

THK



NEW

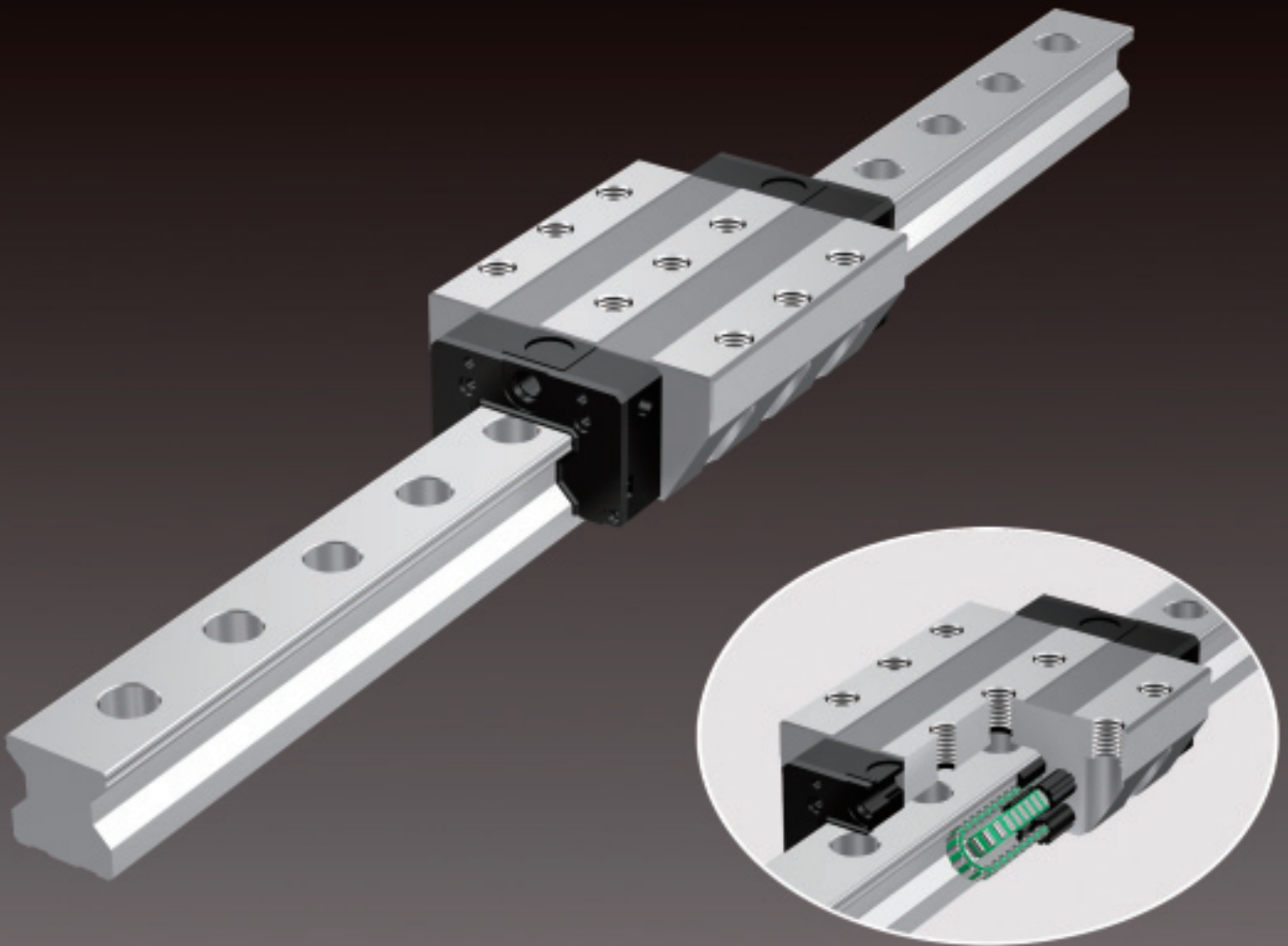
Caged Roller LM Guide

Optimum for large machines that require high rigidity

Ultra-high rigidity Heavy Load

A large roller guide model is added to the lineup

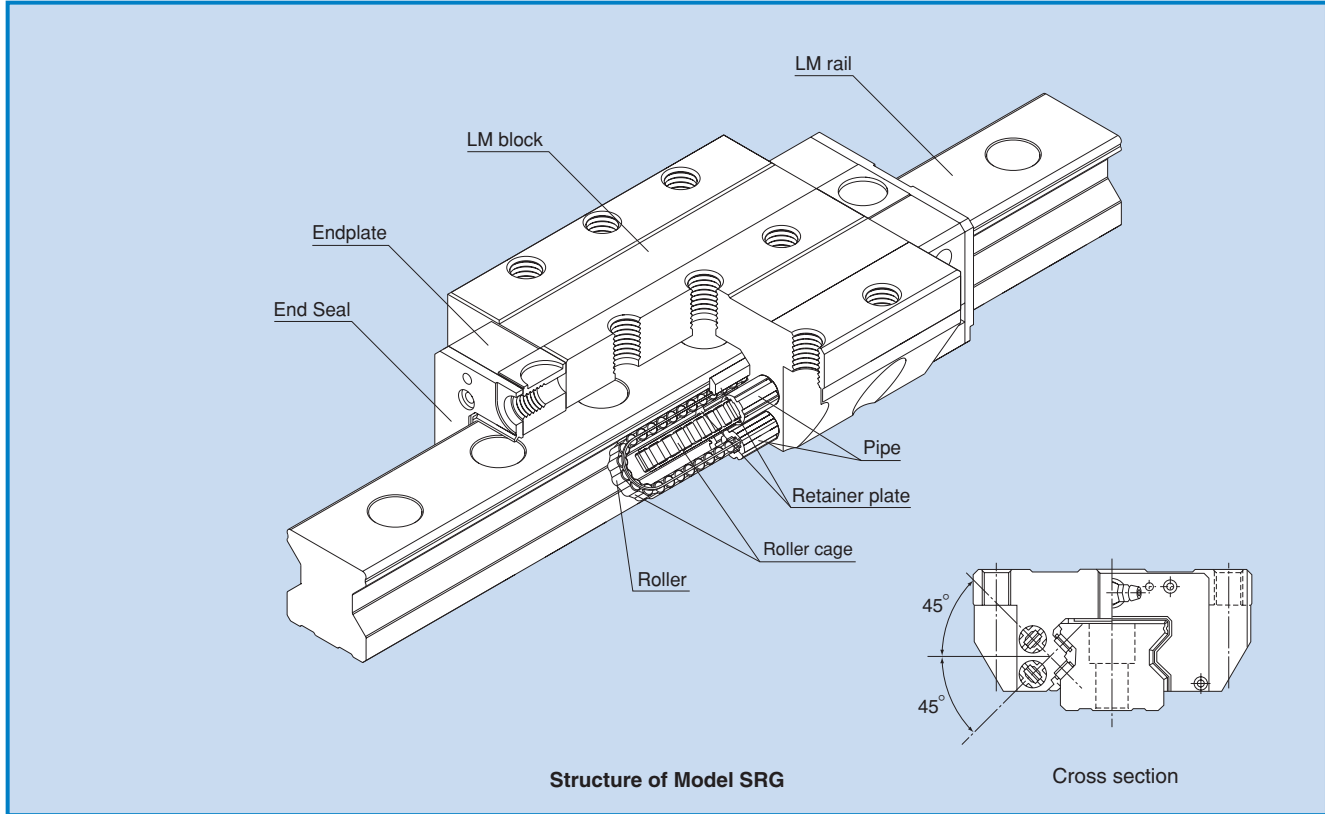
SRG85,100



THK CO., LTD.
TOKYO, JAPAN

CATALOG No.346EW

Caged Roller LM Guide **SRG85,100**

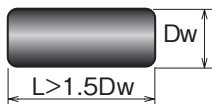


Model SRG is an ultra-high rigidity Roller Guide that uses roller cages to prevent rollers from skewing, thus allowing low-friction, smooth motion and achieve long-term maintenance-free operation.

