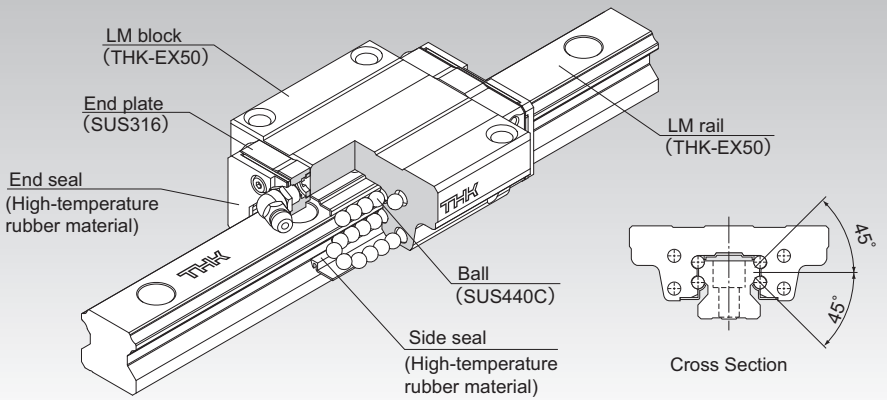
HSR-M1

High-Temperature LM Guide Model HSR-M1



Structure and Features

Balls roll in four 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.
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.
The high-temperature type LM Guide 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: 150℃

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

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

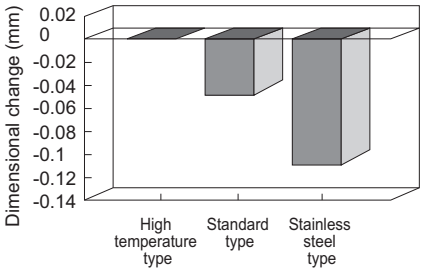
Since the LM block, LM rail, and balls use stainless steel, which is highly corrosion resistant, this model is optimal for clean room applications.

High-Temperature Grease

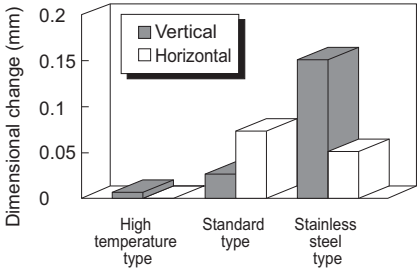
This model uses high-temperature grease that shows little grease-based fluctuation in rolling resistance even if the temperature changes from normal to high.

● Dimensional Stability Data

Since this model has been treated for dimensional stability, its dimensional change after being cooled or heated is only minimal.



Overall LM Rail Length

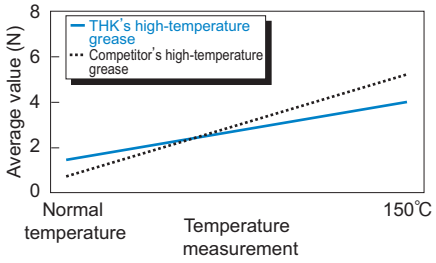


Curvature of the LM Rail

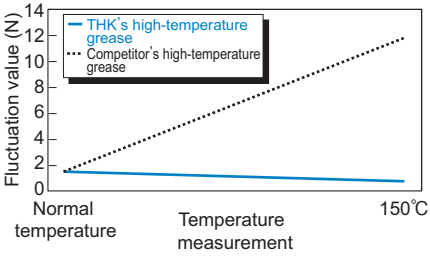
Notes: The above data on overall length and curvature indicate dimensional change when the LM rail is cooled to normal temperature after being heated at 150℃ for 100 hours.
The samples consist of high-temperature, standard, and stainless steel types of model HSR25 + 580L.

● Rolling Resistance Data in Relation to Grease

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



Average Value



Fluctuation Value

For the measurements above, model HSR25M1R1C1 is used.

● Thermal Characteristics of LM Rail and LM Block Materials

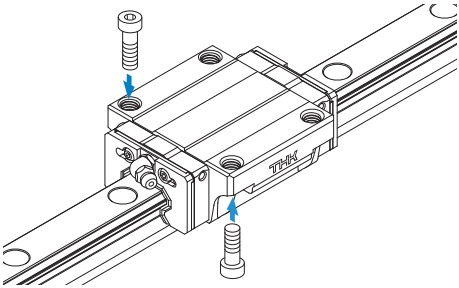
Specific heat capacity: 0.481 J/(g•K)
Thermal conductivity: 20.67 W/(m•K)
Average coefficient of linear expansion: 11.8×10^{-6}/℃

Types and Features

Model HSR-M1C

Dimensional Table⇒A1-362

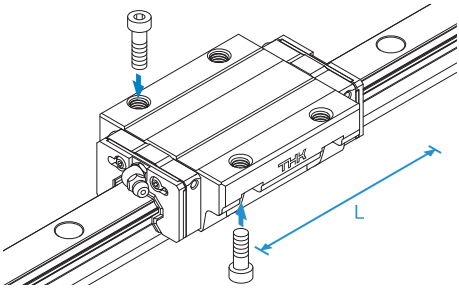
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.
It is used in places where the table cannot have through holes for mounting bolts.



