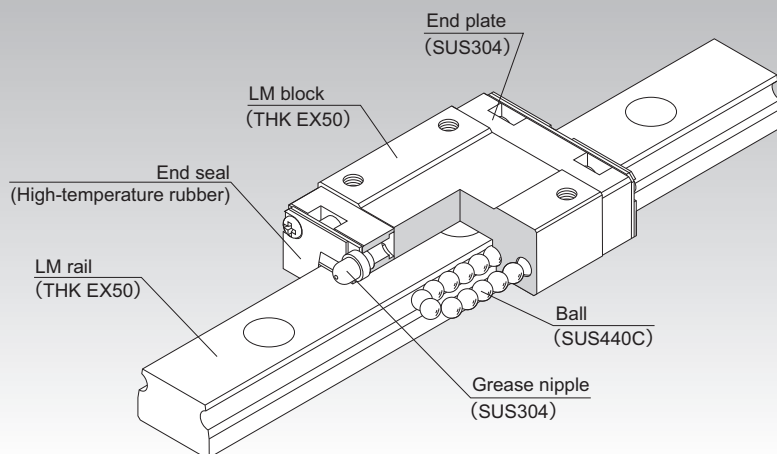


# RSR-M1

## High-Temperature LM Guide Model RSR-M1



**Selection Criteria** **A1-10**

**Design Highlights** **A1-482**

**Options** **A1-507**

**Model No.** **A1-577**

**Handling Precautions** **A1-583**

**Accessories for Lubrication** **A24-1**

**Mounting Procedure** **B1-89**

Equivalent Moment Factor **A1-43**

Rated Loads in All Directions **A1-61**

Equivalent Factor in Each Direction **A1-63**

Radial Clearance **A1-74**

Accuracy Standards **A1-85**

Shoulder Height of the Mounting Base and the Corner Radius **A1-497**

Reference Error Tolerance for the Mounting Surface **A1-499**

Flatness of the Mounting Surface **A1-500**

Dimensions of Each Model with Options Attached **A1-521**

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## Structure and Features

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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.

The miniature High-Temperature LM Guide Model RSR-M1 is capable of being used at service temperatures up to 150°C thanks to THK's unique technologies in material, heat treatment, and lubrication.

### Maximum Service Temperature: 150°C

Use of stainless steel in the end plates and high-temperature rubber in the end seals achieves the maximum service temperature of 150°C.

### Dimensional Stability

The product has undergone processing which grants it superb dimensional stability even when heated or cooled (though it does expand some at high temperatures).

### Highly Corrosion Resistant

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

### High-Temperature Grease

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

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## Thermal Characteristics of LM Rail and LM Block Materials

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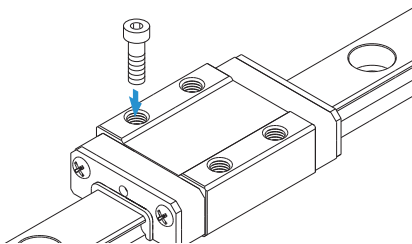
- Specific heat capacity: 0.481 J/(g•K)
- Thermal conductivity: 20.67 W/(m•K)
- Average coefficient of linear expansion:  $11.8 \times 10^{-6}/^{\circ}\text{C}$

## Types and Features

### Models RSR-M1K, M1V

This model is the standard type.

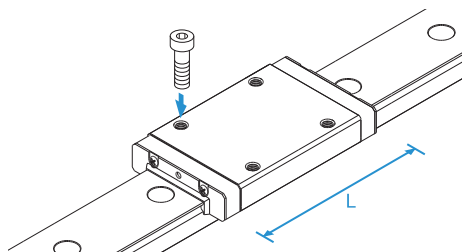
Dimensional Table⇒ **A1-394**



### Model RSR-M1N

This model has a longer overall LM block length (L) and a greater load rating than standard types.

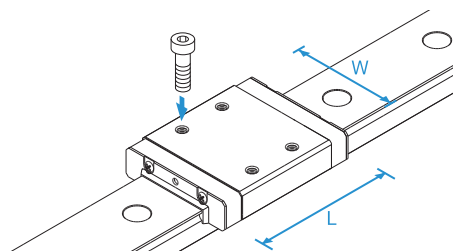
Dimensional Table⇒ **A1-394**



### Model RSR-M1WV

This model has a greater overall LM block length (L), broader width (W), and greater load rating and permissible moment than standard types.

