

LM Guide®

THK General Catalog

LM Guide

THK General Catalog

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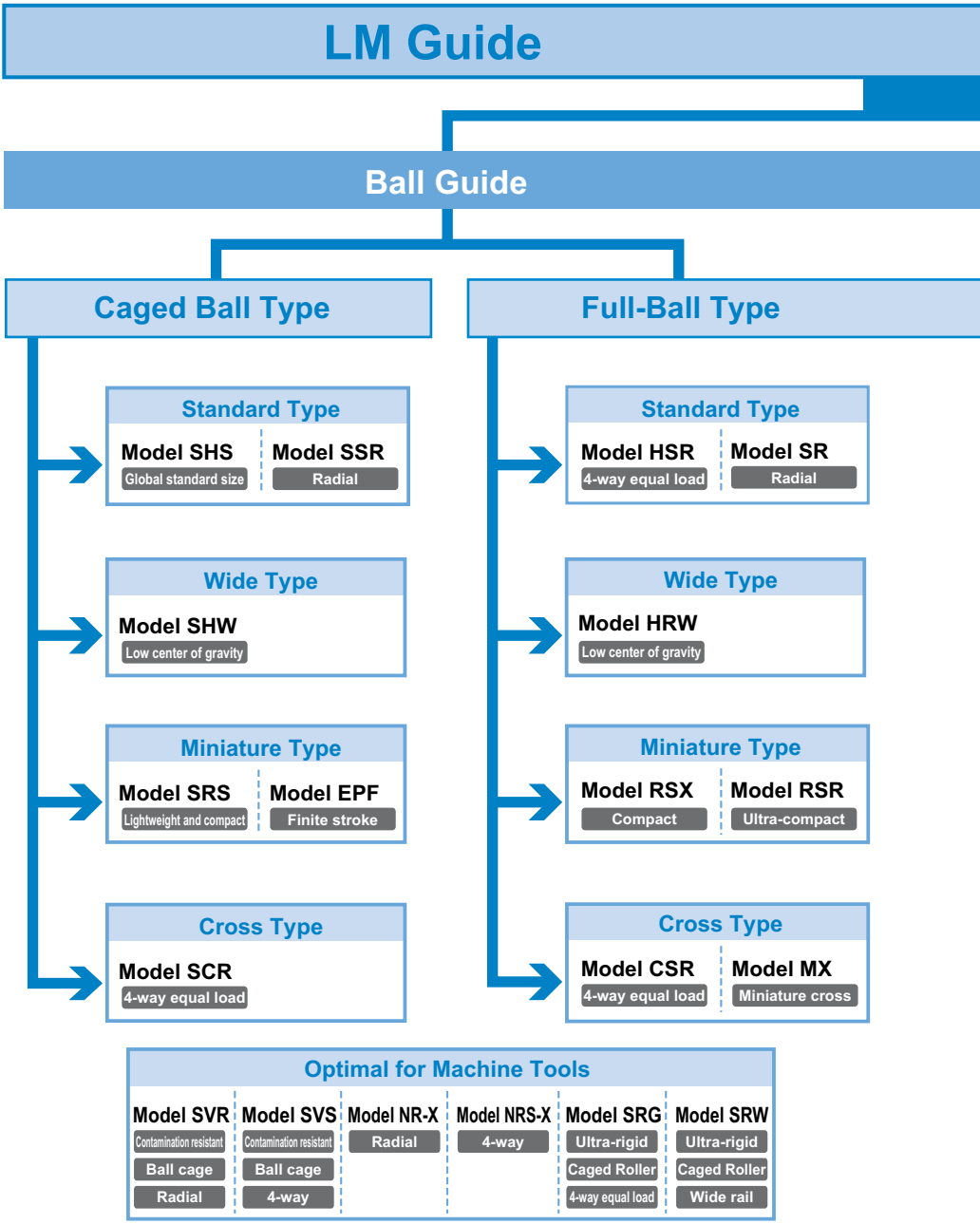
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LM Guide Classification Table



Roller Guide

With a Caged Roller

Standard Type

- **Model SRG** — Ultra-high rigidity
- **Model SRN** — Ultra-high rigidity; Low center of gravity

Wide Type

- **Model SRW** — Ultra-high rigidity

Full-Roller

Standard Type

- **Model HRX** — Super-high rigidity

Curved Type

- **Model HCR** — Curved type
- **Model HMG** — Straight-curved type

Separate Type

- **Model HR** — Heavy load
- **Model GSR** — Interchangeable, self-aligning
- **Model GSR-R** — Interchangeable, self-aligning; With rack

Model JR Type

- **Model JR** — Structural member rail; 4-way equal load

Self-aligning

- **Model NSR-TBC**

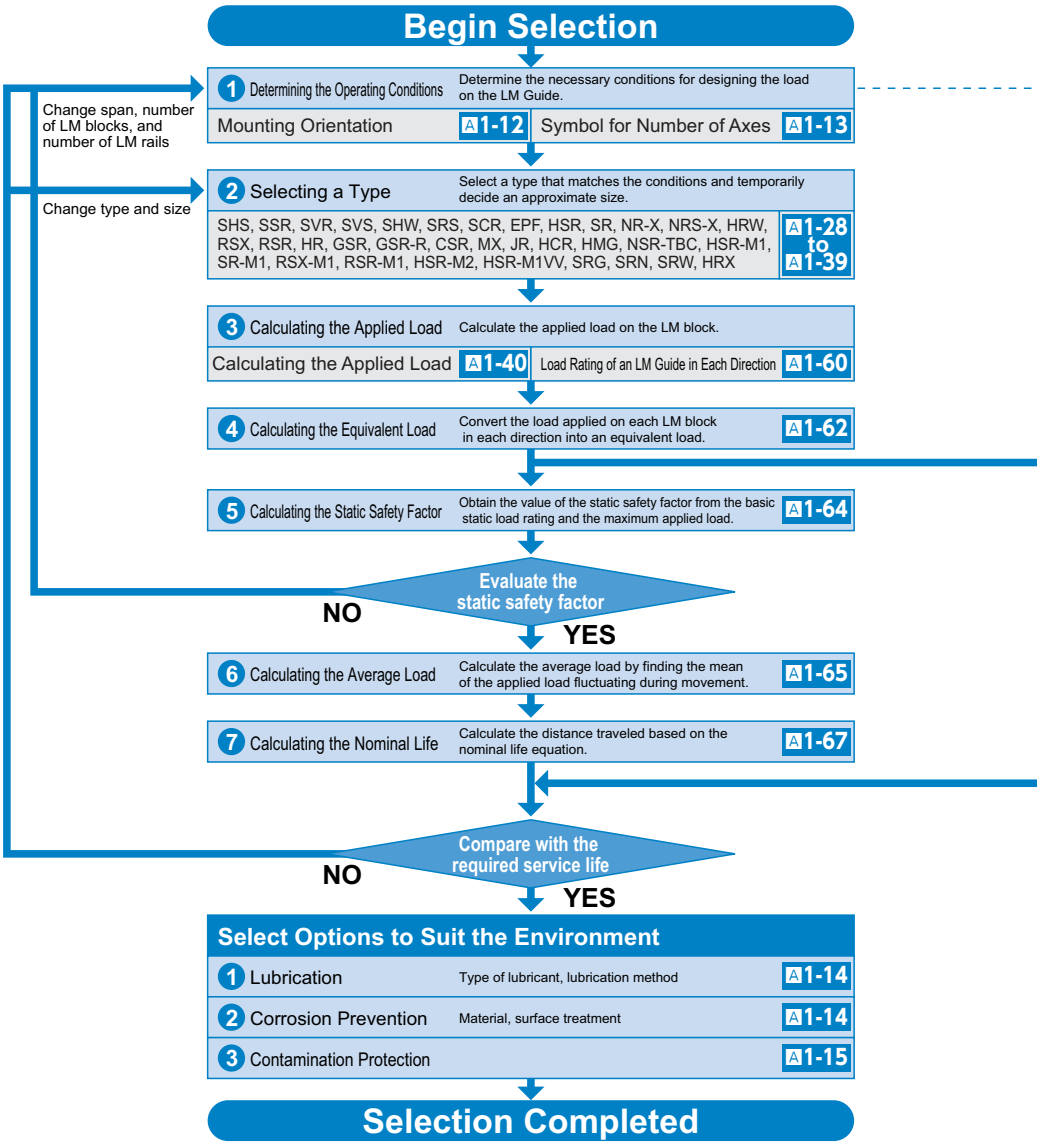
Models with Special Environment Specifications

Model HSR-M1	Model SR-M1	Model HSR-M2	Model RSX-M1	Model HSR-M1VV	Model RSR-M1
High temperature; 4-way equal load	High temperature; Radial	High corrosion resistance; 4-way equal load	High temperature; Compact	Medium-to-low vacuum; 4-way equal load	High temperature; Compact

Flowchart for Selecting an LM Guide

Steps for Selecting an LM Guide

The following flowchart can be used as reference for selecting an LM Guide.



- Space in which the guide will be used
- Dimensions (span, number of LM blocks, number of LM rails, thrust)
- Mounting orientation (horizontal, vertical, slant mount, wall mount, suspended)
- Magnitude, direction, and position of the working load
- Operating frequency (duty cycle)
- Speed (acceleration)
- Stroke length
- Required service life
- Precision of motion
- Environment
- In a special environment (vacuum, clean room, high temperature, environment exposed to contamination, etc.), it is necessary to take into account material, surface treatment, lubrication, and contamination protection.

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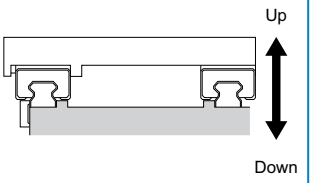
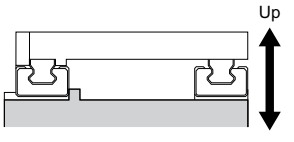
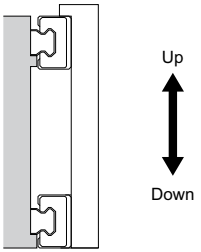
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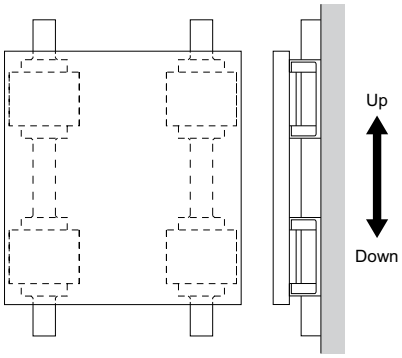
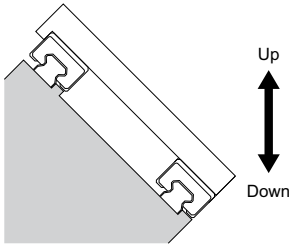
Operating Conditions of the LM Guide

Mounting Orientation

The LM Guide can be mounted in the following five orientations.
The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation. Be sure to let THK know the mounting orientation and the exact position in each LM block where the grease nipple or the piping joint should be attached.
For the lubrication, see A24-2.

Mounting Orientation

Horizontal (symbol: H)	Inverted (symbol: R)	Wall mount (symbol: K)
		

Vertical (symbol: V)	Slant mount (symbol: T)
	

Symbol for Number of Axes

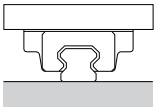
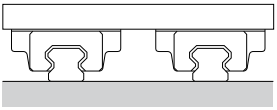
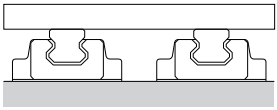
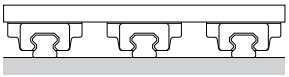
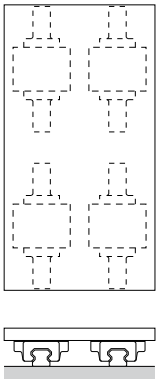
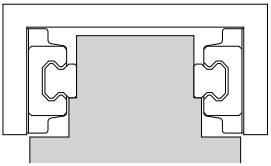
If two or more LM Guide units are used in a parallel combination on the same plane, specify in advance the number of the LM rails (symbol for number of axes) used in combination.
(For accuracy standards and radial clearance standards, see A1-78 and A1-73, respectively.)

Model number coding

SHS25C2SSCO+1000LP -II

- Model number (details are given on the corresponding page of the model)
- Symbol for number of axes ("II" indicates 2 axes. No symbol for a single axis)

Symbol for Number of Axes

Symbol for number of axes: none	Symbol for number of axes: II	Symbol for number of axes: II
Required number of axes: 1	Required number of axes: 2	Required number of axes: 2
	 Note: When placing an order, specify the number in multiples of 2 axes.	 Note: When placing an order, specify the number in multiples of 2 axes.
Symbol for number of axes: III	**Symbol for number of axes: IV**	**Other**
Required number of axes: 3	Required number of axes: 4	Required number of axes: 2
 Note: When placing an order, specify the number in multiples of 3 axes.	 Note: When placing an order, specify the number in multiples of 4 axes.	 Using 2 axes opposed to each other

Service Environment

● Lubrication

When using an LM System, it is necessary to provide effective lubrication. Using the product without lubrication may increase wear on the rolling elements and shorten the service life.
A lubricant has effects such as the following.
(1) Minimizes friction on moving elements to prevent seizure and reduce wear.
(2) Forms an oil film on the raceway to decrease stress acting on the surface and extend rolling fatigue life.
(3) Covers metal surfaces with an oil film to prevent the formation of rust.
To optimize an LM Guide's functionality, it is necessary to provide lubrication according to the operating conditions.
The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation.
Be sure to let THK know the mounting orientation and the exact position in each LM block where the grease nipple or the piping joint should be attached. For the mounting orientations of the LM Guide, see A1-12. For the lubrication, see A24-2.
Even with an LM Guide with seals, the internal lubricant gradually seeps out during operation. Therefore, the system needs to be lubricated at an appropriate interval according to the operating conditions.

● Corrosion Prevention

■Determining a Material

Any LM System requires a material that suits the operating environment. For use in environments where corrosion resistance is required, some LM System models can use martensitic stainless steel. (Martensitic stainless steel can be used for LM Guide models SHS, SSR, SHW, SRS, HSR, SR, HRW, RSX, RSR, and HR.)
The HSR series includes HSR-M2, a highly corrosion-resistant LM Guide using anti-corrosive austenitic stainless steel. For details, see A1-396.

■Surface Treatment

The surfaces of the rails and shafts of the LM System can be treated for anti-corrosive or aesthetic purposes.
THK offers THK-AP treatment, which is the optimum surface treatment for the LM System.
There are roughly three types of THK-AP treatment: AP-HC, AP-C, and AP-CF. (See B0-20.)

● Contamination Protection

It is necessary to prevent foreign materials from getting inside the product, as it will lead to abnormal wear and a shortened service life. Therefore, when entrance of dust or other foreign material is a possibility, it is necessary to select a sealing device or contamination protection option suited to the operating environment and conditions.

THK offers contamination protection accessories for each model of the LM Guide, such as end seals made of a special synthetic rubber with high wear resistance, and side seals and inner seals that provide further contamination protection.

In addition, for applications in adverse environments, a Laminated Contact Scraper LaCS and dedicated bellows are available for various model numbers.

Also, THK offers dedicated caps designed to prevent cutting chips from entering the LM rail mounting holes.

When it is necessary to provide contamination protection for a ball screw in an environment exposed to cutting chips and moisture, we recommend using a telescopic cover that protects the whole system or a large bellows.

For the options, see A**1-508**.

Clean Room

In a clean environment, the generation of dust from the LM System has to be reduced and anti-rust oil cannot be used. Therefore, it is necessary to increase the corrosion resistance of the LM System. In addition, depending on the required level of cleanliness, a dust collector may be necessary.

Dust Generation from the LM System

■Measures to prevent dust generation resulting from spattering grease

THK AFE-CA, AFF, and L100 Grease
Use grease that produces little dust and is suited to a clean environment.

■Measures to reduce dust generation resulting from metallic abrasion

Caged Ball LM Guide
Dust generation can be reduced by using a Caged Ball LM Guide, which has no friction between balls and generates little metallic abrasion dust.

Corrosion Prevention

■Material-based measures

Stainless steel LM Guide
This LM Guide uses corrosion-resistant martensitic stainless steel.

Corrosion-resistant LM Guide
The LM rail uses austenitic stainless steel, which has a high corrosion-resistant effect.

■Surface treatment measures

THK AP-HC, AP-C, and AP-CF Treatment
The LM System is surface-treated to increase corrosion resistance.

Caged Ball LM Guide

Supported models: SHS SSR SVR/SVS SHW SRS SCR EPF

Caged Roller LM Guide

Supported models: SRG SRN SRW

Stainless Steel LM Guide

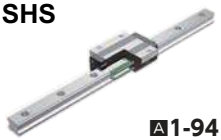
Supported models: SHS SSR SHW SRS HSR SR HRW HR RSX RSR

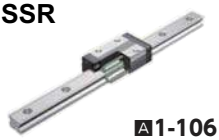
Corrosion-Resistant LM Guide

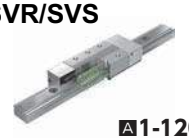
Supported models: HSR-M2

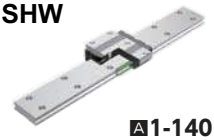
Surface Treatment

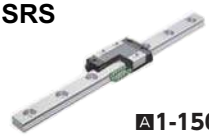
Grease

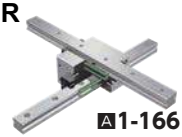
SHS

A1-94

SSR

A1-106

SVR/SVS

A1-120

SHW

A1-140

SRS

A1-150

SCR

A1-166

EPF

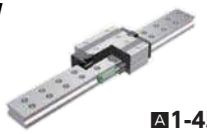
A1-174

SRG

A1-414

SRN

A1-438

SRW

A1-456

SHS

A1-94

SSR

A1-106

SHW

A1-140

SRS

A1-150

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

A1-272

RSX

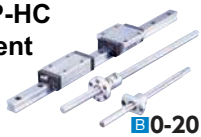
A1-252

RSR

A1-264

HSR-M2

A1-396

THK AP-HC Treatment

B0-20

THK AP-C Treatment

B0-20

THK AP-CF Treatment

B0-20

THK AFE-CA Grease

A24-13

THK AFF Grease

A24-15

L100 Grease

A24-25

Vacuum

In a vacuum environment, measures are required to prevent resin from emitting gas and grease from spattering. Anti-rust oil cannot be used, so it is necessary to select a product with high corrosion resistance.

■Measures to prevent resin from emitting gas

Stainless steel LM Guide

The end plate (ball circulation path normally made of resin) of the LM block is made of stainless steel to reduce emission of gas.

■Measures to prevent grease from evaporating

Vacuum grease

If a general-purpose grease is used in a vacuum environment, oil contained in the grease spatters and the grease loses lubricity. Therefore, use a vacuum grease made with low-vapor-pressure fluorine-based oil.

■Corrosion prevention

Stainless steel LM Guide

In a vacuum environment, use a corrosion-resistant stainless steel LM Guide.

High-temperature LM Guide

If high temperatures are predicted due to baking, use a high-temperature LM Guide, which is highly resistant to heat and corrosion.

Corrosion-resistant LM Guide

This LM Guide uses highly corrosion-resistant austenitic stainless steel in the LM rail.

High-Temperature LM Guide

Supported models: HSR-M1 SR-M1 RSX-M1 RSR-M1

LM Guide for Medium-to-Low Vacuums

Supported models: HSR-M1VV

Corrosion-Resistant LM Guide

Supported models: HSR-M2

Stainless Steel LM Guide

Supported models: HSR SR HRW HR RSX RSR

Vacuum Grease

HSR-M1

A1-350

SR-M1

A1-366

RSX-M1

A1-376

RSR-M1

A1-386

HSR-M1VV

A1-402

HSR-M2

A1-396

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

A1-272

RSX

A1-252

RSR

A1-264

Corrosion Prevention

As with clean room applications, it is necessary to increase corrosion resistance through material selection and surface treatment.

■Material-based measures

Stainless steel LM Guide

This LM Guide uses corrosion-resistant martensitic stainless steel.

Corrosion-resistant LM Guide

This LM Guide uses highly corrosion-resistant austenitic stainless steel in the LM rail.

■Surface treatment measures

THK AP-CF, AP-C, and AP-HC treatment

The LM system is surface-treated to increase corrosion resistance.

Stainless Steel LM Guide

Supported models: **SHS SSR SHW SRS HSR SR HRW HR RSX RSR**

Corrosion-Resistant LM Guide

Supported models: **HSR-M2**

Surface Treatment

SHS

A1-94

SSR

A1-106

SHW

A1-140

SRS

A1-150

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

A1-272

RSX

A1-252

RSR

A1-264

HSR-M2

A1-396

THK AP-CF Treatment

B0-20

THK AP-C Treatment

B0-20

THK AP-HC Treatment

B0-20

High Speed

In a high-speed environment, it is necessary to apply an optimal lubrication method that reduces heat generation during high-speed operation and increases grease retention.

■Measures to reduce heat generation

Caged Ball LM Guide

Use of a ball cage eliminates friction between balls to reduce heat generation. In addition, grease retention is increased, contributing to long service life and high-speed operation.

THK AFA Grease, AFJ Grease

It reduces heat generation in high speed operation and has superb lubricity.

■Measures to improve lubrication

QZ Lubricator

Continuous oil lubrication ensures that the lubrication and maintenance interval can be significantly extended. It also applies the right amount of oil to the raceway, making itself an eco-friendly lubrication system that does not contaminate the surrounding area.

Caged Ball LM Guide

Supported models: SHS SSR SVR/SVS SHW SRS SCR EPF

Caged Roller LM Guide

Supported models: SRG SRN SRW

QZ Lubricator

Grease

SHS

A1-94

SSR

A1-106

SVR/SVS

A1-120

SHW

A1-140

SRS

A1-150

SCR

A1-166

EPF

A1-174

SRG

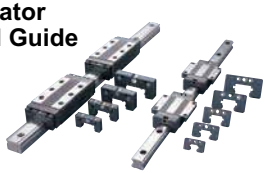
A1-414

SRN

A1-438

SRW

A1-456

QZ Lubricator for the LM Guide

A1-536

THK AFA Grease

A24-7

THK AFJ Grease

A24-21

High Temperature

In a high-temperature environment, dimensional variations caused by heat are problematic. Use a high-temperature LM Guide, which is heat resistant and has minimal dimensional variation when heated. Also, use a high-temperature grease.

■Heat resistance

High-temperature LM Guide

A special heat treatment to maintain dimensional stability minimizes dimensional variations due to heating and cooling.

■Grease

High-temperature grease

Use a high-temperature grease to maintain consistent rolling resistance in the LM System even at high temperatures.

Low Temperature

In a low-temperature environment, use an LM System with a minimal amount of resin components and a grease that minimizes fluctuations in rolling resistance, even at low temperature.

■Impact of low temperature on resin components

Stainless steel LM Guide

The end plate (ball circulation path normally made of resin) of the LM block is made of stainless steel.

■Corrosion prevention

THK AP-CF, AP-C, and AP-HC Treatment

The LM System is surface-treated to increase corrosion resistance.

■Grease

THK AFC Grease

This grease has little rolling resistance fluctuation even in cold temperatures.

Micro Motion

Micro strokes cause the oil film to break, resulting in poor lubrication and early wear. In such applications, select a grease with high oil film strength that can easily form an oil film.

■Grease

THK AFC Grease

AFC Grease is a urea-based grease that excels in oil film strength and wear resistance.

High-Temperature LM Guide

Supported models: HSR-M1 SR-M1 RSX-M1 RSR-M1 HSR-M1VV

High-Temperature Grease

Stainless Steel LM Guide

Supported models: SHS SSR SHW SRS HSR SR HRW HR RSX RSR

Surface Treatment

Low-Temperature Grease

Grease

HSR-M1

A1-350

SR-M1

A1-366

RSX-M1

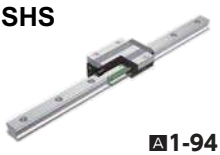
A1-376

RSR-M1

A1-386

HSR-M1VV

A1-402

SHS

A1-94

SSR

A1-106

SHW

A1-140

SRS

A1-150

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

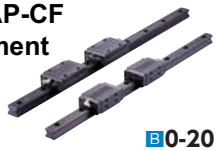
A1-272

RSX

A1-252

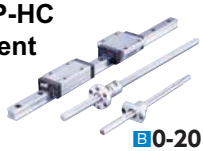
RSR

A1-264

THK AP-CF Treatment

B0-20

THK AP-C Treatment

B0-20

THK AP-HC Treatment

B0-20

THK AFC Grease

A24-11

THK AFC Grease

A24-11

Foreign Matter

If foreign matter enters the LM System, it will cause abnormal wear and shorten the service life. Therefore, it is necessary to prevent such entrance of foreign matter.
Especially in an environment containing small foreign matter or a water-soluble coolant that a telescopic cover or a bellows cannot block, it is necessary to attach a contamination protection accessory capable of efficiently removing foreign matter.

■Metal scraper

It removes relatively large foreign objects such as cutting chips, spatter, sand, or hard foreign materials that adhere to the LM rail.

■Laminated Contact Scraper LaCS

Unlike a metal scraper, it removes foreign matter while making contact with the LM rail. Therefore, it is more effective at preventing contamination by small foreign matter that is difficult to remove with conventional metal scrapers.

■QZ Lubricator

The QZ Lubricator is a lubrication system that feeds the right amount of lubricant to the ball raceway through direct contact with a highly oil-impregnated fiber net.

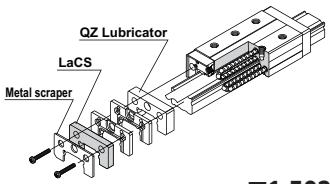
■Dedicated metal caps for LM rail mounting holes - GC caps

GC caps are metal caps that plug LM rail mounting holes (compliant with the RoHS Directives). In harsh environments they prevent the entrance of foreign material and coolant from the top face of the LM rail (mounting holes) and significantly increase contamination protection of the LM Guide if used with a dust seal.

■Protector

The protector minimizes the entrance of foreign material even in harsh environments where foreign material such as fine particles and liquids are present.

LM Guide
+Metal scraper
+Contact scraper LaCS
+GC cap etc.

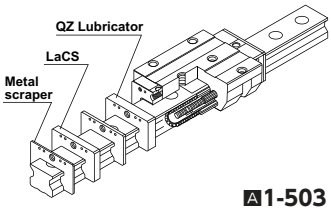


A1-503

Supported models

Caged Ball LM Guide
SHS SSR SVR/SVS SHW SRS
Full-Ball LM Guide
HSR NR-X/NRS-X

Roller Type LM Guide
+Metal scraper
+Contact scraper LaCS
+GC cap etc.



A1-503

Supported models

SRG HRX

Caged Ball LM Guide

SHS



A1-94

SSR



A1-106

SHW



A1-140

SRS



A1-150

SVR/SVS



Featuring the protector A1-120

Full-Ball LM Guide

HSR



A1-182

NR-X/NRS-X



A1-222

Caged Roller LM Guide

SRG



Featuring the protector A1-414

Full-Roller LM Guide

HRX

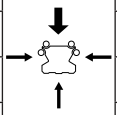
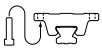
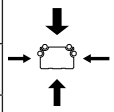


Featuring the protector A1-464

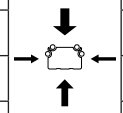
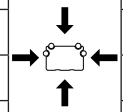
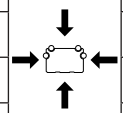
Selecting a Type

Types of LM Guide

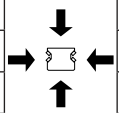
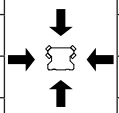
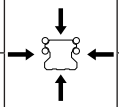
THK offers the LM Guide in a wide array of standard types and dimensions so that you can select the optimal product for any application. The unit structure of the LM Guide allows for high running accuracy with no clearance simply by mounting the product to a flat surface with bolts. We have a proven track record and know-how in extensive applications.

Classification		Type		Dimensional table	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
Radial type	Caged Ball LM Guide models		SSR-XW	▶A1-110		14.7 to 64.6	16.5 to 71.6
			SSR-XV	▶A1-112		9.1 to 48.3	9.7 to 46.7
			SSR-XTB	▶A1-114		14.7 to 64.6	16.5 to 71.6
			SSR-XSB	▶A1-116		9.1 to 48.3	9.7 to 46.7
	Full-Ball LM Guide models		SR-W	▶A1-216		13.8 to 411	20.5 to 537
			SR-M1W	▶A1-370		13.8 to 60.4	20.5 to 81.8
			SR-V	▶A1-216		9.1 to 40.9	11.7 to 46.7
			SR-M1V	▶A1-370		9.1 to 40.9	11.7 to 46.7
			SR-TB	▶A1-218		13.8 to 136	20.5 to 179
			SR-M1TB	▶A1-372		13.8 to 60.4	20.5 to 81.8
			SR-SB	▶A1-218		9.1 to 40.9	11.7 to 46.7
			SR-M1SB	▶A1-372		9.1 to 40.9	11.7 to 46.7
	Caged Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		SVR-C	▶A1-130		48 to 260	68 to 328
			SVR-LC	▶A1-130		57 to 340	86 to 481
			SVR-R	▶A1-126		48 to 260	68 to 328
			SVR-LR	▶A1-126		57 to 340	86 to 481
			SVR-CH	▶A1-136		90 to 177	115 to 238
			SVR-LCH	▶A1-136		108 to 214	159 to 312
			SVR-RH	▶A1-134		90 to 177	115 to 238
			SVR-LRH	▶A1-134		108 to 214	159 to 312

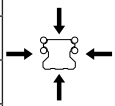
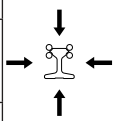
	External dimensions (mm)		Features	Major applications
	Height	Width		
	24 to 48	34 to 70	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Thin and compact design with large radial load capacity • Superb planar running accuracy • Superb capability to absorb mounting error • Stainless steel type also available as standard	• Surface grinder tables • Tool grinder tables • Electric discharge machines • Printed circuit board drilling machines • Chip mounters • High-speed transfer equipment • Robot travel units • Machining centers • NC lathes • Five axis milling machines • Conveyance systems • Pressing machine mold guides • Inspection equipment • Testing machines • Food-related machines • Medical equipment • 3D measuring instruments • Packaging machines • Injection molding machines • Woodworking machines • Ultra precision tables • Semiconductor/liquid crystal manufacturing equipment
	24 to 48	34 to 70		
	24 to 48	52 to 100		
	24 to 48	52 to 100		
	24 to 135	34 to 250	• Thin and compact design with a large radial load capacity • Superb planar running accuracy • Superb capability to absorb mounting error • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150℃, also available	
	24 to 48	34 to 70		
	24 to 48	34 to 70		
	24 to 48	34 to 70		
	24 to 68	52 to 140		
	24 to 48	52 to 100		
	24 to 48	52 to 100		
	24 to 48	52 to 100		
	31 to 75	72 to 170	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with large radial load capacity • High vibration resistance and impact resistance due to improved damping characteristics • Superb planar running accuracy	• Machining centers • NC lathes • Grinding machines • Five axis milling machines • Jig borers • Drilling machines • NC milling machines • Horizontal milling machines • Mold processing machines • Graphite working machines • Electric discharge machines • Wire-cut electric discharge machines
	31 to 75	72 to 170		
	31 to 75	50 to 126		
	31 to 75	50 to 126		
	48 to 70	100 to 140	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Large radial load capacity • High vibration resistance and impact resistance due to improved damping characteristics • Superb planar running accuracy • Has dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard	
	48 to 70	100 to 140		
	55 to 80	70 to 100		
	55 to 80	70 to 100		

Classification		Type		Dimensional table	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
Radial type	Full-Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		NR-RX	▶A1-228		37.1 to 208.7	68.1 to 351.7
			NR-LRX	▶A1-228		45.4 to 268.9	90.8 to 505.5
			NR-CX	▶A1-232		37.1 to 208.7	68.1 to 351.7
			NR-LCX	▶A1-232		45.4 to 268.9	90.8 to 505.5
			NR-R	▶A1-228		271 to 479	610 to 1040
			NR-LR	▶A1-228		355 to 599	800 to 1300
			NR-A	▶A1-236		271 to 479	610 to 1040
			NR-LA	▶A1-236		355 to 599	800 to 1300
			NR-B	▶A1-238		271 to 479	610 to 1040
			NR-LB	▶A1-238		355 to 599	800 to 1300
4-way type	Caged Ball LM Guide Models for machine tools High-rigidity models for super-heavy loads		SVS-R	▶A1-128		37 to 199	52 to 251
			SVS-LR	▶A1-128		44 to 261	66 to 368
			SVS-C	▶A1-132		37 to 199	52 to 251
			SVS-LC	▶A1-132		44 to 261	66 to 368
			SVS-RH	▶A1-134		69 to 136	88 to 182
			SVS-LRH	▶A1-134		83 to 164	122 to 239
			SVS-CH	▶A1-136		69 to 136	88 to 182
			SVS-LCH	▶A1-136		83 to 164	122 to 239
	Full-Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		NRS-CX	▶A1-234		28.4 to 159.8	52.2 to 269.4
			NRS-LCX	▶A1-234		34.7 to 206	69.6 to 387.2
			NRS-RX	▶A1-230		28.4 to 159.8	52.2 to 269.4
			NRS-LRX	▶A1-230		34.7 to 206	69.6 to 387.2
4-way equal load type	Full-Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		NRS-A	▶A1-236		212 to 376	431 to 737
			NRS-LA	▶A1-236		278 to 470	566 to 920
			NRS-B	▶A1-238		212 to 376	431 to 737
			NRS-LB	▶A1-238		278 to 470	566 to 920
			NRS-R	▶A1-230		212 to 376	431 to 737
			NRS-LR	▶A1-230		278 to 470	566 to 920

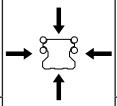
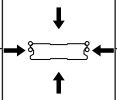
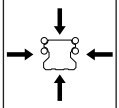
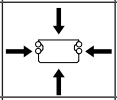
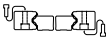
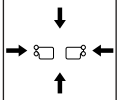
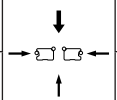
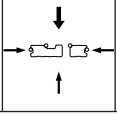
	External dimensions (mm)		Features	Major applications
	Height	Width		
	31 to 75	50 to 126	• Low dust generation, low noise, and acceptable running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with large radial load capacity • High vibration resistance and impact resistance due to improved damping characteristics • Superb planar running accuracy	• Machining centers • NC lathes • Grinding machines • Five axis milling machines • Jig borers • Drilling machines • NC milling machines • Horizontal milling machines • Mold processing machines • Graphite working machines • Electric discharge machines • Wire-cut electric discharge machines
	31 to 75	50 to 126		
	31 to 75	72 to 170		
	31 to 75	72 to 170		
	83 to 105	145 to 200	• Super-heavy load capacity optimal for machine tools • High vibration resistance and impact resistance due to improved damping characteristics • Thin and compact design with large radial load capacity • Superb planar running accuracy	
	83 to 105	145 to 200		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	31 to 75	50 to 126	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with 4-way equal load capacity • High vibration resistance and impact resistance due to improved damping characteristics	
	31 to 75	50 to 126		
	31 to 75	72 to 170		
	31 to 75	72 to 170		
	55 to 80	70 to 100	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • 4-way type • High vibration resistance and impact resistance due to improved damping characteristics • Has dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard	
	55 to 80	70 to 100		
	48 to 70	100 to 140		
	48 to 70	100 to 140		
	31 to 75	72 to 170	• Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with 4-way equal load capacity • High vibration resistance and impact resistance due to improved damping characteristics	
	31 to 75	72 to 170		
	31 to 75	50 to 126		
	31 to 75	50 to 126		
	83 to 105	195 to 260	• Super-heavy load capacity optimal for machine tools • High vibration resistance and impact resistance due to improved damping characteristics • Thin and compact design with 4-way equal load capacity	
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	145 to 200		
	83 to 105	145 to 200		

Classification		Type		Dimensional table	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
4-way equal load type	Caged Roller LM Guide models Ultra-heavy load, high-rigidity types		SRG-A, C	▶A1-420		11.3 to 219	25.8 to 511
			SRG-LA, LC	▶A1-420		25.9 to 601	63.8 to 1170
			SRG-SLC	▶A1-420		83.4 to 352	199 to 899
			SRG-R, V	▶A1-428		11.3 to 219	25.8 to 511
			SRG-LR, LV	▶A1-428		25.9 to 278	63.8 to 670
			SRG-SLR, SLV	▶A1-428		83.4 to 352	199 to 899
			SRN-C	▶A1-444		55.3 to 219	119 to 511
			SRN-LC	▶A1-444		71.4 to 278	165 to 670
			SRN-SLC	▶A1-444		83.4 to 352	199 to 899
			SRN-R	▶A1-446		55.3 to 219	119 to 511
			SRN-LR	▶A1-446		71.4 to 278	165 to 670
			SRN-SLR	▶A1-446		83.4 to 352	199 to 899
			SRW-LR	▶A1-460		115 to 601	256 to 1170
	Full-Roller LM Guide high-rigidity models for super-heavy loads		HRX-C	▶A1-470		26.3 to 205.5	73.1 to 567
			HRX-LC	▶A1-470		30.8 to 257	89.3 to 756
			HRX-R	▶A1-472		26.3 to 205.5	73.1 to 567
			HRX-LR	▶A1-472		30.8 to 257	89.3 to 756
	Caged Ball LM Guide models Heavy-load, high-rigidity types		SHS-C	▶A1-98		14.2 to 205	24.2 to 320
			SHS-LC	▶A1-98		17.2 to 253	31.9 to 408
			SHS-V	▶A1-100		14.2 to 205	24.2 to 320
			SHS-LV	▶A1-100		17.2 to 253	31.9 to 408
			SHS-R	▶A1-102		14.2 to 128	24.2 to 197
			SHS-LR	▶A1-102		36.8 to 161	64.7 to 259

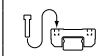
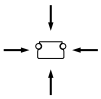
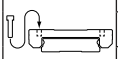
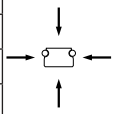
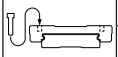
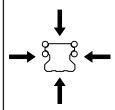
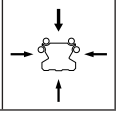
	External dimensions (mm)		Features	Major applications
	Height	Width		
	24 to 90	47 to 170	• Long service life and long-term maintenance-free operation • Low noise and reduced running sound • Superb high-speed performance • Smooth motion due to prevention of rollers from skewing • Ultra-heavy load capacity optimal for machine tools	• Machining centers • NC lathes • Grinding machines • Five axis milling machines • Jig borers • Drilling machines • NC milling machines • Horizontal milling machines • Mold processing machines • Graphite working machines • Electric discharge machines • Wire-cut electric discharge machines
	30 to 120	63 to 250		
	48 to 90	100 to 170		
	24 to 90	34 to 126		
	30 to 90	44 to 126		
	55 to 90	70 to 126		
	44 to 75	100 to 170	• Long service life and long-term maintenance-free operation • Low noise and reduced running sound • Superb high-speed performance • Smooth motion due to prevention of rollers from skewing • Ultra-heavy load capacity optimal for machine tools • Low center of gravity and ultra-high rigidity	
	44 to 75	100 to 170		
	44 to 75	100 to 170		
	44 to 75	70 to 126		
	44 to 75	70 to 126		
	44 to 75	70 to 126		
	70 to 150	135 to 300		
	36 to 90	70 to 170	• Long service life • Superbly high speed • 4-way equal load type • Stable and smooth operation can be achieved by suppressing roller skew • Ultra-heavy load capacity optimal for machine tools	
	36 to 90	70 to 170		
	40 to 100	48 to 126		
	40 to 100	48 to 126		
	24 to 90	47 to 170	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Heavy load and high rigidity • Has dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard • Superb capability to absorb mounting error	• Machining centers • NC lathes • XYZ axes of heavy cutting machine tools • Grinding head feeding axes of grinding machines • Components requiring a heavy moment and high accuracy • NC milling machines • Horizontal milling machines • Gantry five-axis milling machines • Z axes of electric discharge machines • Wire-cut electric discharge machines • Car elevators • Food-related machines • Testing machines • Vehicle doors • Printed circuit board drilling machines • Automatic tool changers • Construction equipment • Shield machines • Semiconductor/liquid crystal manufacturing equipment
	24 to 90	47 to 170		
	24 to 90	34 to 126		
	24 to 90	34 to 126		
	28 to 80	34 to 100		
	28 to 80	34 to 100		

Classification		Type		Dimensional table	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
4-way equal load type	Full-Ball LM Guide models Heavy-load, high-rigidity types		HSR-C/XC	▶A1-188		10.9 to 195	15.7 to 228
			HSR-LC/XLC	▶A1-188		14.2 to 249	22.9 to 323
			HSR-A	▶A1-200		304	355
			HSR-M1A	▶A1-356		10.9 to 53.9	15.7 to 70.2
			HSR-LA	▶A1-200		367	464
			HSR-M1LA	▶A1-356		23.9 to 65	35.8 to 91.7
			HSR-CA/XCA	▶A1-196		19.8 to 304	27.4 to 355
			HSR-HA/XHA	▶A1-196		23.9 to 518	35.8 to 728
			HSR-B	▶A1-200		304	355
			HSR-M1B	▶A1-358		10.9 to 53.9	15.7 to 70.2
			HSR-LB	▶A1-200		367	464
			HSR-M1LB	▶A1-358		23.9 to 65	35.8 to 91.7
			HSR-CB/XCB	▶A1-198		19.8 to 304	27.4 to 355
			HSR-HB/XHB	▶A1-198		23.9 to 518	35.8 to 728
			HSR-R/XR	▶A1-192		1.08 to 304	2.16 to 355
			HSR-M1R	▶A1-360		10.9 to 53.9	15.7 to 70.2
			HSR-LR/XLR	▶A1-192		23.9 to 367	35.8 to 464
			HSR-M1LR	▶A1-360		23.9 to 65	35.8 to 91.7
			HSR-HR	▶A1-202		441 to 518	540 to 728
	LM Guide for medium-to-low vacuums		HSR-M1VV	▶A1-406		10.9	15.7
	Full-Ball LM Guide models Side-mount types		HSR-YR/XYR	▶A1-194		10.9 to 195	15.7 to 228
			HSR-M1YR	▶A1-362		10.9 to 53.9	15.7 to 70.2
	Full-Ball LM Guide models Special LM rail types		JR-A	▶A1-324		27.6 to 121	36.4 to 146
			JR-B	▶A1-324		27.6 to 121	36.4 to 146
			JR-R	▶A1-324		27.6 to 121	36.4 to 146

	External dimensions (mm)		Features	Major applications
	Height	Width		
	24 to 90	47 to 170	• Heavy load and high rigidity • De facto global standard • Superb capability to absorb mounting error • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150℃, also available • Type M2, with high corrosion resistance, also available (Basic dynamic load rating: 2.33 to 5.57 kN) (Basic static load rating: 2.03 to 5.16 kN)	• Machining centers • NC lathes • XYZ axes of heavy cutting machine tools • Grinding head feeding axes of grinding machines • Components requiring a heavy moment and high accuracy • NC milling machines • Horizontal milling machines • Gantry five axis milling machines • Z axis of electric discharge machines • Wire-cut electric discharge machines • Car elevators • Food-related machines • Testing machines • Vehicle doors • Printed circuit board drilling machines • Automatic tool changers • Construction equipment • Shield machines • Semiconductor/liquid crystal manufacturing equipment
	24 to 90	47 to 170		
	110	215		
	24 to 48	47 to 100		
	110	215		
	30 to 48	63 to 100		
	30 to 110	63 to 215		
	30 to 145	63 to 350		
	110	215		
	24 to 48	47 to 100		
	110	215		
	30 to 48	63 to 100		
	30 to 110	63 to 215		
	30 to 145	63 to 350		
	11 to 110	16 to 156		
	28 to 55	34 to 70		
	30 to 110	44 to 156		
	30 to 55	44 to 70		
	120 to 145	250 to 266		
	28	34	• Can be used in a range of environments from atmospheric pressure to a vacuum of (10^{-3} Pa) • Allows baking temperatures of up to 200℃* * If the baking temperature exceeds 100℃, multiply the basic load rating with the temperature coefficient.	• Medical equipment • Semiconductor/liquid crystal manufacturing equipment
	28 to 90	33.5 to 124.5	• Mounting holes on the side faces of the LM block allow for easy mounting and reduced mounting height when using two units facing each other • Heavy load and high rigidity • Superb capability to absorb mounting error • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150℃, also available	• Cross rails of gantry machine tools • Z axes of woodworking machines • Z axes of measuring instruments • Components opposed to each other
	28 to 55	33.5 to 69.5		
	61 to 114	70 to 140	• The thin structure in the central part of the LM rail allows it to absorb error and achieve smooth motion if the parallelism between the two axes is poor • Since the LM rail has a highly rigid cross-sectional shape, it can be used as a structural component	• Automated warehouses • Garages • Gantry robots • FMS traveling rails • Elevators • Conveyance systems • Welding machines • Lifters • Cranes • Forklifts • Coating machines • Shield machines • Stage settings
	61 to 114	70 to 140		
	65 to 124	48 to 100		

Classification		Type		Dimensional table	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
4-way equal load type	Caged Ball Cross LM Guide		SCR	▶A1-170		36.8 to 253	64.7 to 408
	Full-Ball LM Guide Orthogonal type		CSR	▶A1-310		10.9 to 100	15.7 to 135
	Caged Ball LM Guide models Wide types with low centers of gravity		SHW-CA	▶A1-144		4.31 to 70.2	5.66 to 91.4
			SHW-CR, HR	▶A1-146		4.31 to 70.2	5.66 to 91.4
	Full-Ball LM Guide models Wide types with low centers of gravity		HRW-CA	▶A1-246		5.53 to 80.3	9.1 to 109
			HRW-CR, LRM	▶A1-248		3.29 to 62.4	7.16 to 86.3
	Full-Ball Straight-and-curved Guide		HMG	▶A1-340		2.56 to 66.2	Straight section 4.23 to 66.7 Curved section 0.44 to 36.2
	Caged Ball LM Guide finite stroke		EPF	▶A1-178		0.90 to 3.71	1.60 to 5.88
	Full-Ball LM Guide models Separate types		HR, HR-T	▶A1-278		2.82 to 226	3.48 to 232
Interchangeable designs			GSR-T	▶A1-290		8.42 to 37	9.77 to 39.1
			GSR-V	▶A1-290		6.51 to 15.5	6.77 to 15.2
	Full-Ball LM Guide Integrated-rack LM rail type		GSR-R	▶A1-298		15.5 to 37	15.2 to 39.1

	External dimensions (mm)		Features	Major applications
	Height	Width		
	70 to 180	88 to 226	• An XY orthogonal, single-piece LM block allows for a compact XY structure • The possibility of a saddle-less structure allows for machines with lightweight and compact design • Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance	• Low-center-of-gravity precision XY tables • NC lathes • Optical measuring instruments • Automatic lathes • Inspection equipment • Cartesian coordinate robots • Bonding machines • Wire-cut electric discharge machines • Hollow tables • Printed circuit board assemblers • Machine tool tables • Electric discharge machines • XY axes of horizontal machining centers
	47 to 118	38.8 to 129.8	• An XY orthogonal, single-piece LM block allows for a compact XY structure • The possibility of a saddle-less structure allows for machines with lightweight and compact design	
	12 to 50	40 to 162	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Wide, space-saving structure with a low center of gravity • Stainless steel type also available as standard	• Z axes of IC printed circuit board drilling machines • Z axes of small electric discharge machines • Loaders • Machining centers • NC lathes • Robots • Wire-cut electric discharge machines • APC • Semiconductor/liquid crystal manufacturing equipment • Measuring instruments • Wafer transfer equipment • Construction equipment • Railroad vehicles
	12 to 50	30 to 130		
	17 to 60	60 to 200	• 4-way equal load capacity, thin, and highly rigid • Wide, space-saving structure with a low center of gravity • Stainless steel type also available as standard	
	12 to 50	30 to 130		
	24 to 90	47 to 170	• Freedom of design • Cost reduction through simplified structure	• Large swivel bases • Pendulum cars for railroads • Pantagraphs • Control units • Optical measuring machines • Tool grinders • X-Ray machines • CT scanners • Medical equipment • Stage settings • Car elevators • Amusement machines • Turntables • Tool changers
	8 to 16	17 to 32	• Caged Ball effect through use of a retainer • Smooth movement with minimal rolling variation • 4-groove construction in a compact body	• Semiconductor manufacturing equipment • Medical equipment • Inspection equipment • Industrial machinery
	8.5 to 60	18 to 125	• Low-profile and highly rigid with a space-saving structure • Interchangeable with cross-roller guide • Adjustable preload • Stainless steel type also available as standard	• XYZ axes of electric discharge machines • Precision tables • XZ axes of NC lathes • Assembly robots • Conveyance systems • Machining centers • Wire-cut electric discharge machines • Tool changers • Woodworking machines
	20 to 38	32 to 68	• LM block and LM rail are both interchangeable • Adjustable preload • Capable of absorbing error in vertical level and horizontal parallelism	• Industrial robots • Various conveyance systems • Automated warehouses • Palette changers • Automatic tool changers • Door closing devices • Guides using molded aluminum bases • Welding machines • Coating machines • Car washing machines
	20 to 30	32 to 50		
	30 to 38	59.91 to 80.18	• Integrated-rack LM rail design eliminates assembly and adjustment work • Integrated-rack LM rail design enables a space-saving structure • Capable of supporting long strokes	

Classification		Type		Dimensional table	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
Miniature types	Caged Ball LM Guide models		SRS-S	▶A1-156		1.09 to 4.5	0.964 to 3.39
			SRS-M			0.439 to 16.5	0.468 to 20.2
			SRS-N			0.515 to 9.71	0.586 to 8.55
			SRS-WS	▶A1-160		1.38 to 6.64	1.35 to 5.94
			SRS-WM			0.584 to 9.12	0.703 to 8.55
			SRS-WN			0.746 to 12.4	0.996 to 12.1
	Full-Ball LM Guide models		RSX-SM	▶A1-258		0.95 to 4.01	1.16 to 4.24
			RSX-M	▶A1-258		1.16 to 5.59	1.54 to 6.78
			RSX-M1	▶A1-380		2.22 to 5.59	3.06 to 6.78
			RSX-NM	▶A1-258		0.45 to 8.27	0.70 to 11.87
			RSX-M1N	▶A1-380		2.94 to 8.27	4.59 to 11.87
			RSX-WSM	▶A1-260		1.06 to 5.59	1.35 to 6.78
			RSX-WM	▶A1-260		1.63 to 7.43	2.51 to 10.18
			RSX-M1W	▶A1-382		2.80 to 7.43	4.28 to 10.18
			RSX-WNM	▶A1-260		0.64 to 9.87	1.17 to 15.26
			RSX-M1WN	▶A1-382		3.48 to 9.87	5.81 to 15.26
			RSR-M	▶A1-268		0.18 to 8.82	0.27 to 12.7
			RSR-M1V	▶A1-390		1.47 to 8.82	2.25 to 12.7
			RSR-N	▶A1-268		0.3 to 14.2	0.44 to 20.6
			RSR-M1N	▶A1-390		2.6 to 14.2	3.96 to 20.6
	Full-Ball LM Guide models Wide types		RSR-WM/WV	▶A1-268		0.25 to 6.66	0.47 to 9.8
			RSR-M1WV	▶A1-392		2.45 to 6.66	3.92 to 9.8
			RSR-WN	▶A1-268		0.39 to 9.91	0.75 to 14.9
			RSR-M1WN	▶A1-392		3.52 to 9.91	5.37 to 14.9
	Full-Ball LM Guide Orthogonal type		MX	▶A1-316		0.59 to 2.04	1.1 to 3.21
Circular arc type	Full-Ball LM Guide		HCR	▶A1-332		4.7 to 141	8.53 to 215
Self-aligning type	Full-Ball LM Guide		NSR-TBC	▶A1-346		9.41 to 90.8	18.6 to 152

	External dimensions (mm)		Features	Major applications
	Height	Width		
	8 to 16	17 to 32	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Stainless steel type also available as standard • Lightweight and compact	• IC/LSI manufacturing machines • Hard disc drives • Slide units of OA equipment • Wafer transfer equipment • Printed circuit board assembly tables • Medical equipment • Electronic components of electron microscopes • Optical stages • Steppers • Plotting machines • IC bonding machine feed mechanisms • Inspection equipment
	6 to 25	17 to 48		
	6 to 16	12 to 32		
	9 to 16	25 to 60		
	6.5 to 16	17 to 60		
	8 to 16	17 to 32	• Lightweight and compact • Smooth motion in all mounting orientations • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150˚C, also available	• IC/LSI manufacturing machines • Hard disc drives • Slide units of OA equipment • Wafer transfer equipment • Printed circuit board assembly tables • Medical equipment • Electronic components of electron microscopes • Optical stages • Steppers • Plotting machines • IC bonding machine feed mechanisms • Inspection equipment
	8 to 16	17 to 32		
	10 to 16	20 to 32		
	6 to 16	12 to 32		
	10 to 16	20 to 32		
	9 to 16	25 to 60		
	9 to 16	25 to 60		
	12 to 16	30 to 60		
	6.5 to 16	17 to 60		
	12 to 16	30 to 60		
	4 to 25	8 to 46	• Ultra-compact • Stainless steel type also available as standard • Long type with increased load capacity also offered as standard • Type M1, achieving max service temperature of 150˚C, also available	
	10 to 25	20 to 46		
	4 to 25	8 to 46		
	10 to 25	20 to 46		
	4.5 to 16	12 to 60	• Stainless steel type also available as standard • Long type with increased load capacity also offered as standard • Type M1, achieving max service temperature of 150˚C, also available	
	12 to 16	30 to 60		
	4.5 to 16	12 to 60		
	12 to 16	30 to 60		
	10 to 14.5	15.2 to 30.2	• An XY orthogonal, single-piece LM block allows for a compact XY structure • Stainless steel type also available as standard	• IC/LSI manufacturing machines • Inspection equipment • Slide units of OA equipment • Wafer transfer equipment • IC bonding machine feed mechanisms • Printed circuit board assembly tables • Medical equipment • Electronic components of electron microscopes • Optical stages
	18 to 90	39 to 170	• Circular motion guide in a 4-way equal load design • Highly accurate circular motion without play • Allows efficient design with the LM block placed in the load point • Easily achieves large circular motion	• Large swivel bases • Pendulum cars for railroads • Pantagraphs • Control units • Optical measuring machines • Tool grinders • X-Ray machines • CT scanners • Medical equipment • Stage settings • Car elevators • Amusement machines • Turntables • Tool changers
	40 to 105	70 to 175	• Self-aligns on the mounting surface allowing for use after rough installation • Adjustable preload • Can be mounted on a black steel plate	• XY axes of ordinary industrial machinery • Various conveyance systems • Automated warehouses • Palette changers • Automatic coating machines • Various welding machines

Calculating the Applied Load

The LM Guide is capable of receiving loads and moments in all directions whether they are generated by the mounting orientation and position, the location of the center of gravity of the moving object, the position of the thrust, the acceleration, or the cutting resistance.

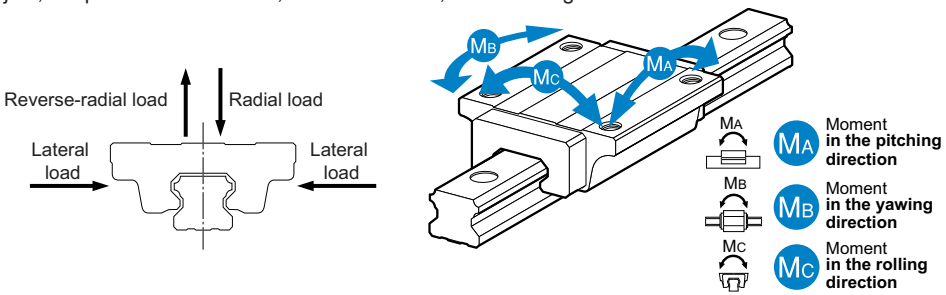


Fig. 1 Directions of the Loads Applied on the LM Guide

Calculating an Applied Load

Single-Axis Use

● **Moment Equivalence**

When the space to install the LM Guide is limited, you may have to use only one LM block, or two LM blocks in close contact with each other. In such a setting, the load distribution is not uniform. As a result, an excessive load is applied in localized areas (i.e., both ends) as shown in Fig. 2. Continued use under such conditions may result in flaking in those areas, consequently shortening the service life. In such a case, calculate the actual load by multiplying the moment value by any one of the equivalent-moment factors specified in Table 1 to Table 6.

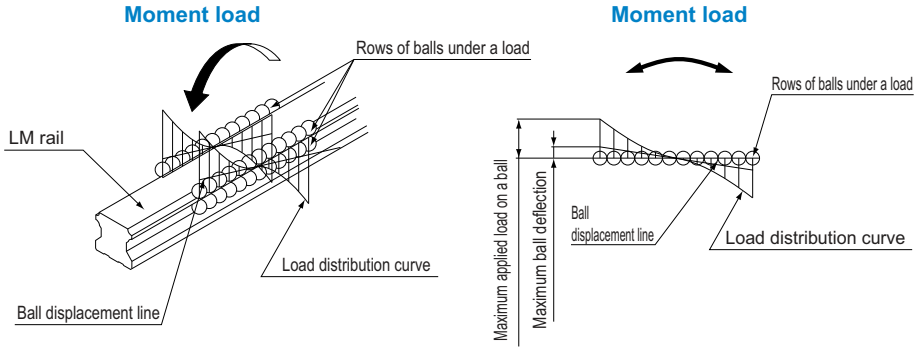


Fig. 2 Ball Load when a Moment is Applied

An equivalent-load equation applicable when a moment acts on an LM Guide is shown below.

$$P = K \cdot M$$

P : Equivalent load per LM Guide (N)
K : Equivalent moment factor
M : Applied moment (N·mm)

● Equivalent Factor

Since the rated load is equivalent to the permissible moment, the equivalent factor to be multiplied when equalizing the M_A, M_B, and M_C moments to the applied load per block is obtained by dividing the rated loads in the corresponding directions.

With models other than 4-way equal load types, however, the load ratings in the 4 directions differ from each other. Therefore, the equivalent factor values for the M_A and M_C moments also differ depending on whether the direction is radial or reverse radial.

