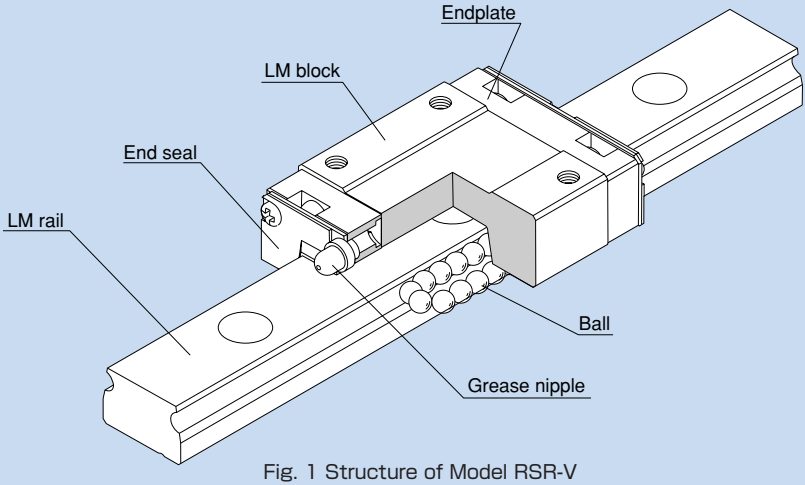

Fig. 1 Structure of Model RSR-V

Structure and Features

With models RSR and RSR-W, balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and endplates incorporated in the LM block allow the balls to circulate.
Balls circulate in a compact structure and perform infinite linear motion with no limit in stroke.
The LM block is designed to have a shape with high rigidity in a limited space, and in combination with large-diameter balls, demonstrates high rigidity in all directions.

●Ultra compact

The absence of cage displacement, a problem that cross-roller guides and types of ball slides with limited stroke tend to cause, make these models highly reliable LM systems.

●Capable of receiving loads in all directions

These models are capable of receiving loads in all directions, and a single-rail guide can adequately operate under a small moment load. Model RSR-W, in particular, has a greater number of effective balls and a broader LM rail to increase its rigidity against a moment. Thus, it achieves a more compact structure and more durable linear motion than a pair of linear bushes in parallel use.

●Stainless steel type also available

A special type whose LM block, LM rail and balls are made of stainless steel is also available.

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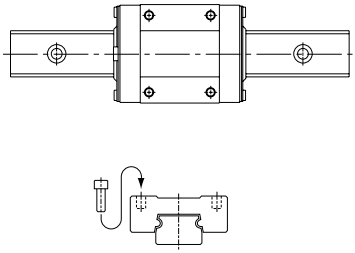
Types and Features

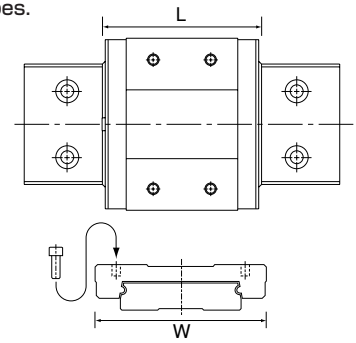
Models RSR/RSR-K/RSR-V

These models are standard types.



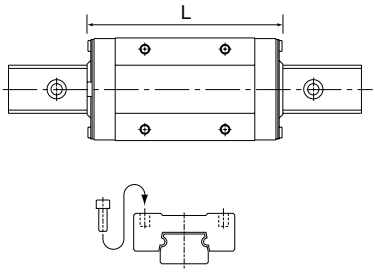
Models RSR-W/WV

It has a longer overall LM block length (L), a broader width (W) and greater rated load and permissible moment than standard types.



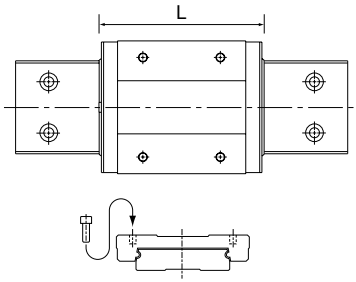
Model RSR-N

It has a longer overall LM block length (L) and a greater rated load than standard types.



Model RSR-WN

It has a longer overall LM block length (L), a greater rated load than standard types. Achieves the greatest load capacity among the miniature type LM Guide models.



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Comparison of Model RSR-W with Other Model Numbers

Locations where a Pair of Linear Bushes Are Used

- Unlike the linear bushes, model RSR-W can be used in a single-rail configuration and allows space saving.
- Since model RSR-W has more load-bearing balls per row and wider LM block and LM rail, thus to achieve high rigidity against an overhung load.
- Accuracy can be achieved simply by mounting the LM rail using bolts. Therefore, the assembly time can be shortened.

Example of comparing model RSR12W with model LM 10 in use

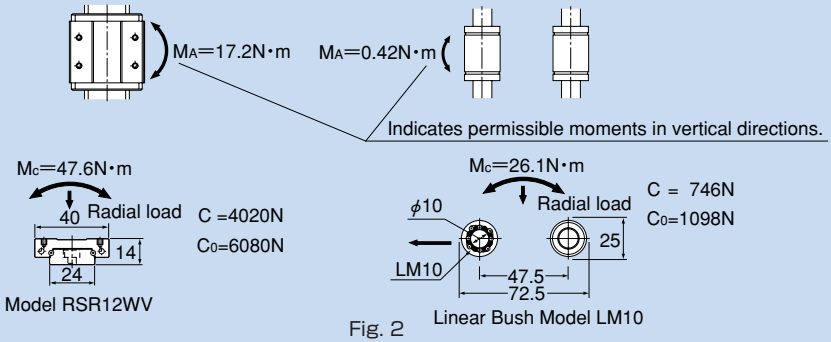

Fig. 2

Locations where a Cross-roller Table Is Used

- Does not show cage displacement even with vertical mount, and capable of performing infinite linear motion.
- Eliminates the need for difficult clearance adjustment and achieves long-term, smooth motion over a long period of time.
- Since the LM block width is large, the model can be used as a miniature table without any modification.

Example of comparing model RSR9WV with model VRM1035 in use

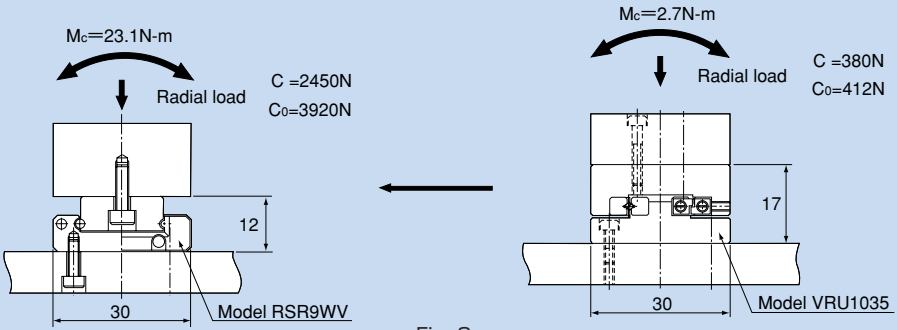

Fig. 3

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Rated Loads in All Directions

Model RSR is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.
The basic load ratings of models RSR3 to 9 are uniform in the four directions (radial, reverse-radial and lateral directions), and their actual values are provided in the dimensional table for RSR.
The basic load ratings of models RSR12 to 20 indicate the values in the radial direction in Fig. 4, and their actual values are provided in the dimensional table for RSR. The values in the reverse-radial and lateral directions are obtained from table 1.

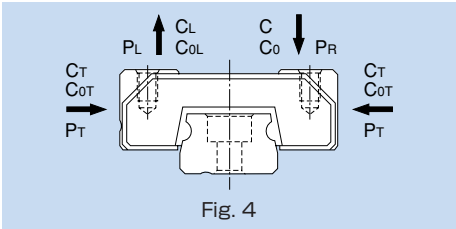

Fig. 4

Table 1 Basic Load Ratings of Models RSR12 to 20 in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse-radial direction	C_L=0.78C	C_{0L}=0.70C_0
Lateral direction	C_T=0.78C	C_{0T}=0.71C_0

Equivalent Load

When the LM block of models RSR3 to 9 receives loads in all four directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R\ (P_L) + P_T$$

where

P_E : Equivalent load (N)
- Radial direction
- Reverse-radial direction
- Lateral direction

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)

When the LM block of model RSR12 to 20 receives loads in the radial and lateral directions, or the reverse-radial and lateral directions, simultaneously, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_R\ (P_L) + Y \cdot P_T$$

where

P_E : Equivalent load (N)
- Radial direction
- Reverse-radial direction
- Lateral direction

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)
X/Y axes : Equivalent factor (see tables 2 and 3)

Table 2 Equivalent Factor of Models RSR12 to 20 (When radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.83
Equivalent load in lateral direction	1.2	1

Table 3 Equivalent Factor of Models RSR12 to 20 (When reverse-radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.99
Equivalent load in lateral direction	1.01	1

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Options

Dust Prevention Accessories

THK offers an end seal for model RSR as a dust prevention accessory.
(For details of the end seal, see page a-24.)

Table 4 Symbol of Dust Prevention Accessory for Model RSR

Symbol	Dust prevention accessory
UU	With end seal

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals RSR···UU, refer to the corresponding value provided in table 5.

Table 5 Maximum Seal Resistance Value of Seals RSR···UU

Unit: N

Model No.	Seal resistance value
RSR 5	0.06
RSR 7	0.08
RSR 9	0.1
RSR 12	0.4
RSR 15	0.8
RSR 20	1.0
RSR 3W	0.2
RSR 5W	0.3
RSR 7W	0.4
RSR 9W	0.8
RSR 12W	1.1
RSR 15W	1.3

●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 is on the same level as the LM rail top face.

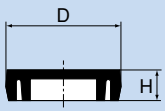
Since the dedicated cap C for LM rail mounting holes uses a special synthetic resin with high oil resistance and high wear resistance, it is highly durable.

When placing an order, specify the desired cap type with the corresponding cap number indicated in table 6.

For the procedure for mounting the cap, see page a-22.

Table 6 Major Dimensions of Dedicated Cap C

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
RSR 9W	C3	M3	6.3	1.2
RSR 12	C3	M3	6.3	1.2
RSR 15	C3	M3	6.3	1.2
RSR 20	C5	M5	9.8	2.4



Dedicated Cap C

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QZ Lubricator™

When QZ Lubricator is required, specify the desired type with the corresponding symbol indicated in table 7 (for details of QZ Lubricator, see pages a-19 and a-20).
For supported LM Guide model numbers for QZ Lubricator and overall LM block length with QZ Lubricator attached (dimension L), see page a-422.

Table 7 Parts Symbol for Model RSR with QZ Lubricator Attached

Symbol	Dust prevention accessories for LM Guide with QZ Lubricator attached
QZUU	With end seal + QZ

Stopper

With miniature LM Guide models RSR/RSR-W, balls will fall off if the LM block is removed from the LM rail.
To prevent the LM block from being pulled out, end pieces are mounted before shipment. If removing the stopper when using the LM Guide, be sure that the LM block will not overrun.

Table 8 Dimensional Table for Stopper (Type C) for Model RSR

Unit: mm

Model No.	A	B	C
RSR 7	11	5	7.7
RSR 9	13	6	9.5
RSR 12	16	7	12.5
RSR 15	19	7	14.5
RSR 20	25	7	20.0
RSR 7W	18	6	8.2
RSR 9W	23	7	11.5
RSR 12W	29	7	13.5
RSR 15W	46	7	14.5

Note: The stopper for models RSR3M/N, 5M/N and 5W uses an O-ring, while that for model RSR3W uses a silicone tube.

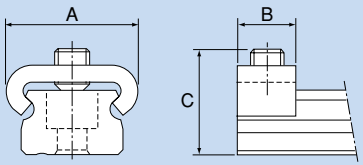

Fig. 5 Stopper (Type C) for Model RSR

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Accuracy of the Mounting Surface

Model RSR uses Gothic arch grooves in the ball raceways. When two rails of RSR are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see Section 7.3 "Permissible Error of the Mounting Surface" on page a-62.

When using this model in locations where it is difficult to obtain satisfactory accuracy of the mounting surface, we recommend using types RSR···A (semi standard) whose ball raceways have circular-arc grooves (avoid using these types in a single-rail configuration).

For specific accuracy of the mounting surface for types RSR···A, see Section 7.3 "Permissible Error of the Mounting Surface" on page a-62.

Standard Length and Maximum Length of the LM Rail

Table 9 shows the standard lengths and the maximum lengths of model RSR variations.

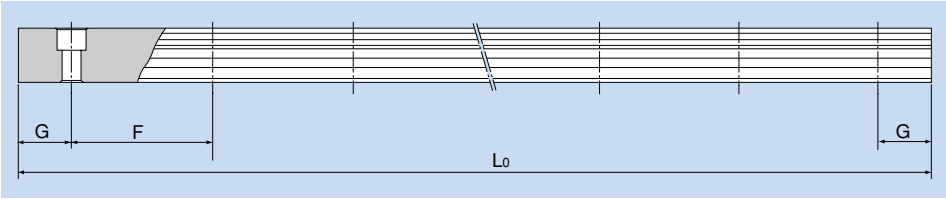

Table 9 Standard Length and Maximum Length of the LM Rail for Model RSR/RSR-W

Unit: mm

Model No.	RSR 3	RSR 5	RSR 7	RSR 9	RSR 12	RSR 15	RSR 20	RSR 3W	RSR 5W	RSR 7W	RSR 9W	RSR 12W	RSR 15W
Standard LM rail length (L_0)	30 40 60 80 100	40 55 70 100 130 160	40 55 70 85 100 130	55 75 95 115 135 155 175 195 275 375	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 350 390 430 470 550 670 870	220 280 340 460 640 880 1000	40 55 70	50 70 90 110 130 150 170	50 80 110 140 170 200 260 290	50 80 110 140 170 200 260 290 320	70 110 150 190 230 270 310 390 470 550	110 150 190 230 270 310 430 550 670 790
Standard pitch F	10	15	15	20	25	40	60	15	20	30	30	40	40
G	5	5	5	7.5	10	15	20	5	5	10	10	15	15
Max length	200	200	300	1000	1340	1430	1800	100	200	400	1000	1430	1800

Note 1: The maximum length varies with accuracy grades. Contact THK for details.
Note 2: The LM rail mounting hole of model RSR3 is an M1.6 through hole.

