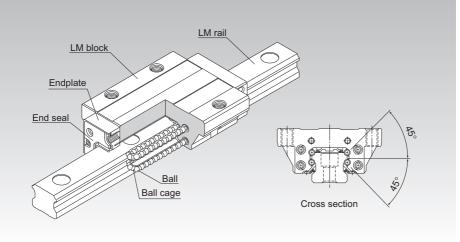
SHS



Caged Ball LM Guide Global Standard Size Model SHS



*For the Ball Cage, see A1-88.

Point of Selection	A1-10
Point of Design	A1-454
Options	A1-477
Model No.	A1-543
Precautions on Use	A 1-549
Accessories for Lubrication	A24-1
Mounting Procedure and Maintenance	■ 1-89
Equivalent moment factor	A1-43
Rated Loads in All Directions	△ 1-59
Equivalent factor in each direction	△1-61
Radial Clearance	A1-71
Accuracy Standards	A1-77
Shoulder Height of the Mounting Base and the Corner Radius	A1-464
Permissible Error of the Mounting Surface	A1-470
Dimensions of Each Model with an Option Attached	A1-491

Structure and Features

Balls roll in four rows of raceways precision-ground on an LM rail and an LM block, and ball cages and endplates 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. In addition, the LM block can receive a well-balanced preload, increasing the rigidity in the four directions while maintaining a constant, low friction coefficient.

[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 block 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 straight motion.

[Global Standard Size]

SHS is designed to have dimensions almost the same as that of Full Ball LM Guide model HSR, which THK as a pioneer of the linear motion system has developed and is practically a global standard size.

[Stainless Steel Type also Available]

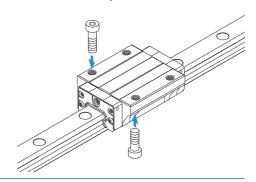
A special type whose LM block, LM rail, and balls are made of stainless steel is also available. Applicable only to models 15 through 25.

Types and Features

Model SHS-C

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

Specification Table⇒A1-96

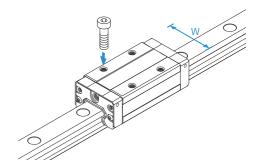


Model SHS-V

With this type, the LM block has a smaller width (W) and tapped holes.

Used in places where the space for table width is limited.

Specification Table⇒ 1-98

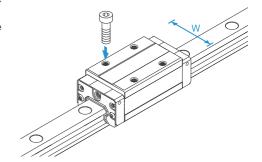


Model SHS-R

The LM block has a smaller width (W) and the mounting holes are tapped.

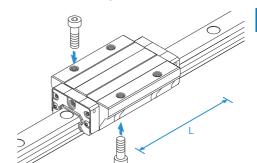
It succeeds the height dimension of full-ball type LM Guide HSR-R.