■Equivalent Factors for the M_A Moment

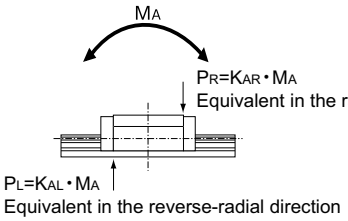


Fig. 3 Equivalent Factors for the M_A Moment

Equivalent factors for the M_A Moment

- Equivalent factor in the radial direction: $K_{AR}=\frac{C_0}{M_A}$
- Equivalent factor in the reverse-radial direction: $K_{AL}=\frac{C_{0L}}{M_A}$

$$\frac{C_0}{K_{AR}\cdot M_A}=\frac{C_{0L}}{K_{AL}\cdot M_A}=1$$

■Equivalent Factors for the M_B Moment

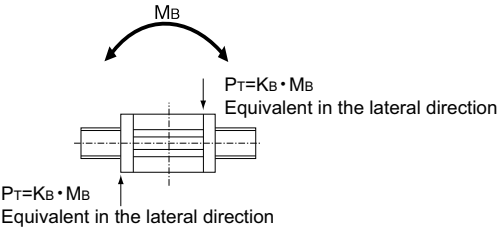


Fig. 4 Equivalent Factors for the M_B Moment

Equivalent factors for the M_B Moment

- Equivalent factor in the lateral directions: $K_B=\frac{C_{0T}}{M_B}$

$$\frac{C_{0T}}{K_B\cdot M_B}=1$$

■Equivalent Factors for the M_C Moment

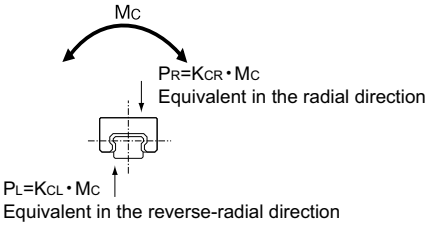


Fig. 5 Equivalent Factors for the M_C Moment

Equivalent factors for the M_C Moment

- Equivalent factor in the radial direction: $K_{CR}=\frac{C_0}{M_C}$
- Equivalent factor in the reverse-radial direction: $K_{CL}=\frac{C_{0L}}{M_C}$

$$\frac{C_0}{K_{CR}\cdot M_C}=\frac{C_{0L}}{K_{CL}\cdot M_C}=1$$

C_0	: Basic static load rating (radial direction)	(N)
C_{0L}	: Basic static load rating (reverse-radial direction)	(N)
C_{0T}	: Basic static load rating (lateral direction)	(N)
P_R	: Calculated load (radial direction)	(N)
P_L	: Calculated load (reverse-radial direction)	(N)
P_T	: Calculated load (lateral direction)	(N)

Table 1: Equivalent Factors (Models SHS, SSR, SVR, SVS, SHW, and SRS)

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SHS	15	1.38×10^{-1}		2.69×10^{-2}		1.38×10^{-1}	2.69×10^{-2}	1.50×10^{-1}	
	15L	1.07×10^{-1}		2.22×10^{-2}		1.07×10^{-1}	2.22×10^{-2}	1.50×10^{-1}	
	20	1.15×10^{-1}		2.18×10^{-2}		1.15×10^{-1}	2.18×10^{-2}	1.06×10^{-1}	
	20L	8.85×10^{-2}		1.79×10^{-2}		8.85×10^{-2}	1.79×10^{-2}	1.06×10^{-1}	
	25	9.25×10^{-2}		1.90×10^{-2}		9.25×10^{-2}	1.90×10^{-2}	9.29×10^{-2}	
	25L	7.62×10^{-2}		1.62×10^{-2}		7.62×10^{-2}	1.62×10^{-2}	9.29×10^{-2}	
	30	8.47×10^{-2}		1.63×10^{-2}		8.47×10^{-2}	1.63×10^{-2}	7.69×10^{-2}	
	30L	6.52×10^{-2}		1.34×10^{-2}		6.52×10^{-2}	1.34×10^{-2}	7.69×10^{-2}	
	35	6.95×10^{-2}		1.43×10^{-2}		6.95×10^{-2}	1.43×10^{-2}	6.29×10^{-2}	
	35L	5.43×10^{-2}		1.16×10^{-2}		5.43×10^{-2}	1.16×10^{-2}	6.29×10^{-2}	
	45	6.13×10^{-2}		1.24×10^{-2}		6.13×10^{-2}	1.24×10^{-2}	4.69×10^{-2}	
	45L	4.79×10^{-2}		1.02×10^{-2}		4.79×10^{-2}	1.02×10^{-2}	4.69×10^{-2}	
	55	4.97×10^{-2}		1.02×10^{-2}		4.97×10^{-2}	1.02×10^{-2}	4.02×10^{-2}	
	55L	3.88×10^{-2}		8.30×10^{-3}		3.88×10^{-2}	8.30×10^{-3}	4.02×10^{-2}	
	65	3.87×10^{-2}		7.91×10^{-3}		3.87×10^{-2}	7.91×10^{-3}	3.40×10^{-2}	
	65L	3.06×10^{-2}		6.51×10^{-3}		3.06×10^{-2}	6.51×10^{-3}	3.40×10^{-2}	
SSR	15XW(XTB)	2.08×10^{-1}	1.04×10^{-1}	3.75×10^{-2}	1.87×10^{-2}	1.46×10^{-1}	2.59×10^{-2}	1.71×10^{-1}	8.57×10^{-2}
	15XV(XSB)	3.19×10^{-1}	1.60×10^{-1}	5.03×10^{-2}	2.51×10^{-2}	2.20×10^{-1}	3.41×10^{-2}	1.71×10^{-1}	8.57×10^{-2}
	20XW(XTB)	1.69×10^{-1}	8.46×10^{-2}	3.23×10^{-2}	1.62×10^{-2}	1.19×10^{-1}	2.25×10^{-2}	1.29×10^{-1}	6.44×10^{-2}
	20XV(XSB)	2.75×10^{-1}	1.37×10^{-1}	4.28×10^{-2}	2.14×10^{-2}	1.89×10^{-1}	2.89×10^{-2}	1.29×10^{-1}	6.44×10^{-2}
	25XW(XTB)	1.41×10^{-1}	7.05×10^{-2}	2.56×10^{-2}	1.28×10^{-2}	9.86×10^{-2}	1.77×10^{-2}	1.10×10^{-1}	5.51×10^{-2}
	25XV(XSB)	2.15×10^{-1}	1.08×10^{-1}	3.40×10^{-2}	1.70×10^{-2}	1.48×10^{-1}	2.31×10^{-2}	1.10×10^{-1}	5.51×10^{-2}
	30XW(XTB)	1.18×10^{-1}	5.91×10^{-2}	2.19×10^{-2}	1.10×10^{-2}	8.26×10^{-2}	1.52×10^{-2}	9.22×10^{-2}	4.61×10^{-2}
	30XV(XSB)	1.85×10^{-1}	9.24×10^{-2}	4.69×10^{-2}	2.34×10^{-2}	1.27×10^{-1}	3.19×10^{-2}	9.16×10^{-2}	4.58×10^{-2}
	35XW(XTB)	1.01×10^{-1}	5.03×10^{-2}	1.92×10^{-2}	9.60×10^{-3}	7.04×10^{-2}	1.33×10^{-2}	7.64×10^{-2}	3.82×10^{-2}
	35XV(XSB)	1.58×10^{-1}	7.91×10^{-2}	4.04×10^{-2}	2.02×10^{-2}	1.09×10^{-1}	2.75×10^{-2}	7.59×10^{-2}	3.80×10^{-2}
SVR	25	1.13×10^{-1}	7.28×10^{-2}	2.25×10^{-2}	1.45×10^{-2}	7.14×10^{-2}	1.43×10^{-2}	9.59×10^{-2}	6.17×10^{-2}
	25L	9.14×10^{-2}	5.88×10^{-2}	1.85×10^{-2}	1.19×10^{-2}	5.80×10^{-2}	1.17×10^{-2}	9.59×10^{-2}	6.17×10^{-2}
	30	1.01×10^{-1}	6.50×10^{-2}	1.89×10^{-2}	1.21×10^{-2}	6.36×10^{-2}	1.19×10^{-2}	8.45×10^{-2}	5.43×10^{-2}
	30L	7.56×10^{-2}	4.86×10^{-2}	1.57×10^{-2}	1.01×10^{-2}	4.79×10^{-2}	1.00×10^{-2}	8.45×10^{-2}	5.43×10^{-2}
	35	9.19×10^{-2}	5.91×10^{-2}	1.68×10^{-2}	1.08×10^{-2}	5.77×10^{-2}	1.06×10^{-2}	7.08×10^{-2}	4.55×10^{-2}
	35L	6.80×10^{-2}	4.37×10^{-2}	1.39×10^{-2}	8.97×10^{-3}	4.31×10^{-2}	8.86×10^{-3}	7.08×10^{-2}	4.55×10^{-2}
	45	6.73×10^{-2}	4.33×10^{-2}	1.35×10^{-2}	8.71×10^{-3}	4.25×10^{-2}	8.59×10^{-3}	5.32×10^{-2}	3.42×10^{-2}
	45L	5.40×10^{-2}	3.47×10^{-2}	1.10×10^{-2}	7.09×10^{-3}	3.41×10^{-2}	6.97×10^{-3}	5.30×10^{-2}	3.41×10^{-2}
	55	5.89×10^{-2}	3.79×10^{-2}	1.14×10^{-2}	7.35×10^{-3}	3.72×10^{-2}	7.24×10^{-3}	4.63×10^{-2}	2.98×10^{-2}
	55L	4.55×10^{-2}	2.92×10^{-2}	9.45×10^{-3}	6.08×10^{-3}	2.89×10^{-2}	6.02×10^{-3}	4.63×10^{-2}	2.98×10^{-2}
	65	4.85×10^{-2}	3.12×10^{-2}	1.01×10^{-2}	6.48×10^{-3}	3.06×10^{-2}	6.40×10^{-3}	3.91×10^{-2}	2.51×10^{-2}
	65L	3.58×10^{-2}	2.30×10^{-2}	7.73×10^{-3}	4.97×10^{-3}	2.28×10^{-2}	4.93×10^{-3}	3.91×10^{-2}	2.51×10^{-2}

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SVS	25	1.09×10^{-1}	9.14×10^{-2}	2.17×10^{-2}	1.82×10^{-2}	1.00×10^{-1}	2.00×10^{-2}	9.95×10^{-2}	8.35×10^{-2}
	25L	8.82×10^{-2}	7.40×10^{-2}	1.78×10^{-2}	1.50×10^{-2}	8.13×10^{-2}	1.64×10^{-2}	9.95×10^{-2}	8.35×10^{-2}
	30	9.71×10^{-2}	8.15×10^{-2}	1.82×10^{-2}	1.52×10^{-2}	8.95×10^{-2}	1.67×10^{-2}	8.78×10^{-2}	7.37×10^{-2}
	30L	7.29×10^{-2}	6.11×10^{-2}	1.51×10^{-2}	1.27×10^{-2}	6.72×10^{-2}	1.39×10^{-2}	8.78×10^{-2}	7.37×10^{-2}
	35	8.84×10^{-2}	7.42×10^{-2}	1.61×10^{-2}	1.35×10^{-2}	8.14×10^{-2}	1.48×10^{-2}	7.36×10^{-2}	6.17×10^{-2}
	35L	6.56×10^{-2}	5.50×10^{-2}	1.34×10^{-2}	1.13×10^{-2}	6.04×10^{-2}	1.24×10^{-2}	7.36×10^{-2}	6.17×10^{-2}
	45	6.48×10^{-2}	5.44×10^{-2}	1.30×10^{-2}	1.09×10^{-2}	5.98×10^{-2}	1.20×10^{-2}	5.45×10^{-2}	4.57×10^{-2}
	45L	5.22×10^{-2}	4.38×10^{-2}	1.07×10^{-2}	8.94×10^{-3}	4.81×10^{-2}	9.81×10^{-3}	5.44×10^{-2}	4.56×10^{-2}
	55	5.67×10^{-2}	4.76×10^{-2}	1.10×10^{-2}	9.24×10^{-3}	5.23×10^{-2}	1.01×10^{-2}	4.78×10^{-2}	4.01×10^{-2}
	55L	4.39×10^{-2}	3.68×10^{-2}	9.12×10^{-3}	7.65×10^{-3}	4.05×10^{-2}	8.40×10^{-3}	4.78×10^{-2}	4.01×10^{-2}
	65	4.67×10^{-2}	3.92×10^{-2}	9.72×10^{-3}	8.15×10^{-3}	4.30×10^{-2}	8.95×10^{-3}	4.04×10^{-2}	3.39×10^{-2}
	65L	3.46×10^{-2}	2.90×10^{-2}	7.46×10^{-3}	6.26×10^{-3}	3.19×10^{-2}	6.88×10^{-3}	4.04×10^{-2}	3.39×10^{-2}
SHW	12	2.48×10^{-1}		4.69×10^{-2}		2.48×10^{-1}	4.69×10^{-2}	1.40×10^{-1}	
	12HR	1.70×10^{-1}		3.52×10^{-2}		1.70×10^{-1}	3.52×10^{-2}	1.40×10^{-1}	
	14	1.92×10^{-1}		3.80×10^{-2}		1.92×10^{-1}	3.80×10^{-2}	9.93×10^{-2}	
	17	1.72×10^{-1}		3.41×10^{-2}		1.72×10^{-1}	3.41×10^{-2}	6.21×10^{-2}	
	21	1.59×10^{-1}		2.95×10^{-2}		1.59×10^{-1}	2.95×10^{-2}	5.57×10^{-2}	
	27	1.21×10^{-1}		2.39×10^{-2}		1.21×10^{-1}	2.39×10^{-2}	4.99×10^{-2}	
	35	8.15×10^{-2}		1.64×10^{-2}		8.15×10^{-2}	1.64×10^{-2}	3.02×10^{-2}	
	50	6.22×10^{-2}		1.24×10^{-2}		6.22×10^{-2}	1.24×10^{-2}	2.30×10^{-2}	
SRS	5M	6.33×10^{-1}		9.20×10^{-2}		6.45×10^{-1}	9.30×10^{-2}	3.85×10^{-1}	
	5GM	6.71×10^{-1}		9.15×10^{-2}		6.66×10^{-1}	9.08×10^{-2}	3.85×10^{-1}	
	5N	5.23×10^{-1}		7.87×10^{-2}		5.32×10^{-1}	7.99×10^{-2}	3.86×10^{-1}	
	5GN	5.25×10^{-1}		7.97×10^{-2}		5.33×10^{-1}	8.12×10^{-2}	3.84×10^{-1}	
	5WM	4.48×10^{-1}		7.30×10^{-2}		4.56×10^{-1}	7.40×10^{-2}	1.96×10^{-1}	
	5WGM	4.58×10^{-1}		7.39×10^{-2}		4.54×10^{-1}	7.34×10^{-2}	1.96×10^{-1}	
	5WN	3.31×10^{-1}		5.93×10^{-2}		3.36×10^{-1}	6.02×10^{-2}	1.96×10^{-1}	
	5WGN	3.31×10^{-1}		5.97×10^{-2}		3.35×10^{-1}	6.05×10^{-2}	1.96×10^{-1}	
	7S	6.03×10^{-1}		7.65×10^{-2}		6.27×10^{-1}	7.91×10^{-2}	2.58×10^{-1}	
	7GS	5.92×10^{-1}		7.89×10^{-2}		6.14×10^{-1}	8.17×10^{-2}	2.58×10^{-1}	
	7M	4.19×10^{-1}		6.76×10^{-2}		4.18×10^{-1}	6.94×10^{-2}	2.58×10^{-1}	
	7GM	4.27×10^{-1}		6.04×10^{-2}		4.43×10^{-1}	6.23×10^{-2}	2.34×10^{-1}	
	7N	2.97×10^{-1}		5.35×10^{-2}		3.07×10^{-1}	5.50×10^{-2}	2.58×10^{-1}	
	7GN	3.11×10^{-1}		5.35×10^{-2}		3.20×10^{-1}	5.51×10^{-2}	2.58×10^{-1}	
	7WS	4.67×10^{-1}		6.89×10^{-2}		4.84×10^{-1}	7.08×10^{-2}	1.36×10^{-1}	
	7WGS	5.23×10^{-1}		6.75×10^{-2}		5.43×10^{-1}	6.95×10^{-2}	1.36×10^{-1}	
	7WM	3.01×10^{-1}		5.32×10^{-2}		3.00×10^{-1}	5.46×10^{-2}	1.36×10^{-1}	
	7WGM	2.83×10^{-1}		4.87×10^{-2}		2.93×10^{-1}	5.02×10^{-2}	1.24×10^{-1}	
	7WN	2.19×10^{-1}		4.16×10^{-2}		2.24×10^{-1}	4.28×10^{-2}	1.36×10^{-1}	
	7WGN	2.20×10^{-1}		4.17×10^{-2}		2.27×10^{-1}	4.31×10^{-2}	1.36×10^{-1}	

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

Table 2: Equivalent Factors (Models SRS, SCR, EPF, and HSR)

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SRS	9XS	4.86×10^{-1}		6.89×10^{-2}		5.04×10^{-1}	7.11×10^{-2}	2.17×10^{-1}	
	9XGS	5.37×10^{-1}		6.77×10^{-2}		5.57×10^{-1}	7.00×10^{-2}	2.17×10^{-1}	
	9XM	2.95×10^{-1}		5.27×10^{-2}		3.06×10^{-1}	5.43×10^{-2}	2.17×10^{-1}	
	9XGM	3.10×10^{-1}		5.28×10^{-2}		3.19×10^{-1}	5.44×10^{-2}	2.17×10^{-1}	
	9XN	2.13×10^{-1}		4.12×10^{-2}		2.19×10^{-1}	4.23×10^{-2}	2.17×10^{-1}	
	9XGN	2.18×10^{-1}		4.14×10^{-2}		2.24×10^{-1}	4.27×10^{-2}	2.17×10^{-1}	
	9WS	4.10×10^{-1}		5.73×10^{-2}		4.25×10^{-1}	5.63×10^{-2}	1.06×10^{-1}	
	9WGS	4.16×10^{-1}		5.80×10^{-2}		4.30×10^{-1}	5.98×10^{-2}	1.06×10^{-1}	
	9WM	2.37×10^{-1}		4.25×10^{-2}		2.44×10^{-1}	4.37×10^{-2}	1.06×10^{-1}	
	9WGM	2.41×10^{-1}		4.80×10^{-2}		2.41×10^{-1}	4.13×10^{-2}	1.06×10^{-1}	
	9WN	1.74×10^{-1}		3.35×10^{-2}		1.78×10^{-1}	3.44×10^{-2}	1.06×10^{-1}	
	9WGN	1.75×10^{-1}		3.38×10^{-2}		1.73×10^{-1}	3.32×10^{-2}	1.06×10^{-1}	
	12S	4.55×10^{-1}		5.60×10^{-2}		4.55×10^{-1}	5.60×10^{-2}	1.52×10^{-1}	
	12GS	5.04×10^{-1}		5.51×10^{-2}		5.04×10^{-1}	5.51×10^{-2}	1.52×10^{-1}	
	12M	2.94×10^{-1}		4.50×10^{-2}		2.94×10^{-1}	4.50×10^{-2}	1.53×10^{-1}	
	12GM	2.93×10^{-1}		4.49×10^{-2}		2.93×10^{-1}	4.49×10^{-2}	1.53×10^{-1}	
	12N	1.86×10^{-1}		3.51×10^{-2}		1.86×10^{-1}	3.51×10^{-2}	1.53×10^{-1}	
	12GN	1.96×10^{-1}		3.50×10^{-2}		1.96×10^{-1}	3.50×10^{-2}	1.53×10^{-1}	
	12WS	3.22×10^{-1}		5.00×10^{-2}		3.22×10^{-1}	5.00×10^{-2}	7.97×10^{-2}	
	12WGS	3.32×10^{-1}		5.07×10^{-2}		3.32×10^{-1}	5.07×10^{-2}	7.97×10^{-2}	
	12WM	2.00×10^{-1}		3.69×10^{-2}		2.00×10^{-1}	3.69×10^{-2}	7.97×10^{-2}	
	12WGM	2.07×10^{-1}		3.64×10^{-2}		2.07×10^{-1}	3.64×10^{-2}	7.96×10^{-2}	
	12WN	1.44×10^{-1}		2.83×10^{-2}		1.44×10^{-1}	2.83×10^{-2}	7.97×10^{-2}	
	12WGN	1.46×10^{-1}		2.85×10^{-2}		1.46×10^{-1}	2.85×10^{-2}	7.95×10^{-2}	
	15S	3.56×10^{-1}		4.38×10^{-2}		3.56×10^{-1}	4.38×10^{-2}	1.41×10^{-1}	
	15GS	3.37×10^{-1}		4.57×10^{-2}		3.37×10^{-1}	4.57×10^{-2}	1.41×10^{-1}	
	15M	2.17×10^{-1}		3.69×10^{-2}		2.17×10^{-1}	3.69×10^{-2}	1.41×10^{-1}	
	15GM	2.31×10^{-1}		3.61×10^{-2}		2.31×10^{-1}	3.61×10^{-2}	1.41×10^{-1}	
	15N	1.43×10^{-1}		2.73×10^{-2}		1.43×10^{-1}	2.73×10^{-2}	1.41×10^{-1}	
	15GN	1.45×10^{-1}		2.75×10^{-2}		1.45×10^{-1}	2.75×10^{-2}	1.41×10^{-1}	
	15WS	2.34×10^{-1}		3.76×10^{-2}		2.34×10^{-1}	3.76×10^{-2}	4.83×10^{-2}	
	15WGS	2.34×10^{-1}		3.81×10^{-2}		2.34×10^{-1}	3.81×10^{-2}	4.84×10^{-2}	
	15WM	1.67×10^{-1}		2.94×10^{-2}		1.67×10^{-1}	2.94×10^{-2}	4.83×10^{-2}	
	15WGM	1.63×10^{-1}		2.93×10^{-2}		1.63×10^{-1}	2.93×10^{-2}	4.83×10^{-2}	
	15WN	1.13×10^{-1}		2.27×10^{-2}		1.13×10^{-1}	2.27×10^{-2}	4.83×10^{-2}	
	15WGN	1.15×10^{-1}		2.28×10^{-2}		1.15×10^{-1}	2.28×10^{-2}	4.83×10^{-2}	
	20M	1.80×10^{-1}		3.30×10^{-2}		1.86×10^{-1}	3.41×10^{-2}	9.34×10^{-2}	
	20GM	2.10×10^{-1}		3.88×10^{-2}		2.10×10^{-1}	3.87×10^{-2}	1.03×10^{-1}	
	25M	1.14×10^{-1}		2.17×10^{-2}		1.14×10^{-1}	2.17×10^{-2}	8.13×10^{-2}	
	25GM	1.23×10^{-1}		2.32×10^{-2}		1.23×10^{-1}	2.32×10^{-2}	8.75×10^{-2}	

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SCR	15S	1.38×10^{-1}		2.69×10^{-2}		1.38×10^{-1}		—	
	20S	1.15×10^{-1}		2.18×10^{-2}		1.15×10^{-1}		—	
	20	8.85×10^{-2}		1.79×10^{-2}		8.85×10^{-2}		—	
	25	9.25×10^{-2}		1.90×10^{-2}		9.25×10^{-2}	1.90×10^{-2}	—	
	30	8.47×10^{-2}		1.63×10^{-2}		8.47×10^{-2}	1.63×10^{-2}	—	
	35	6.95×10^{-2}		1.43×10^{-2}		6.95×10^{-2}	1.43×10^{-2}	—	
	45	6.13×10^{-2}		1.24×10^{-2}		6.13×10^{-2}	1.24×10^{-2}	—	
	65	3.87×10^{-2}		7.91×10^{-3}		3.87×10^{-2}	7.91×10^{-3}	—	
EPF	7M	3.55×10^{-1}		—		3.55×10^{-1}		2.86×10^{-1}	
	9M	3.10×10^{-1}		—		3.10×10^{-1}		2.22×10^{-1}	
	12M	2.68×10^{-1}		—		2.68×10^{-1}		1.67×10^{-1}	
	15M	2.00×10^{-1}		—		2.00×10^{-1}		1.34×10^{-1}	
HSR	8	4.39×10^{-1}		6.75×10^{-2}		4.39×10^{-1}	6.75×10^{-2}	2.97×10^{-1}	
	10	3.09×10^{-1}		5.33×10^{-2}		3.09×10^{-1}	5.33×10^{-2}	2.35×10^{-1}	
	12	2.08×10^{-1}		3.74×10^{-2}		2.08×10^{-1}	3.74×10^{-2}	1.91×10^{-1}	
	15	1.66×10^{-1}		2.98×10^{-2}		1.66×10^{-1}	2.98×10^{-2}	1.57×10^{-1}	
	15L	1.18×10^{-1}		2.33×10^{-2}		1.18×10^{-1}	2.33×10^{-2}	1.57×10^{-1}	
	20	1.26×10^{-1}		2.28×10^{-2}		1.26×10^{-1}	2.28×10^{-2}	1.17×10^{-1}	
	20L	9.88×10^{-2}		1.92×10^{-2}		9.88×10^{-2}	1.92×10^{-2}	1.17×10^{-1}	
	25	1.12×10^{-1}		2.02×10^{-2}		1.12×10^{-1}	2.02×10^{-2}	9.96×10^{-2}	
	25L	8.23×10^{-2}		1.70×10^{-2}		8.23×10^{-2}	1.70×10^{-2}	9.96×10^{-2}	
	30	8.97×10^{-2}		1.73×10^{-2}		8.97×10^{-2}	1.73×10^{-2}	8.24×10^{-2}	
	30L	7.05×10^{-2}		1.44×10^{-2}		7.05×10^{-2}	1.44×10^{-2}	8.24×10^{-2}	
	35	7.85×10^{-2}		1.56×10^{-2}		7.85×10^{-2}	1.56×10^{-2}	6.69×10^{-2}	
	35L	6.17×10^{-2}		1.29×10^{-2}		6.17×10^{-2}	1.29×10^{-2}	6.69×10^{-2}	
	45	6.73×10^{-2}		1.21×10^{-2}		6.73×10^{-2}	1.21×10^{-2}	5.20×10^{-2}	
	45L	5.22×10^{-2}		1.01×10^{-2}		5.22×10^{-2}	1.01×10^{-2}	5.20×10^{-2}	
	55	5.61×10^{-2}		1.03×10^{-2}		5.61×10^{-2}	1.03×10^{-2}	4.26×10^{-2}	
	55L	4.35×10^{-2}		8.56×10^{-3}		4.35×10^{-2}	8.56×10^{-3}	4.26×10^{-2}	
	65	4.49×10^{-2}		9.13×10^{-3}		4.49×10^{-2}	9.13×10^{-3}	3.68×10^{-2}	
	65L	3.29×10^{-2}		7.08×10^{-3}		3.29×10^{-2}	7.08×10^{-3}	3.68×10^{-2}	
	85	3.49×10^{-2}		6.94×10^{-3}		3.49×10^{-2}	6.94×10^{-3}	2.78×10^{-2}	
	85L	2.74×10^{-2}		5.72×10^{-3}		2.74×10^{-2}	5.72×10^{-3}	2.78×10^{-2}	
	100	2.61×10^{-2}		5.16×10^{-3}		2.61×10^{-2}	5.16×10^{-3}	2.24×10^{-2}	
	120	2.37×10^{-2}		4.72×10^{-3}		2.37×10^{-2}	4.72×10^{-3}	1.96×10^{-2}	
	150	2.17×10^{-2}		4.35×10^{-3}		2.17×10^{-2}	4.35×10^{-3}	1.61×10^{-2}	
	15M2A	1.65×10^{-1}		2.89×10^{-2}		1.65×10^{-1}	2.89×10^{-2}	1.86×10^{-1}	
	20M2A	1.23×10^{-1}		2.23×10^{-2}		1.23×10^{-1}	2.23×10^{-2}	1.34×10^{-1}	
	25M2A	1.10×10^{-1}		1.98×10^{-2}		1.10×10^{-1}	1.98×10^{-2}	1.14×10^{-1}	

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

Table 3: Equivalent Factors (Models SR, NR-X, and NR)

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SR	15W (TB)	2.08×10^{-1}	1.04×10^{-1}	3.72×10^{-2}	1.86×10^{-2}	1.46×10^{-1}	2.57×10^{-2}	1.69×10^{-1}	8.43×10^{-2}
	15V (SB)	3.40×10^{-1}	1.70×10^{-1}	5.00×10^{-2}	2.50×10^{-2}	2.34×10^{-1}	3.37×10^{-2}	1.69×10^{-1}	8.43×10^{-2}
	20W (TB)	1.71×10^{-1}	8.56×10^{-2}	3.23×10^{-2}	1.61×10^{-2}	1.20×10^{-1}	2.24×10^{-2}	1.28×10^{-1}	6.40×10^{-2}
	20V (SB)	2.69×10^{-1}	1.34×10^{-1}	4.34×10^{-2}	2.17×10^{-2}	1.86×10^{-1}	2.95×10^{-2}	1.28×10^{-1}	6.39×10^{-2}
	25W (TB)	1.37×10^{-1}	6.85×10^{-2}	2.57×10^{-2}	1.29×10^{-2}	9.61×10^{-2}	1.78×10^{-2}	1.09×10^{-1}	5.47×10^{-2}
	25V (SB)	2.15×10^{-1}	1.08×10^{-1}	3.47×10^{-2}	1.73×10^{-2}	1.49×10^{-1}	2.36×10^{-2}	1.10×10^{-1}	5.48×10^{-2}
	30W (TB)	1.14×10^{-1}	5.71×10^{-2}	2.21×10^{-2}	1.10×10^{-2}	8.01×10^{-2}	1.54×10^{-2}	9.16×10^{-2}	4.58×10^{-2}
	30V (SB)	1.98×10^{-1}	9.92×10^{-2}	2.98×10^{-2}	1.49×10^{-2}	1.37×10^{-1}	2.01×10^{-2}	9.16×10^{-2}	4.58×10^{-2}
	35W (TB)	1.04×10^{-1}	5.21×10^{-2}	1.91×10^{-2}	9.57×10^{-3}	7.30×10^{-2}	1.32×10^{-2}	7.59×10^{-2}	3.80×10^{-2}
	35V (SB)	1.70×10^{-1}	8.50×10^{-2}	2.61×10^{-2}	1.31×10^{-2}	1.17×10^{-1}	1.77×10^{-2}	7.59×10^{-2}	3.80×10^{-2}
	45W (TB)	9.11×10^{-2}	4.56×10^{-2}	1.69×10^{-2}	8.44×10^{-3}	6.38×10^{-2}	1.17×10^{-2}	5.67×10^{-2}	2.83×10^{-2}
	55W (TB)	6.85×10^{-2}	3.42×10^{-2}	1.37×10^{-2}	6.86×10^{-3}	4.80×10^{-2}	9.57×10^{-3}	5.38×10^{-2}	2.69×10^{-2}
NR-X	25	1.19×10^{-1}	7.64×10^{-2}	2.24×10^{-2}	1.43×10^{-2}	7.47×10^{-2}	1.41×10^{-2}	9.69×10^{-2}	6.20×10^{-2}
	25L	9.18×10^{-2}	5.87×10^{-2}	1.85×10^{-2}	1.18×10^{-2}	5.78×10^{-2}	1.17×10^{-2}	9.69×10^{-2}	6.21×10^{-2}
	30	9.95×10^{-2}	6.37×10^{-2}	1.90×10^{-2}	1.21×10^{-2}	6.23×10^{-2}	1.19×10^{-2}	8.55×10^{-2}	5.47×10^{-2}
	30L	7.65×10^{-2}	4.89×10^{-2}	1.57×10^{-2}	1.00×10^{-2}	4.82×10^{-2}	9.91×10^{-3}	8.55×10^{-2}	5.47×10^{-2}
	35	9.08×10^{-2}	5.81×10^{-2}	1.69×10^{-2}	1.08×10^{-2}	5.67×10^{-2}	1.06×10^{-2}	7.17×10^{-2}	4.59×10^{-2}
	35L	6.88×10^{-2}	4.40×10^{-2}	1.40×10^{-2}	8.96×10^{-3}	4.32×10^{-2}	8.81×10^{-3}	7.17×10^{-2}	4.59×10^{-2}
	45	7.02×10^{-2}	4.50×10^{-2}	1.35×10^{-2}	8.64×10^{-3}	4.37×10^{-2}	8.39×10^{-3}	5.31×10^{-2}	3.40×10^{-2}
	45L	5.25×10^{-2}	3.36×10^{-2}	1.11×10^{-2}	7.11×10^{-3}	3.31×10^{-2}	7.05×10^{-3}	5.32×10^{-2}	3.41×10^{-2}
	55	5.92×10^{-2}	3.79×10^{-2}	1.15×10^{-2}	7.36×10^{-3}	3.72×10^{-2}	7.21×10^{-3}	4.66×10^{-2}	2.98×10^{-2}
	55L	4.66×10^{-2}	2.98×10^{-2}	9.43×10^{-3}	6.02×10^{-3}	2.92×10^{-2}	5.93×10^{-3}	4.65×10^{-2}	2.98×10^{-2}
	65	5.12×10^{-2}	3.28×10^{-2}	1.00×10^{-2}	6.40×10^{-3}	3.21×10^{-2}	6.31×10^{-3}	3.93×10^{-2}	2.52×10^{-2}
	65L	3.66×10^{-2}	2.34×10^{-2}	7.73×10^{-3}	4.93×10^{-3}	2.31×10^{-2}	4.89×10^{-3}	3.93×10^{-2}	2.52×10^{-2}
NR	75	4.21×10^{-2}	2.99×10^{-2}	8.31×10^{-3}	5.90×10^{-3}	3.08×10^{-2}	6.13×10^{-3}	3.16×10^{-2}	2.24×10^{-2}
	75L	3.14×10^{-2}	2.23×10^{-2}	6.74×10^{-3}	4.78×10^{-3}	2.33×10^{-2}	5.04×10^{-3}	3.16×10^{-2}	2.24×10^{-2}
	85	3.70×10^{-2}	2.62×10^{-2}	7.31×10^{-3}	5.19×10^{-3}	2.71×10^{-2}	5.40×10^{-3}	2.80×10^{-2}	1.99×10^{-2}
	85L	2.80×10^{-2}	1.99×10^{-2}	6.07×10^{-3}	4.31×10^{-3}	2.08×10^{-2}	4.55×10^{-3}	2.80×10^{-2}	1.99×10^{-2}
	100	3.05×10^{-2}	2.17×10^{-2}	6.20×10^{-3}	4.41×10^{-3}	2.26×10^{-2}	4.63×10^{-3}	2.38×10^{-2}	1.69×10^{-2}
	100L	2.74×10^{-2}	1.95×10^{-2}	5.46×10^{-3}	3.87×10^{-3}	2.00×10^{-2}	4.00×10^{-3}	2.38×10^{-2}	1.69×10^{-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} : M_B Equivalent factor when one LM block is used
K_{B2} : M_B Equivalent factor when two LM blocks are used in close contact with each other
K_{CR} : Equivalent factor in the M_C radial direction
K_{CL} : Equivalent factor in the M_C reverse-radial direction

Table 4: Equivalent Factors (Models NRS-X, NRS, HRW, and RSX)

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
NRS-X	25	1.15×10^{-3}	9.66×10^{-2}	2.16×10^{-2}	1.81×10^{-2}	1.06×10^{-1}	1.98×10^{-2}	9.51×10^{-2}	7.99×10^{-2}
	25L	8.85×10^{-2}	7.44×10^{-2}	1.79×10^{-2}	1.50×10^{-2}	8.14×10^{-2}	1.64×10^{-2}	9.51×10^{-2}	7.99×10^{-2}
	30	9.58×10^{-2}	8.05×10^{-2}	1.83×10^{-2}	1.53×10^{-2}	8.81×10^{-2}	1.68×10^{-2}	8.40×10^{-2}	7.05×10^{-2}
	30L	7.38×10^{-2}	6.20×10^{-2}	1.51×10^{-2}	1.27×10^{-2}	6.79×10^{-2}	1.39×10^{-2}	8.40×10^{-2}	7.05×10^{-2}
	35	8.73×10^{-2}	7.33×10^{-2}	1.62×10^{-2}	1.36×10^{-2}	8.03×10^{-2}	1.49×10^{-2}	7.04×10^{-2}	5.91×10^{-2}
	35L	6.63×10^{-2}	5.57×10^{-2}	1.35×10^{-2}	1.13×10^{-2}	6.10×10^{-2}	1.24×10^{-2}	7.04×10^{-2}	5.91×10^{-2}
	45	6.78×10^{-2}	5.69×10^{-2}	1.30×10^{-2}	1.09×10^{-2}	6.23×10^{-2}	1.19×10^{-2}	5.22×10^{-2}	4.39×10^{-2}
	45L	5.07×10^{-2}	4.26×10^{-2}	1.07×10^{-2}	8.99×10^{-3}	4.66×10^{-2}	9.86×10^{-3}	5.22×10^{-2}	4.39×10^{-2}
	55	5.71×10^{-2}	4.79×10^{-2}	1.10×10^{-2}	9.24×10^{-3}	5.25×10^{-2}	1.01×10^{-2}	4.58×10^{-2}	3.84×10^{-2}
	55L	4.50×10^{-2}	3.78×10^{-2}	9.14×10^{-3}	7.65×10^{-3}	4.14×10^{-2}	8.39×10^{-3}	4.57×10^{-2}	3.84×10^{-2}
	65	4.93×10^{-2}	4.14×10^{-2}	9.70×10^{-3}	8.15×10^{-3}	4.53×10^{-2}	8.88×10^{-3}	3.86×10^{-2}	3.25×10^{-2}
	65L	3.54×10^{-2}	2.97×10^{-2}	7.47×10^{-3}	6.30×10^{-3}	3.25×10^{-2}	6.86×10^{-3}	3.86×10^{-2}	3.25×10^{-2}
NRS	75	4.05×10^{-2}		8.01×10^{-3}		4.05×10^{-2}	8.01×10^{-3}	3.20×10^{-2}	
	75L	3.03×10^{-2}		6.50×10^{-3}		3.03×10^{-2}	6.50×10^{-3}	3.20×10^{-2}	
	85	3.56×10^{-2}		7.05×10^{-3}		3.56×10^{-2}	7.05×10^{-3}	2.83×10^{-2}	
	85L	2.70×10^{-2}		5.87×10^{-3}		2.70×10^{-2}	5.87×10^{-3}	2.83×10^{-2}	
	100	2.93×10^{-2}		5.97×10^{-3}		2.93×10^{-2}	5.97×10^{-3}	2.41×10^{-2}	
	100L	2.65×10^{-2}		5.27×10^{-3}		2.65×10^{-2}	5.27×10^{-3}	2.41×10^{-2}	
HRW	12	2.72×10^{-1}	1.93×10^{-1}	5.16×10^{-2}	3.65×10^{-2}	5.47×10^{-1}	1.04×10^{-1}	1.40×10^{-1}	9.92×10^{-2}
	14	2.28×10^{-1}	1.61×10^{-1}	4.16×10^{-2}	2.94×10^{-2}	4.54×10^{-1}	8.28×10^{-2}	1.01×10^{-1}	7.18×10^{-2}
	17	1.96×10^{-1}		3.34×10^{-2}		1.96×10^{-1}	3.34×10^{-2}	6.30×10^{-2}	
	21	1.65×10^{-1}		2.90×10^{-2}		1.65×10^{-1}	2.90×10^{-2}	5.89×10^{-2}	
	27	1.30×10^{-1}		2.34×10^{-2}		1.30×10^{-1}	2.34×10^{-2}	5.11×10^{-2}	
	35	8.69×10^{-2}		1.60×10^{-2}		8.69×10^{-2}	1.60×10^{-2}	3.06×10^{-2}	
	50	6.52×10^{-2}		1.22×10^{-2}		6.52×10^{-2}	1.22×10^{-2}	2.35×10^{-2}	
	60	5.80×10^{-2}		1.08×10^{-2}		5.80×10^{-2}	1.08×10^{-2}	1.77×10^{-2}	

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
RSX	5M	6.68×10^{-1}		9.11×10^{-2}		6.80×10^{-1}	9.24×10^{-2}	3.86×10^{-1}	
	5NM	5.25×10^{-1}		8.01×10^{-2}		5.36×10^{-1}	8.12×10^{-2}	3.86×10^{-1}	
	5WM	4.58×10^{-1}		7.39×10^{-2}		4.65×10^{-1}	7.51×10^{-2}	1.96×10^{-1}	
	5WNM	3.31×10^{-1}		5.98×10^{-2}		3.36×10^{-1}	6.06×10^{-2}	1.96×10^{-1}	
	7SM	5.90×10^{-1}		7.87×10^{-2}		6.12×10^{-1}	8.15×10^{-2}	2.59×10^{-1}	
	7M	4.72×10^{-1}		6.68×10^{-2}		4.87×10^{-1}	6.88×10^{-2}	2.59×10^{-1}	
	7NM	3.10×10^{-1}		5.18×10^{-2}		3.20×10^{-1}	5.33×10^{-2}	2.59×10^{-1}	
	7WSM	5.23×10^{-1}		6.75×10^{-2}		5.43×10^{-1}	6.95×10^{-2}	1.36×10^{-1}	
	7WM	3.10×10^{-1}		5.34×10^{-2}		3.20×10^{-1}	5.50×10^{-2}	1.36×10^{-1}	
	7WNM	2.21×10^{-1}		4.18×10^{-2}		2.27×10^{-1}	4.32×10^{-2}	1.36×10^{-1}	
	9SM	5.37×10^{-1}		6.77×10^{-2}		5.57×10^{-1}	7.00×10^{-2}	2.17×10^{-1}	
	9M	3.10×10^{-1}		5.28×10^{-2}		3.19×10^{-1}	5.44×10^{-2}	2.17×10^{-1}	
	9NM	2.17×10^{-1}		4.13×10^{-2}		2.24×10^{-1}	4.27×10^{-2}	2.17×10^{-1}	
	9WSM	4.16×10^{-1}		5.80×10^{-2}		4.30×10^{-1}	5.98×10^{-2}	1.06×10^{-1}	
	9WM	2.31×10^{-1}		4.31×10^{-2}		2.38×10^{-1}	4.43×10^{-2}	1.06×10^{-1}	
	9WNM	1.75×10^{-1}		3.38×10^{-2}		1.81×10^{-1}	3.48×10^{-2}	1.06×10^{-1}	
	12SM	5.04×10^{-1}		5.52×10^{-2}		5.04×10^{-1}	5.52×10^{-2}	1.52×10^{-1}	
	12M	2.96×10^{-1}		4.55×10^{-2}		2.96×10^{-1}	4.55×10^{-2}	1.52×10^{-1}	
	12NM	1.96×10^{-1}		3.50×10^{-2}		1.96×10^{-1}	3.50×10^{-2}	1.52×10^{-1}	
	12WSM	3.32×10^{-1}		5.07×10^{-2}		3.32×10^{-1}	5.07×10^{-2}	7.95×10^{-2}	
	12WM	2.10×10^{-1}		3.69×10^{-2}		2.10×10^{-1}	3.69×10^{-2}	7.95×10^{-2}	
	12WNM	1.46×10^{-1}		2.85×10^{-2}		1.46×10^{-1}	2.85×10^{-2}	7.95×10^{-2}	
	15SM	3.36×10^{-1}		4.58×10^{-2}		3.36×10^{-1}	4.58×10^{-2}	1.41×10^{-1}	
	15M	2.34×10^{-1}		3.65×10^{-2}		2.34×10^{-1}	3.65×10^{-2}	1.41×10^{-1}	
	15NM	1.45×10^{-1}		2.75×10^{-2}		1.45×10^{-1}	2.75×10^{-2}	1.41×10^{-1}	
	15WSM	2.34×10^{-1}		3.81×10^{-2}		2.34×10^{-1}	3.81×10^{-2}	4.82×10^{-2}	
	15WM	1.66×10^{-1}		2.97×10^{-2}		1.66×10^{-1}	2.97×10^{-2}	4.82×10^{-2}	
	15WNM	1.15×10^{-1}		2.28×10^{-2}		1.15×10^{-1}	2.28×10^{-2}	4.82×10^{-2}	
	9M1	3.10×10^{-1}		5.28×10^{-2}		3.19×10^{-1}	5.44×10^{-2}	2.17×10^{-1}	
	9M1N	2.17×10^{-1}		4.13×10^{-2}		2.24×10^{-1}	4.27×10^{-2}	2.17×10^{-1}	
	9M1W	2.31×10^{-1}		4.31×10^{-2}		2.38×10^{-1}	4.43×10^{-2}	1.06×10^{-1}	
	9M1WN	1.75×10^{-1}		3.38×10^{-2}		1.81×10^{-1}	3.48×10^{-2}	1.06×10^{-1}	
	12M1	2.96×10^{-1}		4.55×10^{-2}		2.96×10^{-1}	4.55×10^{-2}	1.52×10^{-1}	
	12M1N	1.96×10^{-1}		3.50×10^{-2}		1.96×10^{-1}	3.50×10^{-2}	1.52×10^{-1}	
	12M1W	2.10×10^{-1}		3.69×10^{-2}		2.10×10^{-1}	3.69×10^{-2}	7.95×10^{-2}	
	12M1WN	1.46×10^{-1}		2.85×10^{-2}		1.46×10^{-1}	2.85×10^{-2}	7.95×10^{-2}	
	15M1	2.34×10^{-1}		3.65×10^{-2}		2.34×10^{-1}	3.65×10^{-2}	1.41×10^{-1}	
	15M1N	1.45×10^{-1}		2.75×10^{-2}		1.45×10^{-1}	2.75×10^{-2}	1.41×10^{-1}	
	15M1W	1.66×10^{-1}		2.97×10^{-2}		1.66×10^{-1}	2.97×10^{-2}	4.82×10^{-2}	
	15M1WN	1.15×10^{-1}		2.28×10^{-2}		1.15×10^{-1}	2.28×10^{-2}	4.82×10^{-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} : M_B Equivalent factor when one LM block is used
K_{B2} : M_B Equivalent factor when two LM blocks are used in close contact with each other
K_{CR} : Equivalent factor in the M_C radial direction
K_{CL} : Equivalent factor in the M_C reverse-radial direction

Table 5: Equivalent Factors (Models RSR and HR)

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
RSR	2N	6.81×10^{-1}		1.28×10^{-1}		6.81×10^{-1}	1.28×10^{-1}	8.69×10^{-1}	
	2WN	5.10×10^{-1}		9.32×10^{-2}		5.10×10^{-1}	9.32×10^{-2}	4.54×10^{-1}	
	3M	9.20×10^{-1}		1.27×10^{-1}		9.20×10^{-1}	1.27×10^{-1}	6.06×10^{-1}	
	3N	6.06×10^{-1}		1.01×10^{-1}		6.06×10^{-1}	1.01×10^{-1}	6.06×10^{-1}	
	3W	7.03×10^{-1}		1.06×10^{-1}		7.03×10^{-1}	1.06×10^{-1}	3.17×10^{-1}	
	3WN	4.76×10^{-1}		8.27×10^{-2}		4.76×10^{-1}	8.27×10^{-2}	3.17×10^{-1}	
	9M1K	3.06×10^{-1}		5.19×10^{-2}		3.06×10^{-1}	5.19×10^{-2}	2.15×10^{-1}	
	9M1N	2.15×10^{-1}		4.08×10^{-2}		2.15×10^{-1}	4.08×10^{-2}	2.15×10^{-1}	
	9M1WV	2.44×10^{-1}		4.22×10^{-2}		2.44×10^{-1}	4.22×10^{-2}	1.09×10^{-1}	
	9M1WN	1.73×10^{-1}		3.33×10^{-2}		1.73×10^{-1}	3.33×10^{-2}	1.09×10^{-1}	
	12M1V	3.52×10^{-1}	2.46×10^{-1}	5.37×10^{-2}	3.76×10^{-2}	2.81×10^{-1}	4.21×10^{-2}	2.09×10^{-1}	1.46×10^{-1}
	12M1N	2.30×10^{-1}	1.61×10^{-1}	4.08×10^{-2}	2.85×10^{-2}	1.85×10^{-1}	3.25×10^{-2}	2.09×10^{-1}	1.46×10^{-1}
	12M1WV	2.47×10^{-1}	1.73×10^{-1}	4.38×10^{-2}	3.07×10^{-2}	1.99×10^{-1}	3.49×10^{-2}	1.02×10^{-1}	7.15×10^{-2}
	12M1WN	1.71×10^{-1}	1.20×10^{-1}	3.36×10^{-2}	2.35×10^{-2}	1.38×10^{-1}	2.70×10^{-2}	1.02×10^{-1}	7.15×10^{-2}
	14WV	2.10×10^{-1}	1.47×10^{-1}	3.89×10^{-2}	2.73×10^{-2}	1.69×10^{-1}	3.10×10^{-2}	8.22×10^{-2}	5.75×10^{-2}
	15M1V	2.77×10^{-1}	1.94×10^{-1}	4.38×10^{-2}	3.07×10^{-2}	2.21×10^{-1}	3.45×10^{-2}	1.69×10^{-1}	1.18×10^{-1}
	15M1N	1.70×10^{-1}	1.19×10^{-1}	3.24×10^{-2}	2.27×10^{-2}	1.37×10^{-1}	2.59×10^{-2}	1.69×10^{-1}	1.18×10^{-1}
	15M1WV	1.95×10^{-1}	1.36×10^{-1}	3.52×10^{-2}	2.46×10^{-2}	1.56×10^{-1}	2.80×10^{-2}	5.83×10^{-2}	4.08×10^{-2}
	15M1WN	1.34×10^{-1}	9.41×10^{-2}	2.68×10^{-2}	1.88×10^{-2}	1.09×10^{-1}	2.16×10^{-2}	5.82×10^{-2}	4.08×10^{-2}
	20M1V	1.68×10^{-1}	1.18×10^{-1}	2.92×10^{-2}	2.04×10^{-2}	1.35×10^{-1}	2.32×10^{-2}	1.30×10^{-1}	9.13×10^{-2}
	20M1N	1.20×10^{-1}	8.39×10^{-2}	2.30×10^{-2}	1.61×10^{-2}	9.68×10^{-2}	1.84×10^{-2}	1.30×10^{-1}	9.13×10^{-2}
HR	918	2.65×10^{-1}		3.58×10^{-2}		2.65×10^{-1}	3.58×10^{-2}	—	—
	1123	2.08×10^{-1}		3.17×10^{-2}		2.08×10^{-1}	3.17×10^{-2}	—	—
	1530	1.56×10^{-1}		2.39×10^{-2}		1.56×10^{-1}	2.39×10^{-2}	—	—
	2042	1.11×10^{-1}		1.80×10^{-2}		1.11×10^{-1}	1.80×10^{-2}	—	—
	2042T	8.64×10^{-2}		1.53×10^{-2}		8.64×10^{-2}	1.53×10^{-2}	—	—
	2555	7.79×10^{-2}		1.38×10^{-2}		7.79×10^{-2}	1.38×10^{-2}	—	—
	2555T	6.13×10^{-2}		1.17×10^{-2}		6.13×10^{-2}	1.17×10^{-2}	—	—
	3065	6.92×10^{-2}		1.15×10^{-2}		6.92×10^{-2}	1.15×10^{-2}	—	—
	3065T	5.45×10^{-2}		9.92×10^{-3}		5.45×10^{-2}	9.92×10^{-3}	—	—
	3575	6.23×10^{-2}		1.08×10^{-2}		6.23×10^{-2}	1.08×10^{-2}	—	—
	3575T	4.90×10^{-2}		9.42×10^{-3}		4.90×10^{-2}	9.42×10^{-3}	—	—
	4085	5.19×10^{-2}		9.53×10^{-3}		5.19×10^{-2}	9.53×10^{-3}	—	—
	4085T	4.09×10^{-2}		7.97×10^{-3}		4.09×10^{-2}	7.97×10^{-3}	—	—
	50105	4.15×10^{-2}		7.40×10^{-3}		4.15×10^{-2}	7.40×10^{-3}	—	—
	50105T	3.27×10^{-2}		6.26×10^{-3}		3.27×10^{-2}	6.26×10^{-3}	—	—
	60125	2.88×10^{-2}		5.18×10^{-3}		2.88×10^{-2}	5.18×10^{-3}	—	—

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

Table 6: Equivalent Factors (Models GSR, CSR, MX, JR, NSR, SRG, SRN, SRW, and HRX)

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
GSR	15T	1.61×10^{-1}	1.44×10^{-1}	2.88×10^{-2}	2.59×10^{-2}	1.68×10^{-1}	3.01×10^{-2}	—	—
	15V	2.21×10^{-1}	1.99×10^{-1}	3.54×10^{-2}	3.18×10^{-2}	2.30×10^{-1}	3.68×10^{-2}	—	—
	20T	1.28×10^{-1}	1.16×10^{-1}	2.34×10^{-2}	2.10×10^{-2}	1.34×10^{-1}	2.44×10^{-2}	—	—
	20V	1.77×10^{-1}	1.59×10^{-1}	2.87×10^{-2}	2.58×10^{-2}	1.84×10^{-1}	2.99×10^{-2}	—	—
	25T	1.07×10^{-1}	9.63×10^{-2}	1.97×10^{-2}	1.77×10^{-2}	1.12×10^{-1}	2.06×10^{-2}	—	—
	25V	1.47×10^{-1}	1.33×10^{-1}	2.42×10^{-2}	2.18×10^{-2}	1.53×10^{-1}	2.52×10^{-2}	—	—
	30T	9.17×10^{-2}	8.26×10^{-2}	1.68×10^{-2}	1.51×10^{-2}	9.59×10^{-2}	1.76×10^{-2}	—	—
	35T	8.03×10^{-2}	7.22×10^{-2}	1.48×10^{-2}	1.33×10^{-2}	8.39×10^{-2}	1.55×10^{-2}	—	—
CSR	15	1.66×10^{-1}		—		1.66×10^{-1}	—	—	
	20S	1.26×10^{-1}		—		1.26×10^{-1}	—	—	
	20	9.88×10^{-2}		—		9.88×10^{-2}	—	—	
	25S	1.12×10^{-1}		—		1.12×10^{-1}	—	—	
	25	8.23×10^{-2}		—		8.23×10^{-2}	—	—	
	30S	8.97×10^{-2}		—		8.97×10^{-2}	—	—	
	30	7.05×10^{-2}		—		7.05×10^{-2}	—	—	
	35	6.17×10^{-2}		—		6.17×10^{-2}	—	—	
	45	5.22×10^{-2}		—		5.22×10^{-2}	—	—	
MX	5	4.27×10^{-1}		7.01×10^{-2}		4.27×10^{-1}	7.01×10^{-2}	—	
	7W	2.18×10^{-1}		4.13×10^{-2}		2.18×10^{-1}	4.13×10^{-2}	—	
JR	25	1.12×10^{-1}		2.02×10^{-2}		1.12×10^{-1}	2.02×10^{-2}	9.96×10^{-2}	
	35	7.85×10^{-2}		1.56×10^{-2}		7.85×10^{-2}	1.56×10^{-2}	6.69×10^{-2}	
	45	6.73×10^{-2}		1.21×10^{-2}		6.73×10^{-2}	1.21×10^{-2}	5.20×10^{-2}	
	55	5.61×10^{-2}		1.03×10^{-2}		5.61×10^{-2}	1.03×10^{-2}	4.26×10^{-2}	
NSR	20TBC	2.29×10^{-1}		2.68×10^{-2}		2.29×10^{-1}	2.68×10^{-2}	—	—
	25TBC	2.01×10^{-1}		2.27×10^{-2}		2.01×10^{-1}	2.27×10^{-2}	—	—
	30TBC	1.85×10^{-1}		1.93×10^{-2}		1.85×10^{-1}	1.93×10^{-2}	—	—
	40TBC	1.39×10^{-1}		1.60×10^{-2}		1.39×10^{-1}	1.60×10^{-2}	—	—
	50TBC	1.24×10^{-1}		1.42×10^{-2}		1.24×10^{-1}	1.42×10^{-2}	—	—
	70TBC	9.99×10^{-2}		1.15×10^{-2}		9.99×10^{-2}	1.15×10^{-2}	—	—

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SRG	15X	1.23×10^{-1}		2.07×10^{-2}		1.23×10^{-1}	2.07×10^{-2}	1.04×10^{-1}	
	15XG	1.25×10^{-1}		2.08×10^{-2}		1.25×10^{-1}	2.08×10^{-2}	1.04×10^{-1}	
	20X	9.60×10^{-2}		1.71×10^{-2}		9.60×10^{-2}	1.71×10^{-2}	8.00×10^{-2}	
	20XG	9.67×10^{-2}		1.68×10^{-2}		9.67×10^{-2}	1.68×10^{-2}	8.00×10^{-2}	
	20XL	7.21×10^{-2}		1.42×10^{-2}		7.21×10^{-2}	1.42×10^{-2}	8.00×10^{-2}	
	20XGL	7.38×10^{-2}		1.39×10^{-2}		7.38×10^{-2}	1.39×10^{-2}	8.00×10^{-2}	
	25X	8.96×10^{-2}		1.55×10^{-2}		8.96×10^{-2}	1.55×10^{-2}	7.23×10^{-2}	
	25XG	8.52×10^{-2}		1.51×10^{-2}		8.52×10^{-2}	1.51×10^{-2}	7.23×10^{-2}	
	25XL	6.99×10^{-2}		1.31×10^{-2}		6.99×10^{-2}	1.31×10^{-2}	7.23×10^{-2}	
	25XGL	6.69×10^{-2}		1.27×10^{-2}		6.69×10^{-2}	1.27×10^{-2}	7.23×10^{-2}	
	30X	8.06×10^{-2}		1.33×10^{-2}		8.06×10^{-2}	1.33×10^{-2}	5.61×10^{-2}	
	30XG	7.90×10^{-2}		1.34×10^{-2}		7.90×10^{-2}	1.34×10^{-2}	5.96×10^{-2}	
	30XL	6.12×10^{-2}		1.11×10^{-2}		6.12×10^{-2}	1.11×10^{-2}	5.61×10^{-2}	
	30XGL	6.15×10^{-2}		1.11×10^{-2}		6.15×10^{-2}	1.11×10^{-2}	5.96×10^{-2}	
	35	7.14×10^{-2}		1.18×10^{-2}		7.14×10^{-2}	1.18×10^{-2}	4.98×10^{-2}	
	35G	7.37×10^{-2}		1.17×10^{-2}		7.37×10^{-2}	1.17×10^{-2}	4.86×10^{-2}	
	35L	5.26×10^{-2}		9.67×10^{-3}		5.26×10^{-2}	9.67×10^{-3}	4.98×10^{-2}	
	35GL	5.37×10^{-2}		9.67×10^{-3}		5.37×10^{-2}	9.67×10^{-3}	4.86×10^{-2}	
	35SL	4.40×10^{-2}		8.34×10^{-3}		4.40×10^{-2}	8.34×10^{-3}	4.98×10^{-2}	
	35GSL	4.43×10^{-2}		8.35×10^{-3}		4.43×10^{-2}	8.35×10^{-3}	4.86×10^{-2}	
	45	5.49×10^{-2}		9.58×10^{-3}		5.49×10^{-2}	9.58×10^{-3}	3.85×10^{-2}	
	45G	5.53×10^{-2}		9.60×10^{-3}		5.53×10^{-2}	9.60×10^{-3}	3.68×10^{-2}	
	45L	4.18×10^{-2}		7.93×10^{-3}		4.18×10^{-2}	7.93×10^{-3}	3.85×10^{-2}	
	45GL	4.19×10^{-2}		7.94×10^{-3}		4.19×10^{-2}	7.94×10^{-3}	3.68×10^{-2}	
	45SL	3.28×10^{-2}		6.56×10^{-3}		3.28×10^{-2}	6.56×10^{-3}	3.85×10^{-2}	
	45GSL	3.30×10^{-2}		6.57×10^{-3}		3.30×10^{-2}	6.57×10^{-3}	3.68×10^{-2}	
	55	4.56×10^{-2}		8.04×10^{-3}		4.56×10^{-2}	8.04×10^{-3}	3.25×10^{-2}	
	55G	4.61×10^{-2}		8.05×10^{-3}		4.61×10^{-2}	8.05×10^{-3}	3.14×10^{-2}	
	55L	3.37×10^{-2}		6.42×10^{-3}		3.37×10^{-2}	6.42×10^{-3}	3.25×10^{-2}	
	55GL	3.40×10^{-2}		6.42×10^{-3}		3.40×10^{-2}	6.42×10^{-3}	3.14×10^{-2}	
	55SL	2.56×10^{-2}		5.22×10^{-3}		2.56×10^{-2}	5.22×10^{-3}	3.25×10^{-2}	
	55GSL	2.59×10^{-2}		5.22×10^{-3}		2.59×10^{-2}	5.22×10^{-3}	3.14×10^{-2}	
	65	3.54×10^{-2}		6.06×10^{-3}		3.54×10^{-2}	6.06×10^{-3}	2.70×10^{-2}	
	65G	3.44×10^{-2}		6.10×10^{-3}		3.44×10^{-2}	6.10×10^{-3}	2.63×10^{-2}	
	65L	2.63×10^{-2}		4.97×10^{-3}		2.63×10^{-2}	4.97×10^{-3}	2.70×10^{-2}	
	65GL	2.65×10^{-2}		4.98×10^{-3}		2.65×10^{-2}	4.98×10^{-3}	2.63×10^{-2}	
	65SL	1.97×10^{-2}		4.01×10^{-3}		1.97×10^{-2}	4.01×10^{-3}	2.70×10^{-2}	
	65GSL	1.99×10^{-2}		4.10×10^{-3}		1.99×10^{-2}	4.10×10^{-3}	2.63×10^{-2}	
	85LC	2.19×10^{-2}		4.15×10^{-3}		2.19×10^{-2}	4.15×10^{-3}	1.91×10^{-2}	
	100LC	1.95×10^{-2}		3.67×10^{-3}		1.95×10^{-2}	3.67×10^{-3}	1.62×10^{-2}	
SRN	35	7.14×10^{-2}		1.18×10^{-2}		7.14×10^{-2}	1.18×10^{-2}	4.98×10^{-2}	
	35G	7.37×10^{-2}		1.17×10^{-2}		7.37×10^{-2}	1.17×10^{-2}	4.86×10^{-2}	

Model No.		Equivalent factor							
		K_{AR1}	K_{AL1}	K_{AR2}	K_{AL2}	K_{B1}	K_{B2}	K_{CR}	K_{CL}
SRN	35L	5.26×10^{-2}		9.67×10^{-3}		5.26×10^{-2}	9.67×10^{-3}	4.98×10^{-2}	
	35GL	5.37×10^{-2}		9.67×10^{-3}		5.37×10^{-2}	9.67×10^{-3}	4.86×10^{-2}	
	35SL	4.40×10^{-2}		8.34×10^{-3}		4.40×10^{-2}	8.34×10^{-3}	4.98×10^{-2}	
	35GSL	4.43×10^{-2}		8.35×10^{-3}		4.43×10^{-2}	8.35×10^{-3}	4.86×10^{-2}	
	45	5.49×10^{-2}		9.58×10^{-3}		5.49×10^{-2}	9.58×10^{-3}	3.85×10^{-2}	
	45G	5.53×10^{-2}		9.60×10^{-3}		5.53×10^{-2}	9.60×10^{-3}	3.68×10^{-2}	
	45L	4.18×10^{-2}		7.93×10^{-3}		4.18×10^{-2}	7.93×10^{-3}	3.85×10^{-2}	
	45GL	4.19×10^{-2}		7.94×10^{-3}		4.19×10^{-2}	7.94×10^{-3}	3.68×10^{-2}	
	45SL	3.28×10^{-2}		6.56×10^{-3}		3.28×10^{-2}	6.56×10^{-3}	3.85×10^{-2}	
	45GSL	3.30×10^{-2}		6.57×10^{-3}		3.30×10^{-2}	6.57×10^{-3}	3.68×10^{-2}	
	55	4.56×10^{-2}		8.04×10^{-3}		4.56×10^{-2}	8.04×10^{-3}	3.25×10^{-2}	
	55G	4.61×10^{-2}		8.05×10^{-3}		4.61×10^{-2}	8.05×10^{-3}	3.14×10^{-2}	
	55L	3.37×10^{-2}		6.42×10^{-3}		3.37×10^{-2}	6.42×10^{-3}	3.25×10^{-2}	
	55GL	3.40×10^{-2}		6.42×10^{-3}		3.40×10^{-2}	6.42×10^{-3}	3.14×10^{-2}	
	55SL	2.56×10^{-2}		5.22×10^{-3}		2.56×10^{-2}	5.22×10^{-3}	3.25×10^{-2}	
	55GSL	2.59×10^{-2}		5.22×10^{-3}		2.59×10^{-2}	5.22×10^{-3}	3.14×10^{-2}	
	65	3.54×10^{-2}		6.06×10^{-3}		3.54×10^{-2}	6.06×10^{-3}	2.70×10^{-2}	
	65G	3.44×10^{-2}		6.10×10^{-3}		3.44×10^{-2}	6.10×10^{-3}	2.63×10^{-2}	
	65L	2.63×10^{-2}		4.97×10^{-3}		2.63×10^{-2}	4.97×10^{-3}	2.70×10^{-2}	
	65GL	2.65×10^{-2}		4.98×10^{-3}		2.65×10^{-2}	4.98×10^{-3}	2.63×10^{-2}	
	65SL	1.97×10^{-2}		4.01×10^{-3}		1.97×10^{-2}	4.01×10^{-3}	2.70×10^{-2}	
	65GSL	1.99×10^{-2}		4.10×10^{-3}		1.99×10^{-2}	4.10×10^{-3}	2.63×10^{-2}	
SRW	70	4.18×10^{-2}		7.93×10^{-3}		4.18×10^{-2}	7.93×10^{-3}	2.52×10^{-2}	
	85	3.37×10^{-2}		6.42×10^{-3}		3.37×10^{-2}	6.42×10^{-3}	2.09×10^{-2}	
	100	2.63×10^{-2}		4.97×10^{-3}		2.63×10^{-2}	4.97×10^{-3}	1.77×10^{-2}	
	130	2.19×10^{-2}		4.15×10^{-3}		2.19×10^{-2}	4.15×10^{-3}	1.33×10^{-2}	
	150	1.95×10^{-2}		3.67×10^{-3}		1.95×10^{-2}	3.67×10^{-3}	1.15×10^{-2}	
HRX	25	7.91×10^{-2}		1.51×10^{-2}		7.91×10^{-2}	1.51×10^{-2}	1.29×10^{-1}	1.29×10^{-1}
	25L	6.52×10^{-2}		1.30×10^{-2}		6.52×10^{-2}	1.30×10^{-2}	1.29×10^{-1}	1.29×10^{-1}
	30	7.07×10^{-2}		1.36×10^{-2}		7.07×10^{-2}	1.36×10^{-2}	1.02×10^{-1}	1.02×10^{-1}
	30L	5.54×10^{-2}		1.12×10^{-2}		5.54×10^{-2}	1.12×10^{-2}	1.02×10^{-1}	1.02×10^{-1}
	35	6.45×10^{-2}		1.29×10^{-2}		6.45×10^{-2}	1.29×10^{-2}	8.29×10^{-2}	8.29×10^{-2}
	35L	5.00×10^{-2}		1.05×10^{-2}		5.00×10^{-2}	1.05×10^{-2}	8.29×10^{-2}	8.29×10^{-2}
	45	5.16×10^{-2}		1.05×10^{-2}		5.16×10^{-2}	1.05×10^{-2}	6.52×10^{-2}	6.52×10^{-2}
	45L	4.00×10^{-2}		8.50×10^{-3}		4.00×10^{-2}	8.50×10^{-3}	6.52×10^{-2}	6.52×10^{-2}
	55	4.17×10^{-2}		8.74×10^{-3}		4.17×10^{-2}	8.74×10^{-3}	5.39×10^{-2}	5.39×10^{-2}
	55L	3.14×10^{-2}		6.85×10^{-3}		3.14×10^{-2}	6.85×10^{-3}	5.39×10^{-2}	5.39×10^{-2}
	65	3.08×10^{-2}		6.56×10^{-3}		3.08×10^{-2}	6.56×10^{-3}	4.62×10^{-2}	4.62×10^{-2}
	65L	2.36×10^{-2}		5.15×10^{-3}		2.36×10^{-2}	5.15×10^{-3}	4.62×10^{-2}	4.62×10^{-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} : M_B Equivalent factor when one LM block is used
K_{B2} : M_B Equivalent factor when two LM blocks are used in close contact with each other
K_{CR} : Equivalent factor in the M_C radial direction
K_{CL} : Equivalent factor in the M_C reverse-radial direction

Double-Axis Use

● Determining the Operating Conditions

Set the conditions needed to calculate the applied load and service life in hours for the LM System.