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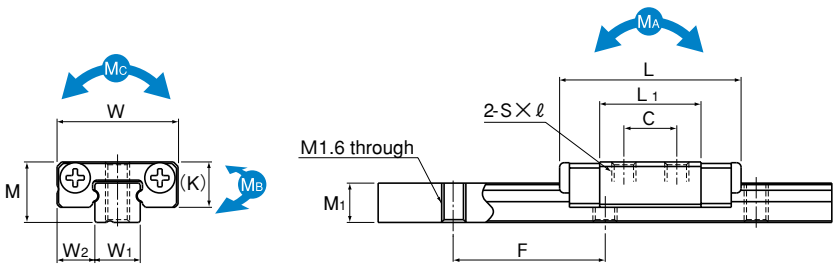
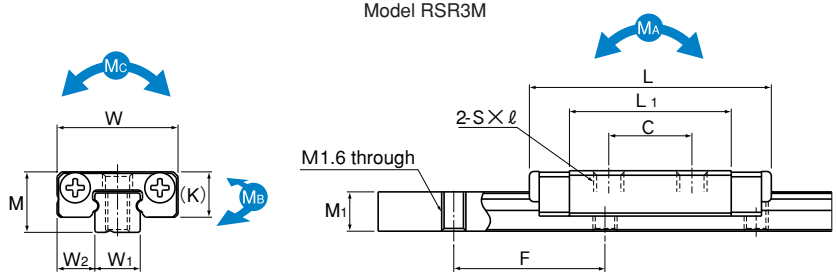
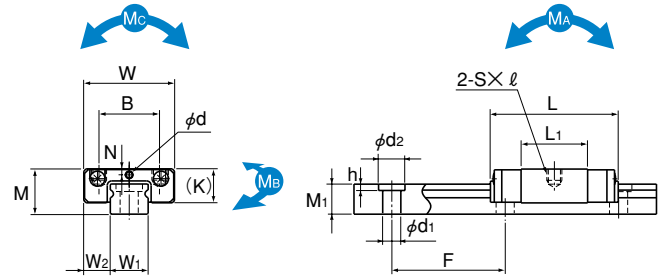
Model RSR-M
Model RSR-N



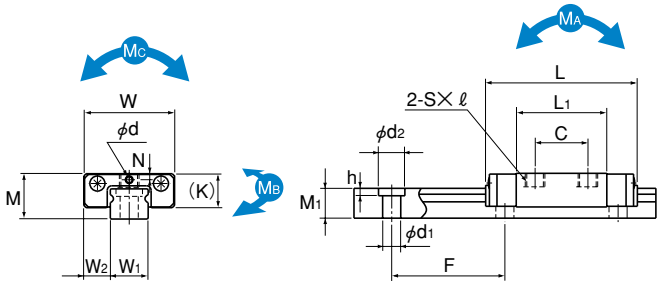
Model RSR3M



Model RSR3N



Model RSR5M



Model RSR5N

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	Co kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
RSR 3M	4	8	12	—	3.5	M1.6×1.3	6.7	—	3	—	—	—	—	3 $^{0}_{-0.02}$	2.5	2.6	10	—	0.18	0.27	0.293	2.11	0.293	2.11	0.45	0.0011	0.055
RSR 3N			16		5.5	M2×1.3	10.7												0.3	0.44	0.726	4.33	0.726	4.33	0.73	0.0016	
RSR 5M	6	12	16.9	8	—	M2×1.5	8.8	—	4.5	0.8	—	0.8	—	5 $^{0}_{-0.02}$	3.5	4	15	2.4×3.5×1	0.32	0.59	0.884	6.51	0.884	6.51	1.53	0.003	0.14
RSR 5N			20.1	—	7	M2.6×1.8	12												0.55	0.96	1.84	11.9	1.84	11.9	2.49	0.004	

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.
Models RSR3M and 3N do not have a greasing hole. When lubricating them, apply a lubricant directly to the LM rail raceways.
To secure the LM rail of models RSR5M and 5N, use cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1) M2.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSR5 M UU C1 +130L P M-Ⅱ
1 2 3 4 5 6 7 8

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-412) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel
8 Symbol for No. of rails used on the same plane

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).

■Recommended tightening torque when mounting the LM rail/block

Table 10 shows recommended bolt tightening torques when mounting the LM block and LM rail of models RSR3M/3N.

Table 10 Recommended Tightening Torques of Mounting Bolts

Model No. of screw	Recommended tightening torque (N-m)
M1.6	0.09
M2	0.19

Note: Applicable to austenitic stainless steel hexagon socket bolts.

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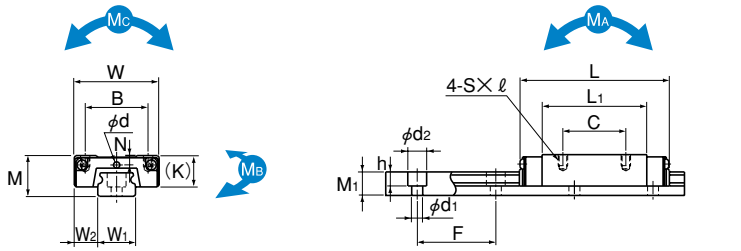
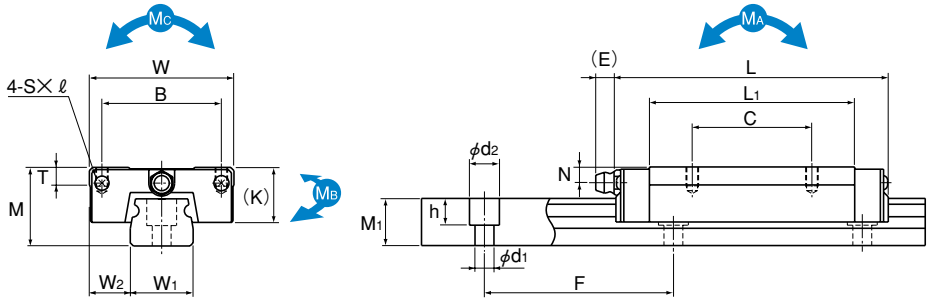
Model RSR-M
Model RSR-KM
Model RSR-VM
Model RSR-N



Models RSR7 to 12N/7M/9KM/12VM



Models RSR15,20VM/N

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	B	C	S× ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	C0 kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
RSR 7M	8	17	23.4	12	8	M2×2.5	13.4	—	6.5	1.7	—	1.2	—	7 0 −0.02	5	4.7	15	2.4×4.2×2.3	0.88	1.37	2.93	20.8	2.93	20.8	5	0.013	0.23
RSR 7N			33		13		23												1.59	2.5	8.68	49.9	8.68	49.9	9.12	0.018	
RSR 9KM	10	20	30.8	15	10	M3×3	19.8	—	7.8	2.4	—	1.5	—	9 0 −0.02	5.5	5.5	20	3.5×6×3.3	1.47	2.25	7.34	43.3	7.34	43.3	10.4	0.018	0.32
RSR 9N			41		16		29.8												2.6	3.96	18.4	97	18.4	97	18.4	0.027	
RSR 12VM	13	27	35	20	15	M3×3.5	20.6	—	10	3	—	2	—	12 0 −0.025	7.5	7.5	25	3.5×6×4.5	2.65	4.02	11.4	74.9	10.1	67.7	19.2	0.037	0.58
RSR 12N			47.7		20		33.3												4.3	6.65	28.9	163	25.5	145	31.8	0.055	
RSR 15VM	16	32	43	25	20	M3×4	25.7	—	12	3.5	3.6	—	PB107	15 0 −0.025	8.5	9.5	40	3.5×6×4.5	4.41	6.57	23.7	149	21.1	135	38.8	0.069	0.925
RSR 15N			61		25		43.5				3.7								7.16	10.7	63.1	330	55.6	293	63	0.093	
RSR 20VM	25	46	66.5	38	38	M4×6	45.2	5.7	17.5	5	6.4	—	A-M6F	20 0 −0.03	13	15	60	6×9.5×8.5	8.82	12.7	75.4	435	66.7	389	96.6	0.245	1.95
RSR 20N			86.3				65												14.2	20.6	171	897	151	795	157	0.337	

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

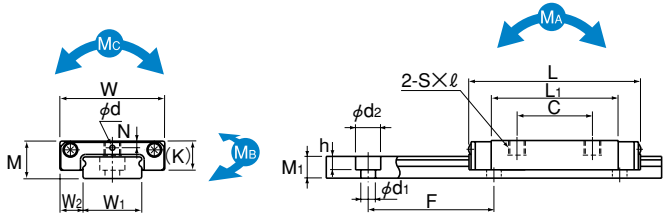
Model number coding

2 RSR15V M UU C1 +230L P M- Ⅱ
1 2 3 4 5 6 7 8

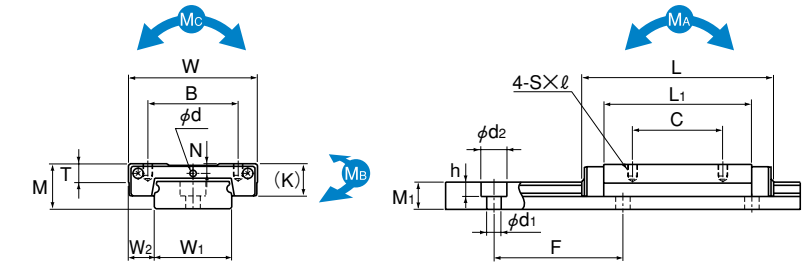
1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-412) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel
8 Symbol for No. of rails used on the same plane

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).

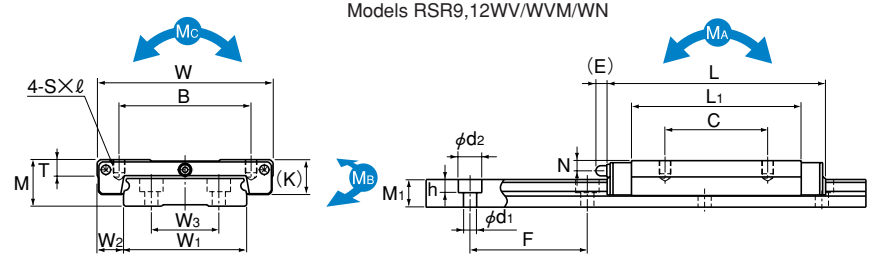
Model RSR-WM (WV)
Model RSR-WVM
Model RSR-WM



Models RSR3 to 7WM/WN



Models RSR9,12WV/WVM/WN



Models RSR15WV/WVM/WN

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	W3	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	C0 kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
**RSR 3WM	4.5	12	14.9	—	4.5	M2×1.7	8.5	—	3.5	0.8	—	0.8	—	6 0 −0.02	3	—	2.6	15	2.4×4×1.5	0.25	0.47	0.668	4.44	0.668	4.44	1.48	0.002	0.12
**RSR 3WN			19.9		8		13.3													0.39	0.75	1.57	9.06	1.57	9.06	2.36	0.003	
**RSR 5WM	6.5	17	22.1	—	6.5	M3×2.3	13.7	—	5	1.1	—	0.8	—	10 0 −0.025	3.5	—	4	20	3×5.5×3	0.51	0.96	1.97	13.1	1.97	13.1	4.89	0.007	0.28
**RSR 5WN			28.1		11		19.7													0.75	1.4	4.06	23.5	4.06	23.5	7.13	0.01	
**RSR 7WM	9	25	31	—	12	M4×3.5	20.4	—	7	1.6	—	1.2	—	14 0 −0.05	5.5	—	5.2	30	3.5×6×3.2	1.37	2.16	7.02	40.7	7.02	40.7	15.4	0.021	0.51
**RSR 7WN			40.9		18		30.3													2.04	3.21	14.7	77.6	14.7	77.6	22.9	0.026	
RSR 9WV	12	30	39	21	12	M2.6×3	27	—	7.8	2	—	1.6	—	18 0 −0.05	6	—	7.5	30	3.5×6×4.5	2.45	3.92	16	92.9	16	92.9	36	0.035	1.08
**RSR 9WVM			39	21	12	M2.6×3	27													2.45	3.92	16	92.9	16	92.9	36	0.035	
**RSR 9WN			50.7	23	24	M3×3	38.7													3.52	5.37	31	161	31	161	49.4	0.051	
RSR 12WV	14	40	44.5	28	15	M3×3.5	30.9	4.5	10	3	—	2	—	24 0 −0.05	8	—	8.5	40	4.5×8×4.5	4.02	6.08	24.5	138	21.7	123	59.5	0.075	1.5
**RSR 12WVM			44.5		15		30.9													4.02	6.08	24.5	138	21.7	123	59.5	0.075	
**RSR 12WN			59.5		28		45.9													5.96	9.21	53.9	274	47.3	242	90.1	0.101	
RSR 15WV	16	60	55.5	45	20	M4×4.5	38.9	5.6	12	3.5	3	—	PB107	42 0 −0.05	9	23	9.5	40	4.5×8×4.5	6.66	9.8	50.3	278	44.4	248	168	0.17	3
**RSR 15WVM			55.5		20		38.9													6.66	9.8	50.3	278	44.4	248	168	0.17	
**RSR 15WN			74.5		35		57.9													9.91	14.9	110	555	97.3	490	255	0.21	

Note "**" indicates that since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.
To secure the LM rail of models RSR3WM and 3WN, use cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1) M2.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSR12WV M UU C1 +310L H M
1 2 3 4 5 6 7

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-412) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel

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Overall LM Block Length with Options

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

Unit: mm

Model No.	UU
RSR 3M	—
RSR 3N	—
RSR 3WM	14.9
RSR 3WN	19.9
RSR 5M	16.9
RSR 5N	20.1
RSR 5WM	22.1
RSR 5WN	28.1
RSR 7M	23.4
RSR 7N	33
RSR 7WM	31
RSR 7WN	40.9
RSR 9KM	30.8
RSR 9N	41
RSR 9WV	39
RSR 9WVM	39
RSR 9WN	50.7

Model No.	UU
RSR 12VM	35
RSR 12N	47.7
RSR 12WV	44.5
RSR 12WVM	44.5
RSR 12WN	59.5
RSR 15VM	43
RSR 15N	61
RSR 15WV	55.5
RSR 15WVM	55.5
RSR 15WN	74.5
RSR 20VM	66.5
RSR 20N	86.3

Note: " — " indicates not available.