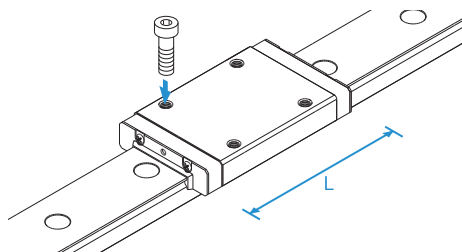
Dimensional Table⇒ **A1-396**



### Model RSR-M1WN

This model has a longer overall LM block length (L) and a greater load rating than standard types. It achieves the greatest load capacity among the high-temperature miniature LM Guide models.

Dimensional Table⇒ **A1-396**



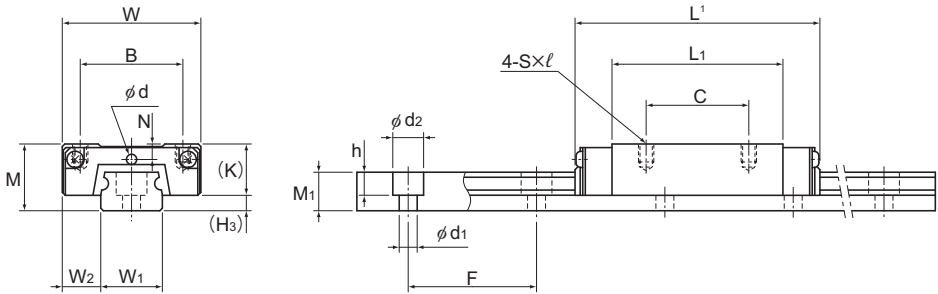
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## Service Life

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When using this product in temperatures higher than 100°C, always multiply the basic dynamic load rating by the temperature coefficient when calculating the rated service life. See **A1-67** for details.

# Models RSR-M1K, RSR-M1V, and RSR-M1N



Models RSR9M1K/9M1N and RSR12M1V/M1N

Model No.	Outer dimensions			LM block dimensions										H <sub>s</sub>
	Height	Width	Length <sup>1</sup>	B	C	S×ℓ	L <sub>1</sub>	T	K	N	E	Lubrication hole d	Grease nipple	
	M	W	L	B	C	S×ℓ	L <sub>1</sub>	T	K	N	E	d		H <sub>s</sub>
RSR 9M1K RSR 9M1N	10	20	30.8 41	15	10 16	M3×3	19.8 29.8	—	7.8	—	—	—	—	2.2
RSR 12M1V RSR 12M1N	13	27	35 47.7	20	15 20	M3×3.5	20.6 33.3	—	10	3	—	2	—	3
RSR 15M1V RSR 15M1N	16	32	43 61	25	20 25	M3×4	25.7 43.5	—	12	3.5	3.6 3.7	—	PB107	4
RSR 20M1V RSR 20M1N	25	46	66.5 86.3	38	38	M4×6	45.2 65	5.7	17.5	5	6.4	—	A-M6F	7.5

## Model number coding

**2 RSR15 M1 V UU C1 +230L P T -II**

Model number

Type of LM block

Contamination protection accessory symbol

LM rail length (in mm)

Symbol for LM rail jointed use

Symbol for No. of rails used on the same plane

No. of LM blocks used on the same rail

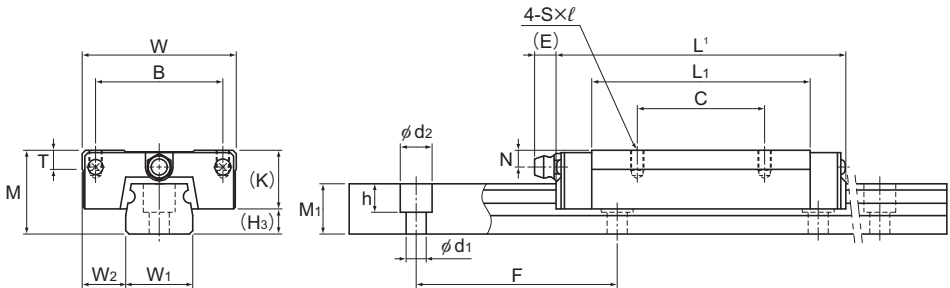
Symbol for high temperature type LM Guide

Radial clearance symbol  
Normal (No symbol)  
Light preload (C1)

Accuracy symbol  
Normal grade (No Symbol)/High accuracy grade (H)  
Precision grade (P)

Notes: 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).

