

Wide, Low Gravity Center Type LM Guide Model SHW

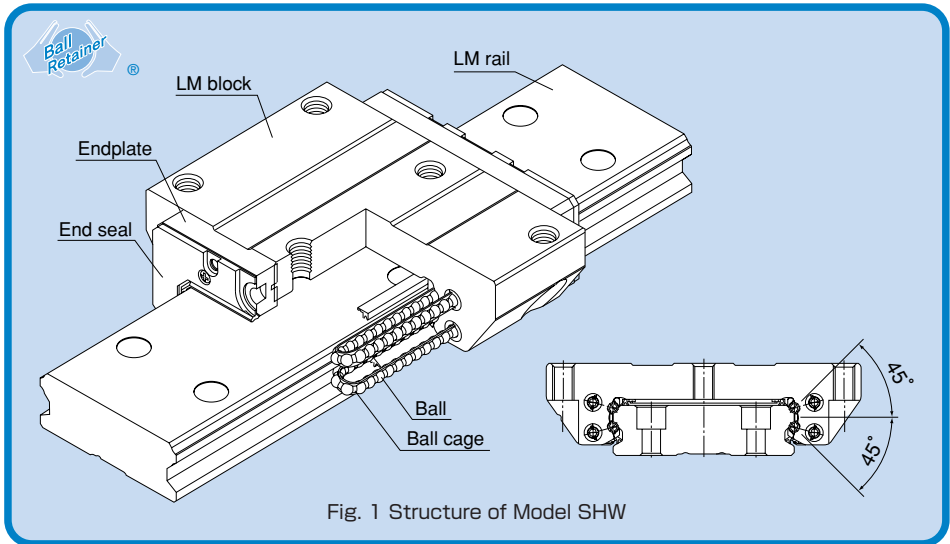


Fig. 1 Structure of Model SHW

● Structure and Features

A wide and highly rigid LM Guide that uses ball cages to achieve low noise, long-term maintenance-free operation and high speed.

● Wide, low gravity center

Model SHW, which has a wide LM rail and a low gravity center, is optimal for locations requiring space saving and large MC moment rigidity.

● 4-way equal load

Each row of balls is placed at a contact angle of 45° so that the rated loads applied to the LM Guide are uniform in the four directions (radial, reverse-radial and lateral directions), enabling the LM Guide to be used in all orientations and in extensive applications.

● Self-adjustment capability

The self-adjustment capability through front-to-front configuration of THK's unique circular-arc grooves (DF set) enables a mounting error to be absorbed even under a preload, thus to achieve highly accurate, smooth linear motion.

● Low dust generation

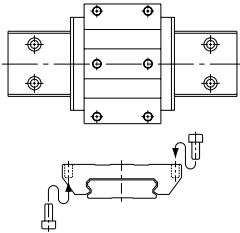
Use of ball cages eliminates friction between balls and retains lubricant, thus achieving low dust generation.

Types and Features

Model SHW-CA

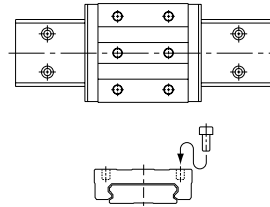
The flange of the LM block has tapped holes.

Can be mounted from the top or the bottom.



Model SHW-CR

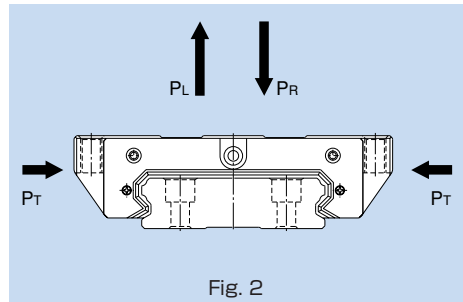
The LM block has tapped holes.



Rated Loads in All Directions

Model SHW is capable of receiving loads in all four 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 actual values are provided in the dimensional table for SHW.