Model HSR-M1LC

Dimensional Table⇒A1-362

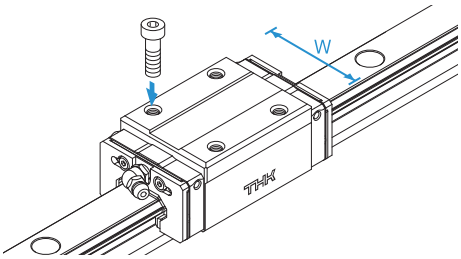
The LM block has the same cross-sectional shape as the Model HSR-M1C, but it has a longer overall LM block length (L) and a greater load rating.



Model HSR-M1R

Dimensional Table⇒A1-364

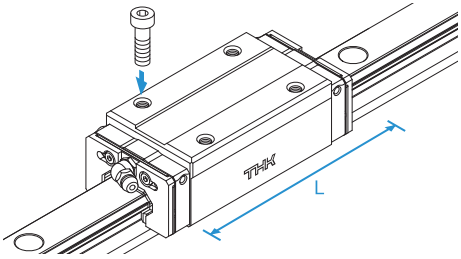
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Model HSR-M1LR

Dimensional Table⇒A1-364

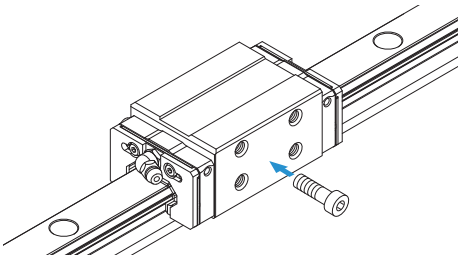
The LM block has the same cross-sectional shape as model HSR-M1R, but has a longer overall LM block length (L) and a greater load rating.



Model HSR-M1YR

Dimensional Table⇒A1-366

When using two units of LM Guide facing each other, the previous model required much time to machine the table, and it was difficult to achieve the desired accuracy and adjust the clearance. The tapped holes on the side of the HSR-M1YR block simplify the structure, which drastically reduces labor time and increases accuracy.



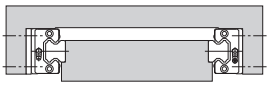


Fig. 1: Conventional Structure

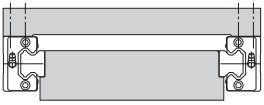
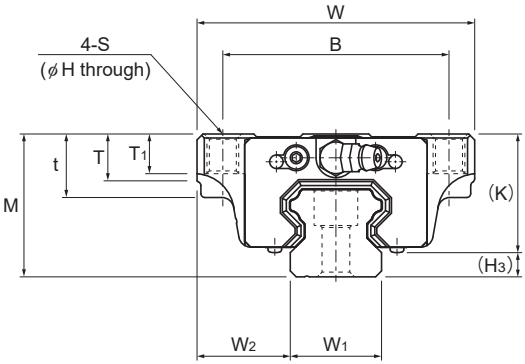