No symbol for single LM block. See [A1-547](#) for contamination protection accessories. See [A1-74](#) for radial clearance symbol. See [A1-85](#) for accuracy symbol. See [A1-13](#) for symbol for number of rails used on the same plane.



Models RSR15 and 20M1V/M1N

Unit: mm

	LM rail dimensions						Basic load rating <sup>1)</sup>			Static permissible moment N·m <sup>4)</sup>						Mass	
	Width		Height		Pitch	Length <sup>2)</sup> Max	C kN	C <sub>0</sub> kN	M <sub>A</sub> 		M <sub>B</sub> 		M <sub>C</sub> 	LM block kg	LM rail kg/m		
	W <sub>1</sub>	W <sub>2</sub>	M <sub>1</sub>	F	d <sub>1</sub> × d <sub>2</sub> × h				1 block	2 blocks	1 block	2 blocks	1 block				
	9 <sup>0</sup> -0.02	5.5	5.5	20	3.5 × 6 × 3.3	1240	1.47 2.6	2.25 3.96	7.34 18.4	43.3 97	7.34 18.4	43.3 97	10.4 18.4	0.018 0.027	0.32		
	12 <sup>0</sup> -0.025	7.5	7.5	25	3.5 × 6 × 4.5	1430	2.65 4.3	4.02 6.65	11.4 28.9	74.9 163	10.1 25.5	67.7 145	19.2 31.8	0.037 0.055	0.58		
	15 <sup>0</sup> -0.025	8.5	9.5	40	3.5 × 6 × 4.5	1600	4.41 7.16	6.57 10.7	23.7 63.1	149 330	21.1 55.6	135 293	38.8 63	0.069 0.093	0.925		
	20 <sup>0</sup> -0.03	13	15	60	6 × 9.5 × 8.5	1800	8.82 14.2	12.7 20.6	75.4 171	435 897	66.7 151	389 795	96.6 157	0.245 0.337	1.95		

<sup>1)</sup> Length L shown in the table is the length with the contamination protection accessories (code: UU).

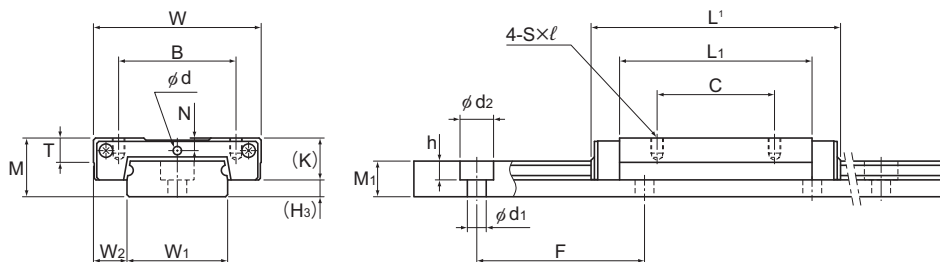
<sup>2)</sup> The maximum length indicates the standard maximum length of an LM rail. (See **A1-398**.)

<sup>3)</sup> The basic load rating is for a load in the radial direction.

Use **A1-61** on Table 7 to calculate the load rating for loads in the reverse-radial direction or lateral direction.

<sup>4)</sup> Static permissible moment    1 block: the static permissible moment with one LM block  
    2 blocks: the static permissible moment with two LM blocks in close contact with each other

## Models RSR-M1WV and RSR-M1WN



Models RSR9 and 12M1WV/M1WN

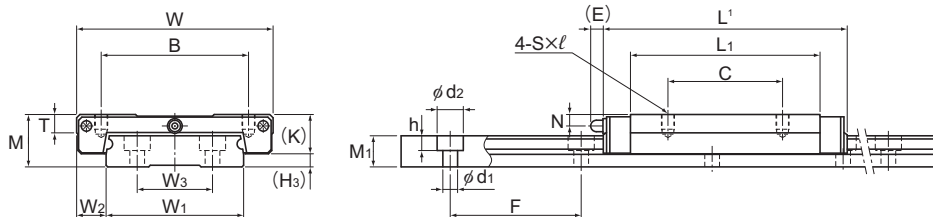
Model No.	Outer dimensions			LM block dimensions										H <sub>s</sub>
	Height	Width	Length <sup>1</sup>	B	C	S × ℓ	L <sub>1</sub>	T	K	N	E	Lubrication hole d	Grease nipple	
	M	W	L	B	C	S × ℓ	L <sub>1</sub>	T	K	N	E	d		H <sub>s</sub>
RSR 9M1WV RSR 9M1WN	12	30	39 50.7	21 23	12 24	M2.6×3 M3×3	27 38.7	—	7.8	2	—	1.6	—	4.2
RSR 12M1WV RSR 12M1WN	14	40	44.5 59.5	28	15 28	M3×3.5	30.9 45.9	4.5	10	3	—	2	—	4
RSR 15M1WV RSR 15M1WN	16	60	55.5 74.5	45	20 35	M4×4.5	38.9 57.9	5.6	12	3.5	3	—	PB107	4