Overall LM Block Length (Dimension L) of Model RSR with QZ Lubricator Attached

Unit: mm

Model No.	QZUU
RSR 9	41
RSR 9N	51
RSR 9W	49
RSR 9WN	61
RSR 12	45
RSR 12N	58
RSR 12W	54.5
RSR 12WN	69.5
RSR 15	55
RSR 15N	73
RSR 15W	67.5
RSR 15WN	86.5

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Overall LM Block Length without a Seal

Unit: mm

Model No.	Without seal
RSR 3M	12
RSR 3N	16
RSR 3WM	14.1
RSR 3WN	19.1
RSR 5M	15.5
RSR 5N	18.7
RSR 5WM	20.7
RSR 5WN	26.7
RSR 7M	22
RSR 7N	31.6
RSR 7WM	30
RSR 7WN	39.9
RSR 9KM	27.8
RSR 9N	37.8
RSR 9WV	36
RSR 9WVM	36
RSR 9WN	47.7

Model No.	Without seal
RSR 12VM	31
RSR 12N	43.7
RSR 12WV	41.3
RSR 12WVM	41.3
RSR 12WN	56.3
RSR 15VM	38.9
RSR 15N	56.5
RSR 15WV	51.5
RSR 15WVM	51.5
RSR 15WN	70.5
RSR 20VM	61.5
RSR 20N	81.3

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Precautions on Use

■QZ Lubricator for THK LM Guides

Handling

●Dropping or hitting this product may damage it. Take much care when handling it.
●Do not clean it with an organic solvent or white kerosene.
●Do not leave it unpacked for a long period of time.
●Do not block the air vent with grease or the like.

Service temperature range

●Be sure the service temperature of this product is between -10℃ and +50℃. When using it beyond the service temperature range, contact THK .

Use in a special environment

●When using it in a special environment, contact THK .

Precaution on selection

●Be sure the stroke is longer than the overall length of the LM block length attached with QZ Lubricator.

Corrosion prevention of LM Guides

●QZ Lubricator is a lubricating device designed to feed a minimum amount of oil to the ball raceway of LM rails, and does not provide corrosion prevention to the whole LM Guide. When using it in an environment subject to a coolant or the like, we strongly recommend applying grease or other anti-corrosion agent to the mounting base surface and the LM rail end surfaces of the LM Guide as an anti-corrosion measure.

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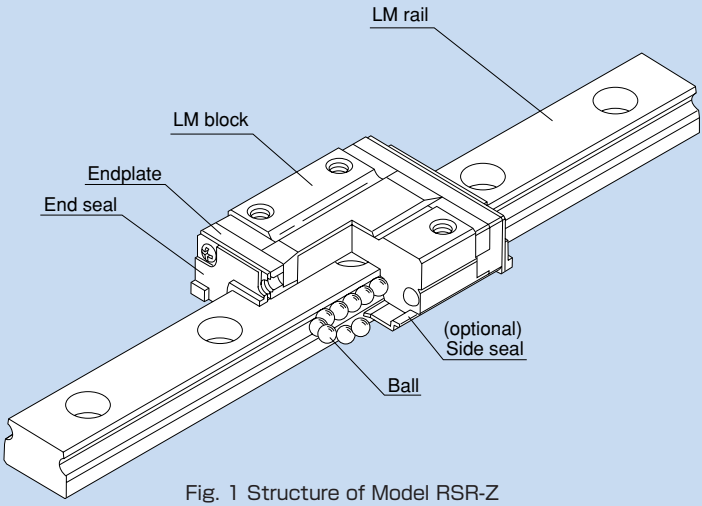

Fig. 1 Structure of Model RSR-Z

Structure and Features

With model RSR-Z, balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and endplates incorporated in the LM block allow the balls to circulate.
Balls of model RSR-Z circulate in a compact structure and perform infinite linear motion with no limit in stroke.
Also, it has the same dimensions as models RSR/RSR-W, but achieves a lighter weight and a lower price.

●Weight saving

Since part of the LM block body uses a resin material, the block mass is reduced by up to 28% from the conventional type model SRS-V. This makes RSR-Z a low-inertia type.

●Smooth motion

The unique structure of the endplate allows the balls to circulate smoothly and infinitely.

●Highly corrosion resistant

Since the LM block, LM rail and balls use stainless steel, this model is highly resistant to corrosion.

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●Low noise

Since the unloaded ball path is made of resin, there is no metallic contact and low noise is achieved.

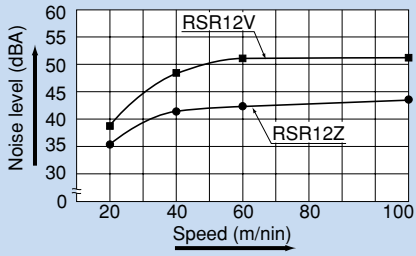
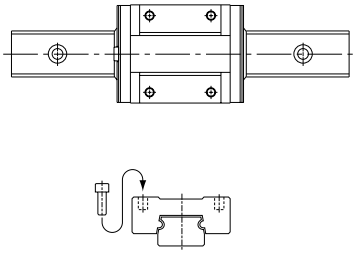


Fig. 2 Noise Levels of Models RSR12Z and RSR12V

Types and Features

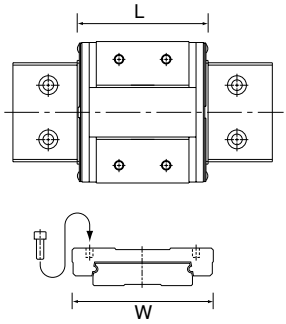
Model RSR-Z

Model RSR-Z is a standard type.



Models RSR-WZ

It has a longer overall LM block length (L), a broader width (W) and greater rated load and permissible moment than RSR-Z.



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Rated Loads in All Directions

Model RSR-Z is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.
The basic load ratings of models RSR7Z/WZ and 9Z/WZ are uniform in the four directions (radial, reverse-radial and lateral directions), and their actual values are provided in the dimensional table for RSR-Z.
The basic load ratings of models RSR12Z/WZ and 15Z/WZ indicate the values in the radial direction in Fig. 3, and their actual values are provided in the dimensional table for RSR-Z. The values in the reverse-radial and lateral directions are obtained from table 1.

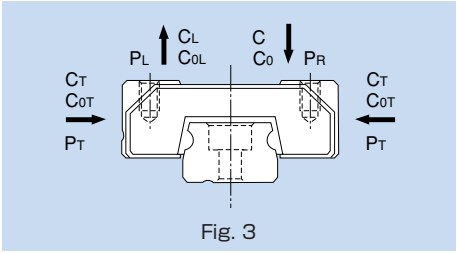


Fig. 3

Table 1 Basic Load Ratings of Models RSR12Z/WZ and 15Z/WZ in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse-radial direction	C_L=0.78C	C_{0L}=0.70C_0
Lateral direction	C_T=0.78C	C_{0T}=0.71C_0

Equivalent Load

When the LM block of models RSR7Z/WZ and 9Z/WZ receives loads in all four directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R\ (P_L) + P_T$$

where

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

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)

When the LM block of model RSR12Z/WZ and 15Z/WZ receives loads in the radial and lateral directions, or the reverse-radial and lateral directions, simultaneously, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_R\ (P_L) + Y \cdot P_T$$

where

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

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)
X/Y axes : Equivalent factor (see tables 2 and 3)

Table 2 Equivalent Factor of Models RSR12Z/WZ and 15Z/WZ (When radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.83
Equivalent load in lateral direction	1.2	1

Table 3 Equivalent Factor of Models RSR12Z/WZ and 15Z/WZ (When reverse-radial and lateral loads are applied)

P_E	X	Y
Equivalent load in reverse-radial direction	1	0.99
Equivalent load in lateral direction	1.01	1

Options

Dust Prevention Accessories

THK offers dust prevention accessories for models RSR-Z/WZ.
When a dust prevention accessory is required, specify the desired item with the corresponding symbol provided in table 4 (for details of dust prevention accessories, see page a-24).
For supported model numbers for dust prevention accessories and overall LM block length with dust prevention accessories attached (dimension L), see page a-436.

Table 4 Symbols of Dust Prevention Accessories for Model RSR-Z

Symbol	Dust prevention accessory
UU	With end seal
SS	With end seal + side seal

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals RSR-Z···UU, refer to the corresponding value provided in table 5.

Table 5 Maximum Seal Resistance Value of Seals RSR-Z···UU

Unit: N

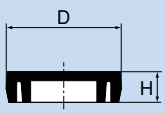
Model No.	Seal resistance value
RSR 7Z	0.08
RSR 9Z	0.1
RSR 12Z	0.4
RSR 15Z	0.8
RSR 7WZ	0.4
RSR 9WZ	0.8
RSR 12WZ	1.1
RSR 15WZ	1.3

●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 is on the same level as the LM rail top face.
Since the dedicated cap C for LM rail mounting holes uses a special synthetic resin with high oil resistance and high wear resistance, it is highly durable.
When placing an order, specify the desired cap type with the corresponding cap number indicated in table 6.
For the procedure for mounting the cap, see page a-22.

Table 6 Major Dimensions of Dedicated Cap C

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
RSR 9WZ	C3	M3	6.3	1.2
RSR 12Z	C3	M3	6.3	1.2
RSR 15Z	C3	M3	6.3	1.2



Dedicated Cap C

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Stopper

With models RSR-Z/WZ, balls will fall off if the LM block is removed from the LM rail. To prevent the LM block from being pulled out, a stopper is mounted before shipment. If removing the stopper when using the LM Guide, be sure that the LM block will not overrun.

Table 7 Dimensional Table for Stopper (Type C) for Model RSR-Z/WZ

Unit: mm

Model No.	A	B	C
RSR 7Z	11	5	7.7
RSR 9Z	13	6	9.5
RSR 12Z	16	7	12.5
RSR 15Z	19	7	14.5
RSR 7WZ	18	6	8.2
RSR 9WZ	23	7	11.5
RSR 12WZ	29	7	13.5
RSR 15WZ	46	7	14.5

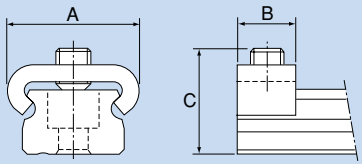

Fig. 4 Stopper (Type C) for Model RSR-Z

Accuracy of the Mounting Surface

Model RSR-Z uses Gothic arch grooves in the ball raceways. When two rails of RSR are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see Section 7.3 "Permissible Error of the Mounting Surface" on page a-62.

a 431 Miniature Type LM Guide Model RSR-Z

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Standard Length and Maximum Length of the LM Rail

Table 8 shows the standard lengths and the maximum lengths of model RSR-Z/WZ variations.