(1) Mass: m (kg)
(2) Direction of the working load
(3) Position of the working point (e.g., center of gravity): ℓ_2, ℓ_3, h_1 (mm)
(4) Thrust position: ℓ_4, h_2 (mm)
(5) LM system arrangement: ℓ_0, ℓ_1 (mm)
(No. of units and axes)
(6) Velocity diagram
Speed: V (mm/s)
Time constant: t_n (s)
Acceleration: α_n (mm/s^2)

$$(\alpha_n = \frac{V}{t_n})$$

(7) Duty cycle
Number of reciprocations per minute: N_1 (min^{-1})
(8) Stroke length: ℓ_s (mm)
(9) Average speed: V_m (m/s)
(10) Required service life in hours: L_h (h)

Gravitational acceleration g = 9.8 (m/s^2)

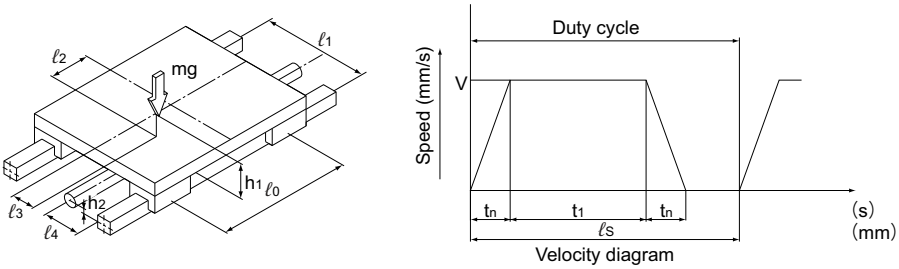


Fig. 6: Operating Conditions

● Applied Load Equation

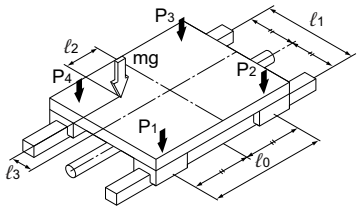
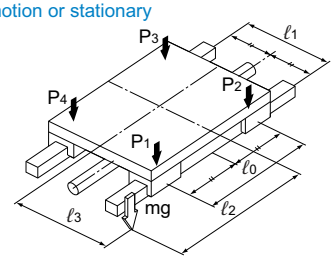
The load applied to the LM Guide varies with external forces such as the location of the center of gravity of the load, the position of the thrust, inertia generated by acceleration and deceleration during starts and stops, and cutting resistance.
In selecting an LM Guide, it is necessary to obtain the value of the applied load while taking into account these conditions.

Calculate the load applied to the LM Guide in each of the examples 1 to 10 shown below.

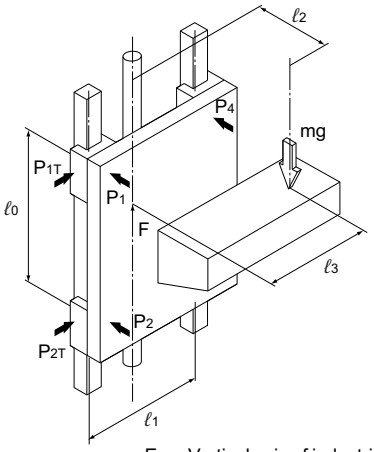
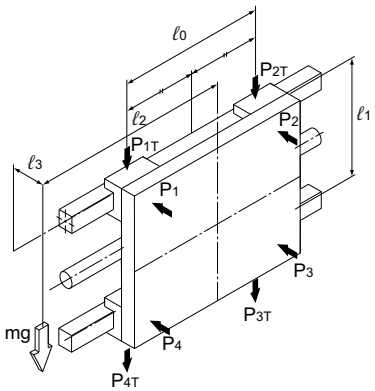
m	:	Mass	(kg)
ℓ_n	:	Distance	(mm)
F_n	:	External force	(N)
P_n	:	Applied load (radial/reverse-radial direction)	(N)
P_{nT}	:	Applied load (lateral directions)	(N)
g	:	Gravitational acceleration ($g = 9.8\ m/s^2$)	(m/s^2)
V	:	Speed	(m/s)
t_n	:	Time constant	(s)
α_n	:	Acceleration	(m/s^2)

$$(\alpha_n = \frac{V}{t_n})$$

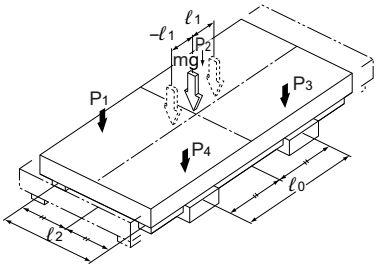
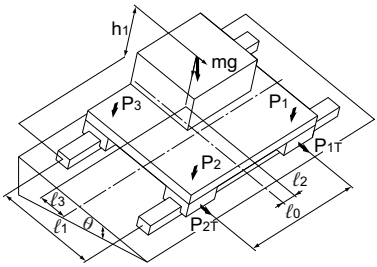
Example

	Operating conditions	Applied load equation
1	Horizontal mount (with the block moving) Uniform motion or stationary 	$P_1 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_2 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_3 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_4 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$
2	Horizontal mount, overhung (with the block moving) Uniform motion or stationary 	$P_1 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_2 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_3 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_4 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$

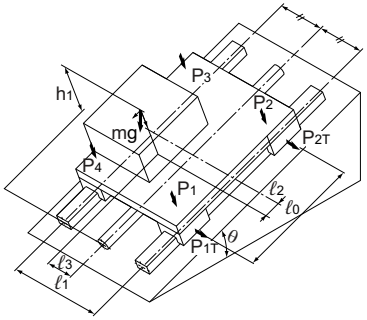
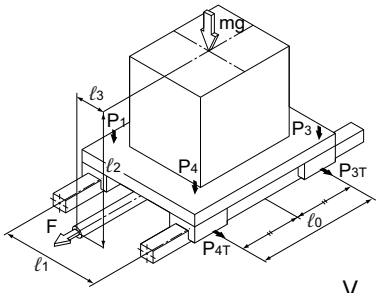
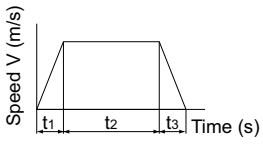
Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
3	**Vertical mount** **Uniform motion or stationary**  E.g.: Vertical axis of industrial robot, automatic coating machine, lifter	$P_1 = P_4 = -\frac{mg \cdot \ell_2}{2 \cdot \ell_0}$ $P_2 = P_3 = \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$ $P_{1T} = P_{4T} = \frac{mg \cdot \ell_3}{2 \cdot \ell_0}$ $P_{2T} = P_{3T} = -\frac{mg \cdot \ell_3}{2 \cdot \ell_0}$
4	**Wall mount** **Uniform motion or stationary**  E.g.: Travel axis of cross-rail loader	$P_1 = P_2 = -\frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_3 = P_4 = \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_{1T} = P_{4T} = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$ $P_{2T} = P_{3T} = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$

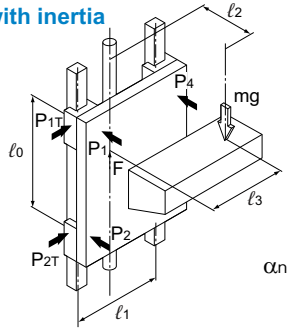
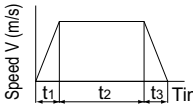
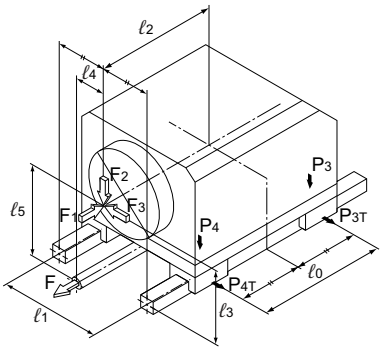
Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
5	**With the LM rails moving** **Horizontal mount**  E.g.: XY table sliding fork	P_1 to P_4 (max) $= \frac{mg}{4} + \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$ P_1 to P_4 (min) $= \frac{mg}{4} - \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$
6	**Lateral tilt mount**  E.g.: NC lathe carriage	$P_1 = + \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{1T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$ $P_2 = + \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{2T} = \frac{mg \cdot \sin\theta}{4} - \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$ $P_3 = + \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{3T} = \frac{mg \cdot \sin\theta}{4} - \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$ $P_4 = + \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{4T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$

Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
7	**Longitudinal tilt mount**  E.g.: NC lathe tool rest	$P_1 = + \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_0}$ $P_{1T} = + \frac{mg \cdot \sin\theta \cdot \ell_3}{2 \cdot \ell_0}$ $P_2 = + \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_0}$ $P_{2T} = - \frac{mg \cdot \sin\theta \cdot \ell_3}{2 \cdot \ell_0}$ $P_3 = + \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_0}$ $P_{3T} = - \frac{mg \cdot \sin\theta \cdot \ell_3}{2 \cdot \ell_0}$ $P_4 = + \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_0}$ $P_{4T} = + \frac{mg \cdot \sin\theta \cdot \ell_3}{2 \cdot \ell_0}$
8	**Horizontal mount with inertia**  $\alpha_n = \frac{V}{t_n}$  Velocity diagram E.g.: Conveyance truck	During acceleration $P_1 = P_4 = \frac{mg}{4} - \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$ $P_2 = P_3 = \frac{mg}{4} + \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$ $P_{1T} = P_{4T} = \frac{m \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0}$ $P_{2T} = P_{3T} = - \frac{m \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0}$ During uniform motion P_1 to $P_4 = \frac{mg}{4}$ During deceleration $P_1 = P_4 = \frac{mg}{4} + \frac{m \cdot \alpha_3 \cdot \ell_2}{2 \cdot \ell_0}$ $P_2 = P_3 = \frac{mg}{4} - \frac{m \cdot \alpha_3 \cdot \ell_2}{2 \cdot \ell_0}$ $P_{1T} = P_{4T} = - \frac{m \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0}$ $P_{2T} = P_{3T} = \frac{m \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0}$

Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
9	**Vertical mount with inertia**  $\alpha n = \frac{V}{tn}$  Velocity diagram E.g.: Conveyance lift	During acceleration $P_1 = P_4 = -\frac{m(g+\alpha_1)\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{m(g+\alpha_1)\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{m(g+\alpha_1)\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{m(g+\alpha_1)\ell_3}{2\cdot\ell_0}$ During uniform motion $P_1 = P_4 = -\frac{mg\cdot\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{mg\cdot\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{mg\cdot\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{mg\cdot\ell_3}{2\cdot\ell_0}$ During deceleration $P_1 = P_4 = -\frac{m(g-\alpha_3)\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{m(g-\alpha_3)\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{m(g-\alpha_3)\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{m(g-\alpha_3)\ell_3}{2\cdot\ell_0}$
10	**Horizontal mount with external force**  E.g.: Drill unit, milling machine, lathe, machining center, and other cutting machines	Under force F_1 $P_1 = P_4 = -\frac{F_1\cdot\ell_5}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{F_1\cdot\ell_5}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{F_1\cdot\ell_4}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{F_1\cdot\ell_4}{2\cdot\ell_0}$ Under force F_2 $P_1 = P_4 = \frac{F_2}{4} + \frac{F_2\cdot\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{F_2}{4} - \frac{F_2\cdot\ell_2}{2\cdot\ell_0}$ Under force F_3 $P_1 = P_2 = \frac{F_3\cdot\ell_3}{2\cdot\ell_1}$ $P_3 = P_4 = -\frac{F_3\cdot\ell_3}{2\cdot\ell_1}$ $P_{1T} = P_{4T} = -\frac{F_3}{4} - \frac{F_3\cdot\ell_2}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{F_3}{4} + \frac{F_3\cdot\ell_2}{2\cdot\ell_0}$

Note) Load is positive in the direction of the arrow.

Calculating the Equivalent Load

Load Rating of an LM Guide in Each Direction

The LM Guide is categorized into roughly two types: the 4-way equal load type, which has the same load rating in the radial, reverse-radial, and lateral directions; and the radial type, which has a large rated load in the radial direction. With the radial type LM Guide, the load rating in the radial direction is different from that in the reverse-radial and lateral directions. The basic load rating in the radial direction is indicated in the dimensional table. The values in the reverse-radial and lateral directions are obtained from Table 7 on A1-61.

Load Ratings in Each Direction

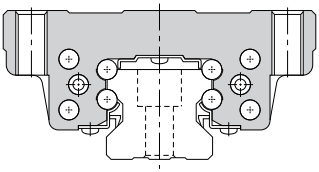
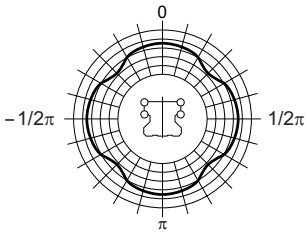
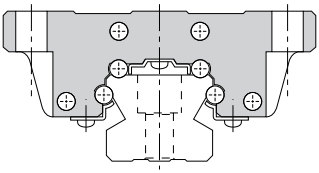
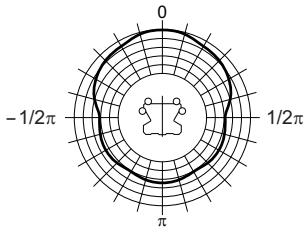
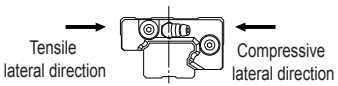
Type	Load distribution curve
4-way equal load type 	
Radial type 	

Table 7: Load Rating in Each Direction

Classification	Model No.		Reverse-radial direction		Lateral directions	
	Type	Size	Dynamic load rating C_L	Static load rating C_{0L}	Dynamic load rating C_T	Static load rating C_{0T}
4-way equal load	SHS		C	C_0	C	C_0
	SHW		C	C_0	C	C_0
	SRS	12,15,25	C	C_0	C	C_0
	SCR		C	C_0	C	C_0
	EPF		C	C_0	C	C_0
	HSR		C	C_0	C	C_0
	NRS	75,85,100	C	C_0	C	C_0
	HRW	17,21,27,35,50,60	C	C_0	C	C_0
	RSX	12,15	C	C_0	C	C_0
	RSR	2,3	C	C_0	C	C_0
	CSR		C	C_0	C	C_0
	MX		C	C_0	C	C_0
	JR		C	C_0	C	C_0
	HCR		C	C_0	C	C_0
	HMG		C	C_0	C	C_0
	HSR-M1		C	C_0	C	C_0
	RSX-M1	12,15	C	C_0	C	C_0
	RSR-M1	9	C	C_0	C	C_0
	HSR-M2		C	C_0	C	C_0
	HSR-M1VV		C	C_0	C	C_0
	SRG		C	C_0	C	C_0
	SRN	35,45,55,65	C	C_0	C	C_0
	SRW		C	C_0	C	C_0
	HRX		C	C_0	C	C_0
Radial	SSR		0.50C	$0.50C_0$	0.53C	$0.43C_0$
	SVR		0.64C	$0.64C_0$	0.47C	$0.38C_0$
	SR	15,20,25,30,35,45,55,70	0.62C	$0.50C_0$	0.56C	$0.43C_0$
	SR	85,100,120,150	0.78C	$0.71C_0$	0.48C	$0.35C_0$
	NR-X		0.64C	$0.64C_0$	0.47C	$0.38C_0$
	NR	75,85,100	0.78C	$0.71C_0$	0.48C	$0.45C_0$
	HRW	12,14	0.78C	$0.71C_0$	0.48C	$0.35C_0$
	NSR		0.62C	$0.50C_0$	0.56C	$0.43C_0$
	SR-M1		0.62C	$0.50C_0$	0.56C	$0.43C_0$
Other	SVS		0.84C	$0.84C_0$	0.92C	$0.85C_0$
	NRS-X		0.84C	$0.84C_0$	0.92C	$0.85C_0$
	SRS	5,7,9,20	C	C_0	1.19C	$1.19C_0$
	RSX	5,7,9	C	C_0	1.19C	$1.19C_0$
	RSR	14	0.78C	$0.70C_0$	0.78C	$0.71C_0$
	HR		C	C_0	C	C_0
	GSR		0.93C	$0.90C_0$	(T) 0.84C* (C) 0.93C*	(T) $0.78C_0$* (C) $0.90C_0$*
	GSR-R		0.93C	$0.90C_0$	(T) 0.84C* (C) 0.93C*	(T) $0.78C_0$* (C) $0.90C_0$*
	RSX-M1	9	C	C_0	1.19C	$1.19C_0$
	RSR-M1	12,15,20	0.78C	$0.70C_0$	0.78C	$0.71C_0$

*(T): Tensile lateral direction; (C): Compressive lateral direction

Note) C and C_0 in the table each represent the basic load rating indicated in the specification table of the respective model.
For types with no size indication in the table, the same factor is applied to all sizes.
Models HR, GSR, and GSR-R cannot be used in single-axis applications.



Equivalent Load P_E

The LM Guide can bear loads and moments in all directions, including a radial load (PR), reverse-radial load (PL), and lateral loads (PT), simultaneously.
When two or more loads (e.g., radial load and lateral load) are simultaneously applied to the LM Guide, the service life and the static safety factor are calculated using equivalent load values obtained by converting all the loads into radial load or reverse-radial load.

Equivalent Load Equation

When the LM block receives loads simultaneously in the radial and lateral directions, or the reverse-radial and lateral directions, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_{R(L)} + Y \cdot P_T$$

P_E	:	Equivalent load ·Radial direction ·Reverse-radial direction	(N)
P_L	:	Reverse-radial load	(N)
P_T	:	Lateral load	(N)
X,Y	:	Equivalent factor	(see Table 8)

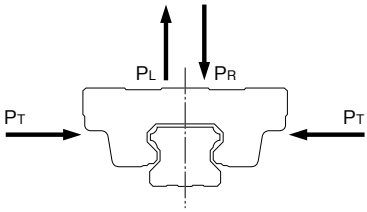


Fig. 7: Equivalent Load of the LM Guide

Table 8: Equivalent Factor in Each Direction

Classification	Model No.		If radial and lateral loads are applied simultaneously  Equivalent in radial direction 		If reverse-radial and lateral loads are applied simultaneously  Equivalent in reverse-radial direction 	
	Type	Size	X	Y	X	Y
4-way equal load	SHS		1.000	1.000	1.000	1.000
	SHW		1.000	1.000	1.000	1.000
	SRS	12,15,25	1.000	1.000	1.000	1.000
	SCR		1.000	1.000	1.000	1.000
	EPF		1.000	1.000	1.000	1.000
	HSR		1.000	1.000	1.000	1.000
	NRS	75,85,100	1.000	1.000	1.000	1.000
	HRW	17,21,27,35,50,60	1.000	1.000	1.000	1.000
	RSX	12,15	1.000	1.000	1.000	1.000
	RSR	2,3	1.000	1.000	1.000	1.000
	CSR		1.000	1.000	1.000	1.000
	MX		1.000	1.000	1.000	1.000
	JR		1.000	1.000	1.000	1.000
	HCR		1.000	1.000	1.000	1.000
	HMG		1.000	1.000	1.000	1.000
	HSR-M1		1.000	1.000	1.000	1.000
	RSX-M1	12,15	1.000	1.000	1.000	1.000
	RSR-M1	9	1.000	1.000	1.000	1.000
	HSR-M2		1.000	1.000	1.000	1.000
	HSR-M1VV		1.000	1.000	1.000	1.000
	SRG		1.000	1.000	1.000	1.000
	SRN		1.000	1.000	1.000	1.000
	SRW		1.000	1.000	1.000	1.000
	HRX		1.000	1.000	1.000	1.000
Radial	SSR		—	—	1.000	1.155
	SVR		—	—	1.000	1.678
	SR	15,20,25,30,35,45,55,70	—	—	1.000	1.155
	SR	85,100,120,150	—	—	1.000	2.000
	NR-X		—	—	1.000	1.678
	NR	75,85,100	—	—	1.000	2.000
	HRW	12,14	—	—	1.000	2.000
	NSR		—	—	1.000	1.155
	SR-M1		—	—	1.000	1.155
Other	SVS		1.000	0.935	1.000	1.020
	NRS-X		1.000	0.935	1.000	1.020
	SRS	5,7,9,20	1.000	0.839	1.000	0.839
	RSX	5,7,9	1.000	0.839	1.000	0.839
	RSR	14	1.000	0.830	1.000	0.990
	HR		1.000	0.500	1.000	0.500
	GSR		1.000	1.280	1.000	1.000
	GSR-R		1.000	1.280	1.000	1.280
	RSX-M1	9	1.000	0.839	1.000	0.839
	RSR-M1	12,15,20	1.000	0.830	1.000	0.990

Note) If the radial type LM Guide receives radial and lateral loads simultaneously, study the static safety factor and the rated load in the radial-load and lateral-load directions.
For types with no size indication in the table, the same factor is applied to all sizes.
Models HR, GSR, and GSR-R cannot be used in single-axis applications.

Calculating the Static Safety Factor

To calculate a load applied to the LM Guide, the average load required for calculating the service life and the maximum load needed for calculating the static safety factor must be obtained first. In particular, if the system starts and stops frequently, if a cutting load acts on the system, or if a large moment caused by an overhanging load is applied, it may experience an unexpectedly large load. When selecting a model number, make sure that the desired model is capable of receiving the required maximum load (whether stationary or in motion). Table 9 shows reference values for the static safety factor.

Table 9: Reference Values for the Static Safety Factor (f_s)

Machine using the LM Guide	Load conditions	Lower limit of f_s
General industrial machinery	Without vibrations or impacts	1.0 to 3.5
	With vibrations or impacts	2.0 to 5.0
Machine tool	Without vibrations or impacts	1.0 to 4.0
	With vibrations or impacts	2.5 to 7.0

When the radial load is large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_0}{P_R} \geqq f_S$
When the reverse-radial load is large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_{0L}}{P_L} \geqq f_S$
When the lateral loads are large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_{0T}}{P_T} \geqq f_S$

f_S : Static safety factor
C_0 : Basic static load rating (radial direction) (N)
C_{0L} : Basic static load rating (reverse-radial direction) (N)
C_{0T} : Basic static load rating (lateral direction) (N)
P_R : Calculated load (radial direction) (N)
P_L : Calculated load (reverse-radial direction) (N)
P_T : Calculated load (lateral direction) (N)
f_H : Hardness factor (see Fig. 8 on A1-69)
f_T : Temperature factor (see Fig. 9 on A1-69)
f_C : Contact factor (see Table 10 on A1-69)

Calculating the Average Load

In cases where the load applied to each LM block fluctuates under different conditions, such as an industrial robot advancing while holding a workpiece with its arm then retreating with its arm empty, or a machine tool handling various workpieces, it is necessary to calculate the service life of the LM block while taking into account such fluctuating loading conditions.
The average load (P_m) is the load under which the service life of the LM Guide is equivalent to that under varying loads applied to the LM blocks.

$$P_m = \sqrt[i]{\frac{1}{L} \cdot \sum_{n=1}^{n} (P_n{}^i \cdot L_n)}$$

P_m	: Average Load[1]	(N)
P_n	: Varying load	(N)
L	: Total travel distance	(mm)
L_n	: Distance traveled under load P_n	(mm)
i	: Constant determined by rolling element	

Note: This equation applies when the rolling elements are balls.

(1) With stepwise load fluctuation

LM Guide Using Balls (i=3)

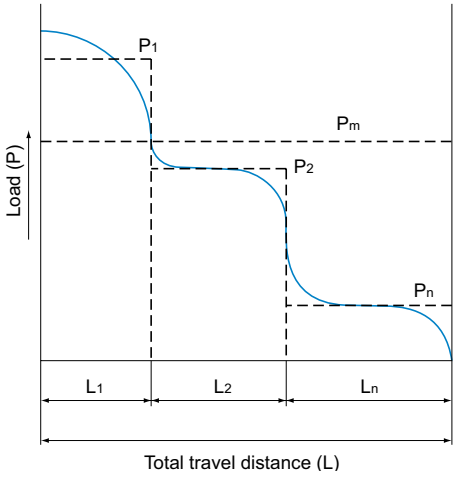
$$P_m = \sqrt[3]{\frac{1}{L}(P_1{}^3 \cdot L_1 + P_2{}^3 \cdot L_2 \cdots\cdots + P_n{}^3 \cdot L_n)} \quad \cdots\cdots\cdots\cdots (1)$$

P_m	: Average load	(N)
P_n	: Varying load	(N)
L	: Total travel distance	(mm)
L_n	: Distance traveled under P_n	(mm)

LM Guide Using Rollers ($i = \frac{10}{3}$)

$$P_m = \sqrt[\frac{10}{3}]{\frac{1}{L}(P_1{}^{\frac{10}{3}} \cdot L_1 + P_2{}^{\frac{10}{3}} \cdot L_2 \cdots\cdots + P_n{}^{\frac{10}{3}} \cdot L_n)} \quad \cdots\cdots\cdots\cdots (2)$$

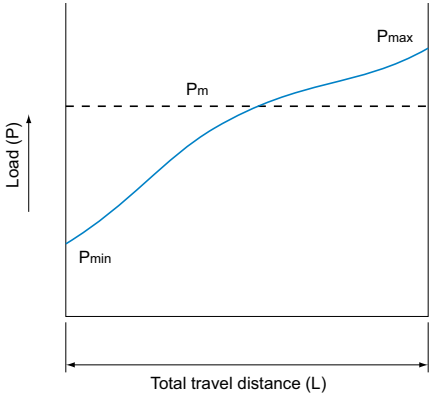
P_m	: Average Load	(N)
P_n	: Varying load	(N)
L	: Total travel distance	(mm)
L_n	: Distance traveled under P_n	(mm)



(2) With monotone load fluctuation

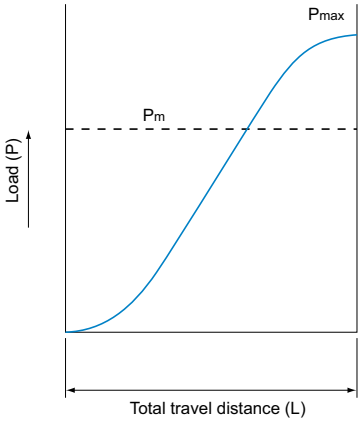
$$P_m \fallingdotseq \frac{1}{3}(P_{min} + 2 \cdot P_{max}) \quad \cdots\cdots (3)$$

P_{min} : Minimum load (N)
P_{max} : Maximum load (N)

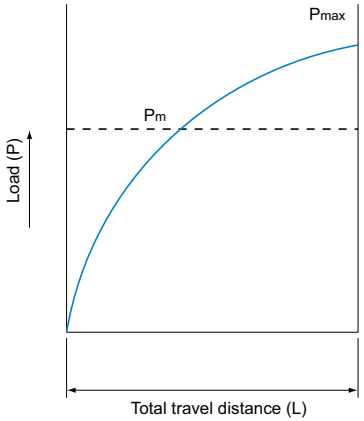


(3) With sinusoidal load fluctuation

(a) $P_m \fallingdotseq 0.65P_{max}$ ····· (4)



(b) $P_m \fallingdotseq 0.75P_{max}$ ····· (5)



Calculating the Nominal Life

The service life of an LM Guide is subject to variations even under the same operational conditions. Therefore, it is necessary to use the nominal life defined below as a reference value for obtaining the service life of the LM Guide. The nominal life means the total travel distance that 90% of a group of units of the same LM Guide model can achieve without flaking (scale-like pieces on the metal surface) after individually running under the same conditions.

Calculating the Nominal Life

The nominal life (L_{10}) of an LM Guide is obtained from the following formulas using the basic dynamic load rating (C), which is based on a reference distance of 50 km for an LM Guide with balls and 100 km for an LM Guide with rollers, and the calculated load acting on the LM Guide (P_C).

●LM Guide with balls (using a basic dynamic load rating based on a nominal life of 50 km)

$$L_{10} = \left(\frac{C}{P_C}\right)^3 \times 50 \quad \cdots\cdots\cdots\cdots (1)$$

L_{10} : Nominal life (km)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

●LM Guide with rollers (using a basic dynamic load rating based on a nominal life of 100 km)

$$L_{10} = \left(\frac{C}{P_C}\right)^{\frac{10}{3}} \times 100 \quad \cdots\cdots\cdots\cdots (2)$$

∗These nominal life formulas may not apply if the length of the stroke is less than or equal to twice the length of the LM block.

When comparing the nominal life (L_{10}), you must take into account whether the basic dynamic load rating was defined based on 50 km or 100 km. Convert the basic dynamic load rating based on ISO 14728-1 as necessary.

ISO-regulated basic dynamic load rating conversion formulas:

• LM Guide with balls

$$C_{100} = \frac{C_{50}}{1.26}$$

C_{50} : Basic dynamic load rating based on a nominal life of 50 km
C_{100} : Basic dynamic load rating based on a nominal life of 100 km

• LM Guide with rollers

$$C_{100} = \frac{C_{50}}{1.23}$$

Calculating the Modified Nominal Life

During use, an LM Guide may be subjected to vibrations and shocks as well as fluctuating loads, which are difficult to detect. In addition, the surface hardness of the raceways, the operating temperature, and having LM blocks arranged directly behind one another will have a decisive impact on the service life. Taking these factors into account, the modified nominal life (L_{10m}) can be calculated according to the following formulas (3) and (4).

●Modified factor α

$$\alpha = \frac{f_H \cdot f_T \cdot f_C}{f_W}$$

α : Modified factor
f_H : Hardness factor (see Fig. 8 on A1-69)
f_T : Temperature factor (see Fig. 9 on A1-69)
f_C : Contact factor (see Table 10 on A1-69)
f_W : Load factor (see Table 11 on A1-70)

●Modified nominal life L_{10m}

• LM Guide with balls

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^3 \times 50 \quad \cdots\cdots\cdots\cdots\cdots (3)$$

• LM Guide with rollers

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^{\frac{10}{3}} \times 100 \quad \cdots\cdots\cdots\cdots (4)$$

L_{10m} : Modified nominal life (km)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

Once the nominal life (L_{10}) has been obtained, the service life time can be obtained using the following equation if the stroke length and the number of reciprocations are constant.

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

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

f_H: Hardness Factor

To ensure that the LM Guide achieves optimum load capacity, the raceway hardness must be between 58 and 64 HRC.

If the hardness is lower than this range, the basic dynamic load rating and the basic static load rating decrease. Therefore, it is necessary to multiply each rating by the respective hardness factor (f_H).

Since the LM Guide has sufficient hardness, the f_H value for the LM Guide is normally 1.0 unless otherwise specified.

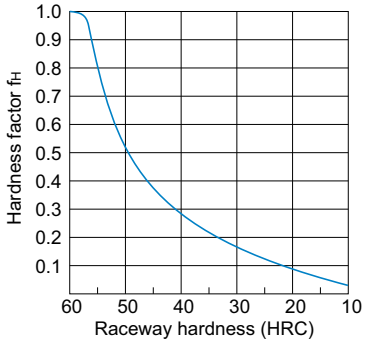


Fig. 8: Hardness Factor (f_H)

f_T: Temperature Factor

If the temperature of the operating environment surrounding the LM Guide exceeds 100°C, take into account the adverse effect of the high temperature and multiply the basic load ratings by the temperature factor indicated in Fig. 9.

In addition, the selected LM Guide must also be of a high-temperature type.

Note: An LM Guide not designed to withstand high temperatures should be used at 80°C or less. Please contact THK if application requirements exceed 80°C.

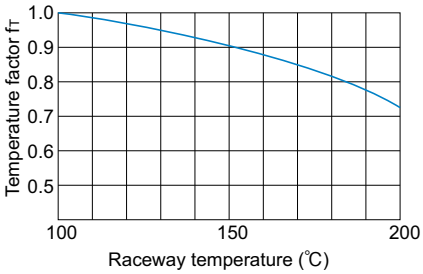


Fig. 9: Temperature Factor (f_T)

f_C: Contact Factor

When multiple LM blocks are used in close contact with each other, it is difficult to achieve uniform load distribution due to moment loads and mounting-surface accuracy. When using multiple blocks in close contact with each other, multiply the basic load rating (C or C_0) by the corresponding contact factor indicated in Table 10.

Note: If uneven load distribution is expected in a large machine, take into account the respective contact factor indicated in Table 10.

Table 10: Contact Factor (f_C)

Number of blocks used in close contact	Contact factor f_C
2	0.81
3	0.72
4	0.66
5	0.61
6 or more	0.6
Normal use	1

f_w: Load Factor

In general, reciprocating machines tend to involve vibrations or impacts during operation. It is extremely difficult to accurately determine vibrations generated during high-speed operation and impacts that occur during frequent starts and stops. Therefore, where the effects of speed and vibration are estimated to be significant, divide the basic dynamic load rating (C) by a load factor selected from Table 11, which contains empirically obtained data.

Table 11: Load Factor (f_w)

Vibrations/ impacts	Speed (V)	f_w
Faint	Very low V≦0.25 m/s	1 to 1.2
Weak	Low 0.25 m/s<V≦1 m/s	1.2 to 1.5
Medium	Medium 1 m/s<V≦2 m/s	1.5 to 2
Strong	High V>2 m/s	2 to 3.5

Predicting the Rigidity

Selecting a Radial Clearance (Preload)

Since the radial clearance of an LM Guide greatly affects the running accuracy, load carrying capacity, and rigidity of the LM Guide, it is important to select an appropriate clearance according to the application. In general, the service life and accuracy are favorably affected by selecting a negative clearance (i.e., applying a preload[1]) while taking into account possible vibrations and impacts generated from reciprocating motion.
For specific radial clearances, contact THK. We will help you select the optimal clearance according to the conditions.
The clearances of all LM Guide models (except models HR, GSR, and GSR-R, which are separate types) are adjusted as specified before shipment, and therefore they do not need further preload adjustment.

[1]Preload is an internal load applied in advance to the rolling elements (balls, rollers, etc.) of an LM block in order to increase its rigidity.

Table 12: Types of Radial Clearance

	Normal clearance	Clearance C1 (light preload)	Clearance C0 (medium preload)
Condition	● The loading direction is fixed, impact and vibrations are minimal and 2 rails are installed in parallel. ● Very high precision is not required, and the sliding resistance must be as low as possible.	● An overhang load or moment load is applied. ● The LM Guide is used in a single-rail configuration. ● Light load and high accuracy are required.	● High rigidity is required and vibrations and impact are applied. ● Heavy-cutting machine tools
Examples of applications	• Beam-welding machines • Book-binding machines • Automatic packaging machines • XY axes of general industrial machinery • Automatic sash-manufacturing machines • Welding machines • Flame cutting machines • Tool changers • Various kinds of material feeders	• Grinding machine table feed axes • Automatic coating machines • Industrial robots • Various kinds of high-speed material feeders • NC drilling machines • Vertical axes of general industrial machinery • Printed circuit board drilling machines • Electric discharge machines • Measuring instruments • Precision XY tables	• Machining centers • NC lathes • Grinding stone feed axes of grinding machines • Milling machines • Vertical/horizontal boring machines • Tool rest guides • Vertical axes of machine tools

Service Life with a Preload Considered

When using an LM Guide under a medium preload (clearance C0), it is necessary to calculate the service life while taking into account the magnitude of the preload.
To identify the appropriate preload for any selected LM Guide model, contact THK.

Rigidity

When a load is applied to an LM Guide, the bearings and LM block will undergo elastic deformation within the allowable load range. The ratio of displacement to applied load is referred to as “rigidity.” The radial internal clearance (preload) for the LM Guide can be specified in order to reduce displacement.
By using balls larger than the width of the raceway, they will naturally deform elastically as they roll, allowing the load to be maintained for longer while limiting displacement in the LM Guide.
The effect of the preload can be up to 2.8 times greater than the size of the preload itself. If that level is exceeded, the preload is released and the effect of the preload is lost.
When a preloaded LM Guide takes an external load, the displacement will be linear. The level of displacement will be approximately half that of an LM Guide with no preload.
The preload, in addition to reducing displacement, helps prevent premature failure due to vibration and impact/shock.

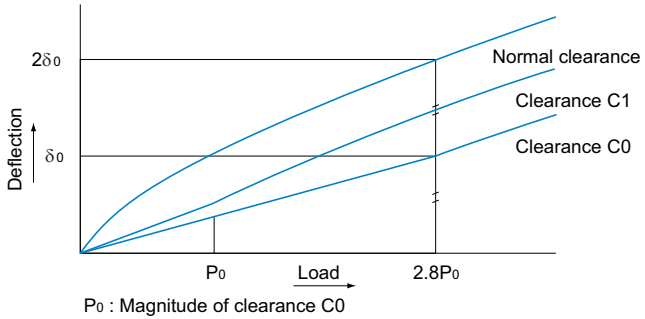
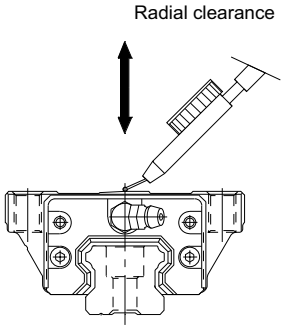


Fig. 10: Rigidity Data

$$K=\frac{P}{\delta}$$

K	: Rigidity value	(N/μm)
δ	: Deflection	(μm)
P	: Calculated load	(N)

Radial Clearance Standard for Each Model



Radial Clearances for Models SHS and SCR

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
15	–5 to 0	–12 to –5	—
20	–6 to 0	–12 to –6	–18 to –12
25	–8 to 0	–14 to –8	–20 to –14
30	–9 to 0	–17 to –9	–27 to –17
35	–11 to 0	–19 to –11	–29 to –19
45	–12 to 0	–22 to –12	–32 to –22
55	–15 to 0	–28 to –16	–38 to –28
65	–18 to 0	–34 to –22	–45 to –34

Radial Clearances for Models SVR/SVS, NR-X/NRS-X, and NR/NRS

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
25	–3 to +2	–6 to –3	–9 to –6
30	–4 to +2	–8 to –4	–12 to –8
35	–4 to +2	–8 to –4	–12 to –8
45	–5 to +3	–10 to –5	–15 to –10
55	–6 to +3	–11 to –6	–16 to –11
65	–8 to +3	–14 to –8	–20 to –14
75	–10 to +4	–17 to –10	–24 to –17
85	–13 to +4	–20 to –13	–27 to –20
100	–14 to +4	–24 to –14	–34 to –24

Radial Clearances for Model SSR

Unit: μm

Indication symbol	Normal	Light preload
Model No.	No symbol	C1
15	–4 to +2	–10 to –4
20	–5 to +2	–12 to –5
25	–6 to +3	–15 to –6
30	–7 to +4	–18 to –7
35	–8 to +4	–20 to –8

Radial Clearances for Models SRS, RSX, and RSX-M1

Unit: μm

Indication symbol	Normal	Light preload
Model No.	No symbol	C1
5	0 to +1.5	–1 to 0
7	–2 to +2	–3 to 0
9	–2 to +2	–4 to 0
12	–3 to +3	–6 to 0
15	–5 to +5	–10 to 0
20	–5 to +5	–10 to 0
25	–7 to +7	–14 to 0

Note) Model RSX includes types 5, 7, 9, 12, and 15.
The Model RSX-M1 is available in models 9, 12, and 15.

Radial Clearances for Model SHW

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
12	–1.5 to 0	–4 to –1	—
14	–2 to 0	–5 to –1	—
17	–3 to 0	–7 to –3	—
21	–4 to +2	–8 to –4	—
27	–5 to +2	–11 to –5	—
35	–8 to +4	–18 to –8	–28 to –18
50	–10 to +5	–24 to –10	–38 to –24

Radial Clearances for Model EPF

Unit: μm

Indication symbol	Normal
Model No.	No symbol
7M	0 or less
9M	
12M	
15M	

Radial Clearances for Models HSR, CSR, HSR-M1, and HSR-M1VV

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
8	–1 to +1	–4 to –1	—
10	–2 to +2	–5 to –1	—
12	–3 to +3	–6 to –2	—
15	–4 to +2	–12 to –4	—
20	–5 to +2	–14 to –5	–23 to –14
25	–6 to +3	–16 to –6	–26 to –16
30	–7 to +4	–19 to –7	–31 to –19
35	–8 to +4	–22 to –8	–35 to –22

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
45	–10 to +5	–25 to –10	–40 to –25
55	–12 to +5	–29 to –12	–46 to –29
65	–14 to +7	–32 to –14	–50 to –32
85	–16 to +8	–36 to –16	–56 to –36
100	–19 to +9	–42 to –19	–65 to –42
120	–21 to +10	–47 to –21	–73 to –47
150	–23 to +11	–51 to –23	–79 to –51

Radial Clearances for Models SR and SR-M1

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
15	–4 to +2	–10 to –4	—
20	–5 to +2	–12 to –5	–17 to –12
25	–6 to +3	–15 to –6	–21 to –15
30	–7 to +4	–18 to –7	–26 to –18
35	–8 to +4	–20 to –8	–31 to –20
45	–10 to +5	–24 to –10	–36 to –24
55	–12 to +5	–28 to –12	–45 to –28
70	–14 to +7	–32 to –14	–50 to –32
85	–20 to +9	–46 to –20	–70 to –46
100	–22 to +10	–52 to –22	–78 to –52
120	–25 to +12	–57 to –25	–87 to –57
150	–29 to +14	–69 to –29	–104 to –69

Radial Clearances for Model HRW

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
12	–1.5 to +1.5	–4 to –1	—
14	–2 to +2	–5 to –1	—
17	–3 to +2	–7 to –3	—
21	–4 to +2	–8 to –4	—
27	–5 to +2	–11 to –5	—
35	–8 to +4	–18 to –8	–28 to –18
50	–10 to +5	–24 to –10	–38 to –24
60	–12 to +5	–27 to –12	–42 to –27

Radial Clearances for Models RSR, RSR-W, and RSR-M1

Unit: μm

Indication symbol	Normal	Light preload
Model No.	No symbol	C1
2	0 to +4	—
3	0 to +1	–0.5 to 0
9	–2 to +2	–4 to 0
12	–3 to +3	–6 to 0
14	–5 to +5	–10 to 0
15	–5 to +5	–10 to 0
20	–7 to +7	–14 to 0

Radial Clearance for Model MX

Unit: μm

Indication symbol	Normal	Light preload
Model No.	No symbol	C1
5	0 to +1.5	–1 to 0
7	–2 to +2	–3 to 0

Radial Clearances for Model JR

Unit: μm

Indication symbol	Normal
Model No.	No symbol
25	0 to +30
35	0 to +30
45	0 to +50
55	0 to +50

Radial Clearances for Model NSR-TBC

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
20	–5 to +5	–15 to –5	–25 to –15
25	–5 to +5	–15 to –5	–25 to –15
30	–5 to +5	–15 to –5	–25 to –15
40	–8 to +8	–22 to –8	–36 to –22
50	–8 to +8	–22 to –8	–36 to –22
70	–10 to +10	–26 to –10	–42 to –26

Radial Clearances for Models HCR and HMG

Unit: μm

Indication symbol	Normal	Light preload
Model No.	No symbol	C1
12	–3 to +3	–6 to –2
15	–4 to +2	–12 to –4
25	–6 to +3	–16 to –6
35	–8 to +4	–22 to –8
45	–10 to +5	–25 to –10
65	–14 to +7	–32 to –14

Radial Clearances for Model HSR-M2

Unit: μm

Indication symbol	Normal	Light preload
Model No.	No symbol	C1
15	–4 to +2	–12 to –4
20	–5 to +2	–14 to –5
25	–6 to +3	–16 to –6

Radial Clearances for Models SRG and SRN

Unit: μm

Indication symbol	Normal	Light preload	Medium preload	Heavy preload	Super heavy preload
Model No.	No symbol	C1	C0	CN1	CN2
15	–0.5 to 0	–1 to –0.5	–2 to –1	—	—
20	–0.8 to 0	–2 to –0.8	–3 to –2	—	—
25	–2 to –1	–3 to –2	–4 to –3	—	—
30	–2 to –1	–3 to –2	–4 to –3	—	—
35	–2 to –1	–3 to –2	–5 to –3	–6 to –5	–7 to –6
45	–2 to –1	–3 to –2	–5 to –3	–6 to –5	–8 to –6
55	–2 to –1	–4 to –2	–6 to –4	–7 to –6	–9 to –7
65	–3 to –1	–5 to –3	–8 to –5	–9 to –8	–11 to –9
85	–3 to –1	–7 to –3	–12 to –7	—	—
100	–3 to –1	–8 to –3	–13 to –8	—	—

Note) Heavy preload and super heavy preload are available only for Model SRG-C/LC/SLC and Model SRN-C/LC/SLC. Contact THK if you desire a heavy preload or super heavy preload.

Radial Clearances for Model SRW

Unit: μm

Indication symbol	Normal	Light preload	Medium preload
Model No.	No symbol	C1	C0
70	–2 to –1	–3 to –2	–5 to –3
85	–2 to –1	–4 to –2	–6 to –4
100	–3 to –1	–5 to –3	–8 to –5
130	–3 to –1	–7 to –3	–12 to –7
150	–3 to –1	–8 to –3	–13 to –8

Radial Clearances for Model HRX

Unit: μm

Indication symbol	Medium preload
Model No.	C0
25	–2 to –1
30	–2 to –1
35	–2 to –1
45	–3 to –2
55	–3 to –2
65	–4 to –2

Determining the Accuracy

Accuracy Standards

Accuracy of the LM Guide is specified in terms of running parallelism, dimensional tolerance for height and width, and height and width difference between a pair when two or more LM blocks are used on one rail or when two or more rails are mounted on the same plane.
For details, see “Accuracy Standards for Each Model” on A1-78 to A1-88.

Running Parallelism

Running parallelism refers to the tolerance for parallelism between the LM block and the LM rail datum surface when the LM block travels the whole length of the LM rail with the LM rail bolted to a reference surface.

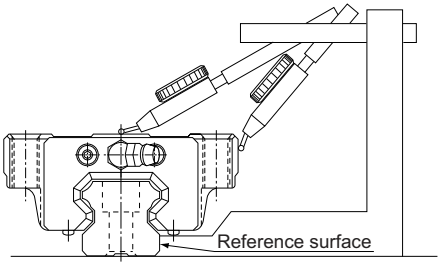


Fig. 11: Running Parallelism

Difference in Height M

The difference in height M indicates the difference between the minimum and maximum values of the height (M) of each of the LM blocks used together on the same plane.

Difference in Width W_2

The difference in width W_2 indicates the difference between the minimum and maximum values of the width (W_2) between an LM rail and each of the LM blocks mounted together on the LM rail.

Note 1) When two or more rails are used on the same plane in parallel, this applies only to the difference in width (W_2) and dimensional tolerance of the master rail. Please specify if you wish for it to apply to the difference in width and dimensional tolerance of the subsidiary rail as well. Master LM rails will have a serial number ending with “KB” printed on them. However, this is not the case for Normal grade products.

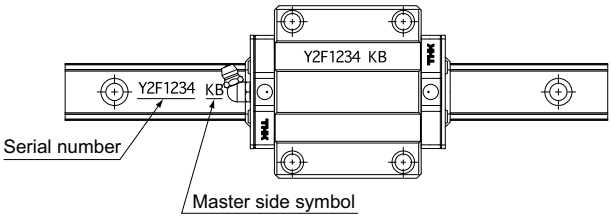


Fig. 12: Master LM Rail (E.g. Model HSR-C)

Note 2) Accuracy measurements each represent the average value of the central point or the central area of the LM block.
Note 3) If it is mounted on a less rigid base such as an aluminum base, the curve of the rail will affect the accuracy of the machine. Therefore, it is necessary to define straightness of the rail in advance.

Guidelines for Accuracy Grades by Machine Type

Table 13 shows guidelines for selecting an accuracy grade of the LM Guide according to the machine type.

Table 13: Guidelines for Accuracy Grades by Machine Type

Type of machine		Accuracy grades				
		Normal	H	P	SP	UP
Machine tools	Machining center			●	●	
	Lathe			●	●	
	Milling machine			●	●	
	Boring machine			●	●	
	Jig borer				●	●
	Grinding machine				●	●
	Electric discharge machine			●	●	●
	Punching press		●	●		
	Laser beam machine		●	●	●	
	Woodworking machine	●	●	●		
	NC drilling machine		●	●		
	Tapping center		●	●		
	Palette changer	●				
	ATC	●				
	Wire cutting machine			●	●	
	Dressing machine				●	●
Industrial robots	Cartesian coordinate	●	●	●		
	Cylindrical coordinate	●	●			
Semiconductor manufacturing equipment	Wire bonding machine			●	●	
	Prober				●	●
	Electronic component inserter		●	●		
	Printed circuit board drilling machine		●	●	●	
Other equipment	Injection molding machine	●	●			
	3D measuring instrument				●	●
	Office equipment	●	●			
	Conveyance system	●	●			
	XY table		●	●	●	
	Coating machine	●	●			
	Welding machine	●	●			
	Medical equipment	●	●			
	Digitizer		●	●	●	
	Inspection equipment			●	●	●

Normal : Normal grade
H : High Accuracy grade
P : Precision grade
SP : Super Precision grade
UP : Ultra Precision grade

Accuracy Standards for Each Model

- Accuracies of models SHS, SSR, SVR/SVS, SHW, HSR, SR, NR-X/NRS-X, NR/NRS, HRW, NSR-TBC, HSR-M1, HSR-M1VV, SR-M1, HSR-M2, SRG, SRN, and HRX are categorized into Normal grade (no symbol), High accuracy grade (H), Precision grade (P), Super precision grade (SP) and Ultra precision grade (UP) by model numbers, as indicated in Table 15 on A1-79.

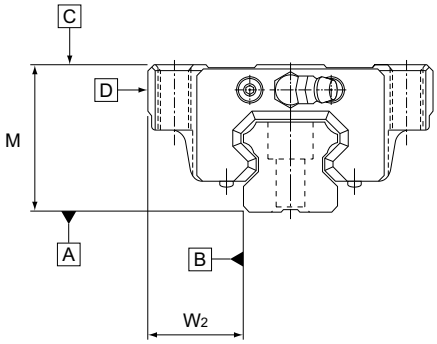


Fig.13

Table 14: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values				
Above	Up to	Normal grade	High Accuracy grade	Precision grade	Super Precision grade	Ultra Precision grade
—	50	5	3	2	1.5	1
50	80	5	3	2	1.5	1
80	125	5	3	2	1.5	1
125	200	5	3.5	2	1.5	1
200	250	6	4	2.5	1.5	1
250	315	7	4.5	3	1.5	1
315	400	8	5	3.5	2	1.5
400	500	9	6	4.5	2.5	1.5
500	630	11	7	5	3	2
630	800	12	8.5	6	3.5	2
800	1000	13	9	6.5	4	2.5
1000	1250	15	11	7.5	4.5	3
1250	1600	16	12	8	5	4
1600	2000	18	13	8.5	5.5	4.5
2000	2500	20	14	9.5	6	5
2500	3090	21	16	11	6.5	5.5

Table 15: Accuracy Standards for Models SHS, SSR, SVR/SVS, SHW, HSR, SR, NR-X/NRS-X, NR/NRS, HRW, NSR-TBC, HSR-M1, HSR-M1VV, SR-M1, HSR-M2, SRG, SRN, and HRX.

Unit: mm

Model No.	Accuracy standards	Normal grade	High Accuracy grade	Precision grade	Super Precision grade	Ultra Precision grade
	Item	No symbol	H	P	SP	UP
8 10 12 14	Dimensional tolerance in height M	±0.07	±0.03	±0.015	±0.007	—
	Difference in height M	0.015	0.007	0.005	0.003	—
	Dimensional tolerance in width W_2	±0.04	±0.02	±0.01	±0.007	—
	Difference in width W_2	0.02	0.01	0.006	0.004	—
	Running parallelism of surface C against surface A	As shown in Table 14 A1-78				
	Running parallelism of surface D against surface B	As shown in Table 14 A1-78				
15 17 20 21	Dimensional tolerance in height M	±0.07	±0.03	0 –0.03	0 –0.015	0 –0.008
	Difference in height M	0.02	0.01	0.006	0.004	0.003
	Dimensional tolerance in width W_2	±0.06	±0.03	0 –0.02	0 –0.015	0 –0.008
	Difference in width W_2	0.02	0.01	0.006	0.004	0.003
	Running parallelism of surface C against surface A	As shown in Table 14 A1-78				
	Running parallelism of surface D against surface B	As shown in Table 14 A1-78				
25 27 30 35	Dimensional tolerance in height M	±0.08	±0.04	0 –0.04	0 –0.02	0 –0.01
	Difference in height M	0.02	0.015	0.007	0.005	0.003
	Dimensional tolerance in width W_2	±0.07	±0.03	0 –0.03	0 –0.015	0 –0.01
	Difference in width W_2	0.025	0.015	0.007	0.005	0.003
	Running parallelism of surface C against surface A	As shown in Table 14 A1-78				
	Running parallelism of surface D against surface B	As shown in Table 14 A1-78				
40 45 50 55 60	Dimensional tolerance in height M	±0.08	±0.04	0 –0.05	0 –0.03	0 –0.015
	Difference in height M	0.025	0.015	0.007	0.005	0.003
	Dimensional tolerance in width W_2	±0.07	±0.04	0 –0.04	0 –0.025	0 –0.015
	Difference in width W_2	0.03	0.015	0.007	0.005	0.003
	Running parallelism of surface C against surface A	As shown in Table 14 A1-78				
	Running parallelism of surface D against surface B	As shown in Table 14 A1-78				
65 70 75 85 100 120 150	Dimensional tolerance in height M	±0.08	±0.04	0 –0.05	0 –0.04	0 –0.03
	Difference in height M	0.03	0.02	0.01	0.007	0.005
	Dimensional tolerance in width W_2	±0.08	±0.04	0 –0.05	0 –0.04	0 –0.03
	Difference in width W_2	0.03	0.02	0.01	0.007	0.005
	Running parallelism of surface C against surface A	As shown in Table 14 A1-78				
	Running parallelism of surface D against surface B	As shown in Table 14 A1-78				

Note1) Models SRG15 to 65 are available in high accuracy grade and above. Other models are only available in precision grade or above. (Normal grade is not available.)
Note2) Model SRN is available in high accuracy grade or above. (Normal grade is not available.)
Note3) The Model HRX is only available in High Accuracy grade and Precision grade.

● Accuracies of model HMG are defined by model number as indicated in Table 16.

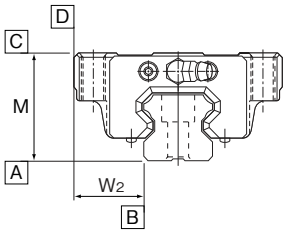


Fig. 14

Table 16: Accuracy Standards for Model HMG

Unit: mm

Model No.	Accuracy standards Item	Normal grade No symbol
15	Dimensional tolerance in height M	±0.1
	Difference in height M	0.02
	Dimensional tolerance in width W_2	±0.1
	Difference in width W_2	0.02
	Running parallelism of surface C against surface A	As shown in Table 17
	Running parallelism of surface D against surface B	As shown in Table 17
25 35	Dimensional tolerance in height M	±0.1
	Difference in height M	0.02
	Dimensional tolerance in width W_2	±0.1
	Difference in width W_2	0.03
	Running parallelism of surface C against surface A	As shown in Table 17
	Running parallelism of surface D against surface B	As shown in Table 17
45 65	Dimensional tolerance in height M	±0.1
	Difference in height M	0.03
	Dimensional tolerance in width W_2	±0.1
	Difference in width W_2	0.03
	Running parallelism of surface C against surface A	As shown in Table 17
	Running parallelism of surface D against surface B	As shown in Table 17

Table 17: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values
Above	Up to	Normal grade
—	125	30
125	200	37
200	250	40
250	315	44
315	400	49
400	500	53
500	630	58
630	800	64
800	1000	70
1000	1250	77
1250	1600	84
1600	2000	92

- Accuracies of model HCR are categorized into Normal and High Accuracy grades by model number as indicated in Table 18.

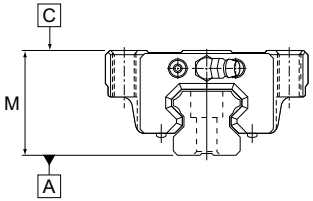


Fig. 15

Table 18: Accuracy Standards for Model HCR

Unit: mm

Model No.	Accuracy standards	Normal grade	High Accuracy grade
	Item	No symbol	H
12 15 25 35	Dimensional tolerance in height M	±0.2	±0.2
	Difference in height M	0.05	0.03
	Running parallelism of surface C against surface A	As shown in Table 19	
45 65	Dimensional tolerance in height M	±0.2	±0.2
	Difference in height M	0.06	0.04
	Running parallelism of surface C against surface A	As shown in Table 19	

Table 19: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values	
Above	Up to	Normal grade	High Accuracy grade
—	125	30	15
125	200	37	18
200	250	40	20
250	315	44	22
315	400	49	24
400	500	53	26
500	630	58	29
630	800	64	32
800	1000	70	35
1000	1250	77	38
1250	1600	84	42
1600	2000	92	46

- Accuracies of model JR are defined by model number as indicated in Table 20.

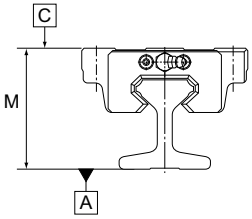


Fig.16

Table 20: Accuracy Standard for Model JR

Unit: mm

Model No.	Accuracy standards	Normal grade
	Item	No symbol
25 35	Difference in height M	0.05
	Running parallelism of surface C against surface A	As shown in Table 21
45 55	Difference in height M	0.06
	Running parallelism of surface C against surface A	As shown in Table 21

Table 21: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values
Above	Up to	Normal grade
—	50	5
50	80	5
80	125	5
125	200	6
200	250	8
250	315	9
315	400	11
400	500	13
500	630	15
630	800	17
800	1000	19
1000	1250	21
1250	1600	23
1600	2000	26
2000	2500	28
2500	3150	30
3150	4000	33

- Accuracies of models SCR and CSR are categorized into Precision, Super Precision, and Ultra Precision grades by model number as indicated in Table 22.

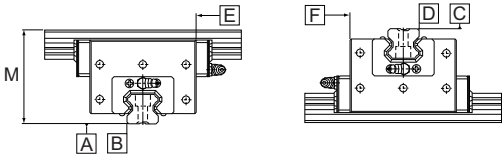


Fig. 17

Table 22: Accuracy Standards for Models SCR and CSR

Unit: mm

Model No.	Accuracy standards	Precision grade	Super Precision grade	Ultra Precision grade
	Item	P	SP	UP
15 20	Difference in height M	0.01	0.007	0.005
	Perpendicularity of surface D against surface B	0.005	0.004	0.003
	Running parallelism of surface E against surface B	As shown in Table 23		
	Running parallelism of surface F against surface D	As shown in Table 23		
25	Difference in height M	0.01	0.007	0.005
	Perpendicularity of surface D against surface B	0.008	0.006	0.004
	Running parallelism of surface E against surface B	As shown in Table 23		
	Running parallelism of surface F against surface D	As shown in Table 23		
30 35	Difference in height M	0.01	0.007	0.005
	Perpendicularity of surface D against surface B	0.01	0.007	0.005
	Running parallelism of surface E against surface B	As shown in Table 23		
	Running parallelism of surface F against surface D	As shown in Table 23		
45	Difference in height M	0.012	0.008	0.006
	Perpendicularity of surface D against surface B	0.012	0.008	0.006
	Running parallelism of surface E against surface B	As shown in Table 23		
	Running parallelism of surface F against surface D	As shown in Table 23		
65	Difference in height M	0.018	0.012	0.009
	Perpendicularity of surface D against surface B	0.018	0.012	0.009
	Running parallelism of surface E against surface B	As shown in Table 23		
	Running parallelism of surface F against surface D	As shown in Table 23		

Table 23: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values		
Above	Up to	Precision grade	Super Precision grade	Ultra Precision grade
—	50	2	1.5	1
50	80	2	1.5	1
80	125	2	1.5	1
125	200	2	1.5	1
200	250	2.5	1.5	1
250	315	3	1.5	1
315	400	3.5	2	1.5
400	500	4.5	2.5	1.5
500	630	5	3	2
630	800	6	3.5	2
800	1000	6.5	4	2.5
1000	1250	7.5	4.5	3
1250	1600	8	5	4
1600	2000	8.5	5.5	4.5
2000	2500	9.5	6	5
2500	3090	11	6.5	5.5

- Accuracies of Model GSR are categorized into Normal, High Accuracy, and Precision grades as indicated in Table 24.

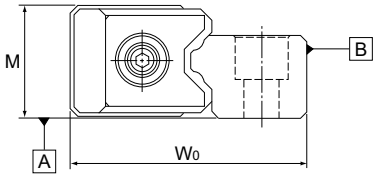


Fig. 18

Table 24: Accuracy Standards for Model HR

Unit: mm

Accuracy standards	Normal grade	High Accuracy grade	Precision grade	Super Precision grade	Ultra Precision grade
Item	No symbol	H	P	SP	UP
Dimensional tolerance in height M	±0.1	±0.05	±0.025	±0.015	±0.01
Difference in height M [1]	0.03	0.02	0.01	0.005	0.003
Dimensional tolerance for total width W_0	±0.1		±0.05		
Difference in total width W_0 [2]	0.03	0.015	0.01	0.005	0.003
Parallelism of the raceway against surfaces A and B	As shown in Table 25				

Note 1) Difference in height M applies to a set of LM Guide units used on the same plane.
Note 2) Difference in total width W_0 applies to LM blocks used in combination on one LM rail.
Note 3) In a set of LM Guides, dimensional tolerance and difference in total width W_0 for Precision and higher grades apply only to the master rail. The Master LM Guide will have a serial number ending with “KB” printed on it.

Table 25: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values				
Above	Up to	Normal grade	High Accuracy grade	Precision grade	Super Precision grade	Ultra Precision grade
—	50	5	3	2	1.5	1
50	80	5	3	2	1.5	1
80	125	5	3	2	1.5	1
125	200	5	3.5	2	1.5	1
200	250	6	4	2.5	1.5	1
250	315	7	4.5	3	1.5	1
315	400	8	5	3.5	2	1.5
400	500	9	6	4.5	2.5	1.5
500	630	11	7	5	3	2
630	800	12	8.5	6	3.5	2
800	1000	13	9	6.5	4	2.5
1000	1250	15	11	7.5	4.5	3
1250	1600	16	12	8	5	4
1600	2000	18	13	8.5	5.5	4.5
2000	2500	20	14	9.5	6	5
2500	3000	21	16	11	6.5	5.5

- Accuracies of Model HR are categorized into Normal, High Accuracy, Precision, Super Precision and Ultra Precision grades by model number as indicated in Table 26.

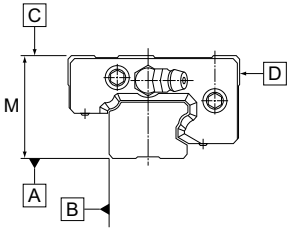


Fig.19

Table 26: Accuracy Standards for Model GSR

Unit: mm

Model No.	Accuracy standards	Normal grade	High-Accuracy grade	Precision grade
	Item	No symbol	H	P
15 20	Dimensional tolerance in height M	±0.02		
	Running parallelism of surface C against surface A	As shown in Table 27		
	Running parallelism of surface D against surface B	As shown in Table 27		
25 30 35	Dimensional tolerance in height M	±0.03		
	Running parallelism of surface C against surface A	As shown in Table 27		
	Running parallelism of surface D against surface B	As shown in Table 27		

Table 27: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values		
Above	Up to	Normal grade	High Accuracy grade	Precision grade
—	50	5	3	2
50	80	5	3	2
80	125	5	3	2
125	200	5	3.5	2
200	250	6	4	2.5
250	315	7	4.5	3
315	400	8	5	3.5
400	500	9	6	4.5
500	630	11	7	5
630	800	12	8.5	6
800	1000	13	9	6.5
1000	1250	15	11	7.5
1250	1600	16	12	8
1600	2000	18	13	8.5
2000	2500	20	14	9.5
2500	3000	21	16	11

- Accuracies of Model GSR-R are categorized into Normal and High Accuracy grades by model number as indicated in Table 28.

