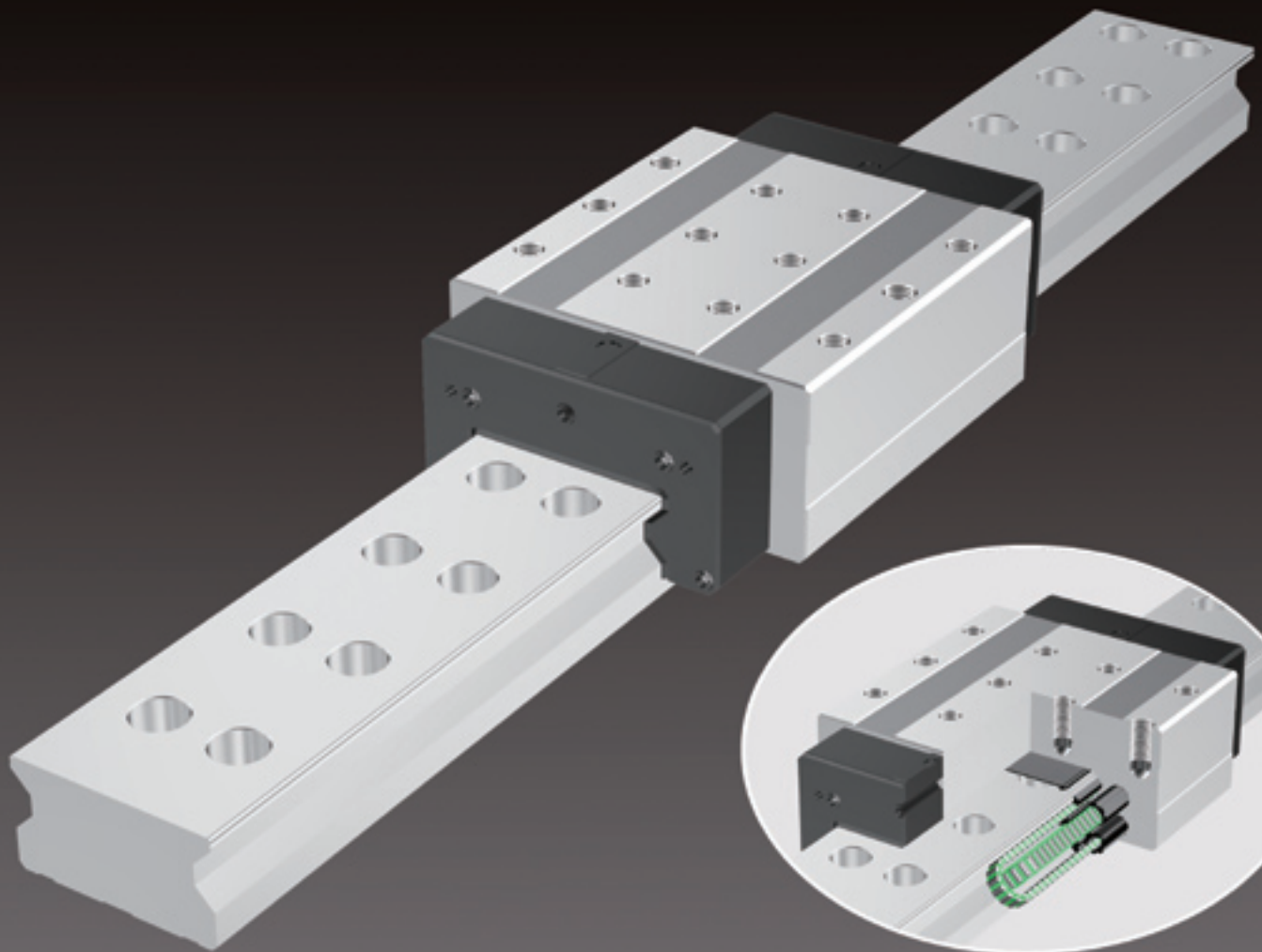# THK

NEW

Wide Caged-roller LM Guide

Optimal for large machines that require high rigidity and mounting accuracy
Ultra-high rigidity, heavy load
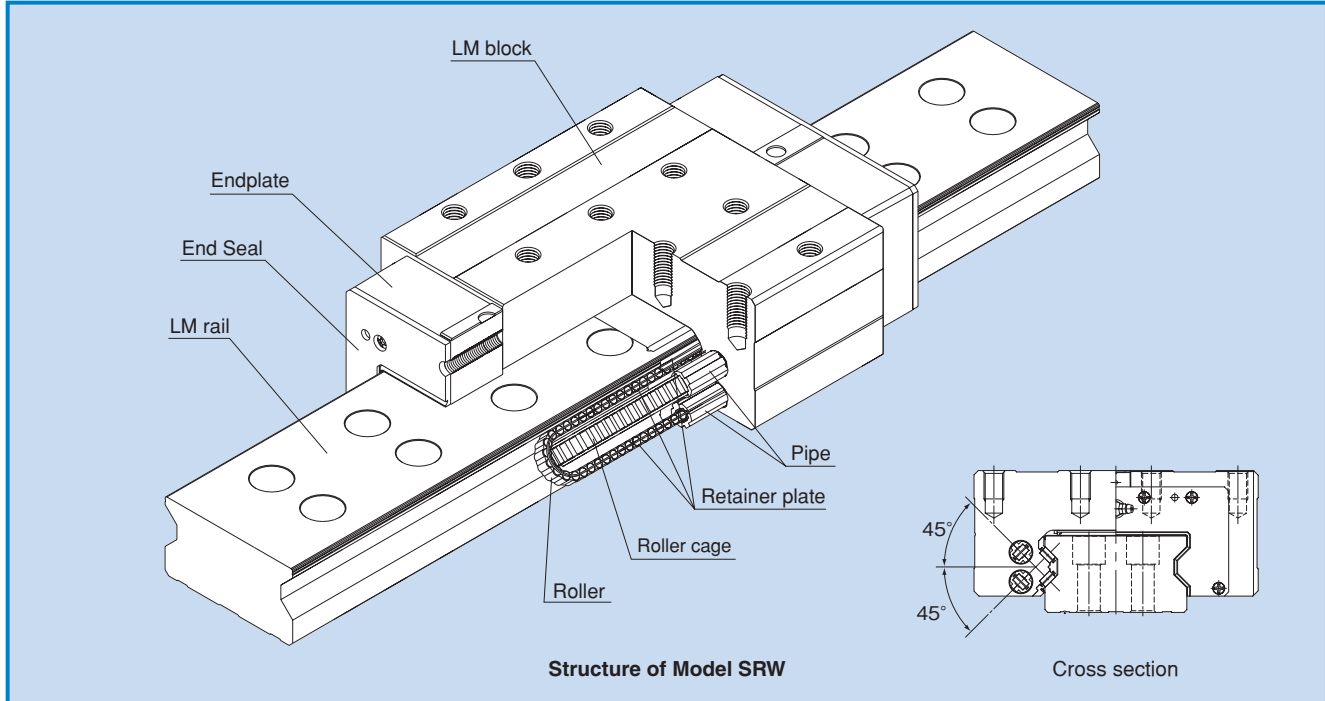A wide, large roller guide model is added to the lineup

SRW130,150

Caged Roller

THK CO., LTD.

TOKYO. JAPAN

Wide Caged-roller LM Guide **SRW130,150**

Structure of Model SRW
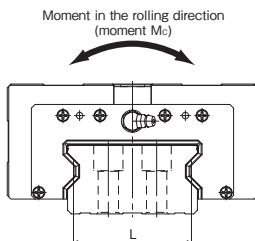
Cross section

45°

45°

Model SRW is a wide, ultra-high rigidity Roller Guide that has an LM rail wider than that of caged-roller LM Guide model SRW and is equipped with two rows of rail mounting holes to increase the mounting strength and the mounting stability. In addition, it uses roller cages to prevent rollers from skewing, thus allowing low-friction, smooth motion and achieve long-term maintenance-free operation.

● Features

● Ultra-high Rigidity

Since its wide rail can be secured with two rows of mounting bolts, the mounting strength is increased. In addition, since the raceway distance (L) in the width direction is large, this model has a strong structure against the moment load (moment M_C) in the rolling direction. For the rolling elements, this model uses highly rigid rollers*.

*The overall roller length is more than 1.5 times the roller diameter.

Moment in the rolling direction
(moment M_C)

L

● 4-way Equal Load

Since each row of rollers is arranged at a contact angle of 45° so that the LM block receives an equal load rating in all four directions (radial, reverse radial and lateral directions), high rigidity is ensured in all directions.

● Smooth Motion through Skewing Prevention

The roller cage allows rollers to form an evenly spaced line while recirculating, thus preventing the rollers from skewing (tilt of rollers) as the block enters a loaded area. As a result, fluctuation of the rolling resistance is minimized and smooth stable motion is achieved.