Equivalent Load

When the LM block of model SHW receives loads in all directions simultaneously, the equivalent load is obtained from the equation below.

$$P_E = P_R (P_L) + P_T$$

where

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)

Options

Dust Prevention Accessories

THK offers various dust prevention accessories for model SHW.

When a dust prevention accessory is required, specify the desired item with the corresponding symbol provided in table 1 (for details of dust prevention accessories, see pages a-24 and a-25).

For supported model numbers for dust prevention accessories and overall LM block length with dust prevention accessories attached (dimension L), see page a-166.

Table 1 Symbols of Dust Prevention Accessories for Model SHW

Symbol	Dust prevention accessory
UU	With end seal
SS	With end seal + side seal + inner seal
DD	With double seals + side seal + inner seal
ZZ	With end seal + side seal + inner seal + metal scraper
KK	With double seals + side seal + inner seal + metal scraper
SSHH	With end seal + side seal + inner seal + LaCS
DDHH	With double seals + side seal + inner seal + LaCS
ZZHH	With end seal + side seal + inner seal + metal scraper + LaCS
KKHH	With double seals + side seal + inner seal + metal scraper + LaCS

Note: The inner seal and LaCS are not available for models SHW12, 14 and 17.

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seals SHW ... UU/SS, refer to the corresponding value provided in table 2.

Table 2 Maximum Seal Resistance

Value of Seals SHW ... UU/SS

Unit: N

Model No.	Seal resistance value	
	UU	SS
SHW 12CA/CR	1.0	1.4
SHW 12HR	1.0	1.8
SHW 14	1.2	1.8
SHW 17	1.4	2.2
SHW 21	4.9	6.9
SHW 27	4.9	8.9
SHW 35	9.8	15.8
SHW 50	14.7	22.7

●Dedicated Bellows JSHW for Model SHW

Table 3 below shows the dimensions of dedicated bellows JSHW for model SHW. Specify the corresponding model number of the desired bellows from the table.

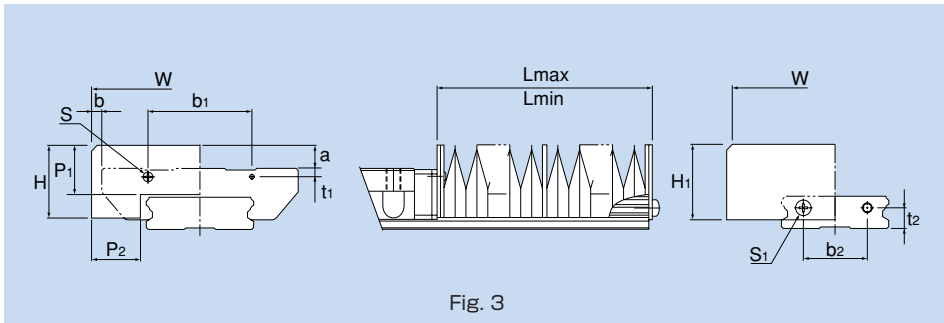


Fig. 3

Table 3 Dimensional Table for JSHW

Unit: mm

Model No.	Major dimensions									Supported model
	W	H	H ₁	P ₁	P ₂	b ₁	t ₁	b ₂	t ₂	
JSHW 17	68	22	23	15	15.4	39	2.6	18	6	SHW 17
JSHW 21	75	25	26	17	17	35.8	2.9	22	7	SHW 21
JSHW 27	85	33.5	33.5	20	20	25	3.5	20	10	SHW 27
JSHW 35	120	35	35	20	20	75	7.5	40	13	SHW 35
JSHW 50	164	42	42	20	20	89.4	14	50	16	SHW 50

Model No.	Other dimensions						A ($\frac{L_{max}}{L_{min}}$)
	Mounting bolt		a	b		A	
*S	S ₁	Type CA		Type CR			
JSHW 17	M2×4 ℓ	M3×6 ℓ	8	4	9	5	
JSHW 21	M2×5 ℓ	M3×6 ℓ	8	3.5	10.5	6	
JSHW 27	M2.6×6 ℓ	M3×6 ℓ	10	2.5	11.5	7	
JSHW 35	M3×8 ℓ	M3×6 ℓ	6	0	10	7	
JSHW 50	M4×12 ℓ	M4×8 ℓ	—	1	17	7	

Note 1: When desiring to use the dedicated bellows other than in horizontal mount (i.e., vertical, wall and inverted mount), or when desiring a heat-resistant type of bellows, contact .

