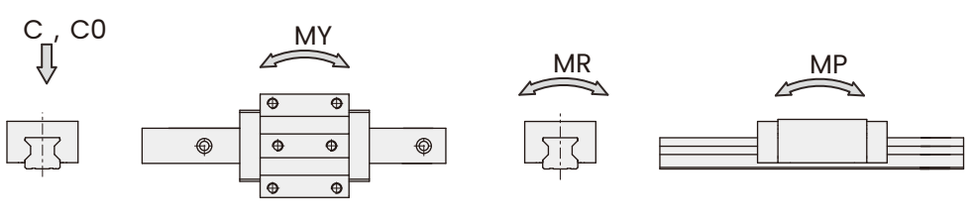


Unit (mm)

Model No.	Rail dimension					Basic load rating		Static moment rating			Weight	
	Width		Height	Pitch	Mounting bolt hole	Dynamic	Static	M_P (KN·m)	M_Y (KN·m)	M_R (KN·m)	Carriage Kg	Rail Kg/m
	W1	W2	M1	F	D×h×d	C KN	C0 KN					
LMR25C	23	23.5	23.6	30	11×9×7	26.6	51.5	0.59	0.59	0.74	0.68	3.16
LMR25LC	23	23.5	23.6	30	11×9×7	30.9	62.3	0.85	0.85	0.90	0.85	3.16
LMR30 C	28	31	28	40	14×12×9	39.6	70.1	0.85	0.85	1.26	1.19	4.4
LMR30LC	28	31	28	40	14×12×9	51.3	98.2	1.64	1.64	1.76	1.45	4.4
LMR35 C	34	33	30.7	40	14×12×9	49.4	93.5	1.49	1.49	2.01	1.61	6.23
LMR35 LC	34	33	30.7	40	14×12×9	58.8	116.9	2.30	2.30	2.51	2.13	6.23
LMR45 C	45	37.5	38	52.5	20×17×14	88.3	181.5	3.56	3.56	5.00	3.04	10.23
LMR45 LC	45	37.5	38	52.5	20×17×14	109.4	239.2	6.12	6.12	6.59	3.85	10.23
LMR55 C	53	43.5	44	60	23×20×16	120.0	254.9	5.80	5.80	8.25	4.62	14.45
LMR55 LC	53	43.5	44	60	23×20×16	154.6	352.2	10.82	10.82	11.42	6.43	14.45

Dimensions of LMR···H / LH

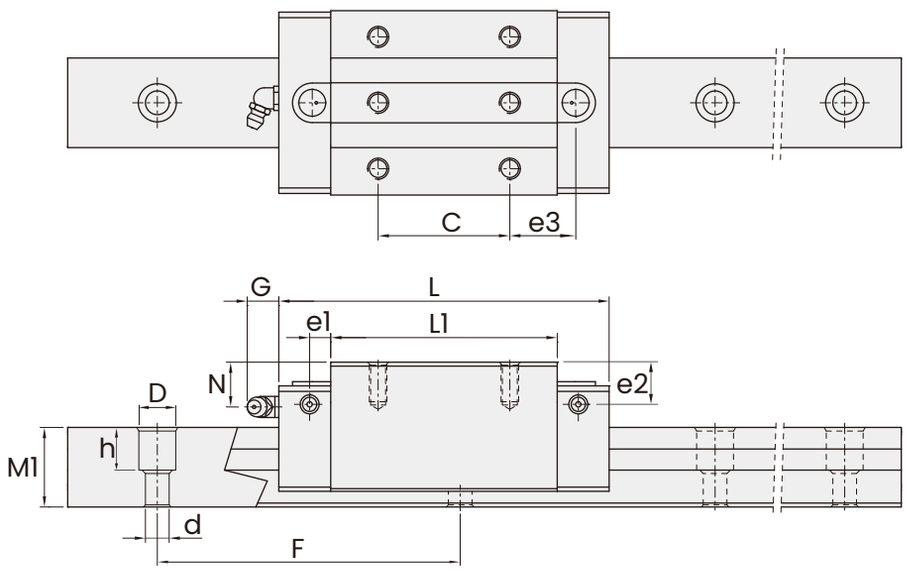




Unit (mm)