Features

● Ultra-high Rigidity

A higher rigidity is achieved by using highly rigid rollers as the rolling elements and having the overall roller length (L) more than 1.5 times greater than the roller diameter (Dw).



Roller shape

● 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.

Rated Load and Service Life

Calculating the Service Life

The service life of model SRG 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]

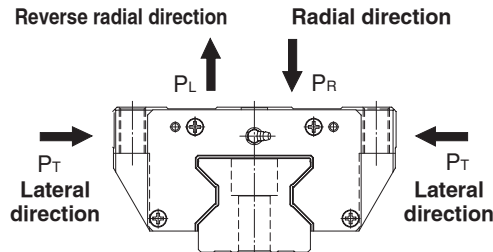
Load Rating

Model SRG 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 SRG 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}
SRG 85LC	2.19×10^{-2}		4.15×10^{-3}		2.19×10^{-2}	4.15×10^{-3}		1.91×10^{-2}
SRG100LC	1.95×10^{-2}		3.67×10^{-3}		1.95×10^{-2}	3.67×10^{-3}		1.62×10^{-2}

K_{AR1} : Equivalent factor in the MA radial direction when one LM block is used

K_{AL1} : Equivalent factor in the MA reverse radial direction when one LM block is used

K_{AR2} : Equivalent factor in the MA radial direction when two LM blocks are used in close contact with each other

K_{AL2} : Equivalent factor in the MA reverse radial direction when two LM blocks are used in close contact with each other

K_{B1} : Equivalent factor in the MB radial direction when one LM block is used

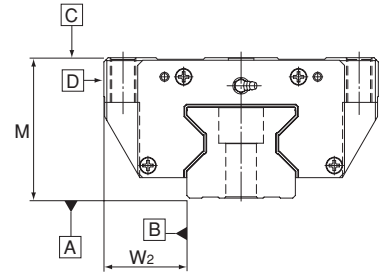
K_{B2} : Equivalent factor in the MB radial direction when two LM blocks are used in close contact with each other

K_{CR} : MC Equivalent factor in the radial direction

K_{CL} : MC Equivalent factor in the reverse radial direction

Accuracy Standards

For the accuracy of model SRG, 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 W_2**
See the General Catalog for details.

Unit:mm

Model No.	Accuracy Standards	Precision grade	Super precision grade	Ultra precision grade
	Item	P	SP	UP
85 100	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 SRG

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.

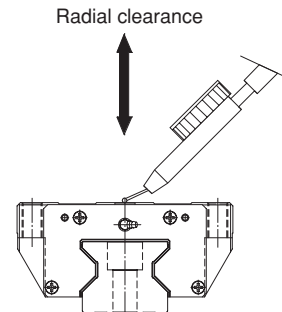
Radial clearance

The table below shows the radial clearance of model SRG.

Unit:μm

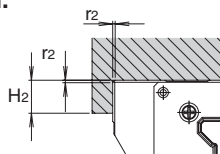
Indication symbol Model No.	Normal	Light preload	Medium preload
	No Symbol	C1	C0
SRG 85LC	- 3 to - 1	- 7 to - 3	- 12 to - 7
SRG100LC	- 3 to - 1	- 8 to - 3	- 13 to - 8

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.

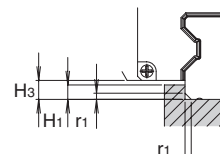


Shoulder Height of the Mounting Base and the Shape of the Corner

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 r_1 or r_2 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



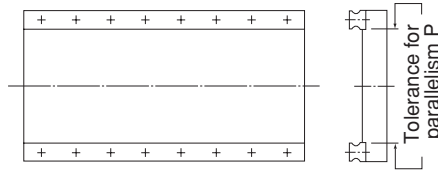
Shoulder for the LM rail

Unit:mm

Model No.	Corner radius (Shoulder for the LM rail) r_1 (Max.)	Corner radius (Shoulder for the LM block) r_2 (Max.)	Shoulder height (Shoulder for the LM rail) H_1	Shoulder height (Shoulder for the LM block) H_2	H_3
SRG 85LC	1.5	1.5	12	14	16
SRG100LC	2	2	12	16	16

