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Find the *THK SSR15XVM2* at our website: *Click HERE*

THK

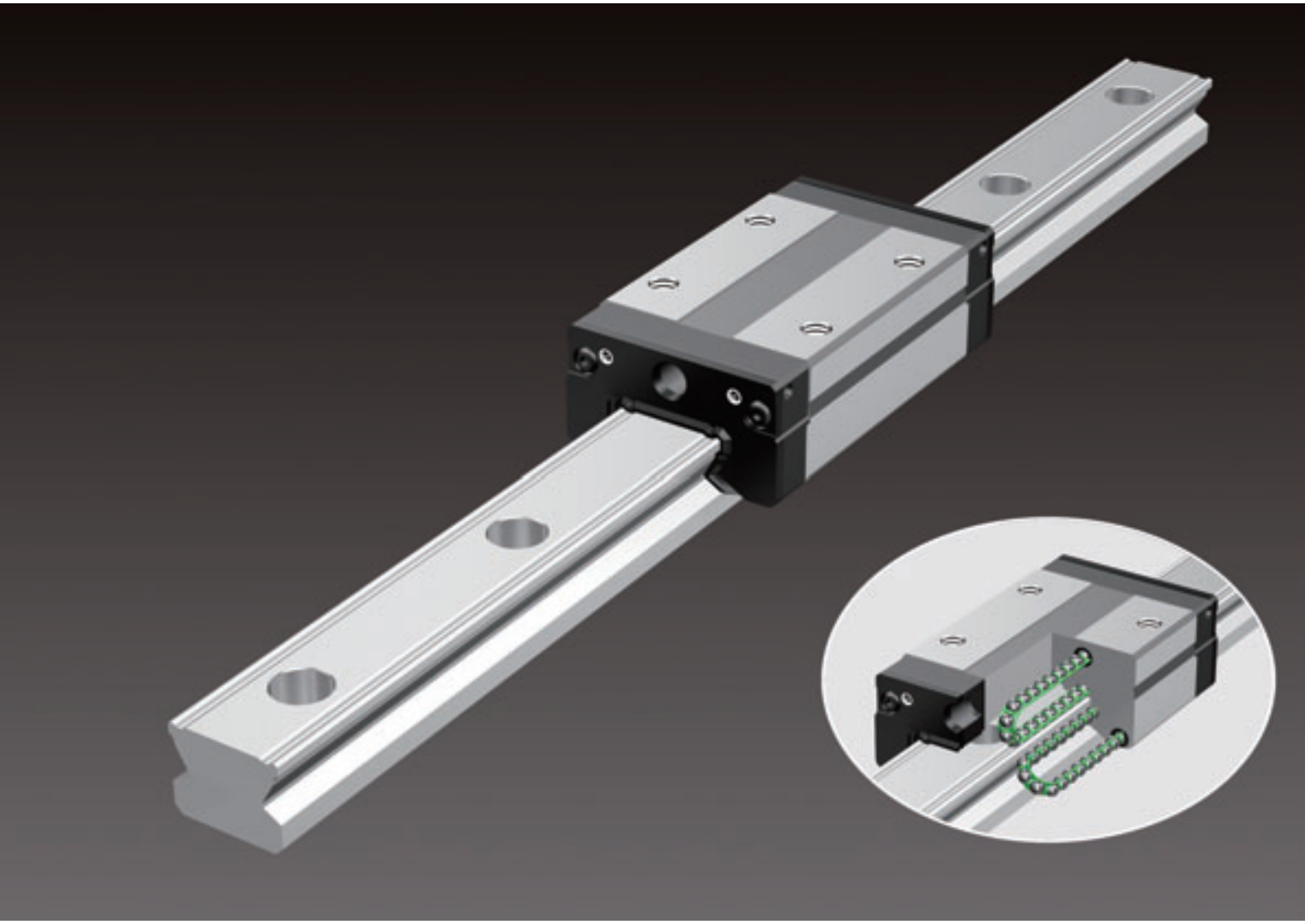
Caged Ball™

Compliant with
New Accuracy Standards

Caged Ball LM Guide

Ball Cage Effect
Compact, Radial Type

SSR



THK CO., LTD.
TOKYO. JAPAN

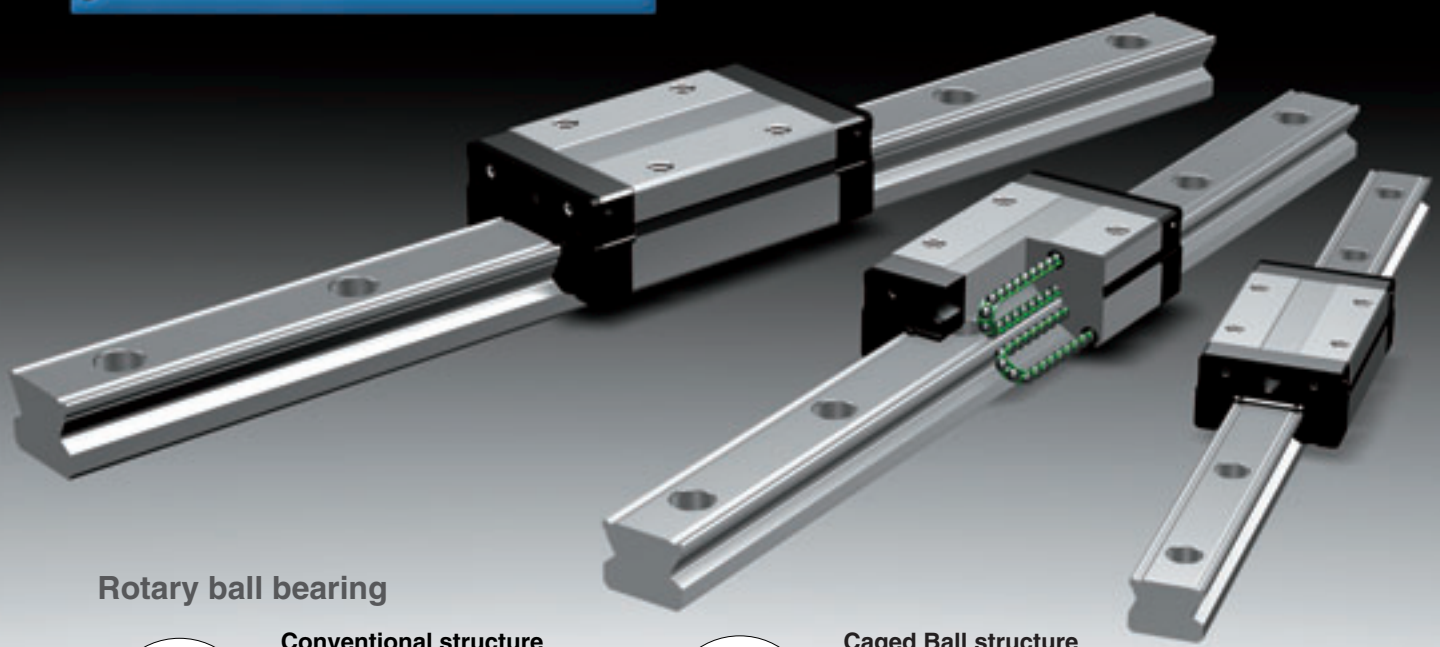
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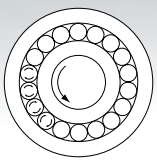
Ball Cage Effect

The early forms of ball bearings were full-ball types without ball cages. Friction between balls caused loud noise, made high-speed rotation impossible and shortened the service life. Twenty years later, a Caged Ball design was developed for ball bearings. The new design enabled high-speed rotation at a low noise level, and extended the service life despite the reduced number of balls used. It marked a major development in the history of ball bearings.
Similarly, the quality of needle bearings was significantly improved by the caged needle structure.
With cage-less, full-ball types of ball bearings, balls make metallic contact with one another and produce loud noise. In addition, they rotate in opposite directions, causing the sliding contact between two adjacent balls to occur at a speed twice the ball-spinning rate. It results in severe wear and shortens the service life.
In addition, without a cage, balls make point contact to increase bearing stress, thus facilitating breakage of the oil film. In contrast, each caged ball contacts the cage over a wide area. Therefore, the oil film does not break, the noise level is low and balls can rotate at a high speed, resulting in a long service life.

- **Long Service Life and Long-term Maintenance-free Operation**
- **Superbly High Speed**
- **Low Noise, Acceptable Running Sound**
- **Smooth Motion**
- **Low Particle Generation**

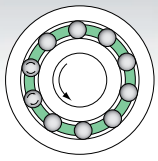


Rotary ball bearing



Conventional structure

- Adjacent balls contact each other at a point. As a result, contact stress is high and the oil film breaks due to friction.
- The service life becomes shorter.