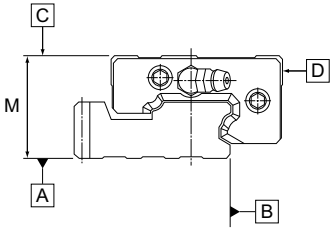


Fig. 20

Table 28: Accuracy Standards for GSR-R

Unit: mm

Model No.	Accuracy standards	Normal grade	High Accuracy grade
	Item	No symbol	H
25 30 35	Dimensional tolerance in height M	±0.03	
	Running parallelism of surface C against surface A	As shown in Table 29	
	Running parallelism of surface D against surface B	As shown in Table 29	

Table 29: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values	
Above	Up to	Normal grade	High Accuracy grade
—	50	5	3
50	80	5	3
80	125	5	3
125	200	5	3.5
200	250	6	4
250	315	7	4.5
315	400	8	5
400	500	9	6
500	630	11	7
630	800	12	8.5
800	1000	13	9
1000	1250	15	11
1250	1600	16	12
1600	2000	18	13

- Accuracies of Models SRS, RSX, RSR, RSX-M1, and RSR-M1 are categorized into Normal, High Accuracy, and Precision grades by model number as indicated in Table 30.

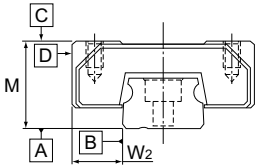


Fig. 21

Table 30: Accuracy Standards for Models SRS, RSX, RSR, RSX-M1, and RSR-M1

Unit: mm

Model No.	Accuracy standards	Normal grade	High Accuracy grade	Precision grade
	Item	No symbol	H	P
3 5	Dimensional tolerance in height M	±0.03	—	±0.015
	Difference in height M	0.015	—	0.005
	Dimensional tolerance in width W_2	±0.03	—	±0.015
	Difference in width W_2	0.015	—	0.005
	Running parallelism of surface C against surface A	As shown in Table 31		
	Running parallelism of surface D against surface B	As shown in Table 31		
7 9 12 14 15 20 25	Dimensional tolerance in height M	±0.04	±0.02	±0.01
	Difference in height M	0.03	0.015	0.007
	Dimensional tolerance in width W_2	±0.04	±0.025	±0.015
	Difference in width W_2	0.03	0.02	0.01
	Running parallelism of surface C against surface A	As shown in Table 32		
	Running parallelism of surface D against surface B	As shown in Table 32		

Table 31: LM Rail Length and Running Parallelism for Models SRS5, RSX5, and RSR3 by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values	
Above	Up to	Normal grade	Precision grade
—	25	2.5	1.5
25	50	3.5	2
50	100	5.5	3
100	150	7	4
150	200	8.4	5

Table 32: LM Rail Length and Running Parallelism for Models SRS7 to SRS25, RSX7 to RSX15, and RSR9 to RSR15 by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values		
Above	Up to	Normal grade	High Accuracy grade	Precision grade
—	40	8	4	1
40	70	10	4	1
70	100	11	4	2
100	130	12	5	2
130	160	13	6	2
160	190	14	7	2
190	220	15	7	3
220	250	16	8	3
250	280	17	8	3
280	310	17	9	3
310	340	18	9	3
340	370	18	10	3
370	400	19	10	3
400	430	20	11	4
430	460	20	12	4
460	520	21	12	4
520	550	22	12	4
550	640	22	13	4
640	670	23	13	4
670	700	23	13	5
700	820	23	14	5
820	850	24	14	5
850	970	24	15	5
970	1030	25	16	5
1030	1150	25	16	6
1150	1330	26	17	6
1330	1420	27	18	6
1420	1510	27	18	7
1510	1830	28	19	7
1830	2000	28	19	8

Table 33: LM Rail Length and Running Parallelism for Model RSR2 by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values	
Above	Up to	Normal grade	Precision grade
—	25	2	1
25	50	2	1
50	75	2.5	1
75	100	3.5	1
100	125	4	1.5
125	150	5	1.5
150	175	5.5	2
175	200	6	2

- Accuracies of Model MX are categorized into Normal and Precision grades by model number as indicated in Table 34.

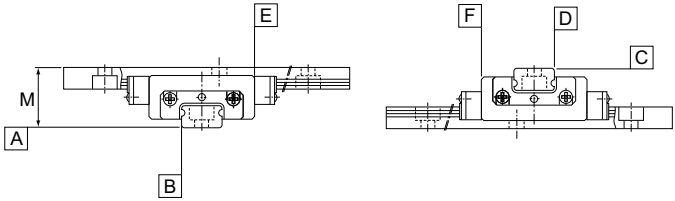


Fig. 22

Table 34: Accuracy Standards for Model MX

Unit: mm

Model No.	Accuracy standards	Normal grade	Precision grade
	Item	No symbol	P
5	Difference in height M	0.015	0.005
	Perpendicularity of surface D against surface B	0.003	0.002
	Running parallelism of surface E against surface B	As shown in Table 35	
	Running parallelism of surface F against surface D	As shown in Table 35	
7	Difference in height M	0.03	0.007
	Perpendicularity of surface D against surface B	0.01	0.005
	Running parallelism of surface E against surface B	As shown in Table 36	
	Running parallelism of surface F against surface D	As shown in Table 36	

Table 35: LM Rail Length and Running Parallelism for Model MX5 by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values	
Above	Up to	Normal grade	Precision grade
—	25	2.5	1.5
25	50	3.5	2
50	100	5.5	3
100	150	7	4
150	200	8.4	5

Table 36: LM Rail Length and Running Parallelism for Model MX7 by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values	
Above	Up to	Normal grade	Precision grade
—	40	8	1
40	70	10	1
70	100	11	2
100	130	12	2
130	160	13	2
160	190	14	2
190	220	15	3
220	250	16	3
250	280	17	3
280	310	17	3
310	340	18	3
340	370	18	3
370	400	19	3

- Accuracies of Model SRW are categorized into Precision, Super Precision, and Ultra Precision grades by model number as indicated in Table 37.

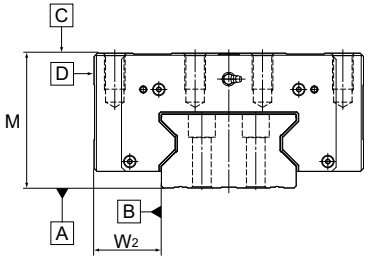


Fig. 23

Table 37: Accuracy Standards for Model SRW

Unit: mm

Model No.	Accuracy standards	Precision grade	Super Precision grade	Ultra Precision grade
	Item	P	SP	UP
70 85	Dimensional tolerance in height M	0 –0.05	0 –0.03	0 –0.015
	Difference in height M	0.007	0.005	0.003
	Dimensional tolerance in width W_2	0 –0.04	0 –0.025	0 –0.015
	Difference in width W_2	0.007	0.005	0.003
	Running parallelism of surface C against surface A	As shown in Table 38		
	Running parallelism of surface D against surface B	As shown in Table 38		
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 Table 38		
	Running parallelism of surface D against surface B	As shown in Table 38		
130 150	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 Table 38		
	Running parallelism of surface D against surface B	As shown in Table 38		

Table 38: LM Rail Length and Running Parallelism by Accuracy Standard

Unit: μm

LM rail length (mm)		Running parallelism values		
Above	Up to	Precision grade	Super Precision grade	Ultra Precision grade
—	50	2	1.5	1
50	80	2	1.5	1
80	125	2	1.5	1
125	200	2	1.5	1
200	250	2.5	1.5	1
250	315	3	1.5	1
315	400	3.5	2	1.5
400	500	4.5	2.5	1.5
500	630	5	3	2
630	800	6	3.5	2
800	1000	6.5	4	2.5
1000	1250	7.5	4.5	3
1250	1600	8	5	4
1600	2000	8.5	5.5	4.5
2000	2500	9.5	6	5
2500	3090	11	6.5	5.5

- Accuracies of Model EPF are categorized into Normal, High Accuracy, and Precision grades by model number as indicated in Table 39.

Table 39: Accuracy Standards for Model EPF

Unit: mm

Model No.	Accuracy Standards	Normal grade	High Accuracy grade	Precision grade
	Item	No Symbol	H	P
7M 9M 12M 15M	Dimensional tolerance in height M	±0.04	±0.02	±0.01
	Difference in height M	0.03	0.015	0.007
	Dimensional tolerance in width W_2	±0.04	±0.025	±0.015
	Running parallelism of surface C against surface A[1]	0.008	0.004	0.001
	Running parallelism of surface D against surface B[1]	0.008	0.004	0.001

Note) If the stroke is more than 40 mm, contact THK.

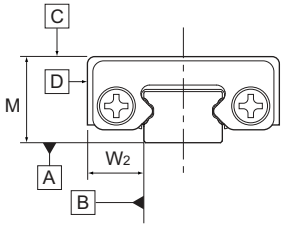


Fig. 24

LM Guide

Features and Dimensions of Each Model

Structure and Features of the Caged Ball LM Guide

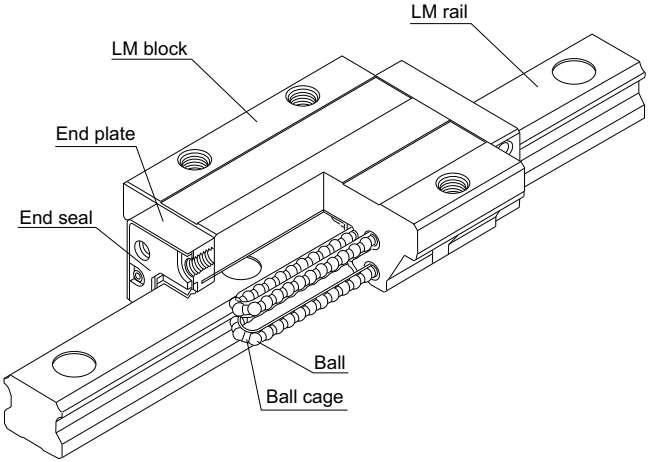


Fig. 1: Structural Drawing of the Caged Ball LM Guide Model SHS

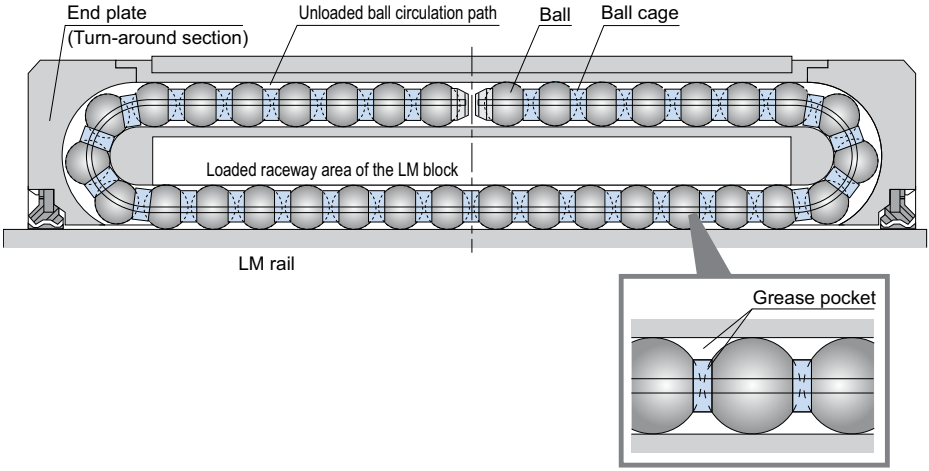


Fig. 2: Circulation Structure inside the LM Block of the Caged Ball LM Guide

With the Caged Ball LM Guide, the use of a ball cage allows lines of evenly spaced balls to circulate and eliminates friction between the balls.
In addition, grease held in a space between the ball circulation path and the ball cage (grease pocket) is applied on the contact surface between each ball and the ball cage as the ball rotates, forming an oil film on the ball surface. As a result, the oil film is not easily broken.

Advantages of Caged Ball Technology

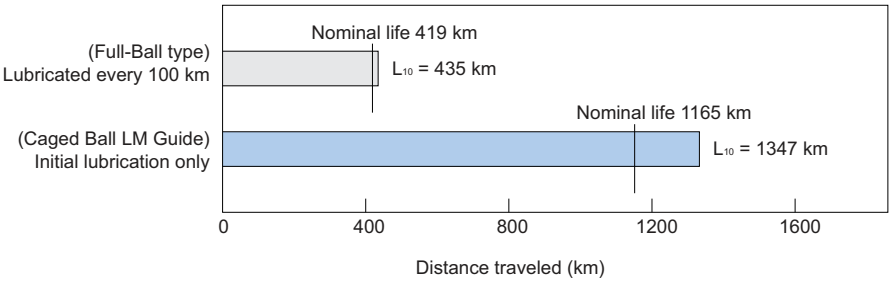
(1) The absence of friction between balls, together with increased grease retention, achieves long service life and long-term maintenance-free (lubrication-free) operation.
(2) The absence of ball-to-ball collision achieves low noise and reduced running sound.
(3) The absence of friction between balls enables low heat generation and high speed operation.
(4) The circulation of rows of evenly arranged balls ensures smooth movement.
(5) The absence of friction between balls allows high grease retention and low dust generation.

Long Service Life and Long-Term Maintenance-Free Operation

● **Data on Long Service Life and Long-Term Maintenance-Free Operation**

Use of a ball cage eliminates friction between balls and increases grease retention to achieve long service life and long-term maintenance-free operation.

Operating Conditions
Speed : 60 m/min
Stroke : 350 mm
Acceleration: 9.8 m/s^2
Orientation : horizontal
Load : Caged Ball LM Guide : 11.1 kN
Full-Ball type : 9.8 kN

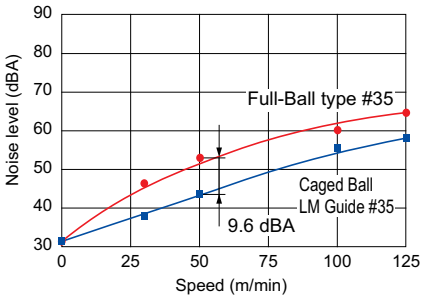


Caged Ball LM Guide and Full-Ball Type Durability Testing Data

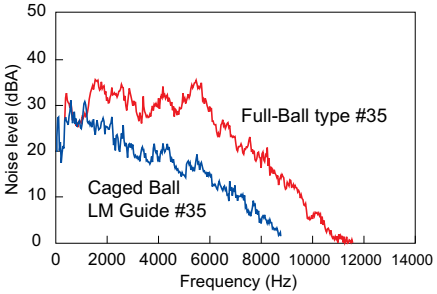
Low Noise and Reduced Running Sound

● Noise Level Data

Since the ball circulation path inside the LM block is made of resin, metallic noise between balls and the LM block is eliminated. In addition, use of a ball cage eliminates metallic noise of ball-to-ball collision, allowing a low noise level to be maintained even at high speed.



Comparison of Noise Levels between Caged Ball LM Guide #35 and Full-Ball Type #35



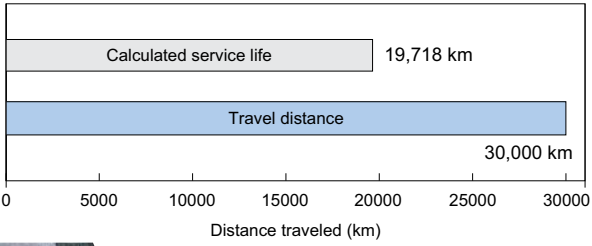
Comparison of Noise Levels between Caged Ball LM Guide #35 and Full-Ball Type #35 (at speed of 50 m/min)

High Speed

● High-Speed Durability Test Data

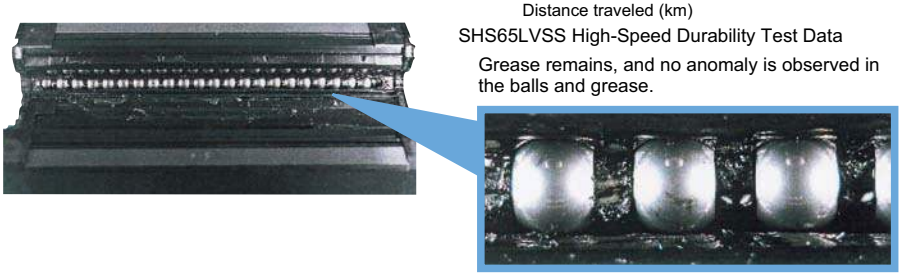
Since use of a ball cage eliminates friction between balls, it enables low heat generation and high-speed operation.

Operating Conditions
Model No. : Caged Ball LM Guide Model SHS65LVSS
Speed : 200 m/min
Stroke : 2500 mm
Lubrication : initial lubrication only
Applied load: 34.5 kN
Acceleration: 1.5 G



SHS65LVSS High-Speed Durability Test Data

Grease remains, and no anomaly is observed in the balls and grease.

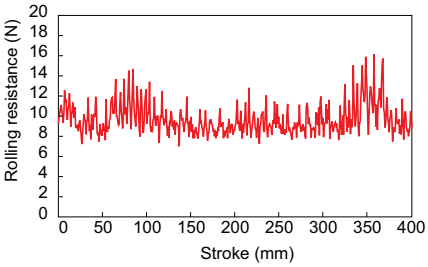


Detail view of the ball cage

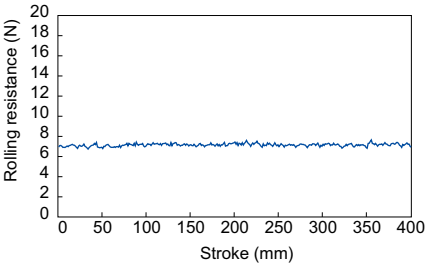
Smooth Motion

● Rolling Resistance Data

Use of a ball cage allows the balls to be uniformly aligned and prevents a line of balls from meandering as they enter the LM block. This enables smooth and stable motion, minimizes fluctuations in rolling resistance, and ensures high accuracy in any mounting orientation.



Rolling Resistance Fluctuation Data with Full-Ball Type #25
(Vertical-use feeding speed: 1 mm/s)

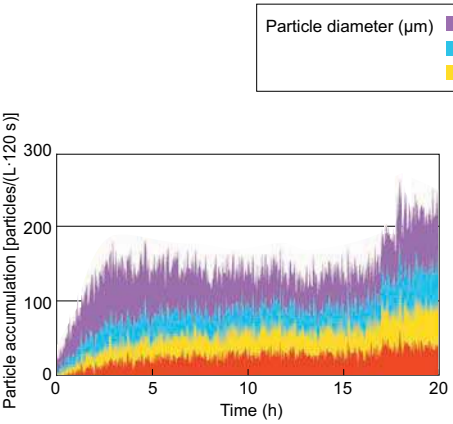


Rolling Resistance Fluctuation Data with Caged Ball LM Guide #25
(Vertical-use feeding speed: 1 mm/s)

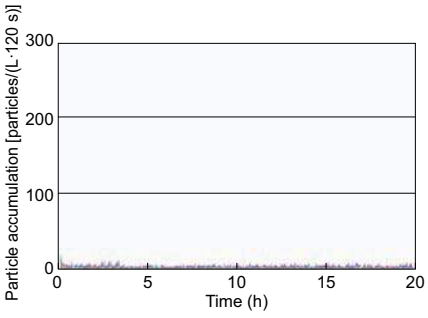
Low Dust Generation

● Low Dust Generation Data

In addition to eliminating friction between balls, using resin for the through holes also eliminates metallic contact. Furthermore, the Caged Ball LM Guide has a high level of grease retention and minimizes spattering of grease, thus achieving superbly low dust generation.



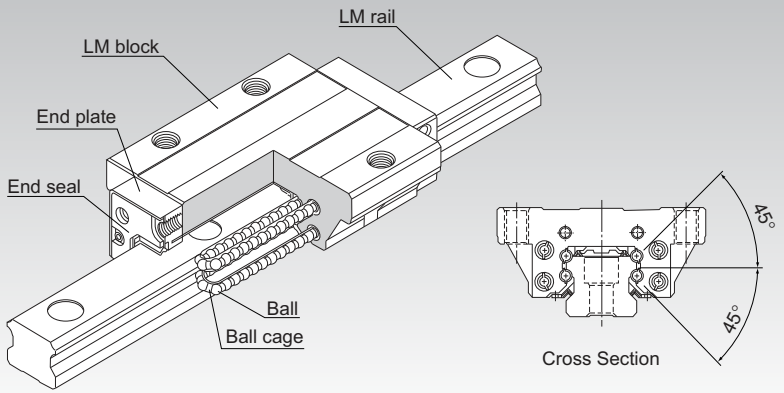
Full-Ball Type Dust Generation Data



Caged Ball LM Guide Model SSR20
Dust Generation Data

SHS

Global Standard Caged Ball LM Guide Model SHS



*For the ball cage, see A1-90.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-488
Reference Error Tolerance for the Mounting Surface A1-494
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in four rows of raceways precision-ground on the LM rail and LM block and are circulated by ball cages and end plates incorporated in the LM block.
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 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 load ratings 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 of the front-to-front configuration of THK's unique circular-arc grooves (DF set) enables mounting error to be absorbed even under a preload, thus achieving highly accurate and smooth linear motion.

Global Standard Size

SHS is designed to have dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard with which THK pioneered the LM System.

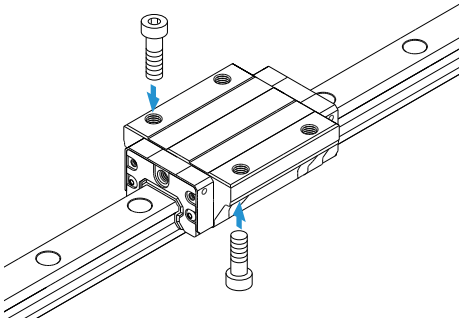
Stainless Steel Type also Available

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

Model SHS-C

Dimensional Table⇒A1-98

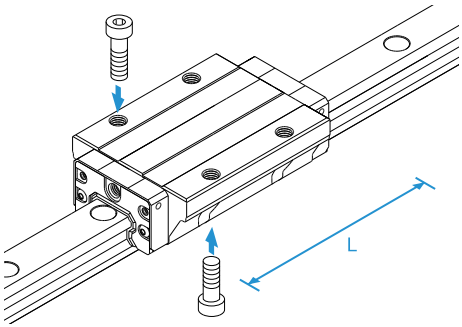
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.
It is used in places where the table cannot have through holes for mounting bolts.



Model SHS-LC

Dimensional Table⇒A1-98

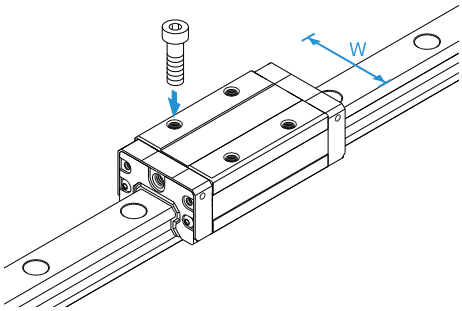
The LM block has the same cross-sectional shape as the Model SHS-C, but it has a longer overall LM block length (L) and a greater load rating.



Model SHS-V

Dimensional Table⇒A1-100

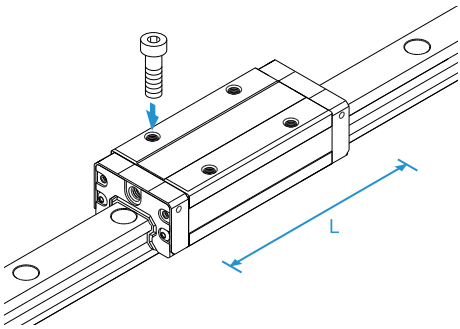
With this type, the LM block has a smaller width (W) and tapped holes.
It is used in places where the space for table width is limited.



Model SHS-LV

Dimensional Table⇒A1-100

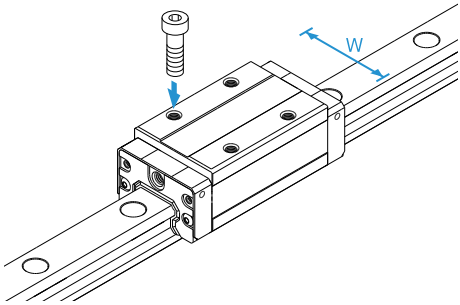
The LM block has the same cross-sectional shape as model SHS-V, but has a longer overall LM block length (L) and a greater load rating.



Model SHS-R

Dimensional Table⇒A1-102

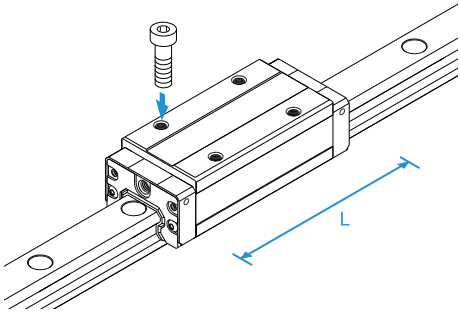
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for the table width is limited.
It has the same height dimension as the Full-Ball LM Guide Model HSR-R.



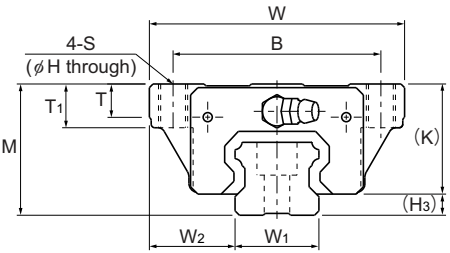
Model SHS-LR

Dimensional Table⇒A1-102

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 load rating.



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



Model No.	Outer dimensions			LM block dimensions											Pilot hole for side nipple		
	Height M	Width W	Length L	B	C	S	H	L_1	T	T_1	K	N	E	Grease nipple	e_0	f_0	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

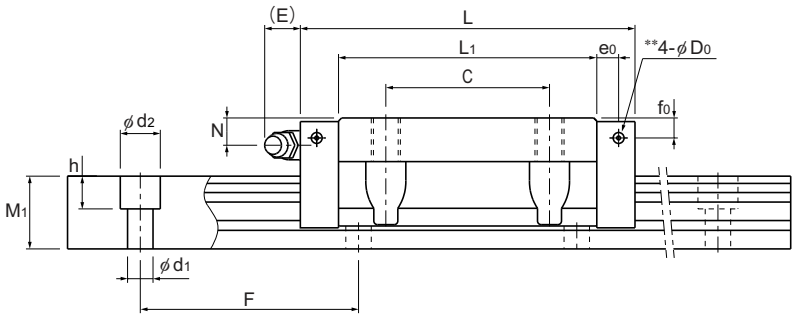
SHS25 LC 2 QZ KKHH C0 M +1240L P Z T M -II

- SHS25: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- M: Stainless steel LM block
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3) Normal grade (No Symbol) High accuracy grade (H) Precision grade (P) Super precision grade (SP) Ultra precision grade (UP)
- Z: With steel tape
- T: Symbol for LM rail jointed use
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

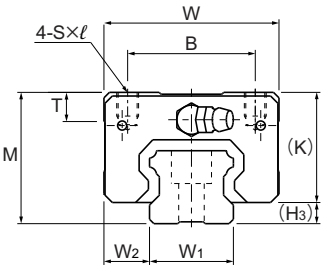
		LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	W_1 0 -0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	2 blocks	1 block	2 blocks	1 block	kg	kg/m
	3	15	16	13	60	4.5×7.5×5.3	3000 (1240)	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 A**1-104**.)
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 A**1-517** or A**1-539**)

** 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.

Options⇒A1-503

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



Model No.	Outer dimensions			LM block dimensions									Pilot hole for side nipple		
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Grease nipple	e_0	f_0	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

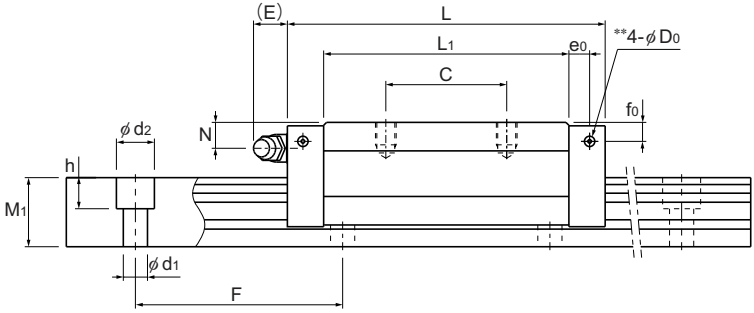
SHS25 V 2 QZ KKHH C1 M +1240L P Z T M -II

- SHS25: Model number
- V: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- M: Stainless steel LM block
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3) Normal grade (No Symbol) High accuracy grade (H) Precision grade (P) Super precision grade (SP) Ultra precision grade (UP)
- Z: With steel tape
- T: Symbol for LM rail jointed use
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

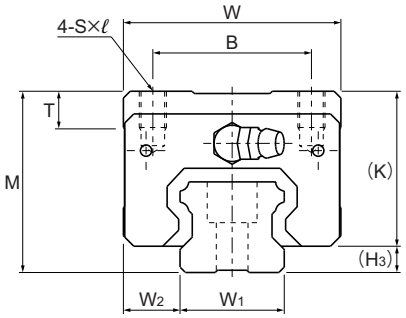
		LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	W_1 0 -0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	2 blocks	1 block	2 blocks	1 block	kg	kg/m
	3	15	9.5	13	60	4.5×7.5×5.3	3000 (1240)	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 **A1-104**.)
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 **A1-517** or **A1-539**)

** 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.

Options⇒A1-503

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



Model No.	Outer dimensions			LM block dimensions								Pilot hole for side nipple		
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Grease nipple	e_0	f_0	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

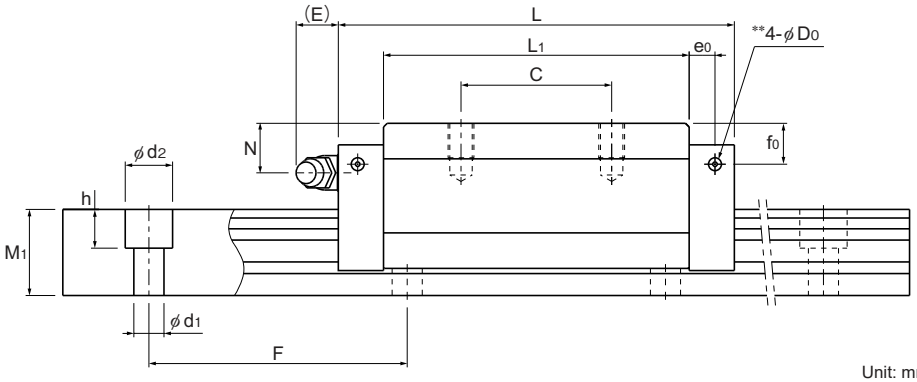
SHS25 LR 2 QZ KKHH C0 M +1240L P T M -II

- SHS25: Model number
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- M: Stainless steel LM block
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

		LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	W_1 0 -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
	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 **A1-104**.)
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 **A1-517** or **A1-539**)

** 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.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 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 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.

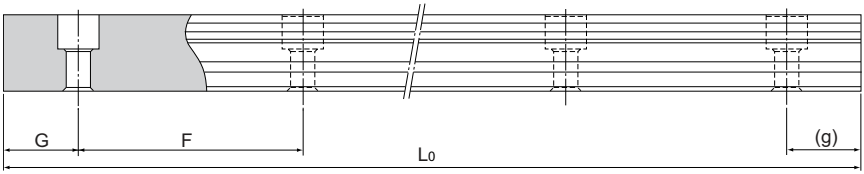


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model SHS

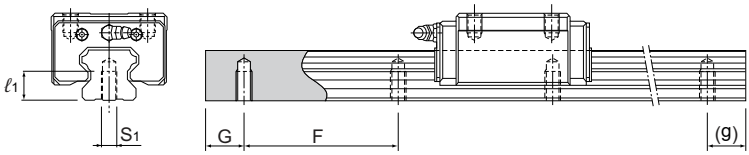
Unit: mm

Model No.	SHS 15	SHS 20	SHS 25	SHS 30	SHS 35	SHS 45	SHS 55	SHS 65
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600 1720 1840 1960 2080 2200	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 2200 2320 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620
Standard pitch F	60	60	60	80	80	105	120	150
G, g	20	20	20	20	20	22.5	30	35
Max length	3000 (1240)	3000 (1480)	3000 (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 Type LM Rail

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) A tapped-hole LM rail type is available only for Precision grade or lower grades.
(2) For standard pitches of the taps and the G and g dimensions, see Table 1 on A1-104.

Table 2: 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

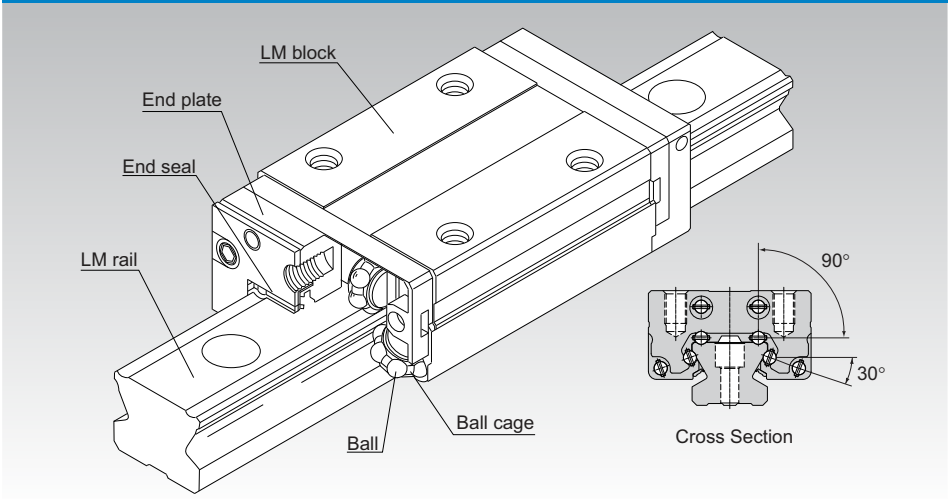
Model number coding

SHS35LC2UU+1000LH K

Symbol for tapped-hole LM rail

SSR

Radial Type Caged Ball LM Guide Model SSR



*For the ball cage, see **A1-90**.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-491
Reference Error Tolerance for the Mounting Surface A1-494
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in four rows of raceways precision-ground on the LM rail and LM block and are circulated by ball cages and end plates incorporated in the LM block.
Use of the ball cage eliminates friction between balls and increases grease retention, thereby achieving low noise, high speeds, and long-term maintenance-free operations.

Compact, Radial Type

Since it is a compactly designed model with a low cross-sectional height and a ball contact structure that is suited to large loads in the radial direction, this model is optimal for horizontal guide units.

Superb Planar Running Accuracy

Use of a ball contact structure that is suited to large loads in the radial direction minimizes radial displacement under radial loads and allows stable, highly accurate motion.

Self-Adjustment Capability

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

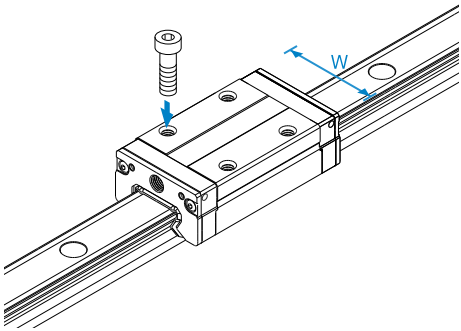
Stainless Steel Type Also Available

A special type whose LM block, LM rail, and balls are made of stainless steel is also available.

Model SSR-XW

Dimensional Table⇒A1-110

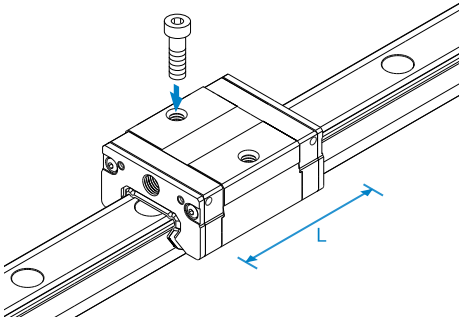
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for the table width is limited.



Model SSR-XV

Dimensional Table⇒A1-112

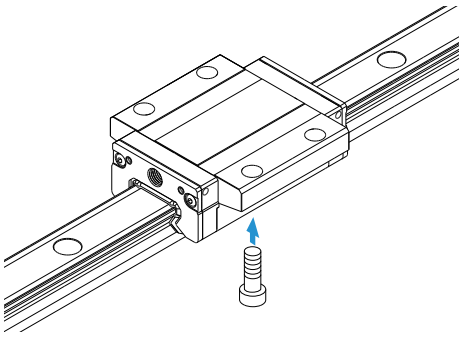
This type has the same cross-sectional shape as SSR-XW but has a shorter overall LM block length (L).



Model SSR-XTB

Dimensional Table⇒A1-114

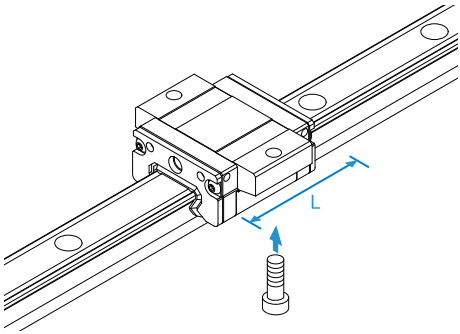
The flange of the LM block has through holes. It is used in places where the table cannot have through holes for mounting bolts.



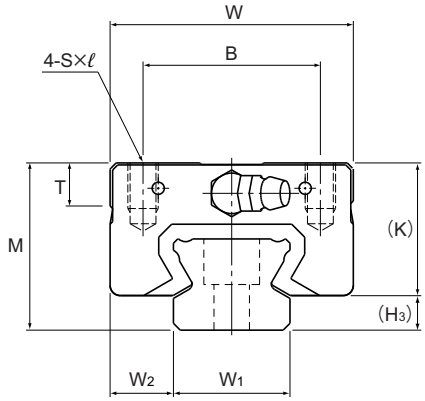
Model SSR-XSB

Dimensional Table⇒A1-116

This type has the same cross-sectional shape as SSR-XTB but has a shorter overall LM block length (L).



Models SSR-XW and SSR-XWM



Model No.	Outer dimensions			LM block dimensions												H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	f_0	e_0	D_0	Grease nipple	
SSR 15XW SSR 15XWM	24	34	56.9	26	26	M4×7	39.9	6.5	19.5	4.5	5.5	2.7	4.5	3	PB1021B	4.5
SSR 20XW SSR 20XWM	28	42	66.5	32	32	M5×8	46.6	8.2	22	5.5	12	2.9	5.2	3	B-M6F	6
SSR 25XW SSR 25XWM	33	48	83	35	35	M6×9	59.8	8.4	26.2	6	12	3.3	6.8	3	B-M6F	6.8
SSR 30XW SSR 30XWM	42	60	97	40	40	M8×12	70.7	11.3	32.5	8	12	4.5	7.6	4	B-M6F	9.5
SSR 35XW	48	70	110.9	50	50	M8×12	80.5	13	36.5	8.5	12	4.7	8.8	4	B-M6F	11.5

Note) The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel.
The stainless steel provides excellent corrosion and environmental resistance.

Model number coding

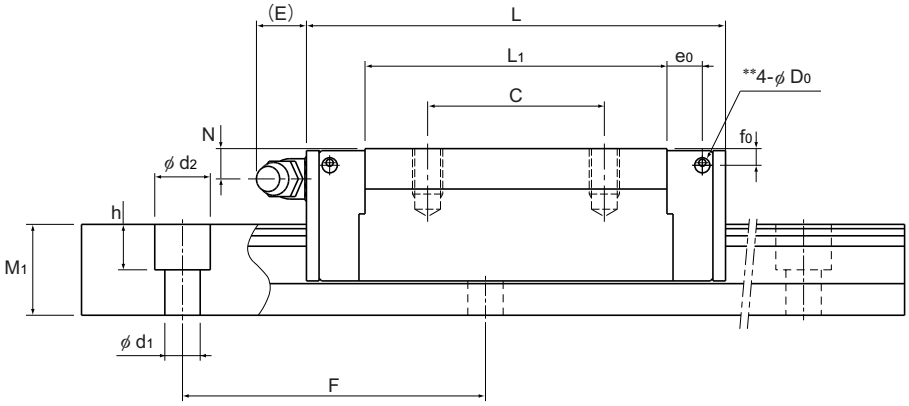
SSR25X W 2 QZ UU C1 M +1200L Y P T M -II

- SSR25X: Model number
- W: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1)
- M: Stainless steel LM block
- +1200L: LM rail length (in mm)
- Y: Applied to only 15 and 25
- P: Accuracy symbol (*3) — 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	12.5	60	4.5×7.5×5.3	3000 (1240)	14.7	16.5	0.0792	0.44	0.0486	0.274	0.0962	0.15	1.2
	20	11	15.5	60	6×9.5×8.5	3000 (1480)	19.6	23.4	0.138	0.723	0.0847	0.448	0.18	0.25	2.1
	23	12.5	18	60	7×11×9	3000 (2020)	31.5	36.4	0.258	1.42	0.158	0.884	0.33	0.4	2.7
	28	16	23	80	7×11×9	3000 (2520)	46.5	52.7	0.446	2.4	0.274	1.49	0.571	0.8	4.3
	34	18	27.5	80	9×14×12	3000	64.6	71.6	0.711	3.72	0.437	2.31	0.936	1.1	6.4

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-118**.)
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 **A1-517** or **A1-539**)

** 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.

Note2) For models SSR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.

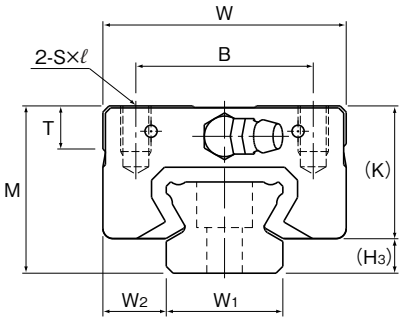
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SSR 15	For M4 (symbol Y)	For M3 (no symbol)
SSR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Models SSR-XV and SSR-XVM



Model No.	Outer dimensions			LM block dimensions											H_3
	Height M	Width W	Length L	B	S×ℓ	L_1	T	K	N	E	f_0	e_0	D_0	Grease nipple	
SSR 15XV SSR 15XVM	24	34	40.3	26	M4×7	23.3	6.5	19.5	4.5	5.5	2.7	4.5	3	PB1021B	4.5
SSR 20XV SSR 20XVM	28	42	47.7	32	M5×8	27.8	8.2	22	5.5	12	2.9	5.2	3	B-M6F	6
SSR 25XV SSR 25XVM	33	48	60	35	M6×9	36.8	8.4	26.2	6	12	3.3	6.8	3	B-M6F	6.8
SSR 30XV SSR 30XVM	42	60	66.7	40	M8×12	40.4	11.5	32.5	8	12	4.5	7.6	4	B-M6F	9.5
SSR 35XV	48	70	77.5	50	M8×12	47.1	16.2	36.5	8.5	12	4.7	8.8	4	B-M6F	11.5

Note) The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Model number coding

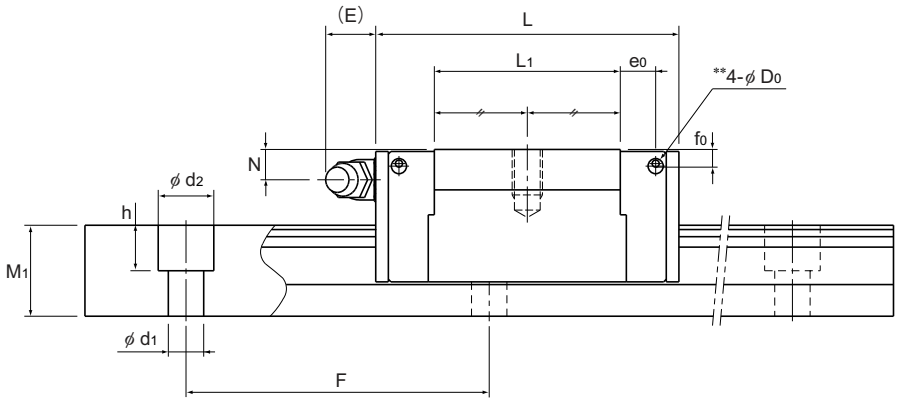
SSR25X V 2 QZ UU C1 M +1200L Y P T M -Ⅲ

- SSR25X: Model number
- V: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)
- M: Stainless steel LM block
- +1200L: LM rail length (in mm)
- Y: Applied to only 15 and 25
- P: Accuracy symbol (*3) 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
- M: Stainless steel LM rail
- -Ⅲ: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*4) See **A1-13**.

Note) This model number indicates that a single-rail unit constitutes one set. (i.e., required number of sets when 3 rails are used in parallel is 3 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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	12.5	60	4.5×7.5×5.3	3000 (1240)	9.1	9.7	0.0303	0.119	0.0189	0.122	0.0562	0.08	1.2
	20	11	15.5	60	6×9.5×8.5	3000 (1480)	13.4	14.4	0.0523	0.336	0.0326	0.213	0.111	0.14	2.1
	23	12.5	18	60	7×11×9	3000 (2020)	21.7	22.5	0.104	0.661	0.0652	0.419	0.204	0.23	2.7
	28	16	23	80	7×11×9	3000 (2520)	34.8	34.4	0.186	1.12	0.116	0.711	0.376	0.43	4.3
	34	18	27.5	80	9×14×12	3000	48.3	46.7	0.295	1.77	0.184	1.12	0.615	0.6	6.4

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-118**.)
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 **A1-517** or **A1-539**)

** 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.

Note2) For models SSR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.

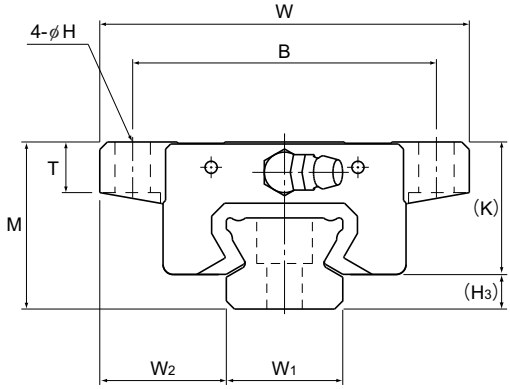
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SSR 15	For M4 (symbol Y)	For M3 (no symbol)
SSR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Model SSR-XTB



Model No.	Outer dimensions			LM block dimensions												H_3
	Height M	Width W	Length L	B	C	H	L_1	T	K	N	E	f_0	e_0	D_0	Grease nipple	
SSR 15XTB	24	52	56.9	41	26	4.5	39.9	7	19.5	4.5	5.5	2.7	4.5	3	PB1021B	4.5
SSR 20XTB	28	59	66.5	49	32	5.5	46.6	9	22	5.5	12	2.9	5.2	3	B-M6F	6
SSR 25XTB	33	73	83	60	35	7	59.8	10	26.2	6	12	3.3	6.8	3	B-M6F	6.8
SSR 30XTB	42	90	97	72	40	9	70.7	10	32.5	8	12	4.5	7.6	4	B-M6F	9.5
SSR 35XTB	48	100	110.9	82	50	9	80.5	13	36.5	8.5	12	4.7	8.8	4	B-M6F	11.5

Model number coding

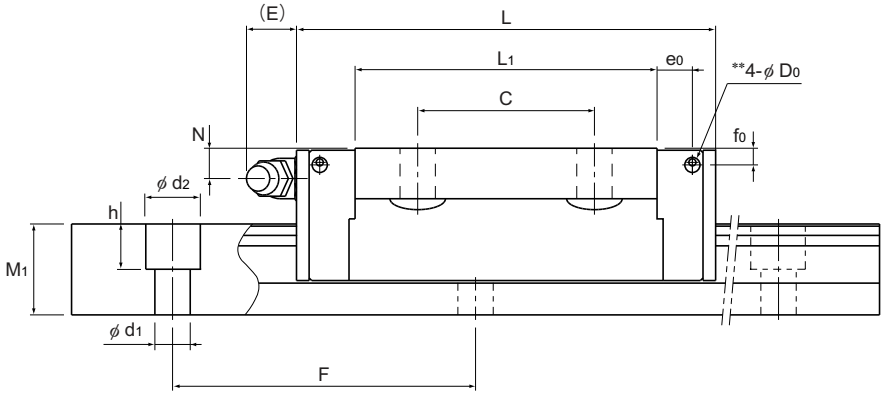
SSR15X TB 2 QZ UU C1 +820L Y P T -II

- SSR15X: Model number
- TB: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +820L: LM rail length (in mm)
- Y: Applied to only 15 and 25 sizes
- P: Accuracy symbol (*3)
  - 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	18.5	12.5	60	4.5×7.5×5.3	3000 (1240)	14.7	16.5	0.0792	0.44	0.0486	0.274	0.0962	0.19	1.2
	20	19.5	15.5	60	6×9.5×8.5	3000 (1480)	19.6	23.4	0.138	0.723	0.0847	0.448	0.18	0.31	2.1
	23	25	18	60	7×11×9	3000 (2020)	31.5	36.4	0.258	1.42	0.158	0.884	0.33	0.53	2.7
	28	31	23	80	7×11×9	3000 (2520)	46.5	52.7	0.446	2.4	0.274	1.49	0.571	0.87	4.3
	34	33	27.5	80	9×14×12	3000	64.6	71.6	0.711	3.72	0.437	2.31	0.936	1.33	6.4

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-118**.)
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 **A1-517** or **A1-539**)

** 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.

Note2) For models SSR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.

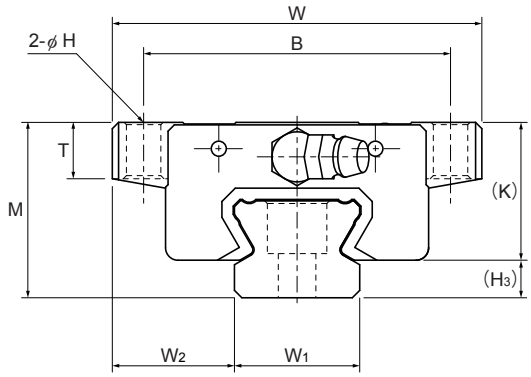
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SSR 15	For M4 (symbol Y)	For M3 (no symbol)
SSR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Model SSR-XSB



Model No.	Outer dimensions			LM block dimensions											H_3
	Height M	Width W	Length L	B	H	L_1	T	K	N	E	f_0	e_0	D_0	Grease nipple	
SSR 15XSB	24	52	40.3	41	4.5	23.3	7	19.5	4.5	5.5	2.7	4.5	3	PB1021B	4.5
SSR 20XSB	28	59	47.7	49	5.5	27.8	9	22	5.5	12	2.8	5.2	3	B-M6F	6
SSR 25XSB	33	73	60	60	7	36.8	10	26.2	6	12	3.3	7	3	B-M6F	6.8
SSR 30XSB	42	90	66.7	72	9	40.4	10	32.5	8	12	4.5	7.6	4	B-M6F	9.5
SSR 35XSB	48	100	77.5	82	9	47.1	13	36.5	8.5	12	4.7	8.8	4	B-M6F	11.5

Model number coding

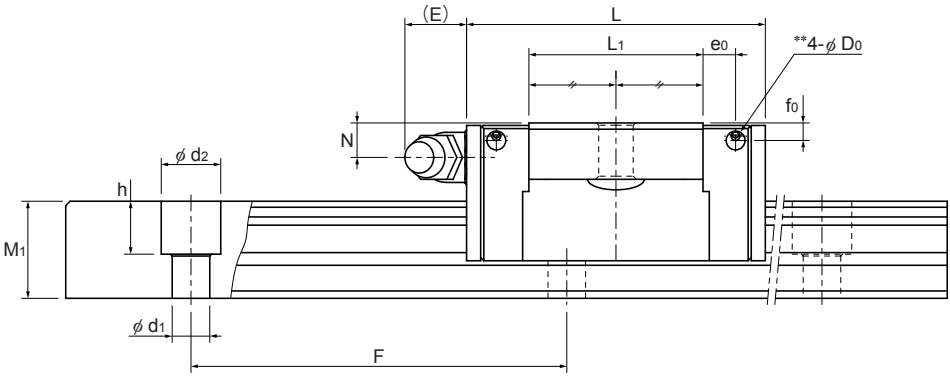
SSR15X SB 2 QZ UU C1 +820L Y P T -II

- SSR15X: Model number
- SB: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +820L: LM rail length (in mm)
- Y: Applied to only 15 and 25 sizes
- P: Accuracy symbol (*3)
  - 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*4) See **A1-13**.

Note) This model number indicates that a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2 at a minimum).
Those models equipped with a QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model with a QZ attached, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m *					Mass	
	Width		Height	Pitch		Length*	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	18.5	12.5	60	4.5×7.5×5.3	3000 (1240)	9.1	9.7	0.0303	0.1192	0.0189	0.122	0.0562	0.11	1.2
	20	19.5	15.5	60	6×9.5×8.5	3000 (1480)	13.4	14.4	0.0523	0.336	0.0326	0.213	0.111	0.18	2.1
	23	25	18	60	7×11×9	3000 (2020)	21.7	22.5	0.104	0.661	0.0652	0.419	0.204	0.31	2.7
	28	31	23	80	7×11×9	3000 (2520)	34.8	34.4	0.186	1.12	0.116	0.711	0.376	0.52	4.3
	34	33	27.5	80	9×14×12	3000	48.3	46.7	0.295	1.77	0.184	1.12	0.615	0.77	6.4

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-118**.)
Static permissible moment* 1 block: The static permissible moment with one LM block
2 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 A**1-517** or A**1-539**)

** 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.

Note2) For models SSR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.

Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SSR 15	For M4 (symbol Y)	For M3 (no symbol)
SSR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model SSR variations. If the maximum length of the desired LM rail exceeds these values, joint 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.

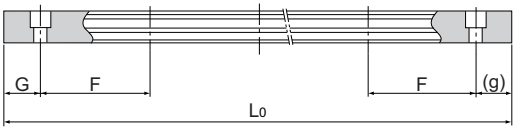


Table 1: Standard Lengths and Maximum Lengths of LM Rails

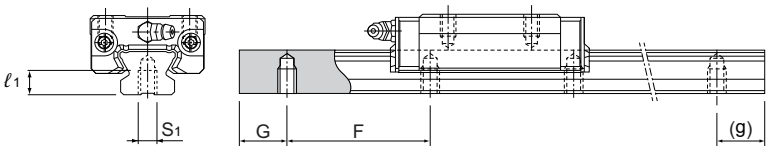
Unit: mm

Model No.	SSR 15X	SSR 20X	SSR 25X	SSR 30X	SSR 35X
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1660 1720 1780 1840 1900 1960 2020 2080 2140	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1240 1300 1360 1420 1480 1540 1600 1660 1720 1780 1840 1900 1960 2020 2080 2140 2200 2260 2320 2380 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1640 1720 1800 1880 1960 2040 2120 2200 2280 2360 2440 2520 2600 2680 2760 2840 2920	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1640 1720 1800 1880 1960 2040 2120 2200 2280 2360 2440 2520 2600 2680 2760 2840 2920
Standard pitch F	60	60	60	80	80
G, g	20	20	20	20	20
Max length	3000 (1240)	3000 (1480)	3000 (2020)	3000 (2520)	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 made models.

Tapped-Hole Type LM Rail

LM rails with tapped holes machined on the bottom surface are available for the Model SSR. This type is useful when mounting from the bottom of the base and when increased contamination protection is desired.



(1) A tapped-hole LM rail type is available only for Precision grade or lower grades.
(2) For standard pitches of the taps and the G and g dimensions, see Table 1 on A1-118.

Table 2: Dimensions of the LM Rail Tap Unit: mm

Model No.	S_1	Effective tap depth ℓ_1
SSR 15X	M5	7
SSR 20X	M6	9
SSR 25X	M6	10
SSR 30X	M8	14
SSR 35X	M8	16

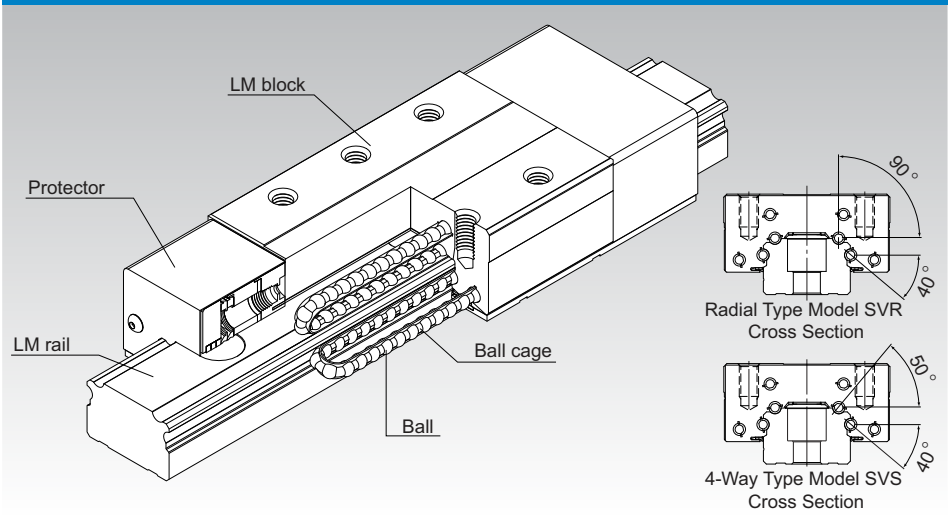
Model number coding

SSR20XW2UU+1200LH K

Symbol for tapped-hole LM rail

SVR/SVS

Super-Heavy Load Caged Ball LM Guide Model SVR/SVS for Machine Tools



*For the ball cage, see **A1-90**.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-488
Reference Error Tolerance for the Mounting Surface A1-494
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in four rows of raceways precision-ground on the LM rail and LM block and are circulated by ball cages and end plates incorporated in the LM block.
Models SVR and SVS have especially high rigidity and load carrying capacity among the Caged Ball LM Guide series. In addition, these models achieve stable LM Guide performance and high reliability by strengthening contamination protection functionality with a broad range of options that take into account the service environments of machine tools, etc.

*Models SVR and SVS have extremely high rigidity, which makes it easier for misalignment in the mounting surface or mounting error to negatively impact the product's service life and hinder its performance. If affected by these factors, their service life may be shortened or their motion may be disrupted. When considering using these models, contact THK.

Super-Heavy Load and Increased Damping

The raceways of models SVR and SVS adopt a deep circular-arc groove with a curvature approximate to the ball diameter. Since the ball contact area increases as the applied load increases, a large load carrying capacity is achieved and damping is also improved.

Increased Contamination Protection Performance

The protector's improved ability to remove foreign material strengthens its contamination protection performance. In addition, use of a side scraper reduces the entrance of foreign material into the LM block, thus maintaining the LM Guide performance for a long period even in adverse environments.

High Rigidity

Models SVR and SVS achieve the highest rigidity among the Caged Ball LM Guide series.
Both the radial type SVR and the 4-way type SVS are available in the same sizes. Depending on the intended use, you can select either type.

Wide Array of Options

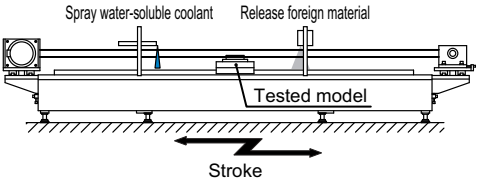
Various options are available, including an end seal, inner seal, side seal, Laminated Contact Scraper LaCS, protector, side scraper, and GC cap, to cope with diversified service environments.

Contamination Protection Performance Evaluation for Models SVR and SVS

Models SVR and SVS maintain their performance under severe conditions with fine particles or liquid contamination.

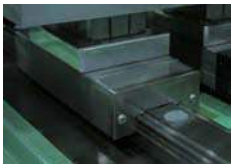
Test conditions

Item		Description
Tested model		SVS45LR1TTHHYYC1+2880LP×2set
Maximum speed		200 m/min
Stroke		2500 mm
Grease used		THK AFB-LF Grease
Environmental conditions	Foreign material	Type: Metal powder (atomized powder) (particle diameter: 125 μm or less)
		Amount: 0.4 g/20 min
	Coolant	Water-soluble coolant
		Amount: 0.2 cc/10 s



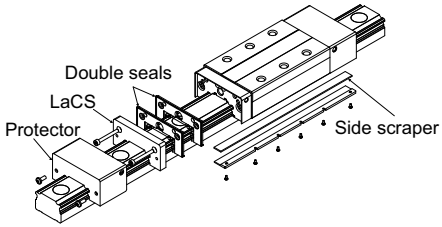


Test equipment



Tested model (before use)

Models SVR and SVS with accessories (TTHHYY option)



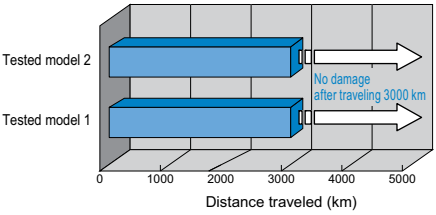
TTHHYY Option:

- Double seals
- Laminated Contact Scraper LaCS
- Protector
- Side scraper

Test result



After traveling 3000 km



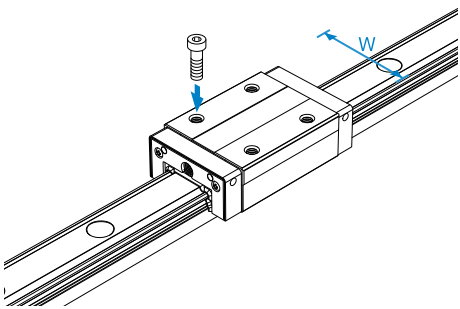
Models SVR and SVS maintain their performance even after traveling 3000 km under severe conditions with exposure to coolant and contamination.

Types and Features

Models SVR-R/SVS-R

Dimensional Table⇒A1-126/A1-128

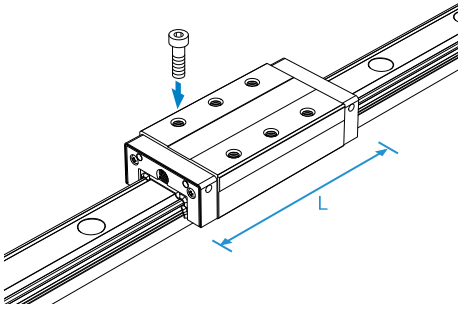
With this type, the LM block has a smaller width (W) and tapped holes.
It is used in places where the space for table width is limited.



Models SVR-LR/SVS-LR

Dimensional Table⇒A1-126/A1-128

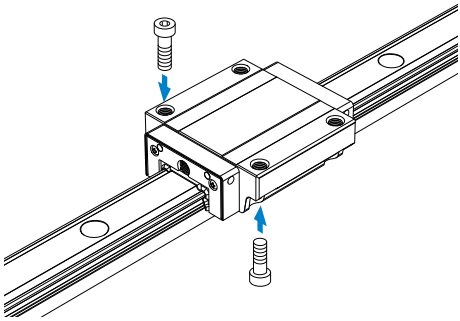
The LM block has the same cross-sectional shape as models SVR and SVS-R, but has a longer overall LM block length (L) and a greater load rating.