● Long-term Maintenance-free Operation

Use of the roller cage eliminates friction between rollers and enables the lubricant to be retained in grease pockets formed between adjacent rollers. As the rollers recirculate, the grease pocket serves to provide the adequate amount of lubricant to achieve long-term maintenance-free operation.

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● Rated Load and Service Life

● Calculating the Service Life

The service life of model SRW is obtained using the following equation.

$$L = \left(\frac{f_t \cdot f_c}{f_w} \cdot \frac{C}{P_c} \right)^{\frac{10}{3}} \times 100$$

L : Nominal life   [km]
(The total travel distance that 90% of a group of identical LM Guide units independently operating under the same conditions can achieve without showing flaking)

C : Basic dynamic load rating   [N]
P_c : Calculated load   [N]
f_t : Temperature Factor   (see General Catalog)
f_c : Contact factor   (see General Catalog)
f_w : Load Factor   (see General Catalog)

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

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

● Load Rating

Model SRW is capable of receiving loads in all directions: radial, reverse-radial and lateral directions.
The basic load ratings are uniform in the four directions (radial, reverse-radial and lateral directions), and their values are provided in the dimensional table (see P.5).

● Equivalent Load

When the LM block of model SRW receives loads in all directions simultaneously, the equivalent load is obtained from the equation below.
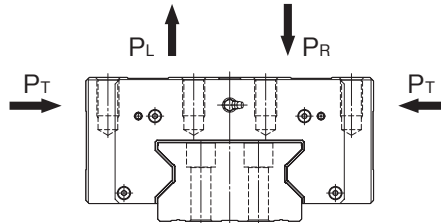
$$P_E = P_R (P_L) + P_T$$

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]

● Equivalent moment factor

If a moment load is applied when a single LM block is used, or two LM blocks are used in close contact with each other, convert the moment load to an equivalent load by multiplying the moment load with the moment equivalent factor indicated in Table 1. See the General Catalog – Technical Descriptions of the Products for details.

$$P = K \cdot M$$

P : Equivalent load per LM Guide   [N]
K : Equivalent moment factor   (see table 1)
M : Applied moment   [N-mm]

Table 1 Equivalent moment factor

Model No.	Equivalent factor							
	K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SRW 130LR	2.19×10^{-2}		4.15×10^{-3}		2.19×10^{-2}	4.15×10^{-3}	1.33×10^{-2}	
SRW 150LR	1.95×10^{-2}		3.67×10^{-3}		1.95×10^{-2}	3.67×10^{-3}	1.15×10^{-2}	

K_{AR1} : Equivalent factor in the M_A radial direction when one LM block is used
K_{AL1} : Equivalent factor in the M_A reverse radial direction when one LM block is used
K_{AR2} : Equivalent factor in the M_A radial direction when two LM blocks are used in close contact with each other
K_{AL2} : Equivalent factor in the M_A reverse radial direction when two LM blocks are used in close contact with each other

K_{B1} : Equivalent factor in the M_B radial direction when one LM block is used
K_{B2} : Equivalent factor in the M_B radial direction when two LM blocks are used in close contact with each other
K_{CR} : M_C Equivalent factor in the radial direction
K_{CL} : M_C Equivalent factor in the reverse radial direction

● Accuracy Standards

For the accuracy of model SRW, running parallelism, dimensional tolerance in height and width, and difference in height and width required when multiple LM blocks are used on one rail or multiple rails are used on the same plane, are defined as indicated in the table below.
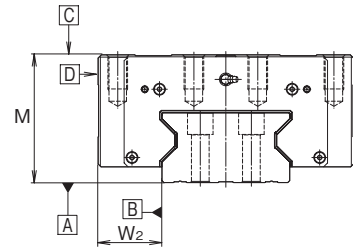
■ **Running of parallelism**
See the General Catalog for details.

■ **Difference in height M**
See the General Catalog for details.

■ **Difference in Width W₂**
See the General Catalog for details.

Unit:mm

Model No.	Accuracy Standards	Precision grade	Super precision grade	Ultra precision grade
	Item	P	SP	UP
130 100	Dimensional tolerance in height M	0 −0.05	0 −0.04	0 −0.03
	Difference in height M	0.01	0.007	0.005
	Dimensional tolerance in width W_2	0 −0.05	0 −0.04	0 −0.03
	Difference in width W_2	0.01	0.007	0.005
	Running parallelism of surface C against surface A	as shown in the table below		
	Running parallelism of surface D against surface B	as shown in the table below		

LM Rail Length and Running Parallelism for Model SRW

Unit:μm

LM rail length (mm)		Running Parallelism Values		
Above	Or less	Precision grade	Super precision grade	Ultra precision grade
		P	SP	UP
1250	1600	8	5	4
1600	2000	8.5	5.5	4.5
2000	2500	9.5	6	5
2500	3150	11	6.5	5.5
3150	4000	12	7.5	6
4000	5000	13	8.5	6.5

Note: For the running parallelism with the LM rail length exceeding the maximum value, contact THK.