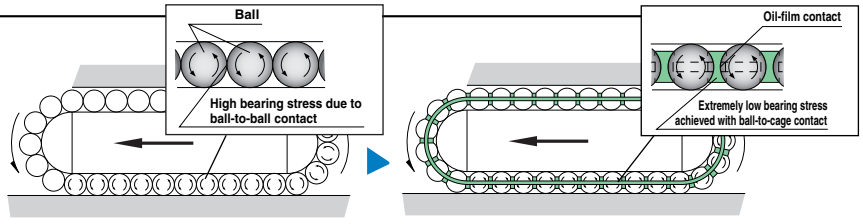


Caged Ball structure

- The service life is prolonged due to the elimination of wear caused by friction between balls.
- The absence of friction between balls results in reduced heat generation during high-speed rotation.
- The absence of friction between balls eliminates collision noise of the balls.
- The even spacing of the balls enables them to move smoothly.
- Retention of lubricant in the ball cage ensures a long service life.

Caged Ball LM Guide

With the Caged Ball LM Guide, the use of a ball cage allows lines of evenly spaced balls to circulate, thus eliminating friction between the balls.
In addition, grease held in a space between the ball circulation path and the ball cage (grease pocket) is applied on the contact surface between each ball and the ball cage as the ball rotates, forming an oil film on the ball surface. This minimizes the risk of oil-film break.

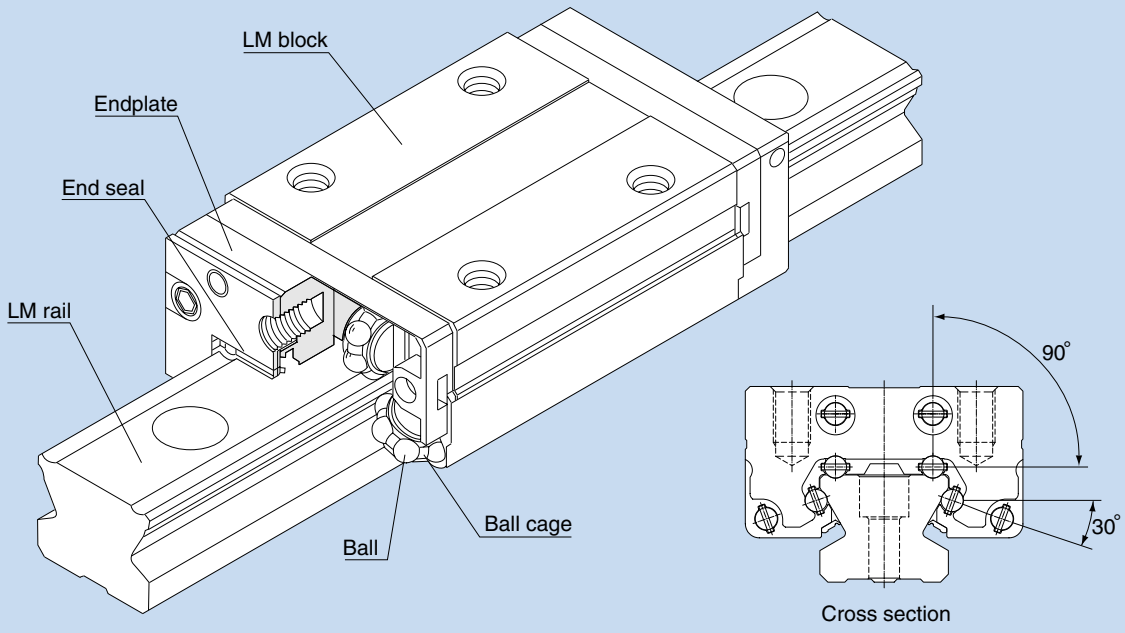


Conventional structure | Caged Ball structure

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Compact, Radial Type Caged Ball LM Guide

SSR



Structure of Model SSR

Balls roll in four rows of raceways precision-ground on an LM rail and an LM block, and ball cages and endplates incorporated in the LM block allow the balls to circulate.
Use of the ball cage eliminates friction between balls and increases grease retention, thus to achieve low noise, high speed and long-term maintenance-free operation.

Compact, Radial Type

The compact design with a low sectional height and the ball contact structure at 90° make SSR an optimal model for horizontal guides.

Superb Planar Running Accuracy

Use of a ball contact structure at 90° in the radial direction reduces displacement in the radial direc-tion under a radial load and achieves highly accurate, smooth straight motion.

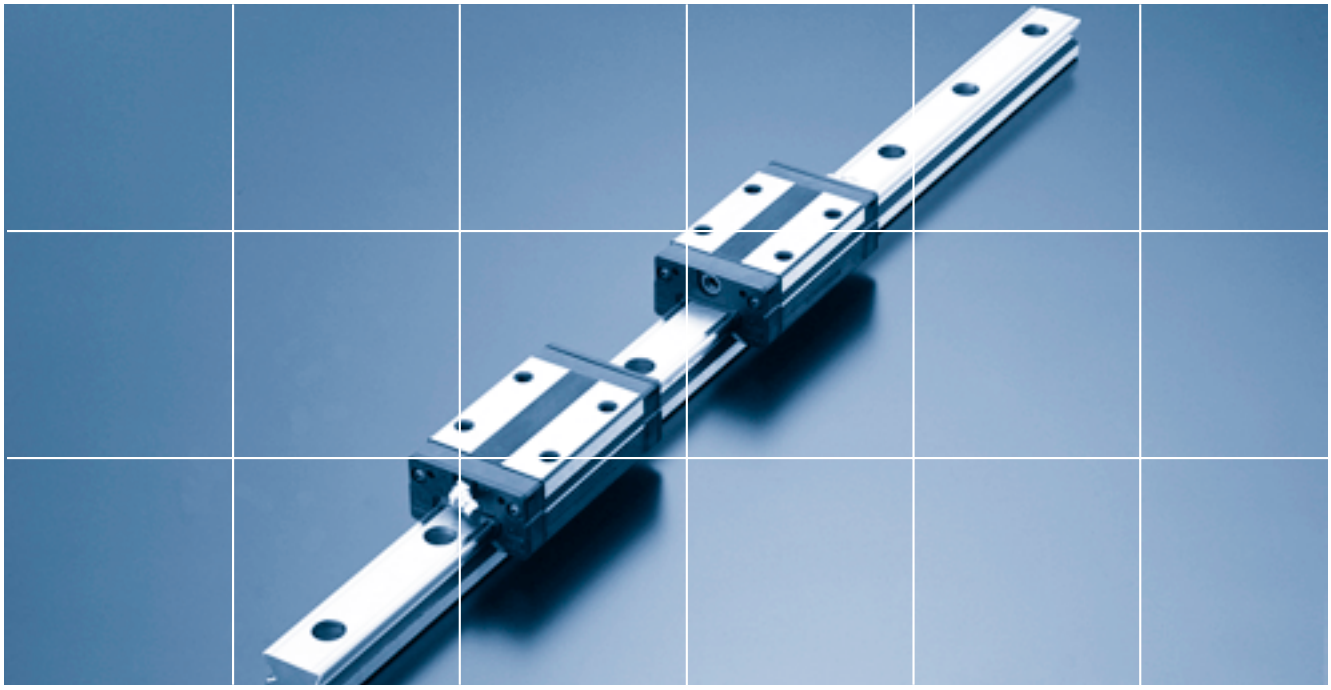
Self-adjustment Capability

The self-adjustment capability through front-to-front configuration of THK's unique circular-arc grooves (DF set) enables a mounting error to be absorbed even under a preload, thus to achieve highly accurate, smooth straight motion.

Stainless Steel Type also Available as Standard

A stainless steel type with its LM block, LM rail and balls all made of stainless steel, which is superbly corrosion resistant, is also available as standard.

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SSR Outline

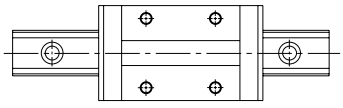
Model SSR - Product Overview

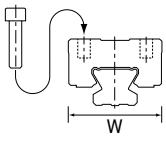
With a low mounting height, compact design and a large radial load capacity, this model is optimal for horizontal guides.

Major applications **Grinding machine / semiconductor manufacturing machine / printed circuit board drilling machine / 3D measuring instrument / chip mounter / medical equipment**

Model SSR-XW

With this type, the LM block has a smaller width (W) and tapped holes.

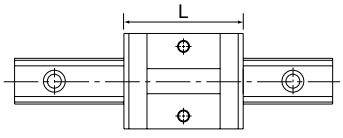


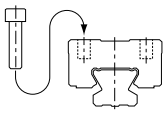


- SSR 15XW
- SSR 15XWM
- SSR 20XW
- SSR 20XWM
- SSR 25XW
- SSR 25XWM
- SSR 30XW
- SSR 30XWM
- SSR 35XW

Model SSR-XV

This type has the same cross-sectional shape as SSR-XW but has a shorter overall LM block length (L).