Models SVR-C/SVS-C

Dimensional Table⇒A1-130/A1-132

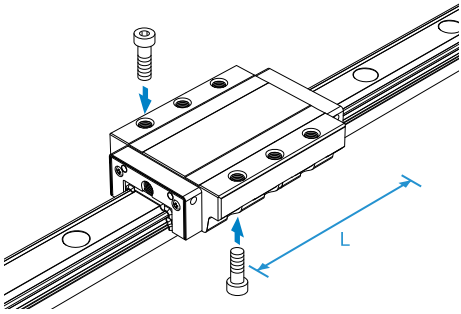
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.
It can also be used in places where the table cannot have through holes for mounting bolts.



Models SVR-LC/SVS-LC

Dimensional Table⇒A1-130/A1-132

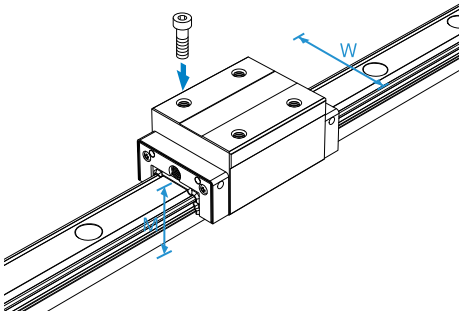
The LM block has the same cross-sectional shape as models SVR and SVS-C, but has a longer overall LM block length (L) and a greater load rating.



Models SVR-RH/SVS-RH

Dimensional Table⇒A1-134

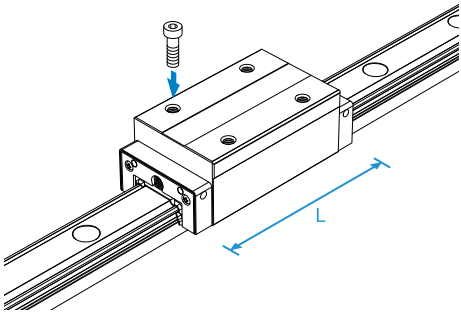
The dimensions are almost the same as those of LM Guide models SHS and HSR, and the LM block has tapped holes. They are used in places where the space for table width is limited.



Models SVR-LRH/SVS-LRH

Dimensional Table⇒A1-134

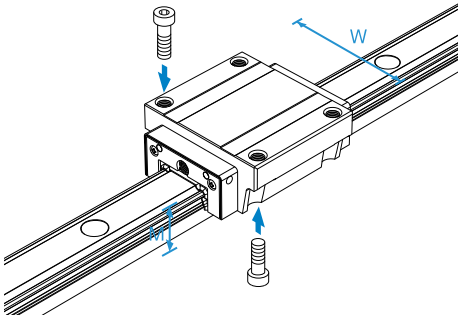
The LM block has the same cross-sectional shape as models SVR and SVS-RH, but has a longer overall LM block length (L) and a greater load rating.



Models SVR-CH/SVS-CH

Dimensional Table⇒A1-136

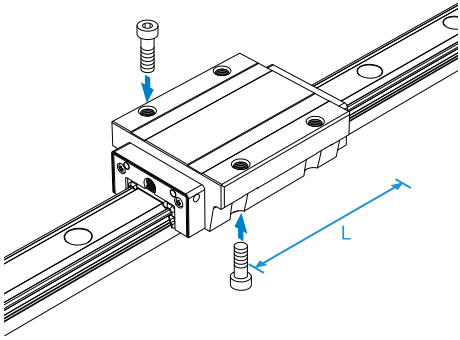
The dimensions are similar to those of LM Guide models SHS and HSR, and the flange of the LM block has tapped holes. It can be mounted from the top or the bottom. It is used in places where the table cannot have through holes for mounting bolts.



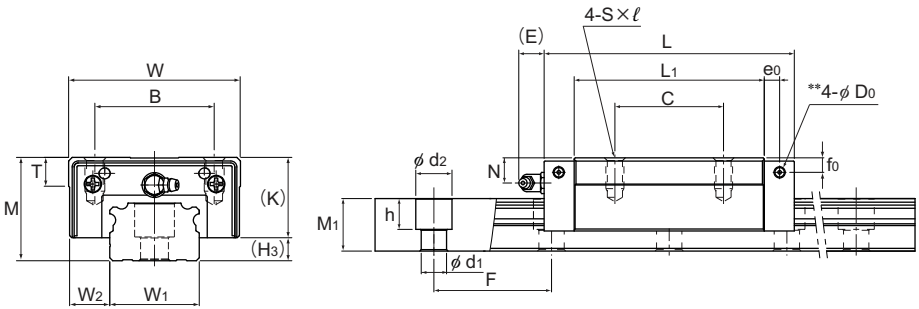
Models SVR-LCH/SVS-LCH

Dimensional Table⇒A1-136

The LM block has the same cross-sectional shape as models SVR and SVS-CH, but has a longer overall LM block length (L) and a greater load rating.



Models SVR-R and SVR-LR



SVR-R

Model No.	Outer dimensions			LM block dimensions													Grease nipple	H3
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	N	f0	E	e0	D0				
SVR 25R SVR 25LR	31	50	82.8 102	32	35 50	M6×8	61.4 80.6	9.7	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
SVR 30R SVR 30LR	38	60	98 120.5	40	40 60	M8×10	72.1 94.6	9.7	31	10.3	7	12	6.5	3.9	B-M6F	7
SVR 35R SVR 35LR	44	70	109.5 135	50	50 72	M8×12	79 104.5	11.7	35	12.1	8	12	6	5.2	B-M6F	9
SVR 45R SVR 45LR	52	86	138.2 171	60	60 80	M10×17	105 137.8	14.7	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
SVR 55R SVR 55LR	63	100	163.3 200.5	65	75 95	M12×18	123.6 160.8	17.7	49	16.6	10	16	10	5.2	B-PT1/8	14
SVR 65R SVR 65LR	75	126	186 246	76	70 110	M16×20	143.6 203.6	21.6	60	19	15	16	8.7	8.2	B-PT1/8	15

Model number coding

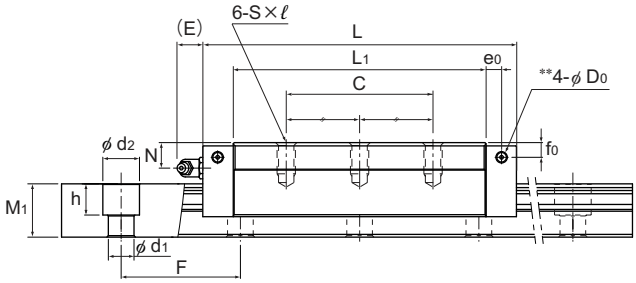
SVR45 LR 2 QZ TTHH C0 +1200L P T -II

- SVR45: Model No.
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*4) See A1-13.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used in parallel is 2).
Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



SVR-LR

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length	C	C_0	M_A		M_B		M_C	LM block	LM rail
	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
	25	12.5	17	40	6×9.5×8.5	3000	48.2 57	68.1 86.3	0.602 0.944	3.02 4.67	0.365 0.57	1.83 2.81	0.71 0.9	0.4 0.5	2.9
	28	16	21	80	7×11×9	3000	67.9 84	91.6 124	0.907 1.64	4.85 7.92	0.552 0.991	2.94 4.76	1.08 1.47	0.7 0.9	4.2
	34	18	24.5	80	9×14×12	3000	89.6 112	116 160	1.26 2.35	6.91 11.5	0.769 1.42	4.2 6.91	1.64 2.26	1 1.3	6.0
	45	20.5	29	105	14×20×17	3090	138 161	186 233	2.76 4.52	13.7 22.1	1.67 2.74	8.3 13.4	3.5 4.6	1.8 2.3	9.5
	53	23.5	36.5	120	16×23×20	3060	177 214	235 309	3.99 6.8	20.6 32.7	2.42 4.1	12.4 19.7	5.07 6.67	3.3 4.3	14
	63	31.5	43	150	18×26×22	3000	271 339	352 484	7.26 13.5	34.9 62.6	4.4 8.14	21.1 37.6	9 12.4	6.0 8.5	19.6

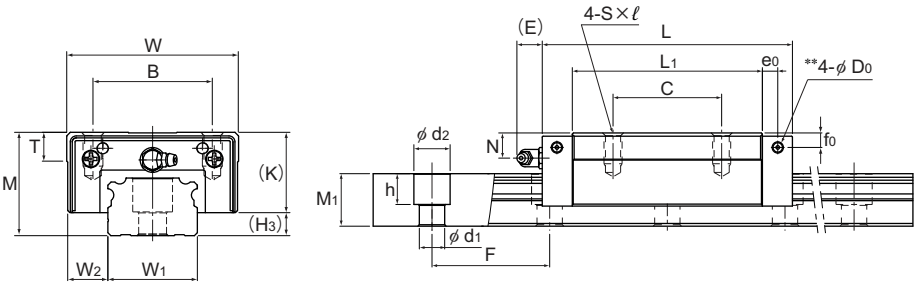
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-138**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models SVS-R and SVS-LR



SVS-R

Model No.	Outer dimensions			LM block dimensions												Grease nipple	H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	f_0	E	e_0	D_0			
SVS 25R SVS 25LR	31	50	82.8 102	32	35 50	M6×8	61.4 80.6	9.7	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
SVS 30R SVS 30LR	38	60	98 120.5	40	40 60	M8×10	72.1 94.6	9.7	31	10.3	7	12	6.5	3.9	B-M6F	7
SVS 35R SVS 35LR	44	70	109.5 135	50	50 72	M8×12	79 104.5	11.7	35	12.1	8	12	6	5.2	B-M6F	9
SVS 45R SVS 45LR	52	86	138.2 171	60	60 80	M10×17	105 137.8	14.7	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
SVS 55R SVS 55LR	63	100	163.3 200.5	65	75 95	M12×18	123.6 160.8	17.7	49	16.6	10	16	10	5.2	B-PT1/8	14
SVS 65R SVS 65LR	75	126	186 246	76	70 110	M16×20	143.6 203.6	21.6	60	19	15	16	8.7	8.2	B-PT1/8	15

Model number coding

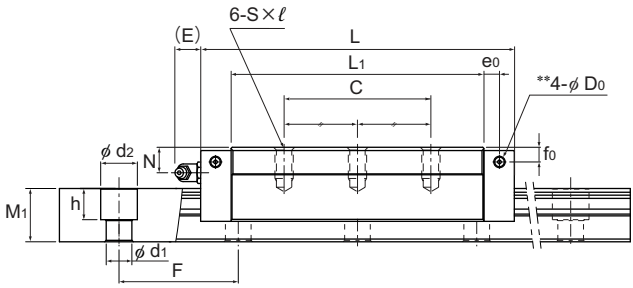
SVS45 LR 2 QZ TTHH C0 +1200L P T -II

- SVS45: Model No.
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*4) See A1-13.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used in parallel is 2).
Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



SVS-LR

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	25	12.5	17	40	6×9.5×8.5	3000	37 43.7	52.2 66.1	0.479 0.75	2.41 3.71	0.443 0.693	2.23 3.43	0.525 0.665		0.4 0.5	2.9
	28	16	21	80	7×11×9	3000	52 64.4	70.1 95.2	0.722 1.31	3.86 6.3	0.667 1.21	3.58 5.83	0.798 1.08		0.7 0.9	4.2
	34	18	24.5	80	9×14×12	3000	68.6 86.1	88.6 123	1 1.88	5.49 9.15	0.927 1.73	5.09 8.46	1.2 1.67		1 1.3	6.0
	45	20.5	29	105	14×20×17	3090	105 123	142 178	2.19 3.58	10.9 17.5	2.02 3.31	10.1 16.2	2.6 3.44		1.8 2.3	9.5
	53	23.5	36.5	120	16×23×20	3060	136 164	180 237	3.17 5.4	16.4 26	2.93 4.99	15.1 24	3.76 4.96		3.3 4.3	14
	63	31.5	43	150	18×26×22	3000	208 260	269 370	5.76 10.7	27.7 49.6	5.33 9.88	25.6 45.8	6.66 9.16		6.0 8.5	19.6

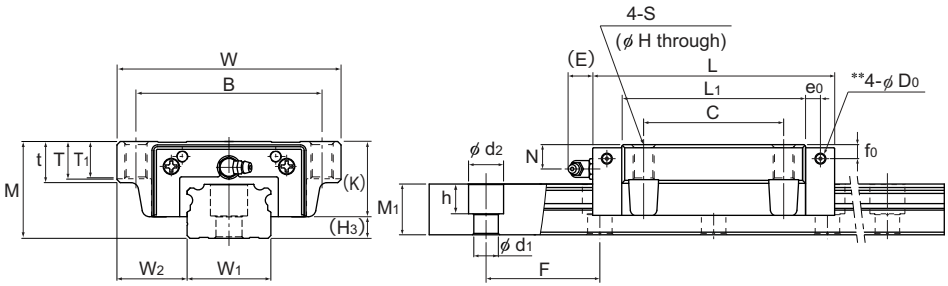
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-138**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models SVR-C and SVR-LC



SVR-C

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	T_1	K	N	f_0	E	e_0	D_0		
SVR 25C SVR 25LC	31	72	82.8 102	59	45	M8	6.8	61.4 80.6	16	14.8	12	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
SVR 30C SVR 30LC	38	90	98 120.5	72	52	M10	8.5	72.1 94.6	18.1	16.9	14	31	10.3	7	12	6.5	3.9	B-M6F	7
SVR 35C SVR 35LC	44	100	109.5 135	82	62	M10	8.5	79 104.5	20.1	18.9	16	35	12.1	8	12	6	5.2	B-M6F	9
SVR 45C SVR 45LC	52	120	138.2 171	100	80	M12	10.5	105 137.8	22.1	20.6	20	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
SVR 55C SVR 55LC	63	140	163.3 200.5	116	95	M14	12.5	123.6 160.8	24	22.5	22	49	16.6	10	16	10	5.2	B-PT1/8	14
SVR 65C SVR 65LC	75	170	186 246	142	110	M16	14.5	143.6 203.6	28	26	25	60	19	15	16	8.7	8.2	B-PT1/8	15

Model number coding

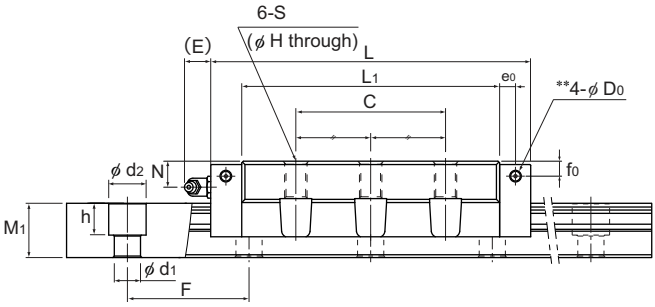
SVR45 LC 2 QZ TTHH C0 +1200L P T -II

- SVR45: Model No.
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: LM rail length (in mm)
  - Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*4) See **A1-13**.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used in parallel is 2).
Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



SVR-LC

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	25	23.5	17	40	6×9.5×8.5	3000	48.2 57	68.1 86.3	0.602 0.944	3.02 4.67	0.365 0.57	1.83 2.81	0.71 0.9		0.6 0.8	2.9
	28	31	21	80	7×11×9	3000	67.9 84	91.6 124	0.907 1.64	4.85 7.92	0.552 0.991	2.94 4.76	1.08 1.47		1.1 1.5	4.2
	34	33	24.5	80	9×14×12	3000	89.6 112	116 160	1.26 2.35	6.91 11.5	0.769 1.42	4.2 6.91	1.64 2.26		1.6 2	6.0
	45	37.5	29	105	14×20×17	3090	138 161	186 233	2.76 4.52	13.7 22.1	1.67 2.74	8.3 13.4	3.5 4.6		2.7 3.6	9.5
	53	43.5	36.5	120	16×23×20	3060	177 214	235 309	3.99 6.8	20.6 32.7	2.42 4.1	12.4 19.7	5.07 6.67		4.5 5.9	14
	63	53.5	43	150	18×26×22	3000	271 339	352 484	7.26 13.5	34.9 62.6	4.4 8.14	21.1 37.6	9 12.4		7.8 11.0	19.6

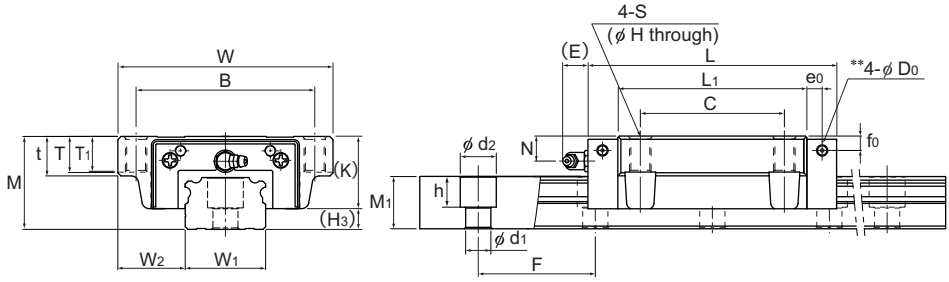
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-138**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models SVS-C and SVS-LC



SVS-C

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	T_1	K	N	f_0	E	e_0	D_0		
SVS 25C SVS 25LC	31	72	82.8 102	59	45	M8	6.8	61.4 80.6	16	14.8	12	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
SVS 30C SVS 30LC	38	90	98 120.5	72	52	M10	8.5	72.1 94.6	18.1	16.9	14	31	10.3	7	12	6.5	3.9	B-M6F	7
SVS 35C SVS 35LC	44	100	109.5 135	82	62	M10	8.5	79 104.5	20.1	18.9	16	35	12.1	8	12	6	5.2	B-M6F	9
SVS 45C SVS 45LC	52	120	138.2 171	100	80	M12	10.5	105 137.8	22.1	20.6	20	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
SVS 55C SVS 55LC	63	140	163.3 200.5	116	95	M14	12.5	123.6 160.8	24	22.5	22	49	16.6	10	16	10	5.2	B-PT1/8	14
SVS 65C SVS 65LC	75	170	186 246	142	110	M16	14.5	143.6 203.6	28	26	25	60	19	15	16	8.7	8.2	B-PT1/8	15

Model number coding

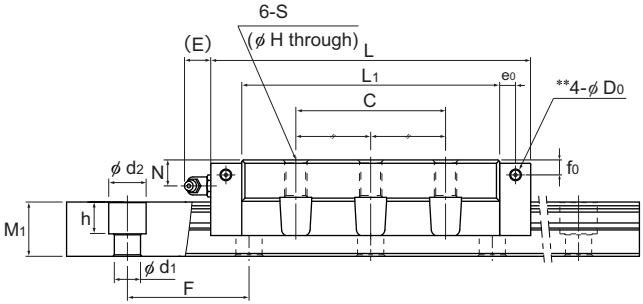
SVS45 LC 2 QZ TTHH C0 +1200L P T -II

- SVS45: Model No.
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*4) See **A1-13**.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used in parallel is 2).
Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



SVS-LC

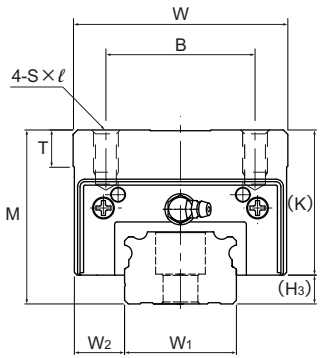
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length	C	C_0	M_A		M_B		M_C	LM block	LM rail
	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
	25	23.5	17	40	6×9.5×8.5	3000	37 43.7	52.2 66.1	0.479 0.75	2.41 3.71	0.443 0.693	2.23 3.43	0.525 0.665	0.6 0.8	2.9
	28	31	21	80	7×11×9	3000	52 64.4	70.1 95.2	0.722 1.31	3.86 6.3	0.667 1.21	3.58 5.83	0.798 1.08	1.1 1.5	4.2
	34	33	24.5	80	9×14×12	3000	68.6 86.1	88.6 123	1 1.88	5.49 9.15	0.927 1.73	5.09 8.46	1.2 1.67	1.6 2	6.0
	45	37.5	29	105	14×20×17	3090	105 123	142 178	2.19 3.58	10.9 17.5	2.02 3.31	10.1 16.2	2.6 3.44	2.7 3.6	9.5
	53	43.5	36.5	120	16×23×20	3060	136 164	180 237	3.17 5.4	16.4 26	2.93 4.99	15.1 24	3.76 4.96	4.5 5.9	14
	63	53.5	43	150	18×26×22	3000	208 260	269 370	5.76 10.7	27.7 49.6	5.33 9.88	25.6 45.8	6.66 9.16	7.8 11.0	19.6

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-138**.)
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
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
** 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.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models SVR-RH, SVR-LRH, SVS-RH, and SVS-LRH



Model No.	Outer dimensions			LM block dimensions												H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	f_0	E	e_0	D_0	Grease nipple	
SVR 35RH SVS 35RH	55	70	109.5	50	50	M8×12	79	11.7	46	23.1	19	12	6	5.2	B-M6F	9
SVR 35LRH SVS 35LRH	55	70	135	50	72	M8×12	104.5	11.7	46	23.1	19	12	6	5.2	B-M6F	9
SVR 45RH SVS 45RH	70	86	138.2	60	60	M10×17	105	14.7	58.4	31.9	26	16	8.5	5.2	B-PT1/8	11.6
SVR 45LRH SVS 45LRH	70	86	171	60	80	M10×17	137.8	14.7	58.4	31.9	26	16	8.5	5.2	B-PT1/8	11.6
SVR 55RH SVS 55RH	80	100	163.3	75	75	M12×18	123.6	17.7	66	33.6	27	16	10	5.2	B-PT1/8	14
SVR 55LRH SVS 55LRH	80	100	200.5	75	95	M12×18	160.8	17.7	66	33.6	27	16	10	5.2	B-PT1/8	14

Model number coding

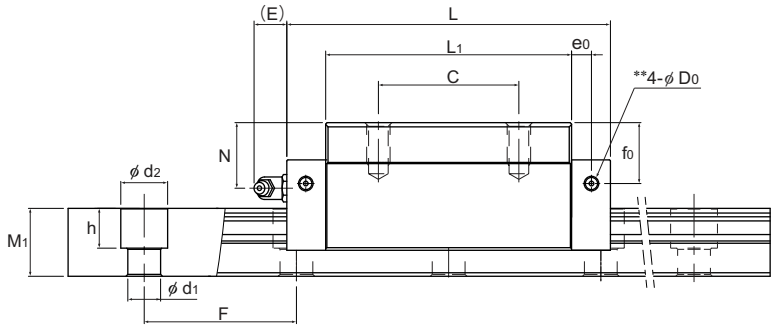
SVR35 RH 2 QZ TTHH C0 +920L H T -II

- SVR35: Model No.
- RH: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: LM rail length (in mm)
  - Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +920L: LM rail length (in mm)
- H: Accuracy symbol (*3)
  - 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 (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*4) See A1-13.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used in parallel is 2).
Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	34	18	24.5	80	9×14×12	3000	89.6 68.6	116 88.6	1.26 1	6.91 5.49	0.769 0.927	4.2 5.09	1.64 1.2		1.5	6.0
	34	18	24.5	80	9×14×12	3000	112 86.1	160 123	2.35 1.88	11.5 9.15	1.42 1.73	6.91 8.46	2.26 1.67		2	6.0
	45	20.5	29	105	14×20×17	3090	138 105	186 142	2.76 2.19	13.7 10.9	1.67 2.02	8.3 10.1	3.5 2.6		3.1	9.5
	45	20.5	29	105	14×20×17	3090	161 123	233 178	4.52 3.58	22.1 17.5	2.74 3.31	13.4 16.2	4.6 3.44		4.1	9.5
	53	23.5	36.5	120	16×23×20	3060	177 136	235 180	3.99 3.17	20.6 16.4	2.42 2.93	12.4 15.1	5.07 3.76		4.7	14
	53	23.5	36.5	120	16×23×20	3060	214 164	309 237	6.8 5.4	32.7 26	4.1 4.99	19.7 24	6.67 4.96		6.2	14

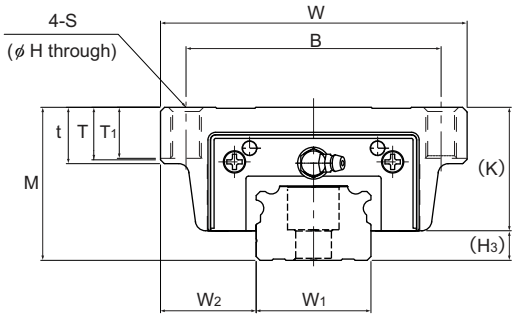
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-138**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models SVR-CH, SVR-LCH, SVS-CH, and SVS-LCH



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	T_1	K	N	f_0	E	e_0	D_0		
SVR 35CH SVS 35CH	48	100	109.5	82	62	M10	8.5	79	20	19	16	39	16.1	12	12	6	5.2	B-M6F	9
SVR 35LCH SVS 35LCH	48	100	135	82	62	M10	8.5	104.5	20	19	16	39	16.1	12	12	6	5.2	B-M6F	9
SVR 45CH SVS 45CH	60	120	138.2	100	80	M12	10.5	105	22	20.5	20	48.4	21.9	16	16	8.5	5.2	B-PT1/8	11.6
SVR 45LCH SVS 45LCH	60	120	171	100	80	M12	10.5	137.8	22	20.5	20	48.4	21.9	16	16	8.5	5.2	B-PT1/8	11.6
SVR 55CH SVS 55CH	70	140	163.3	116	95	M14	12.5	123.6	24	22.5	22	56	23.6	17	16	10	5.2	B-PT1/8	14
SVR 55LCH SVS 55LCH	70	140	200.5	116	95	M14	12.5	160.8	24	22.5	22	56	23.6	17	16	10	5.2	B-PT1/8	14

Model number coding

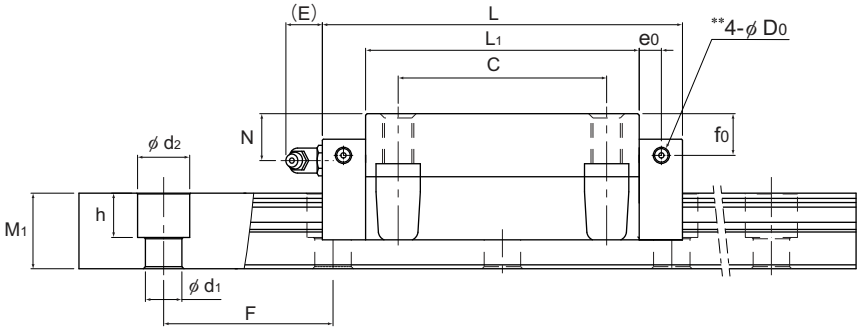
SVR45 LCH 2 QZ TTHH C0 +1200L P T -II

- SVR45 LCH: Model No. / Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**. (*4) See **A1-13**.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used in parallel is 2).
Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length	C	C_0	M_A		M_B		M_C	LM block	LM rail
	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
	34	33	24.5	80	9×14×12	3000	89.6 68.6	116 88.6	1.26 1	6.91 5.49	0.769 0.927	4.2 5.09	1.64 1.2	1.7	6.0
	34	33	24.5	80	9×14×12	3000	112 86.1	160 123	2.35 1.88	11.5 9.15	1.42 1.73	6.91 8.46	2.26 1.67	2.2	6.0
	45	37.5	29	105	14×20×17	3090	138 105	186 142	2.76 2.19	13.7 10.9	1.67 2.02	8.3 10.1	3.5 2.6	3.3	9.5
	45	37.5	29	105	14×20×17	3090	161 123	233 178	4.52 3.58	22.1 17.5	2.74 3.31	13.4 16.2	4.6 3.44	4.3	9.5
	53	43.5	36.5	120	16×23×20	3060	177 136	235 180	3.99 3.17	20.6 16.4	2.42 2.93	12.4 15.1	5.07 3.76	5.1	14
	53	43.5	36.5	120	16×23×20	3060	214 164	309 237	6.8 5.4	32.7 26	4.1 4.99	19.7 24	6.67 4.96	6.6	14

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-138**.)
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
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A**1-12**, Lubricant: see A**24-2**)
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 A**1-517** or A**1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model SVR/SVS 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.

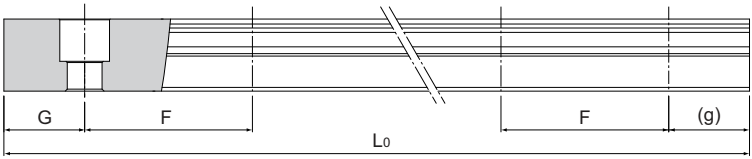


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Models SVR/SVS

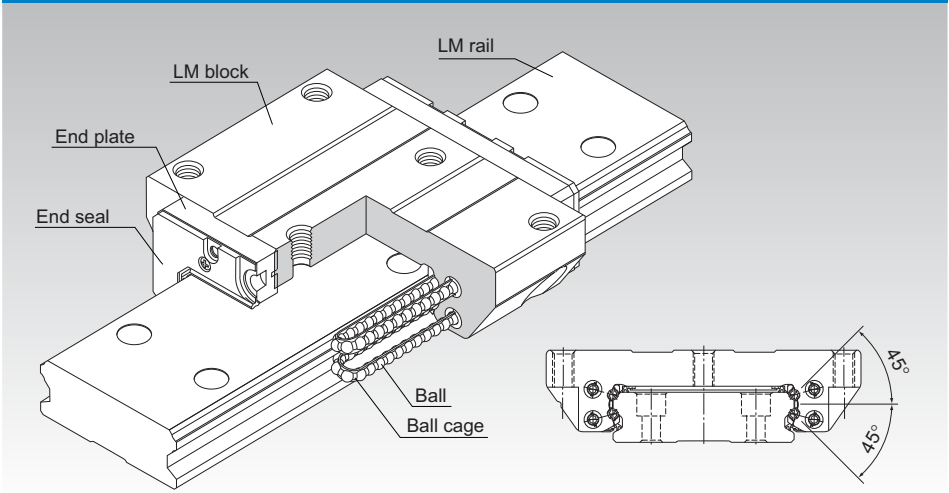
Unit: mm

Model No.	SVR/SVS 25	SVR/SVS 30	SVR/SVS 35	SVR/SVS 45	SVR/SVS 55	SVR/SVS 65
LM rail standard lengths (L_o)	230 270 350 390 470 510 590 630 710 750 830 950 990 1070 1110 1190 1230 1310 1350 1430 1470 1550 1590 1710 1830 1950 2070 2190 2310 2430 2470	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620
Standard pitch F	40	80	80	105	120	150
G, g	15	20	20	22.5	30	35
Max length	3000	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.

SHW

Wide-Rail Caged Ball LM Guide Model SHW



*For the ball cage, see **A1-90**.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-491
Reference Error Tolerance for the Mounting Surface A1-495
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in four rows of raceways precision-ground on the LM rail and LM block and are circulated by ball cages and end plates incorporated in the LM block.
This is a wide and highly rigid LM Guide that uses ball cages to achieve low noise, long-term maintenance free operation, and high speed.

Wide with a Low Center of Gravity

The Model SHW, which has a wide LM rail and a low center of gravity, is optimal for locations requiring compactness and a large M_C 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 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 of the front-to-front configuration of THK's unique circular-arc grooves (DF set) enables mounting error to be absorbed even under a preload, thus achieving highly accurate, smooth linear motion.

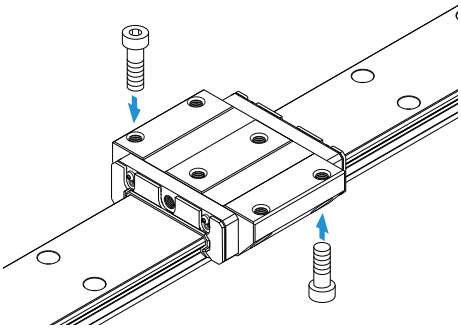
Low Dust Generation

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

Model SHW-CA

Dimensional Table⇒A1-144

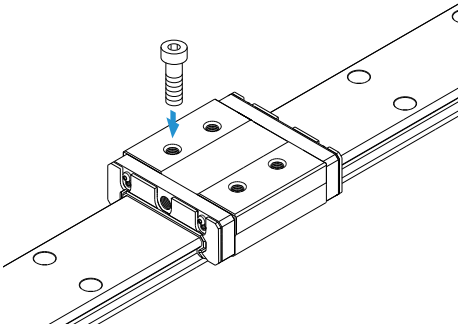
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.



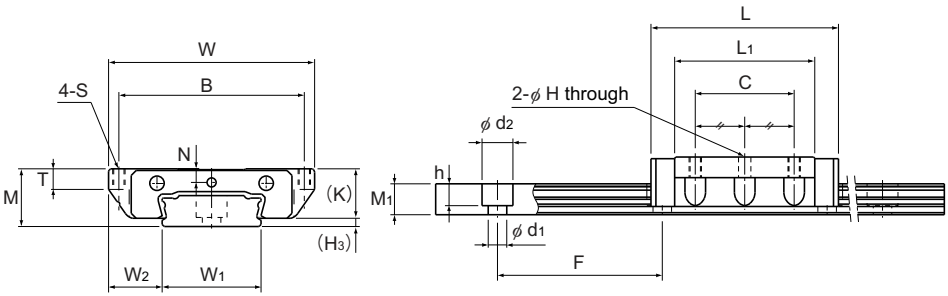
Models SHW-CR/HR

Dimensional Table⇒A1-146

The LM block has tapped holes.



Model SHW-CA



Models SHW12CAM and SHW14CAM

Model No.	Outer dimensions			LM block dimensions								
	Height	Width	Length									
	M	W	L	B	C	S	H	L_1	T	K	N	H_3
SHW 12CAM	12	40	37	35	18	M3	2.5	27	4	10	2.8	2
SHW 14CAM	14	50	45.5	45	24	M3	2.5	34	5	12	3.3	2
SHW 17CAM	17	60	51	53	26	M4	3.3	38	6	14.5	4	2.5
SHW 21CA	21	68	59	60	29	M5	4.4	43.6	8	17.7	5	3.3
SHW 27CA	27	80	72.8	70	40	M6	5.3	56.6	10	23.5	6	3.5
SHW 35CA	35	120	107	107	60	M8	6.8	83	14	31	7.6	4
SHW 50CA	50	162	141	144	80	M10	8.6	107	18	46	14	4

Note) The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Model number coding

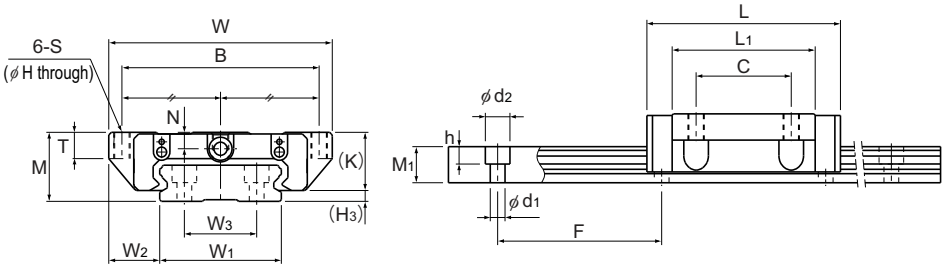
SHW17 CA 2 QZ UU C1 M +580L P M -II

- SHW17: Model number
- CA: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- M: Stainless steel LM block
- +580L: LM rail length (in mm)
- P: Accuracy symbol (*3) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)/Super precision grade (SP) Ultra precision grade (UP)
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SHW17CAM and SHW21 to 50CA

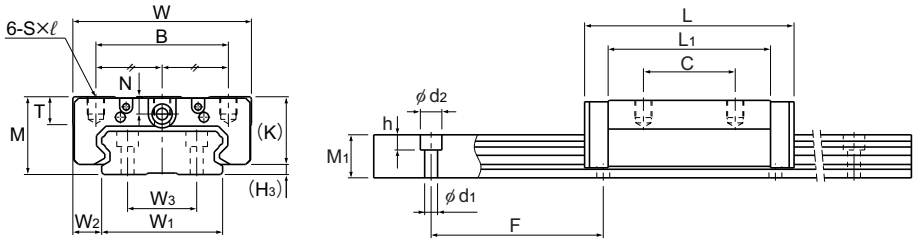
Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*					Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 0 -0.05	W_2	W_3	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
	18	11	—	6.6	40	4.5×7.5×5.3	1230	4.31	5.66	0.0228	0.12	0.0228	0.12	0.0405	0.05	0.8
	24	13	—	7.5	40	4.5×7.5×5.3	1430	7.05	8.98	0.0466	0.236	0.0466	0.236	0.0904	0.1	1.23
	33	13.5	18	8.6	40	4.5×7.5×5.3	1800	7.65	10.18	0.0591	0.298	0.0591	0.298	0.164	0.15	1.9
	37	15.5	22	11	50	4.5×7.5×5.3	3000	8.24	12.8	0.0806	0.434	0.0806	0.434	0.229	0.24	2.9
	42	19	24	15	60	4.5×7.5×5.3	3000	16	22.7	0.187	0.949	0.187	0.949	0.455	0.47	4.5
	69	25.5	40	19	80	7×11×9	3000	35.5	49.2	0.603	3	0.603	3	1.63	1.4	9.6
	90	36	60	24	80	9×14×12	3000	70.2	91.4	1.46	7.37	1.46	7.37	3.97	3.7	15

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-148**.)
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 **A1-517** or **A1-539**)

Options⇒A1-503

Models SHW-CR and SHW-HR



Models SHW27 to 50CR

Model No.	Outer dimensions			LM block dimensions							H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	
SHW 12CRM	12	30	37	21	12	M3×3.5	27	4	10	2.8	2
SHW 12HRM	12	30	50.4	21	24	M3×3.5	40.4	4	10	2.8	2
SHW 14CRM	14	40	45.5	28	15	M3×4	34	5	12	3.3	2
SHW 17CRM	17	50	51	29	15	M4×5	38	6	14.5	4	2.5
SHW 21CR	21	54	59	31	19	M5×6	43.6	8	17.7	5	3.3
SHW 27CR	27	62	72.8	46	32	M6×6	56.6	10	23.5	6	3.5
SHW 35CR	35	100	107	76	50	M8×8	83	14	31	7.6	4
SHW 50CR	50	130	141	100	65	M10×15	107	18	46	14	4

Note) The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Model number coding

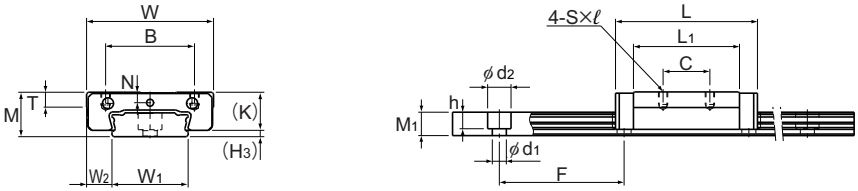
SHW17 CR 2 QZ KKHH C1 M +820L P M -II

- SHW17: Model number
- CR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- M: Stainless steel LM block
- +820L: LM rail length (in mm)
- P: Accuracy symbol (*3) — Normal grade (No Symbol), High accuracy grade (H)/Precision grade (P), Super precision grade (SP)/Ultra precision grade (UP)
- M: LM rail is made of stainless steel
- -II: Symbol for No. of rails used on the same plane (* 4)

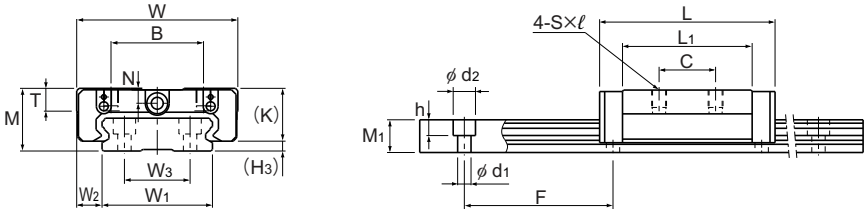
(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79. (*4) See A1-13.

Note) Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SHW12CRM, SHW12HRM, and SHW14CRM



Models SHW17CRM and SHW21CR

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*					Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 0 -0.05	W_2	W_3	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
	18	6	—	6.6	40	4.5×7.5×5.3	1230	4.31	5.66	0.0228	0.12	0.0228	0.12	0.0405	0.04	0.8
	18	6	—	6.6	40	4.5×7.5×5.3	1230	5.56	8.68	0.0511	0.246	0.0511	0.246	0.0621	0.06	0.8
	24	8	—	7.5	40	4.5×7.5×5.3	1430	7.05	8.98	0.0466	0.236	0.0466	0.236	0.0904	0.08	1.23
	33	8.5	18	8.6	40	4.5×7.5×5.3	1800	7.65	10.18	0.0591	0.298	0.0591	0.298	0.164	0.13	1.9
	37	8.5	22	11	50	4.5×7.5×5.3	3000	8.24	12.8	0.0806	0.434	0.0806	0.434	0.229	0.19	2.9
	42	10	24	15	60	4.5×7.5×5.3	3000	16	22.7	0.187	0.949	0.187	0.949	0.455	0.36	4.5
	69	15.5	40	19	80	7×11×9	3000	35.5	49.2	0.603	3	0.603	3	1.63	1.2	9.6
	90	20	60	24	80	9×14×12	3000	70.2	91.4	1.46	7.37	1.46	7.37	3.97	3	15

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-148**.)
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 **A1-517** or **A1-539**)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model SHW 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.

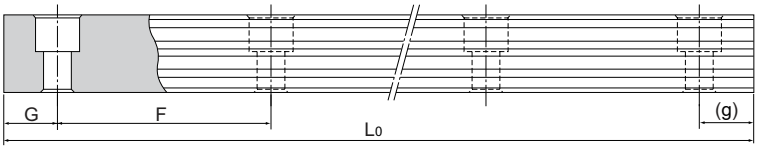


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model SHW

Unit: mm

Model No.	SHW 12	SHW 14	SHW 17	SHW 21	SHW 27	SHW 35	SHW 50
LM rail standard lengths (L_0)	70 110 150 190 230 270 310 390 470	70 110 150 190 230 270 310 390 470 550 670	110 190 310 470 550	130 230 380 480 580 780	160 280 340 460 640 820	280 440 760 1000 1240 1560	280 440 760 1000 1240 1640 2040
Standard pitch F	40	40	40	50	60	80	80
G, g	15	15	15	15	20	20	20
Max length	1230	1430	1800	3000	3000	3000	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) Models SHW12, 14 and 17 are made of stainless steel.

Lubrication Hole

Grease Nipple and Lubrication Hole for Model SHW

Model SHW does not have a grease nipple as standard. Installation of a grease nipple and the drilling of a lubrication hole is performed at THK. When ordering SHW, indicate that the desired model requires a grease nipple or lubrication hole. (For lubrication hole dimensions and supported grease nipple types and dimensions, see Table 2).

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

Note1) Grease nipple is not available for models SHW12 and SHW14. They can have a lubrication hole.
Note2) Using a lubrication hole other than for greasing may cause damage.
Note3) For QZ Lubricator*, see A1-536. For Laminated Contact Scraper LaCS*, see A1-510.
Note4) When desiring a grease nipple for a model attached with QZ Lubricator, contact THK.

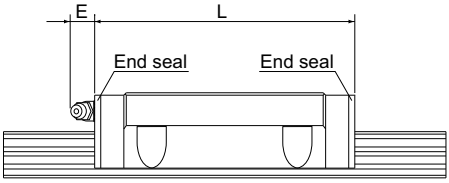


Fig. 1: Dimensions of the Grease Nipple for Model SHW

Note) For the L dimension, see the corresponding specification table.

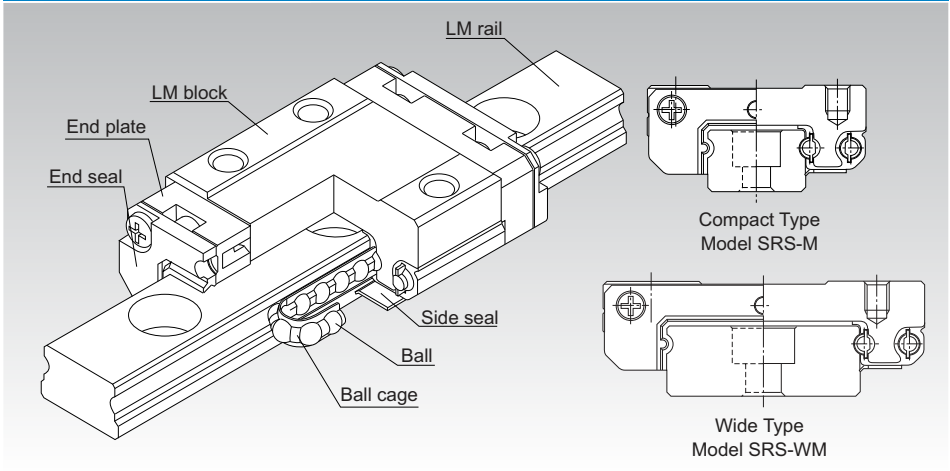
Table 2: Table of Grease Nipple and Lubrication Hole Dimensions

Unit: mm

Model No.		E	Grease nipple or lubrication hole
SHW	12	—	ϕ 2.2 drilled hole
	14	—	ϕ 2.2 drilled hole
	17	5	PB107
	21	5.5	PB1021B
	27	12	B-M6F
	35	12	B-M6F
	50	16	B-PT1/8

SRS

Miniature Caged Ball LM Guide Model SRS



*For the ball cage, see A1-90.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-85
Shoulder Height of the Mounting Base and the Corner Radius A1-493
Reference Error Tolerance for the Mounting Surface A1-495
Flatness of the Mounting Surface A1-496
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Caged Ball LM Guide Model SRS has two raceways incorporated into its compact structure, enabling the model to receive loads in all directions, and to be used as a single axis in locations where a moment is applied. In addition, use of ball cages eliminates friction between balls, thus achieving high speed, low noise, reduced running sound, long service life, and long-term maintenance-free operation.

Low Dust Generation

Use of ball cages eliminates friction between balls and retains lubricant, thus achieving low dust generation. In addition, the LM block and LM rail use stainless steel, which is highly resistant to corrosion.

Compact

Because the LM rail has a low cross-sectional height and a compact structure with a single row of balls on either side, it can be installed in smaller areas.

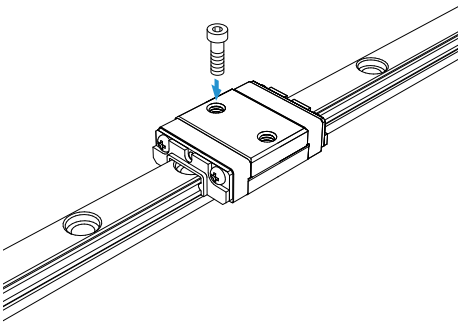
Lightweight

Since parts of the LM block (e.g., around the ball release hole) are made of resin and formed through injection molding, SRS is a lightweight, low-inertia type of LM Guide.

Model SRS5M

Dimensional Table⇒A1-156

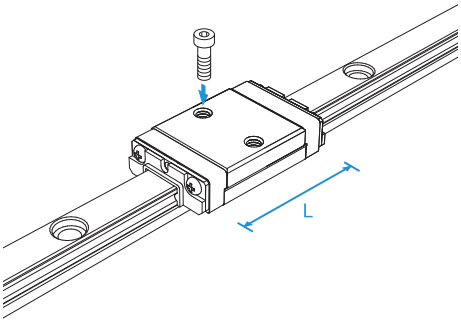
SRS5 is the smallest Caged Ball LM guide.



Model SRS5N

Dimensional Table⇒A1-156

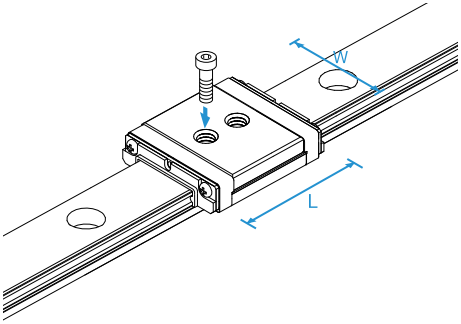
The overall LM block length (L) is greater than for model SRS5M; load rating and permissible moment are higher as well.



Model SRS5WM

Dimensional Table⇒A1-160

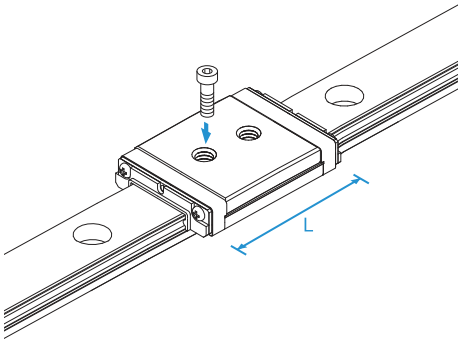
This model has a larger overall LM block length (L), width (W), load rating and permissible moment than model SRS5M.



Model SRS5WN

Dimensional Table⇒A1-160

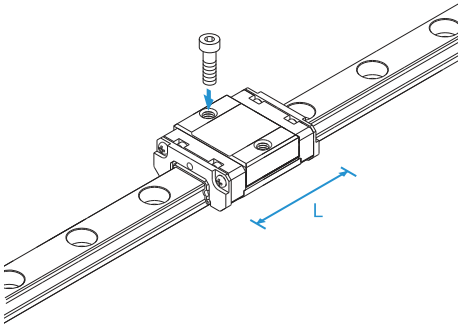
The overall LM block length (L) is greater than for model SRS5WM; load rating and permissible moment are higher as well.



Model SRS-S

Dimensional Table⇒A1-156

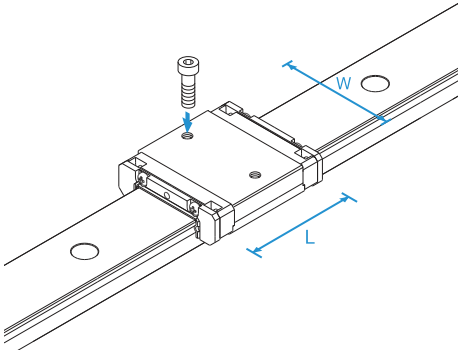
The overall LM block length (L) is less than that of model SRS-M.



Model SRS-WS

Dimensional Table⇒A1-160

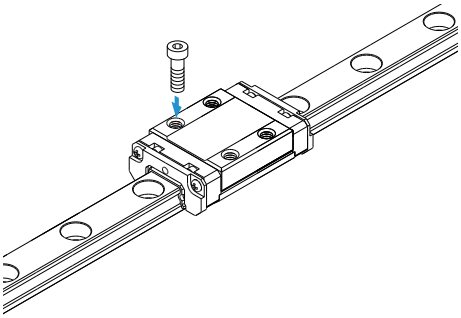
This model has a longer overall LM block length (L), a greater width, and a larger load rating and permissible moment than SRS-S.



Model SRS-M

Dimensional Table⇒A1-156

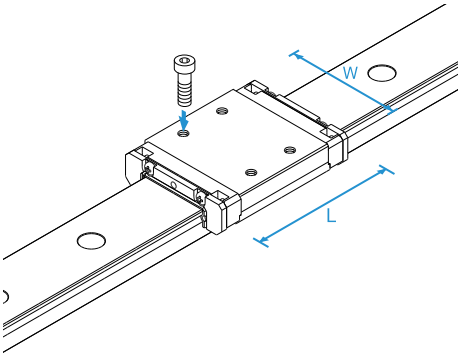
This model is the standard type of SRS.



Model SRS-WM

Dimensional Table⇒A1-160

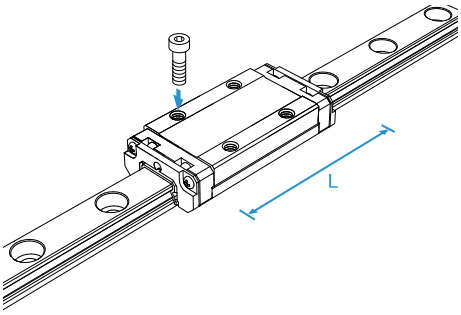
This model has a longer overall LM block length (L), a greater width, and a larger load rating and permissible moment than SRS-M.



Model SRS-N

Dimensional Table⇒A1-156

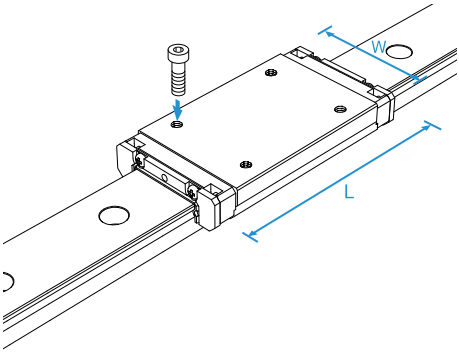
Compared with Model SRS-M, it has a longer total LM block length (L) and a higher load rating and permissible moment.



Model SRS-WN

Dimensional Table⇒A1-160

Compared with Model SRS-WM, it has a longer total LM block length (L) and a higher load rating and permissible moment.



SRS-G

Dimensional Table⇒A1-156 to A1-162

The SRS-G, a model equipped with uncaged, full-complement bearings, is also available. Due to its cageless design, however, the SRS-G's dynamic load rating is lower than that of standard SRS models. For specific data, please refer to the dimension tables in this catalog.

Flatness of the LM Rail and the LM Block Mounting Surface

Since the Model SRS has Gothic-arch grooves, any precision errors in the mounting surface may negatively affect its operability. Therefore, we recommend using SRS on mounting surfaces made with high precision.

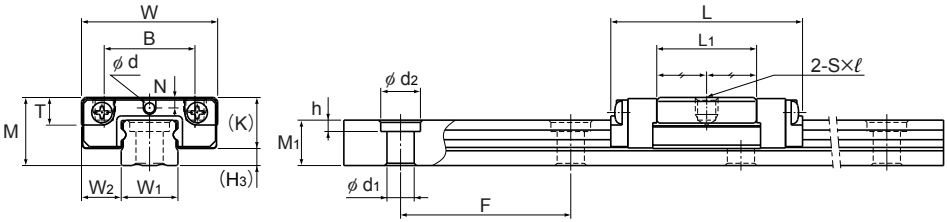
Table 1: Flatness of the LM Rail and the LM Block Mounting Surface

Unit: mm

Model No.	Flatness error
SRS 5	0.015/200
SRS 7	0.025/200
SRS 9	0.035/200
SRS 12	0.050/200
SRS 15	0.060/200
SRS 20	0.070/200
SRS 25	0.070/200

Note 1) As many factors can affect the mounting precision, we recommend using values 70% or less than those shown.
Note 2) The above figures apply to normal clearances. When using two or more rails with C1 clearance, we recommend using values 50% or less than those shown.

Models SRS-S, SRS-M, and SRS-N



Model SRS5

Model No.	Outer dimensions			LM block dimensions								
	Height	Width	Length								Lubrication hole	
	M	W	L	B	C	S×ℓ	L_1	T	K	N	d	H_3
SRS 5M SRS 5GM	6	12	16.9	8	—	M2×1.5	8.8	1.7	4.5	0.93	0.8	1.5
SRS 5N SRS 5GN	6	12	20.1	8	—	M2×1.5	12	1.7	4.5	0.93	0.8	1.5
SRS 7S SRS 7GS	8	17	19	12	—	M2×2.3	9	3.3	6.7	1.6	1.2	1.3
SRS 7M SRS 7GM	8	17	23.4	12	8	M2×2.3	13.4	3.3	6.7	1.6	1.2	1.3
SRS 7N SRS 7GN	8	17	31	12	13	M2×2.3	21	3.3	6.7	1.6	1.2	1.3
SRS 9XS SRS 9XGS	10	20	21.5	15	—	M3×2.8	10.5	4.5	8.5	2.4	1.6	1.5
SRS 9XM SRS 9XGM	10	20	30.8	15	10	M3×2.8	19.8	4.5	8.5	2.4	1.6	1.5
SRS 9XN SRS 9XGN	10	20	40.8	15	16	M3×2.8	29.8	4.5	8.5	2.4	1.6	1.5
SRS 12S SRS 12GS	13	27	25	20	—	M3×3.2	11.2	5.7	11	3	2	2.1
SRS 12M SRS 12GM	13	27	34.4	20	15	M3×3.2	20.6	5.7	11	3	2	2.1
SRS 12N SRS 12GN	13	27	47.1	20	20	M3×3.2	33.3	5.7	11	3	2	2.1

Note) Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistant to corrosion and environment. The SRS-G is equipped with uncaged, full-complement bearings.
Using a lubrication hole other than for greasing may cause damage.

Model number coding

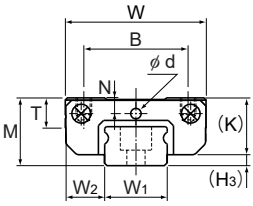
2 SRS12M QZ UU C1 +220L P M -II

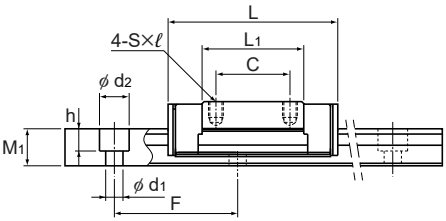
- 2: No. of LM blocks used on the same rail (*1)
- SRS12M: Model No.
- QZ: With QZ Lubricator
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3) Normal (No symbol)/Light preload (C1)
- +220L: LM rail length (in mm)
- P: Accuracy symbol (*4) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*5)

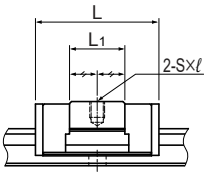
(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) See A1-13.

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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com







Models SRS7M/N, 9XM/XN, 12M/N

Models SRS7S, 9XS, 12S

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment N·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	$W_1{}^{0}_{-0.02}$	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
	5	3.5	4	15	2.4×3.5×1	220	0.439 0.366	0.468 0.527	0.74 0.79	5.11 5.76	0.86 0.94	5.99 6.91	1.21 1.37		0.002	0.13
	5	3.5	4	15	2.4×3.5×1	220	0.515 0.448	0.586 0.703	1.12 1.34	7.45 8.82	1.31 1.57	8.73 10.3	1.52 1.83		0.003	0.13
	7	5	4.7	15	2.4×4.2×2.3	480	1.09 0.946	0.964 1.16	1.60 1.96	12.6 14.7	1.83 2.25	14.5 16.9	3.73 4.49		0.005	0.25
	7	5	4.7	15	2.4×4.2×2.3	480	1.51 1.16	1.29 1.54	3.09 3.61	17.2 25.5	3.69 4.14	17.3 29.4	5.02 6.57		0.009	0.25
	7	5	4.7	15	2.4×4.2×2.3	480	2.01 1.63	2.31 2.51	7.77 8.08	43.2 46.9	8.96 9.32	50.0 54.2	8.96 9.72		0.012	0.25
	9	5.5	5.5	20	3.5×6×3.3	1240	1.78 1.37	1.53 1.53	3.15 2.85	22.2 22.6	3.61 3.27	25.6 26	7.04 7.04		0.009	0.36
	9	5.5	5.5	20	3.5×6×3.3	1240	2.69 2.22	2.75 3.06	9.31 9.87	52.2 57.9	10.7 11.4	60.3 66.9	12.7 14.1		0.016	0.36
	9	5.5	5.5	20	3.5×6×3.3	1240	3.48 2.94	3.98 4.59	18.7 21.1	96.5 111	21.6 24.4	112 128	18.3 21.1		0.024	0.36
	12	7.5	7.5	25	3.5×6×4.5	2000	2.70 2.07	2.10 2.10	4.62 4.17	37.5 38.1	4.62 4.17	37.5 38.1	13.8 13.8		0.017	0.65
	12	7.5	7.5	25	3.5×6×4.5	2000	4.00 3.36	3.53 3.55	12.0 12.1	78.5 79.0	12.0 12.1	78.5 79.0	23.1 23.2		0.027	0.65
	12	7.5	7.5	25	3.5×6×4.5	2000	5.82 4.72	5.30 6.83	28.4 34.8	151 195	28.4 34.8	151 195	34.7 44.7		0.049	0.65

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-164**.)
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 A**1-517** or A**1-539**)
For the SRS5M and SRS5N LM guide, the balls will fall out of the block if it is removed from the rail.
To secure the LM rail of model SRS5M, use cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1) M2.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

- Reference bolt tightening torque when mounting an LM block for model SRS 5 and 7 are shown in the table below.

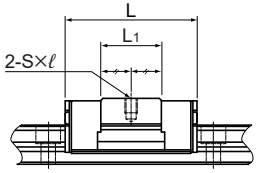
Reference tightening torque

Model No.	Model No. of screw	Screw depth (mm)	Reference tightening torque (N·m)*
SRS 5	M2	1.5	0.4
SRS 7	M2	2.3	0.4

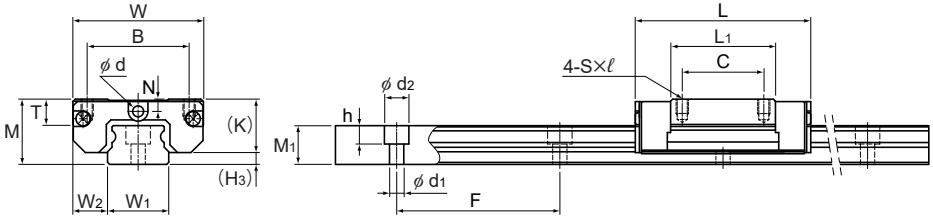
*Tightening above the tightening torque affects accuracy.
Be sure to tighten at or below the defined tightening torque.

Options⇒A**1-503**

Models SRS-S, SRS-M, and SRS-N



Model SRS15S



Models SRS15M/N, 20M, 25M

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
SRS 15S SRS 15GS	16	32	32	25	—	M3×3.5	14.7	6.5	13.3	3	— 4	3 —	— PB107	2.7
SRS 15M SRS 15GM	16	32	43	25	20	M3×3.5	25.7	6.5	13.3	3	— 4	3 —	— PB107	2.7
SRS 15N SRS 15GN	16	32	60.8	25	25	M3×3.5	43.5	6.5	13.3	3	— 4	3 —	— PB107	2.7
SRS 20M SRS 20GM	20	40	50	30	25	M4×6	34	9	16.6	4	— 3.5	3 —	— PB107	3.4
SRS 25M SRS 25GM	25	48	77	35	35	M6×7	56	11	20	5	— 4	4 —	— PB1021B	5

Note) Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistant to corrosion and environment.
The SRS-G is equipped with uncaged, full-complement bearings.
For the SRS15S/M/N, 20M, and 25M, if a grease nipple is required, please specify upon ordering.
Using a lubrication hole other than for greasing may cause damage.

Model number coding

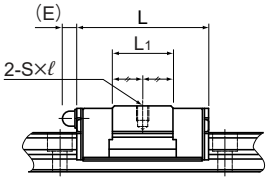
2 SRS20M QZ UU C1 +220L P M -II

- 2: No. of LM blocks used on the same rail (*1)
- SRS20M: Model No.
- QZ: With QZ Lubricator
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3) Normal (No symbol)/Light preload (C1)
- +220L: LM rail length (in mm)
- P: Accuracy symbol (*4) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*5)

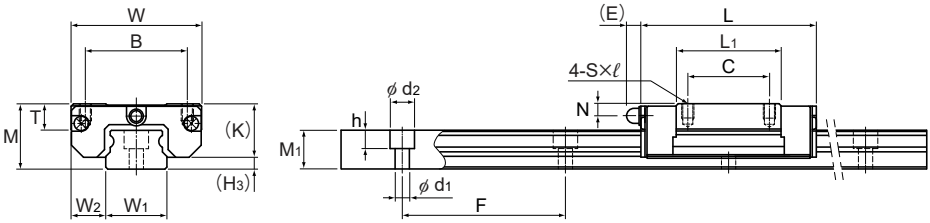
(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) See A1-13.