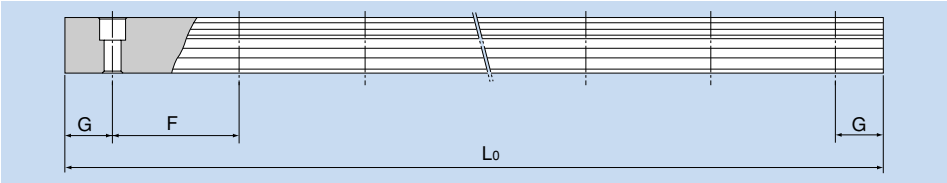


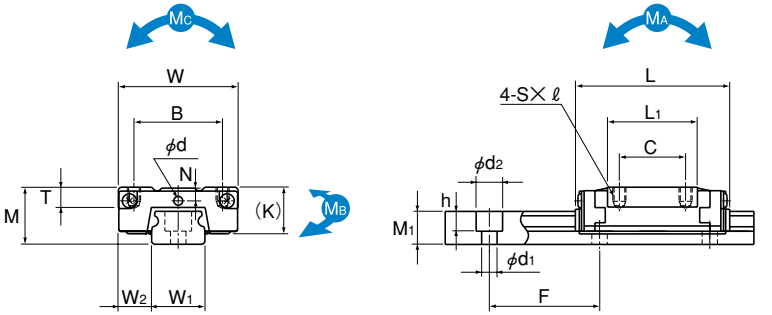
Table 8 Standard Length and Maximum Length of the LM Rail for Model RSR-Z/WZ

Unit: mm

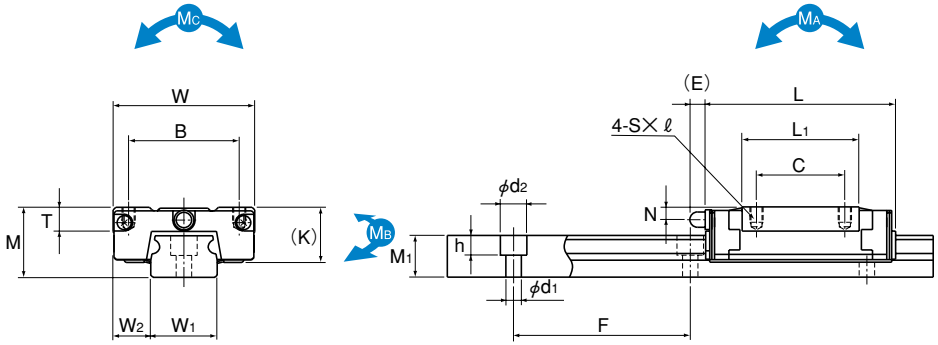
Model No.	RSR 7Z	RSR 9Z	RSR 12Z	RSR 15Z	RSR 7WZ	RSR 9WZ	RSR 12WZ	RSR 15WZ
Standard LM rail length (L_0)	40 55 70 85 100 130	55 75 95 115 135 155 175 195 275 375	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 350 390 430 470 550 670 870	50 80 110 140 170 200 260 290	50 80 110 140 170 200 260 290 320	70 110 150 190 230 270 310 390 470 550	110 150 190 230 270 310 430 550 670 790
Standard pitch F	15	20	25	40	30	30	40	40
G	5	7.5	10	15	10	10	15	15
Max length	300	1000	1340	1430	400	1000	1430	1800

Note 1: The maximum length varies with accuracy grades. Contact THK for details.
Note 2: The LM rails of these models are all made of stainless steel.

Model RSR-ZM



Models RSR7 to 12ZM



Model RSR15ZM

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	C0 kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
RSR 7ZM	8	17	23.4	12	8	M2×2.5	13.2	3.4	6.5	1.6	—	1.5	—	$7\ ^{0}_{-0.02}$	5	4.7	15	2.4X4.2X2.3	0.88	1.37	2.93	20.7	2.93	20.7	5	0.008	0.23
RSR 9ZM	10	20	30.8	15	10	M3×2.7	19.4	4.6	7.8	2.4	—	1.6	—	$9\ ^{0}_{-0.02}$	5.5	5.5	20	3.5X6X3.3	1.47	2.25	7.34	43	7.34	43	10.4	0.014	0.32
RSR 12ZM	13	27	35	20	15	M3×3.2	20.4	4.5	10.6	3.1	—	2	—	$12\ ^{0}_{-0.025}$	7.5	7.5	25	3.5X6X4.5	2.65	4.02	11.4	74.9	10.1	67.7	19.2	0.028	0.58
RSR 15ZM	16	32	43	25	20	M3×3.5	26.5	5.5	12.6	2.9	3.6	—	PB107	$15\ ^{0}_{-0.025}$	8.5	9.5	40	3.5X6X4.5	4.41	6.57	23.7	149	21.1	135	38.8	0.05	0.925

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSR15Z M UU C1 +230L P M- II
1 2 3 4 5 6 7 8

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-429) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel
8 Symbol for No. of rails used on the same plane

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).

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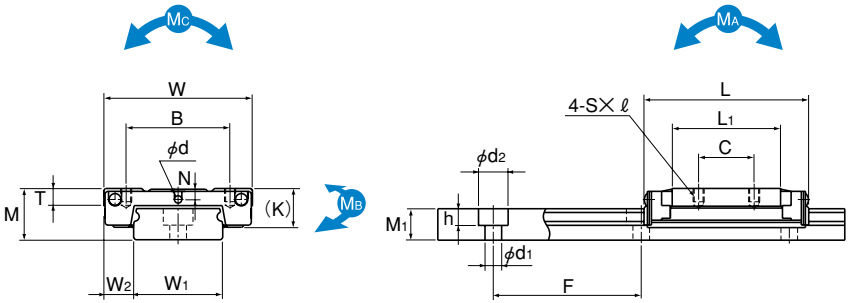
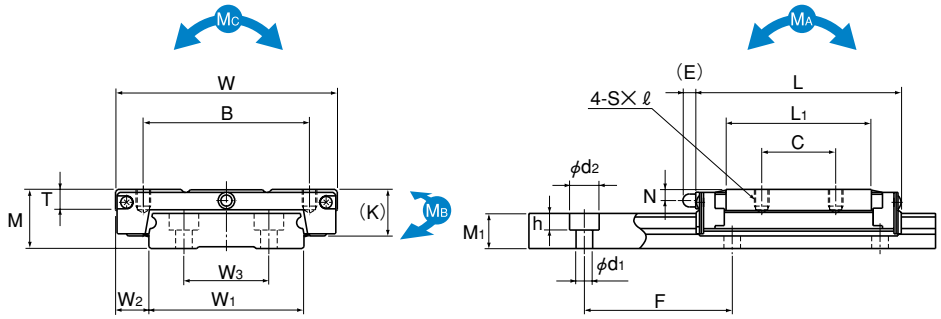


Models RSR7 to 12WZM



Model RSR15WZM

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L_1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W_1	W_2	W_3	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Basic load rating C kN	C_0 kN	Static permissible moment N-m* M_A 1 block	M_A 2 blocks in close contact	M_B 1 block	M_B 2 blocks in close contact	M_C 1 block	Mass LM block kg	LM rail kg/m
RSR 7WZM	9	25	31.5	19	10	M3×2.8	19.7	3.4	7	1.8	—	1.6	—	$14^{0}_{-0.05}$	5.5	—	5.2	30	3.5×6×3.2	1.37	2.16	6.54	42.1	6.54	42.1	15.4	0.018	0.51
RSR 9WZM	12	30	39	21	12	M3×2.8	27	3.9	9.1	2.3	—	1.6	—	$18^{0}_{-0.05}$	6	—	7.5	30	3.5×6×4.5	2.45	3.92	16	92.9	16	92.9	36	0.03	1.08
RSR 12WZM	14	40	44.5	28	15	M3×3.6	29.3	4.5	10.6	3	—	2	—	$24^{0}_{-0.05}$	8	—	8.5	40	4.5×8×4.5	4.02	6.08	24.5	138	21.7	123	59.5	0.06	1.5
RSR 15WZM	16	60	55.5	45	20	M4×4.5	39.3	5.4	12.6	3	3.6	—	PB107	$42^{0}_{-0.05}$	9	23	9.5	40	4.5×8×4.5	6.66	9.8	50.3	278	44.4	248	168	0.135	3

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSR12WZ M SS C1 +390L H M
1 2 3 4 5 6 7

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-429) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel

a-434 THK
Standard Length and Maximum Length of the LM Rail P. a-431
Selecting a Model Number Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately
THK a-435

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Overall LM Block Length with Options

Overall LM Block Length (Dimension L) of Models RSR-Z and RSR-WZ with a Dust Prevention Accessory Attached

Unit: mm

Model No.	UU	SS
RSR 7ZM	23.4	—
RSR 9ZM	30.8	—
RSR 12ZM	35	35
RSR 15ZM	43	43

Model No.	UU	SS
RSR 7WZM	31.5	—
RSR 9WZM	39	39
RSR 12WZM	44.5	44.5
RSR 15WZM	55.5	55.5

Note: "—" indicates not available.

Overall LM Block Length without a Seal

Unit: mm

Model No.	Without seal
RSR 7ZM	20.4
RSR 9ZM	29.1
RSR 12ZM	32.6
RSR 15ZM	40.2

Model No.	Without seal
RSR 7WZM	28
RSR 9WZM	37.6
RSR 12WZM	42.1
RSR 15WZM	53.1

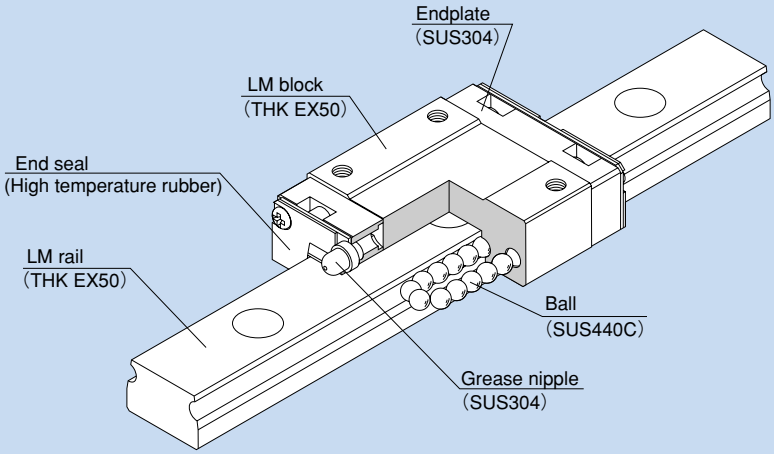

Fig. 1 Structure of Model RSR-M1V

Structure and Features

Balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and end-plates incorporated in the LM block allow the balls to circulate.
High temperature type miniature LM Guide model RSR-M1 is capable of being used at service temperature up to 150℃ thanks to THK 's unique technologies in material, heat treatment and lubrication.

●Maximum service temperature of 150℃

Use of stainless steel in the endplates and high-temperature rubber in the end seals achieves the maximum service temperature of 150℃.

●Dimensional stability

Since it is dimensionally stabilized, it demonstrates superb dimensional stability after being heated or cooled (note that it shows linear expansion at high temperature).

●Corrosion resistance

Since its LM block, LM rail and balls are made of stainless steel, this model is highly resistant to corrosion.

●High temperature grease

This model uses high temperature grease that shows little grease-based fluctuation in rolling resistance even if temperature changes from low to high levels.

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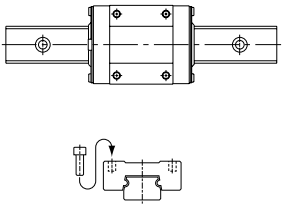
Thermal Characteristics of LM Rail and LM Block Materials

●Specific heat capacity	:0.481J/(g·K)
●Thermal conductivity	:20.67W/(m·K)
●Average coefficient of linear expansion	:11.8×10⁻⁶/℃

Types and Features

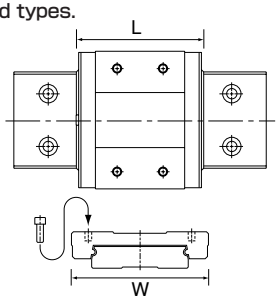
Models RSR-M1/RSR-M1K/M1V

These models are standard types.



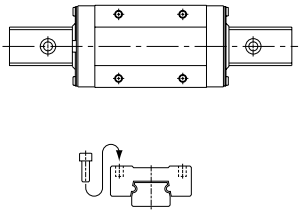
Models RSR-M1W/M1WV

These models have greater overall LM block lengths (L), broader widths (W) and greater rated loads and permissible moments than standard types.



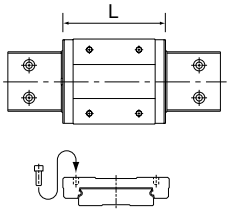
Model RSR-M1N

It has a greater overall LM block length (L) and a greater rated load than standard types.



Model RSR-M1WN

It has a longer overall LM block length (L), a greater rated load than standard types. Achieves the greatest load capacity among the high-temperature type miniature LM Guide models.



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Rated Loads in All Directions

Model RSR-M1 is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.

The basic load ratings of models RSR9M1/M1W are uniform in the four directions (radial, reverse-radial and lateral directions), and their actual values are provided in the dimensional table for RSR-M1.

The basic load ratings of models RSR12M1 to 20M1 indicate the values in the radial direction in Fig. 2, and their actual values are provided in the dimensional table for RSR-M1. The values in the reverse-radial and lateral directions are obtained from table 1.

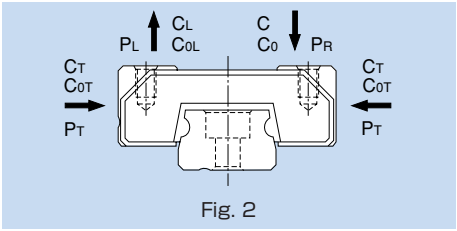

Fig. 2

Table 1 Basic Load Ratings of Models RSR12M1 to 20M1 in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse-radial direction	C_L=0.78C	C_{0L}=0.70C_0
Lateral direction	C_T=0.78C	C_{0T}=0.71C_0

Equivalent Load

When the LM block of models RSR9M1/M1W receives loads in all four directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R\ (P_L) + P_T$$

where

P_E : Equivalent load (N)
- Radial direction
- Reverse-radial direction
- Lateral direction

P_R : Radial load (N)

P_L : Reverse-radial load (N)

P_T : Lateral load (N)

When the LM block of models RSR12M1 to 20M1 receives loads in the radial and lateral directions, or the reverse-radial and lateral directions, simultaneously, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_R\ (P_L) + Y \cdot P_T$$

where

P_E : Equivalent load (N)
- Radial direction
- Reverse-radial direction
- Lateral direction

P_R : Radial load (N)

P_L : Reverse-radial load (N)

P_T : Lateral load (N)

X/Y axes : Equivalent factor (see tables 2 and 3)

Table 2 Equivalent Factor of Models RSR12M1 to 20M1 (When radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.83
Equivalent load in lateral direction	1.2	1

Table 3 Equivalent Factor of Models RSR12M1 to 20M1 (When reverse-radial and lateral loads are applied)

P_E	X	Y
Equivalent load in reverse-radial direction	1	0.99
Equivalent load in lateral direction	1.01	1

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Options

Dust Prevention Accessories

THK offers an end seal for model RSR-M1 as a dust prevention accessory.
(For details of the end seal, see page a-24).