Fig. 2: Mounting Structure for Model HSR-M1YR

Service Life

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 HSR-M1C and HSR-M1LC



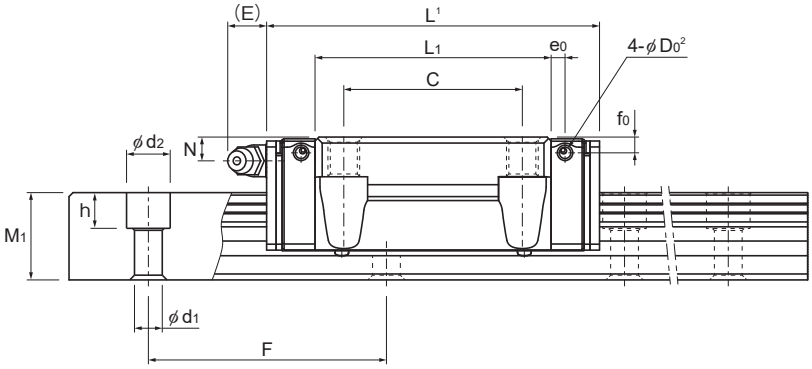
Model No.	Outer dimensions			LM block dimensions												Pilot hole for side nipple			
	Height	Width	Length[1]												Grease nipple				
	M	W	L	B	C	S	H	L_1	t	T	T_1	K	N	E		e_0	f_0	D_0[2]	H_3
HSR 15M1C HSR 15M1LC	24	47	59.6 77.6	38	30	M5	4.4	38.8 56.8	11	7	7	19.3	4.3	5.5	PB1021B	3.2	3.9	3	4.7
HSR 20M1C HSR 20M1LC	30	63	76 92	53	40	M6	5.4	50.8 66.8	10	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25M1C HSR 25M1LC	36	70	83.9 103	57	45	M8	6.8	59.5 78.6	16	11	10	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 30M1C HSR 30M1LC	42	90	98.8 121.4	72	52	M10	8.5	70.4 93	18	9	10	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 35M1C HSR 35M1LC	48	100	112 137.4	82	62	M10	8.5	80.4 105.8	21	12	13	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5

Model number coding

HSR25 M1 C 2 UU C1 +1240L P T -II

- HSR25: Model number
- M1: Symbol for high temperature type LM Guide
- C: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol
- C1: Radial clearance symbol — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1240L: LM rail length (in mm)
- P: Accuracy symbol — Normal grade (No Symbol)/High accuracy grade (H), Precision grade (P)/Super precision grade (SP), Ultra precision grade (UP)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane

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).
See **A1-547** for contamination protection accessories, see **A1-74** for radial clearance symbol. See **A1-79** for accuracy symbol. See **A1-13** for symbol for number of rails used on the same plane.

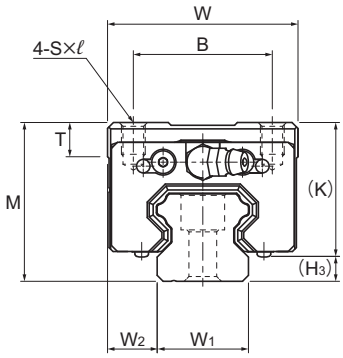


Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m 4					Mass	
	Width		Height	Pitch		Length 3	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 ±0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	2 blocks	1 block	2 blocks	1 block	kg	kg/m
	15	16	15	60	4.5×7.5×5.3	1240	10.9 14.2	15.7 22.9	0.0945 0.194	0.527 0.984	0.0945 0.194	0.527 0.984	0.0998 0.145	0.23 0.32	1.5
	20	21.5	18	60	6×9.5×8.5	1480	19.8 23.9	27.4 35.8	0.218 0.363	1.2 1.87	0.218 0.363	1.2 1.87	0.235 0.307	0.42 0.54	2.3
	23	23.5	22	60	7×11×9	1500	27.6 35.2	36.4 51.6	0.324 0.627	1.8 3.04	0.324 0.627	1.8 3.04	0.366 0.518	0.68 0.84	3.3
	28	31	26	80	9×14×12	1500	40.5 48.9	53.7 70.2	0.599 0.995	3.1 4.89	0.599 0.995	3.1 4.89	0.652 0.852	1.25 1.45	4.8
	34	33	29	80	9×14×12	1500	53.9 65	70.2 91.7	0.895 1.49	4.51 7.13	0.895 1.49	4.51 7.13	1.05 1.37	1.81 2.21	6.6

[1] Length L shown in the table is the length with the contamination protection accessories, code UU or SS.
The length L of the high-temperature type LM Guide model HSR-M1 is longer than the normal type of model HSR. (Dimension L_1 is the same.)
[2] The side nipple pilot holes will not be through holes. For grease nipple mount machining, contact THK.
[3] The maximum length indicates the standard maximum length of an LM rail. (See A1-368.)
[4] 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 HSR-M1R and HSR-M1LR