Note 2: For lubrication when using the dedicated bellows, contact .

Note 3: For the mounting bolts marked with "*", use tapping screws.

Note 4: When using the dedicated bellows, the LM block and LM rail need to be machined so that the bellows can be mounted. Be sure to indicate that the dedicated bellows is required when ordering SHS.

Model number coding **JSHW21-60/360**

1 **2**

- 1** Model number ... bellows for SHW21
- 2** Bellows dimensions (length when compressed / length when extended)

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

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

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

●Dedicated Cap C for LM Rail Mounting Holes

If any of the LM rail mounting holes of an LM Guide is filled with cutting chips or foreign matter, they may enter the LM block structure. Entrance of such foreign matter can be prevented by covering each LM rail mounting hole with the dedicated cap so that the top of the mounting holes are on the same level as the LM rail top face.

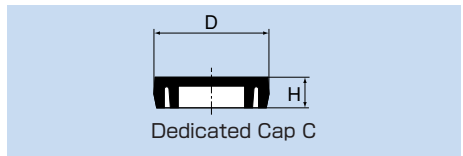
Since the dedicated cap C for LM rail mounting holes uses a special synthetic resin with high oil resistance and high wear resistance, it is highly durable.

When placing an order, specify the desired cap type with the corresponding cap number indicated in table 4.

For the procedure for mounting the cap, see page a-22.

Table 4 Major Dimensions of Dedicated Cap C

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
SHW 12	C4	M4	7.8	1.0
SHW 14	C4	M4	7.8	1.0
SHW 17	C4	M4	7.8	1.0
SHW 21	C4	M4	7.8	1.0
SHW 27	C4	M4	7.8	1.0
SHW 35	C6	M6	11.4	2.7
SHW 50	C8	M8	14.4	3.7



QZ Lubricator™

When QZ Lubricator is required, specify the desired type with the corresponding symbol indicated in table 5 (for details of QZ Lubricator, see pages a-19 and a-20).

For supported LM Guide model numbers for QZ Lubricator and overall LM block length with QZ Lubricator attached (dimension L), see page a-166.

Table 5 Parts Symbols for Model SHW with QZ Lubricator Attached

Symbol	Dust prevention accessories for LM Guide with QZ Lubricator attached
QZUU	With end seal + QZ Lubricator
QZSS	With end seal + side seal + QZ Lubricator
QZDD	With double seals + side seal + QZ Lubricator
QZZZ	With end seal + side seal + metal scraper + QZ Lubricator
QZKK	With double seals + side seal + metal scraper + QZ Lubricator
QZSSH	With end seal + side seal + LaCS + QZ Lubricator
QZDDH	With double seals + side seal + LaCS + QZ Lubricator
QZZHH	With end seal + side seal + metal scraper + LaCS + QZ Lubricator
QZKHH	With double seals + side seal + metal scraper + LaCS + QZ Lubricator

Note: The inner seal and LaCS are not available for models SHW12, 14 and 17.

Grease Nipple and Greasing Hole

Model SHW does not have a grease nipple as standard. Installation of a grease nipple and the drilling of a greasing hole is performed at THK. When ordering SHW, indicate that the desired model requires a grease nipple or greasing hole (for greasing hole dimensions and supported grease nipple types and dimensions, see table 6).

When using SHW under harsh conditions, use QZ Lubricator* (optional) or Laminated Contact Scraper LaCS* (optional).

Note 1: Grease nipple is not available for models SHW12, 14 and 17. They can have a greasing hole.

Note 2: Using a greasing hole other than for greasing may cause damage.