Specification Table⇒A1-100



Model SHS-LC

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

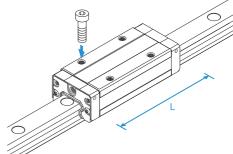


Model SHS-LV

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



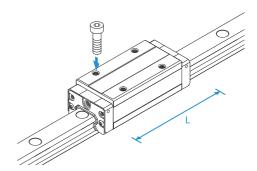
Specification Table⇒A1-96



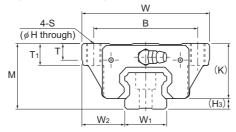
Model SHS-LR

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

Specification Table⇒A1-100



Models SHS-C, SHS-CM, SHS-LC and SHS-LCM



	Outer	dimer	nsions				LM b	lock c	dimen	sions					Pilot hole for side nipple		
Model No.	Height M	Width	Length L	В	С	S	Н	Lı	Т	T ₁	К	N	Е	Grease nipple	e ₀	fo	D ₀
SHS 15C SHS 15CM	24	47	64.4	38	30	M5	4.4	48	5.9	8	21	5.5	5.5	PB1021B	4	4	3
SHS 15LC SHS 15LCM	24	47	79.4	38	30	M5	4.4	63	5.9	8	21	5.5	5.5	PB1021B	4	4	3
SHS 20C SHS 20CM	30	63	79	53	40	M6	5.4	59	7.2	10	25.4	6.5	12	B-M6F	4.3	5.3	3
SHS 20LC SHS 20LCM	30	63	98	53	40	M6	5.4	78	7.2	10	25.4	6.5	12	B-M6F	4.3	5.3	3
SHS 25C SHS 25CM	36	70	92	57	45	M8	6.8	71	9.1	12	30.2	7.5	12	B-M6F	4.5	5.5	3
SHS 25LC SHS 25LCM	36	70	109	57	45	M8	6.8	88	9.1	12	30.2	7.5	12	B-M6F	4.5	5.5	3
SHS 30C SHS 30LC	42	90	106 131	72	52	M10	8.5	80 105	11.5	15	35	8	12	B-M6F	5.8	6	5.2
SHS 35C SHS 35LC	48	100	122 152	82	62	M10	8.5	93 123	11.5	15	40.5	8	12	B-M6F	6.5	5.5	5.2
SHS 45C SHS 45LC	60	120	140 174	100	80	M12	10.5	106 140	14.1	18	51.1	10.5	16	B-PT1/8	8	8	5.2
SHS 55C SHS 55LC	70	140	171 213	116	95	M14	12.5	131 173	16	21	57.3	11	16	B-PT1/8	10	8	5.2
SHS 65C SHS 65LC	90	170	221 272	142	110	M16	14.5	175 226	18.8	24	71	19	16	B-PT1/8	10	12	5.2

Model number coding

QZ KKHH C0 M +1240L Ζ **SHS25** LC

steel

Model number

Type of LM block No. of LM blocks

used on the same rail

With QZ Lubricator protection

Contamination accessory symbol (*1)

Normal (No symbol)

Medium preload (C0)

Light preload (C1)

Radial clearance symbol (*2)

Stainless LM rail length (in mm) LM block

tape Accuracy symbol (*3) Normal grade (No Symbol) High accuracy grade (H)

Precision grade (P)

Super precision grade (SP)

Ultra precision grade (UP)

LM rail Symbol for LM rail jointed use Symbol for

With steel Stainless steel

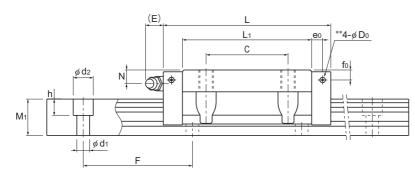
No. of rails used on the same

(*1) See contamination protection accessory on A1-516. (*2) See A1-71. (*3) See A1-77. (*4) See A1-13.

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. When desiring a grease nipple for a model attached with QZ, contact THK.







Unit: mm

			LM	rail d	mensions		Basic loa	ad rating	Static	permis	sible m	oment l	ĸN•m*	Mass	
	Width Height Pitch		Length		O	C ₀	2	√ ≥				LM block	LM rail		
Н₃	W ₁ 0 -0.05	W ₂	M ₁	F	$d_1{\times}d_2{\times}h$	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
3	15	16	13	60	4.5×7.5×5.3	3000 (1240)	14.2	24.2	0.175	0.898	0.175	0.898	0.16	0.23	1.3
3	15	16	13	60	4.5×7.5×5.3	3000 (1240)	17.2	31.9	0.296	1.43	0.296	1.43	0.212	0.29	1.3
4.6	20	21.5	16.5	60	6×9.5×8.5	3000 (1480)	22.3	38.4	0.334	1.75	0.334	1.75	0.361	0.46	2.3
4.6	20	21.5	16.5	60	6×9.5×8.5	3000 (1480)	28.1	50.3	0.568	2.8	0.568	2.8	0.473	0.61	2.3
5.8	23	23.5	20	60	7×11×9	3000 (2020)	31.7	52.4	0.566	2.75	0.566	2.75	0.563	0.72	3.2
5.8	23	23.5	20	60	7×11×9	3000 (2020)	36.8	64.7	0.848	3.98	0.848	3.98	0.696	0.89	3.2
7	28	31	23	80	9×14×12	3000	44.8 54.2	66.6 88.8	0.786 1.36	4.08 6.6	0.786 1.36	4.08 6.6	0.865 1.15	1.34 1.66	4.5
7.5	34	33	26	80	9×14×12	3000	62.3 72.9	96.6 127	1.38 2.34	6.76 10.9	1.38 2.34	6.76 10.9	1.53 2.01	1.9 2.54	6.2
8.9	45	37.5	32	105	14×20×17	3090	82.8 100	126 166	2.05 3.46	10.1 16.3	2.05 3.46	10.1 16.3	2.68 3.53	3.24 4.19	10.4
12.7	53	43.5	38	120	16×23×20	3060	128 161	197 259	3.96 6.68	19.3 31.1	3.96 6.68	19.3 31.1	4.9 6.44	5.35 6.97	14.5
19	63	53.5	53	150	18×26×22	3000	205 253	320 408	8.26 13.3	40.4 62.6	8.26 13.3	40.4 62.6	9.4 11.9	10.7 13.7	23.7

