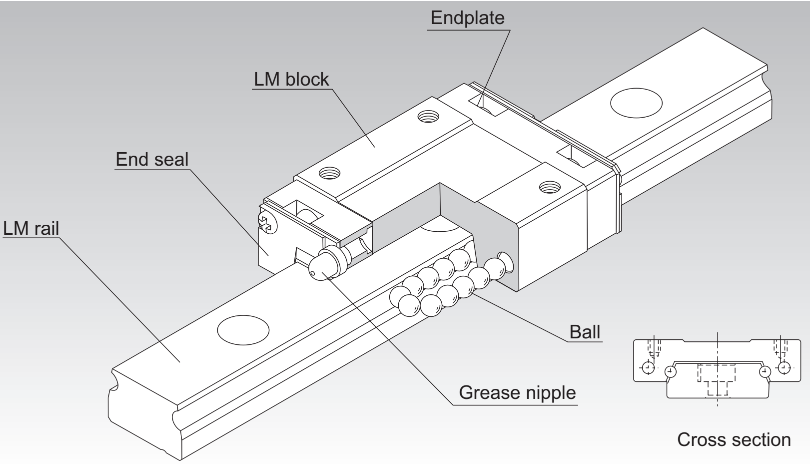
RSR

LM Guide Miniature Types Model RSR



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.
Since balls circulate in a compact structure, the LM Block is able to provide infinite straight motion and thus infinite 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 finite stroke tend to cause, make these models highly reliable LM systems.

[Capable of Receiving a Load in Any Direction]

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 straight motion than a pair of linear bushes in parallel use.

[Stainless Steel Type also Available]

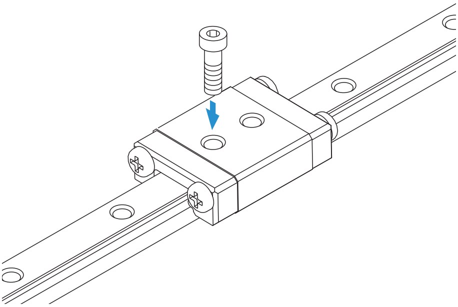
A special type where LM block, LM rail and balls are made of stainless steel is also available.

Types and Features

Model RSR-M

Specification Table⇒A1-272

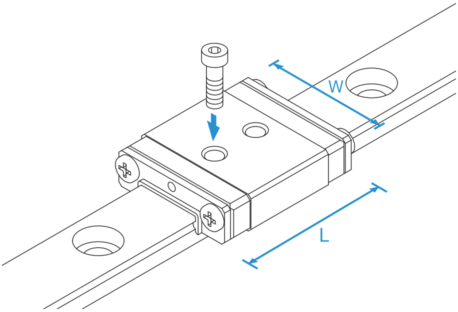
This model is a standard type.



Model RSR-WM

Specification Table⇒A1-272

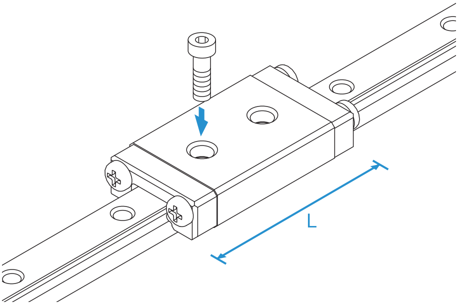
This model has a broader width (W), greater overall length (L), and greater rated load and permissible moment than the Model RSR-M.



Model RSR-N

Specification Table⇒A1-272

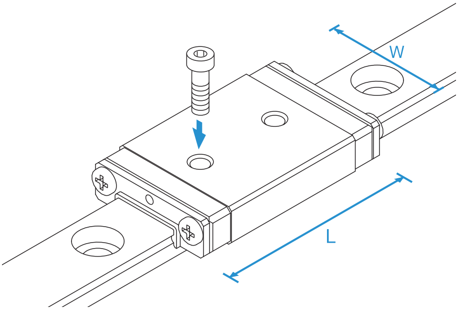
This model has a longer overall LM block length (L) and a greater rated load.