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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model SRS15GS



Models SRS15GM/GN, 20GM, 25GM

Unit: mm

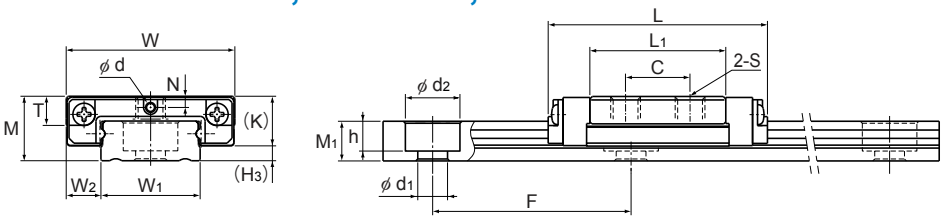
	LM rail dimensions						Basic load rating		Static permissible moment N·m*					Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15 $^{0}_{-0.02}$	8.5	9.5	40	3.5×6×4.5	2000	4.50 4.01	3.39 4.24	9.54 12.6	77.5 92.7	9.54 12.6	77.5 92.7	24.1 30.1	0.033	0.96
	15 $^{0}_{-0.02}$	8.5	9.5	40	3.5×6×4.5	2000	6.66 5.59	5.7 5.72	26.2 24.8	154 158	26.2 24.8	154 158	40.4 40.6	0.047	0.96
	15 $^{0}_{-0.02}$	8.5	9.5	40	3.5×6×4.5	2000	9.71 8.27	8.55 11.9	59.7 82.3	312 433	59.7 82.3	312 433	60.7 84.5	0.095	0.96
	20 $^{0}_{-0.03}$	10	11	60	6×9.5×8	1800	7.75 5.95	9.77 9.4	54.3 44.7	296 242	62.4 53.3	341 289	104 91.4	0.11	1.68
	23 $^{0}_{-0.03}$	12.5	15	60	7×11×9	1800	16.5 13.3	20.2 22.3	177 181	932 962	177 181	932 962	248 255	0.24	2.6

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-164**.)
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 A**1-517** or A**1-539**)

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models SRS-WS, SRS-WM, and SRS-WN



Model SRS5

Model No.	Outer dimensions			LM block dimensions								
	Height	Width	Length								Lubrication hole	
	M	W	L	B	C	S×ℓ	L_1	T	K	N	d	H_3
SRS 5WM SRS 5WGM	6.5	17	22.1	—	6.5	M3 through	13.7	2.7	5	1.1	0.8	1.5
SRS 5WN SRS 5WGN	6.5	17	28.1	—	11	M3 through	19.7	2.7	5	1.1	0.8	1.5
SRS 7WS SRS 7WGS	9	25	22.5	19	—	M3×2.8	11.9	3.8	7.2	1.8	1.2	1.8
SRS 7WM SRS 7WGM	9	25	31	19	10	M3×2.8	20.4	3.8	7.2	1.8	1.2	1.8
SRS 7WN SRS 7WGN	9	25	40.9	19	17	M3×2.8	30.3	3.8	7.2	1.8	1.2	1.8
SRS 9WS SRS 9WGS	12	30	26.5	21	—	M3×2.8	14.5	4.9	9.1	2.3	1.6	2.9
SRS 9WM SRS 9WGM	12	30	39	21	12	M3×2.8	27	4.9	9.1	2.3	1.6	2.9
SRS 9WN SRS 9WGN	12	30	50.7	23	24	M3×2.8	38.7	4.9	9.1	2.3	1.6	2.9
SRS 12WS SRS 12WGS	14	40	30.5	28	—	M3×3.5	16.9	5.7	11	3	2	3
SRS 12WM SRS 12WGM	14	40	44.5	28	15	M3×3.5	30.9	5.7	11	3	2	3
SRS 12WN SRS 12WGN	14	40	59.5	28	28	M3×3.5	45.9	5.7	11	3	2	3

Note) Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistant to corrosion and environment. The SRS-G is equipped with uncaged, full-complement bearings.
Using a lubrication hole other than for greasing may cause damage.

Model number coding

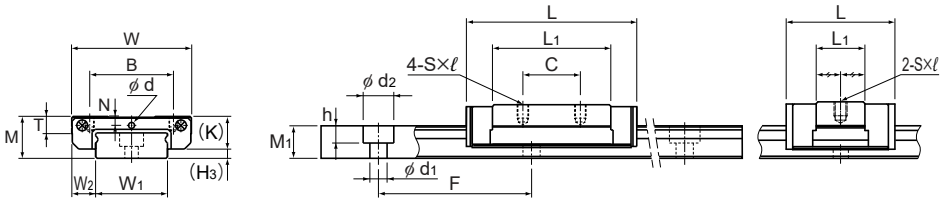
2 SRS12WM QZ UU C1 +470L P M -II

- 2: No. of LM blocks used on the same rail (*1)
- SRS12WM: Model No.
- QZ: With QZ Lubricator
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3) Normal (No symbol)/ Light preload (C1)
- +470L: LM rail length (in mm)
- P: Accuracy symbol (*4) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*5)

(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) 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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRS7WM/WN, 9WM/WN, 12WM/WN Models SRS7 to 12WS

Unit: mm

LM rail dimensions								Basic load rating		Static permissible moment N·m*					Mass	
Width			Height	Pitch		Length*		C	C0	MA		MB		MC	LM block	LM rail
W1 0 −0.02	W2	W3	M1	F	d1×d2×h	Max		kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
10	3.5	—	4	20	3×5.5×3	220		0.584 0.498	0.703 0.82	1.57 1.79	9.59 11.1	1.83 2.15	11.24 13.3	3.58 4.18	0.005	0.27
10	3.5	—	4	20	3×5.5×3	220		0.746 0.64	0.996 1.17	3.01 3.54	16.8 19.6	3.53 4.15	19.7 23	5.08 5.97	0.007	0.27
14	5.5	—	5.2	30	3.5×6×3.2	480		1.38 1.06	1.35 1.35	2.89 2.58	19.6 20.0	3.32 2.96	22.7 23.1	9.95 9.95	0.011	0.56
14	5.5	—	5.2	30	3.5×6×3.2	480		2.01 1.63	1.94 2.51	6.47 8.87	36.4 51.5	7.71 10.2	42.3 59.5	14.33 20.3	0.018	0.56
14	5.5	—	5.2	30	3.5×6×3.2	480		2.56 2.12	3.28 3.66	15.0 16.6	78.9 87.7	17.4 19.2	91.2 101	24.2 27	0.026	0.56
18	6	—	7.5	30	3.5×6×4.5	1430		2.03 1.73	1.84 2.14	4.49 5.15	32.1 36.9	5.15 5.92	38.9 42.6	17.4 20.2	0.018	1.01
18	6	—	7.5	30	3.5×6×4.5	1430		3.29 2.67	3.34 3.35	14.0 13.9	78.6 69.7	16.2 16.6	91.0 96.7	31.5 31.7	0.031	1.01
18	6	—	7.5	30	3.5×6×4.5	1430		4.20 3.48	4.37 5.81	25.1 33.2	130 172	29.1 40	151 208	41.3 54.9	0.049	1.01
24	8	—	8.5	40	4.5×8×4.5	2000		3.58 3.05	3.15 3.68	9.77 11.1	63 72.6	9.77 11.1	63 72.6	39.5 46.2	0.034	1.52
24	8	—	8.5	40	4.5×8×4.5	2000		5.48 4.46	5.3 5.32	26.4 25.7	143 146	26.4 25.7	143 146	66.5 66.8	0.055	1.52
24	8	—	8.5	40	4.5×8×4.5	2000		7.13 5.93	7.07 9.46	49.2 64.7	249 332	49.2 64.7	249 332	88.7 119	0.091	1.52

Note1) The maximum length under "Length * " indicates the standard maximum length of an LM rail. (See A**1-164**.)

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 A**1-517** or A**1-539**)

For the SRS5WM and SRS5WN, the balls will fall out of the block if it is removed from the rail.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

- Reference bolt-tightening torques when mounting an LM block for model SRS 5 and 7W are shown in the table below.

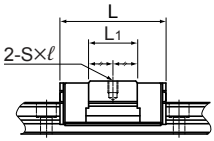
Reference Tightening Torques

Model No.	Model No. of screw	Screw depth (mm)	Reference tightening torque (N·m)*
SRS 5W	M3	2.3	0.4
SRS 7W	M3	2.8	0.4

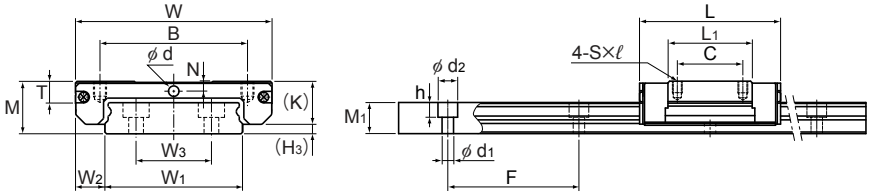
*Tightening above the tightening torque affects accuracy.
Be sure to tighten at or below the defined tightening torque.

Options⇒A**1-503**

Models SRS-WS, SRS-WM, and SRS-WN



Model SRS15WS



Model SRS15WM/WN

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
SRS 15WS SRS 15WGS	16	60	41.5	45	—	M4×4.5	24.9	6.5	13.3	3	— 4	3 —	— PB107	2.7
SRS 15WM SRS 15WGM	16	60	55.5	45	20	M4×4.5	38.9	6.5	13.3	3	— 4	3 —	— PB107	2.7
SRS 15WN SRS 15WGN	16	60	74.5	45	35	M4×4.5	57.9	6.5	13.3	3	— 4	3 —	— PB107	2.7

Note) Since stainless steel is used in the LM block, LM rail and balls, these models are highly resistant to corrosion and environment.
The SRS-G is equipped with uncaged, full-complement bearings.
For the SRS15WS/WM/WN, if a grease nipple is required, please specify upon ordering.
Using a lubrication hole other than for greasing may cause damage.

Model number coding

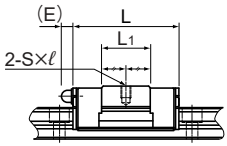
2 SRS15WM QZ UU C1 +550L P M -II

- **2** — No. of LM blocks used on the same rail (*1)
- **SRS15WM** — Model No.
- **QZ** — With QZ Lubricator
- **UU** — Contamination protection accessory symbol (*2)
- **C1** — Radial clearance symbol (*3): Normal (No symbol)/ Light preload (C1)
- **+550L** — LM rail length (in mm)
- **P** — Accuracy symbol (*4): Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)
- **M** — Stainless steel LM rail
- **-II** — Symbol for No. of rails used on the same plane (*5)

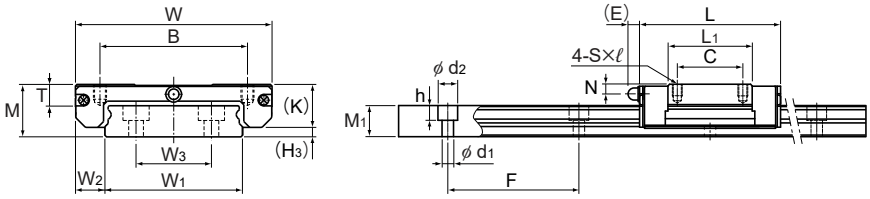
(*1) No symbol for 1 LM block. (*2) See A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) See A1-13.

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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model SRS15WGS



Model SRS15WGM/WGN

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment N·m*					Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 $^{0}_{-0.02}$	W_2	W_3	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
	42	9	23	9.5	40	4.5×8×4.5	2000	6.64 5.59	5.94 6.78	25.4 29	158 178	25.4 29	158 178	123 140	0.087	2.87
	42	9	23	9.5	40	4.5×8×4.5	2000	9.12 7.43	8.55 8.59	51.2 52.7	290 293	51.2 52.7	290 293	176 178	0.13	2.87
	42	9	23	9.5	40	4.5×8×4.5	2000	12.4 9.87	12.1 15.3	106 133	532 671	106 133	532 671	250 317	0.201	2.87

Note) The maximum length under "Length * " indicates the standard maximum length of an LM rail. (See A**1-164**.)
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 A**1-517** or A**1-539**)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 2 shows the standard lengths and the maximum lengths of model SRS 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.

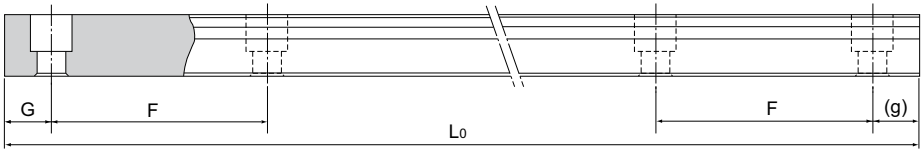


Table 2: Standard Lengths and Maximum Lengths of LM Rails for Model SRS

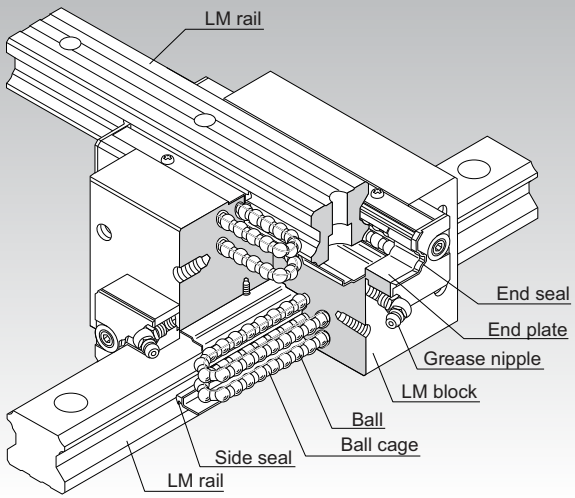
Unit: mm

Model No.	SRS 5	SRS 5W	SRS 7	SRS 7W	SRS 9	SRS 9W	SRS 12	SRS 12W	SRS 15	SRS 15W	SRS 20	SRS 25
LM rail standard lengths (L_o)	40 55 70 100 130 160	50 70 90 110 130 150 170	40 55 70 85 100 115 130	50 80 110 140 170 200 260 290	55 75 95 115 135 155 175 195 275 375	50 80 110 140 170 200 260 290 320	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 390 470 550	70 110 150 190 230 270 310 350 390 430 470 550 670 870	110 150 190 230 270 310 430 550 670 790	220 280 340 460 640 880 1000	220 280 340 460 640 880 1000
Standard pitch F	15	20	15	30	20	30	25	40	40	40	60	60
G, g	5	5	5	10	7.5	10	10	15	15	15	20	20
Max length	220	220	480	480	1240	1430	2000	2000	2000	2000	1800	1800

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.

SCR

Caged Ball Cross LM Guide Model SCR



*For the ball cage, see A1-90.

Selection Criteria A1-10

Design Highlights A1-478

Options A1-503

Model No. A1-571

Handling Precautions A1-577

Accessories for Lubrication A24-1

Mounting Procedure B1-89

Equivalent Moment Factor A1-43

Rated Loads in All Directions A1-61

Equivalent Factor in Each Direction A1-63

Radial Clearance A1-73

Accuracy Standards A1-82

Shoulder Height of the Mounting Base and the Corner Radius A1-488

Reference Error Tolerance for the Mounting Surface A1-494

Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in four rows of raceways precision-ground on an LM rail and an LM block, and ball cages and end plates incorporated in the LM block allow the balls to circulate.
This LM Guide has two rails intersecting at right angles integrated back-to-back into a single block with the same internal structure as the proven Caged Ball LM Guide Model SHS. Because an orthogonal LM System can be achieved with the Model SCR alone, conventional saddles are no longer necessary, enabling simplified X-Y motion and compact structure.

4-Way Equal Load

Each row of balls is placed at a contact angle of 45° so that the load ratings 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.

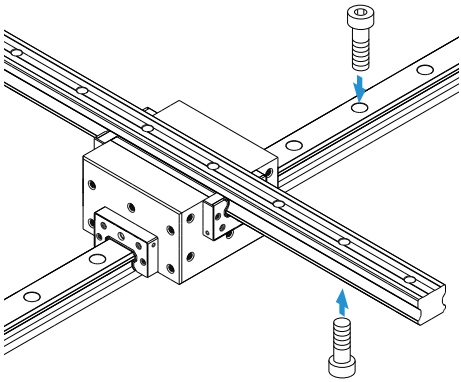
High Rigidity

Since the balls are well balanced in four rows, this model is able to withstand moments, and it achieves smooth straight motion even when a preload is applied to increase the rigidity.
The rigidity of the single LM block is higher than that of a combination of two conventional LM blocks secured back-to-back with bolts, making this model optimal for building an X-Y table that requires high rigidity.

Model SCR

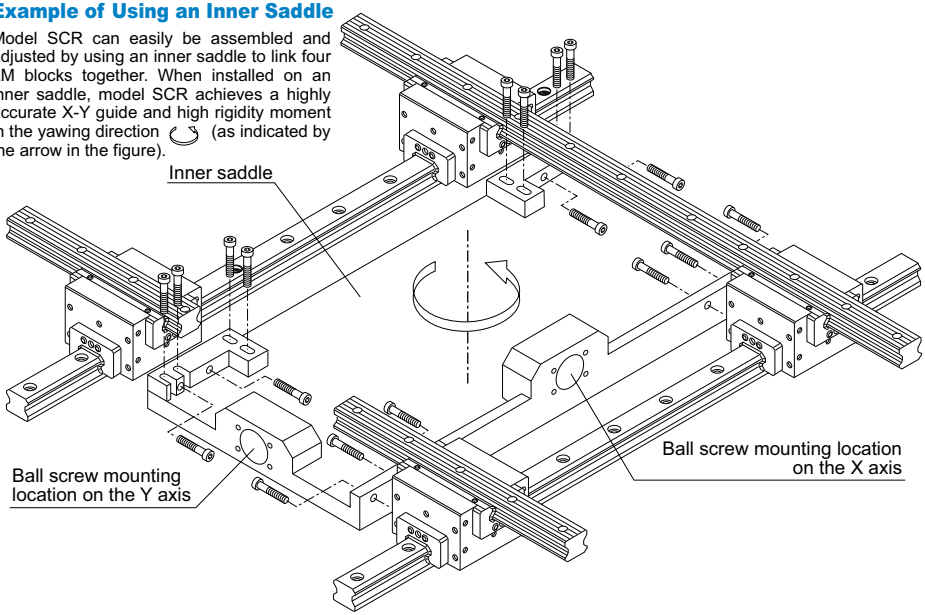
Dimensional Table⇒A1-170

This model is the standard type.

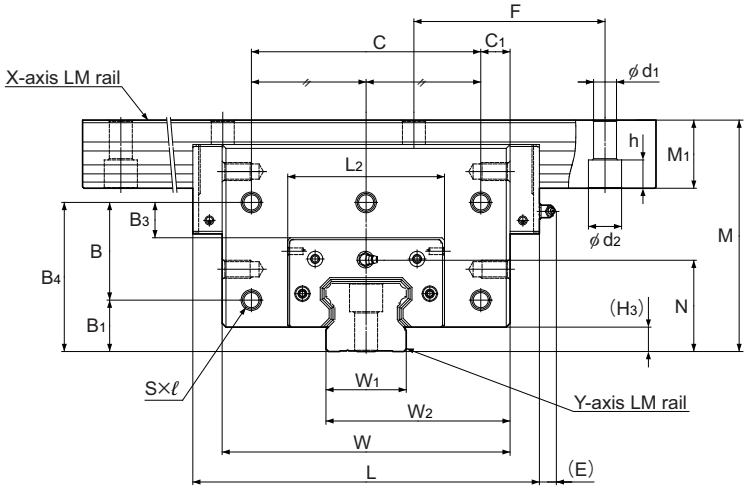


Example of Using an Inner Saddle

Model SCR can easily be assembled and adjusted by using an inner saddle to link four LM blocks together. When installed on an inner saddle, model SCR achieves a highly accurate X-Y guide and high rigidity moment in the yawing direction (as indicated by the arrow in the figure).



Model SCR



Model No.	Outer dimensions			LM block dimensions											
	Height M	Width W	Length L	B_1	B_3	B_4	B	C	C_1	S×ℓ	L_2	H_3	N	E
SCR 15S	47	48	64.4	—	11.3	34.8	—	20	14	2×2-M4×6	33.4	3	18.5	5.5
SCR 20S	57	59	79	—	13	42.5	—	30	14.5	2×2-M5×8	43	4.6	23.5	12
SCR 20	57	78	98	13	7.5	37	24	56	11	2×5-M5×8	43	4.6	23.5	12
SCR 25	70	88	109	18	9	44	26	64	12	2×5-M6×10	47.4	5.8	28.5	12
SCR 30	82	105	131	21	12	53	32	76	14.5	2×5-M6×10	58	7	34	12
SCR 35	95	123	152	24	14	61	37	90	16.5	2×5-M8×14	68	7.5	40	12
SCR 45	118	140	174	30	16.5	75	45	110	15	2×5-M10×15	84.6	8.9	49.5	16
SCR 65	180	226	272	40	27.5	116	76	180	23	2×5-M14×22	123	19	71	16

Model number coding

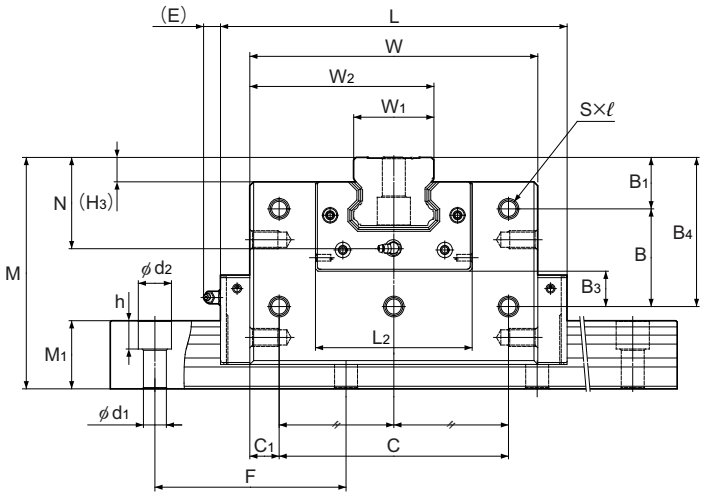
4 SCR25 QZ KKHH C0 +1240/1000L P

- **4**: Total No. of LM blocks
- **SCR25**: Model number
- **QZ**: With QZ Lubricator
- **KKHH**: Contamination protection accessory symbol (*1)
- **C0**: Radial clearance symbol (*2) Normal (No symbol)/Light preload (C1) Medium preload (C0)
- **+1240**: LM rail length on the X axis (in mm)
- **/1000L**: LM rail length on the Y axis (in mm)
- **P**: Accuracy symbol (*3) Precision grade (P) Super precision grade (SP) Ultra precision grade (UP)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-82.

Note) Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

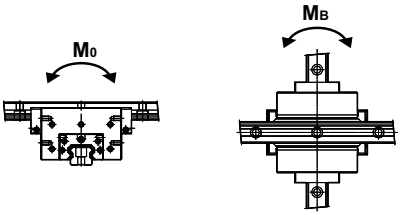
Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

		LM rail dimensions					Basic load rating		Static permissible moment*		Mass	
	Grease nipple	Width W_1 $^{0}_{-0.05}$	W_2	Height M_1	Pitch F	Mounting hole $d_1 \times d_2 \times h$	C kN	C_0 kN	M_O kN·m	M_B kN·m	LM block kg	LM rail kg/m
	PB1021B	15	31.5	13	60	4.5×7.5×5.3	14.2	24.2	0.16	0.175	0.54	1.3
	B-M6F	20	39.5	16.5	60	6×9.5×8.5	22.3	38.4	0.334	0.334	0.88	2.3
	B-M6F	20	49	16.5	60	6×9.5×8.5	28.1	50.3	0.473	0.568	1.7	2.3
	B-M6F	23	55.5	20	60	7×11×9	36.8	64.7	0.696	0.848	3.4	3.2
	B-M6F	28	66.5	23	80	9×14×12	54.2	88.8	1.15	1.36	4.6	4.5
	B-M6F	34	78.5	26	80	9×14×12	72.9	127	2.01	2.34	6.8	6.2
	B-PT1/8	45	92.5	32	105	14×20×17	100	166	3.46	3.46	10.8	10.4
	B-PT1/8	63	144.5	53	150	18×26×22	253	408	11.9	13.3	44.5	23.7

Note) Static permissible moment* 1 block: the static permissible moment with one LM block
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 A1-517 or A1-539)



Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard and maximum lengths of the Model SCR rail. If the maximum length of the desired LM rail exceeds these values, joint 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.

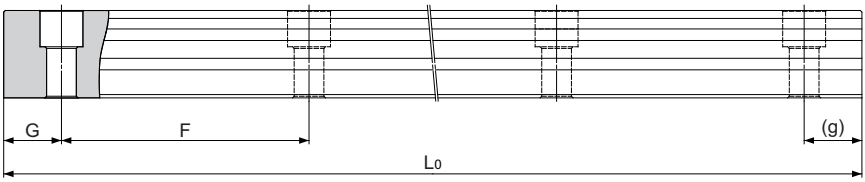


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model SCR

Unit: mm

Model No.	SCR 15	SCR 20	SCR 25	SCR 30	SCR 35	SCR 45	SCR 65
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600 1720 1840 1960 2080 2200	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 2200 2320 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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	1270 1570 2020 2620
Standard pitch F	60	60	60	80	80	105	150
G, g	20	20	20	20	20	22.5	35
Max length	3000	3000	3000	3000	3000	3090	3000

Model SCR with Tapped Holes in the LM Rail

Model SCR rails also include a type where the LM rail is tapped from the bottom. With the X-axis LM rail having tapped holes, this model can be secured with bolts from the top.

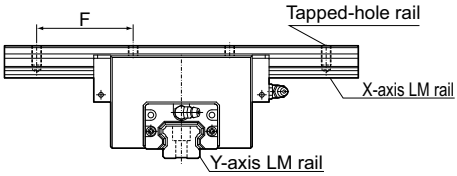


Table 2: Dimensions of the LM Rail Tap Unit: mm

Model No.	Tap diameter	Tap depth
15	M5	8
20	M6	10
25	M6	12
30	M8	15
35	M8	17
45	M12	20
65	M20	30

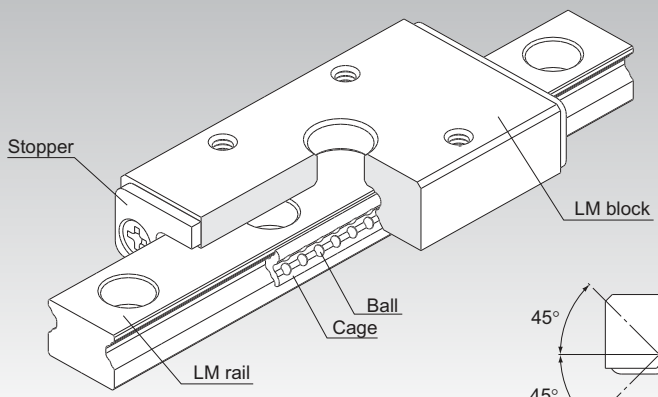
Model number coding

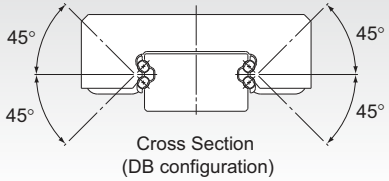
4SCR35KKHHC0+1000LP K /1000LP

Symbol for tapped-hole LM rail type

EPF

Finite Stroke Caged Ball LM Guide Model EPF





Cross Section
(DB configuration)

*For the ball cage, see A1-90.

Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-73
Accuracy Standards	A1-88
Shoulder Height of the Mounting Base and the Corner Radius	A1-489
Accuracy of the Mounting Surface	A1-177
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Balls are held in cages with spherical ball holders and they roll in four rows of circular-arc grooves in raceways precision-ground in LM rails and LM blocks.

Smooth Motion

Because a finite stroke is used, balls do not circulate and movement is smooth even with preload. Also, because variations in rolling resistance are small, this model is ideal for locations where smooth movement is required with a short stroke.

High Rigidity

Because model EPF uses a DB construction featuring four rows of circular-arc grooves, it offers particularly high rigidity with respect to moment in the M_C direction. This makes it ideal for locations where M_C moment is applied with one rail.

Miniature Type

Because the mounting method is compatible with the Miniature LM Guide Model RSR-N, the models are dimensionally interchangeable.

4-Way Equal Load

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

Ball Cage Technology Application 1

Because the cage is formed out of plastic resin, there is no metal contact between the cage and the balls, providing excellent noise characteristics, low dust emissions, and long product life.

Ball Cage Technology Application 2

Forming the cage in a spherical shape out of plastic resin allows lubricant to be held in grease pockets, enabling long periods of maintenance-free operation.

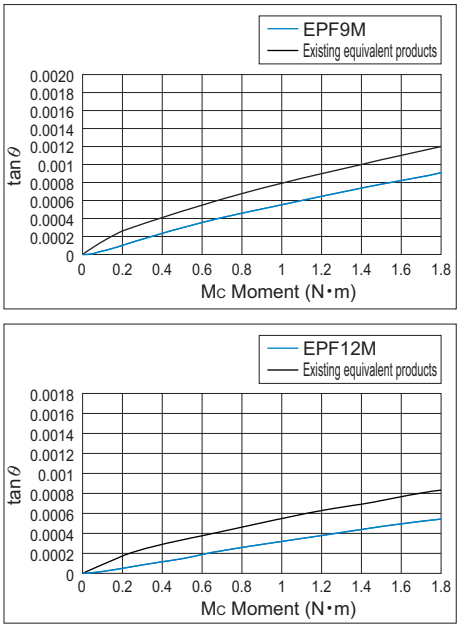


Fig. 1: Comparison of M_C Moment Test Data

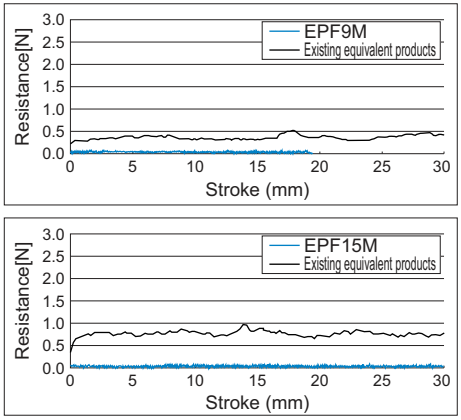
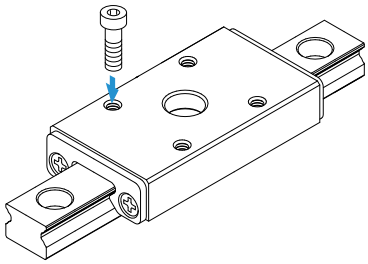


Fig. 2: Comparison of Rolling Resistance Test Data

Model EPF

Dimensional Table⇒A1-178



Accuracy of the Mounting Surface

If there is not sufficient precision in the LM rail and LM block mounting surfaces, the product may not function to its full potential. Machine to values no higher than those in Table 1. (Recommended value: 70% of Table 1)

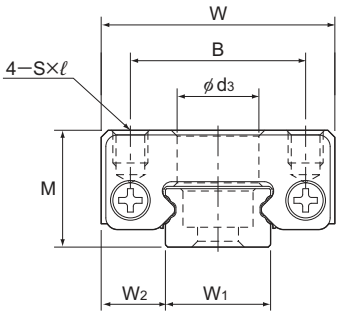
Table 1: Flatness of the LM Rail and the LM Block Mounting Surface

Unit: mm

Model No.	Flatness error
EPF 7M, 9M	0.015/200
EPF 12M	0.025/200
EPF 15M	0.035/200

Note) It is recommended that highly rigid materials such as steel or cast metal be used as the mounting material. If a material with poor rigidity, such as aluminum, is used, unforeseen loads may be applied to the product. In such situations, contact THK.

Model EPF



Model No.	Outer dimensions			LM block dimensions					LM rail dimensions		
	Height M	Width W	Length L_B	B	C	d_3	S×ℓ	L_{B1}	W_1	W_2	M_1
EPF 7M	8	17	31.6	12	13	5	M2×2.3	29.6	7	5	5
EPF 9M	10	20	37.8	15	16	7	M3×2.8	35.8	9	5.5	5
EPF 12M	13	27	43.7	20	20	7	M3×3.2	41.7	12	7.5	6.75
EPF 15M	16	32	56.5	25	25	7	M3×3.5	54.5	15	8.5	9

Note) The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Model number coding

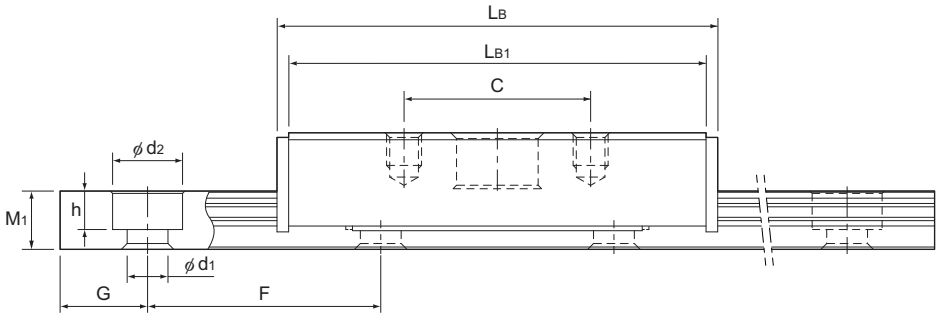
EPF7M 16 +55L P M

- EPF7M: Model No.
- 16: Guaranteed stroke (in mm)
- +55L: LM rail length (in mm)
- P: Accuracy symbol (*1)
- M: Rail material: Stainless steel (standard)

(*1) See **A1-88**.

Note) This model number indicates that a single-rail unit constitutes one set.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

				Guaranteed stroke	Basic load rating		Static permissible moment N·m*			Mass	
	G	F	$d_1 \times d_2 \times h$	S_T	C kN	C_0 kN	M_A	M_B	M_C	LM block kg	LM rail kg/m
	5	15	2.4×4.2×2.6	16	0.90	1.60	5.08	5.08	5.26	0.019	0.230
	7.5	20	3.5×6×3.3	21	1.00	1.87	6.81	6.81	7.89	0.036	0.290
	10	25	3.5×6×3.8	27	2.26	3.71	15.5	15.5	20.8	0.074	0.550
	15	40	3.5×6×4	34	3.71	5.88	33.0	33.0	41.3	0.136	0.940

Note) Static permissible moment*: Static permissible moment value with 1 LM block

Table 2: Recommended Tightening Torques of Mounting Bolts

Unit: N·m

Model No.	Nominal bolt	Rated tightening torque		
		Iron	Casting	Aluminum
EPF 7M	M2	0.588	0.392	0.294
EPF 9M	M3	1.96	1.27	0.98
EPF 12M				
EPF 15M				

Table 3: Maximum Slip Resistance

Unit: N

Model No.	Maximum slip resistance
EPF 7M	20
EPF 9M	20
EPF 12M	30
EPF 15M	30

Note) While the cage used to hold the balls is designed to operate extremely precisely, factors such as impacts, inertial moment, or drive vibration from the machine can cause cage distortion.
If using the EPF LM Guide in the following conditions, contact THK.
- Vertical orientation
- Under a large moment load
- Butting the guide's external stopper with the table
- Applications with rapid acceleration or deceleration

If cage distortion occurs, the cage must be forcibly restored to its original shape.
Table 3 shows the required slip resistance in this event. Set the thrust so that it is no less than the maximum value shown in the table.

Options⇒A1-503

Standard Lengths of LM Rails

Table 4 shows the standard LM rail lengths of model EPF.
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.

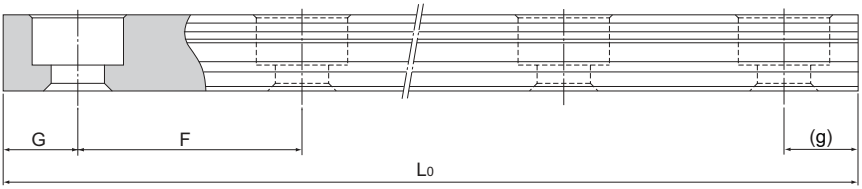


Table 4: Standard Lengths of LM Rails for Model EPF

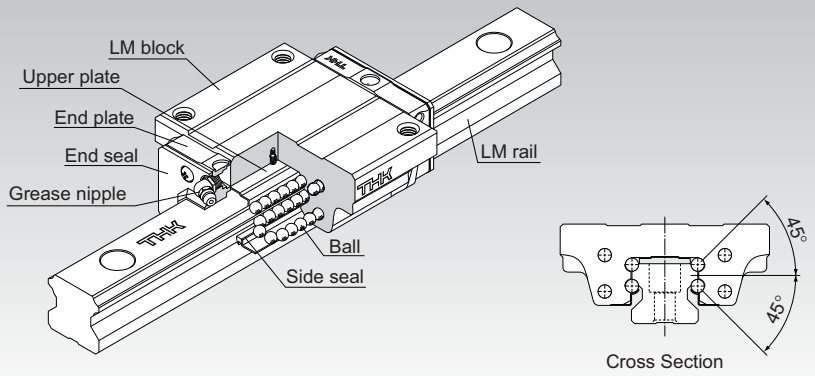
Unit: mm

Model No.	EPF 7M	EPF 9M	EPF 12M	EPF 15M
LM rail standard lengths (L_0)	55	75	95	110
Standard pitch F	15	20	25	40
G, g	5	7.5	10	15

Note) Lengths other than the standard LM rail length (L_0) are also available. Contact THK for details.

HSR

Global Standard LM Guide Model HSR



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-74
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-489
Reference Error Tolerance for the Mounting Surface	A1-494
Dimensions of Each Model with Options Attached	A1-517

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. Since retainer plates hold the balls, they will not fall out even if the LM block is removed from the LM rail (except models HSR 8, 10, and 12).
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 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. The low height of the LM block makes it highly rigid, achieving stable, high-precision linear motion.

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.

High Rigidity

Since the balls are well balanced in four rows, a large preload can be applied and the rigidity in four directions can easily be increased.

Self-Adjustment Capability

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

High Durability

Balls do not undergo differential slip, even under a preload or excessive biased load, allowing for smooth motion. Due to the product's high wear resistance, it maintains long-term accuracy.

Stainless Steel Type also Available

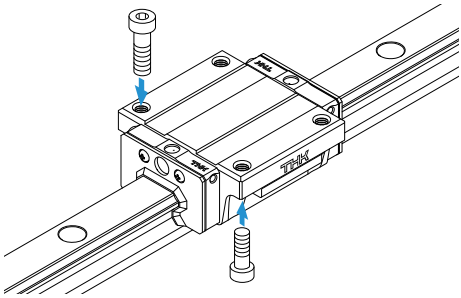
A special type whose LM block, LM rail, and balls are made of stainless steel is also available.

Types

Models HSR-C/XC

Dimensional Table⇒A1-188

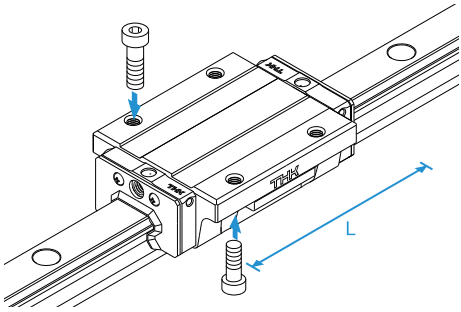
The flange of the LM block has tapped holes. This type can be mounted from the top or the bottom. It is used in places where the table cannot have through holes for mounting bolts.



Models HSR-LC/XLC

Dimensional Table⇒A1-188

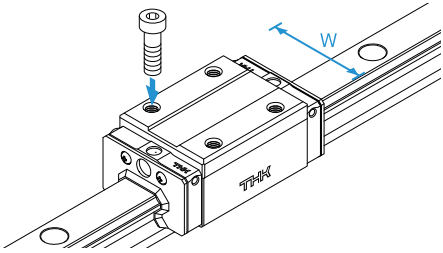
The LM block has the same cross-sectional shape as model HSR-C, but has a longer overall LM block length (L) and a greater load rating.



Models HSR-R/XR

Dimensional Table⇒A1-190/A1-192

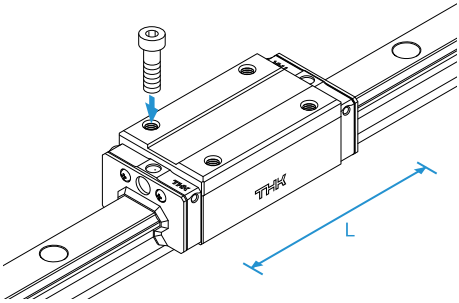
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Models HSR-LR/XLR

Dimensional Table⇒A1-192

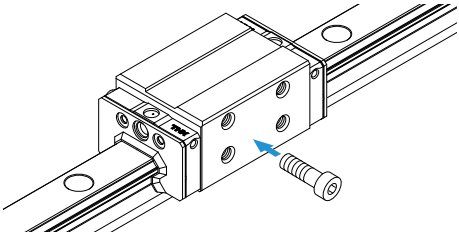
The LM block has the same cross-sectional shape as model HSR-R, but has a longer overall LM block length (L) and a greater load rating.



Models HSR-YR/XYR

Dimensional Table⇒A1-194

If using two conventional LM Guide units facing each other, it takes a long time to machine the table, and is difficult to achieve the desired accuracy and adjust the clearance. With the Model HSR-YR and Model HSR-XYR, the tapped holes on the side of the LM block simplify the structure, which drastically reduces labor time and increases accuracy.



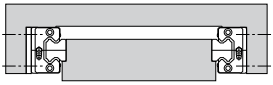


Fig. 1: Conventional Structure

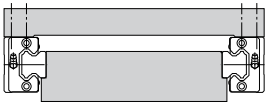
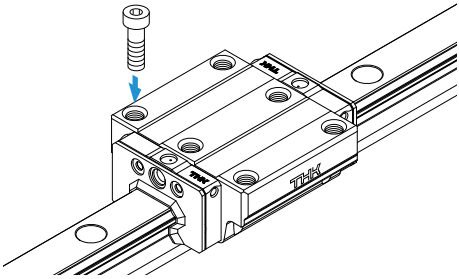


Fig. 2: Mounting Structure for Model HSR-YR

Models HSR-CA/XCA

Dimensional Table⇒A1-196

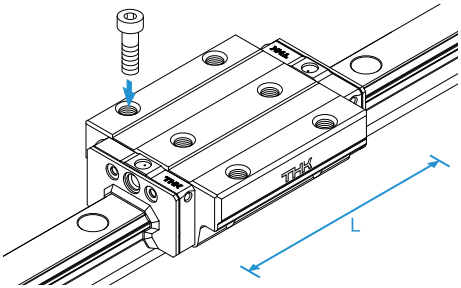
This model has six tapped holes on the LM block.



Models HSR-HA/XHA

Dimensional Table⇒A1-196

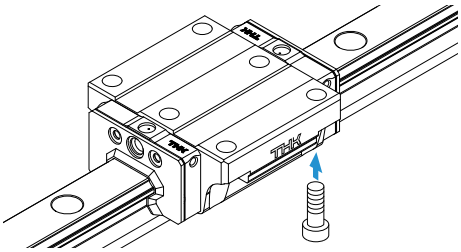
The LM block has the same cross-sectional shape as the Model HSR-CA, but it has a longer overall LM block length (L) and a greater load rating.



Models HSR-CB/XCB

Dimensional Table⇒A1-198

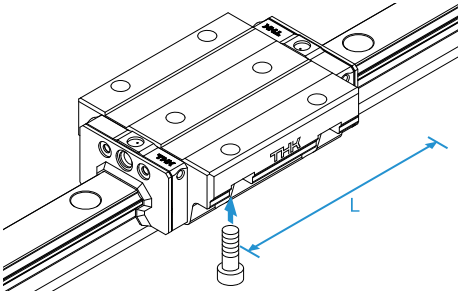
The LM block has six through holes. It is used in places where the table cannot have through holes for mounting bolts.



Models HSR-HB/XHB

Dimensional Table⇒A1-198

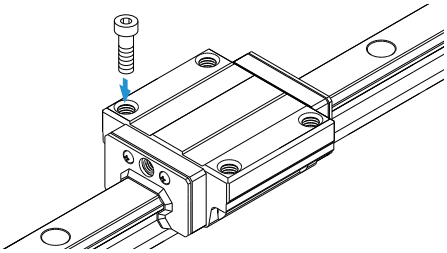
The LM block has the same cross sectional shape as model HSR-CB, but has a longer overall LM block length (L) and a greater load rating.



Model HSR85A

Dimensional Table⇒A1-200

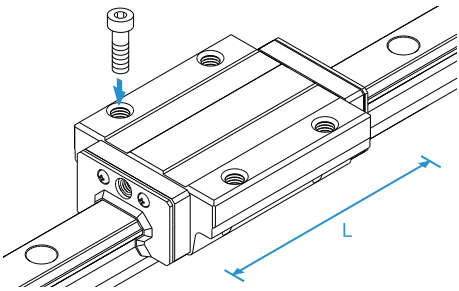
The flange of its LM block has tapped holes.



Model HSR85LA

Dimensional Table⇒A1-200

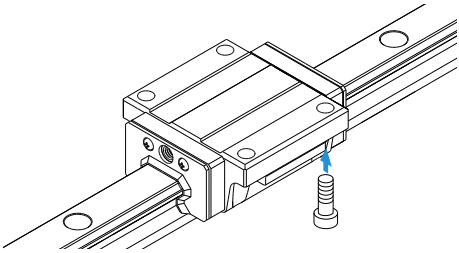
The LM block has the same cross-sectional shape as model HSR85A, but has a longer overall LM block length (L) and a greater load rating.



Model HSR85B

Dimensional Table⇒A1-200

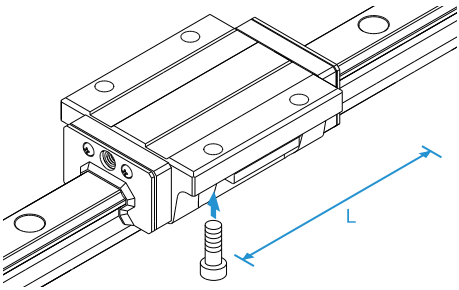
The flange of the LM block has through holes. It is used in places where the table cannot have through holes for mounting bolts.



Model HSR85LB

Dimensional Table⇒A1-200

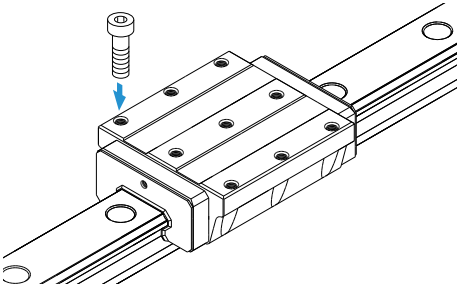
The LM block has the same cross-sectional shape as model HSR85B, but has a longer overall LM block length (L) and a greater load rating.



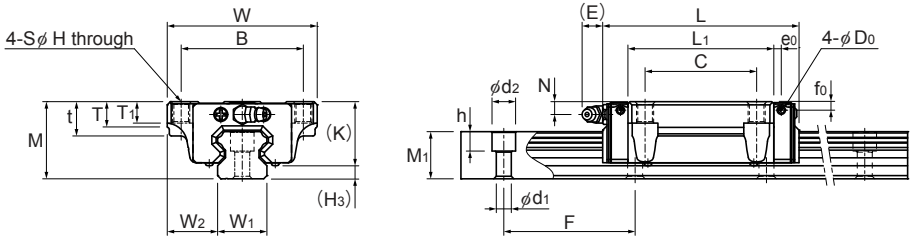
Models HSR 100/120/150 HA/HB/HR

Dimensional Table⇒A1-202

These are large types of model HSR that can be used in large-scale machine tools and building structures.
Models HSR100/120/150HA/HB have nine tapped holes on the LM block. Models HSR100/120/150HR have six tapped holes on the LM block.



Models HSR-C, HSR-CM, HSR-LC, HSR-LCM, HSR-XC, and HSR-XLC



Models HSR15 to 35C/LC/CM/LCM

Model No.	Outer dimensions			LM block dimensions											Grease nipple	Pilot hole for side nipple			H_3
	Height	Width	Length			Mounting hole													
	M	W	L	B	C	S	H	L_1	t	T	T_1	K	N	E		e_0	f_0	D_0	
HSR 15C HSR 15CM	24	47	56.6	38	30	M5	4.5	38.8	11	7	7	19.3	4.3	5.5	PB1021B	3.2	3.9	3	4.7
HSR 15LC HSR 15LCM	24	47	74.6	38	30	M5	4.5	56.8	11	7	7	19.3	4.3	5.5	PB1021B	3.2	3.9	3	4.7
HSR 20C HSR 20CM	30	63	74	53	40	M6	5.4	50.8	10	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 20LC HSR 20LCM	30	63	90	53	40	M6	5.4	66.8	10	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25C HSR 25CM	36	70	83.1	57	45	M8	6.8	59.5	16	11	10	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 25LC HSR 25LCM	36	70	102.2	57	45	M8	6.8	78.6	16	11	10	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 30C HSR 30CM	42	90	98	72	52	M10	8.5	70.4	18	9	10	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 30LC HSR 30LCM	42	90	120.6	72	52	M10	8.5	93	18	9	10	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 35C HSR 35CM	48	100	109.4	82	62	M10	8.5	80.4	21	12	13	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5
HSR 35LC HSR 35LCM	48	100	134.8	82	62	M10	8.5	105.8	21	12	13	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5
HSR 45C HSR 45LC	60	120	139 170.8	100	80	M12	10.5	98 129.8	25	13	15	50	10	16	B-PT1/8	6.1	6.6	5.2	10
HSR 55C HSR 55LC	70	140	163 201.1	116	95	M14	12.5	118 156.1	29	13.5	17	57	11	16	B-PT1/8	5.6	7.7	5.2	13
HSR 65XC HSR 65XLC	90	170	190.5 250	142	110	M16	14.5	138.5 198	37	21.5	23	76	19	16	B-PT1/8	6.8	14.6	5.2	14

Model number coding

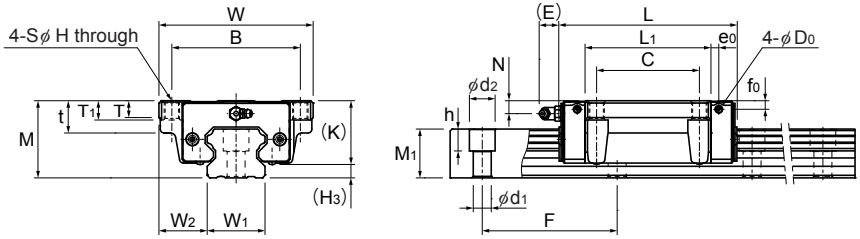
HSR25 C 2 QZ UU C0 M +1200L P T M -II

- HSR25: Model number
- C: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- M: Stainless steel LM block
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HSR45 to 65C/LC/XC/XLC

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m *						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	15	16	15	60	4.5×7.5×5.3	3000 (1240)	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998		0.2	1.5
	15	16	15	60	4.5×7.5×5.3	3000 (1240)	14.2	22.9	0.194	0.984	0.194	0.984	0.145		0.29	1.5
	20	21.5	18	60	6×9.5×8.5	3000 (1480)	19.8	27.4	0.218	1.2	0.218	1.2	0.235		0.35	2.3
	20	21.5	18	60	6×9.5×8.5	3000 (1480)	23.9	35.8	0.363	1.87	0.363	1.87	0.307		0.47	2.3
	23	23.5	22	60	7×11×9	3000 (2020)	27.6	36.4	0.324	1.8	0.324	1.8	0.366		0.59	3.3
	23	23.5	22	60	7×11×9	3000 (2020)	35.2	51.6	0.627	3.04	0.627	3.04	0.518		0.75	3.3
	28	31	26	80	9×14×12	3000 (2520)	40.5	53.7	0.599	3.1	0.599	3.1	0.652		1.1	4.8
	28	31	26	80	9×14×12	3000 (2520)	48.9	70.2	0.995	4.89	0.995	4.89	0.852		1.3	4.8
	34	33	29	80	9×14×12	3000 (2520)	53.9	70.2	0.895	4.51	0.895	4.51	1.05		1.6	6.6
	34	33	29	80	9×14×12	3000 (2520)	65	91.7	1.49	7.13	1.49	7.13	1.37		2.0	6.6
	45	37.5	38	105	14×20×17	3090	82.2 100	101 135	1.5 2.59	8.37 13.4	1.5 2.59	8.37 13.4	1.94 2.6		2.8 3.3	11 11
	53	43.5	44	120	16×23×20	3060	121 148	146 194	2.6 4.46	14.1 22.7	2.6 4.46	14.1 22.7	3.43 4.56		4.5 5.7	15.1 15.1
	63	53.5	53	150	18×26×22	3000	195 249	228 323	5.08 9.81	25 45.6	5.08 9.81	25 45.6	6.2 8.79		8.5 10.7	22.5 22.5

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-204.)

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

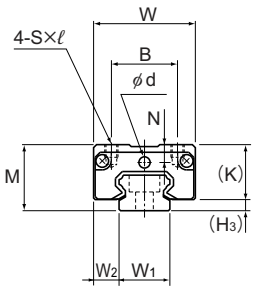
Overall block length dimension (L) The overall block lengths (L) in the dimension table are for when the contamination protection accessory symbol is UU or SS. The overall block length (L) will increase if another contamination protection accessory or lubricator is attached. (See A1-517 or A1-539)

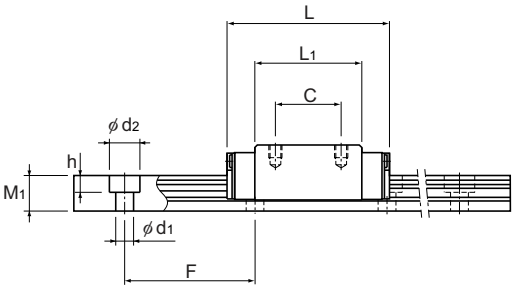
An "M" in the model number indicates the material of the LM block, LM rail, or balls are stainless steel. Stainless steel products have superior corrosion resistance and environmental resistance.

*The diagram shows the side nipple pilot holes for when a grease nipple is desired for a product with LaCS or a QZ Lubricator. In all other cases, the side nipple pilot holes will not be through holes. Consult with THK if you desire drilling for grease nipple mounting. (See A1-436.)

Options⇒A1-503

Model HSR-RM





Models HSR8RM and 10RM

Model No.	Outer dimensions			LM block dimensions											
	Height	Width	Length									Lubrication hole	Grease nipple		
	M	W	L	B	C	S×ℓ	L_1	T	K	N	E	d			H_3
HSR 8RM	11	16	24	10	10	M2×2.5	15	—	8.9	2.6	—	2.2	—		2.1
HSR 10RM	13	20	31	13	12	M2.6×2.5	20.1	—	10.8	3.5	—	2.5	—		2.2
HSR 12RM	20	27	45	15	15	M4×4.5	30.5	6	16.9	5.2	4	—	PB107		3.1

Model number coding

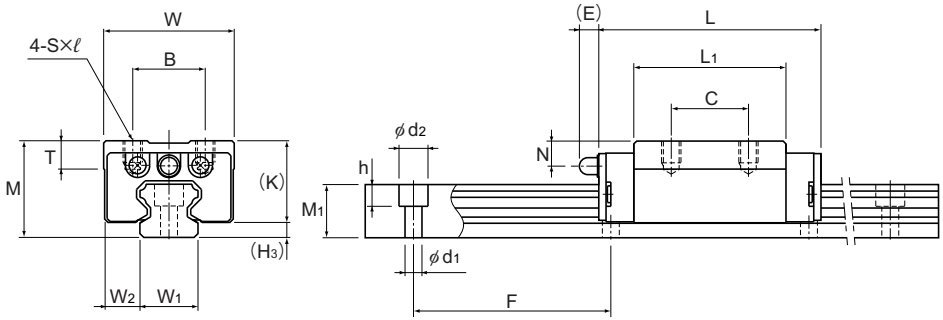
HSR12 R 2 UU C1 M +670L H T M -II

- HSR12: Model number
- R: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)
- M: Stainless steel LM block
- +670L: LM rail length (in mm)
- H: Accuracy symbol (*3) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)/Super precision grade (SP)
- T: Symbol for LM rail jointed use
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model HSR12RM

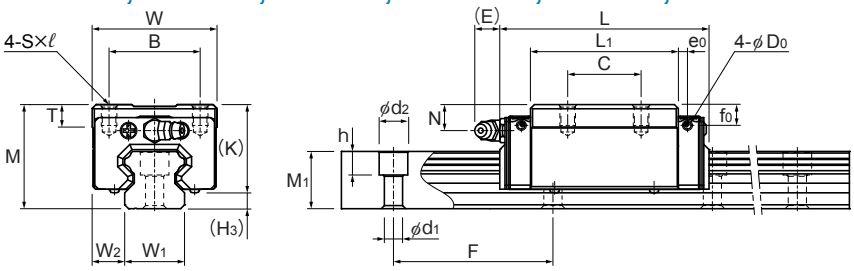
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m *					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	8	4	6	20	2.4×4.2×2.3	(975)	1.08	2.16	0.00492	0.0319	0.00492	0.0319	0.00727	0.012	0.3
	10	5	7	25	3.5×6×3.3	(995)	1.96	3.82	0.0123	0.0716	0.0123	0.0716	0.0162	0.025	0.45
	12	7.5	11	40	3.5×6×4.5	(1240)	4.7	8.53	0.0409	0.228	0.0409	0.228	0.0445	0.08	0.83

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-204**.)
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
Overall block length dimension (L) The overall block lengths (L) in the dimension table are for when the contamination protection accessory symbol is UU or SS. The overall block length (L) will increase if another contamination protection accessory or lubricator is attached. (See A**1-517** or A**1-539**)
An "M" in the model number indicates the material of the LM block, LM rail, or balls are stainless steel. Stainless steel products have superior corrosion resistance and environmental resistance.

Options⇒A1-503

Models HSR-R, HSR-RM, HSR-LR, HSR-LRM, HSR-XR, and HSR-XLR



Models HSR15 to 35R/LR/RM/LRM

Model No.	Outer dimensions			LM block dimensions									Pilot hole for side nipple			
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	N	E	Grease nipple	e0	f0	D0	H3
HSR 15R HSR 15RM	28	34	56.6	26	26	M4×5	38.8	6	23.3	8.3	5.5	PB1021B	3.2	7.9	3	4.7
HSR 15LR HSR 15LRM	28	34	74.6	26	34	M4×5	56.8	6	23.3	8.3	5.5	PB1021B	3.2	7.9	3	4.7
HSR 20R HSR 20RM	30	44	74	32	36	M5×6	50.8	8	26	5	12	B-M6F	3.1	3.4	3	4
HSR 20LR HSR 20LRM	30	44	90	32	50	M5×6	66.8	8	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25R HSR 25RM	40	48	83.1	35	35	M6×8	59.5	9	34.5	10	12	B-M6F	3.5	8	3	5.5
HSR 25LR HSR 25LRM	40	48	102.2	35	50	M6×8	78.6	9	34.5	10	12	B-M6F	3.5	8	3	5.5
HSR 30R HSR 30RM	45	60	98	40	40	M8×10	70.4	9	38	10	12	B-M6F	5.2	9.2	5.2	7
HSR 30LR HSR 30LRM	45	60	120.6	40	60	M8×10	93	9	38	10	12	B-M6F	5.2	9.2	5.2	7
HSR 35R HSR 35RM	55	70	109.4	50	50	M8×12	80.4	11.7	47.5	15	12	B-M6F	5.5	12.6	5.2	7.5
HSR 35LR HSR 35LRM	55	70	134.8	50	72	M8×12	105.8	11.7	47.5	15	12	B-M6F	5.5	12.6	5.2	7.5
HSR 45R HSR 45LR	70	86	139 170.8	60	60 80	M10×17	98 129.8	15	60	20	16	B-PT1/8	6.1	16.6	5.2	10
HSR 55R HSR 55LR	80	100	163 201.1	75	75 95	M12×18	118 156.1	20.5	67	21	16	B-PT1/8	5.6	17.7	5.2	13
HSR 65XR HSR 65XLR	90	126	190.5 250	76	70 120	M16×20	138.5 198	23	76	19	16	B-PT1/8	6.8	14.6	5.2	14
HSR 85R HSR 85LR	110	156	245.6 303	100	80 140	M18×25	178.6 236	29	94	23	16	B-PT1/8	—	—	—	16

Model number coding

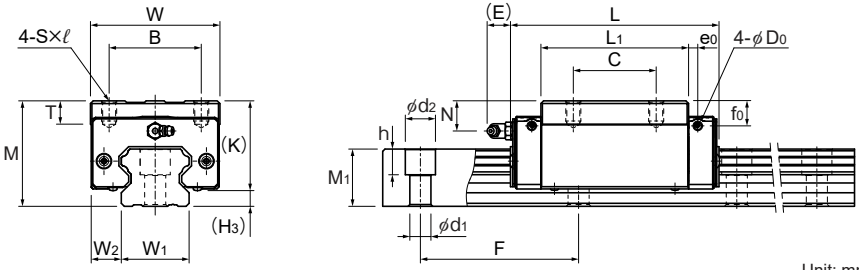
HSR35 R 2 QZ SS C0 M +1400L P T M -II

- HSR35: Model number
- R: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- SS: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- M: Stainless steel LM block
- +1400L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HSR45 to 85R/LR/XR/XLR

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	9.5	15	60	4.5×7.5×5.3	3000 (1240)	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998	0.18	1.5
	15	9.5	15	60	4.5×7.5×5.3	3000 (1240)	14.2	22.9	0.194	0.984	0.194	0.984	0.145	0.26	1.5
	20	12	18	60	6×9.5×8.5	3000 (1480)	19.8	27.4	0.218	1.2	0.218	1.2	0.235	0.25	2.3
	20	12	18	60	6×9.5×8.5	3000 (1480)	23.9	35.8	0.363	1.87	0.363	1.87	0.307	0.35	2.3
	23	12.5	22	60	7×11×9	3000 (2020)	27.6	36.4	0.324	1.8	0.324	1.8	0.366	0.54	3.3
	23	12.5	22	60	7×11×9	3000 (2020)	35.2	51.6	0.627	3.04	0.627	3.04	0.518	0.67	3.3
	28	16	26	80	9×14×12	3000 (2520)	40.5	53.7	0.599	3.1	0.599	3.1	0.652	0.9	4.8
	28	16	26	80	9×14×12	3000 (2520)	48.9	70.2	0.995	4.89	0.995	4.89	0.852	1.1	4.8
	34	18	29	80	9×14×12	3000 (2520)	53.9	70.2	0.895	4.51	0.895	4.51	1.05	1.5	6.6
	34	18	29	80	9×14×12	3000 (2520)	65	91.7	1.49	7.13	1.49	7.13	1.37	2	6.6
	45	20.5	38	105	14×20×17	3090	82.2 100	101 135	1.5 2.59	8.37 13.4	1.5 2.59	8.37 13.4	1.94 2.6	2.6 3.1	11
	53	23.5	44	120	16×23×20	3060	121 148	146 194	2.6 4.46	14.1 22.7	2.6 4.46	14.1 22.7	3.43 5.4	4.3 5.4	15.1
	63	31.5	53	150	18×26×22	3000	195 249	228 323	5.08 9.81	25 45.6	5.08 9.81	25 45.6	6.2 8.79	7.3 9.7	22.5 22.5
	85	35.5	65	180	24×35×28	3000	304 367	355 464	10.2 16.9	51.2 81	10.2 16.9	51.2 81	12.8 16.7	13 16	35.2

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-204**.)