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-102**.)

Static permissible moment*

1 block: the static permissible moment with one LM block

Double blocks: static permissible moment when two LM blocks are in close contact with each other

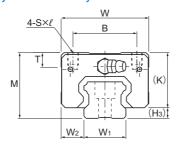
Total block length L

The total block length L shown in the table is the length with the dust proof parts, code UU or SS. If other contamination protection accessories or lubricant equipment are installed, the total block length will increase.

(See <u>M</u>1-491 or <u>M</u>1-512)

^{**} A pilot hole for side nipples, when a grease nipple for a model equipped with LaCS or QZ Lubricator is needed. Pilot holes for side nipples are not drilled through for models other than those stated above. For grease nipple mount machining, contact THK.

Models SHS-V, SHS-VM, SHS-LV and SHS-LVM



	Oute	r dimen	sions		LM block dimensions										Pilot hole for side nipple		
Model No.	Height	Width	Length									Grease nipple					
	М	W	L	В	С	S×ℓ	L ₁	Т	K	N	Е		e ₀	fo	D ₀		
SHS 15V SHS 15VM	24	34	64.4	26	26	M4×4	48	5.9	21	5.5	5.5	PB1021B	4	4	3		
SHS 15LV SHS 15LVM	24	34	79.4	26	34	M4×4	63	5.9	21	5.5	5.5	PB1021B	4	4	3		
SHS 20V SHS 20VM	30	44	79	32	36	M5×5	59	8	25.4	6.5	12	B-M6F	4.3	5.3	3		
SHS 20LV SHS 20LVM	30	44	98	32	50	M5×5	78	8	25.4	6.5	12	B-M6F	4.3	5.3	3		
SHS 25V SHS 25VM	36	48	92	35	35	M6×6.5	71	8	30.2	7.5	12	B-M6F	4.5	5.5	3		
SHS 25LV SHS 25LVM	36	48	109	35	50	M6×6.5	88	8	30.2	7.5	12	B-M6F	4.5	5.5	3		
SHS 30V SHS 30LV	42	60	106 131	40	40 60	M8×8	80 105	8	35	8	12	B-M6F	5.8	6	5.2		
SHS 35V SHS 35LV	48	70	122 152	50	50 72	M8×10	93 123	14.7	40.5	8	12	B-M6F	6.5	5.5	5.2		
SHS 45V SHS 45LV	60	86	140 174	60	60 80	M10×15	106 140	14.9	51.1	10.5	16	B-PT1/8	8	8	5.2		
SHS 55V SHS 55LV	70	100	171 213	75	75 95	M12×15	131 173	19.4	57.3	11	16	B-PT1/8	10	8	5.2		
SHS 65V SHS 65LV	90	126	221 272	76	70 120	M16×20	175 226	19.5	71	19	16	B-PT1/8	10	12	5.2		

Model number coding

SHS25 QZ KKHH C1 M +1240L Z

Model number

Type of LM block With QZ No. of LM blocks

used on the same rail

Contamination Lubricator protection accessory symbol (*1)