Table 4 Symbol of Dust Prevention Accessory for Model RSR-M1

Symbol	Dust prevention accessory
UU	With end seal

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals RSR-M1···UU, refer to the corresponding value provided in table 5.

Table 5 Maximum Seal Resistance Value of Seals RSR-M1···UU

Unit: N

Model No.	Seal resistance value
RSR 9M1	0.1
RSR 12M1	0.4
RSR 15M1	0.8
RSR 20M1	1.0
RSR 9M1W	0.8
RSR 12M1W	1.1
RSR 15M1W	1.3

Note: The seal resistance values above are values at normal temperature.

Stopper

With models RSR-M1, balls will fall off if the LM block is removed from the LM rail. To prevent the LM block from being pulled out, a stopper is mounted before shipment. If removing the stopper when using the LM Guide, be sure that the LM block will not overrun.

Table 6 Dimensional Table for Stopper (Type C) for Model RSR-M1

Unit: mm

Model No.	A	B	C
RSR 9M1	13	6	9.5
RSR 12M1	16	7	12.5
RSR 15M1	19	7	14.5
RSR 20M1	25	7	20.0
RSR 9M1W	23	7	11.5
RSR 12M1W	29	7	13.5
RSR 15M1W	46	7	14.5

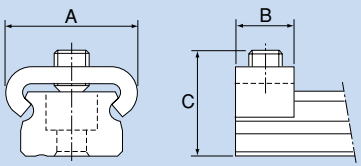

Fig. 3 Stopper (Type C) for Model RSR-M1

Accuracy of the Mounting Surface

Model RSR-M1 uses Gothic arch grooves in the ball raceways. When two rails of RSR are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see Section 7.3 "Permissible Error of the Mounting Surface" on page a-62.

Standard Length and Maximum Length of the LM Rail

Table 7 shows the standard lengths and the maximum lengths of model RSR-M1 variations.

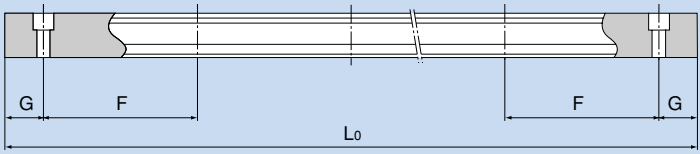

Table 7 Standard Length and Maximum Length of the LM Rail for Model RSR-M1

Unit: mm

Model No.	RSR 9M1	RSR 12M1	RSR 15M1	RSR 20M1	RSR 9M1W	RSR 12M1W	RSR 15M1W
Standard LM rail length (L_0)	55 75 95 115 135 155 175 195 275 375	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 350 390 430 470 550 670 870	220 280 340 460 640 880 1000	50 80 110 140 170 200 260 290 320	70 110 150 190 230 270 310 390 470 550	110 150 190 230 270 310 430 550 670 790
Standard pitch F	20	25	40	60	30	40	40
G	7.5	10	15	20	10	15	15
Max length	1000	1340	1430	1800	1000	1430	1800

Note 1: The maximum length varies with accuracy grades. Contact THK for details.

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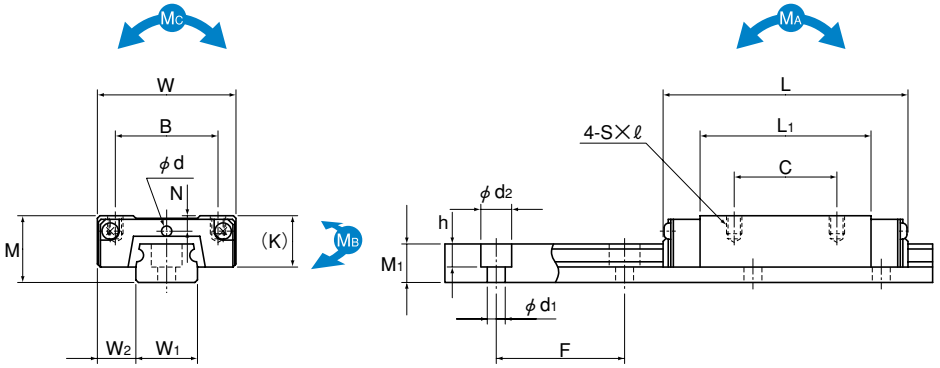
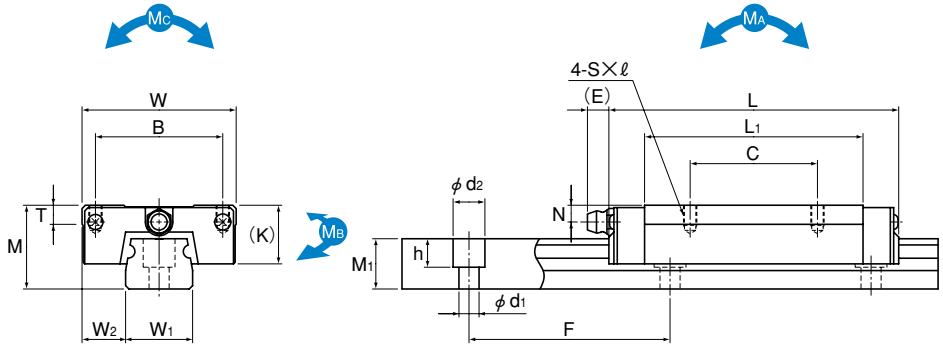
Model RSR-M1K
Model RSR-M1V
Model RSR-M1N



Models RSR9M1K/9M1N and RSR12M1V/M1N



Models RSR15, 20M1V/M1N

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S×ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	C0 kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
RSR 9M1K	10	20	30.8	15	10	M3×3	19.8	—	7.8	—	—	—	—	$9\ ^{0}_{-0.02}$	5.5	5.5	20	3.5×6×3.3	1.47	2.25	7.34	43.3	7.34	43.3	10.4	0.018	0.32
RSR 9M1N			41		16		29.8												2.6	3.96	18.4	97	18.4	97	18.4	0.027	
RSR 12M1V	13	27	35	20	15	M3×3.5	20.6	—	10	3	—	2	—	$12\ ^{0}_{-0.025}$	7.5	7.5	25	3.5×6×4.5	2.65	4.02	11.4	74.9	10.1	67.7	19.2	0.037	0.58
RSR 12M1N			47.7		20		33.3												4.3	6.65	28.9	163	25.5	145	31.8	0.055	
RSR 15M1V	16	32	43	25	20	M3×4	25.7	—	12	3.5	3.6	—	PB107	$15\ ^{0}_{-0.025}$	8.5	9.5	40	3.5×6×4.5	4.41	6.57	23.7	149	21.1	135	38.8	0.069	0.925
RSR 15M1N			61		25		43.5				3.7								7.16	10.7	63.1	330	55.6	293	63	0.093	
RSR 20M1V	25	46	66.5	38	38	M4×6	45.2	5.7	17.5	5	6.4	—	A-M6F	$20\ ^{0}_{-0.03}$	13	15	60	6×9.5×8.5	8.82	12.7	75.4	435	66.7	389	96.6	0.245	1.95
RSR 20M1N			86.3				65												14.2	20.6	171	897	151	795	157	0.337	

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSR15 M1 V UU C1 +230L P- II
1 2 3 4 5 6 7 8 9

1 No. of LM blocks used on the same rail 2 Model number 3 Symbol for high-temperature type LM Guide
4 Type of LM block 5 Dust prevention accessory symbol (see page a-441)
6 Radial clearance symbol (see page a-35) 7 LM rail length (in mm) 8 Accuracy symbol (see page a-45)
9 Symbol for No. of rails used on the same plane

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).

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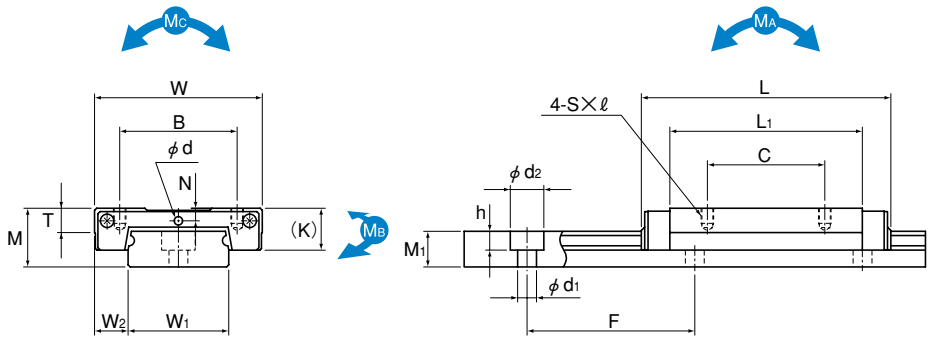
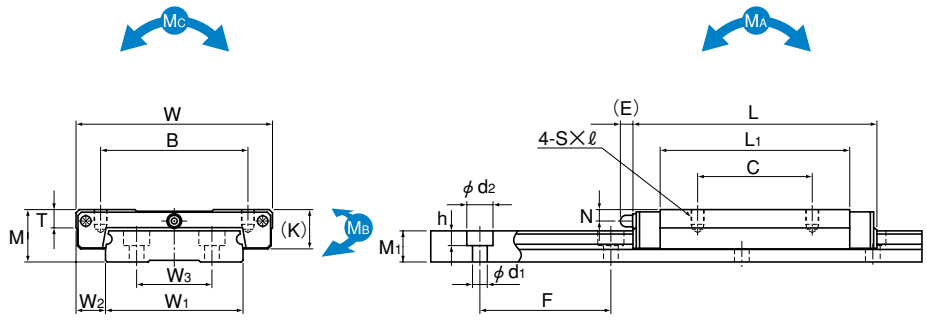
Model RSR-M1WV
Model RSR-M1WN



Models RSR9, 12M1WV/M1WN



Models RSR15M1WV/M1WN

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	W3	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	C0 kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
RSR 9M1WV	12	30	39	21	12	M2.6×3	27	—	7.8	2	—	1.6	—	18 $^{0}_{-0.05}$	6	—	7.5	30	3.5×6×4.5	2.45	3.92	16	92.9	16	92.9	36	0.035	1.08
RSR 9M1WN			50.7	23	24	M3×3	38.7													3.52	5.37	31	161	31	161	49.4	0.051	
RSR 12M1WV	14	40	44.5	28	15	M3×3.5	30.9	4.5	10	3	—	2	—	24 $^{0}_{-0.05}$	8	—	8.5	40	4.5×8×4.5	4.02	6.08	24.5	138	21.7	123	59.5	0.075	1.5
RSR 12M1WN			59.5	28	28		45.9													5.96	9.21	53.9	274	47.3	242	90.1	0.101	
RSR 15M1WV	16	60	55.5	45	20	M4×4.5	38.9	5.6	12	3.5	3	—	PB107	42 $^{0}_{-0.05}$	9	23	9.5	40	4.5×8×4.5	6.66	9.8	50.3	278	44.4	248	168	0.17	3
RSR 15M1WN			74.5	35	35		57.9													9.91	14.9	110	555	97.3	490	255	0.21	

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding 2 RSR12 M1 WN UU C1 +310L P
1 2 3 4 5 6 7 8

1 No. of LM blocks used on the same rail 2 Model number 3 Symbol for high-temperature type LM Guide
4 Type of LM block 5 Dust prevention accessory symbol (see page a-441)
6 Radial clearance symbol (see page a-35) 7 LM rail length (in mm) 8 Accuracy symbol (see page a-45)

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Overall LM Block Length with Options

Overall LM Block Length (Dimension L) of Model RSR-M1 with a Dust Prevention Accessory Attached

Unit: mm

Model No.	UU
RSR 9M1K	30.8
RSR 9M1N	41
RSR 9M1WV	39
RSR 9M1WN	50.7
RSR 12M1V	35
RSR 12M1N	47.7
RSR 12M1WV	44.5
RSR 12M1WN	59.5

Model No.	UU
RSR 15M1V	43
RSR 15M1N	61
RSR 15M1WV	55.5
RSR 15M1WN	74.5
RSR 20M1V	66.5
RSR 20M1N	86.3

Overall LM Block Length without a Seal

Unit: mm

Model No.	Without seal
RSR 9M1K	27.8
RSR 9M1N	37.8
RSR 9M1WV	36
RSR 9M1WN	47.7
RSR 12M1V	31
RSR 12M1N	43.7
RSR 12M1WV	41.3
RSR 12M1WN	56.3

Model No.	Without seal
RSR 15M1V	38.9
RSR 15M1N	56.5
RSR 15M1WV	51.5
RSR 15M1WN	70.5
RSR 20M1V	61.5
RSR 20M1N	81.3

Precautions on Use

THK High Temperature LM Guide

Service Temperature of the High Temperature LM Guide

- Maximum service temperature: 150℃

Selection of a High Temperature LM Guide

- For selecting a model number of high temperature LM Guide model RSR-M1, see section A of the "THK General Catalog - Technical Descriptions of the Products," provided separately. When selecting a model number, also determine the temperature factor fT while referring to the corresponding graph, and set hardness factor fH at 1.0.