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

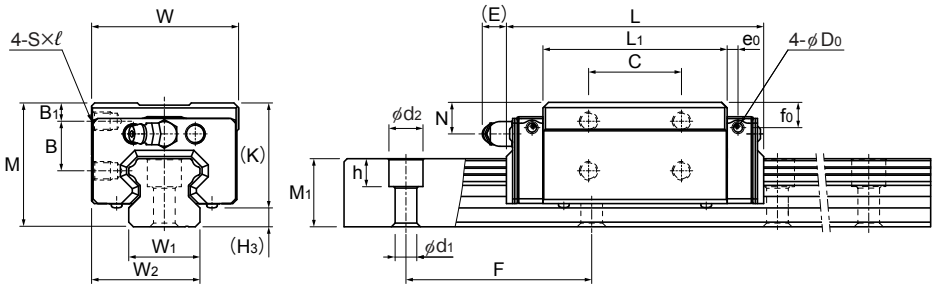
Overall block length dimension (L) The overall block lengths (L) in the dimension table are for when the contamination protection accessory symbol is UU or SS. The overall block length (L) will increase if another contamination protection accessory or lubricator is attached. (See **A1-517** or **A1-539**)

An "M" in the model number indicates the material of the LM block, LM rail, or balls are stainless steel.
Stainless steel products have superior corrosion resistance and environmental resistance.

*The diagram shows the side nipple pilot holes for when a grease nipple is desired for a product with LaCS or a QZ Lubricator. In all other cases, the side nipple pilot holes will not be through holes. Consult with THK if you desire drilling for grease nipple mounting.

Options⇒A1-503

Models HSR-YR, HSR-YRM, and HSR-XYR



Models HSR15 to 35YR/YRM

Model No.	Outer dimensions			LM block dimensions								Pilot hole for side nipple			
	Height	Width	Length								Grease nipple				
	M	W	L	B_1	B	C	S×ℓ	L_1	K	N	E	e_0	f_0	D_0	H_3
HSR 15YR HSR 15YRM	28	33.5	56.6	4.3	11.5	18	M4×5	38.8	23.3	8.3	5.5	PB1021B	3.2	7.9	3	4.7
HSR 20YR HSR 20YRM	30	43.5	74	4	11.5	25	M5×6	50.8	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25YR HSR 25YRM	40	47.5	83.1	6	16	30	M6×6	59.5	34.5	10	12	B-M6F	3.5	8	3	5.5
HSR 30YR HSR 30YRM	45	59.5	98	8	16	40	M6×9	70.4	38	10	12	B-M6F	5.2	9.2	5.2	7
HSR 35YR HSR 35YRM	55	69.5	109.4	8	23	43	M8×10	80.4	47.5	15	12	B-M6F	5.5	12.6	5.2	7.5
HSR 45XYR	70	85.5	139	10	30	55	M10×12	98	60	20	16	B-PT1/8	6.1	16.6	5.2	10
HSR 45YR	70	85.5	139	10	30	55	M10×14	98	60	20	16	B-PT1/8	—	—	—	10
HSR 55XYR	80	99.5	163	12	32	70	M12×13	118	67	21	16	B-PT1/8	5.6	17.7	5.2	13
HSR 55YR	80	99.5	163	12	32	70	M12×15	118	67	21	16	B-PT1/8	—	—	—	13
HSR 65XYR	90	124.5	190.5	12	35	85	M16×18	138.5	76	19	16	B-PT1/8	6.8	14.6	5.2	14

Model number coding

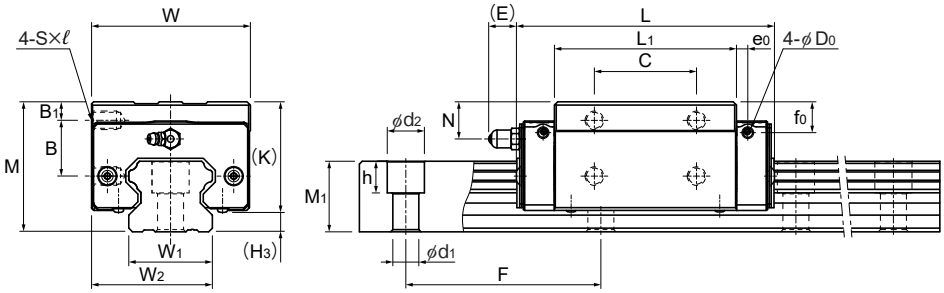
HSR25 YR 2 UU C0 M +1200L P T M -II

- HSR25: Model number
- YR: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- M: Stainless steel LM block
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HSR45 to 65YR/XYR

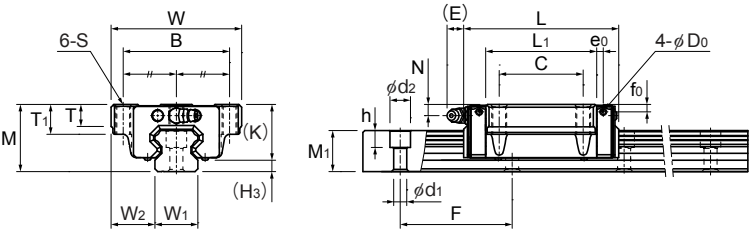
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	24	15	60	4.5×7.5×5.3	3000 (1240)	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998	0.18	1.5
	20	31.5	18	60	6×9.5×8.5	3000 (1480)	19.8	27.4	0.218	1.2	0.218	1.2	0.235	0.25	2.3
	23	35	22	60	7×11×9	3000 (2020)	27.6	36.4	0.324	1.8	0.324	1.8	0.366	0.54	3.3
	28	43.5	26	80	9×14×12	3000 (2520)	40.5	53.7	0.599	3.1	0.599	3.1	0.652	0.9	4.8
	34	51.5	29	80	9×14×12	3000 (2520)	53.9	70.2	0.895	4.51	0.895	4.51	1.05	1.5	6.6
	45	65	38	105	14×20×17	3090	82.2	101	1.5	8.37	1.5	8.37	1.94	2.6	11
	45	65	38	105	14×20×17	3090	82.2	101	1.5	8.37	1.5	8.37	1.94	2.6	11
	53	76	44	120	16×23×20	3060	121	146	2.6	14.1	2.6	14.1	3.43	4.3	15.1
	53	76	44	120	16×23×20	3060	121	146	2.6	14.1	2.6	14.1	3.43	4.3	15.1
	63	93	53	150	18×26×22	3000	195	228	5.08	25	5.08	25	6.2	7.3	22.5

Note) See **A1-479** or **A1-481** for how to install the HSR-YR and HSR-YRM.
The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-204**.)
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 **A1-517** or **A1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Options⇒A1-503

Models HSR-CA, HSR-CAM, HSR-HA, HSR-HAM, HSR-XCA, and HSR-XHA



Models HSR20 to 35CA/HA/CAM/HAM

Model No.	Outer dimensions			LM block dimensions										Pilot hole for side nipple			
	Height	Width	Length										Grease nipple				
	M	W	L	B	C	S	L_1	t	T	T_1	K	N	E	e_0	f_0	D_0	H_3
HSR 20CA HSR 20CAM	30	63	74	53	40	M6	50.8	—	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 20HA HSR 20HAM	30	63	90	53	40	M6	66.8	—	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25CA HSR 25CAM	36	70	83.1	57	45	M8	59.5	—	11	16	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 25HA HSR 25HAM	36	70	102.2	57	45	M8	78.6	—	11	16	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 30CA HSR 30CAM	42	90	98	72	52	M10	70.4	—	9	18	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 30HA HSR 30HAM	42	90	120.6	72	52	M10	93	—	9	18	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 35CA HSR 35CAM	48	100	109.4	82	62	M10	80.4	—	12	21	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5
HSR 35HA HSR 35HAM	48	100	134.8	82	62	M10	105.8	—	12	21	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5
HSR 45CA HSR 45HA	60	120	139 170.8	100	80	M12	98 129.8	25	13	15	50	10	16	B-PT1/8	6.1	6.6	5.2	10
HSR 55CA HSR 55HA	70	140	163 201.1	116	95	M14	118 156.1	29	13.5	17	57	11	16	B-PT1/8	5.6	7.7	5.2	13
HSR 65XCA HSR 65XHA	90	170	190.5 250	142	110	M16	138.5 198	37	21.5	23	76	19	16	B-PT1/8	6.8	14.6	5.2	14
HSR 85CA HSR 85HA	110	215	245.6 303	185	140	M20	178.6 236	55	28	30	94	23	16	B-PT1/8	—	—	—	16

Model number coding

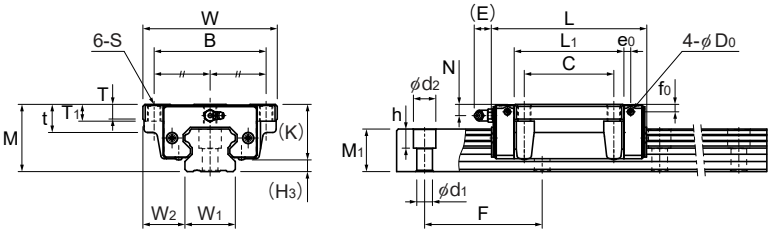
HSR25 HA 2 QZ KKHH C0 M +1300L P T M -II

- HSR25: Model number
- HA: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- M: Stainless steel LM block
- +1300L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HSR45 to 85CA/HA/XCA/XHA

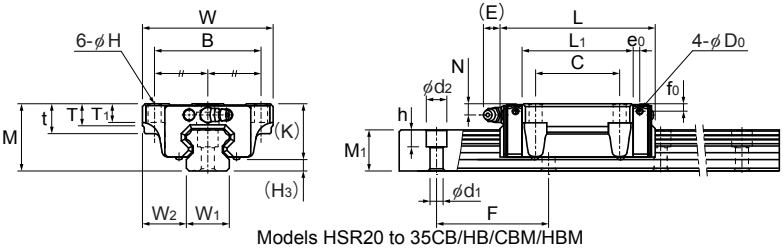
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	20	21.5	18	60	6×9.5×8.5	3000 (1480)	19.8	27.4	0.218	1.2	0.218	1.2	0.235		0.35	2.3
	20	21.5	18	60	6×9.5×8.5	3000 (1480)	23.9	35.8	0.363	1.87	0.363	1.87	0.307		0.47	2.3
	23	23.5	22	60	7×11×9	3000 (2020)	27.6	36.4	0.324	1.8	0.324	1.8	0.366		0.59	3.3
	23	23.5	22	60	7×11×9	3000 (2020)	35.2	51.6	0.627	3.04	0.627	3.04	0.518		0.75	3.3
	28	31	26	80	9×14×12	3000 (2520)	40.5	53.7	0.599	3.1	0.599	3.1	0.652		1.1	4.8
	28	31	26	80	9×14×12	3000 (2520)	48.9	70.2	0.995	4.89	0.995	4.89	0.852		1.3	4.8
	34	33	29	80	9×14×12	3000 (2520)	53.9	70.2	0.895	4.51	0.895	4.51	1.05		1.6	6.6
	34	33	29	80	9×14×12	3000 (2520)	65	91.7	1.49	7.13	1.49	7.13	1.37		2	6.6
	45	37.5	38	105	14×20×17	3090	82.2 100	101 135	1.5 2.59	8.37 13.4	1.5 2.59	8.37 13.4	1.94 2.6		2.8 3.3	11
	53	43.5	44	120	16×23×20	3060	121 148	146 194	2.6 4.46	14.1 22.7	2.6 4.46	14.1 22.7	3.43 4.56		4.5 5.7	15.1
	63	53.5	53	150	18×26×22	3000	195 249	228 323	5.08 9.81	25 45.6	5.08 9.81	25 45.6	6.2 8.79		8.5 10.7	22.5
	85	65	65	180	24×35×28	3000	304 367	355 464	10.2 16.9	51.2 81	10.2 16.9	51.2 81	12.8 16.7		17 23	35.2

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-204**.)
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 **A1-517** or **A1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Options⇒A1-503

Models HSR-CB, HSR-CBM, HSR-HB, HSR-HBM, HSR-XCB, and HSR-XHB



Models HSR20 to 35CB/HB/CBM/HBM

Model No.	Outer dimensions			LM block dimensions										Grease nipple	Pilot hole for side nipple			
	Height M	Width W	Length L	B	C	H	L_1	t	T	T_1	K	N	E		e_0	f_0	D_0	H_3
HSR 20CB HSR 20CBM	30	63	74	53	40	6	50.8	10	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 20HB HSR 20HBM	30	63	90	53	40	6	66.8	10	9.5	10	26	5	12	B-M6F	3.1	3.4	3	4
HSR 25CB HSR 25CBM	36	70	83.1	57	45	7	59.5	16	11	10	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 25HB HSR 25HBM	36	70	102.2	57	45	7	78.6	16	11	10	30.5	6	12	B-M6F	3.5	4	3	5.5
HSR 30CB HSR 30CBM	42	90	98	72	52	9	70.4	18	9	10	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 30HB HSR 30HBM	42	90	120.6	72	52	9	93	18	9	10	35	7	12	B-M6F	5.2	6.2	5.2	7
HSR 35CB HSR 35CBM	48	100	109.4	82	62	9	80.4	21	12	13	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5
HSR 35HB HSR 35HBM	48	100	134.8	82	62	9	105.8	21	12	13	40.5	8	12	B-M6F	5.5	5.6	5.2	7.5
HSR 45CB HSR 45HB	60	120	139 170.8	100	80	11	98 129.8	25	13	15	50	10	16	B-PT1/8	6.1	6.6	5.2	10
HSR 55CB HSR 55HB	70	140	163 201.1	116	95	14	118 156.1	29	13.5	17	57	11	16	B-PT1/8	5.6	7.7	5.2	13
HSR 65XCB HSR 65XHB	90	170	190.5 250	142	110	16	138.5 198	37	21.5	23	76	19	16	B-PT1/8	6.8	14.6	5.2	14
HSR 85CB HSR 85HB	110	215	245.6 303	185	140	18	178.6 236	55	28	30	94	23	16	B-PT1/8	—	—	—	16

Model number coding

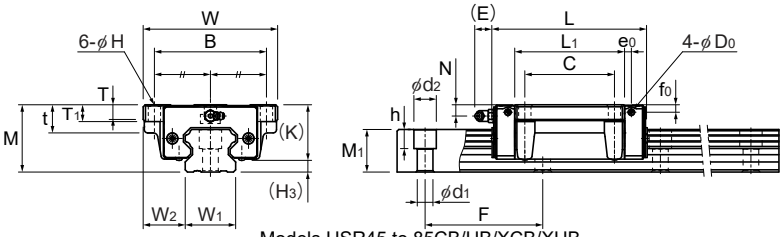
HSR35 CB 2 QZ ZZHH C0 M +1400L P T M -II

- HSR35: Model number
- CB: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- ZZHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- M: Stainless steel LM block
- +1400L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HSR45 to 85CB/HB/XCB/XHB

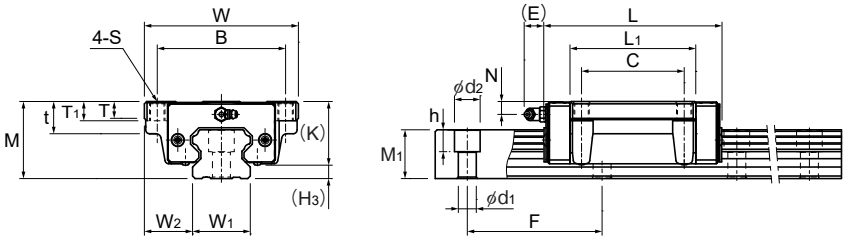
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	20	21.5	18	60	6×9.5×8.5	3000 (1480)	19.8	27.4	0.218	1.2	0.218	1.2	0.235		0.35	2.3
	20	21.5	18	60	6×9.5×8.5	3000 (1480)	23.9	35.8	0.363	1.87	0.363	1.87	0.307		0.47	2.3
	23	23.5	22	60	7×11×9	3000 (2020)	27.6	36.4	0.324	1.8	0.324	1.8	0.366		0.59	3.3
	23	23.5	22	60	7×11×9	3000 (2020)	35.2	51.6	0.627	3.04	0.627	3.04	0.518		0.75	3.3
	28	31	26	80	9×14×12	3000 (2520)	40.5	53.7	0.599	3.1	0.599	3.1	0.652		1.1	4.8
	28	31	26	80	9×14×12	3000 (2520)	48.9	70.2	0.995	4.89	0.995	4.89	0.852		1.3	4.8
	34	33	29	80	9×14×12	3000 (2520)	53.9	70.2	0.895	4.51	0.895	4.51	1.05		1.6	6.6
	34	33	29	80	9×14×12	3000 (2520)	65	91.7	1.49	7.13	1.49	7.13	1.37		2	6.6
	45	37.5	38	105	14×20×17	3090	82.2 100	101 135	1.5 2.59	8.37 13.4	1.5 2.59	8.37 13.4	1.94 2.6		2.8 3.3	11
	53	43.5	44	120	16×23×20	3060	121 148	146 194	2.6 4.46	14.1 22.7	2.6 4.46	14.1 22.7	3.43 4.56		4.5 5.7	15.1
	63	53.5	53	150	18×26×22	3000	195 249	228 323	5.08 9.81	25 45.6	5.08 9.81	25 45.6	6.2 8.79		8.5 10.7	22.5
	85	65	65	180	24×35×28	3000	304 367	355 464	10.2 16.9	51.2 81	10.2 16.9	51.2 81	12.8 16.7		17 23	35.2

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-204**.)
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 **A1-517** or **A1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Options⇒A1-503

Models HSR85A, HSR85LA, HSR85B, and HSR85LB



Models HSR85A/LA

Model No.	Outer dimensions			LM block dimensions												H_3
	Height M	Width W	Length L	B	C	H	S	L_1	t	T	T_1	K	N	E	Grease nipple	
HSR 85A HSR 85LA	110	215	245.6 303	185	140	—	M20	178.6 236	55	28	30	94	23	16	B-PT1/8	16
HSR 85B HSR 85LB	110	215	245.6 303	185	140	18	—	178.6 236	55	28	30	94	23	16	B-PT1/8	16

Model number coding

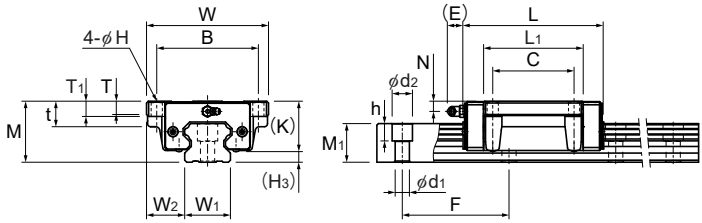
HSR85 A 2 UU C0 +2250L H T -II

- HSR85: Model number
- A: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +2250L: LM rail length (in mm)
- H: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HSR85B/LB

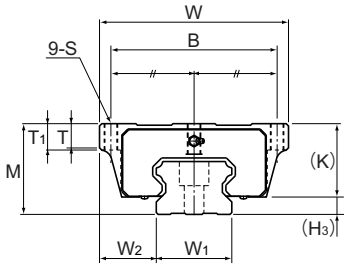
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m *					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	85	65	65	180	24×35×28	3000	304 367	355 464	10.2 16.9	51.2 81	10.2 16.9	51.2 81	12.8 16.7	17 23	35.2
	85	65	65	180	24×35×28	3000	304 367	355 464	10.2 16.9	51.2 81	10.2 16.9	51.2 81	12.8 16.7	17 23	35.2

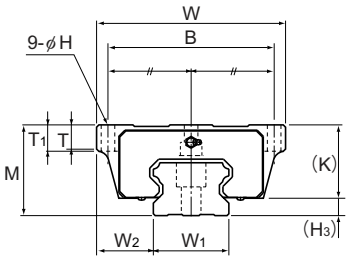
Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-204**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
Total block 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 **A1-517** or **A1-539**)

Options⇒A1-503

Models HSR-HA, HSR-HB, and HSR-HR



Models HSR100 to 150HA



Models HSR100 to 150HB

Model No.	Outer dimensions			LM block dimensions										Grease nipple	H_3
	Height M	Width W	Length L	B	C	H	S×ℓ	L_1	T	T_1	K	N	E		
HSR 100HA	120	250	334	220	200	—	M18*	261	32	35	100	23	16	B-PT1/4	20
HSR 100HB		250		220		20	—		32	35					
HSR 100HR		200		130		—	M18×27		33	—					
HSR 120HA	130	290	365	250	210	—	M20*	287	34	38	110	26.5	16	B-PT1/4	20
HSR 120HB		290		250		22	—		34	38					
HSR 120HR		220		146		—	M20×30		33.7	—					
HSR 150HA	145	350	396	300	230	—	M24*	314	36	40	123	29	16	B-PT1/4	22
HSR 150HB		350		300		26	—		36	40					
HSR 150HR		266		180		—	M24×35		33	—					

Note) "*" indicates a through hole.

Model number coding

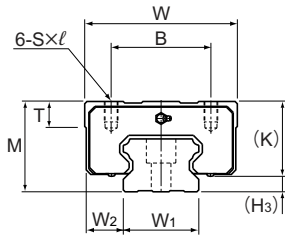
HSR150 HR 2 UU C1 +2350L H T -II

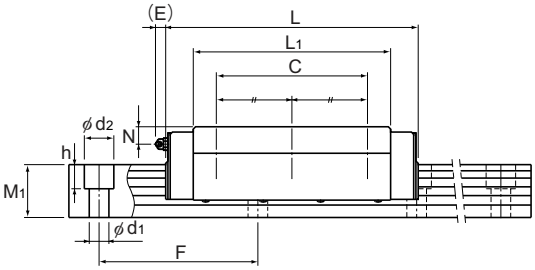
- HSR150: Model number
- HR: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +2350L: LM rail length (in mm)
- H: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com





Models HSR100 to 150HR

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	100	75 75 50	70	210	26×39×32	3000	441	540	20.7	105	20.7	105	24.1	32	49
	114	88 88 53	75	230	33×48×43	3000	540	653	27.5	138	27.5	138	33.3	43	61
	144	103 103 61	85	250	39×58×46	3000	518	728	33.6	167	33.6	167	45.2	62	87

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-204**.)
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 **A1-517** or **A1-539**)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model HSR 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.

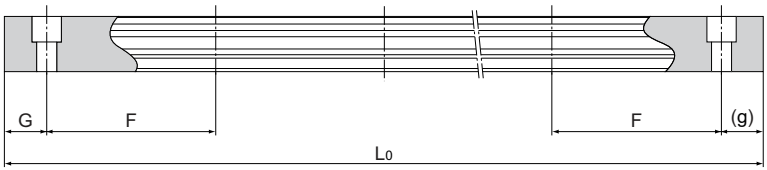


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HSR

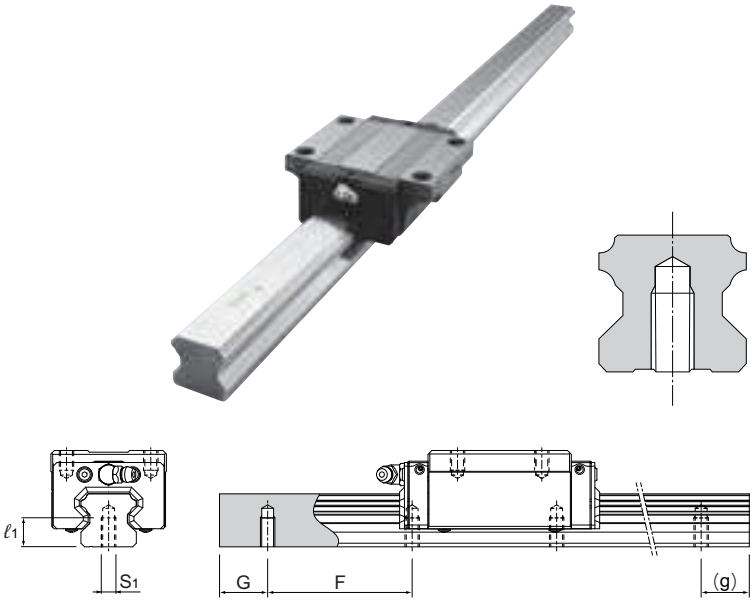
Unit: mm

Model No.	HSR 8	HSR 10	HSR 12	HSR 15	HSR 20	HSR 25	HSR 30	HSR 35	HSR 45	HSR 55	HSR 65	HSR 85	HSR 100	HSR 120	HSR 150
LM rail standard lengths (L_o)	35 55 75 95 115 135 155 175 195 215 235 255 275	45 70 95 120 145 170 195 220 245 270 295 320 345 370 395 420 445 470	70 110 150 190 230 270 310 350 390 430 470 510 550 590 630 670	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600 1720 1840 1960 2080 2200	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 2200 2320 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620	1530 1890 2250 2610	1340 1760 2180 2600	1470 1930 2390	1600 2100 2350
Standard pitch F	20	25	40	60	60	60	80	80	105	120	150	180	210	230	250
G, g	7.5	10	15	20	20	20	20	20	22.5	30	35	45	40	45	50
Max length	(975)	(995)	(1240)	3000 (1240)	3000 (1480)	3000 (2020)	3000 (2520)	3000 (2520)	3090	3060	3000	3000	3000	3000	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 made models.

Tapped-Hole Type LM Rail

HSR 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) A tapped-hole LM rail type is available only for Precision grade or lower grades.
(2) A tapped-hole LM rail type is also available for models HSR-YR and HSR-XYR.
(3) For standard pitches of the taps and the G and g dimensions, see Table 1 on A1-204.

Table 2: Dimensions of the LM Rail Tap

Unit: mm

Model No.	S_1	Effective tap depth ℓ_1
HSR 15	M5	8
HSR 20	M6	10
HSR 25	M6	12
HSR 30	M8	15
HSR 35	M8	17
HSR 45	M12	24
HSR 55	M14	24
HSR 65	M20	30

Model number coding

HSR30R2UU+1000LH K

Symbol for tapped-hole LM rail type

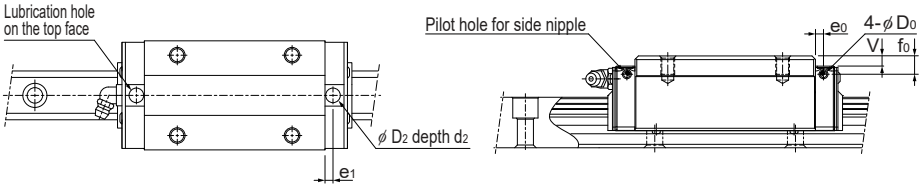
Preventing the LM Block from Falling off of the LM Rail

In miniature Model HSR, the balls fall out if the LM block comes off the LM rail.
For this reason, LM Guide assemblies are delivered with a part which prevents the LM block from coming off the rail. If you remove this part when using the product, please take precautions to avoid overrunning the blocks off of the rail.

Lubrication Hole

Lubrication Hole for Model HSR

The Model HSR LM block can be lubricated from the side or top surface. In order to prevent foreign material from entering the LM block, lubrication holes are not through holes in blocks with regular specifications. Contact THK if these will be used.
In addition, contact THK if you will use an upper surface lubrication hole with a Model HSR-R, HSR-XR, HSR-LR, HSR-XLR, HSR-YR, or HSR-XYR, as a lubrication adapter is required.
The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation. Be sure to let THK know the mounting orientation and the position where the grease nipple or plumbing fixture will be attached to each LM block.
See **A1-12** for the mounting orientation and **A24-2** for lubrication.



* Upper surface lubrication is oil lubrication only. Contact THK if you are considering using the lubrication hole on the top face for grease lubrication.

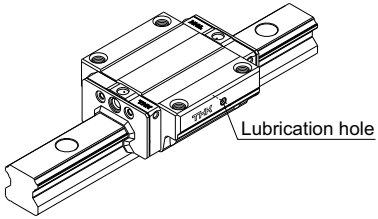
Unit: mm

Model No.		Pilot hole for side nipple			Applicable nipple	Lubrication hole on the top face				
		e_0	f_0	D_0		D_2	(O-ring)	V	e_1	d_2
HSR	15C 15LC 15CA 15HA 15CB 15HB	3.2	3.9	3	PB107	5.1	SS4	0.3	3.2	0.65
	15R 15LR 15YR	3.2	7.9	3				4.3		
	20C 20LC 20CA 20HA 20CB 20HB	3.1	3.4	3		6	SS5	0.2	4.3	0.6
	20R 20LR 20YR	3.1	3.4	3				0.2		

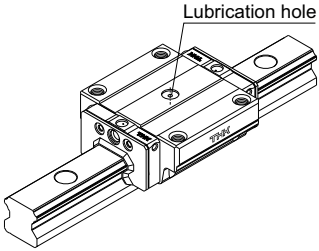
Model No.		Pilot hole for side nipple			Applicable nipple	Lubrication hole on the top face				
		e_0	f_0	D_0		D_2	(O-ring)	V	e_1	d_2
HSR	25C 25LC 25CA 25HA 25CB 25HB	3.5	4	3	PB107	6.2	P3	0.4	3.9	1
	25R 25LR 25YR	3.5	8	3				4.4		
	30C 30LC 30CA 30HA 30CB 30HB	5.2	6.2	5.2	M6F	6.2	P3	0.4	5.2	1
	30R 30LR 30YR	5.2	9.2	5.2				3.4		
	35C 35LC 35CA 35HA 35CB 35HB	5.5	5.6	5.2		6.2	P3	0.4	5.5	1
	35R 35LR 35YR	5.5	12.6	5.2				7.4		
	45C 45LC 45CA 45HA 45CB 45HB	6.1	6.6	5.2		10.2	P7	0.4	8.2	1
	45R 45LR 45XYR	6.1	16.6	5.2				10.4		
	55C 55LC 55CA 55HA 55CB 55HB	5.6	7.7	5.2		10.2	P7	0.4	9.1	1
	55R 55LR 55XYR	5.6	17.7	5.2				10.4		
	65XC 65XLC 65XCA 65XHA 65XCB 65XHB	6.8	14.6	5.2		10.2	P7	5.9	9.5	1
	65XR 65XLR 65XYR	6.8	14.6	5.2				5.9		

Semi-Standard Lubrication Hole for Model HSR

For model HSR, a semi-standard lubrication hole is available. Specify the appropriate model number according to the application.



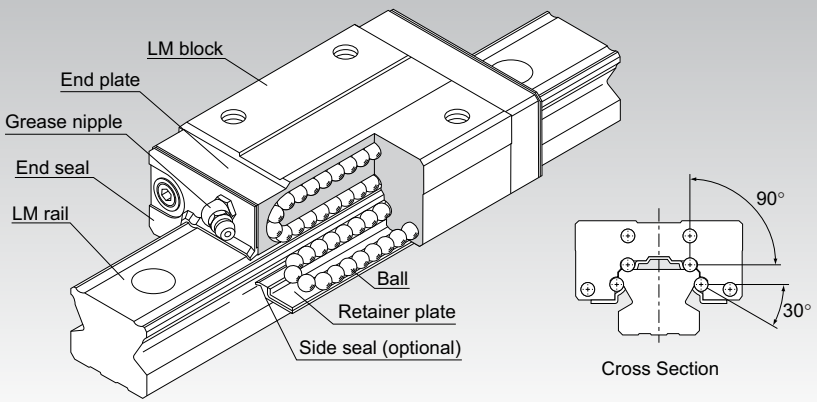
Type with a Lubrication Hole Drilled on the Side Surface



Type with a Lubrication Hole Drilled on the Top Face

SR

Radial Type LM Guide Model SR



Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
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Mounting Procedure B1-89

Equivalent Moment Factor A1-43
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Equivalent Factor in Each Direction A1-63
Radial Clearance A1-74
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-487
Reference Error Tolerance for the Mounting Surface A1-494
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in four rows of raceways precision-ground on an LM rail and an LM block, and endplates incorporated in the LM block allow the balls to circulate. Since a retainer plate holds the balls, they will not fall off even if the LM block is removed from the LM rail. The low height of the LM block makes it highly rigid, achieving stable, high-precision linear motion.

Compact with Large Load Capacity

Since it is a compactly designed model that has a low cross-sectional height and a ball contact structure that is suited to large loads in the radial direction, this model is optimal for horizontal guide units.

Mounting Accuracy can Easily be Achieved

Since this self-adjusting model is capable of easily absorbing accuracy error in parallelism and level between two rails, it achieves highly accurate and smooth motion.

Low Noise

The end plate installed at each end of the LM block is designed to ensure the smooth and quiet circulation of balls at the turning areas.

High Durability

Balls do not undergo differential slip even under a preload or excessive biased load. Due to the product's high wear resistance, it maintains long-term accuracy.

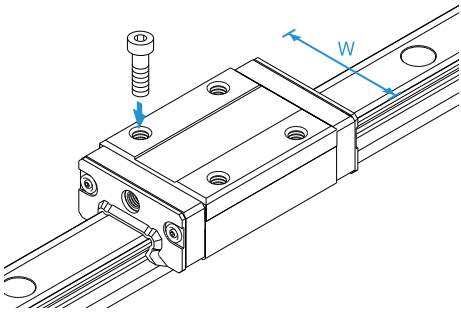
Stainless Steel Type also Available

A special type whose LM block, LM rail, and balls are made of stainless steel is also available.

Models SR-W/T

Dimensional Table⇒A1-216

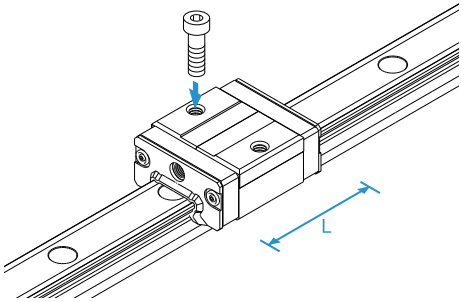
With this type, the LM block has a smaller width (W) and tapped holes.



Model SR-V

Dimensional Table⇒A1-216

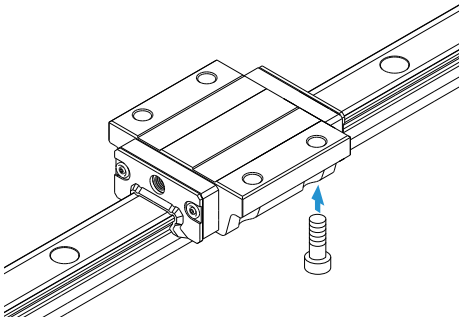
This is a space-saving type whose LM block has the same cross-sectional shape as the Model SR-W, but it has a smaller overall LM block length (L).



Model SR-TB

Dimensional Table⇒A1-218

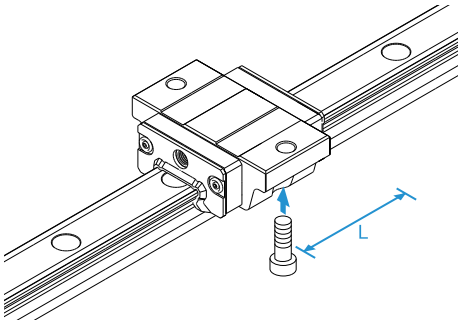
The LM block has the same height as the Model SR-W, and the flange of the LM block has through holes. It is used in places where the table cannot have through holes for mounting bolts.



Model SR-SB

Dimensional Table⇒A1-218

This is a space-saving type whose LM block has the same cross-sectional shape as model SR-TB, but has a smaller overall LM block length (L).



Characteristics of Model SR

When compared to models with a contact angle of 45°, model SR demonstrates the following excellent characteristics. By taking advantage of these characteristics, you will be able to design and manufacture highly accurate and highly rigid machines or equipment.

Difference in Load Rating and Service Life

Since SR has a contact angle of 90°, its rated load and service life are different from models with a contact angle of 45°. When comparing model SR with a model that has a contact angle of 45° and when the same radial load is applied to the two models with the same ball diameter as shown in the figure below, the load applied to SR is 70% of the other model. As a result, the service life of SR is more than twice that of the other model.

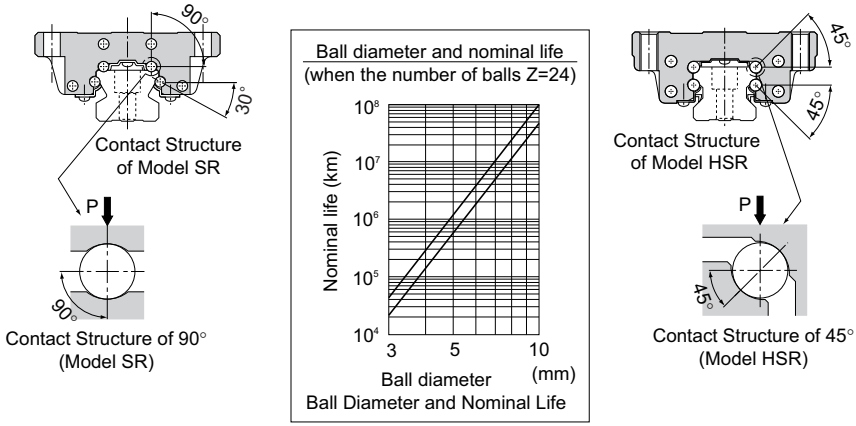


Fig. 1

Difference in Accuracy

If a machining error (grinding error) occurs in the LM rail or LM block, it will affect the running accuracy. Assuming that there is a machining error of Δ on the raceway, the error in the radial direction is 1.4 times greater in a model with a contact angle of 45° (model HSR) than in a model with a contact angle of 90° (model SR). For the horizontal direction, the error in a model with a contact angle of 45° is 1.22 times greater than that of a model with a contact angle of 30°.

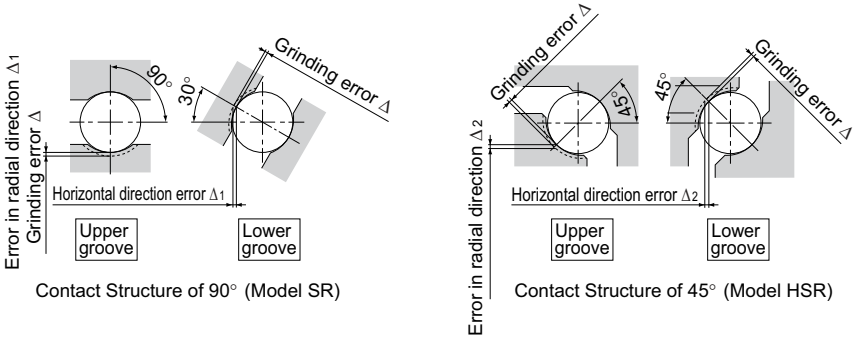


Fig. 2: Machining Error and Accuracy

Difference in Rigidity

The 90° contact angle adopted by Model SR is also different from the 45° contact angle in terms of rigidity. Accordingly, Model SR is better suited to applications that require high rigidity in the radial direction. The figure below shows the difference in radial load and displacement.

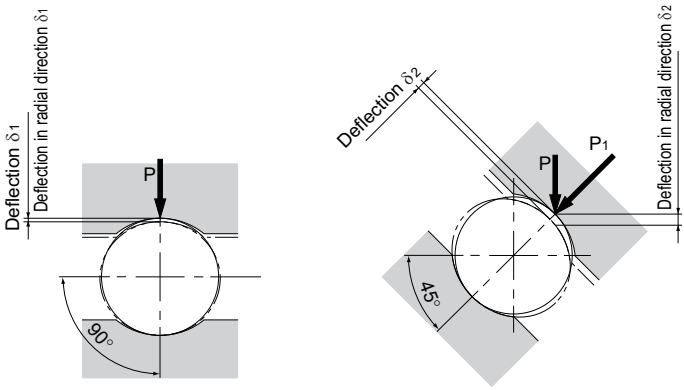


Fig. 3: Deflection Under a Radial Load

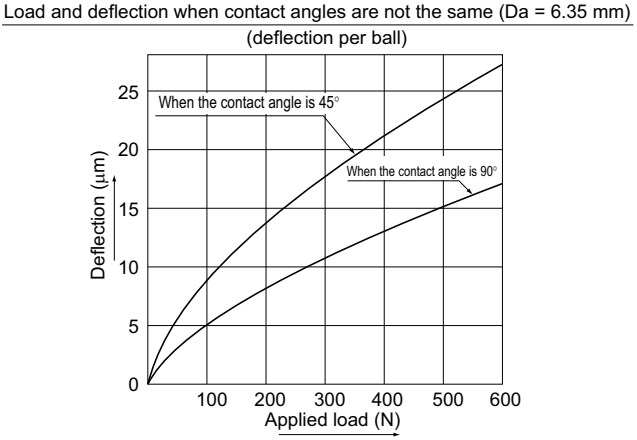
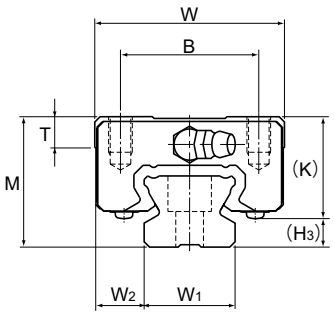


Fig. 4: Radial Load and Deflection

Conclusion

The 90° contact structure of the Model SR makes it ideal for locations where the load applied is mostly radial, locations where radial rigidity is required, and locations where accurate motion is demanded in the vertical and horizontal directions.
However, if the reverse-radial load, the lateral load, or the moment is large, we recommend Model HSR, which has a contact angle of 45° (4-way equal load).

Models SR-W, SR-WM, SR-V, SR-VM, and SR-T



Model No.	Outer dimensions			LM block dimensions									
	Height	Width	Length								Grease nipple	
	M	W	L	B	C	S×ℓ	L_1	T	K	N	E		H_3
SR 15V/VM SR 15W/WM	24	34	40.4 57	26	— 26	M4×7	22.9 39.5	5.7	18.2	6	5.5	PB1021B	5.8
SR 20V/VM SR 20W/WM	28	42	47.3 66.2	32	— 32	M5×8	27.8 46.7	7.2	22	6	12	B-M6F	6
SR 25V/VM SR 25W/WM	33	48	59.2 83	35	— 35	M6×9	35.2 59	7.7	26	7	12	B-M6F	7
SR 30V/VM SR 30W/WM	42	60	67.9 96.8	40	— 40	M8×12	40.4 69.3	8.5	32.5	8	12	B-M6F	9.5
SR 35V/VM SR 35W/WM	48	70	77.6 111	50	— 50	M8×12	45.7 79	12.5	36.5	8.5	12	B-M6F	11.5
SR 45W	60	86	126	60	60	M10×15	90.5	15	47.5	11.5	16	B-PT1/8	12.5
SR 55W	68	100	156	75	75	M12×20	117	16.7	54.5	12	16	B-PT1/8	13.5
SR 70T	85	126	194.6	90	90	M16×25	147.6	24.5	70	12	16	B-PT1/8	15
SR 85T	110	156	180	100	80	M18×30	130	25.5	91.5	27	12	A-PT1/8	18.5
SR 100T	120	178	200	120	100	M20×35	150	29.5	101	32	12	A-PT1/8	19
SR 120T	110	205	235	160	120	M20×35	180	24	95	14	13.5	B-PT1/4	15
SR 150T	135	250	280	200	160	M20×35	215	24	113	17	13.5	B-PT1/4	22

Model number coding

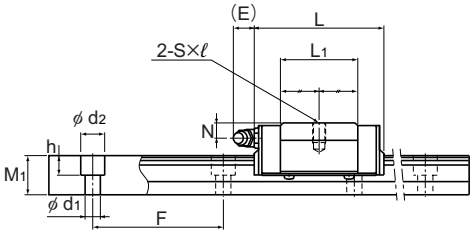
SR25 W 2 UU C0 M +1240L Y P T M -II

- SR25: Model number
- W: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- M: Stainless steel LM block
- +1240L: LM rail length (in mm)
- Y: Applied to only 15 and 25
- P: Accuracy symbol (*3) 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
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*4)

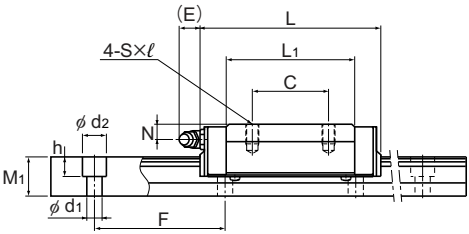
(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*4) See **A1-13**.

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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model SR-V



Models SR-W/T

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	15	9.5	12.5	60	3.5×6×4.5	(1240) 3000	9.1 13.8	11.7 20.5	0.0344 0.0984	0.234 0.551	0.0215 0.0604	0.149 0.343	0.0694 0.122		0.12 0.2	1.2
	20	11	15.5	60	6×9.5×8.5	(1480) 3000	13.4 19.2	17.2 28.6	0.064 0.167	0.396 0.887	0.0397 0.102	0.25 0.55	0.135 0.224		0.2 0.3	2.1
	23	12.5	18	60	7×11×9	(2020) 3000	21.6 30.9	26.8 44.7	0.125 0.326	0.773 1.74	0.0774 0.2	0.488 1.08	0.245 0.408		0.3 0.4	2.7
	28	16	23	80	7×11×9	(2520) 3000	29.5 45.6	34.4 64.4	0.173 0.564	1.15 2.92	0.108 0.346	0.735 1.8	0.376 0.703		0.5 0.8	4.3
	34	18	27.5	80	9×14×12	(2520) 3000	40.9 60.4	46.7 81.8	0.275 0.785	1.79 4.27	0.171 0.482	1.14 2.65	0.615 1.08		0.8 1.2	6.4
	45	20.5	35.5	105	11×17.5×14	3000	80.4	107	1.17	6.34	0.721	3.94	1.89		2.2	11.3
	48	26	38	120	14×20×17	3000	136	179	2.61	13	1.6	8.05	3.33		3.6	12.8
	70	28	47	150	18×26×22	3000	226	282	5.03	25.7	3.09	15.9	7.47		7	22.8
	85	35.5	65.5	180	18×26×22	3000	120	224	2.54	15.1	1.25	7.47	5.74		10.1	34.9
	100	39	70.3	210	22×32×25	3000	148	283	3.95	20.9	1.95	10.3	8.55		14.1	46.4
	114	45.5	65	230	26×39×30	3000	279	377	5.83	32.9	2.87	16.2	13.7		—	—
	144	53	77	250	33×48×36	3000	411	537	9.98	55.8	4.92	27.5	24.3		—	—

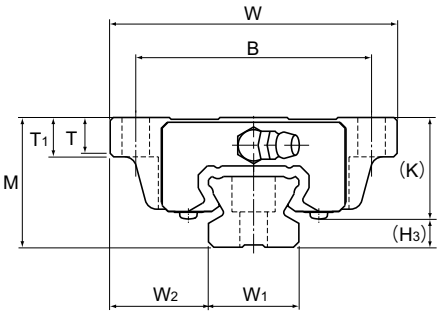
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-220**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
Total block 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 **A1-517** or **A1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.
Models SR85T, 100T, 120T and 150T are build to order.
Models SR85T and 100T include a grease nipple on the side face of the LM block. Contact THK for details.
Note2) For models SR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SSR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SR 15	For M3 (no symbol)	For M4 (symbol Y)
SR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Models SR-TB, SR-TBM, SR-SB, and SR-SBM



Model No.	Outer dimensions			LM block dimensions										
	Height	Width	Length									Grease nipple		
	M	W	L	B	C	H	L_1	T	T_1	K	N	E		H_3
SR 15SB/SBM SR 15TB/TBM	24	52	40.4 57	41	— 26	4.5	22.9 39.5	6.1	7	18.2	6	5.5	PB1021B	5.8
SR 20SB/SBM SR 20TB/TBM	28	59	47.3 66.2	49	— 32	5.5	27.8 46.7	8	9	22	6	12	B-M6F	6
SR 25SB/SBM SR 25TB/TBM	33	73	59.2 83	60	— 35	7	35.2 59	9.1	10	26	7	12	B-M6F	7
SR 30SB/SBM SR 30TB/TBM	42	90	67.9 96.8	72	— 40	9	40.4 69.3	8.7	10	32.5	8	12	B-M6F	9.5
SR 35SB/SBM SR 35TB/TBM	48	100	77.6 111	82	— 50	9	45.7 79	11.2	13	36.5	8.5	12	B-M6F	11.5
SR 45TB	60	120	126	100	60	11	90.5	12.8	15	47.5	11.5	16	B-PT1/8	12.5
SR 55TB	68	140	156	116	75	14	117	15.3	17	54.5	12	16	B-PT1/8	13.5

Model number coding

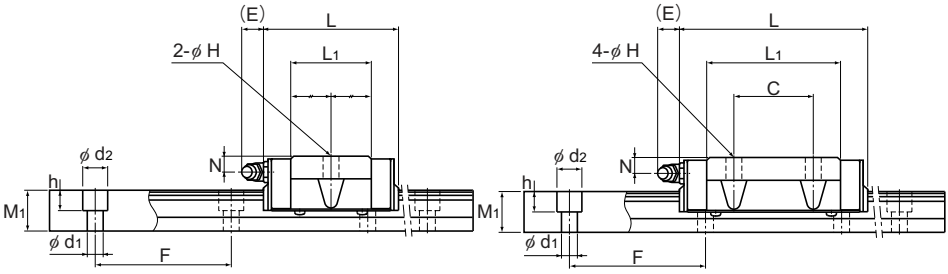
SR25 TB 2 UU C1 +1200L Y H T -II

- SR25: Model number
- TB: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +1200L: LM rail length (in mm)
- Y: Applied to only 15 and 25
- H: Accuracy symbol (*3)
  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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	15	18.5	12.5	60	3.5×6×4.5	(1240) 3000	9.1 13.8	11.7 20.5	0.0344 0.0984	0.234 0.551	0.0215 0.0604	0.149 0.343	0.0694 0.122		0.15 0.2	1.2
	20	19.5	15.5	60	6×9.5×8.5	(1480) 3000	13.4 19.2	17.2 28.6	0.064 0.167	0.396 0.887	0.0397 0.102	0.25 0.55	0.135 0.224		0.3 0.4	2.1
	23	25	18	60	7×11×9	(2020) 3000	21.6 30.9	26.8 44.7	0.125 0.326	0.773 1.74	0.0774 0.2	0.488 1.08	0.245 0.408		0.4 0.6	2.7
	28	31	23	80	7×11×9	(2520) 3000	29.5 45.6	34.4 64.4	0.173 0.564	1.15 2.92	0.108 0.346	0.735 1.8	0.376 0.703		0.8 1.1	4.3
	34	33	27.5	80	9×14×12	(2520) 3000	40.9 60.4	46.7 81.8	0.275 0.785	1.79 4.27	0.171 0.482	1.14 2.65	0.615 1.08		1 1.5	6.4
	45	37.5	35.5	105	11×17.5×14	3000	80.4	107	1.17	6.34	0.721	3.94	1.89		2.5	11.3
	48	46	38	120	14×20×17	3000	136	179	2.61	13	1.6	8.05	3.33		4.2	12.8

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-220**.)
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 A**1-517** or A**1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.
Note2) For models SR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SSR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SR 15	For M3 (no symbol)	For M4 (symbol Y)
SR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model SR 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.

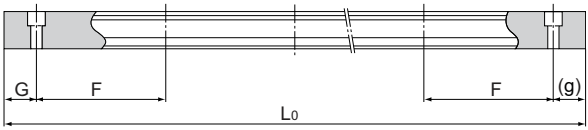


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model SR

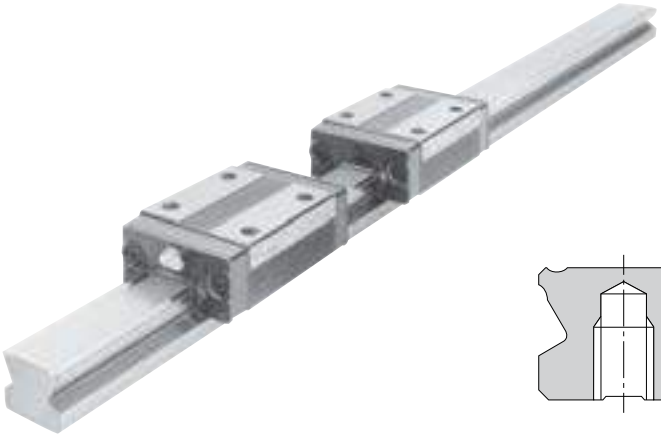
Unit: mm

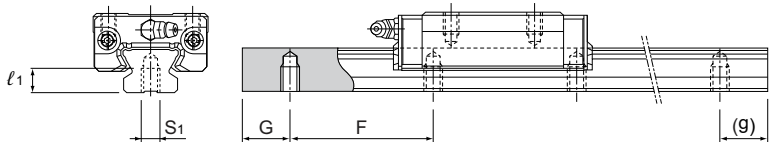
Model No.	SR 15	SR 20	SR 25	SR 30	SR 35	SR 45	SR 55	SR 70	SR 85	SR 100	SR 120	SR 150
LM rail standard lengths (L_o)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1660 1720 1780 1840 1900 1960 2020 2080 2140	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1660 1720 1780 1840 1900 1960 2020 2080 2140 2200 2260 2320 2380 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1640 1720 1800 1880 1960 2040 2120 2200 2280 2360 2440 2520 2600 2680 2760 2840 2920	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1640 1720 1800 1880 1960 2040 2120 2200 2280 2360 2440 2520 2600 2680 2760 2840 2920	570 675 780 885 990 1095 1200 1305 1410 1515 1725 1830 1935 2040 2145 2250 2355 2460 2565 2670 2775 2880 2985	780 900 1020 1140 1260 1380 1500 1740 1860 1980 2100 2220 2340 2460 2580 2700 2820 2940	1270 1570 2020 2620	1520 2060 2600	1550 1970 2600	1700 2390	1600 2100
Standard pitch F	60	60	60	80	80	105	120	150	180	210	230	250
G, g	20	20	20	20	20	22.5	30	35	40	40	45	50
Max length	3000 (1240)	3000 (1480)	3000 (2020)	3000 (2520)	3000 (2520)	3000	3000	3000	3000	3000	3000	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) Those model numbers including and greater than SR85T are semi-standard models. If desiring these models, contact THK.
Note4) The figures in the parentheses indicate the maximum lengths of stainless steel made models.

Tapped-Hole Type LM Rail

Model SR 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) A tapped-hole LM rail is available only for Precision or lower grades.
(2) For standard pitches of the taps and the G and g dimensions, see Table 1 on **A1-220**.

Table 2: Dimensions of the LM Rail Tap Unit: mm

Model No.	S_1	Effective tap depth ℓ_1
SR 15	M5	7
SR 20	M6	9
SR 25	M6	10
SR 30	M8	14
SR 35	M8	16
SR 45	M12	20
SR 55	M14	22

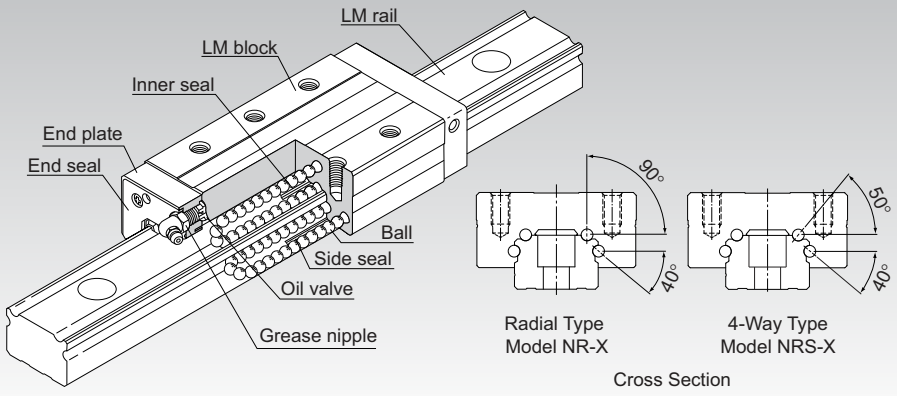
Model number coding

SR30W2UU+1000LH K

Symbol for tapped-hole LM rail type

NR-X/NRS-X

Super-Heavy Load LM Guide Model NR-X/NRS-X for Machine Tools



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-73
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-488
Reference Error Tolerance for the Mounting Surface	A1-494
Dimensions of Each Model with Options Attached	A1-517

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. The raceways are cut into deep grooves that have a radius closer to that of the balls than in the conventional design, using special equipment and an extremely precise cutting technique. This design allows high rigidity, high vibration and impact resistance, and high damping capacity, all of which are required for machine tools, thus making these models capable of bearing super-heavy loads.

* Due to the extremely high rigidity of LM Guide units of models NR-X and NRS-X, the construction does not easily absorb the effects of mounting surface misalignment and installation errors. Where such effects arise, there is a risk of reduced operating life and/or malfunction. Contact THK when considering the use of these products.

Improved Damping Capacity

While not performing cutting operations, the LM Guide travels normally and smoothly. While cutting a workpiece, the cutting force is applied to the LM Guide and increases the contact area between the balls and the raceway, allowing an appropriate mixture of rolling and sliding motion to be achieved. Accordingly, the friction resistance is increased and the damping capacity is improved.
Since the absolute slip during the rolling and sliding motion is insignificant, it causes little wear and does not affect the service life.

Highly Practical LM Guide

The excessively large differential slip occurring in a Gothic-arch groove does not happen with these models. They smoothly travel and achieve high positioning accuracy during fast feeding. NR and NRS are extremely practical models of LM Guide that generate differential slip appropriate to the cutting load, increase rolling resistance and damping, and improve cutting performance.

High Rigidity

To increase the rigidity of the LM block and the LM rail, which may impact the overall rigidity of the LM Guide in the reverse-radial and lateral directions, THK made full use of FEM to achieve optimal design within the limited dimensional range.
THK offers two identically sized models with different characteristics, namely the radial type Model NR-X and 4-way type Model NRS-X. Users can select the model that best suits their specifications.

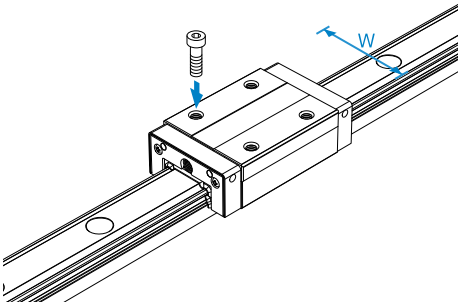
Super-Heavy Load

Since the curvature of the raceway is matched to the ball diameter, the ball contact area under a load is increased and the LM Guide is capable of receiving a super-heavy load.

Models NR-RX/NRS-RX

Dimensional Table⇒A1-228/A1-230

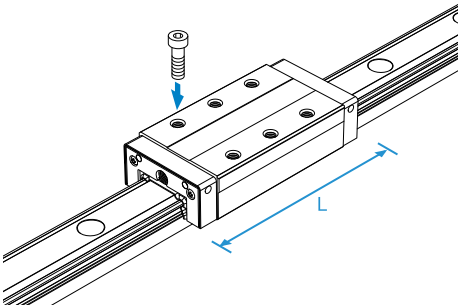
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Models NR-LRX/NRS-LRX

Dimensional Table⇒A1-228/A1-230

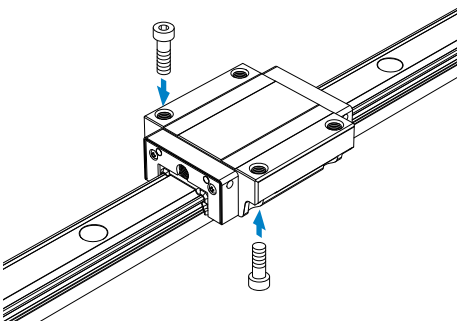
The LM block has the same cross-sectional shape as models NR-RX/NRS-RX, but has a longer overall LM block length (L) and a greater load rating.



Models NR-CX/NRS-CX

Dimensional Table⇒A1-232/A1-234

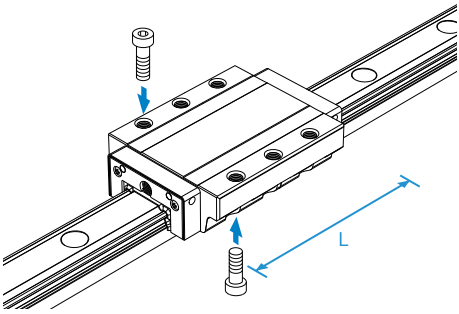
The flange of the LM block has tapped holes. It can be mounted from the top or the bottom. It can also be used in places where the table cannot have through holes for mounting bolts.



Models NR-LCX/NRS-LCX

Dimensional Table⇒A1-232/A1-234

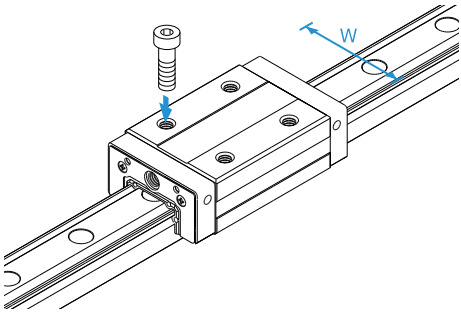
The LM block has the same cross-sectional shape as models NR-CX/NRS-CX, but has a longer overall LM block length (L) and a greater load rating.



Models NR-R/NRS-R

Dimensional Table⇒A1-228/A1-230

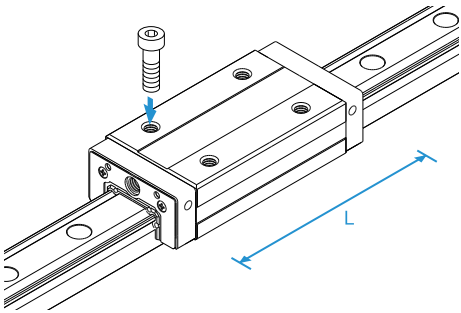
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Models NR-LR/NRS-LR

Dimensional Table⇒A1-228/A1-230

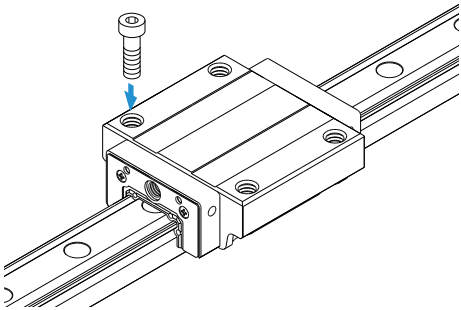
The LM block has the same cross-sectional shape as models NR-R/NRS-R, but has a longer overall LM block length (L) and a greater load rating.



Models NR-A/NRS-A

Dimensional Table⇒A1-236

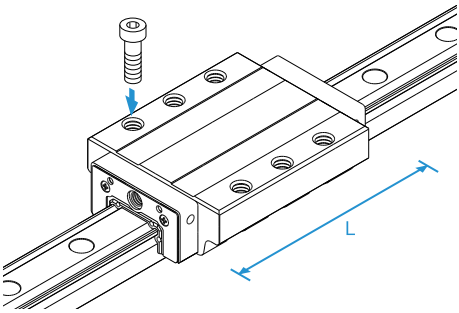
The flange of its LM block has tapped holes.



Models NR-LA/NRS-LA

Dimensional Table⇒A1-236

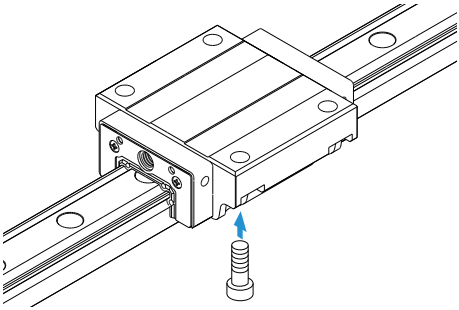
The LM block has the same cross-sectional shape as models NR-A/NRS-A, but has a longer overall LM block length (L) and a greater load rating.