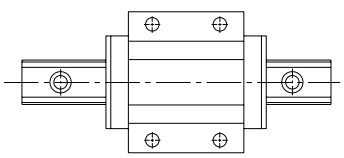


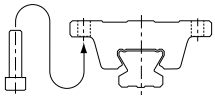


- SSR 15XV
- SSR 15XVM
- SSR 20XV
- SSR 20XVM
- SSR 25XV
- SSR 25XVM

Model SSR-XTB

Since the LM block can be mounted from the bottom, this type is optimal for applications where through holes for mounting bolts cannot be drilled on the table.





- SSR 15XTB
- SSR 20XTB
- SSR 25XTB

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*1: Specification table for model SSR
Model SSR-XW
→ pages 9-10
Model SSR-XV
→ pages 9-10
Model SSR-XTB
→ pages 11-12

Rated Loads in All Directions

Model SSR is capable of receiving loads in four directions: radial, reverse radial and lateral directions. Its basic dynamic load rating is represented by the symbol in the radial direction indicated in the figure on the right, and the actual value is provided in the specification table*1 for SSR. The values in the reverse radial and lateral directions are obtained from Table1 below.

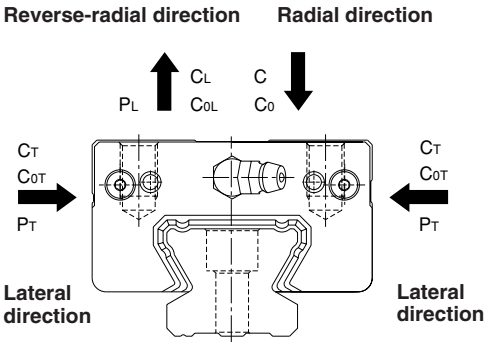


Table 1 Rated Load of Model SSR in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse radial direction	C_L=0.50C	C_{0L}=0.50C_0
Lateral direction	C_T=0.53C	C_{0T}=0.43C_0

Equivalent Load

When the LM block of model SSR receives a reverse radial direction and a lateral direction simultaneously, the equivalent load is obtained in the equation below.

$$P_E = X \cdot P_L + Y \cdot P_T$$

P_E :Equivalent load (N)
·Reverse radial direction
·Lateral direction

P_L :Reverse radial load (N)
P_T :Lateral load (N)
X, Y:Equivalent factor (see Table 2)

Table 2 Equivalent Factor of Model SSR

P_E	X	Y
Equivalent load in reverse radial direction	1	1.155
Equivalent load in lateral direction	0.866	1

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*1: Basic dynamic load rating (C)

It refers to a load with a constant magnitude and direction under which the nominal life (L) of a group of identical LM Guide units independently operating is 50 km.

Service life

The service life of an LM Guide is subject to variations even under the same operational conditions. Therefore, it is necessary to use the nominal life defined below as a reference value for obtaining the service life of the LM Guide.

Nominal life

The nominal life means the total travel distance that 90% of a group of units of the same LM Guide model can achieve without flaking (scale-like pieces on the metal surface) after individually running under the same conditions.

$$L = \left(\frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{P_C}\right)^3 \times 50$$

L	: Nominal life	(km)
C	: Basic dynamic load rating*1	(N)
P_C	: Calculated load	(N)
f_H	: Hardness factor	(see Fig. 1)
f_T	: Temperature factor	
f_C	: Contact factor	(see Table 1)
f_W	: Load factor	(see Table 2)

Service life time

Once the nominal life (L) has been obtained, the service life time can be obtained using the equation on the right if the stroke length and the number of reciprocations are constant.

$$L_h = \frac{L \times 10^6}{2 \times \ell_s \times n_1 \times 60}$$

L_h	: Service life time	(h)
ℓ_s	: Stroke length	(mm)
n_1	: Number of reciprocations per minute	(min^{-1})

f_H : Hardness factor

To ensure the achievement of the optimum load capacity of the LM Guide, the raceway hardness must be between 58 and 64 HRC.
At hardness below this range, the basic dynamic and static load ratings decrease. Therefore, the rating values must be multiplied by the respective hardness factors (f_H).
Since the LM Guide has sufficient hardness, the f_H value for the LM Guide is normally 1.0 unless otherwise specified.

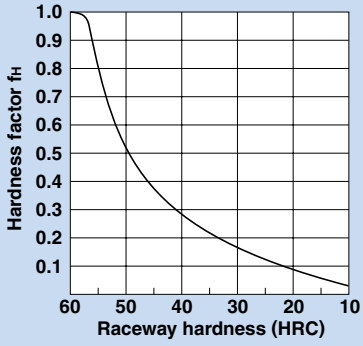


Fig. 1

f_C : Contact factor

When multiple LM blocks are used in close contact with each other, it is difficult to achieve uniform load distribution due to moment loads and mounting-surface accuracy. When using multiple blocks in close contact with each other, multiply the basic load rating (C or C_0) by the corresponding contact factor indicated in Table 1.

Note: When uneven load distribution is expected in a large machine, consider using a contact factor from Table 1.

Table 1 Contact Factor (f_C)

Number of blocks used in close contact	Contact factor f_C
2	0.81
3	0.72
4	0.66
5	0.61
6 or greater	0.6
Normal use	1

f_T : Temperature factor

Since the service temperature of Caged Ball LM Guides is normally 80˚C or below, the f_T value is 1.0.

f_W : Load factor

In general, reciprocating machines tend to produce vibrations or impact during operation. It is especially difficult to accurately determine all vibrations generated during high-speed operation and impacts produced each time the machine starts and stops. Therefore, where the effects of speed and vibration are estimated to be significant, divide the basic dynamic load rating (C) by a load factor selected from Table 2, which contains empirically obtained data.

Table 2 Load Factor (f_W)

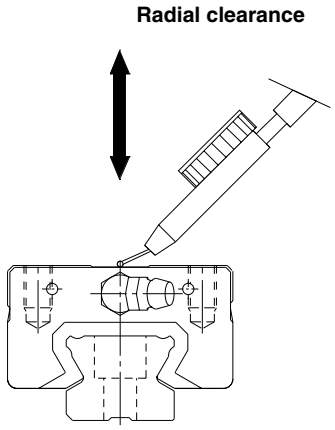
Vibrations/impact	Speed (V)	f_W
Faint	Very low V≦0.25m/s	1 to 1.2
Weak	Slow 0.25<V≦1m/s	1.2 to 1.5
Medium	Medium 1<V≦2m/s	1.5 to 2
Strong	High V>2m/s	2 to 3.5

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Radial Clearance Standard

Since the radial clearance of an LM Guide greatly affects the running accuracy, load carrying capacity and rigidity of the LM Guide, it is important to select an appropriate clearance according to the application.

In general, selecting a negative clearance (i.e., a preload*1 is applied) while taking into account possible vibrations and impact generated from reciprocating motion favorably affects the service life and the accuracy.



Unit: μm

Model No. \ Indication symbol	Normal	Light preload
	No symbol	C1
15	− 4 to + 2	−10 to − 4
20	− 5 to + 2	−12 to − 5
25	− 6 to + 3	−15 to − 6
30	− 7 to + 4	−18 to − 7
35	− 8 to + 4	−20 to − 8

***1: Preload**

Preload is an internal load applied to the rolling elements (balls, rollers, etc.) of an LM block in advance in order to increase its rigidity.
The clearance of all model SSR units is adjusted to the designated value before being shipped. Therefore, it is unnecessary to adjust the preload.

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***1: Running parallelism**

It refers to the parallelism error between the LM block and the LM rail datum plane when the LM block travels the whole length of the LM rail with the LM rail secured on the reference datum plane using bolts.

***2: Difference in height M**

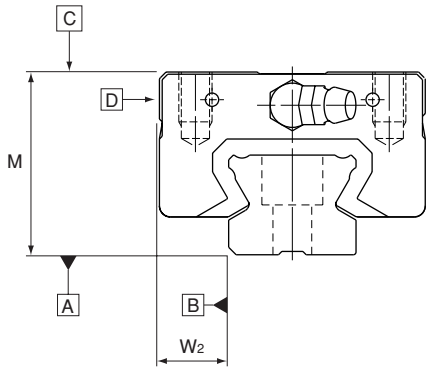
It indicates the difference between the minimum and maximum values of height (M) of each of the LM blocks used on the same plane in combination.

***3: Difference in width W_2**

It indicates the difference between the minimum and maximum values of the width (W_2) between each of the LM blocks, mounted on one LM rail in combination, and the LM rail.

Accuracy Standard

The accuracy of model SSR is specified in terms of running parallelism (*1), dimensional tolerance for height and width, and height and width difference between a pair (*2, *3) when two or more LM blocks are used on one rail or when two or more rails are mounted on the same plane.



The accuracy of model SSR is categorized into Normal grade (no symbol), High-accuracy grade (H), Precision grade (P), Super-precision grade (SP) and Ultra-precision grade (UP) by model numbers, as indicated in the table below.