Accuracy of the Mounting Surface

Model SRG 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
SRG 85LC		0.040	0.027	0.021
SRG100LC		0.045	0.031	0.024

Error Allowance in Level (X) between the Rails

Unit:mm

Radial clearance	Normal	C1	C0
Permissible error on the mounting surface X	0.00030a	0.00021a	0.00011a

$$X = X_1 + X_2$$

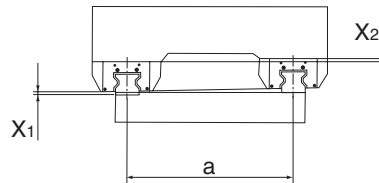
X_1 : Level difference on the rail mounting surface

X_2 : Level difference on the block mounting surface

Example of Calculation

When the rail span : a=500mm

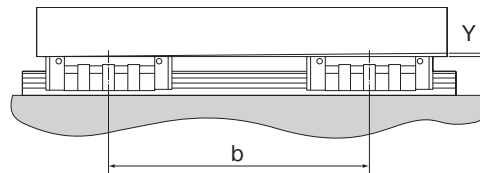
$$\begin{aligned} \text{Permissible error on the mounting surface } X &= 0.0003 \times 500 \\ &= 0.15 \end{aligned}$$



Error Allowance in Level (Y) in the Axial Direction

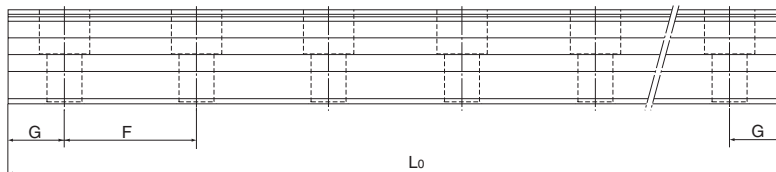
Unit:mm

Permissible error on the mounting surface	0.000036b
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Standard Length and Maximum Length of the LM Rail

The table below shows the standard lengths and the maximum lengths of model SRG 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 SRG

Unit:mm

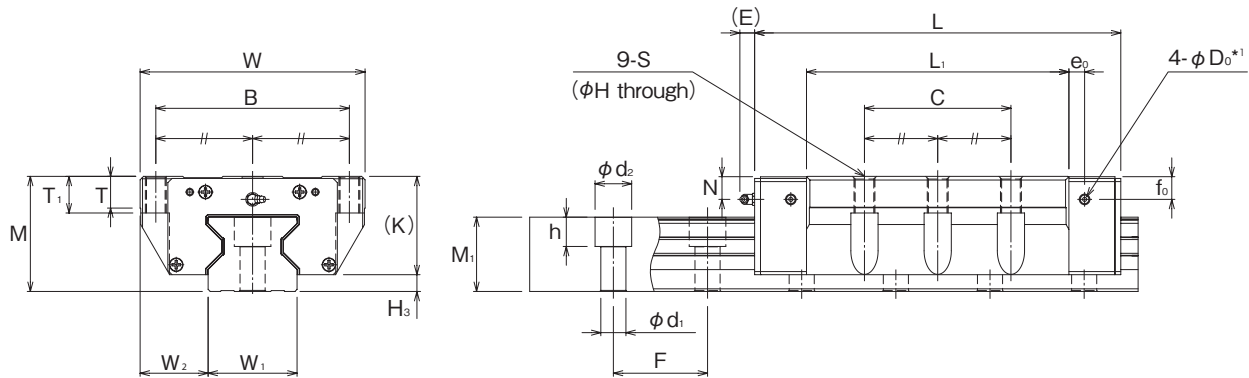
	SRG 85LC	SRG 100LC
Standard length (L_0)	1530	1340
	1890	1760
	2250	2180
	2610	2600
Standard pitch	90	105
G	45	40
Max length	3000	3000

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.