● Radial clearance

The table below shows the radial clearance of model SRW.

Unit:μm

| Indication symbol	Normal	Light preload	Medium preload
Model No.	No Symbol	C1	C0
SRW 130LR	− 3 to − 1	− 7 to − 3	− 12 to − 7
SRW 150LR	− 3 to − 1	− 8 to − 3	− 13 to − 8

Radial clearance

Note: If desiring normal clearance, add no symbol; for Light or Medium preload, indicate "C1" or "C0" in the model number. See the example of model number coding (see P.5) for details.
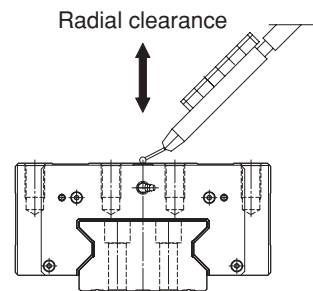
● Shoulder Height of the Mounting Base and the Shape of the Corner

For the shoulder height of the mounting base for the LM block and the LM rail, we recommend using the value indicated in the table below. For the corner of the mounting base, secure a recess, or machine the corner to have a radius at or below the r₁ or r₂ value shown in the table below, so that the corner will not interfere with the chamfers of the LM block and the LM rail.
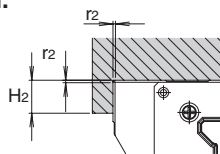
Shoulder for the LM block

Shoulder for the LM rail

Unit:mm
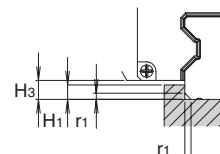
Model No.	Corner radius (Shoulder for the LM rail) r₁ (Max.)	Corner radius (Shoulder for the LM block) r₂ (Max.)	Shoulder height (Shoulder for the LM rail) H₁	Shoulder height (Shoulder for the LM block) H₂	H₃
SRW 130LR	1.5	1.5	12	14	16
SRW 150LR	2.0	2.0	12	16	16

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Accuracy of the Mounting Surface

Model SRW is highly rigid since it uses rollers as its rolling elements, and the roller cage prevents the rollers from skewing (tilt). However, the mounting surface needs to be machined with high accuracy.
If the error on the mounting surface is high, it will affect the rolling resistance and the service life. Therefore, for the accuracy of the mounting surface, do not exceed the maximum permissible value (limit value) that corresponds to the radial clearance indicated in the table below.
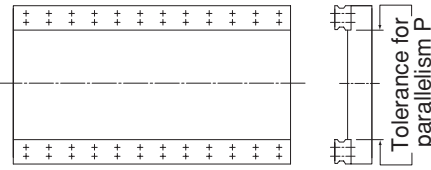
Error Allowance in Parallelism (P) between Two Rails

Unit:mm

Model No. Radial clearance	Normal	C1	C0
SRW 130LR	0.026	0.018	0.014
SRW 150LR	0.030	0.021	0.016

Error Allowance in Level (X) between the Rails

Unit:mm

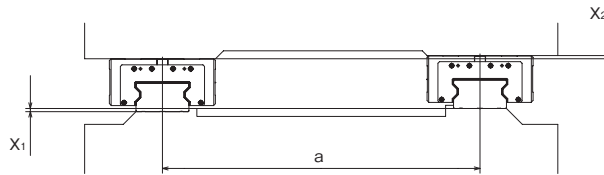| Radial clearance	Normal	C1	C0
Permissible error on the mounting surface X	0.00020a	0.00014a	0.00072a

$X = X_1 + X_2$

X_1: Level difference on the rail mounting surface
X_2: Level difference on the block mounting surface

Example of Calculation

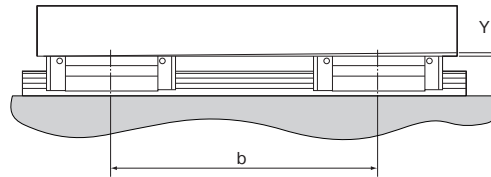When the rail span : a=500mm
Permissible error on the mounting surface