Model RSR-WN

Specification Table⇒A1-272

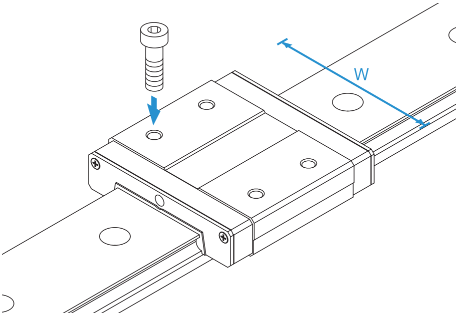
This model has a broader width (W), greater overall length (L), and greater rated load and permissible moment than the Model RSR-N.



Model RSR14WVM

Specification Table⇒A1-272

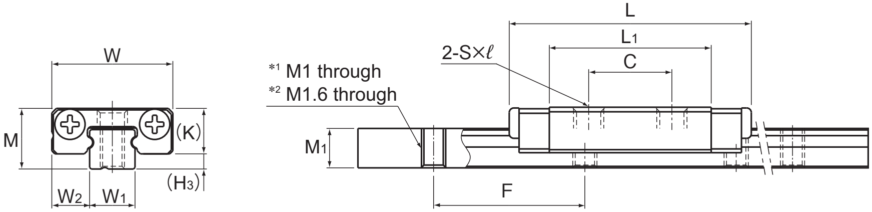
This model has a greater overall LM block width (W) and a greater permissible moment.



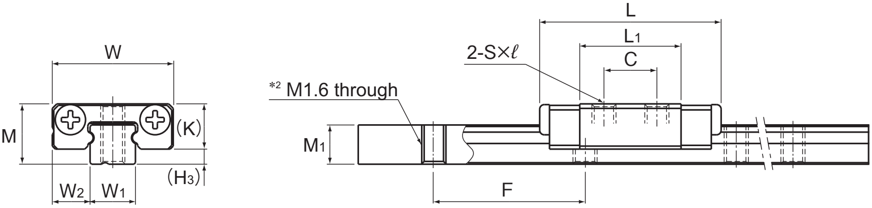
Accuracy of the Mounting Surface

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 [Flatness of the Mounting Surface] on A**1-478**.

Models RSR-M, RSR-N, RSR-WM, RSR-WN and RSR-WVM



Models RSR2N, RSR3N



Model RSR3M

Model No.	Outer dimensions			LM block dimensions										
	Height	Width	Length									Greasing hole	Grease nipple	
	M	W	L	B	C	S×ℓ	L₁	T	K	N	E	d		H₃
RSR 2N RSR 2WN	3.2 4	6 10	12.4 16.7	—	4 6.5	M1.4×1.1 M2×1.3	8.84 11.9	—	2.5 3	—	—	—	—	0.7 1
RSR 3M RSR 3N	4	8	12 16	—	3.5 5.5	M1.6×1.3 M2×1.3	6.7 10.7	—	3	—	—	—	—	1
RSR 3WM RSR 3WN	4.5	12	14.9 19.9	—	4.5 8	M2×1.7	8.5 13.3	—	3.5	0.8	—	0.8	—	1
RSR 14WVM	15	50	50	35	18	M4×4.5	34.3	6	11.5	3	4	—	PB107	3.5

Note) Models RSR2 and 3 do not have an oil hole. When lubricating them, apply a lubricant directly to the LM rail raceways.
No contamination protection seal for RSR2N/2WN/3M/3N.

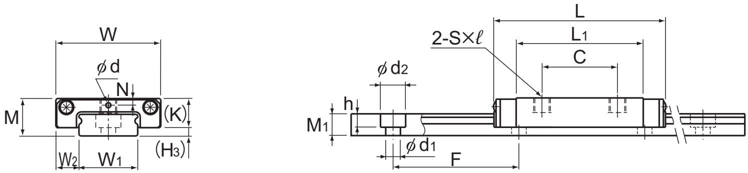
Model number coding

2 RSR3W M UU C1 +80L P M -Ⅱ

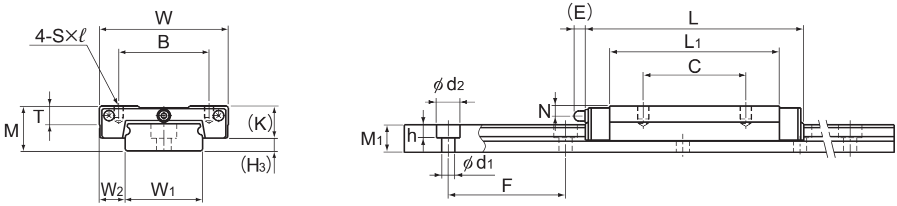
- 2: No. of LM blocks used on the same rail (*1)
- RSR3W M: Model number
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3)
Normal (No symbol)
Light preload (C1)
- +80L: LM rail length (in mm)
- P: Accuracy symbol (*4)
Normal grade (No Symbol)/Precision grade (P)
- M: Stainless steel LM rail
- -Ⅱ: Symbol for No. of rails used on the same plane (*5)

(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on **A1-524**.
(*3) See **A1-73**. (*4) See **A1-84**. (*5) See **A1-13**.