Model SRG-LC

Dimensional Table for Model SRG-LC



Unit:mm

Model No.	Outer dimensions			LM block dimensions													Grease Nipple	H ₃
	Height M	Width W	Length L	B	C	S	H	L ₁	T	T ₁	K	N	E	e ₀	f ₀	D ₀		
SRG 85LC	110	215	350	185	140	M20	17.8	250.8	30	35	94	22	16	15	22	8.2	B-PT1/8	16
SRG 100LC	120	250	395	220	200	M20	17.8	280.2	35	38	104	23	16	15	23	8.2	B-PT1/4	16

Unit:mm

Model No.	LM rail dimensions					Basic load rating Maximum length*2	Static permissible moment [kN-m] ^{*3}		Mass						
	Width W ₁ ^{0 -0.05}	W ₂	M ₁	F	d ₁ ×d ₂ ×h		C [kN]	C ₀ [kN]	M _A [kN-m] 1 block	M _B [kN-m] Double casings	M _C [kN-m] 1 block	M _D [kN-m] Double casings	M _E [kN-m] 1 block	LM block [kg]	LM rail [kg/m]
SRG 85LC	85	65	71	90	24×35×28	3000	497	990	45.3	239	45.3	239	51.9	26.2	35.7
SRG 100LC	100	75	77	105	26×39×32	3000	601	1170	60	319	60	319	72.3	37.6	46.8

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

SRG85 LC 2 KK C0 + 2610L P T - II

Model No. Type of LM block Radial clearance symbol (see P.3) Accuracy symbol (see P.3) Symbol for No. of rails used on the same plane (See the General Catalog for details.)

No. of LM blocks used on the same rail

Dust prevention accessory symbol (See the General Catalog for details.) LM rail length (in mm) Symbol for LM rail jointed use

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.

Maximum Seal Resistance /Contamination protection accessory

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

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.

Model No.	UU	SS	DD	ZZ	KK
SRG 85LC	350	350	361.2	365.2	376.4
SRG100LC	395	395	406.2	411	422.2

Note 1: For details of contamination protection accessories, see the General Catalog.

Note 2: For model SRG, the SS type is available as standard.

Note 3: If you desire QZ or LaCS, contact THK.

Dedicated Bellows JSRG for Model SRG

The table below shows the dimensions of dedicated bellows JSRG for model SRG. 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
JSRG 85LC	168	91	91	35.5	30	120	15	30	55
JSRG100LC	198	100	100	43	33	152	13.3	36	60

Model No.	Main dimensions [mm]				Extension rate A ($\frac{L_{max}}{L_{min}}$)	Supported model numbers
	Screw size S	Mounting bolt S ₁	a	b		
JSRG 85LC	M6	M6×8L	3	23.5	9	SRG 85LC
JSRG100LC	M6	M6×8L	4	26	9	SRG100LC

Model Number Coding

JSRG85 - 60 / 300

Model No. Dimensions of the bellows
(length when compressed / length when extended)

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

$$L_{min} = \frac{S}{(A-1)} \quad S: \text{Stroke length (mm)}$$

$$L_{max} = L_{min} \cdot A \quad A: \text{Extension rate}$$

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
SRG 85LC	C22	M22	35.5	5.7
SRG 100LC	C24	M24	39.5	7.7

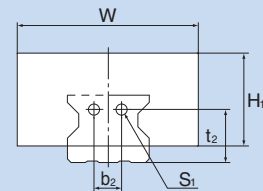
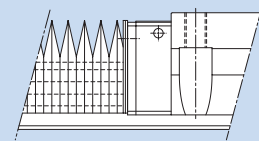
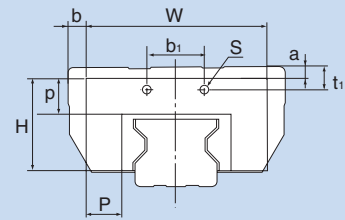
Greasing hole

Model SRG 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

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
SRG 85LC	15	22	8.2	PT1/8	13 (P10)	0.4	10
SRG 100LC	15	23	8.2	PT1/4	13 (P10)	0.4	10