$X = 0.0003 \times 500 = 0.15$

**Error Allowance in Level (Y) in the Axial Direction**

Unit:mm

Permissible error on the mounting surface	0.000036b

Standard Length and Maximum Length of the LM Rail

The table below shows the standard lengths and the maximum lengths of model SRW variations. If the maximum length of the desired LM rail exceeds them, jointed rails will be used. For the G dimension when a special length is required, we recommend selecting the corresponding G value from the table. The longer the G dimension is, the less stable the G area may become after installation, thus causing an adverse impact to accuracy.
If desiring connected use of this model, be sure to specify the overall length in terms of total length when placing an order so that we can manufacture the LM rail without leaving a level difference in the joint.
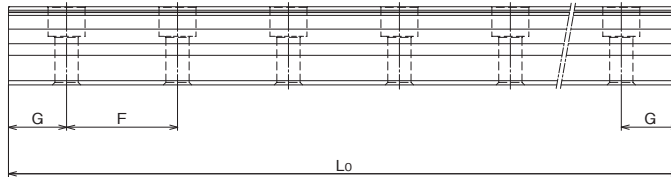
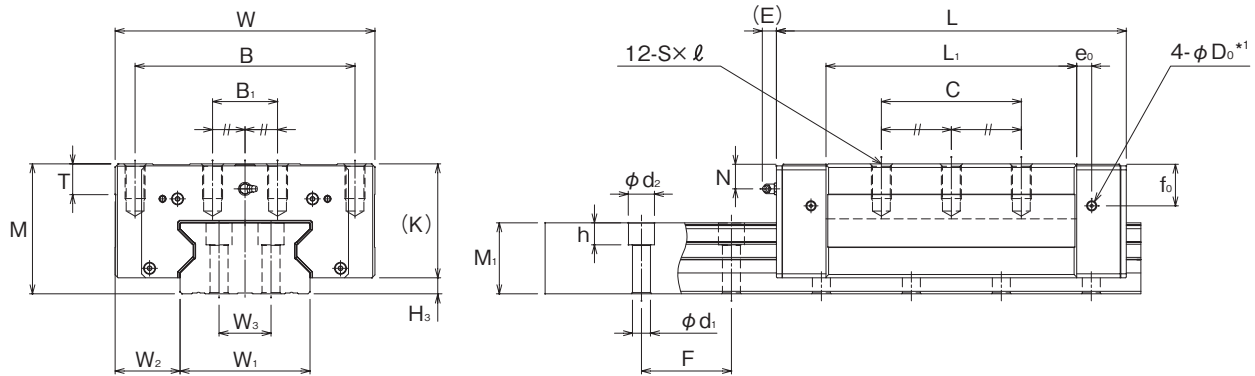**Standard Length and Maximum Length of the LM Rail for Model SRW**

Unit:mm

	SRW 130LR	SRW 150LR
Standard length (L₀)	1530	1340
	1890	1760
	2250	2180
	2610	2600
Standard pitch	90	105
G	45	40
Max length	3000	3000

Note 1: The maximum length varies with accuracy grades. Contact THK for details.
Note 2: If jointed rails are not allowed and a greater length than the maximum values above is required, contact THK.

THK 4

Model SRW-LR

Dimensional Table for Model SRW-LR

Model No.	Outer dimensions			LM block dimensions												Grease	
	Height	Width	Length	B	B₁	C	S×ℓ	L₁	T	K	N	E	e₀	f₀	D₀	Grease Nipple	H₃
	M	W	L														
SRW 130LR	130	260	350	220	65	140	M20×35	250.8	30	114	25	16	15	42	8.2	B-PT1/8	16
SRW 150LR	150	300	395	260	75	200	M20×40	280.2	35	134	28.8	16	15	53	8.2	B-PT1/4	16

Model No.	LM rail dimensions							Basic load rating		Static permissible moment [kN-m] *3					Mass	
	Width			Height	Pitch			Maximum	C	C₀	M_A		M_B		M_C	LM block	LM rail
	W₁ ⁰₋₀.₀₅	W₂	W₃	M₁	F	d₁×d₂×h	length*2	[kN]	[kN]	1 block	Double casings	1 block	Double casings	1 block	[kg]	[kg/m]
SRW 130LR	130	65	52	71	90	18×26×22	3000	497	990	45.3	239	45.3	239	74.2	41.7	61.0
SRW 150LR	150	75	60	77	105	24×35×28	3000	601	1170	60	319	60	319	101.6	65.1	74.4

Note *1: The pilot hole for the side nipple is not drilled through in order to prevent foreign material from entering the LM block. THK will mount grease nipples per your request. Therefore, do not use the side nipple pilot holes for purposes other than mounting a grease nipple.