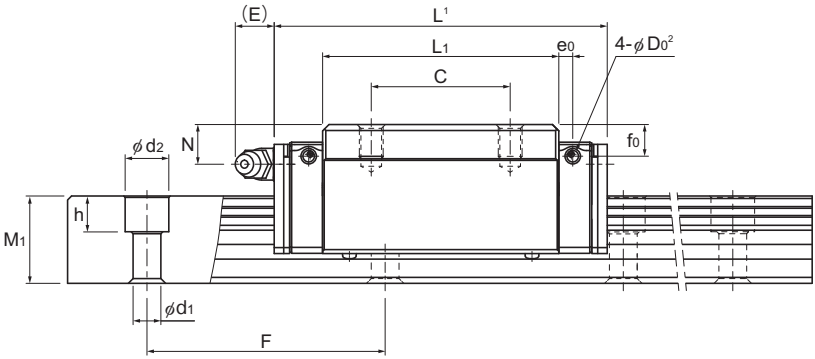
Model No.	Outer dimensions			LM block dimensions								Grease nipple	Pilot hole for side nipple			
	Height M	Width W	Length[1] L	B	C	S×ℓ	L_1	T	K	N	E		e_0	f_0	D_0[2]	H_3
HSR 15M1R HSR 15M1LR	28	34	59.6 77.6	26	26 34	M4×5	38.8 56.8	6	23.3	8.3	5.5	PB1021B	3.2	7.9	3	4.7
HSR 20M1R HSR 20M1LR	30	44	76 92	32	36 50	M5×6	50.8 66.8	8	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25M1R HSR 25M1LR	40	48	83.9 103	35	35 50	M6×8	59.5 78.6	8	34.5	10	12	B-M6F	3.5	8	3	5.5
HSR 30M1R HSR 30M1LR	45	60	98.8 121.4	40	40 60	M8×10	70.4 93	8	38	10	12	B-M6F	5.2	9.2	5.2	7
HSR 35M1R HSR 35M1LR	55	70	112 137.4	50	50 72	M8×12	80.4 105.8	10	47.5	15	12	B-M6F	5.5	12.6	5.2	7.5

Model number coding

HSR35 M1 R 2 UU C0 +1080L P T -II

- HSR35: Model number
- M1: Type of LM block — Symbol for high temperature type LM Guide
- R: No. of LM blocks used on the same rail
- 2: Contamination protection accessory symbol
- UU: Radial clearance symbol — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1080L: LM rail length (in mm)
- P: Accuracy symbol — Normal grade (No Symbol)/High accuracy grade (H), Precision grade (P)/Super precision grade (SP), Ultra precision grade (UP)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane

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).
See **A1-547** for contamination protection accessories, see **A1-74** for radial clearance symbol. See **A1-79** for accuracy symbol. See **A1-13** for symbol for number of rails used on the same plane.



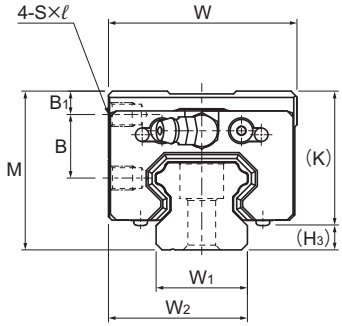
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m [4]					Mass	
	Width		Height	Pitch		Length [3]	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 ±0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	2 blocks	1 block	2 blocks	1 block	kg	kg/m
	15	9.5	15	60	4.5×7.5×5.3	1240	10.9 14.2	15.7 22.9	0.0945 0.194	0.527 0.984	0.0945 0.194	0.527 0.984	0.0998 0.145	0.21 0.29	1.5
	20	12	18	60	6×9.5×8.5	1480	19.8 23.9	27.4 35.8	0.218 0.363	1.2 1.87	0.218 0.363	1.2 1.87	0.235 0.307	0.32 0.42	2.3
	23	12.5	22	60	7×11×9	1500	27.6 35.2	36.4 51.6	0.324 0.627	1.8 3.04	0.324 0.627	1.8 3.04	0.366 0.518	0.63 0.76	3.3
	28	16	26	80	9×14×12	1500	40.5 48.9	53.7 70.2	0.599 0.995	3.1 4.89	0.599 0.995	3.1 4.89	0.652 0.852	1.05 1.25	4.8
	34	18	29	80	9×14×12	1500	53.9 65	70.2 91.7	0.895 1.49	4.51 7.13	0.895 1.49	4.51 7.13	1.05 1.37	1.71 2.21	6.6

[1] Length L shown in the table is the length with the contamination protection accessories, code UU or SS.
The length L of the high-temperature type LM Guide model HSR-M1 is longer than the normal type of model HSR. (Dimension L_1 is the same.)
[2] The side nipple pilot holes will not be through holes. For grease nipple mount machining, contact THK.
[3] The maximum length indicates the standard maximum length of an LM rail. (See A1-368.)
[4] 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