Dimensional Accuracy of the High Temperature LM Guide

- The high temperature LM Guide is manufactured with the same dimensional accuracy as a standard LM Guide. At high service temperature, however, the former shows thermal expansion, and therefore, its dimensional accuracy changes by the thermal expansion.

Calculation of Thermal Expansion of the High Temperature LM Guide

●Thermal expansion of the high temperature LM Guide is calculated in the following equation.

$L_{2\text{-}1} = \alpha (t_2 - t_1) L_1$

$L_{2\text{-}1}$: Thermal expansion by heating (mm)

α : Coefficient of linear expansion (see table 8)

t_2 : Heating temperature (℃)

t_1 : Normal temperature (℃)

L_1 : Length at normal temperature (mm)

Table 8 Coefficient of Linear Expansion by Material ($\times 10^{-6}$/℃)

(The values other than high temperature LM Guide are excerpts from "Actual Designing - Part 2" by The Nikkan Kogyo Shimbun, Ltd.)

	High temperature LM Guide	SS400	FC25	SUS304	Aluminum
Coefficient of linear expansion	11.8	11.2 to 11.3	8.6 to 8.7	16.4	23

Note: If mounting the high temperature LM Guide on a material whose linear expansion coefficient is significantly different, or if the linear expansion coefficient is the same but the temperature is uneven, it may cause the LM rail to bend or the preload on the LM Guide to change (for preloads on the LM Guide, see page a-31).

Grease Used in the High Temperature LM Guide

●The LM Guide contains fluorinated grease as standard unless otherwise specified. The following table shows general properties of the grease for the high temperature LM Guide.

If other type of grease or lubricant is mixed with the high temperature grease, it may deteriorate the product performance.

When using the LM Guide in a vacuum environment, contact THK.

Name: Krytox GPL225 (DuPont)

Base oil	GPL105
Base oil viscosity (20℃)	550(mm²/s)
Oil separation rate (30 hr, 99℃)	4%(wt)
Additive	Anticorrosive agent
Service temperature range	-35℃ to +205℃
Worked penetration	NLGI No.2

Change in Sliding Resistance due to Grease and Seal

●The sliding resistance of the LM Guide tends to increase in proportion to the increase in temperature due to high temperature grease or seal.

Lubrication of the High Temperature LM Guide

●The high temperature LM Guide needs to be greased roughly at an interval of every 100 km in travel distance. However, the greasing interval may vary depending on the service conditions, environment, atmosphere or temperature. It is necessary to adjust the greasing interval according to the circumstances.

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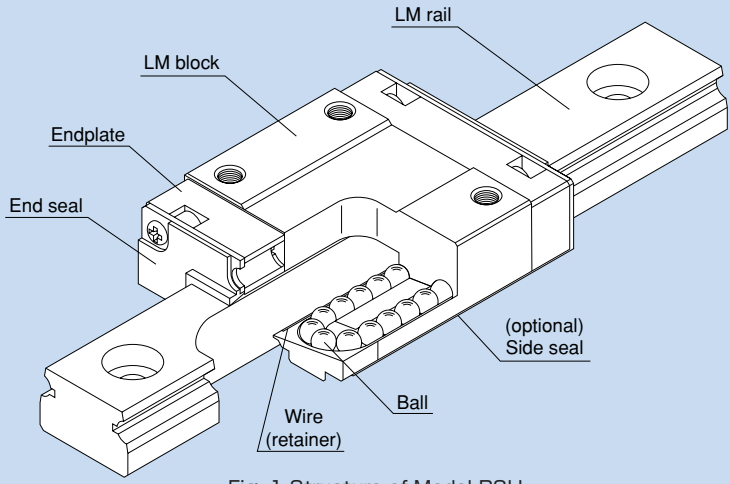

Fig. 1 Structure of Model RSH

Structure and Features

Balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and end-plates incorporated in the LM block allow the balls to circulate. Since a retainer holds the balls, they will not fall.
With the Miniature Type LM Guide with a Ball-fall-preventing Retainer Model RSH, balls circulate in a compact structure and perform infinite linear motion with no limit in stroke. The LM block is designed to have a shape with high rigidity in a limited space, and in combination with large-diameter balls, demonstrates high rigidity in all directions.

●Miniature size

This model is a highly reliable, ultra compact LM Guide that responds to weight saving and space saving.

●Capable of receiving loads in all directions

This model is capable of receiving loads in all directions, and has a high load capacity because of large-diameter balls incorporated in two rows of raceways.

●Highly corrosion resistant

Since the LM block, LM rail and balls use stainless steel, which is highly resistant to corrosion, it is optimal for clean-room applications.

●Equipped with a ball-fall-preventing retainer

The LM block contains a retainer capable of preventing balls from falling off. Since the balls will not fall even if the LM block is removed from the LM rail, you can use this LM Guide at ease.

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a 451 Miniature Type LM Guide with a Ball-fall-preventing Retainer Model RSH

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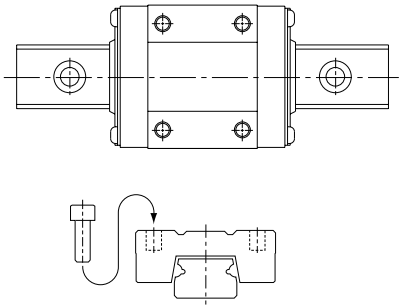
Type and Features

Model RSH

This model is a standard type.



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Rated Loads in All Directions

Model RSH is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.
The basic load ratings of models RSH7 and 9 are uniform in the four directions (radial, reverse-radial and lateral directions), and their actual values are provided in the dimensional table for RSH.
The basic load ratings of model RSH12 indicate the values in the radial direction in Fig. 2, and their actual values are provided in the dimensional table for RSH. The values in the reverse-radial and lateral directions are obtained from table 1.

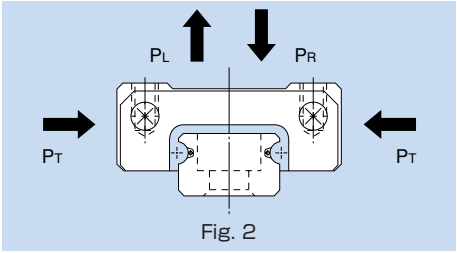


Fig. 2

Table 1 Basic Load Ratings of Model RSH12 in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse-radial direction	C_L=0.78C	C_{0L}=0.70C_0
Lateral direction	C_T=0.78C	C_{0T}=0.71C_0

Equivalent Load

When the LM block of models RSH7 and 9 receives loads in all four directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R\ (P_L) + P_T$$

where

P_E : Equivalent load (N)
- Radial direction
- Reverse-radial direction
- Lateral direction

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)

When the LM block of model RSH12 receives loads in the radial and lateral directions, or the reverse-radial and lateral directions, simultaneously, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_R\ (P_L) + Y \cdot P_T$$

where

P_E : Equivalent load (N)
- Radial direction
- Reverse-radial direction
- Lateral direction

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)
X/Y axes : Equivalent factor (see tables 2 and 3)

Table 2 Equivalent Factor of Model RSH12
(When radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.83
Equivalent load in lateral direction	1.2	1

Table 3 Equivalent Factor of Model RSH12
(When reverse-radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.99
Equivalent load in lateral direction	1.01	1

Options

Dust Prevention Accessories

THK offers an end seal for model RSH as a dust prevention accessory.
When the end seal is required, specify the desired item with the corresponding symbol provided in table 4.
(For details of the end seal, see page a-24.)

Table 4 Symbol of Dust Prevention Accessory for Model RSH

Symbol	Dust prevention accessory
UU	With end seal

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals RSH···UU, refer to the corresponding value provided in table 5.

Table 5 Maximum Seal Resistance Value of Seals RSR···UU

Unit: N

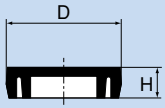
Model No.	Seal resistance value
RSH 7	0.08
RSH 9	0.1
RSH 12	0.4

●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 is on the same level as the LM rail top face.
Since the dedicated cap C for LM rail mounting holes uses a special synthetic resin with high oil resistance and high wear resistance, it is highly durable.
When placing an order, specify the desired cap type with the corresponding cap number indicated in table 6.
For the procedure for mounting the cap, see page a-22.

Table 6 Major Dimensions of Dedicated Cap C

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
RSH 12	C3	M3	6.3	1.2



Dedicated Cap C

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Accuracy of the Mounting Surface

Model RSH uses Gothic arch grooves in the ball raceways. When two rails of RSH are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see Section 7.3 "Permissible Error of the Mounting Surface" on page a-62.

Standard Length and Maximum Length of the LM Rail

Table 7 shows the standard lengths and the maximum lengths of model RSH variations.

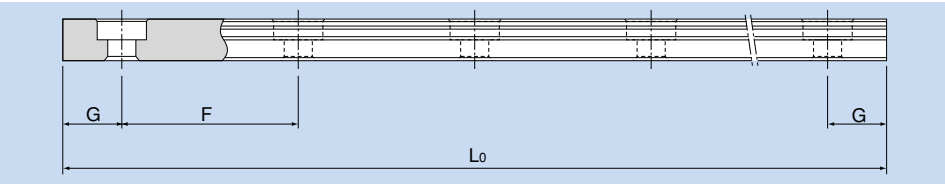
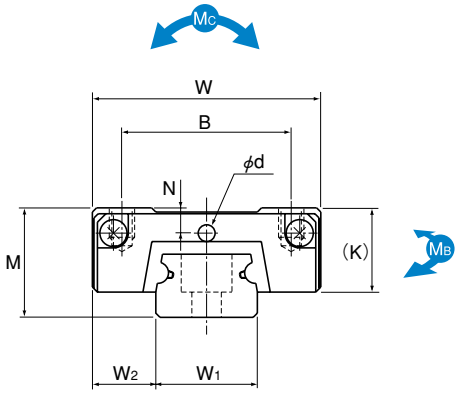


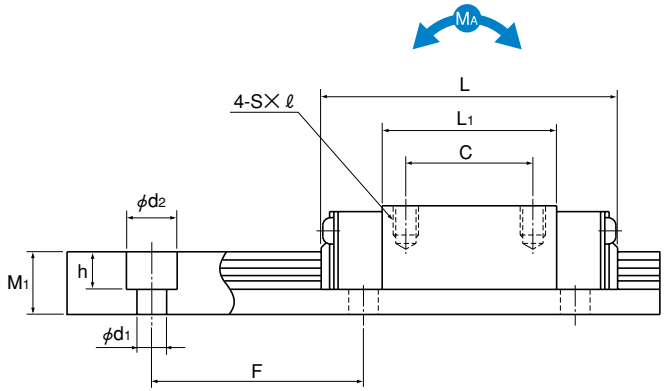
Table 7 Standard Length and Maximum Length of the LM Rail for Model RSH Unit: mm

Model No.	RSH 7	RSH 9	RSH 12
Standard LM rail length (L_0)	40 55 70 85 100 130	55 75 95 115 135 155 175 195 275 375	70 95 120 145 170 195 220 245 270 320 370 470 570
Standard pitch F	15	20	25
G	5	7.5	10
Max length	300	1000	1340

Note 1: The maximum length varies with accuracy grades. Contact THK for details.

Model RSH-M
Model RSH-KM
Model RSH-VM





Unit: mm

Model No.	External dimensions			LM block dimensions							LM rail dimensions					Basic load rating		Static permissible moment N-m*					Mass	
	Height	Width	Length							Greasing hole	Width		Height	Pitch		C	Co	MA		MB		MC	LM block	LM rail
	M	W	L	B	C	S× ℓ	L1	K	N	d	W1	W2	M1	F	d1×d2×h	kN	kN	1 block	2 blocks in close contact	1 block	2 blocks in close contact	1 block	kg	kg/m
RSH 7M	8	17	23.4	12	8	M2×2.5	13.4	6.5	1.7	1.2	7 $^{0}_{-0.02}$	5	4.7	15	2.4×4.2×2.3	0.88	1.37	2.93	20.8	2.93	20.8	5	0.01	0.23
RSH 9KM	10	20	30.8	15	10	M3×3	19.8	7.8	2.4	1.5	9 $^{0}_{-0.02}$	5.5	5.5	20	3.5×6×3.3	1.47	2.25	7.34	43.3	7.34	43.3	10.4	0.018	0.32
RSH 12VM	13	27	35	20	15	M3×3.5	20.6	10	3	2	12 $^{0}_{-0.025}$	7.5	7.5	25	3.5×6×4.5	2.65	4.02	11.4	74.9	10.1	67.7	19.2	0.037	0.58

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSH9K M UU C1 +100L P M- Ⅱ
1 2 3 4 5 6 7 8

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-453) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel
8 Symbol for No. of rails used on the same plane

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).