Normal (No symbol)

Medium preload (C0)

Light preload (C1)

Radial clearance symbol (*2)

Stainless LM rail length steel (in mm) LM block

Accuracy symbol (*3) Normal grade (No Symbol) High accuracy grade (H) Precision grade (P) Super precision grade (SP) Ultra precision grade (UP)

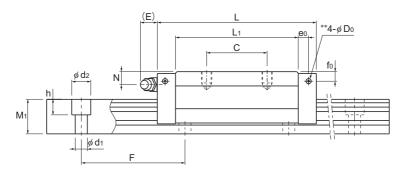
With steel Stainless steel tape LM rail Symbol for LM rail

jointed use Symbol for No. of rails used on the same

(*1) See contamination protection accessory on A1-516. (*2) See A1-71. (*3) See A1-77. (*4) See A1-13.

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. When desiring a grease nipple for a model attached with QZ, contact THK.





Unit: mm

			LM	rail d	imensions		Basic loa	ad rating	Static	permis	κN•m*	Mass			
	Width		Height Pitch			Length*	С	C ₀	2	M _A			M° CC	LM block	LM rail
Н₃	W ₁ 0 -0.05	W ₂	M ₁	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
3	15	9.5	13	60	4.5×7.5×5.3	3000 (1240)	14.2	24.2	0.175	0.898	0.175	0.898	0.16	0.19	1.3
3	15	9.5	13	60	4.5×7.5×5.3	3000 (1240)	17.2	31.9	0.296	1.43	0.296	1.43	0.212	0.22	1.3
4.6	20	12	16.5	60	6×9.5×8.5	3000 (1480)	22.3	38.4	0.334	1.75	0.334	1.75	0.361	0.35	2.3
4.6	20	12	16.5	60	6×9.5×8.5	3000 (1480)	28.1	50.3	0.568	2.8	0.568	2.8	0.473	0.46	2.3
5.8	23	12.5	20	60	7×11×9	3000 (2020)	31.7	52.4	0.566	2.75	0.566	2.75	0.563	0.54	3.2
5.8	23	12.5	20	60	7×11×9	3000 (2020)	36.8	64.7	0.848	3.98	0.848	3.98	0.696	0.67	3.2
7	28	16	23	80	9×14×12	3000	44.8 54.2	66.6 88.8	0.786 1.36	4.08 6.6	0.786 1.36	4.08 6.6	0.865 1.15	0.94 1.16	4.5
7.5	34	18	26	80	9×14×12	3000	62.3 72.9	96.6 127	1.38 2.34	6.76 10.9	1.38 2.34	6.76 10.9	1.53 2.01	1.4 1.84	6.2
8.9	45	20.5	32	105	14×20×17	3090	82.8 100	126 166	2.05 3.46	10.1 16.3	2.05 3.46	10.1 16.3	2.68 3.53	2.54 3.19	10.4
12.7	53	23.5	38	120	16×23×20	3060	128 161	197 259	3.96 6.68	19.3 31.1	3.96 6.68	19.3 31.1	4.9 6.44	4.05 5.23	14.5
19	63	31.5	53	150	18×26×22	3000	205 253	320 408	8.26 13.3	40.4 62.6	8.26 13.3	40.4 62.6	9.4 11.9	8.41 10.7	23.7

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-102**.)

Static permissible moment*

1 block: the static permissible moment with one LM block

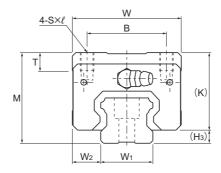
Double blocks: static permissible moment when two LM blocks are in close contact with each other

Total block length L

[:] The total block length L shown in the table is the length with the dust proof parts, code UU or SS. If other contamination protection accessories or lubricant equipment are installed, the

^{**} A pilot hole for side nipples, when a grease nipple for a model equipped with LaCS or QZ Lubricator is needed. Pilot holes for side nipples are not drilled through for models other than those stated above. For grease nipple mount machining, contact THK.