Note 3: For QZ Lubricator* and Laminated Contact Scraper LaCS*, see pages a-19 and a-20, and pages a-29 and a-30, respectively.

Note 4: When desiring a grease nipple for a model attached with QZ Lubricator, contact THK.

Table 6 Table of Grease Nipple and Greasing Hole Dimensions

Unit: mm

Model No.	E	Grease nipple or greasing hole
SHW 12	—	φ2.2 drilled hole
SHW 14	—	φ2.2 drilled hole
SHW 17	5	PB107
SHW 21	5.5	PB1021B
SHW 27	12	B-M6F
SHW 35	12	B-M6F
SHW 50	16	B-PT1/8

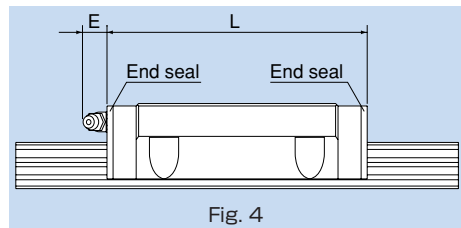


Fig. 4

Note: For the L dimension, see the corresponding dimension table.

Standard Length and Maximum Length of the LM Rail

Table 7 shows the standard lengths and the maximum lengths of model SHW variations. If the maximum length of the desired LM rail exceeds them, connected rails will be used. Contact THK for details.

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.

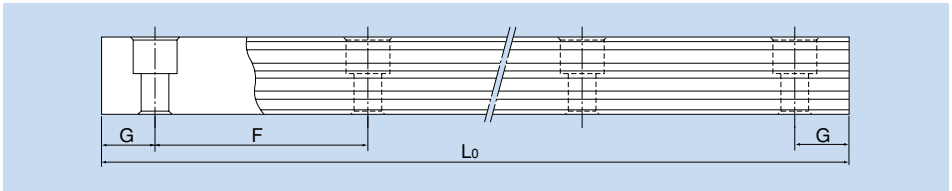


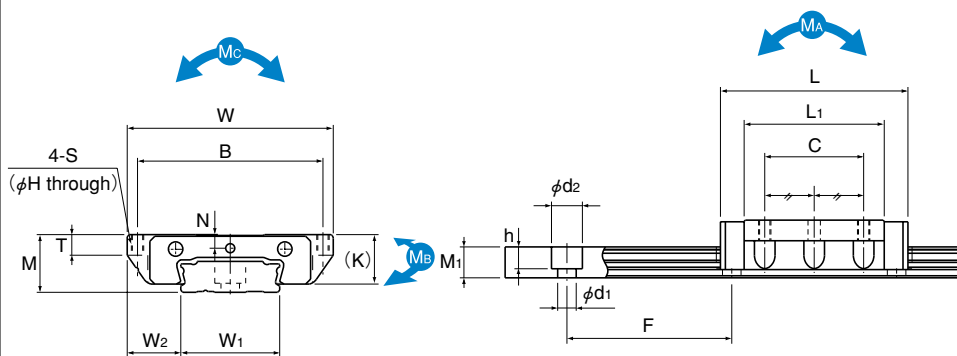
Table 7 Standard Length and Maximum Length of the LM Rail for Model SHW Unit: mm

Model No.	SHW 12	SHW 14	SHW 17	SHW 21	SHW 27	SHW 35	SHW 50
Standard LM rail length (L_0)	70	70	110	130	160	280	280
	110	110	190	230	280	440	440
	150	150	310	380	340	760	760
	190	190	470	480	460	1000	1000
	230	230	550	580	640	1240	1240
	270	270		780	820	1560	1640
	310	310					2040
	390	390					
	470	470					
		550	670				
Standard pitch F	40	40	40	50	60	80	80
G	15	15	15	15	20	20	20
Max length	1000	1430	1800	1900	3000	3000	3000