*2: The maximum length indicates the standard maximum length of an LM rail.

*3: Static permissible moment One block: static permissible moment value with one LM block

          Double blocks : static permissible moment value with double block closely contacting with each other

Note: The removing/mounting jig is not included in the package as standard. If you desire to use it, contact THK.

Model Number Coding

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.) Those models equipped with QZ Lubricator cannot have a grease nipple.

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Maximum Seal Resistance /Contamination protection accessory

Table 2 shows the maximum seal resistance value per LM block with the SRW...SS seal.

Table 2 Maximum Seal Resistance
Unit:N

Model No.	Maximum Seal Resistance*
SRG 85LC	47
SRG100LC	53

* The maximum seal resistance value with lubricant applied.

Overall LM block length after a contamination protection accessory is attached.
Unit:mm

Model No.	UU	SS	DD	ZZ	KK
SRW 130LR	350	350	361.2	365.2	376.4
SRW 150LR	395	395	406.2	411	422.2

Note 1: For details of contamination protection accessories, see the General Catalog.
Note 2: If you desire QZ or LaCS, contact THK.

Dedicated Bellows JSRG for Model SRW

The table below shows the dimensions of dedicated bellows JSRW for model SRW. Specify the corresponding model number of the desired bellows from the table.

Model No.	Main dimensions [mm]								
	W	H	H_1	P	p	b_1	t_1	b_2	t_2
JSRW 130	220	96	96	36.5	35	165	35	60	55
JSRW 150	260	114	114	49	47	200	43.3	70	60

Model No.	Main dimensions [mm]				Extension rate A $\left(\dfrac{L_{max}}{L_{min}}\right)$	Supported model numbers
	Screw size S	Mounting bolt S_1	a	b		
JSRW 130	M6	M6×8L	18	20	9	SRW 130LR
JSRW 150	M6	M6×8L	20	20	9	SRW 150LR

Model Number Coding

$$\text{JSRW130} - 150 / 1350$$

Model No.

Dimensions of the bellows (length when compressed / length when extended)

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

$$L_{min} = \frac{S}{(A-1)}$$

$L_{max} = L_{min} \cdot A$
S:Stroke length (mm)
A:Extension rate

Dedicated Bellows JSRG for Model SRW

Note 1: For lubrication when using the dedicated bellows, contact THK.
Note 2: If you desire to use the dedicated bellows other than in horizontal mount (i.e., vertical, wall and inverted mount), or desire a heat-resistant type of bellows, contact THK.

Dedicated C-Cap for LM Rail Mounting Holes

If any of the LM rail mounting holes of an LM Guide is filled with cutting chips or foreign material, they may enter the LM block. Entrance of such foreign material can be prevented by covering each LM rail mounting hole with the dedicated cap to eliminate the level difference between all the hole tops and the top face of the LM rail.

Major dimensions of the C-Cap

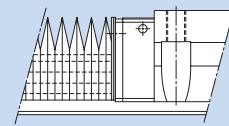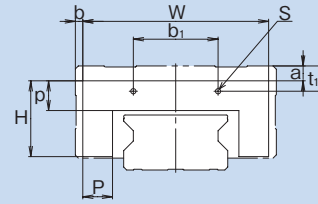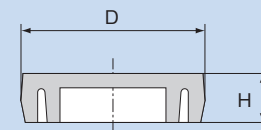| Model No.	Model No.	Bolt used	Main dimensions [mm]	
			D	H
SRW 130	M16	M16	35.5	5.7
SRW 150	M22	M22	39.5	7.7

Dedicated C-Cap for LM Rail Mounting Holes

Greasing hole

Model SRW allows lubrication from both the side and top faces of the LM block. The greasing hole of standard types is not drilled through in order to prevent foreign matter from entering the LM block.
When using the greasing hole, contact THK.

Mounting dimensions of the greasing holes
Unit:mm

Model No.	Pilot hole for side nipple			Applicable nipple	Greasing hole on the top face		
	e_0	f_0	D_0		D_2 (O-ring)	V	e_1
SRW 130	15	42	8.2	PT1/8	13 (P10)	0.4	10
SRW 150	15	53	8.2	PT1/4	13 (P10)	0.4	10

Greasing hole

THK