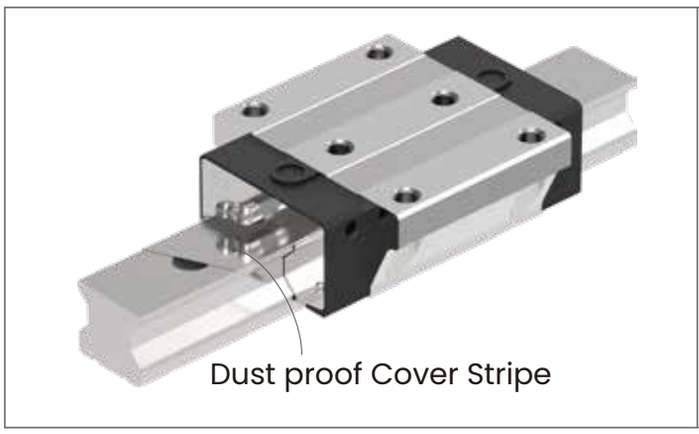
Model No.	External dimension			Carriage dimension											
	Height	Width	Length	B	C	Mounting hole S×l	L1	T	H1	N	e1	e2	e3	G	Grease nipple
	M	W	L												
LMR25H	40	48	101.2	35	35	M6×8	65.2	8	5	10.6	7.5	10.5	22.1	15	M6×0.75
LMR25LH	40	48	117.2	35	50	M6×8	81.2	8	5	10.6	7.5	10.5	22.6	15	M6×0.75
LMR30 H	45	60	113.1	40	40	M8×10	71.5	9	5.8	10.2	7.5	10.3	22.7	15	M6×0.75
LMR30LH	45	60	135.6	40	60	M8×10	94	9	5.8	10.2	7.5	10.3	24	15	M6×0.75
LMR35 H	55	70	129	50	50	M8×12	86	15	6.5	16.5	8	16	25	15	M6×0.75
LMR35 LH	55	70	158.4	50	72	M8×12	111.8	15	6.5	16.5	8	16	26.9	15	M6×0.75
LMR45 H	70	86	153	60	60	M10×17	107	12	7.8	20	8.5	20	30.5	16.5	PT 1/8
LMR45 LH	70	86	184.2	60	80	M10×17	138.2	12	7.8	20	8.5	20	36.1	16.5	PT 1/8
LMR55 H	80	100	182	75	75	M12×18	126.4	17	10	22	9	20	32.7	16.5	PT 1/8
LMR55 LH	80	100	231.6	75	95	M12×18	176	17	10	22	9	20	47.5	16.5	PT 1/8

Dimensions of LMR···H / LH



Unit (mm)

Model No.	Rail dimension					Basic load rating		Static moment rating			Weight	
	Width		Height	Pitch	Mounting bolt hole	Dynamic	Static	M_P (KN·m)	M_Y (KN·m)	M_R (KN·m)	Carriage Kg	Rail Kg/m
	W1	W2	M1	F	D×h×d	C KN	C_0 KN					
LMR25H	23	12.5	23.6	30	11×9×7	26.6	51.5	0.59	0.59	0.74	0.61	3.16
LMR25LH	23	12.5	23.6	30	11×9×7	30.9	62.3	0.85	0.85	0.90	0.76	3.16
LMR30 H	28	16	28	40	14×12×9	39.6	70.1	0.85	0.85	1.26	0.94	4.4
LMR30LH	28	16	28	40	14×12×9	51.3	98.2	1.64	1.64	1.76	1.15	4.4
LMR35 H	34	18	30.7	40	14×12×9	49.4	93.5	1.49	1.49	2.01	1.55	6.23
LMR35 LH	34	18	30.7	40	14×12×9	58.8	116.9	2.30	2.30	2.51	2.07	6.23
LMR45 H	45	20.5	38	52.5	20×17×14	88.3	181.5	3.56	3.56	5.00	3.07	10.23
LMR45 LH	45	20.5	38	52.5	20×17×14	109.4	239.2	6.12	6.12	6.59	3.87	10.23
LMR55 H	53	23.5	44	60	23×20×16	120.0	254.9	5.80	5.80	8.25	4.27	14.45
LMR55 LH	53	23.5	44	60	23×20×16	154.6	352.2	10.82	10.82	11.42	5.94	14.45



Product characteristics

Easy to install and disassemble

Quick installation during installation, simple and fast disassembly of the entire strip during disassembly.

Prevent foreign object intrusion

Effectively prevent the chip or foreign matter damage the bolt hole special cover and then invade the inside of the slider, affecting the life of the linear guide.

Strong versatility

There is no need for special processing or individual customization of the slide, which greatly saves costs.

Specifications

LMR 25 C 2 ZZ P1 +R C 1000 -20 /20 P

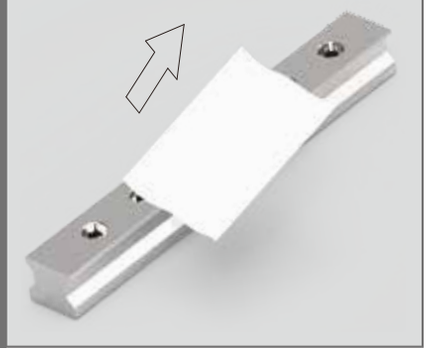
Series：LMR
Size：25 , 30 , 35 , 45 , 55
Dust proof Cover Stripe

Note:

- Dust proof steel belt can not be bent.
- Before installing the dust-proof steel belt, clean the upper surface of the guide rail.
- The edge and both ends of the dust-proof steel belt are sharp. To prevent scratches, please wear gloves when installing.
- Make chamfering at the cut off of the dust-proof steel belt to avoid scratches during installation.
- When cutting the dust-proof steel strip, it is recommended that the length of the steel strip on each side be 1~2mm shorter than the rail.