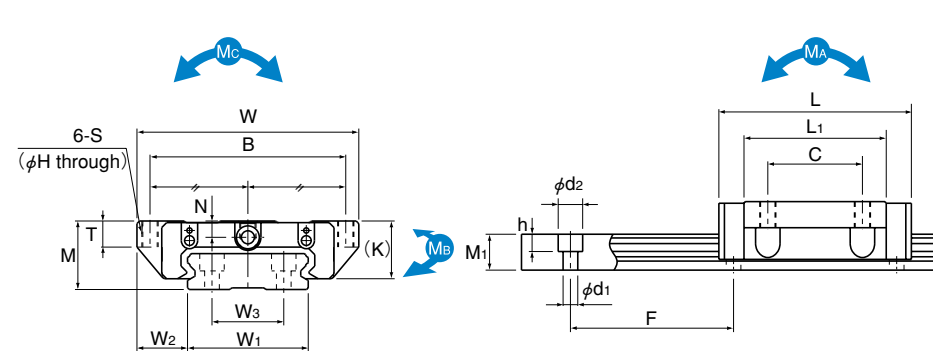
Note 1: The maximum length varies with accuracy grades. Contact THK for details.

Note 2: If connected rails are not allowed and a greater length than the maximum values above is required, contact THK.

Note 3: Models SHW12, 14 and 17 are made of stainless steel.



Models SHW12CAM and SHW14CAM



Models SHW17CAM and SHW21 to 50CA

Unit: mm

Model No.	External dimensions			LM block dimensions								LM rail dimensions					Basic load rating		Static permissible moment kN-m*					Mass		
	Height M	Width W	Length L	B	C	S	H	L ₁	T	K	N	Width W ₁	W ₂	W ₃	Height M ₁	Pitch F	d ₁ ×d ₂ ×h	C	C ₀	M _A 1 block	M _A 2 blocks in close contact	M _B 1 block	M _B 2 blocks in close contact	M _C 1 block	LM block kg	LM rail kg/m
SHW 12CAM	12	40	37	35	18	M 3	2.5	27	4	10	2.8	18	11	—	6.6	40	4.5×7.5×5.3	4.31	5.66	0.0228	0.12	0.0228	0.12	0.0405	0.05	0.8
SHW 14CAM	14	50	45.5	45	24	M 3	2.5	34	5	12	3.3	24	13	—	7.5	40	4.5×7.5×5.3	7.05	8.98	0.0466	0.236	0.0466	0.236	0.0904	0.1	1.23
SHW 17CAM	17	60	51	53	26	M 4	3.3	38	6	14.5	4	33	13.5	18	8.6	40	4.5×7.5×5.3	7.65	10.18	0.0591	0.298	0.0591	0.298	0.164	0.15	1.9
SHW 21CA	21	68	59	60	29	M 5	4.4	43.6	8	17.7	5	37	15.5	22	11	50	4.5×7.5×5.3	8.24	12.8	0.0806	0.434	0.0806	0.434	0.229	0.24	2.9
SHW 27CA	27	80	72.8	70	40	M 6	5.3	56.6	10	23.5	6	42	19	24	15	60	4.5×7.5×5.3	16	22.7	0.187	0.949	0.187	0.949	0.455	0.47	4.5
SHW 35CA	35	120	107	107	60	M 8	6.8	83	14	31	7.6	69	25.5	40	19	80	7×11×9	35.5	49.2	0.603	3	0.603	3	1.63	1.4	9.6
SHW 50CA	50	162	141	144	80	M10	8.6	107	18	46	14	90	36	60	24	80	9×14×12	70.2	91.4	1.46	7.37	1.46	7.37	3.97	3.7	15

Note Since it uses stainless steel in the LM block, LM rail and balls, this model is highly resistant to corrosion and environment.