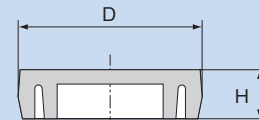
Dedicated Bellows JSRG for Model SRG



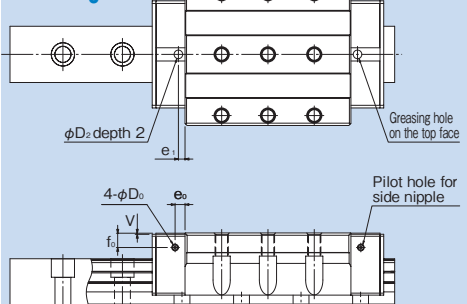
Note 1: For lubrication when using the dedicated bellows, contact THK.

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



Greasing hole



Precautions on Use

● Handling

- This product is a heavy object (over 20 kg). When carrying this heavy object, two or more people must hold it or a conveyor must be used. Failure to do so may cause injury or damage the product.
- Do not disassemble the parts. Doing so may let dust enter the product or lose some of the functions.
- Tilting an LM block or LM rail may cause them to fall by their own weight.
- Do not drop or hit the LM Guide. Doing so may cause injury or damage the product. If an impact is applied, some of the functions may be lost even if the product looks intact.
- If the mounting surface is machined with low accuracy, it may decrease the accuracy or the service life and damage the product.
- When mounting the LM block, secure it with bolts at 9 points to gain a sufficient rigidity.
- Take care to prevent foreign material such as dust and cutting chips from entering the product. Failure to do so may damage the roller circulating part or cause a functional loss.
- Some types of coolants may disrupt product functions. If using the product in an environment where the coolant may enter the LM block, contact THK in advance.
- Do not use the product at temperature of 80°C or higher. Contact THK if you desire to use the product at a temperature of 80°C or higher.
- If foreign material such as dust or cutting chips adheres to the product, replenish the lubricant after cleaning the product with pure white kerosene. For available types of detergent, contact THK.
- If using the LM Guide in an inverted orientation, take a measure such as adding a safety mechanism for preventing the LM Guide from falling. If the end plate is fractured in an accident or the like, rollers may drop off and the LM block may come off and fall from the LM rail.
- When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, contact THK in advance.
- If you remove the LM block from the LM rail and then reassemble the LM block with the LM rail, be sure to use the removing/mounting jig and carefully remove and insert the LM block. The removing/mounting jig is not including in the package as standard. If you desire to use it, contact THK.
- If using the pilot holes (not drilled through to prevent foreign material from entering the product) for top and side nipples of the LM block, contact THK in advance.
- Nipples are mounted at THK. Do not use the pilot holes dedicated for the top and side nipples for purposes other than mounting the nipples. Doing so may damage the product.

● Lubrication

- Thoroughly remove anti-rust oil and feed lubricant before using the product. When planning to use a special lubricant, contact THK before using it.
- Do not mix lubricants of different physical properties.
- In locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, normal lubricants may not be used. Contact THK for details.
- When adopting oil lubrication, the lubricant may not be distributed throughout the LM system depending on the mounting orientation of the system. Contact THK for details.
- Lubrication interval varies according to the conditions. Contact THK for details.

● Storage

- When storing the LM Guide, enclose it in a package designated by THK and store it in a horizontal orientation while avoiding high temperature, low temperature and high humidity.

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- The photo may differ slightly in appearance from the actual product.
 - The appearance and specifications of the product are subject to change without notice. Contact THK before placing an order.
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THK CO., LTD.

HEAD OFFICE 3-1-6, NISHI-GOTANDA, SHINAGAWA-KU, TOKYO 141-8503 JAPAN
INTERNATIONAL SALES DEPARTMENT PHONE:+81-3-5434-0351 FAX:+81-3-5434-0353
Global site : <http://www.thk.com/>

NORTH AMERICA

THK America, Inc.