Models SHS-R, SHS-RM, SHS-LR and SHS-LRM



	Outer dimensions LM block dimensions									Pilot hole for side nipple					
Model No.	Height M	Width	Length L	В	С	S×ℓ	L ₁	Т	К	N	Е	Grease nipple	e ₀	fo	D ₀
SHS 15R SHS 15RM	28	34	64.4	26	26	M4×5	48	5.9	25	9.5	5.5	PB1021B	4	8	3
SHS 25R SHS 25RM	40	48	92	35	35	M6×8	71	8	34.2	11.5	12	B-M6F	6	9.5	3
SHS 25LR SHS 25LRM	40	48	109	35	50	M6×8	88	8	34.2	11.5	12	B-M6F	6	9.5	3
SHS 30R SHS 30LR	45	60	106 131	40	40 60	M8×10	80 105	8	38	11	12	B-M6F	5.8	9	5.2
SHS 35R SHS 35LR	55	70	122 152	50	50 72	M8×12	93 123	14.7	47.5	15	12	B-M6F	6.5	12.5	5.2
SHS 45R SHS 45LR	70	86	140 174	60	60 80	M10×17	106 140	14.9	61.1	20.5	16	B-PT1/8	8	18	5.2
SHS 55R SHS 55LR	80	100	171 213	75	75 95	M12×18	131 173	19.4	67.3	21	16	B-PT1/8	10	18	5.2

Model number coding

+1240L **SHS25 KKHH** QΖ

Model number

Type of LM block No. of LM blocks

used on the same rail

With QZ Lubricator protection

Contamination

Stainless steel accessory symbol (*1) LM block

Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)

LM rail length (in mm) Accuracy symbol (*3) Normal grade (No Symbol)

High accuracy grade (H) LM rail Precision grade (P) Super precision grade (SP) Ultra precision grade (UP)

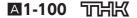
Stainless steel LM rail

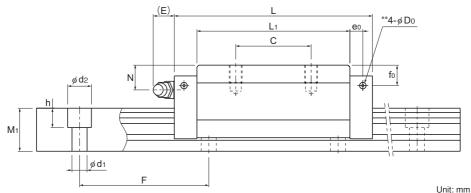
Symbol for Symbol for No. of rails used on the same jointed use plane (*4)

(*1) See contamination protection accessory on \$\textbf{1}\$-516. (*2) See \$\textbf{1}\$-77. (*3) See \$\textbf{1}\$-77. (*4) See \$\textbf{1}\$-13.

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. When desiring a grease nipple for a model attached with QZ, contact THK.





															Offic. Ithiri
			LM	rail d	imensions		Basic loa	ad rating	Static	permis	sible m	oment k	κN•m*	Mass	
	Width		Height	Pitch		Length*	С	C ₀	N C	1 _A		18	M° C□	LM block	LM rail
Н₃	W ₁ 0 -0.05	W ₂	M ₁	F	$d_1 \times d_2 \times h$	Max	kN	kN		Double blocks	1 block	Double blocks	1 block	kg	kg/m
3	15	9.5	13	60	4.5×7.5×5.3	3000 (1240)	14.2	24.2	0.175	0.898	0.175	0.898	0.16	0.22	1.3
5.8	23	12.5	20	60	7×11×9	3000 (2020)	31.7	52.4	0.566	2.75	0.566	2.75	0.563	0.66	3.2
5.8	23	12.5	20	60	7×11×9	3000 (2020)	36.8	64.7	0.848	3.98	0.848	3.98	0.696	0.8	3.2
7	28	16	23	80	9×14×12	3000	44.8 54.2	66.6 88.8	0.786 1.36	4.08 6.6	0.786 1.36	4.08 6.6	0.865 1.15	1.04 1.36	4.5
7.5	34	18	26	80	9×14×12	3000	62.3 72.9	96.6 127	1.38 2.34	6.76 10.9	1.38 2.34	6.76 10.9	1.53 2.01	1.8 2.34	6.2
8.9	45	20.5	32	105	14×20×17	3090	82.8 100	126 166	2.05 3.46	10.1 16.3	2.05 3.46	10.1 16.3	2.68 3.53	3.24 4.19	10.4
12.7	53	23.5	38	120	16×23×20	3060	128 161	197 259	3.96 6.68	19.3 31.1	3.96 6.68	19.3 31.1	4.9 6.44	5.05 6.57	14.5