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Overall LM Block Length with Options

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

Unit: mm

Model No.	UU
RSH 7M	23.4
RSH 9KM	30.8
RSH 12VM	35

Overall LM Block Length without a Seal

Unit: mm

Model No.	Without seal
RSH 7M	20.4
RSH 9KM	27.8
RSH 12VM	31

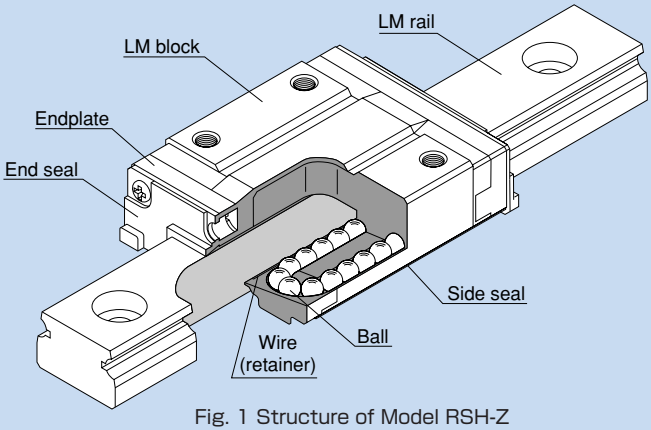

Fig. 1 Structure of Model RSH-Z

Structure and Features

Balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and end-plates incorporated in the LM block allow the balls to circulate. Since a retainer holds the balls, they will not fall off even if the LM block is removed from the LM rail.
With model RSH-Z, balls circulate in a compact structure and perform infinite linear motion with no limit in stroke.
Also, it has the same dimensions as the conventional model, but achieves a lower price.

●Equipped with a ball-fall-preventing retainer

Model RSH-Z has a retainer capable of preventing balls from falling off. Since the balls will not fall even if the LM block is removed from the LM rail, you can use this LM Guide at ease.

●Weight saving

Since part of the LM block body uses a resin material, the block mass is reduced by up to 30% from the conventional type. This makes RSH-Z a low-inertia type.

●Highly corrosion resistant

Since the LM block, LM rail and balls use stainless steel, which is highly resistant to corrosion, this model is optimal for clean-room applications.

●Low noise

Since the unloaded ball path is made of resin, there is no metallic contact and low noise is achieved.

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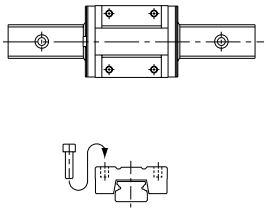
Types and Features

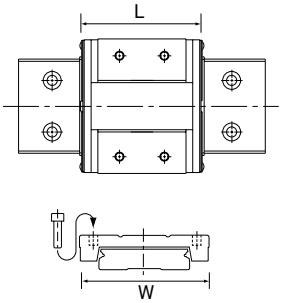
Model RSH-Z

This model is a standard type.



Model RSH-WZ

This model has a greater overall LM block length (L), broader width (W) and greater rated load and permissible moment than model RSH-Z.



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Rated Loads in All Directions

Model RSH-Z is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.
The basic load ratings of models RSH7Z/WZ and 9Z/WZ are uniform in the four directions (radial, reverse-radial and lateral directions), and their actual values are provided in the dimensional table for RSH-Z.
The basic load ratings of models RSH12Z/WZ and 15Z/WZ indicate the values in the radial direction in Fig. 2, and their actual values are provided in the dimensional table for RSH-Z. The values in the reverse-radial and lateral directions are obtained from table 1.

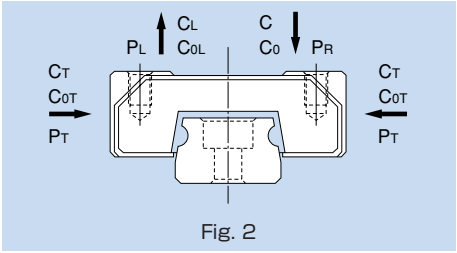

Fig. 2

Table 1 Basic Load Ratings of Models RSH12Z/WZ and 15Z/WZ in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse-radial direction	C_L=0.78C	C_{0L}=0.70C_0
Lateral direction	C_T=0.78C	C_{0T}=0.71C_0

Equivalent Load

When the LM block of models RSH7Z/WZ and 9Z/WZ receives loads in all four directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R\ (P_L) + P_T$$

where

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

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)

When the LM block of models RSH12Z/WZ and 15Z/WZ receives loads in the radial and lateral directions, or the reverse-radial and lateral directions, simultaneously, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_R\ (P_L) + Y \cdot P_T$$

where

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

P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)
X/Y axes : Equivalent factor (see tables 2 and 3)

Table 2 Equivalent Factor of Models RSH12Z/WZ and 15Z/WZ (When radial and lateral loads are applied)

P_E	X	Y
Equivalent load in radial direction	1	0.83
Equivalent load in lateral direction	1.2	1

Table 3 Equivalent Factor of Models RSH12Z/WZ and 15Z/WZ (When reverse-radial and lateral loads are applied)

P_E	X	Y
Equivalent load in reverse-radial direction	1	0.99
Equivalent load in lateral direction	1.01	1

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Options

Dust Prevention Accessories

THK offers dust prevention accessories for models RSH-Z and WZ.
When a dust prevention accessory is required, specify the desired item with the corresponding symbol provided in table 4 (for details of dust prevention accessories, see page a-24).
For supported model numbers for dust prevention accessories and overall LM block length with dust prevention accessories attached (dimension L), see page a-470.

Table 4 Symbols of Dust Prevention Accessories for Models RSH-Z and WZ

Symbol	Dust prevention accessory
UU	With end seal
SS	With end seal + side seal

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals RSH-Z···UU, refer to the corresponding value provided in table 5.

Table 5 Maximum Seal Resistance Value of Seals RSH-Z, WZ···UU

Unit: N

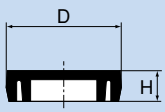
Model No.	Seal resistance value
RSH 7Z	0.08
RSH 9Z	0.1
RSH 12Z	0.4
RSH 15Z	0.8
RSH 7WZ	0.4
RSH 9WZ	0.8
RSH 12WZ	1.1
RSH 15WZ	1.3

●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 is on the same level as the LM rail top face.
Since the dedicated cap C for LM rail mounting holes uses a special synthetic resin with high oil resistance and high wear resistance, it is highly durable.
When placing an order, specify the desired cap type with the corresponding cap number indicated in table 6.
For the procedure for mounting the cap, see page a-22.

Table 6 Major Dimensions of Dedicated Cap C

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
RSH 9WZ	C3	M3	6.3	1.2
RSH 12Z	C3	M3	6.3	1.2
RSH 15Z	C3	M3	6.3	1.2



Dedicated Cap C

Accuracy of the Mounting Surface

Models RSH-Z and WZ use Gothic arch grooves in the ball raceways. When two rails of RSH-Z or WZ are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see Section 7.3 "Permissible Error of the Mounting Surface" on page a-62.

Standard Length and Maximum Length of the LM Rail

Table 7 shows the standard lengths and the maximum lengths of models RSH-Z and WZ variations.

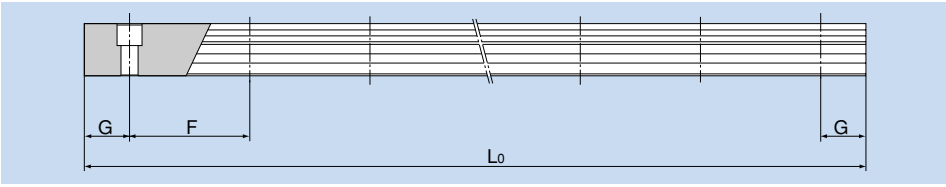


Table 7 Standard Length and Maximum Length of the LM Rail for Models RSH-Z and WZ

Unit: mm

Model No.	RSH 7Z	RSH 9Z	RSH 12Z	RSH 15Z	RSH 7WZ	RSH 9WZ	RSH 12WZ	RSH 15WZ
Standard LM rail length (L_0)	40 55 70 85 100 130	55 75 95 115 135 155 175 195 275 375	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 350 390 430 470 550 670 870	50 80 110 140 170 200 260 290	50 80 110 140 170 200 260 290 320	70 110 150 190 230 270 310 390 470 550	110 150 190 230 270 310 430 550 670 790
Standard pitch F	15	20	25	40	30	30	40	40
G	5	7.5	10	15	10	10	15	15
Max length	300	1000	1340	1430	400	1000	1430	1800

Note 1: The maximum length varies with accuracy grades. Contact THK for details.

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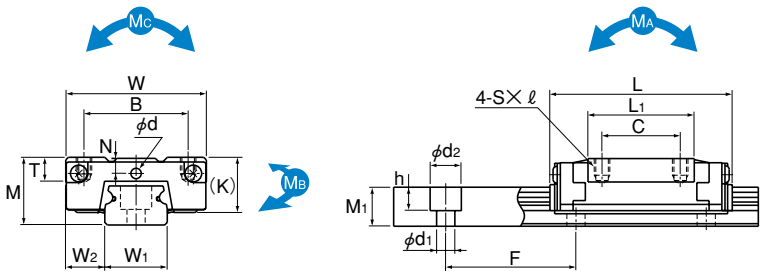
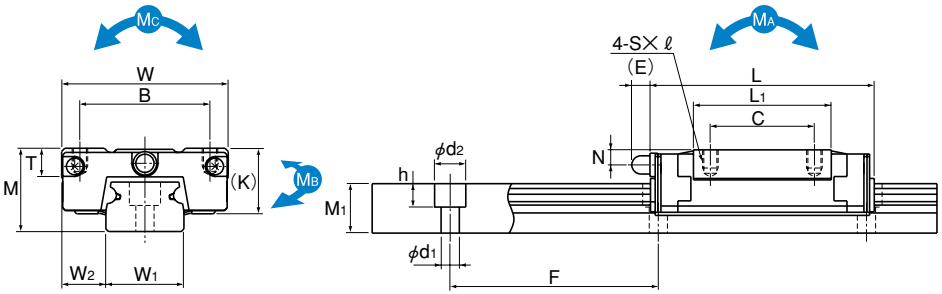
Model RSH-ZM



Models RSH7 to 12ZM



Model RSH15ZM

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W1	W2	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	C0 kN	Static permissible moment N-m* MA 1 block	MA 2 blocks in close contact	MB 1 block	MB 2 blocks in close contact	MC 1 block	Mass LM block kg	LM rail kg/m
RSH 7ZM	8	17	23.4	12	8	M2×2.5	13.2	3.4	6.5	1.6	—	1.5	—	7 $^{0}_{-0.02}$	5	4.7	15	2.4×4.2×2.3	0.88	1.37	2.93	20.7	2.93	20.7	5	0.008	0.23
RSH 9ZM	10	20	30.8	15	10	M3×2.8	19.4	4.6	7.8	2.4	—	1.6	—	9 $^{0}_{-0.02}$	5.5	5.5	20	3.5×6×3.3	1.47	2.25	7.34	43	7.34	43	10.4	0.014	0.32
RSH 12ZM	13	27	35	20	15	M3×3.2	20.4	4.5	10.6	3.1	—	2	—	12 $^{0}_{-0.025}$	7.5	7.5	25	3.5×6×4.5	2.65	4.02	11.4	74.9	10.1	67.7	19.2	0.028	0.58
RSH 15ZM	16	32	43	25	20	M3×3.5	26.5	5.5	12.6	2.9	3.6	—	PB107	15 $^{0}_{-0.025}$	8.5	9.5	40	3.5×6×4.5	4.41	6.57	23.7	149	21.1	135	38.8	0.05	0.925

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSH15Z M UU C1 +230L P M- II
1 2 3 4 5 6 7 8

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-463)
4 Radial clearance symbol (see page a-35) 5 LM rail length (in mm) 6 Accuracy symbol (see page a-45)
7 LM rail is made of stainless steel 8 Symbol for No. of rails used on the same plane

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).