Unit: mm

Model No.	Accuracy standard	Normal grade	High-accuracy grade	Precision grade	Super-precision grade	Ultra-precision grade
	Item	No symbol	H	P	SP	UP
15 20	Dimensional tolerance for height M	± 0.07	± 0.03	$^{0}_{-0.03}$	$^{0}_{-0.015}$	$^{0}_{-0.008}$
	Difference in height M	0.02	0.01	0.006	0.004	0.003
	Dimensional tolerance for width W_2	± 0.06	± 0.03	$^{0}_{-0.02}$	$^{0}_{-0.015}$	$^{0}_{-0.008}$
	Difference in width W_2	0.02	0.01	0.006	0.004	0.003
	Running parallelism of surface C against surface A	as shown in the table below				
	Running parallelism of surface D against surface B	as shown in the table below				
25 30 35	Dimensional tolerance for height M	± 0.08	± 0.04	$^{0}_{-0.04}$	$^{0}_{-0.02}$	$^{0}_{-0.01}$
	Difference in height M	0.02	0.015	0.007	0.005	0.003
	Dimensional tolerance for width W_2	± 0.07	± 0.03	$^{0}_{-0.03}$	$^{0}_{-0.015}$	$^{0}_{-0.01}$
	Difference in width W_2	0.025	0.015	0.007	0.005	0.003
	Running parallelism of surface C against surface A	as shown in the table below				
	Running parallelism of surface D against surface B	as shown in the table below				

LM Rail Length and Running Parallelism by Accuracy Standard for Models SSR

Unit: μm

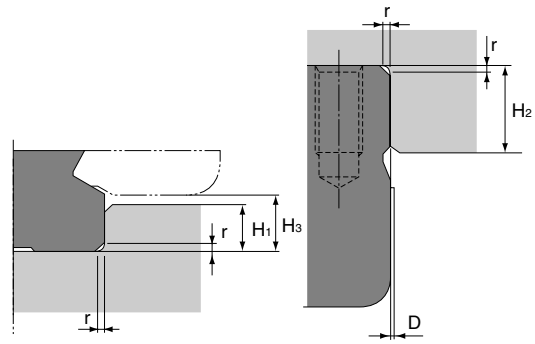
LM rail length (mm)		Running Parallelism Values				
Above	Or less	Normal grade	High-accuracy grade	Precision grade	Super precision grade	Ultra precision grade
		No Symbol	H	P	SP	UP
—	50	5	3	2	1.5	1
50	80	5	3	2	1.5	1
80	125	5	3	2	1.5	1
125	200	5	3.5	2	1.5	1
200	250	6	4	2.5	1.5	1
250	315	7	4.5	3	1.5	1
315	400	8	5	3.5	2	1.5
400	500	9	6	4.5	2.5	1.5
500	630	11	7	5	3	2
630	800	12	8.5	6	3.5	2
800	1000	13	9	6.5	4	2.5
1000	1250	15	11	7.5	4.5	3
1250	1600	16	12	8	5	4
1600	2000	18	13	8.5	5.5	4.5
2000	2500	20	14	9.5	6	5
2500	3150	21	16	11	6.5	5.5
3150	4000	23	17	12	7.5	6
4000	5000	24	18	13	8.5	6.5

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Shoulder Height of the Mounting Base and the Corner Radius

Normally, the mounting base for the LM rail and the LM block has a reference-surface on the side face of the shoulder of the base in order to allow easy installation and highly accurate positioning.

The corner of the mounting shoulder must be machined to have a recess, or machined to be smaller than the corner radius "r," to prevent interference with the chamfer of the LM rail or the LM block.



Shoulder for the LM rail Shoulder for the LM block

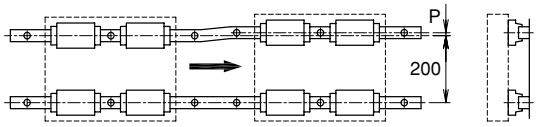
Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3	D
15X	0.5	3.8	5.5	4.5	0.3
20X	0.5	5	7.5	6	0.3
25X	1	5.5	8	6.8	0.4
30X	1	8	11.5	9.5	0.4
35X	1	9	16	11.5	0.4

Note: When closely contacting the LM block with the datum shoulder, the resin layer may stick out from the overall width of the LM block by the dimension D. To avoid this, machine the datum shoulder to have a recess or limit the datum shoulder's height below the dimension H_2.

Error Allowance in the Parallelism Between Two Rails

The table shows error allowances in parallelism (P) between two rails that will not affect the service life in normal operation.

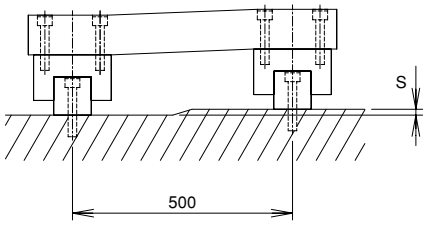


Unit: μm

Model No.	Clearance C0	Clearance C1	Normal clearance
15X	—	25	35
20X	25	30	40
25X	30	35	50
30X	35	40	60
35X	45	50	70

Error Allowance in Vertical Level Between Two Rails

The values in the tables indicate the error allowances in vertical level (S) between two rails per axis-to-axis distance of 500mm and are proportional to the axis-to-axis distances.



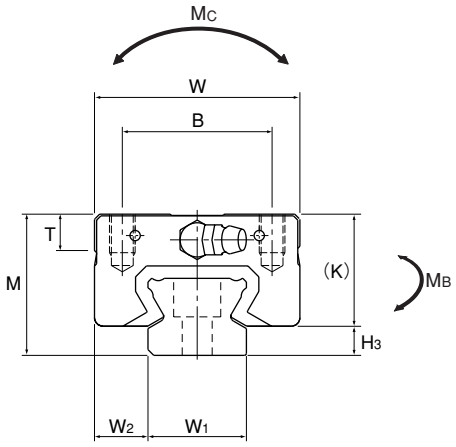
Unit: μm

Model No.	Clearance C0	Clearance C1	Normal clearance
15X	—	100	180
20X	80	100	180
25X	100	120	200
30X	120	150	240
35X	170	210	300

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Models SSR-XV(XVM)/SSR-XW(XWM)

Dimensional Table for Models SSR-XV(XVM)/SSR-XW(XWM)



Model No.	External dimensions			LM block dimensions												
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	N	E	f0	e0	D0	Grease nipple	H3
SSR 15XV (XVM) **SSR 15XW (XWM)**	24	34	40.3 56.9	26	— 26	M4×7	23.3 39.9	6.5	19.5	4.5	5.5	2.7	4.5	3	PB1021B	4.5
SSR 20XV (XVM) **SSR 20XW (XWM)**	28	42	47.7 66.5	32	— 32	M5×8	27.8 46.6	8.2	22	5.5	12	2.8	5.2	3	B-M6F	6
SSR 25XV (XVM) **SSR 25XW (XWM)**	33	48	60 83	35	— 35	M6×9	36.8 59.8	8.4	26.2	6	12	3.3	7	3	B-M6F	6.8
SSR 30XW (XWM)	42	60	97	40	40	M8×12	70.7	11.3	32.5	8	12	4.5	7.6	4	B-M6F	9.5
SSR 35XW	48	70	110.9	50	50	M8×12	80.5	13	36.5	8.5	12	4.7	8.8	4	B-M6F	11.5

Note Symbol M indicates that stainless steel is used in the LM block, LM rail and balls. Those models marked with this symbol are therefore highly resistant to corrosion and environment.

Model number coding

SSR25X V 2 UU C1 M +1240L Y P T M -II

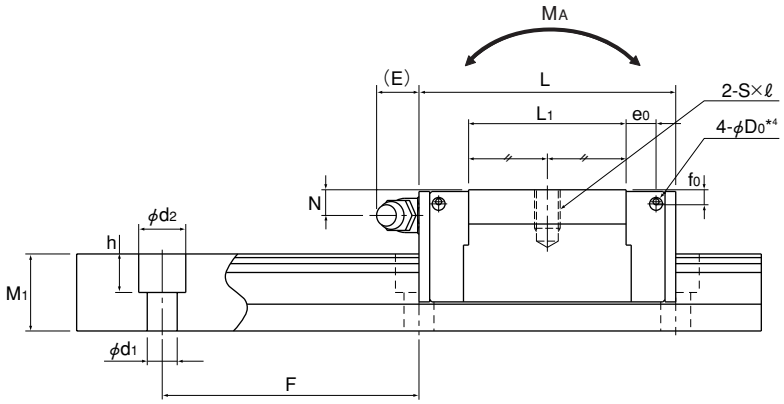
- SSR25X: Model number
- V: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)
- M: Stainless steel LM block
- +1240L: LM rail length (in mm)
- Y: Applied to only 15 and 25
- P: Accuracy symbol (*3) Normal grade (No Symbol) High accuracy grade (H)/Precision grade (P) Super precision grade (SP)/Ultra precision grade (UP)
- T: Symbol for LM rail jointed use
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane

(*1) See contamination protection accessory on page 14. (*2) See page 6. (*3) See page 7.