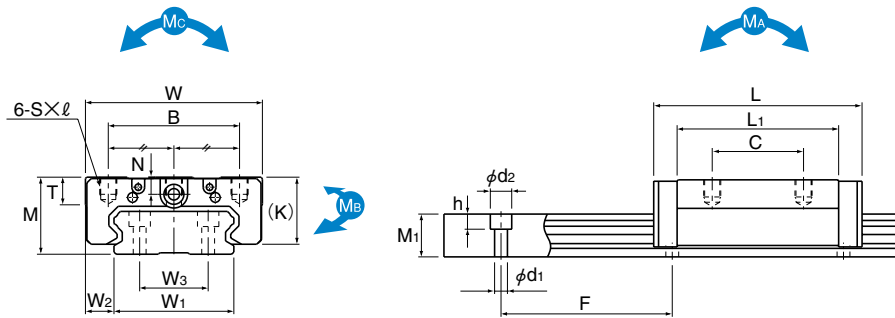
Note If a grease nipple is required, indicate "with grease nipple;" if a greasing hole is required, indicate "with greasing hole."

Model number coding **SHW17 CA 2 QZ UU C1 M +580L P M - II**
 1 2 3 4 5 6 7 8 9 10 11

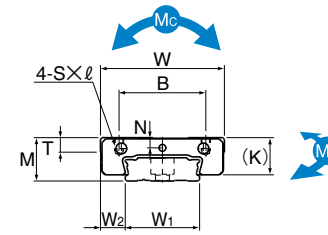
- 1 Model number
- 2 Type of LM block
- 3 No. of LM blocks used on the same rail
- 4 With QZ Lubricator
- 5 Dust prevention accessory symbol (see page a-156)
- 6 Radial clearance symbol (see page a-34)
- 7 LM block is made of stainless steel
- 8 LM rail length (in mm)
- 9 Accuracy symbol (see page a-38)
- 10 LM rail is made of stainless steel
- 11 No. of rails used on the same plane

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.

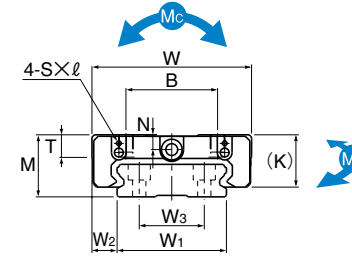
Static permissible moment*: 1 block: static permissible moment value with 1 LM block
 2 blocks: static permissible moment value with 2 blocks closely contacting with each other



Models SHW27 to 50CR



Models SHW12CRM, SHW12HRM and SHW14CRM



Models SHW17CRM and SHW21CR

Unit: mm

Model No.	External dimensions			LM block dimensions							LM rail dimensions					Basic load rating		Static permissible moment kN-m*			Mass				
	Height M	Width W	Length L	B	C	S x l	L ₁	T	K	N	Width W ₁	W ₂	W ₃	Height M ₁	Pitch F	d ₁ x d ₂ x h	C kN	C ₀ kN	M _A 1 block	M _B 2 blocks in close contact	M _C 1 block	LM block kg	LM rail kg/m		
SHW 12CRM	12	30	37	21	12	M3X3.5	27	4	10	2.8	18	6	—	6.6	40	4.5X7.5X5.3	4.31	5.66	0.0228	0.12	0.0228	0.12	0.0405	0.04	0.8
SHW 12HRM	12	30	50.4	21	24	M3X3.5	40.4	4	10	2.8	18	6	—	6.6	40	4.5X7.5X5.3	5.56	8.68	0.0511	0.246	0.0511	0.246	0.0621	0.06	0.8
SHW 14CRM	14	40	45.5	28	15	M3X4	34	5	12	3.3	24	8	—	7.5	40	4.5X7.5X5.3	7.05	8.98	0.0466	0.236	0.0466	0.236	0.0904	0.08	1.23
SHW 17CRM	17	50	51	29	15	M4X5	38	6	14.5	4	33	8.5	18	8.6	40	4.5X7.5X5.3	7.65	10.18	0.0591	0.298	0.0591	0.298	0.164	0.13	1.9
SHW 21CR	21	54	59	31	19	M5X6	43.6	8	17.7	5	37	8.5	22	11	50	4.5X7.5X5.3	8.24	12.8	0.0806	0.434	0.0806	0.434	0.229	0.19	2.9
SHW 27CR	27	62	72.8	46	32	M6X6	56.6	10	23.5	6	42	10	24	15	60	4.5X7.5X5.3	16	22.7	0.187	0.949	0.187	0.949	0.455	0.36	4.5
SHW 35CR	35	100	107	76	50	M8X8	83	14	31	7.6	69	15.5	40	19	80	7X11X9	35.5	49.2	0.603	3	0.603	3	1.63	1.2	9.6
SHW 50CR	50	130	141	100	65	M10X15	107	18	46	14	90	20	60	24	80	9X14X12	70.2	91.4	1.46	7.37	1.46	7.37	3.97	3	15