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **1-102**.) Static permissible moment * 1 block: the static permissible moment with one LM block Double blocks: static permissible moment when two LM blocks are in close contact with each other

Total block length L

Double blocks: static permissible moment when two LM blocks are in close contact with each other: The total block length L shown in the table is the length with the dust proof parts, code UU or SS. If other contamination protection accessories or lubricant equipment are installed, the total block length will increase.

** A pilot hole for side nipples, when a grease nipple of model equipped with LaCS or QZ Lubricator is needed. Pilot holes for side nipples are not drilled through for models other than those stated above. For grease nipple mount machining, contact THK.

Standard Length and Maximum Length of the LM Rail

Table1 shows the standard and maximum lengths of the SHS model rail. If a rail length longer than the listed max length is required, rails may be jointed to meet the overall length. Contact THK for details. For special rail lengths, it is recommended to use a value corresponding to the G,g dimension from the table. As the G,g dimension increases, this portion becomes less stable, and the accuracy performance is severely impacted.

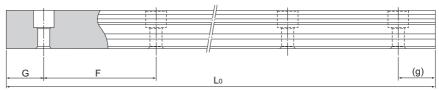


Table1 Standard Length and Maximum Length of the LM Rail for Model SHS

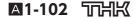
Unit: mm

Model No.	SHS 15	SHS 20	SHS 25	SHS 30	SHS 35	SHS 45	SHS 55	SHS 65
LM rail standard length (L₀)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1180 1240 1360 1480 1600	220 280 340 400 460 520 580 640 700 760 820 940 1000 1120 1180 1240 1360 1480 1600 1720 1840 1960 2080 2200	220 280 340 400 460 520 580 640 700 760 820 940 1000 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 22440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1880 1960 2040 2200 2360 2520 2680 2840 3000	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1880 1960 2040 2200 2360 2520 2680 2840 3000	570 675 780 885 990 1095 1200 1305 1410 1515 1620 1725 1830 1935 2040 2145 2250 2355 2460 2565 2670 2775 2880 2985 3090	780 900 1020 1140 1260 1380 1500 1620 1740 1860 1980 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620
Standard pitch F G,g	60 20	60 20	60 20	80 20	80 20	105 22.5	120 30	150 35
	3000	3000	3000					
Max length	(1240)	(1480)	(2020)	3000	3000	3090	3060	3000

Note1) The maximum length varies with accuracy grades. Contact THK for details.

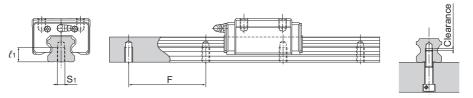
Note2) If jointed rails are not allowed and a greater length than the maximum values above is required, contact THK.

Note3) The figures in the parentheses indicate the maximum lengths of stainless steel models.



Tapped-hole LM Rail Type of Model SHS

SHS model rails also include a type where the LM rail is tapped from the bottom. This type is useful when mounting from the bottom of the base and when increased contamination protection is desired.



- (1) Determine the bolt length so that a clearance of 2 to 5 mm is secured between the bolt end and the bottom of the tap (effective tap depth). (See figure above.)
- (2) For standard pitches of the taps, see Table1 on A1-102.

Table2 Dimensions of the LM Rail Tap

Unit: mm

Model No.	S ₁	Effective tap depth ℓ_1						
SHS 15	M5	8						
SHS 20	M6	10						
SHS 25	M6	12						
SHS 30	M8	15						
SHS 35	M8	17						
SHS 45	M12	20						
SHS 55	M14	24						
SHS 65	M20	30						

Model number coding

SHS35 LC2UU +1000LH K

Symbol for tapped-hole LM rail type