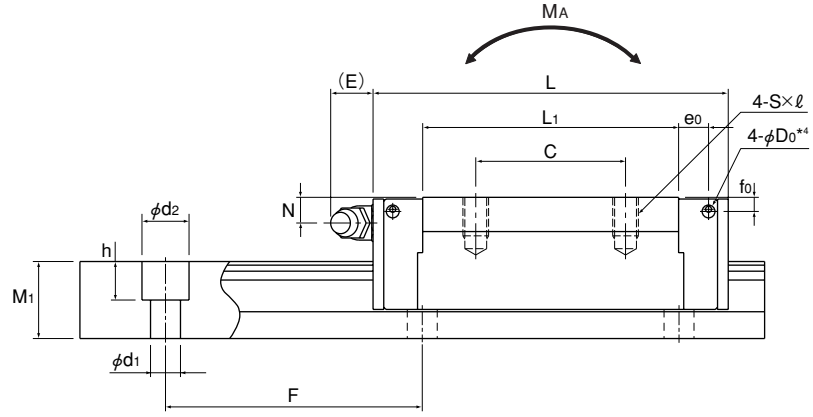
Note This model number indicates that a single-rail unit constitutes one set. (i.e., required number of sets when 2 rails are used in parallel is 2 at a minimum.)

Note The LM rail mounting hole of SSR15X is drilled for M4 screws as standard (with Y indication). If you order the hole to be drilled for M3 screws (without Y indication), contact THK. When replacing this model with model SR, pay attention to the dimension of the rail mounting hole.

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Models SSR-XV/XVM



Models SSR-XW/XWM

Unit: mm

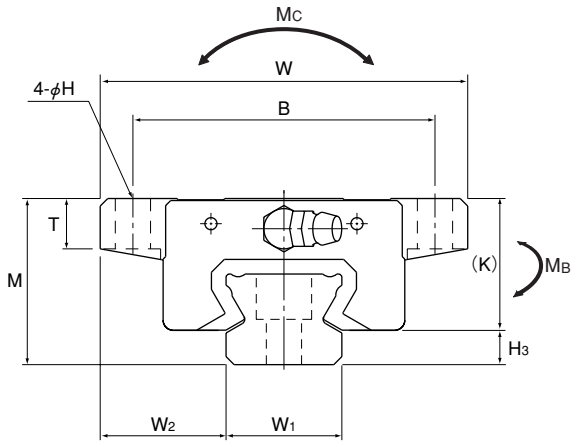
	LM rail dimensions						Basic load rating		Static permissible moment [kN-m]*6					Mass	
	Width W_1 ±0.05	W_2	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Length*5 Max	C [kN]	C_0 [kN]	M_A 1 block	M_A Double blocks	M_B 1 block	M_B Double blocks	M_C 1 block	LM block [kg]	LM rail [kg/m]
	15	9.5	12.5	60	4.5×7.5×5.3	2500	9.1	9.7	0.0303	0.192	0.0189	0.122	0.0562	0.08	1.2
						(1240)	14.7	16.5	0.0792	0.44	0.0486	0.274	0.0962	0.15	
	20	11	15.5	60	6×9.5×8.5	3000	13.4	14.4	0.0523	0.336	0.0326	0.213	0.111	0.14	2.1
						(1480)	19.6	23.4	0.138	0.723	0.0847	0.448	0.18	0.25	
	23	12.5	18	60	7×11×9	3000	21.7	22.5	0.104	0.661	0.0652	0.419	0.204	0.23	2.7
						(2020)	31.5	36.4	0.258	1.42	0.158	0.884	0.33	0.4	
	28	16	23	80	7×11×9	3000 (2520)	46.5	52.7	0.446	2.4	0.274	1.49	0.571	0.8	4.3
	34	18	27.5	80	9×14×12	3000	64.6	71.6	0.711	3.72	0.437	2.31	0.936	1.1	6.4

*4 Pilot holes for side nipples are not drilled through in order to prevent foreign material from entering the product.
THK will mount grease nipples per your request. Therefore, do not use the side nipple pilot holes for purposes other than mounting a grease nipple.
*5 The maximum length under “Length” indicates the standard maximum length of an LM rail. (See page 13.)
*6 Static permissible moment : 1 block: static permissible moment value with 1 LM block
Double blocks: static permissible moment value with 2 blocks closely contacting with each other

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Model SSR-XTB

Dimensional Table for Model SSR-XTB



Model No.	External dimensions			LM block dimensions												
	Height M	Width W	Length L	B	C	H	L_1	T	K	N	E	f_0	e_0	D_0	Grease nipple	H_3
SSR 15XTB	24	52	56.9	41	26	4.5	39.9	7	19.5	4.5	5.5	2.7	4.5	3	PB1021B	4.5
SSR 20XTB	28	59	66.5	49	32	5.5	46.6	9	22	5.5	12	2.8	5.2	3	B-M6F	6
SSR 25XTB	33	73	83	60	35	7	59.8	10	26.2	6	12	3.3	7	3	B-M6F	6.8

Model number coding

SSR25X TB 2 UU C1 +1240L Y P T -II

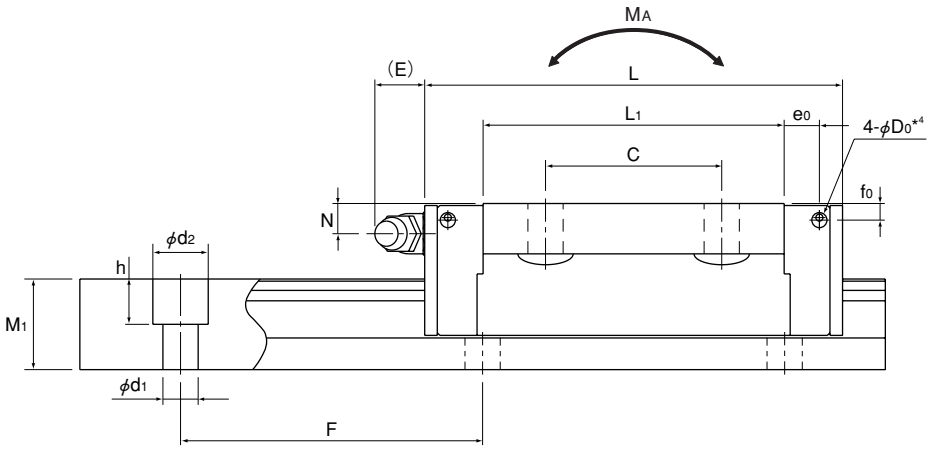
- SSR25X: Model number
- TB: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)
- +1240L: LM rail length(in mm)
- Y: Applied to only 15 and 25
- P: Accuracy symbol (*3) Normal grade (No Symbol) High accuracy grade (H)/Precision grade (P) Super precision grade (SP)/Ultra precision grade (UP)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane

(*1) See contamination protection accessory on page 14. (*2) See page 6. (*3) See page 7.

Note This model number indicates that a single-rail unit constitutes one set. (i.e., required number of sets when 2 rails are used in parallel is 2 at a minimum.)

Note The LM rail mounting hole of SSR15X is drilled for M4 screws as standard (with Y indication). If you order the hole to be drilled for M3 screws (without Y indication), contact THK. When replacing this model with model SR, pay attention to the dimension of the rail mounting hole.

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Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment [kN-m]*6					Mass	
	Width W_1 ±0.05	W_2	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Length*5 Max	C [kN]	C_0 [kN]	M_A 1 block	M_A Double blocks	M_B 1 block	M_B Double blocks	M_C 1 block	LM block [kg]	LM rail [kg/m]
	15	18.5	12.5	60	4.5×7.5×5.3	2500 (1240)	14.7	16.5	0.0792	0.44	0.0486	0.274	0.0962	0.19	1.2
	20	19.5	15.5	60	6×9.5×8.5	3000 (1480)	19.6	23.4	0.138	0.723	0.0847	0.448	0.18	0.31	2.1
	23	25	18	60	7×11×9	3000 (2020)	31.5	36.4	0.258	1.42	0.158	0.884	0.33	0.53	2.7

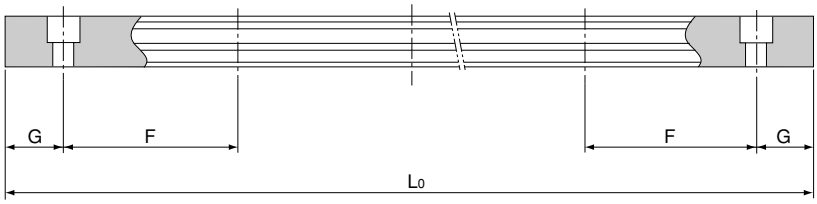
*4 Pilot holes for side nipples are not drilled through in order to prevent foreign material from entering the product.
THK will mount grease nipples per your request. Therefore, do not use the side nipple pilot holes for purposes other than mounting a grease nipple.
*5 The maximum length under “Length” indicates the standard maximum length of an LM rail. (See page 13.)
*6 Static permissible moment: 1 block: static permissible moment value with 1 LM block
Double blocks: static permissible moment value with 2 blocks closely contacting with each other

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SSR

Standard Length and Maximum Length of the LM Rail

The table below shows the standard LM rail lengths and the maximum lengths of model SSR variations. If the maximum length of the desired LM rail exceeds them, connected rails will be used. Contact THK for details.
For the G dimension when a special length is required, we recommend selecting the corresponding G value from the table. The longer the G dimension is, the less stable the G area may become after installation, thus adversely affecting accuracy.