Note Since it uses stainless steel in the LM block, LM rail and balls, this model is highly resistant to corrosion and environment.

Note If a grease nipple is required, indicate "with grease nipple;" if a greasing hole is required, indicate "with greasing hole."

Model number coding SHW27 CR 2 QZ KKHH C1 +820L P

1 2 3 4 5 6 7 8

- 1 Model number
- 2 Type of LM block
- 3 No. of LM blocks used on the same rail
- 4 With QZ Lubricator
- 5 Dust prevention accessory symbol (see page a-156)
- 6 Radial clearance symbol (see page a-34)
- 7 LM rail length (in mm)
- 8 Accuracy symbol (see page a-38)

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

Static permissible moment*: 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

Overall LM Block Length with Options

Overall LM Block Length (Dimension L) of Model SHW with a Dust Prevention Accessory Attached

Unit: mm

Model No.	UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
SHW12 CAM/CRM	37	37	—	—	—	—	—	—	—
SHW12 HRM	50.4	50.4	—	—	—	—	—	—	—
SHW14 CAM/CRM	45.5	45.5	—	—	—	—	—	—	—
SHW17 CAM/CRM	51	51	54	53.4	56.4	—	—	—	—
SHW21 CA/CR	59	59	64	63.2	68.2	75.6	80.6	77.2	82.2
SHW27 CA/CR	72.8	72.8	78.6	77.8	83.6	89.4	95.2	91.8	97.6
SHW35 CA/CR	107	107	114.4	112	119.4	129	136.4	131.4	138.8
SHW50 CA/CR	141	141	149.2	147.4	155.6	166	174.2	168.4	176.6

Note: "—" indicates not available.

Overall LM Block Length (Dimension L) of Model SHW with QZ Lubricator Attached

Unit: mm

Model No.	QZUU	QZSS	QZDD	QZZZ	QZKK	QZSSHH	QZDDHH	QZZZHH	QZKKHH
SHW12 CAM/CRM	47	47	—	—	—	—	—	—	—
SHW12 HRM	60.4	60.4	—	—	—	—	—	—	—
SHW14 CAM/CRM	55.5	55.5	—	—	—	—	—	—	—
SHW17 CAM/CRM	63	63	66	65.4	68.4	—	—	—	—
SHW21 CA/CR	75	75	80	77.8	82.8	91.6	96.6	93.2	98.2
SHW27 CA/CR	92.8	92.8	98.6	96.4	102.2	109.4	115.2	111.8	117.6
SHW35 CA/CR	127	127	134.4	132	134.4	149	156.4	151.4	158.8
SHW50 CA/CR	161	161	169.2	167.4	175.6	186	194.2	188.4	196.6

Note: "—" indicates not available.

Basic Specifications of LaCS®

① Service temperature range of LaCS:

-20°C to +80°C

② Resistance of LaCS: indicated in table 8

Table 8 Resistance of LaCS

Unit: N

Model No.	Resistance of LaCS
SHW 21	3.9
SHW 27	6.5
SHW 35	13.0
SHW 50	19.5

Note 1: Each resistance value in the table only consists of that of LaCS, and does not include sliding resistances of seals and other accessories.

Note 2: For the maximum service speed of LaCS, contact THK.