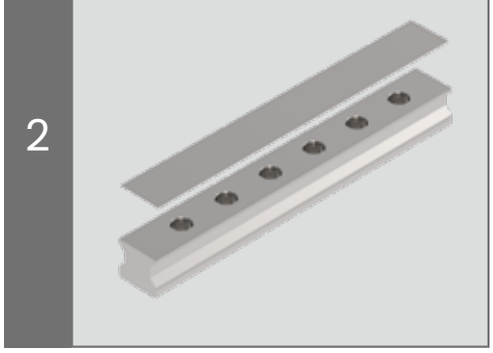
Installation

1



Clean rail surface before installation.

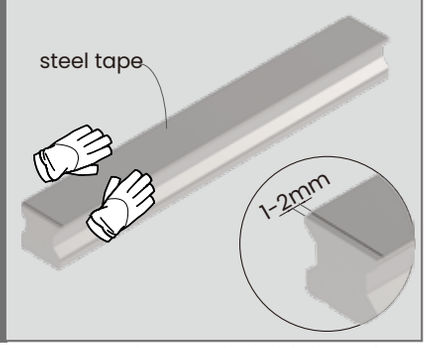
2



When cutting , make the cover stripe1~2mm shorter than the guideway.

⚠ The cover stripe cannot be bent.

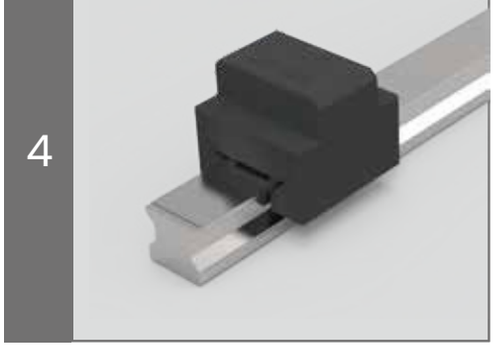
3



Place the cover stripe neatly, hold down the edge of the cover stripe, and press down to make sure that the end of the cover stripe is closely connected with the end of the guideway.

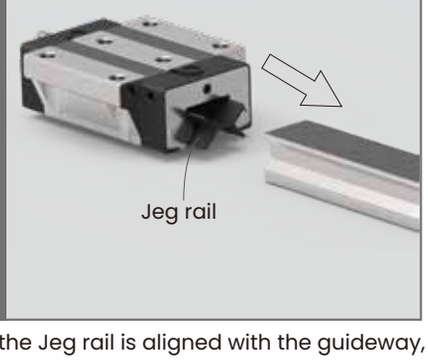
⚠ The cover stripe cannot be bent.

4



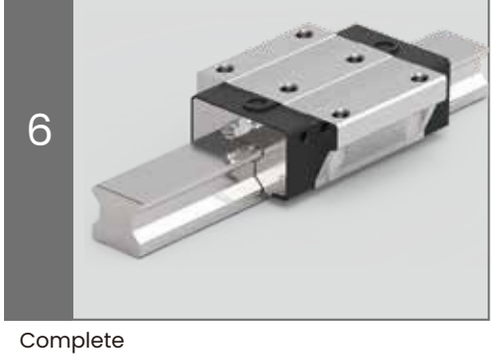
Align the cover stripe with the guideway and push it downward to check whether the cover stripe is in place. Repeat Step 4 until the cover stripe is in place.

5



After the Jeg rail is aligned with the guideway, push the slide block into the guideway. Take out the slide block, use the Jeg rail.

6



Complete

Description of slider back hole cove

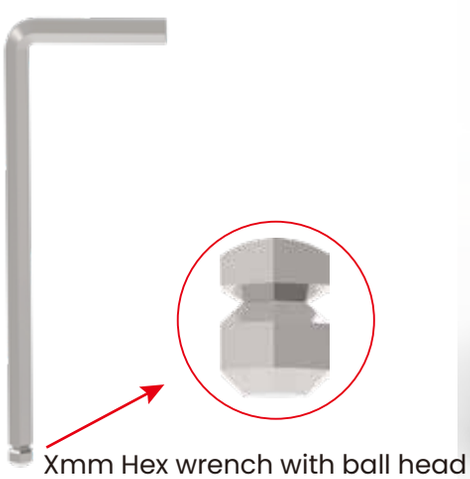
Characteristics

When the LMR series C-type slider is locked down，Prevent foreign objects from entering the interior of the slider through the back hole of the slider，Affects the service life of linear guides.

Disassembly method

When using the middle two holes, remove the dust plug from the back hole of the slider as follows.

1.Insert the ball head of the M4 Allen wrench into the center slot of the dustproof back hole cover. Lift out the dust proof back hole cover with vertical upward force.



Xmm Hex wrench with ball head