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.)



Models RSR2WN, RSR3WM/WN



Model RSR14WVM

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment N·m*					Mass	
	Width			Height	Pitch		Length*	C	C₀	M_A		M_B		M_C	LM block	LM rail
										1 block	Double blocks	1 block	Double blocks	1 block		
	W_1		W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN						kg	kg/m
	2 4	0 −0.03	2 3	2 2.6	8 10	—[*1] 1.8×2.8×0.75	200	0.214 0.395	0.384 0.682	0.564 1.336	2.994 7.32	0.564 1.336	2.994 7.32	0.442 1.501	0.0008 0.0020	0.029 0.075
	3	0 −0.02	2.5	2.6	10	—[*2]	220	0.18 0.3	0.27 0.44	0.293 0.726	2.11 4.33	0.293 0.726	2.11 4.33	0.45 0.73	0.0011 0.0016	0.055
	6	0 −0.02	3	2.6	15	2.4×4×1.5	335	0.25 0.39	0.47 0.75	0.668 1.57	4.44 9.06	0.668 1.57	4.44 90.6	1.48 2.36	0.002 0.003	0.12
	30	0 −0.05	10	9	40	4.5×7.5×5.3	1800	6.01	9.08	43.2	233	38.2	208	110	0.096	2

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-274**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
Total block length L : The total block length L shown in the table is the length with the dust-proof parts (code: UU).
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel.
The stainless steel provides excellent corrosion and environmental resistance.
Please be aware that balls will fall out if the LM block is removed from the LM rail.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table7 on **A1-60** to calculate the load rating for loads in the reverse radial direction or lateral direction.

- Recommended tightening torque when mounting the LM rail/block

Table1 shows recommended bolt tightening torques when mounting the LM block and LM rail of models RSR2 and RSR3.

Table1 Recommended Tightening Torques of Mounting Bolts

Model No.	Recommended tightening torque (N·m)		Remarks
	Block	Rail	Applicable bolt
RSR 2N	0.09	0.03	Flathead machine screw designed for use with precision equipment
RSR 2WN	0.28	0.138	
RSR 3M	0.09	0.09	Austenitic stainless steel hexagonal-socket-head type bolts
RSR 3N	0.19	0.09	
RSR 3WM/3WN	0.19	—	
	—	0.25	Cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1)

Options⇒A1-485

Standard Length and Maximum Length of the LM Rail

Table2 shows the standard and maximum lengths of the RSR model rail.

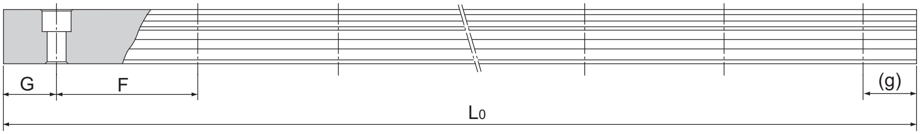


Table2 Standard Length and Maximum Length of the LM Rail for Model RSR/RSR-W

Unit: mm

Model No.	RSR2N	RSR2WN	RSR3	RSR3W	RSR14W
LM rail standard length (L_0)	32 40 56 80 104	40 60 70 80 100 180	30 40 60 80 100	40 55 70	110 150 190 230 270 310 430 550 670 790
Standard pitch F	8	10	10	15	40
G,g	4	5	5	5	15
Max length	200	200	220	335	1800

Note1) The maximum length varies with accuracy grades. Contact THK for details.
Note2) The LM rail mounting hole of model RSR3 is an M1.6 through hole.

Prevention of LM block from falling off of LM rail

In model RSR/RSR-W, the balls fall out if the LM block comes off the LM rail.
For this reason, LM Guide assemblies are delivered with a part which prevents the LM block from coming off the rail. If you remove this part when using the product, please take precautions to avoid overrunning the blocks off of the rail.