● HEADQUARTERS

Phone:+1-847-310-1111 Fax:+1-847-310-1271

● CHICAGO OFFICE

Phone:+1-847-310-1111 Fax:+1-847-310-1182

● NEW YORK OFFICE

Phone:+1-845-369-4035 Fax:+1-845-369-4909

● ATLANTA OFFICE

Phone:+1-770-840-7990 Fax:+1-770-840-7897

● LOS ANGELES OFFICE

Phone:+1-949-955-3145 Fax:+1-949-955-3149

● SAN FRANCISCO OFFICE

Phone:+1-925-455-8948 Fax:+1-925-455-8965

● BOSTON OFFICE

Phone:+1-781-575-1151 Fax:+1-781-575-9295

● DETROIT OFFICE

Phone:+1-248-858-9330 Fax:+1-248-858-9455

● TORONTO OFFICE

Phone:+1-905-820-7800 Fax:+1-905-820-7811

SOUTH AMERICA

THK Brasil LTDA

Phone:+55-11-3767-0100 Fax:+55-11-3767-0101

EUROPE

THK GmbH

● EUROPEAN HEADQUARTERS

Phone:+49-2102-7425-0 Fax:+49-2102-7425-217

● DÜSSELDORF OFFICE

Phone:+49-2102-7425-0 Fax:+49-2102-7425-299

● FRANKFURT OFFICE

Phone:+49-2102-7425-650 Fax:+49-2102-7425-699

● STUTTGART OFFICE

Phone:+49-7150-9199-0 Fax:+49-7150-9199-888

● MÜNCHEN OFFICE

Phone:+49-8937-0616-0 Fax:+49-8937-0616-26

● U.K. OFFICE

Phone:+44-1908-30-3050 Fax:+44-1908-30-3070

● ITALY MILANO OFFICE

Phone:+39-039-284-2079 Fax:+39-039-284-2527

● ITALY BOLOGNA OFFICE

Phone:+39-051-641-2211 Fax:+39-051-641-2230

● SWEDEN OFFICE

Phone:+46-8-445-7630 Fax:+46-8-445-7639

● AUSTRIA OFFICE

Phone:+43-7229-51400 Fax:+43-7229-51400-79

● SPAIN OFFICE

Phone:+34-93-652-5740 Fax:+34-93-652-5746

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Phone:+90-216-362-4050 Fax:+90-216-362-4050

● PRAGUE OFFICE

Phone:+420-2-41025-100 Fax:+420-2-41025-199

THK France S.A.S.

Phone:+33-4-3749-1400 Fax:+33-4-3749-1401

CHINA

THK (CHINA) CO.,LTD.

● HEADQUARTERS

Phone:+86-411-8733-7111 Fax:+86-411-8733-7000

● SHANGHAI OFFICE

Phone:+86-21-6219-3000 Fax:+86-21-6219-9890

● BEIJING OFFICE

Phone:+86-10-8441-7277 Fax:+86-10-6590-3557

● CHENGDU OFFICE

Phone:+86-28-8526-8025 Fax:+86-28-8525-6357

● GUANGZHOU OFFICE

Phone:+86-20-8523-8418 Fax:+86-20-3801-0456

THK (SHANGHAI) CO.,LTD.

Phone:+86-21-6275-5280 Fax:+86-21-6219-9890

TAIWAN

THK TAIWAN CO.,LTD.

● TAIPEI HEAD OFFICE

Phone:+886-2-2888-3818 Fax:+886-2-2888-3819

● TAICHUNG OFFICE

Phone:+886-4-2359-1505 Fax:+886-4-2359-1506

● TAINAN OFFICE

Phone:+886-6-289-7668 Fax:+886-6-289-7669

KOREA

SEOUL REPRESENTATIVE OFFICE

Phone:+82-2-3468-4351 Fax:+82-2-3468-4353

SINGAPORE

THK LM SYSTEM Pte. Ltd.

Phone:+65-6884-5500 Fax:+65-6884-5550

INDIA

BANGALORE REPRESENTATIVE OFFICE

Phone:+91-80-2330-1524 Fax:+91-80-2314-8226