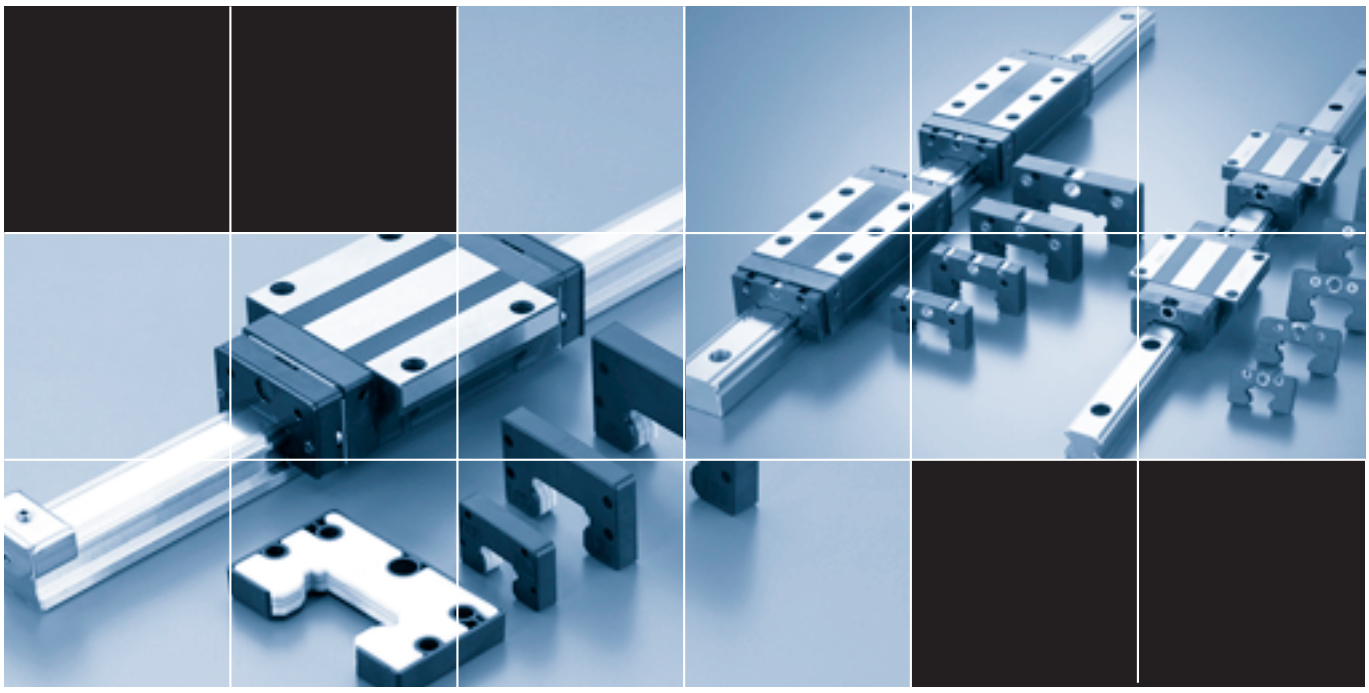
Standard Length and Maximum Length of the LM Rail for Model SSR

Unit: mm

Model No.	SSR 15X	SSR 20X	SSR 25X	SSR 30X	SSR 35X
LM rail Standard Length (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1660 1720 1780 1840 1900 1960 2020 2080 2140	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1240 1300 1360 1420 1480 1540 1600 1660 1720 1780 1840 1900 1960 2020 2080 2140 2200 2260 2320 2380 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1640 1720 1800 1880 1960 2040 2120 2200 2280 2360 2440 2520 2600 2680 2760 2840 2920	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1640 1720 1800 1880 1960 2040 2120 2200 2280 2360 2440 2520 2600 2680 2760 2840 2920
Standard pitch F	60	60	60	80	80
G	20	20	20	20	20
Max length	2500(1240)	3000(1480)	3000(2020)	3000(2520)	3000

Note 1: The maximum length varies with accuracy grades. Contact THK for details.
Note 2: If connected rails are not allowed and a greater length than the maximum values above is required, contact THK.
Note 3: The values in the parentheses indicate the maximum lengths of stainless steel types.

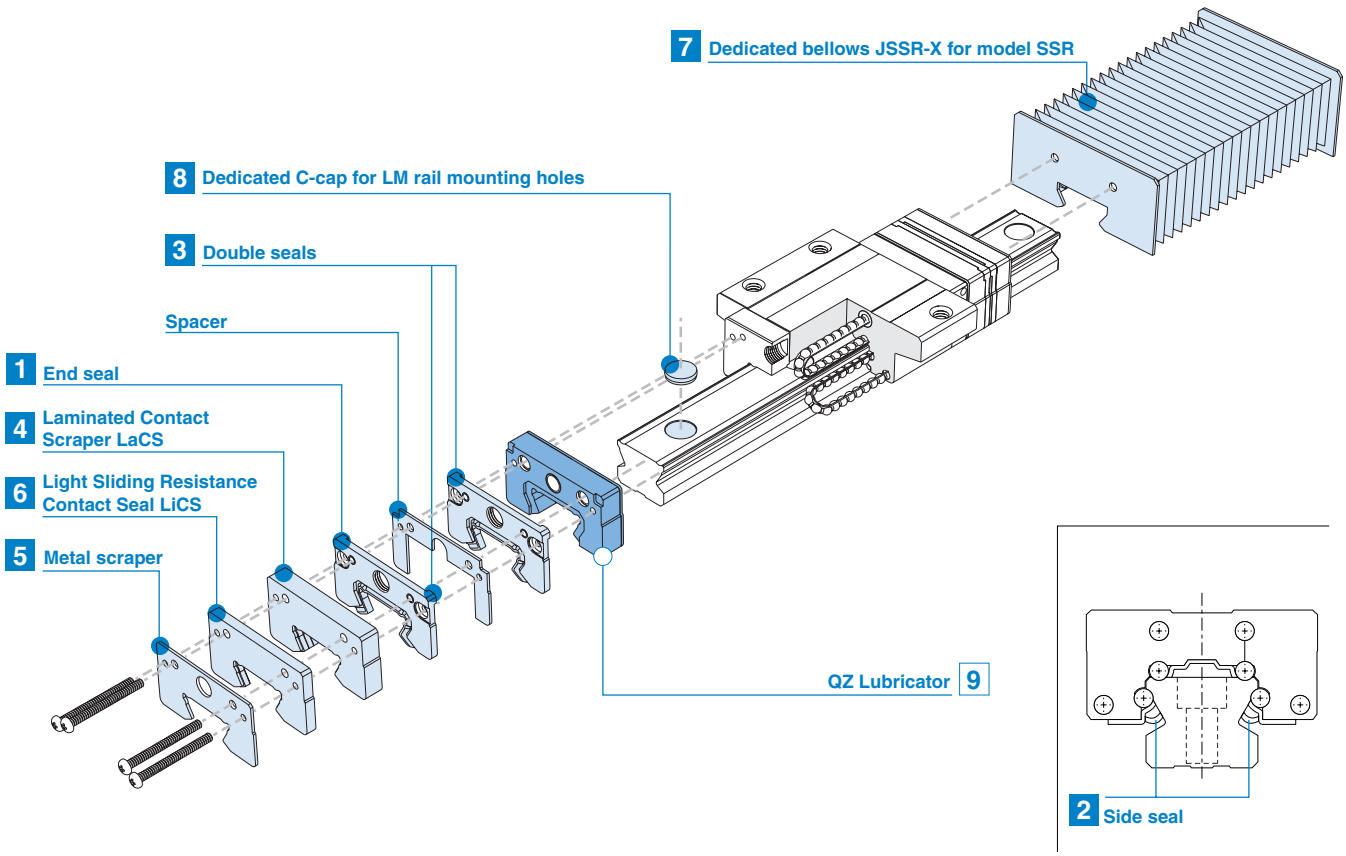
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SSR OPTIONS

Options

For model SSR, dust-prevention and lubrication accessories are available. Make a selection according to the application and the installation site.