Grease Nipple

Those LM Guide models without QZ Lubricator are equipped with a grease nipple. Fig. 5 shows the mounting location for the grease nipple. Please note that attaching the grease nipple increases the LM block width.

■ For LM Guide Models with Dust Prevention Accessories SSHH, DDHH, ZZHH or KKHH

LM Guide models with dust prevention accessories SSHH, DDHH, ZZHH or KKHH have the grease nipple in the location indicated in Fig. 5. Table 9 shows incremental dimensions with the grease nipple.

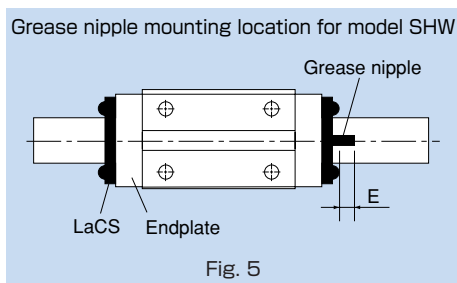


Table 9

Unit: mm

Model No.	Incremental dimension with grease nipple E	Nipple type
SHW 21CA/CR	4.2	PB1021B
SHW 27CA/CR	10.7	B-M6F
SHW 35CA/CR	10.0	B-M6F
SHW 50CA/CR	21.0	B-PT1/8

Note: When desiring the mounting location for the grease nipple other than the one indicated in Fig. 5, contact **THK**.

■ For LM Guide Models with Dust Prevention Accessories UU or SS

For the incremental dimension of the grease nipple when dust prevention accessories UU or SS are attached, see table 6 on page a-159.

■ For LM Guide Models with Dust Prevention Accessories DD, ZZ or KK

For the mounting location of the grease nipple and its incremental dimension when dust prevention accessories DD, ZZ or KK are attached, contact **THK**.

Model number coding

SHW21 CA 2 QZ KKHH C1 +780L P

1

2

3

1 LM Guide model number

2 QZ : with QZ Lubricator, without grease nipple
No symbol: without QZ Lubricator (note 2)

3 Dust prevention accessory symbol (see page a-156)

Note 1: QZ Lubricator and LaCS are not sold alone.

Note 2: Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring both QZ Lubricator and LaCS to be attached, contact **THK**.

Note 3: When desiring a model without QZ Lubricator and with a grease nipple, indicate "with grease nipple" (otherwise, the grease nipple will not be provided).

Precautions on Use

■ Laminated Contact Scraper LaCS for THK LM Guides

Service environment

- Be sure the service temperature range of Laminated Contact Scraper LaCS is between -20°C and $+80^{\circ}\text{C}$, and do not clean LaCS in an organic solvent or white kerosene, or leave it unpacked.

Impregnating oil

- The lubricant impregnated into Laminated Contact Scraper LaCS is used to increase the sliding capability of LaCS itself. For lubrication of the LM Guide, attach QZ Lubricator or the grease nipple.

Function

- The intended role of Laminated Contact Scraper LaCS is to remove foreign matter or liquids. To seal oils, end seals are needed.

Design

- When using Laminated Contact Scraper LaCS, be sure to use the dedicated cap C for LM rail mounting holes or an appropriate form of cover.

■ QZ Lubricator for THK LM Guides

Handling

- Dropping or hitting this product may damage it. Take much care when handling it.
- Do not clean it with an organic solvent or white kerosene.
- Do not leave it unpacked for a long period of time.
- Do not block the air vent with grease or the like.

Service temperature range

- Be sure the service temperature of this product is between -10°C and $+50^{\circ}\text{C}$.

Use in a special environment

- When using it in a special environment, contact THK.

Precaution on selection

- Be sure the stroke is longer than the overall length of the LM block length attached with QZ Lubricator.

Corrosion prevention of LM Guides

- QZ Lubricator is a lubricating device designed to feed a minimum amount of oil to the ball raceway of LM rails, and does not provide corrosion prevention to the whole LM Guide. When using it in an environment subject to a coolant or the like, we strongly recommend taking an anti-corrosion measure.