Options⇒A1-507

Model HSR-M1YR



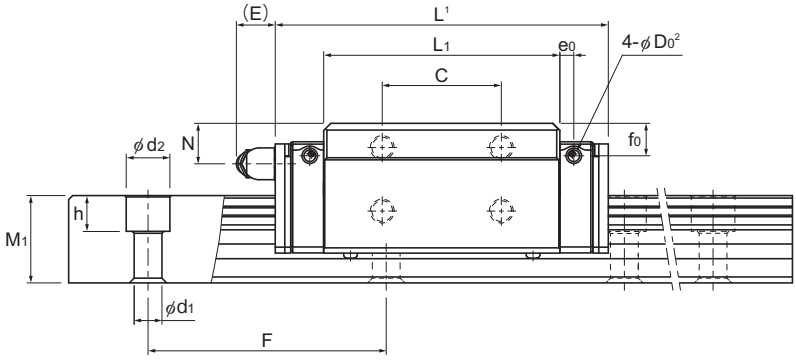
Model No.	Outer dimensions			LM block dimensions								Grease nipple	Pilot hole for side nipple			H_3
	Height M	Width W	Length[1] L	B_1	B	C	S×ℓ	L_1	K	N	E		e_0	f_0	D_0[2]	
HSR 15M1YR	28	33.5	59.6	4.3	11.5	18	M4×5	38.8	23.3	8.3	5.5	PB1021B	3.2	7.9	3	4.7
HSR 20M1YR	30	43.5	76	4	11.5	25	M5×6	50.8	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25M1YR	40	47.5	83.9	6	16	30	M6×6	59.5	34.5	10	12	B-M6F	3.5	8	3	5.5
HSR 30M1YR	45	59.5	98.8	8	16	40	M6×9	70.4	38	10	12	B-M6F	5.2	9.2	5.2	7
HSR 35M1YR	55	69.5	112	8	23	43	M8×10	80.4	47.5	15	12	B-M6F	5.5	12.6	5.2	7.5

Model number coding

HSR25 M1 YR 2 UU C0 +1240L P T -II

- HSR25: Model number
- M1: Symbol for high temperature type LM Guide
- YR: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol
- C0: Radial clearance symbol — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1240L: LM rail length (in mm)
- P: Accuracy symbol — Normal grade (No Symbol)/High accuracy grade (H), Precision grade (P)/Super precision grade (SP), Ultra precision grade (UP)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane

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).
See **A1-547** for contamination protection accessories, see **A1-74** for radial clearance symbol. See **A1-79** for accuracy symbol. See **A1-13** for symbol for number of rails used on the same plane.



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m 4						Mass	
	Width		Height	Pitch		Length 3	C	C_0	M_A		M_B		M_C		LM block	LM rail
	W_1 ±0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	2 blocks	1 block	2 blocks	1 block		kg	kg/m
	15	24	15	60	4.5×7.5×5.3	1240	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998		0.21	1.5
	20	31.5	18	60	6×9.5×8.5	1480	19.8	27.4	0.218	1.2	0.218	1.2	0.235		0.32	2.3
	23	35	22	60	7×11×9	1500	27.6	36.4	0.324	1.8	0.324	1.8	0.366		0.63	3.3
	28	43.5	26	80	9×14×12	1500	40.5	53.7	0.599	3.1	0.599	3.1	0.652		1.05	4.8
	34	51.5	29	80	9×14×12	1500	53.9	70.2	0.895	4.51	0.895	4.51	1.05		1.71	6.6

[1] Length L shown in the table is the length with the contamination protection accessories, code UU or SS.
The length L of the high-temperature type LM Guide model HSR-M1 is longer than the normal type of model HSR. (Dimension L_1 is the same.)
[2] The side nipple pilot holes will not be through holes. For grease nipple mount machining, contact THK.
[3] The maximum length indicates the standard maximum length of an LM rail. (See A1-368.)
[4] 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

Options⇒A1-507

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model HSR-M1 variations. If the maximum length of the desired LM rail exceeds these values, jointed rails will be used. Contact THK for details.
For special rail lengths, it is recommended to use a value corresponding to the G and g dimensions from the table. As the G and g dimensions increase, this portion becomes less stable, and the accuracy performance is severely impacted.

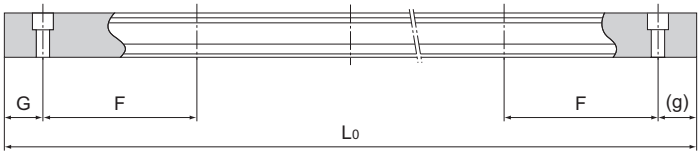


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HSR-M1

Unit: mm

Model No.	HSR 15M1	HSR 20M1	HSR 25M1	HSR 30M1	HSR 35M1
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480
Standard pitch F	60	60	60	80	80
G, g	20	20	20	20	20
Max length	1240	1480	1500	1500	1500

Notes: The maximum length varies with accuracy grades. Contact THK for details.
If jointed rails are not allowed and a greater length than the maximum values above is required, contact THK.