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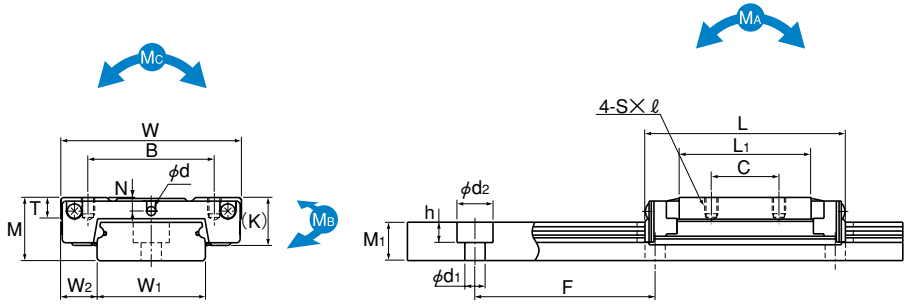
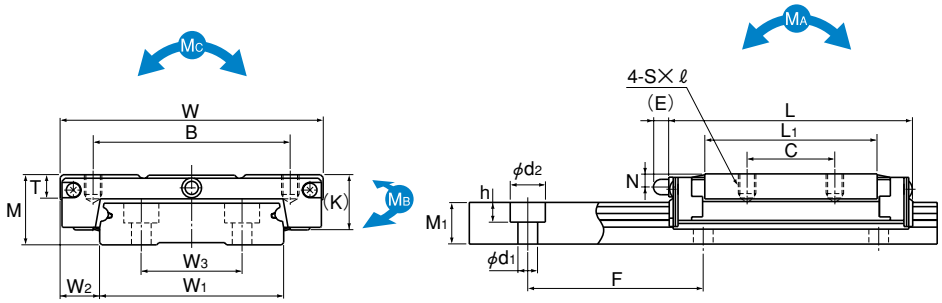


Models RSH7 to 12WZM



Model RSH15WZM

Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions B	C	S× ℓ	L_1	T	K	N	E	Greasing hole d	Grease nipple	LM rail dimensions Width W_1	W_2	W_3	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Basic load rating C kN	C_0 kN	Static permissible moment N-m* M_A 1 block	M_A 2 blocks in close contact	M_B 1 block	M_B 2 blocks in close contact	M_C 1 block	Mass LM block kg	LM rail kg/m
RSH 7WZM	9	25	31.5	19	10	M3×2.5	19.7	3.4	7	1.8	—	1.5	—	$14^{0}_{-0.05}$	5.5	—	5.2	30	3.5×6×3.2	1.37	2.16	6.54	42.1	6.54	42.1	15.4	0.018	0.51
RSH 9WZM	12	30	39	21	12	M3×2.8	27	3.9	9.1	2.3	—	1.6	—	$18^{0}_{-0.05}$	6	—	7.5	30	3.5×6×4.5	2.45	3.92	16	92.9	16	92.9	36	0.03	1.08
RSH 12WZM	14	40	44.5	28	15	M3×3.6	29.3	4.5	10.6	3	—	2	—	$24^{0}_{-0.05}$	8	—	8.5	40	4.5×8×4.5	4.02	6.08	24.5	138	21.7	123	59.5	0.06	1.5
RSH 15WZM	16	60	55.5	45	20	M4×4.5	39.3	5.4	12.6	3	3.6	—	PB107	$42^{0}_{-0.05}$	9	23	9.5	40	4.5×8×4.5	6.66	9.8	50.3	278	44.4	248	168	0.135	3

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment* 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Model number coding

2 RSH9WZ M SS C1 +170L P M
1 2 3 4 5 6 7

1 No. of LM blocks used on the same rail 2 Model number
3 Dust prevention accessory symbol (see page a-463) 4 Radial clearance symbol (see page a-35)
5 LM rail length (in mm) 6 Accuracy symbol (see page a-45) 7 LM rail is made of stainless steel

a-468 THK
Standard Length and Maximum Length of the LM Rail P. a-464
Selecting a Model Number Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately
THK a-469

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Overall LM Block Length with Options

Overall LM Block Length (Dimension L) of Model RSR-M1 with a Dust Prevention Accessory Attached

Unit: mm

Model No.	UU	SS
RSH 7ZM	23.4	—
RSH 9ZM	30.8	—
RSH 12ZM	35	35
RSH 15ZM	43	43
RSH 7WZM	31.5	—
RSH 9WZM	39	39
RSH 12WZM	44.5	44.5
RSH 15WZM	55.5	55.5

Note: "—" indicates not available.

Overall LM Block Length without a Seal

Unit: mm

Model No.	Without seal
RSH 7ZM	20.4
RSH 9ZM	29.1
RSH 12ZM	32.6
RSH 15ZM	40.2
RSH 7WZM	28
RSH 9WZM	37.6
RSH 12WZM	42.1
RSH 15WZM	53.1

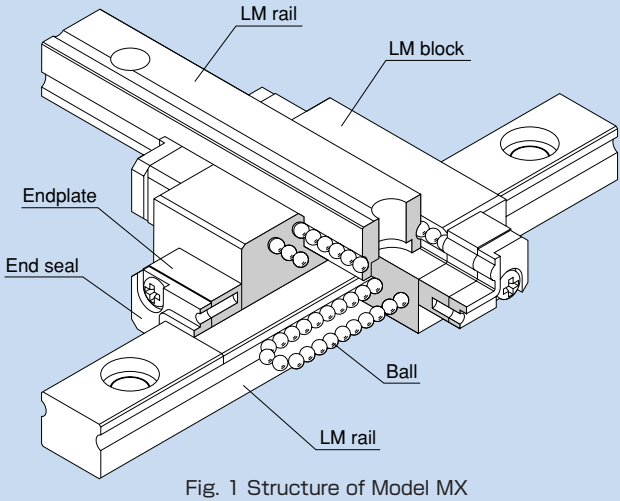

Fig. 1 Structure of Model MX

Structure and Features

Balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and end-plates incorporated in the LM block allow the balls to circulate. This model is an integral type of LM Guide that squares a unit of miniature LM Guide model RSR with another and uses two LM rails in combination. Since an orthogonal LM system with an extremely low height can be achieved with model MX alone, a conventionally required saddle is no longer necessary and the whole system can be downsized.

●4-way equal load

Each row of balls is placed at a contact angle of 45° so that the rated loads applied to the LM block are uniform in the four directions (radial, reverse-radial and lateral directions), enabling the LM Guide to be used in all orientations and in extensive applications.

●Tapped LM rail type

There are two types of the LM rail: one designed to be mounted from the top with bolts, and a semi-standard type whose bottom face has tapped holes, allowing the rail to be mounted from the bottom.

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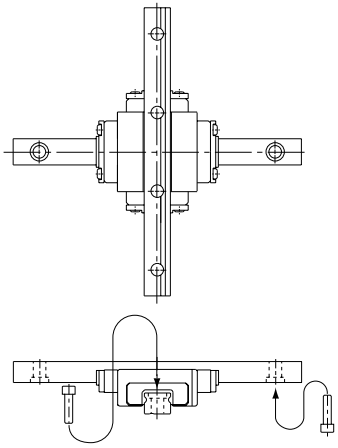
Types and Features

Model MX

MX is divided into two types: RSR5M cross type and RSR7WM cross type.



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Rated Loads in All Directions

Model MX is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.
The basic load ratings are defined with an LM rail and an LM block, and uniform in the four directions (radial, reverse-radial and lateral directions). Their actual values are provided in the dimensional table for MX.

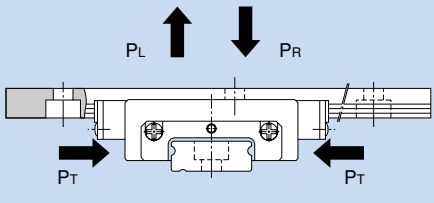

Fig. 2

Equivalent Load

When the LM block of model MX receives loads in the radial, reverse-radial and lateral directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R\ (P_L) + P_T$$

where

P_E	: Equivalent load	(N)
	・Radial direction	
	・Reverse-radial direction	
	・Lateral direction	
P_R	: Radial load	(N)
P_L	: Reverse-radial load	(N)
P_T	: Lateral load	(N)

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Options

Dust Prevention Accessory

THK offers an end seal for model MX as a dust prevention accessory.
When the end seal is required, specify the desired item with the corresponding symbol provided in table 1.
(For details of the end seal, see page a-24.)

Table 1 Symbol of Dust Prevention Accessory for Model MX

Symbol	Dust prevention accessory
UU	With end seal

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals MX···UU, refer to the corresponding value provided in table 2.

Table 2 Maximum Seal Resistance Value of Seals MX···UU

Unit: N

Model No.	Seal resistance value
MX 5	0.06
MX 7W	0.4

Stopper

With model MX, balls will fall off if the LM block is removed from the LM rail. To prevent the LM block from being pulled out, a stopper is mounted before shipment. If removing the stopper when using the LM Guide, be sure that the LM block will not overrun.

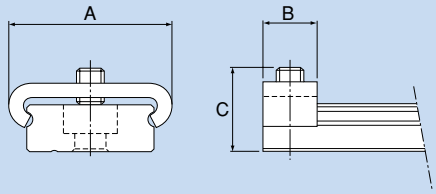

Fig. 3 Stopper (Type C) for Model MX

Table 3 Dimensional Table for Stopper (Type C) for Model MX

Unit: mm

Model No.	A	B	C
MX 7W	18	6	9.2

Note: The stopper for model MX uses an O-ring.

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Standard Length and Maximum Length of the LM Rail

Table 4 shows the standard lengths and the maximum lengths of model MX variations.

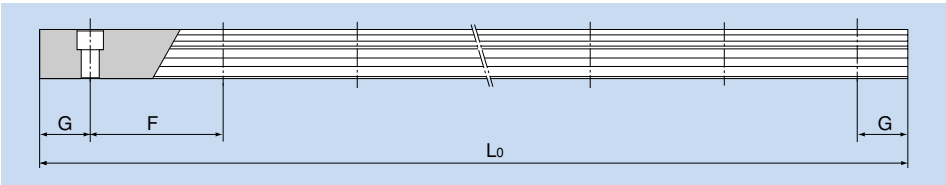

Table 4 Standard Length and Maximum Length of the LM Rail for Model MX Unit: mm

Model No.	MX 5	MX 7W
Standard LM rail length (L_0)	40 55 70 100 130 160	50 80 110 140 170 200 260 290
Standard pitch F	15	30
G	5	10
Max length	200	400

Note 1: The maximum length varies with accuracy grades. Contact THK for details.

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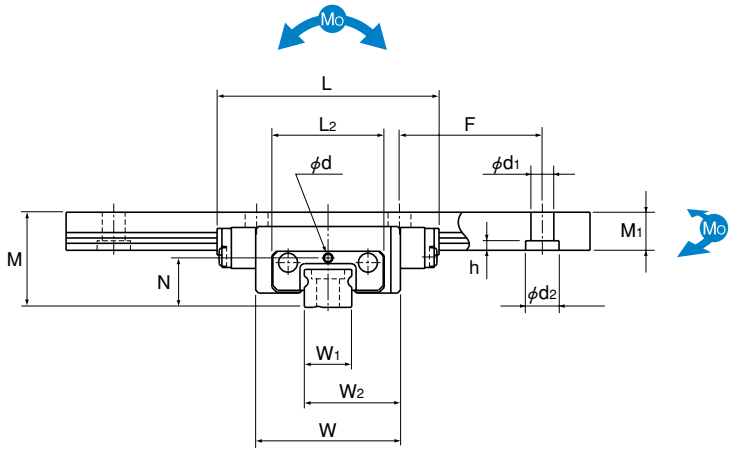
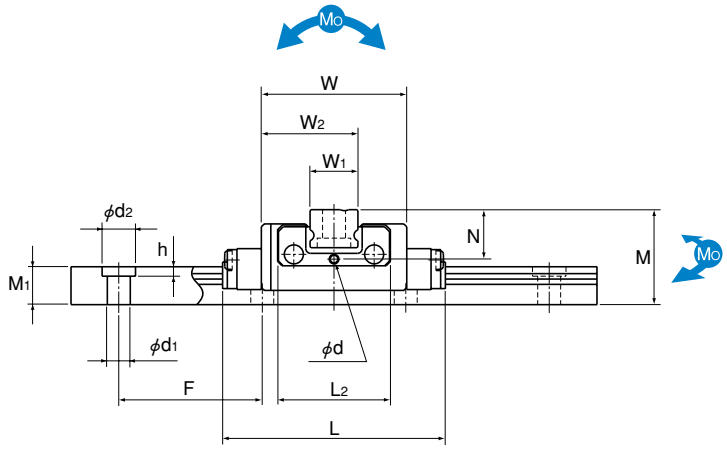
Model MX





Unit: mm

Model No.	External dimensions Height M	Width W	Length L	LM block dimensions L2	N	Greasing hole d	LM rail dimensions Width W1	W2	Height M1	Pitch F	d1×d2×h	Basic load rating C kN	Co kN	Static permissible moment* N-m Mo	Mass LM block kg	LM rail kg/m
MX 5M	10	15.2	23.3	11.8	5.2	0.8	5 $^{0}_{-0.02}$	10.1	4	15	2.4X3.5X1	0.59	1.1	2.57	0.01	0.14
MX 7WM	14.5	30.2	40.8	24.6	7.4	1.2	14 $^{0}_{-0.025}$	22.1	5.2	30	3.5X6X3.2	2.04	3.21	14.7	0.051	0.51

Note Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistance to corrosion and environment.

Note Static permissible moment*: Static permissible moment value with 1 LM block

Model number coding

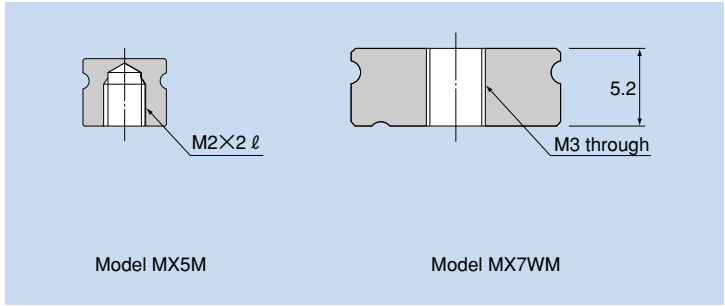
4 MX7W M UU C1 +120/100L P M

1 2 3 4 5 6 7 8

1 Total No. of LM blocks 2 Model number 3 Dust prevention accessory symbol (see page a-475)
4 Radial clearance symbol (see page a-35) 5 X-axis LM rail length (in mm)
6 Y-axis LM rail length (in mm) 7 Accuracy symbol (see page a-46) 8 LM rail is made of stainless steel

Note If the LM rail mount of a semi-standard model is of a tapped LM rail type, add symbol "K" after the accuracy symbol.
Example:···4 MX7W M UU C1+120/100 L P K M
└Add symbol K

For the LM rail mounting hole, a tapped LM rail type is available as semi-standard.



When mounting the LM rail of model MX7WM, take into account the thread length of the mounting bolt in order not to let the bolt end stick out of the top face of the LM rail.

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Overall LM Block Length with Options

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

Unit: mm

Model No.	UU
MX 5M	23.3
MX 7WM	40.8

Overall LM Block Length without a Seal

Unit: mm

Model No.	Without seal
MX 5M	22.3
MX 7WM	39.8

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