### Model number coding

**2 RSR12 M1 WN UU C1 +310L P T**

2	RSR12	M1	WN	UU	C1	+310L	P	T
No. of LM blocks used on the same rail	Model number	Symbol for high temperature type LM Guide	Type of LM block contamination protection accessory symbol	Contamination protection accessory symbol	Radial clearance symbol Normal (No symbol) Light preload (C1)	LM rail length (in mm)	Symbol for LM rail jointed use	Accuracy symbol Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)

Notes: No symbol for 1 LM block. See contamination protection accessories on **A1-547**. See **A1-74** for radial clearance symbol. See **A1-85** for accuracy symbol.



Models RSR15M1WV/M1WV

Unit: mm

	LM rail dimensions							Basic load rating <sup>2</sup>		Static permissible moment N·m <sup>4</sup>					Mass	
	Width		W <sub>3</sub>	Height/Pitch		Length <sup>2</sup>	C	C <sub>0</sub>	M <sub>A</sub>		M <sub>B</sub>		M <sub>C</sub>	LM block	LM rail	
	W <sub>1</sub>	W <sub>2</sub>		M <sub>1</sub>	F				d <sub>1</sub> × d <sub>2</sub> × h	Max	kN	kN	1 block			2 blocks
	18	6	—	7.5	30	3.5 × 6 × 4.5	1430	2.45 3.52	3.92 5.37	16 31	92.9 161	16 31	92.9 161	36 49.4	0.035 0.051	1.08
	24	8	—	8.5	40	4.5 × 8 × 4.5	1600	4.02 5.96	6.08 9.21	24.5 53.9	138 274	21.7 47.3	123 242	59.5 90.1	0.075 0.101	1.5
	42	9	23	9.5	40	4.5 × 8 × 4.5	1800	6.66 9.91	9.8 14.9	50.3 110	278 555	44.4 97.3	248 490	168 255	0.17 0.21	3

<sup>1</sup> Length L shown in the table is the length with the contamination protection accessories (code: UU).

<sup>2</sup> The maximum length indicates the standard maximum length of an LM rail. (See **A1-398**.)

<sup>3</sup> The basic load rating is for a load in the radial direction.

Use **A1-61** on Table 7 to calculate the load rating for loads in the reverse-radial direction or lateral direction.

<sup>4</sup> Static permissible moment    1 block: the static permissible moment with one LM block  
    2 blocks: the static permissible moment with two LM blocks in close contact with each other

## Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard and maximum lengths of RSR M1 model rails.

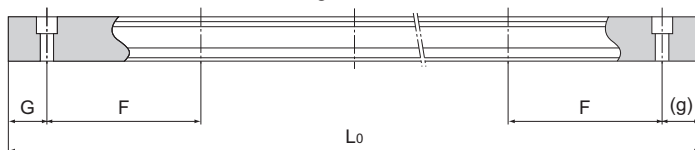


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model RSR-M1

Unit: mm

Model No.	RSR 9M1	RSR 9M1W	RSR 12M1	RSR 12M1W	RSR 15M1	RSR 15M1W	RSR 20M1
LM rail standard lengths ( $L_0$ )	55	50	70	70	70	110	220
	75	80	95	110	110	150	280
	95	110	120	150	150	190	340
	115	140	145	190	190	230	460
	135	170	170	230	230	270	640
	155	200	195	270	270	310	880
	175	260	220	310	310	430	1000
	195	290	245	390	350	550	
	275	320	270	470	390	670	
	375		320	550	430	790	
			370		470		
			470		550		
			570		670		
				870			
Standard pitch F	20	30	25	40	40	40	60
G, g	7.5	10	10	15	15	15	20
Max length	1240	1430	1430	1600	1600	1800	1800

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

## Preventing the LM Block from Falling off of the LM Rail

In models RSR-M1/RSR-M1W, 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.