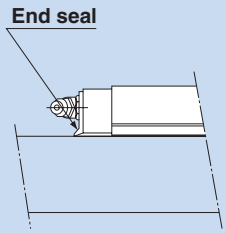
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Dust Prevention Accessories

When foreign matter enters an LM system, it will cause abnormal wear or shorten the service life. It is necessary to prevent foreign matter from entering the system. Therefore, when possible entrance of foreign matter is predicted, it is important to select an effective sealing device or dust-prevention device that meets the working conditions.

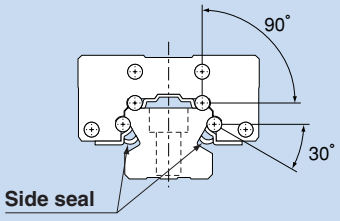
1 End seal

Used in locations exposed to dust.



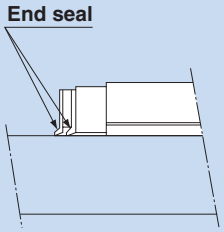
2 Side seal

Used in locations where dust may enter the LM block from the side or bottom surface, such as vertical, horizontal and inverted mounts.



3 Double seals

Used in locations exposed to much dust or many cutting chips.



Seals and Scrapers

1 to 3 Seals

Highly wear-resistant end seals made of special resin rubber and side seals for increased dust-prevention effect are available.

If desiring a dust-prevention accessory, specify it with the corresponding symbol indicated in table 3.
For the supported model numbers for dust-prevention accessories and the overall LM block length with a dust-prevention accessory attached (dimension L), see table 4.

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seal SSR ··· UU, refer to the corresponding value provided in table 1.

Table 1 Maximum Seal Resistance Value of Seal SSR ··· UU

Unit: N

Model No.	Seal resistance value
15X	2.0
20X	2.6
25X	3.5
30X	4.9
35X	6.3

4 5 Scrapers
Laminated Contact Scraper LaCS

For locations with an even more adverse working conditions, the Laminated Contact Scraper LaCS is available.
LaCS prevents minute foreign matter from entering the LM block by removing such foreign matter adhering to the LM rail in multiple stages through a laminated contact structure (3-layered scraper).

Features

- Since the 3 layers of scrapers fully contact the LM rail, LaCS is highly capable of removing minute foreign matter.
- Since it uses oil-impregnated, foam synthetic rubber with a self-lubricating function, low friction resistance is achieved.

Basic Specifications of LaCS

① Service temperature range of LaCS: -20°C to +80°C
② Resistance of LaCS: indicated in table 2

*Note that LaCS is not sold alone.

Table 2 Resistance of LaCS

Unit: N

Model No.	Resistance of LaCS
15X	5.9
20X	6.9
25X	8.1
30X	12.8
35X	15.1

Note 1: Each resistance value in the table only consists of that of LaCS, and does not include sliding resistances of seals and other accessories.
Note 2: For the maximum service speed of LaCS, contact THK.

6 Light Sliding Resistance Contact Seal LiCS

LiCS is a contact seal with a low sliding resistance. It is effective in removing dust and the like from the raceway and retaining a lubricant such as grease. With its very low sliding resistance, LiCS achieves a smooth and stable motion.

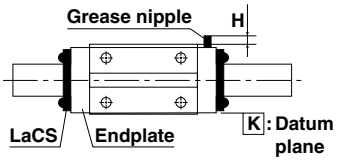
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Table 3 Symbols of Dust Prevention Accessories for Model SSR

Symbol	Dust prevention accessory
UU	With end seal
SS	With end seal + side seal
DD	With double seals + side seal
GG	LiCS
PP	LiCS + side seal
ZZ	With end seal + side seal + metal scraper
KK	With double seals + side seal + metal scraper
SSHH	With end seal + side seal + LaCS
DDHH	With double seals + side seal + LaCS
ZZHH	With end seal + side seal + metal scraper + LaCS
KKHH	With double seals + side seal + metal scraper + LaCS

When Dust Prevention Accessories SSHH, DDHH, ZZHH or KKHH are Attached

When dust prevention accessories SSHH, DDHH, ZZHH or KKHH are attached, the grease nipple in the location indicated in the figure below. The table on the right shows incremental dimensions with the grease nipple.



Note: When desiring the mounting location for the grease nipple other than the one indicated in the figure above, contact THK.

Unit: mm

Model No.	Incremental dimension with grease nipple H	Nipple type
15XV/XW	4.4	PB107
15XTB	—	PB107
20XV/XW	4.6	PB107
20XTB	—	PB107
25XV/XW	4.5	PB107
25XTB	—	PB107
30XW	5.0	PB1021B
35XW	5.0	PB1021B

When Dust Prevention Accessories GG, PP are Attached

The table on the right shows incremental dimensions with the grease nipple when dust prevention accessories GG, PP are attached.

Unit: mm

Model No.	Incremental dimension with grease nipple E	Nipple type
15XV	2.9	PB1021B
15XW/XTB	2.9	PB1021B
20XV	9	B-M6F
20XW/XTB	9	B-M6F
25XV	9	B-M6F
25XW/XTB	9	B-M6F
30XW	9	B-M6F
35XW	8	B-M6F

When Dust Prevention Accessories DD, ZZ or KK are Attached

For the mounting location of the grease nipple and its incremental dimension when dust prevention accessories DD, ZZ or KK are attached, contact THK.

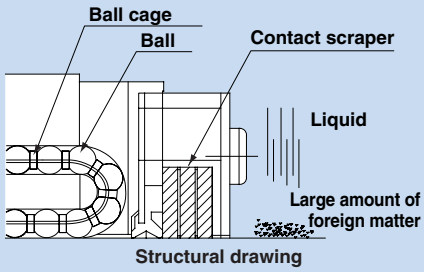
Table 4 Overall LM Block Length (Dimension L) of Model SSR with a Dust Prevention Accessory Attached

Unit: mm

Model No.	UU	SS	DD	GG	PP	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
15XV	40.3	40.3	47.3	48.7	48.7	44.9	50.7	59.5	65.3	60.7	66.5
15XW/XTB	56.9	56.9	63.9	65.3	65.3	61.5	67.3	76.1	81.9	77.3	83.1
20XV	47.7	47.7	54.6	55.8	55.8	53.4	60.3	67.7	74.6	70.1	77
20XW/XTB	66.5	66.5	73.4	74.6	74.6	72.2	79.1	86.5	93.4	88.9	95.8
25XV	60	60	67.4	67.6	67.6	65.7	73.1	80	87.4	82.4	89.8
25XW/XTB	83	83	90.4	90.6	90.6	88.7	96.1	103	110.4	105.4	112.8
30XW	97	97	105.1	106.7	106.7	102.7	110.8	121	129.1	123.4	131.5
35XW	110.9	110.9	119.9	121.7	121.7	117.7	126.7	136.9	145.9	139.3	148.3

4 LaCS

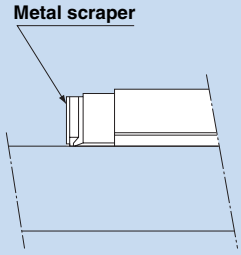
Used in harsh environments exposed to foreign matter such as fine dust and liquids.



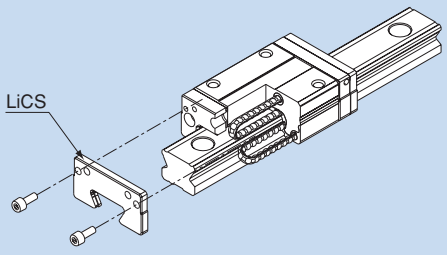
Structural drawing

5 Metal scraper

Used in locations where welding spatter may adhere to the LM rail.



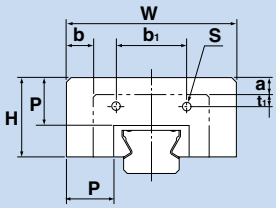
6 LiCS

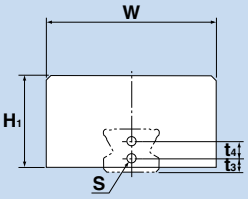


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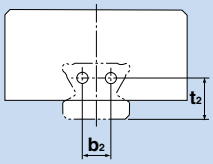
6 Dedicated bellows JSSR-X for model SSR

Used in locations exposed to dust or cutting chips.





Models SSR15X to 25X



Models SSR30X and 35X

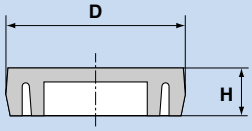
Note: The length of the bellows is calculated as follows.

$L_{min} = \frac{S}{(A-1)}$ **S: Stroke length (mm)**

$L_{max} = L_{min} \cdot A$ **A: Extension rate**

7 Dedicated Cap C

It prevents cutting chips from entering the LM rail mounting holes.



6 Dedicated Bellows JSSR-X for Model SSR

For locations with an even more adverse working conditions, dedicated bellows are available. The dimensions of the dedicated bellows are provided below. When placing an order, specify the desired bellows type with the corresponding bellows model number indicated below.

Table 1 The dimensions of dedicated bellows JSSR-X for model SSR Unit: mm

Model No.	Major dimensions										Mounting bolt		b		A (Lmax / Lmin)	Supported model
	W	H	H_1	P	b_1	t_1	b_2	t_2	t_3	t_4	S	a	XW/XV	XTB		
JSSR 15X	51	24	26	15	20.5	4.7	—	—	8	—	M3×5 ℓ	5	8.5	–0.5	5	SSR 15X
JSSR 20X	58	26	30	15	25	4.2	—	—	6	6	M3×5 ℓ	4	8	–0.5	5	SSR 20X
JSSR 25X	71	33	38	20	29	5	—	—	6	7	M3×5 ℓ	7	11.5	–1	7	SSR 25X
JSSR 30X	76	37.5	37.5	20	35	9	12	17	—	—	M4×6 ℓ	3	8	—	7	SSR 30X
JSSR 35X	84	39	39	20	44	7	14	20	—	—	M5×10 ℓ	2	7	—	7	SSR 35X

Note 1: When desiring to use the dedicated bellows other than in horizontal mount (i.e., vertical, wall and inverted mount), or when desiring a heat-resistant type of bellows, contact THK.
Note 2: For lubrication when using the dedicated bellows, contact THK.
Note 3: When using the dedicated bellows, the LM block and LM rail need to be machined so that the bellows can be mounted. Be sure to indicate that the dedicated bellows is required when ordering SSR.

■ Example of model number coding

JSSR35X-60/420
1 2

1 Model number ··· bellows for SSR35X
2 Bellows dimensions (length when compressed / length when extended)

7 Dedicated Cap C for LM Rail Mounting Holes

If any of the LM rail mounting holes of an LM Guide is filled with cutting chips or foreign matter, they may enter the LM block structure. Entrance of such foreign matter can be prevented by covering each LM rail mounting hole with the dedicated cap so that the top of the mounting holes are on the same level as the LM rail top face.

The dedicated Cap C for LM rail mounting holes is highly durable since it uses a special synthetic resin with high oil resistance and high wear resistance. When placing an order, specify the desired cap type with the corresponding cap number indicated in the table on the right.

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
15	C4	M4	7.8	1.0
20	C5	M5	9.8	2.4
25	C6	M6	11.4	2.7
30	C6	M6	11.4	2.7
35	C8	M8	14.4	3.7

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Lubrication Accessories

8 QZ Lubricator™

The QZ Lubricator feeds the right amount of lubricant to the ball raceway on the LM rail. This allows an oil film to continuously be formed between the balls and the raceway, and drastically extends the lubrication and maintenance intervals.

When the QZ Lubricator is required, specify the desired type with the corresponding symbol indicated in table 1.
For supported LM Guide model numbers for the QZ Lubricator and overall LM block length with the QZ Lubricator attached (dimension L), see table 2.

Features

- Supplements lost oil to drastically extend the lubrication/maintenance interval.
- Eco-friendly lubrication system that does not contaminate the surrounding area since it feeds the right amount of lubricant to the ball raceway.
- The user can select a type of lubricant that meets the intended use.

Significant Extension of the Maintenance Interval

Attaching the QZ Lubricator helps extend the maintenance interval throughout the whole load range from the light-load area to the heavy-load area.

Note1: The QZ Lubricator is not sold alone.
Note2: Those models equipped with the QZ Lubricator cannot have a grease nipple.
When desiring both the QZ Lubricator and a grease nipple to be attached, contact THK.

Table 1 Parts Symbols for Model SSR with the QZ Lubricator

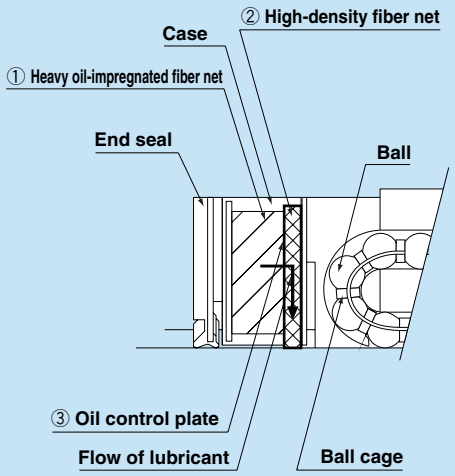
Symbol	Dust prevention accessories for model SSR with QZ Lubricator
QZUU	With end seal + QZ Lubricator
QZSS	With end seal + side seal + QZ Lubricator
QZDD	With double seals + side seal + QZ Lubricator
QZGG	With LiCS + QZ
QZPP	With LiCS + side seal + QZ
QZZZ	With end seal + side seal + metal scraper + QZ Lubricator
QZKK	With double seals + side seal + metal scraper + QZ Lubricator
QZSSHH	With end seal + side seal + LaCS + QZ Lubricator
QZDDHH	With double seals + side seal + LaCS + QZ Lubricator
QZZZHH	With end seal + side seal + metal scraper + LaCS + QZ Lubricator
QZKKHH	With double seals + side seal + metal scraper + LaCS + QZ Lubricator

Table 2 Overall LM Block Length (Dimension L) of Model SSR with the QZ Lubricator Attached

Unit: mm

Model No.	QZUU	QZSS	QZDD	QZZZ	QZKK	QZSSHH	QZDDHH	QZZZHH	QZKKHH
15XV	59.3	59.3	65.1	62.7	68.5	75.5	81.3	76.7	82.5
15XW/XTB	75.9	75.9	81.7	79.3	85.1	92.1	97.9	93.3	99.1
20XV	66.2	66.2	73.1	72.1	79	83.7	90.6	86.1	93
20XW/XTB	85	85	91.9	90.9	97.8	102.5	109.4	104.9	111.8
25XV	82.6	82.6	90	88.4	95.8	100	107.4	102.4	109.8
25XW/XTB	105.6	105.6	113	111.4	118.8	123	130.4	125.4	132.8
30XW	119.7	119.7	127.8	125.4	133.4	141	149.1	143.4	151.5
35XW	134.3	134.3	143.3	141.3	150.3	156.9	165.9	159.3	168.3

QZ Lubricator 8



The structure of the QZ Lubricator consists of three major components:
① a heavy oil-impregnated fiber net (functions to store lubricant).
② a high-density fiber net (functions to apply lubricant to the raceway).
③ an oil-control plate (functions to adjust oil flow).
The lubricant contained in the QZ Lubricator is fed by the capillary phenomenon, which is used also in felt pens and many other products, as the fundamental principle.

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THK Caged Ball LM Guide Model SSR

⚠ Precautions on use

● Handling
- Disassembling components may cause dust to enter the system or degrade mounting accuracy of parts. Do not disassemble the product.
- Tilting an LM block or LM rail may cause them to fall by their own weight.
- Dropping or hitting the LM Guide may damage it. Giving an impact to the LM Guide could also cause damage to its function even if the guide looks intact.

● Lubrication
- Thoroughly remove anti-corrosion oil and feed lubricant before using the product.
- Do not mix lubricants of different physical properties.
- In locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, normal lubricants may not be used. Contact THK for details.
- When planning to use a special lubricant, contact THK before using it.
- When adopting oil lubrication, the lubricant may not be distributed throughout the LM system depending on the mounting orientation of the system. Contact THK for details.
- Lubrication interval varies according to the service conditions. Contact THK for details.

● Precautions on Use
- Entrance of foreign matter may cause damage to the ball circulating path or functional loss. Prevent foreign matter, such as dust or cutting chips, from entering the system.
- When planning to use the LM system in an environment where coolant penetrates the LM block, it may cause trouble to product functions depending on the type of coolant. Contact THK for details.
- Do not use the LM system at temperature of 80℃ or higher. When desiring to use the system at temperature of 80℃ or higher, contact THK in advance.
- If foreign matter adheres to the LM system, replenish the lubricant after cleaning the product. For available types of detergent, contact THK .
- When using the LM Guide with an inverted mount, breakage of the endplate due to an accident or the like may cause balls to fall out and the LM block to come off from the LM rail and fall. In these cases, take preventive measures such as adding a safety mechanism for preventing such falls.
- When using the LM system in locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, contact THK in advance.
- When removing the LM block from the LM rail and then replacing the block, an LM block mounting/removing jig that facilitates such installation is available. Contact THK for details.

● Storage
- When storing the LM Guide, enclose it in a package designated by THK and store it in a horizontal orientation while avoiding high temperature, low temperature and high humidity.

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