Models NR-B/NRS-B

Dimensional Table⇒A1-238

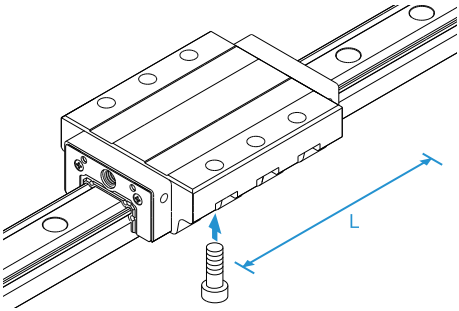
The flange of the LM block has through holes. It is used in places where the table cannot have through holes for mounting bolts.



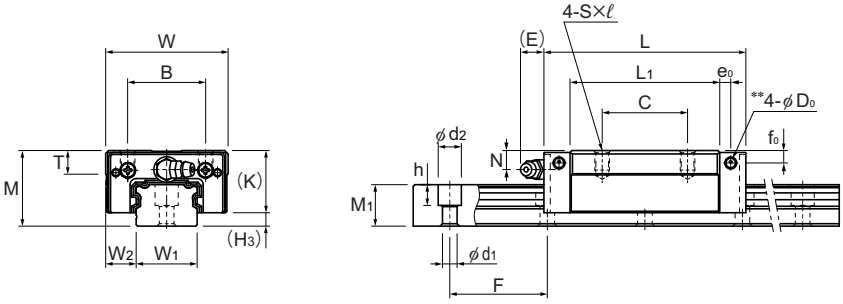
Models NR-LB/NRS-LB

Dimensional Table⇒A1-238

The LM block has the same cross-sectional shape as models NR-B/NRS-B, but has a longer overall LM block length (L) and a greater load rating.



Models NR-RX, NR-LRX, NR-R, and NR-LR



Model NR-RX

Model No.	Outer dimensions			LM block dimensions												Grease nipple	H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	f_0	E	e_0	D_0		
NR 25RX NR 25LRX	31	50	82.8 102	32	35 50	M6×8	61.4 80.6	9.7	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
NR 30RX NR 30LRX	38	60	98 120.5	40	40 60	M8×10	72.1 94.6	9.7	31	10.3	7	12	6.5	3.9	B-M6F	7
NR 35RX NR 35LRX	44	70	109.5 135	50	50 72	M8×12	79 104.5	11.7	35	12.1	8	12	6	5.2	B-M6F	9
NR 45RX NR 45LRX	52	86	138.2 171	60	60 80	M10×17	105 137.8	14.7	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
NR 55RX NR 55LRX	63	100	163.3 200.5	65	75 95	M12×18	123.6 160.8	17.7	49	16.6	10	16	10	5.2	B-PT1/8	14
NR 65RX NR 65LRX	75	126	186 246	76	70 110	M16×20	143.6 203.6	21.6	60	19	15	16	8.7	8.2	B-PT1/8	15
NR 75R NR 75LR	83	145	218 274	95	80 130	M18×25	170.2 226.2	25.3	68	18	17	16	9	8.2	B-PT1/8	15
NR 85R NR 85LR	90	156	246.7 302.8	100	80 140	M18×25	194.9 251	27.3	73	20	20	16	10	8.2	B-PT1/8	17
NR 100R NR 100LR	105	200	286.2 326.2	130	150 200	M18×27	223.4 263.4	34.3	85	23	23	10	12	8.2	B-PT1/4	20

Model number coding

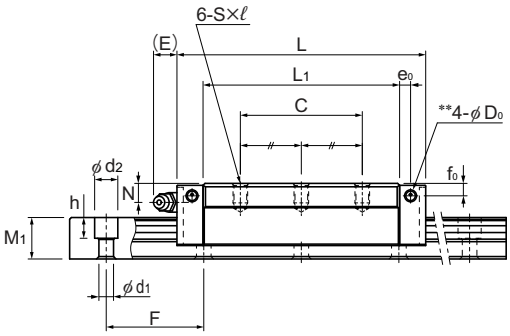
NR35 LRX 2 QZ KKHH C0 +1240L P T -II

- NR35: Model number
- LRX: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on **A1-543** (*2) See **A1-73**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model NR-LRX

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	C	C0	MA		MB		MC		LM block	LM rail
	W1 0 -0.05	W2	M1	F	d1×d2×h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	25	12.5	17	40	6×9.5×8.5	3000	37.1 45.4	68.1 90.8	0.57 0.989	3.04 4.91	0.346 0.597	1.84 2.95	0.703 0.937		0.4 0.5	2.9
	28	16	21	80	7×11×9	3000	54.7 66.9	98.1 130.8	0.986 1.71	5.17 8.34	0.599 1.03	3.13 5.02	1.15 1.53		0.7 0.9	4.2
	34	18	24.5	80	9×14×12	3000	72.4 89.6	124.6 169.1	1.37 2.46	7.38 12.1	0.835 1.49	4.48 7.3	1.74 2.36		1 1.3	6
	45	20.5	29	105	14×20×17	3090	110.2 132	197.6 255.8	2.81 4.87	14.7 23	1.72 2.94	8.95 13.8	3.72 4.81		1.8 2.3	9.5
	53	23.5	36.5	120	16×23×20	3060	141.9 175.1	250.2 338.4	4.22 7.27	21.8 35.9	2.56 4.4	13.2 21.7	5.37 7.27		3.3 4.3	14
	63	31.5	43	150	18×26×22	3000	208.7 268.9	351.7 505.5	6.87 13.8	35 65.4	4.16 8.31	21.2 39.3	8.94 12.9		6 8.5	19.6
	75	35	44	150	22×32×26	3000	271 355	610 800	14.4 25.4	73.3 118	8.91 15.4	44.7 71.4	19.3 25.2		8.7 11.6	24.6
	85	35.5	48	180	24×35×28	3000	336 435	751 972	20.3 34.7	102 160	12.4 21	62.6 96.2	26.8 34.6		12.3 15.8	30.5
	100	50	57	210	26×39×32	3000	479 599	1040 1300	34 47.3	167 238	20.7 29.2	101 146	43.4 54.6		21.8 26.1	42.6

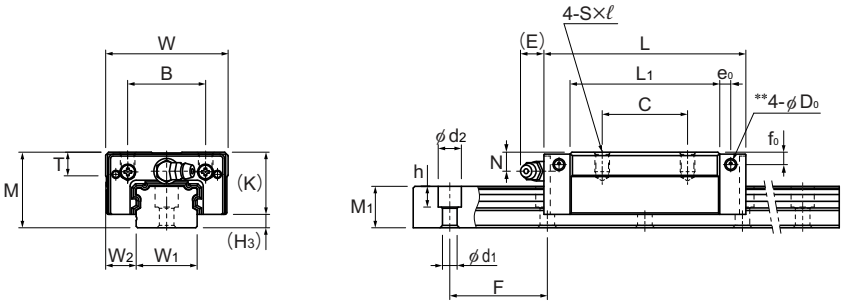
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-240**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models NRS-RX, NRS-LRX, NRS-R, and NRS-LR



Model NRS-RX

Model No.	Outer dimensions			LM block dimensions												Grease nipple	H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	f_0	E	e_0	D_0			
NRS 25RX NRS 25LRX	31	50	82.8 102	32	35 50	M6×8	61.4 80.6	9.7	25.5	7.8	5.1	12	4.5	3.9		B-M6F	5.5
NRS 30RX NRS 30LRX	38	60	98 120.5	40	40 60	M8×10	72.1 94.6	9.7	31	10.3	7	12	6.5	3.9		B-M6F	7
NRS 35RX NRS 35LRX	44	70	109.5 135	50	50 72	M8×12	79 104.5	11.7	35	12.1	8	12	6	5.2		B-M6F	9
NRS 45RX NRS 45LRX	52	86	138.2 171	60	60 80	M10×17	105 137.8	14.7	40.4	13.9	8	16	8.5	5.2		B-PT1/8	11.6
NRS 55RX NRS 55LRX	63	100	163.3 200.5	65	75 95	M12×18	123.6 160.8	17.7	49	16.6	10	16	10	5.2		B-PT1/8	14
NRS 65RX NRS 65LRX	75	126	186 246	76	70 110	M16×20	143.6 203.6	21.6	60	19	15	16	8.7	8.2		B-PT1/8	15
NRS 75R NRS 75LR	83	145	218 274	95	80 130	M18×25	170.2 226.2	25.3	68	18	17	16	9	8.2		B-PT1/8	15
NRS 85R NRS 85LR	90	156	246.7 302.8	100	80 140	M18×25	194.9 251	27.3	73	20	20	16	10	8.2		B-PT1/8	17
NRS 100R NRS 100LR	105	200	286.2 326.2	130	150 200	M18×27	223.4 263.4	34.3	85	23	23	10	12	8.2		B-PT1/4	20

Model number coding

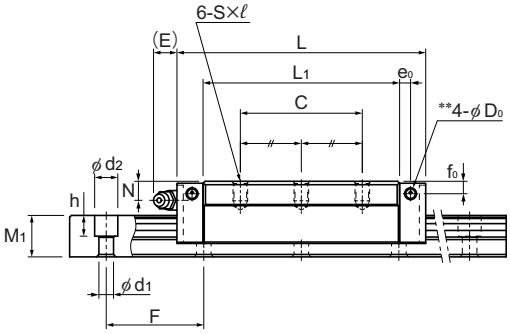
NRS45 LRX 2 QZ ZZHH C0 +1200L P T -II

- NRS45: Model number
- LRX: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- ZZHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol)/Light preload (C1) Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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 (*4)

(*1) See contamination protection accessory on **A1-543** (*2) See **A1-73**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model NRS-LRX

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	C	C0	MA		MB		MC		LM block	LM rail
	W1 0 -0.05	W2	M1	F	d1×d2×h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	25	12.5	17	40	6×9.5×8.5	3000	28.4 34.7	52.2 69.6	0.457 0.786	2.43 3.9	0.422 0.727	2.25 3.61	0.552 0.732		0.4 0.5	2.9
	28	16	21	80	7×11×9	3000	41.9 51.2	75.2 100.2	0.785 1.36	4.12 6.62	0.726 1.26	3.82 6.13	0.896 1.19		0.7 0.9	4.2
	34	18	24.5	80	9×14×12	3000	55.5 68.6	95.5 129.5	1.09 1.95	5.88 9.61	1.01 1.81	5.45 8.9	1.36 1.84		1 1.3	6
	45	20.5	29	105	14×20×17	3090	84.4 101.1	151.4 195.9	2.23 3.87	11.7 18.3	2.07 3.57	10.8 16.9	2.9 3.75		1.8 2.3	9.5
	53	23.5	36.5	120	16×23×20	3060	108.7 134.1	191.6 259.3	3.36 5.76	17.4 28.4	3.1 5.32	16.1 26.3	4.19 5.67		3.3 4.3	14
	63	31.5	43	150	18×26×22	3000	159.8 206	269.4 387.2	5.46 10.9	27.8 51.9	5.05 10.1	25.8 48	6.97 10.02		6 8.5	19.6
	75	35	44	150	22×32×26	3000	212 278	431 566	10.6 18.6	53.8 87	10.6 18.6	53.8 87	13.4 17.6		8.7 11.6	24.6
	85	35.5	48	180	24×35×28	3000	264 342	531 687	14.9 25.4	75.3 117	14.9 25.4	75.3 117	18.7 24.2		12.3 15.8	30.5
	100	50	57	210	26×39×32	3000	376 470	737 920	25.1 34.6	123 174	25.1 34.6	123 174	30.4 38.1		21.8 26.1	42.6

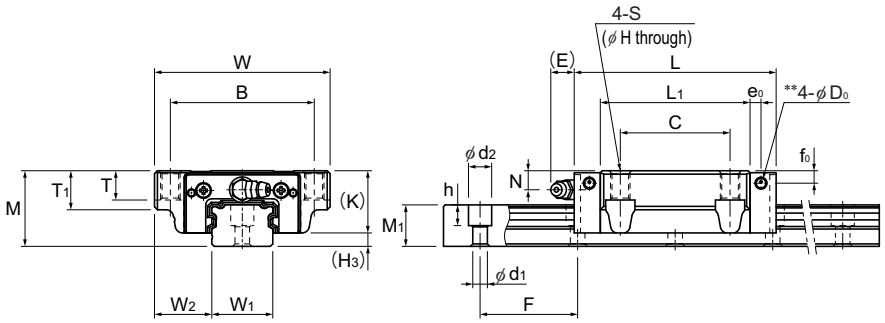
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-240**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models NR-CX and NR-LCX



Model NR-CX

Model No.	Outer dimensions			LM block dimensions														H_3
	Height M	Width W	Length L	B	C	S	H	L_1	T	T_1	K	N	f_0	E	e_0	D_0	Grease nipple	
NR 25CX NR 25LCX	31	72	82.8 102	59	45	M8	6.8	61.4 80.6	14.8	16	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
NR 30CX NR 30LCX	38	90	98 120.5	72	52	M10	8.5	72.1 94.6	16.9	18.1	31	10.3	7	12	6.5	3.9	B-M6F	7
NR 35CX NR 35LCX	44	100	109.5 135	82	62	M10	8.5	79 104.5	18.9	20.1	35	12.1	8	12	6	5.2	B-M6F	9
NR 45CX NR 45LCX	52	120	138.2 171	100	80	M12	10.5	105 137.8	20.6	22.1	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
NR 55CX NR 55LCX	63	140	163.3 200.5	116	95	M14	12.5	123.6 160.8	22.5	24	49	16.6	10	16	10	5.2	B-PT1/8	14
NR 65CX NR 65LCX	75	170	186 246	142	110	M16	14.5	143.6 203.6	26	28	60	19	15	16	8.7	8.2	B-PT1/8	15

Model number coding

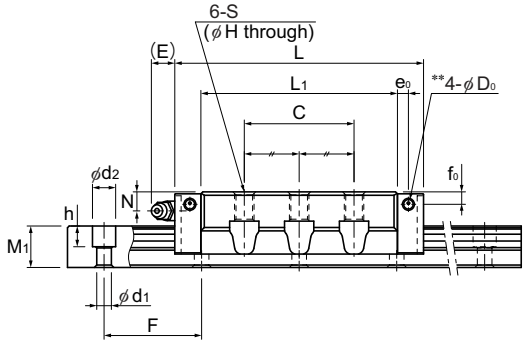
NR35 CX 2 QZ KKHH C0 +1400L P T -II

- NR35: Model number
- CX: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1400L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

(*1) See contamination protection accessory on A1-543 (*2) See A1-73. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model NR-LCX

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	25	23.5	17	40	6×9.5×8.5	3000	37.1 45.4	68.1 90.8	0.57 0.989	3.04 4.91	0.346 0.597	1.84 2.95	0.703 0.937		0.6 0.8	2.9
	28	31	21	80	7×11×9	3000	54.7 66.9	98.1 130.8	0.986 1.71	5.17 8.34	0.599 1.03	3.13 5.02	1.15 1.53		1.1 1.5	4.2
	34	33	24.5	80	9×14×12	3000	72.4 89.6	124.6 169.1	1.37 2.46	7.38 12.1	0.835 1.49	4.48 7.3	1.74 2.36		1.6 2	6
	45	37.5	29	105	14×20×17	3090	110.2 132	197.6 255.8	2.81 4.87	14.7 23	1.72 2.94	8.95 13.8	3.72 4.81		2.7 3.6	9.5
	53	43.5	36.5	120	16×23×20	3060	141.9 175.1	250.2 338.4	4.22 7.27	21.8 35.9	2.56 4.4	13.2 21.7	5.37 7.27		4.5 5.9	14
	63	53.5	43	150	18×26×22	3000	208.7 268.9	351.7 505.5	6.87 13.8	35 65.4	4.16 8.31	21.2 39.3	8.94 12.9		7.8 11	19.6

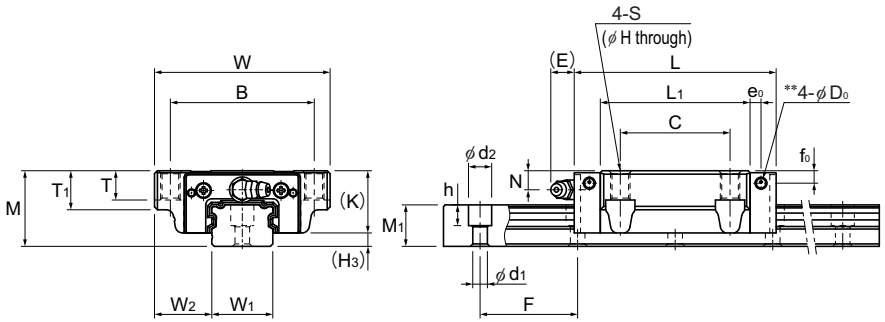
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-240**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models NRS-CX and NRS-LCX



Model NRS-CX

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	f_0	E	e_0	D_0			
NRS 25CX NRS 25LCX	31	72	82.8 102	59	45	M8	6.8	61.4 80.6	14.8	16	25.5	7.8	5.1	12	4.5	3.9	B-M6F	5.5
NRS 30CX NRS 30LCX	38	90	98 120.5	72	52	M10	8.5	72.1 94.6	16.9	18.1	31	10.3	7	12	6.5	3.9	B-M6F	7
NRS 35CX NRS 35LCX	44	100	109.5 135	82	62	M10	8.5	79 104.5	18.9	20.1	35	12.1	8	12	6	5.2	B-M6F	9
NRS 45CX NRS 45LCX	52	120	138.2 171	100	80	M12	10.5	105 137.8	20.6	22.1	40.4	13.9	8	16	8.5	5.2	B-PT1/8	11.6
NRS 55CX NRS 55LCX	63	140	163.3 200.5	116	95	M14	12.5	123.6 160.8	22.5	24	49	16.6	10	16	10	5.2	B-PT1/8	14
NRS 65CX NRS 65LCX	75	170	186 246	142	110	M16	14.5	143.6 203.6	26	28	60	19	15	16	8.7	8.2	B-PT1/8	15

Model number coding

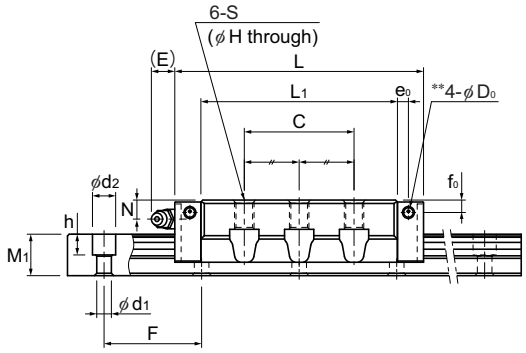
NRS45 LCX 2 QZ SSHH C0 +2040L P T -II

- NRS45: Model number
- LCX: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- SSHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +2040L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  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 (*4)

(*1) See contamination protection accessory on **A1-543** (*2) See **A1-73**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model NRS-LCX

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	25	23.5	17	40	6×9.5×8.5	3000	28.4 34.7	52.2 69.6	0.457 0.786	2.43 3.9	0.422 0.727	2.25 3.61	0.552 0.732		0.6 0.8	2.9
	28	31	21	80	7×11×9	3000	41.9 51.2	75.2 100.2	0.785 1.36	4.12 6.62	0.726 1.26	3.82 6.13	0.896 1.19		1.1 1.5	4.2
	34	33	24.5	80	9×14×12	3000	55.5 68.6	95.5 129.5	1.09 1.95	5.88 9.61	1.01 1.81	5.45 8.9	1.36 1.84		1.6 2	6
	45	37.5	29	105	14×20×17	3000	84.4 101.1	151.4 195.9	2.23 3.87	11.7 18.3	2.07 3.57	10.8 16.9	2.9 3.75		2.7 3.6	9.5
	53	43.5	36.5	120	16×23×20	3000	108.7 134.1	191.6 259.3	3.36 5.76	17.4 28.4	3.1 5.32	16.1 26.3	4.19 5.67		4.5 5.9	14
	63	53.5	43	150	18×26×22	3000	159.8 206	269.4 387.2	5.46 10.9	27.8 51.9	5.05 10.1	25.8 48	6.97 10.02		7.8 11	19.6

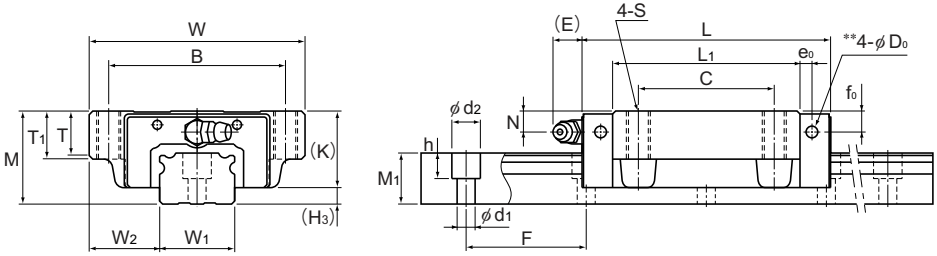
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-240**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models NR-A, NR-LA, NRS-A, and NRS-LA



Models NR-A and NRS-A

Model No.	Outer dimensions			LM block dimensions													Grease nipple	H3
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	T1	K	N	f0	E	e0	D0			
NR 75A NR 75LA	83	195	218 274	165	130	M18×30	170.2 226.2	28	30	68	18	17	16	9	8.2		B-PT1/8	15
NR 85A NR 85LA	90	215	246.7 302.8	185	140	M20×34	194.9 251	32	34	73	20	20	16	10	8.2		B-PT1/8	17
NR 100A NR 100LA	105	260	286.2 326.2	220	150 200	M20×38	223.4 263.4	35	38	85	23	23	10	12	8.2		B-PT1/4	20
NRS 75A NRS 75LA	83	195	218 274	165	130	M18×30	170.2 226.2	28	30	68	18	17	16	9	8.2		B-PT1/8	15
NRS 85A NRS 85LA	90	215	246.7 302.8	185	140	M20×34	194.9 251	32	34	73	20	20	16	10	8.2		B-PT1/8	17
NRS 100A NRS 100LA	105	260	286.2 326.2	220	150 200	M20×38	223.4 263.4	35	38	85	23	23	10	12	8.2		B-PT1/4	20

Model number coding

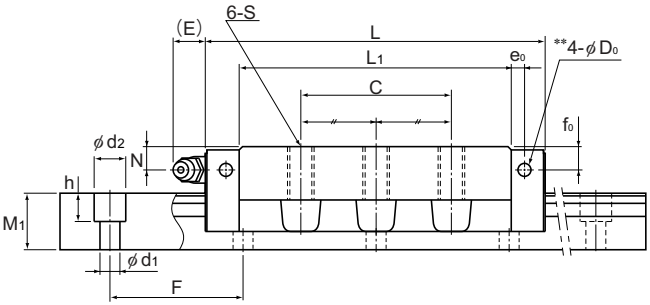
NR75 A 2 QZ KKHH C0 +1400L P Z T -II

- NR75: Model number
- A: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1400L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - Normal grade (No Symbol)/High accuracy grade (H)
  - Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- Z: With plate cover or steel tape (*4)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*5)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-79.
(*4) Specify the plate cover or the steel tape. (*5) 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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models NR-LA and NRS-LA

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	75	60	44	150	22×32×26	3000	271 355	610 800	14.4 25.4	73.3 118	8.91 15.4	44.7 71.4	19.3 25.2		11.3 15	24.6
	85	65	48	180	24×35×28	3000	336 435	751 972	20.3 34.7	102 160	12.4 21	62.6 96.2	26.8 34.6		16.2 20.7	30.5
	100	80	57	210	26×39×32	3000	479 599	1040 1300	34 47.3	167 238	20.7 29.2	101 146	43.4 54.6		26.7 31.2	42.6
	75	60	44	150	22×32×26	3000	212 278	431 566	10.6 18.6	53.8 87	10.6 18.6	53.8 87	13.4 17.6		11.3 15	24.6
	85	65	48	180	24×35×28	3000	264 342	531 687	14.9 25.4	75.3 117	14.9 25.4	75.3 117	18.7 24.2		16.2 20.7	30.5
	100	80	57	210	26×39×32	3000	376 470	737 920	25.1 34.6	123 174	25.1 34.6	123 174	30.4 38.1		26.7 31.2	42.6

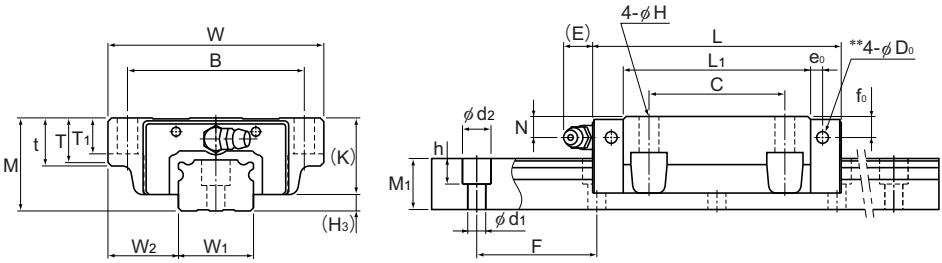
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-240**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models NR-B, NR-LB, NRS-B, and NRS-LB



Models NR-B and NRS-B

Model No.	Outer dimensions			LM block dimensions													Grease nipple	H_3
	Height M	Width W	Length L	B	C	H	L_1	t	T	T_1	K	N	f_0	E	e_0	D_0		
NR 75B NR 75LB	83	195	218 274	165	130	18	170.2 226.2	30	28	26	68	18	17	16	9	8.2	B-PT1/8	15
NR 85B NR 85LB	90	215	246.7 302.8	185	140	18	194.9 251	34	32	28	73	20	20	16	10	8.2	B-PT1/8	17
NR 100B NR 100LB	105	260	286.2 326.2	220	150 200	20	223.4 263.4	38	35	32	85	23	23	10	12	8.2	B-PT1/4	20
NRS 75B NRS 75LB	83	195	218 274	165	130	18	170.2 226.2	30	28	26	68	18	17	16	9	8.2	B-PT1/8	15
NRS 85B NRS 85LB	90	215	246.7 302.8	185	140	18	194.9 251	34	32	28	73	20	20	16	10	8.2	B-PT1/8	17
NRS 100B NRS 100LB	105	260	286.2 326.2	220	150 200	20	223.4 263.4	38	35	32	85	23	23	10	12	8.2	B-PT1/4	20

Model number coding

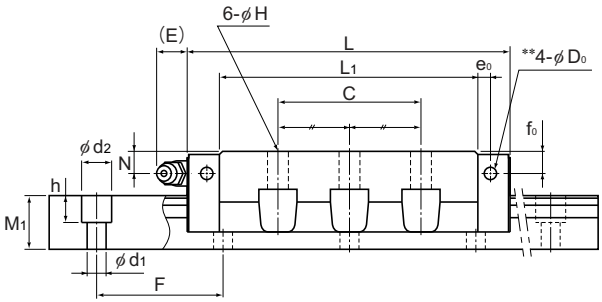
NR75 B 2 QZ DDHH C0 +1080L P Z T -II

- NR75: Model number
- B: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- DDHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1080L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - Normal grade (No Symbol)/High accuracy grade (H)
  - Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- Z: With plate cover or steel tape (*4)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*5)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-73**. (*3) See **A1-79**.
(*4) Specify the plate cover or the steel tape. (*5) 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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models NR-LB and NRS-LB

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	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
	75	60	44	150	22×32×26	3000	271 355	610 800	14.4 25.4	73.3 118	8.91 15.4	44.7 71.4	19.3 25.2		11.3 15	24.6
	85	65	48	180	24×35×28	3000	336 435	751 972	20.3 34.7	102 160	12.4 21	62.6 96.2	26.8 34.6		16.2 20.7	30.5
	100	80	57	210	26×39×32	3000	479 599	1040 1300	34 47.3	167 238	20.7 29.2	101 146	43.4 54.6		26.7 31.2	42.6
	75	60	44	150	22×32×26	3000	212 278	431 566	10.6 18.6	53.8 87	10.6 18.6	53.8 87	13.4 17.6		11.3 15	24.6
	85	65	48	180	24×35×28	3000	264 342	531 687	14.9 25.4	75.3 117	14.9 25.4	75.3 117	18.7 24.2		16.2 20.7	30.5
	100	80	57	210	26×39×32	3000	376 470	737 920	25.1 34.6	123 174	25.1 34.6	123 174	30.4 38.1		26.7 31.2	42.6

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-240**.)
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
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A**1-12**, Lubricant: see A**24-2**)
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 A**1-517** or A**1-539**)

** 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.

Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of models NR-X/NRS-X 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.

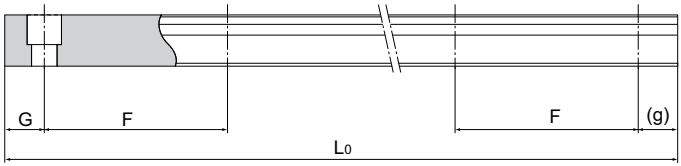


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Models NR-X/NRS-X

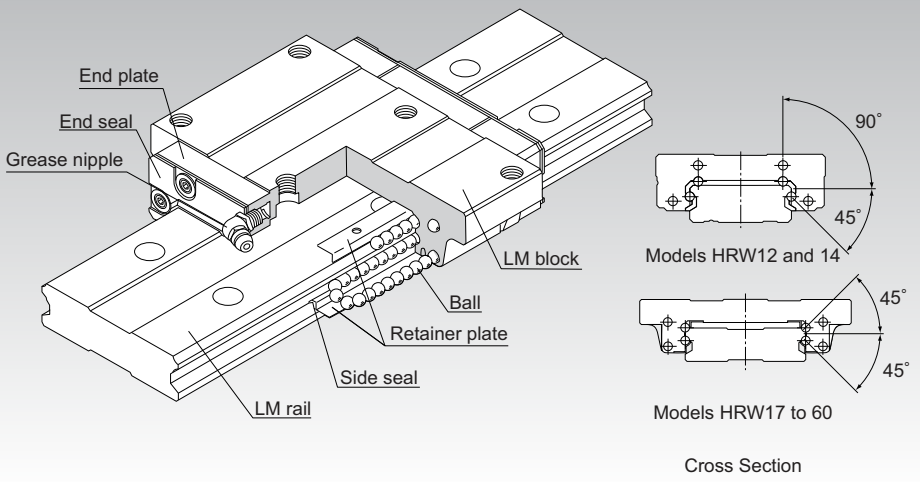
Unit: mm

Model No.	NR/NRS25X	NR/NRS30X	NR/NRS35X	NR/NRS45X	NR/NRS55X	NR/NRS65X	NR/NRS75	NR/NRS85	NR/NRS100
LM rail standard lengths (L_0)	230	280	280	570	780	1270	1280	1530	1340
	270	360	360	675	900	1570	1580	1890	1760
	350	440	440	780	1020	2020	2030	2250	2180
	390	520	520	885	1140	2620	2630	2610	2600
	470	600	600	990	1260				
	510	680	680	1095	1380				
	590	760	760	1200	1500				
	630	840	840	1305	1620				
	710	920	920	1410	1740				
	750	1000	1000	1515	1860				
	830	1080	1080	1620	1980				
	950	1160	1160	1725	2100				
	990	1240	1240	1830	2220				
	1070	1320	1320	1935	2340				
	1110	1400	1400	2040	2460				
	1190	1480	1480	2145	2580				
	1230	1560	1560	2250	2700				
	1310	1640	1640	2355	2820				
	1350	1720	1720	2460	2940				
	1430	1800	1800	2565	3060				
	1470	1880	1880	2670					
	1550	1960	1960	2775					
	1590	2040	2040	2880					
	1710	2200	2200	2985					
	1830	2360	2360	3090					
	1950	2520	2520						
	2070	2680	2680						
	2190	2840	2840						
	2310	3000	3000						
	2430								
	2470								
Standard pitch F	40	80	80	105	120	150	150	180	210
G, g	15	20	20	22.5	30	35	40	45	40
Max length	3000	3000	3000	3090	3060	3000	3000	3000	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.

HRW

Wide-Rail LM Guide Model HRW



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-74
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-491
Reference Error Tolerance for the Mounting Surface	A1-495
Dimensions of Each Model with Options Attached	A1-517

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. Since retainer plates hold the balls, they will not fall out even if the LM block is removed from the LM rail (except models HRW 12 and 14LR).
Each row of balls is placed at a contact angle of 45° so that the load ratings 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 constantly low friction coefficient. The LM rail is wide and has a low center of gravity with a low overall height, so it can be used as a single axis in locations where space is limited or where high rigidity is required due to moment loads.

Compact with Large Load Capacity

Because of the large number of load-bearing balls, this model is highly rigid in all directions. The LM rail is wide and sufficient to receive a moment load even in a single rail configuration.
Additionally, since the secondary cross-sectional moment of inertia of the LM rail is large, the rigidity in the lateral directions is also high. Accordingly, it does not need reinforcement such as a side support.

Self-Adjustment Capability

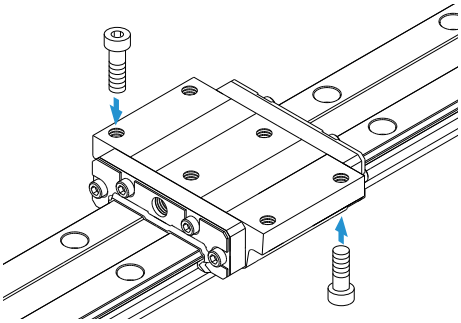
The self-adjustment capability of the front-to-front configuration of THK's unique circular-arc grooves (DF set) enables mounting error to be absorbed even under a preload, thus achieving highly accurate and smooth linear motion.

Types and Features

Model HRW-CA

Dimensional Table⇒A1-246

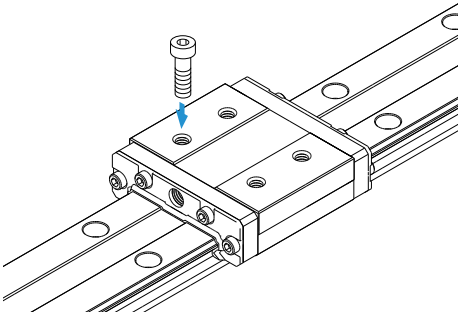
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.



Model HRW-CR

Dimensional Table⇒A1-248

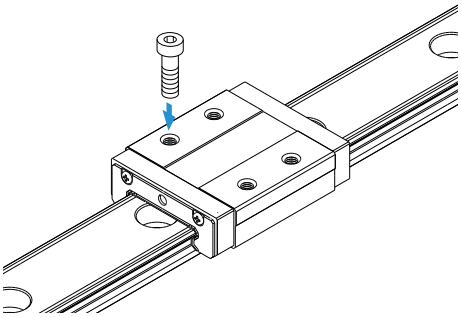
Models HRW17/21CR have four tapped holes in the LM block. Models HRW27/35/50CR have six tapped holes in the LM block.



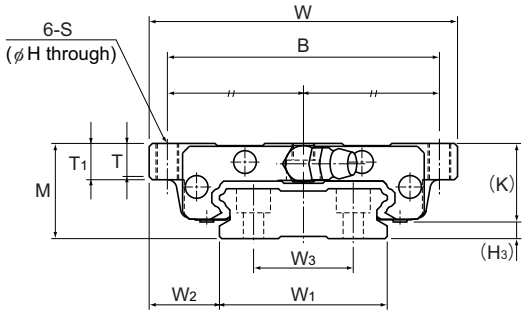
Miniature Model HRW-LRM

Dimensional Table⇒A1-248

The LM block has tapped holes.



Models HRW-CA and HRW-CAM



Model No.	Outer dimensions			LM block dimensions											
	Height	Width	Length											Grease nipple	
	M	W	L	B	C	H	S	L_1	T	T_1	K	N	E		H_3
HRW 17CA HRW 17CAM	17	60	50.8	53	26	3.3	M4	33.6	5.5	6	14.5	4	2	PB107	2.5
HRW 21CA HRW 21CAM	21	68	58.8	60	29	4.4	M5	40	7.3	8	18	4.5	12	B-M6F	3
HRW 27CA HRW 27CAM	27	80	72.8	70	40	5.3	M6	51.8	9.5	10	24	6	12	B-M6F	3
HRW 35CA HRW 35CAM	35	120	106.6	107	60	6.8	M8	77.6	13	14	31	8	12	B-M6F	4
HRW 50CA	50	162	140.5	144	80	8.6	M10	103.5	16.5	18	46.6	14	16	B-PT1/8	3.4
HRW 60CA	60	200	158.9	180	80	10.5	M12	117.5	23.5	25	53.5	15	16	B-PT1/8	6.5

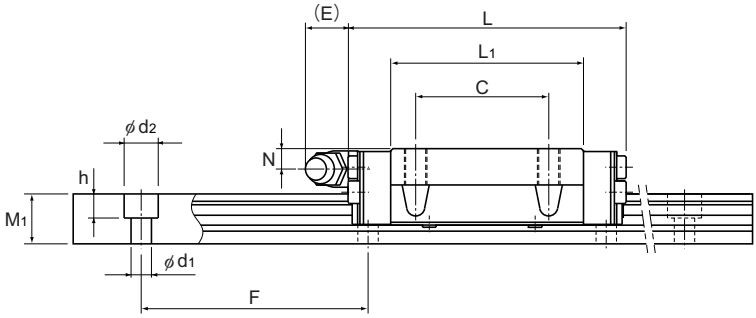
Model number coding

HRW35 CA 2 UU C1 M +1000L P T M

- HRW35: Model number
- CA: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- M: Stainless steel LM block
- +1000L: LM rail length (in mm)
- P: Symbol for LM rail jointed use
- T: Accuracy symbol (*3)
  - Normal grade (No Symbol)/High accuracy grade (H)
  - Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- M: Stainless steel LM rail

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



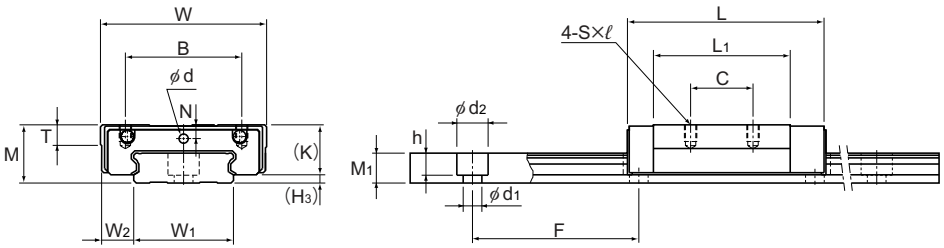
Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*					Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 ±0.05	W_2	W_3	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
	33	13.5	18	9	40	4.5×7.5×5.3	1900 (800)	5.53	9.1	0.0464	0.272	0.0464	0.272	0.144	0.15	2.1
	37	15.5	22	11	50	4.5×7.5×5.3	3000 (1000)	8.02	12.9	0.0784	0.445	0.0784	0.445	0.219	0.25	2.9
	42	19	24	15	60	4.5×7.5×5.3	3000 (1200)	14.2	21.6	0.166	0.923	0.166	0.923	0.423	0.5	4.3
	69	25.5	40	19	80	7×11×9	3000 (2120)	33.8	48.6	0.559	3.03	0.559	3.03	1.59	1.4	9.9
	90	36	60	24	80	9×14×12	3000	62.4	86.3	1.32	7.08	1.32	7.08	3.67	4	14.6
	120	40	80	31	105	11×17.5×14	3000	80.3	109	1.88	10.1	1.88	10.1	6.17	5.7	27.8

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-250**.)
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 **A1-517** or **A1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.

Options⇒A1-503

Models HRW-CR, HRW-CRM, and HRW-LRM



Models HRW12 and 14LRM

Model No.	Outer dimensions			LM block dimensions										
	Height	Width	Length									Lubrication hole	Grease nipple	
	M	W	L	B	C	S×ℓ	L_1	T	K	N	E	d		H_3
HRW 12LRM	12	30	37	21	12	M3×3.5	27	4	10	2.8	—	2.2	—	2
HRW 14LRM	14	40	45.5	28	15	M3×4	32.9	5	12	3.3	—	2.2	—	2
HRW 17CR HRW 17CRM	17	50	50.8	29	15	M4×5	33.6	6	14.5	4	2	—	PB107	2.5
HRW 21CR HRW 21CRM	21	54	58.8	31	19	M5×6	40	8	18	4.5	12	—	B-M6F	3
HRW 27CR HRW 27CRM	27	62	72.8	46	32	M6×6	51.8	10	24	6	12	—	B-M6F	3
HRW 35CR HRW 35CRM	35	100	106.6	76	50	M8×8	77.6	14	31	8	12	—	B-M6F	4
HRW 50 CR	50	130	140.5	100	65	M10×15	103.5	18	46.6	14	16	—	B-PT1/8	3.4

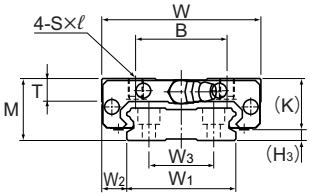
Model number coding

HRW27 CR 2 UU C1 M +820L P T M

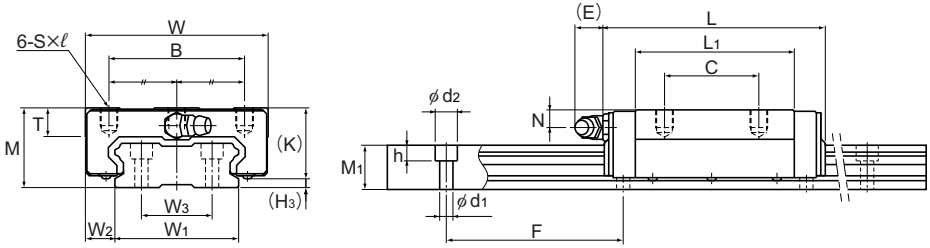
- HRW27: Model number
- CR: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- M: Stainless steel LM block
- +820L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  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
- M: Stainless steel LM rail

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HRW17 and 21CR/CRM



Models HRW27, 35CR/CRM, and HRW50CR

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*					Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 ±0.05	W_2	W_3	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
	18	6	—	6.5	40	4.5×8×4.5	(1000)	3.29	7.16	0.0262	0.138	0.013	0.069	0.051	0.045	0.79
	24	8	—	7.2	40	4.5×7.5×5.3	(1430)	5.38	11.4	0.0499	0.273	0.025	0.137	0.112	0.08	1.2
	33	8.5	18	9	40	4.5×7.5×5.3	1900 (800)	5.53	9.1	0.0464	0.272	0.0464	0.272	0.144	0.12	2.1
	37	8.5	22	11	50	4.5×7.5×5.3	3000 (1000)	8.02	12.9	0.0784	0.445	0.0784	0.445	0.219	0.19	2.9
	42	10	24	15	60	4.5×7.5×5.3	3000 (1200)	14.2	21.6	0.166	0.923	0.166	0.923	0.423	0.37	4.3
	69	15.5	40	19	80	7×11×9	3000 (2120)	33.8	48.6	0.559	3.03	0.559	3.03	1.59	1.2	9.9
	90	20	60	24	80	9×14×12	3000	62.4	86.3	1.32	7.08	1.32	7.08	3.67	3.2	14.6

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-250**.)
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 **A1-517** or **A1-539**)
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel. The stainless steel provides excellent corrosion and environmental resistance.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction for models 12 and 14, as those values are different.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard and maximum lengths of the HRW 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 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.

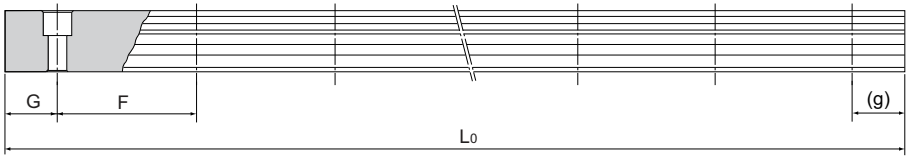


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HRW

Unit: mm

Model No.	HRW 12	HRW 14	HRW 17	HRW 21	HRW 27	HRW 35	HRW 50	HRW 60
LM rail standard lengths (L_0)	70 110 150 190 230 270 310 390 470	70 110 150 190 230 270 310 390 470 550 670	110 190 310 470 550	130 230 380 480 580 780	160 280 340 460 640 820	280 440 760 1000 1240 1560	280 440 760 1000 1240 1640 2040	570 885 1200 1620 2040 2460
Standard pitch F	40	40	40	50	60	80	80	105
G, g	15	15	15	15	20	20	20	22.5
Max length	(1000)	(1430)	1900 (800)	3000 (1000)	3000 (1200)	3000 (2120)	3000	3000

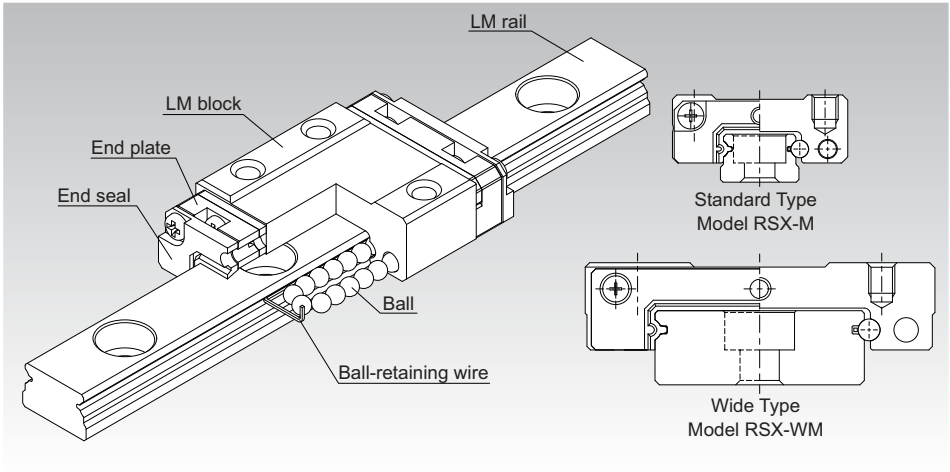
Note1) The maximum length varies with accuracy grades. Contact THK for details.
Note2) If jointed rails are not allowed and a greater length than the maximum values above is required, contact THK.
Note3) The figures in the parentheses indicate the maximum lengths of stainless steel made models.

Preventing the LM Block from Falling off of the LM Rail

In miniature model HRW, the balls fall out if the LM block comes off the LM rail.
For this reason, LM Guide assemblies are delivered with a part which prevents the LM block from coming off the rail. If you remove this part when using the product, please take precautions to avoid overrunning the blocks off of the rail.

RSX

Miniature LM Guide Model RSX



Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-85
Shoulder Height of the Mounting Base and the Corner Radius A1-493
Reference Error Tolerance for the Mounting Surface A1-495
Flatness of the Mounting Surface A1-496
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in two 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 recirculate. The Model RSX uses two rows of raceways, and it can help reduce the size of a device because it has more compact outer dimensions than models with four raceways. In addition, despite its compact size, the ball contact structure can take loads in each direction, so it can be used with a single axis in locations where moments are applied.

Super Compact

The LM rail has one raceway on each side, and its compact design with low cross-sectional height allows it to be installed in locations with limited space.

Corrosion Prevention

The LM rail, LM block, and balls are made of stainless steel, which has high corrosion resistance.

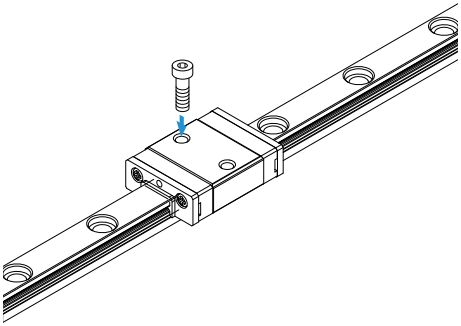
Retains Balls

This model incorporates a ball-retaining wire that prevents balls from falling out when the LM block is removed from and inserted onto the LM rail, making mounting easy.

Model RSX5M

Dimensional Table⇒A1-258

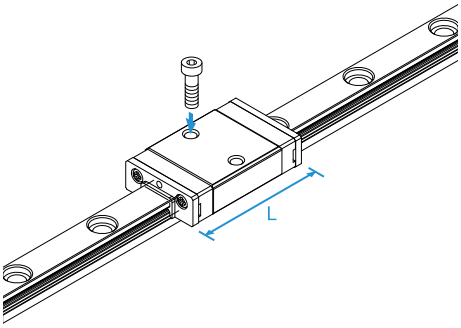
This is the smallest model of RSX.



Model RSX5NM

Dimensional Table⇒A1-258

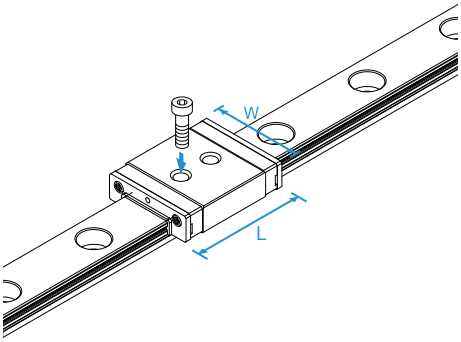
This type has a longer overall LM block length (L) and a larger load rating and permissible moment than the Model RSX5M.



Model RSX5WM

Dimensional Table⇒A1-260

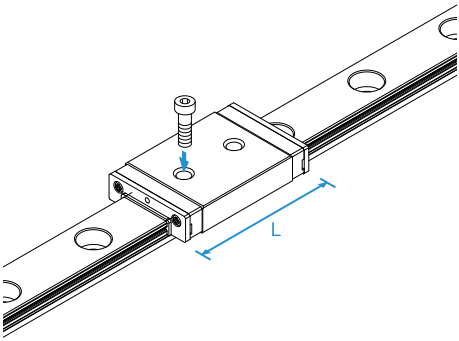
This type has a longer overall LM block length (L), a greater width, and a larger load rating and permissible moment than the Model RSX5M.



Model RSX5WNM

Dimensional Table⇒A1-260

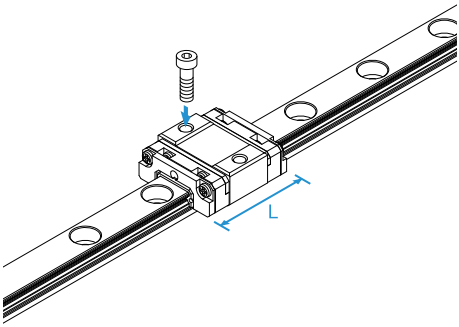
This type has a longer overall LM block length (L) and a larger load rating and permissible moment than the Model RSX5WM.



Model RSX-SM

Dimensional Table⇒A1-258

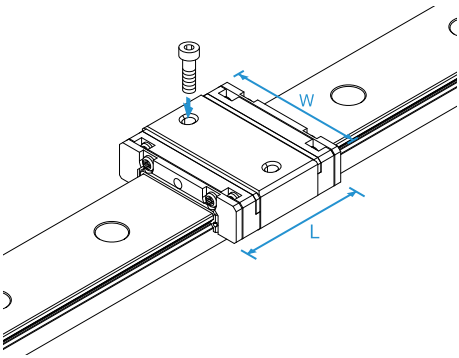
This type has a shorter overall LM block length (L) than the Model RSX-M.



Model RSX-WSM

Dimensional Table⇒A1-260

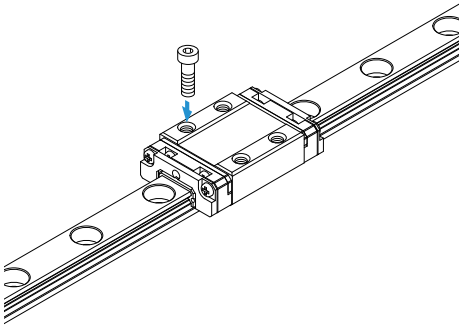
This type has a longer overall LM block length (L), a greater width, and a larger load rating and permissible moment than the Model RSX-SM.



Model RSX-M

Dimensional Table⇒A1-258

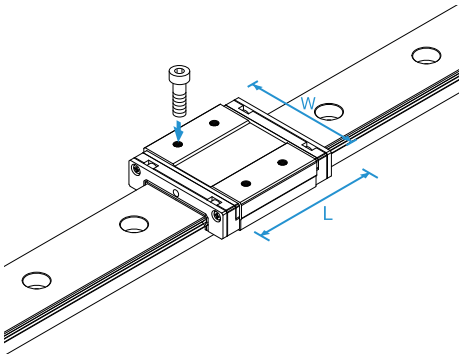
This is the standard type of RSX.



Model RSX-WM

Dimensional Table⇒A1-260

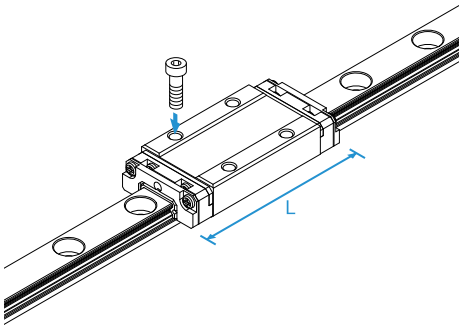
This type has a longer overall LM block length (L), a greater width and a larger load rating and permissible moment than RSX-M.



Model RSX-NM

Dimensional Table⇒A1-258

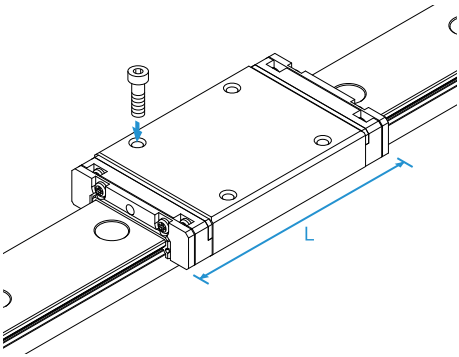
This type has a longer overall LM block length (L) and a larger load rating and permissible moment than the Model RSX-M.



Model RSX-WNM

Dimensional Table⇒A1-260

This type has a longer overall LM block length (L) and a larger load rating and permissible moment than the Model RSX-WM.



Flatness of the LM Rail and the LM Block Mounting Surface

Since the Model RSX has Gothic-arch grooves, any precision errors in the mounting surface may negatively affect its operability. Therefore, we recommend using it on mounting surfaces made with high precision.

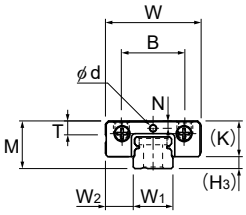
Table 1: Flatness of the LM Rail and the LM Block Mounting Surface

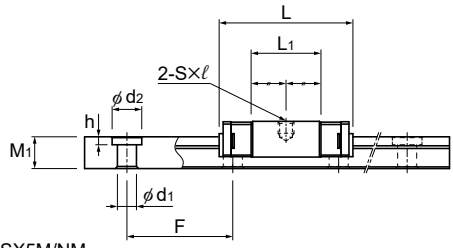
Unit: mm

Model No.	Flatness error
RSX 5	0.015/200
RSX 7	0.025/200
RSX 9	0.035/200
RSX 12	0.050/200
RSX 15	0.060/200

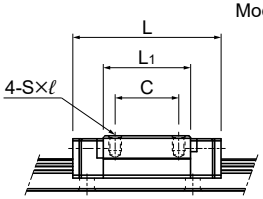
Note1) As there are many cases in which the mounting surface precision is affected by a number of factors, we recommend using 70% or less of the values shown.
Note2) The above figures apply to normal clearances. When using two or more rails with C1 clearance, we recommend using 50% or less of the values shown.

Models RSX-SM, RSX-M, and RSX-NM

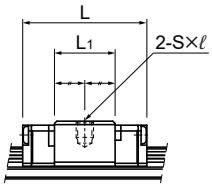




Models RSX5M/NM



Models RSX7 to 12M/NM



Models RSX7 to 12SM

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
RSX 5M	6	12	16.9	8	—	M2×1.5	8.8	—	4.5	0.93	—	0.8	—	1.5
RSX 5NM	6	12	20.1	8	—	M2×1.5	12	—	4.5	0.93	—	0.8	—	1.5
RSX 7SM	8	17	19	12	—	M2×2.6	9	—	6.5	1.7	—	1.2	—	1.5
RSX 7M	8	17	23.4	12	8	M2×2.6	13.4	—	6.5	1.7	—	1.2	—	1.5
RSX 7NM	8	17	31	12	13	M2×2.6	21	—	6.5	1.7	—	1.2	—	1.5
RSX 9SM	10	20	21.5	15	—	M3×2.8	10.5	—	7.8	2.4	—	1.6	—	2.2
RSX 9M	10	20	30.8	15	10	M3×2.8	19.8	—	7.8	2.4	—	1.6	—	2.2
RSX 9NM	10	20	40.8	15	16	M3×2.8	29.8	—	7.8	2.4	—	1.6	—	2.2
RSX 12SM	13	27	25.6	20	—	M3×3.5	11.2	5.3	10	3	—	2	—	3
RSX 12M	13	27	35	20	15	M3×3.5	20.6	5.3	10	3	—	2	—	3
RSX 12NM	13	27	47.7	20	20	M3×3.5	33.3	5.3	10	3	—	2	—	3
RSX 15SM	16	32	31.9	25	—	M3×4	14.7	5.8	12	3	4	—	PB107	4
RSX 15M	16	32	42.9	25	20	M3×4	25.7	5.8	12	3	4	—	PB107	4
RSX 15NM	16	32	60.7	25	25	M3×4	43.5	5.8	12	3	4	—	PB107	4

Note) Since stainless steel is used in the LM block, LM rail, and balls, these models are highly resistant to corrosion and environment. Using a lubrication hole for anything other than greasing may cause damage.

Model number coding

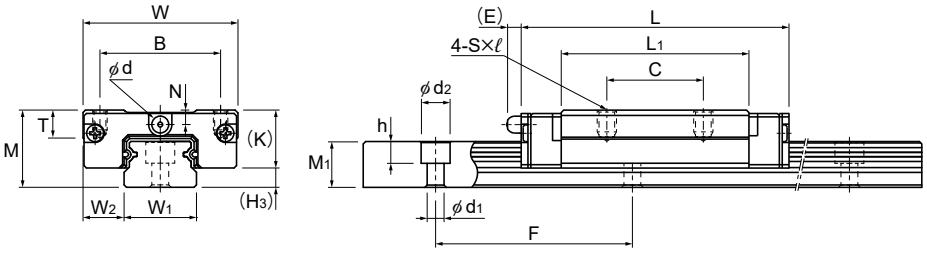
2 RSX12M UU C1 +220L P M -II

- 2: No. of LM blocks used on the same rail (*1)
- RSX12M: Model number
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3) — Normal (No symbol), Light preload (C1)
- +220L: LM rail length (in mm)
- P: Accuracy symbol (*4) — Normal grade (No Symbol)/High accuracy grade (H)/Precision grade (P)
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*5)

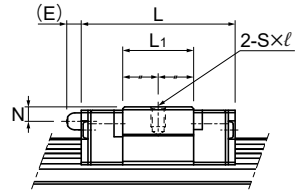
(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) See A1-13.

Note) This model number indicates that a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2 at a minimum).

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models RSX15M/NM



Model RSX15SM

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment N·m*					Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1 $^{0}_{-0.02}$	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
	5	3.5	4	15	2.4×3.5×1	220	0.37	0.53	0.789	5.79	0.923	6.79	1.38	0.002	0.136
	5	3.5	4	15	2.4×3.5×1	220	0.45	0.7	1.34	8.78	1.56	10.3	1.82	0.003	0.136
	7	5	4.7	15	2.4×4.2×2.3	480	0.95	1.16	1.96	14.7	2.25	16.9	4.49	0.005	0.227
	7	5	4.7	15	2.4×4.2×2.3	480	1.16	1.54	3.27	23.1	3.77	26.7	5.96	0.008	0.227
	7	5	4.7	15	2.4×4.2×2.3	480	1.63	2.51	8.08	48.4	9.32	56	9.71	0.012	0.227
	9	5.5	5.5	20	3.5×6×3.3	1240	1.37	1.53	2.85	22.6	3.27	26	7.04	0.008	0.32
	9	5.5	5.5	20	3.5×6×3.3	1240	2.22	3.06	9.87	57.9	11.4	66.9	14.1	0.018	0.32
	9	5.5	5.5	20	3.5×6×3.3	1240	2.94	4.59	21.1	111	24.4	128	21.1	0.024	0.32
	12	7.5	7.5	25	3.5×6×4.5	2000	2.07	2.1	4.17	38.1	4.17	38.1	13.8	0.015	0.65
	12	7.5	7.5	25	3.5×6×4.5	2000	3.36	4.21	14.2	92.5	14.2	92.5	27.6	0.037	0.65
	12	7.5	7.5	25	3.5×6×4.5	2000	4.72	6.83	34.8	195	34.8	195	44.7	0.047	0.65
	15	8.5	9.5	40	3.5×6×4.5	2000	4.01	4.24	12.6	92.6	12.6	92.6	30.1	0.03	0.96
	15	8.5	9.5	40	3.5×6×4.5	2000	5.59	6.78	29	186	29	186	48.1	0.069	0.96
	15	8.5	9.5	40	3.5×6×4.5	2000	8.27	11.8	82.1	432	82.1	432	84.3	0.089	0.96

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-262.)
Static permissible moment* 1 block: The static permissible moment with one LM block
2 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).
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A1-61 to calculate the load rating for loads in the reverse-radial direction or lateral direction.

- Reference bolt tightening torques when mounting an LM block for models RSX 5 and 7 are shown in the table below.

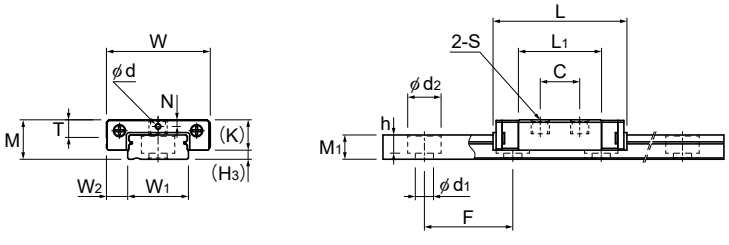
Reference Tightening Torque

Model No.	Model No. of screw	Screw depth (mm)	Reference tightening torque (N·m)*
RSX 5	M2	1.5	0.4
RSX 7	M2	2.3	0.4

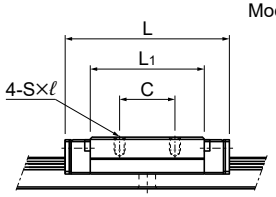
* Tightening above the tightening torque affects accuracy.
Be sure to tighten at or below the defined tightening torque.

Options⇒A1-503

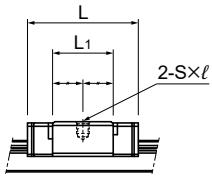
Models RSX-WSM, RSX-WM, and RSX-WNM



Models RSX5WM/WNM



Models RSX7 to 12WM/WNM



Models RSX7 to 12WSM

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
RSX 5WM	6.5	17	22.1	—	6.5	M3 through	13.7	—	5	1.1	—	0.8	—	1.5
RSX 5WNM	6.5	17	28.1	—	11	M3 through	19.7	—	5	1.1	—	0.8	—	1.5
RSX 7WSM	9	25	22.5	19	—	M3×2.8	11.9	—	7	1.8	—	1.2	—	2
RSX 7WM	9	25	31	19	10	M3×2.8	20.4	—	7	1.8	—	1.2	—	2
RSX 7WNM	9	25	40.9	19	17	M3×2.8	30.3	—	7	1.8	—	1.2	—	2
RSX 9WSM	12	30	26.5	21	—	M3×2.8	14.5	—	8.3	2.3	—	1.6	—	3.7
RSX 9WM	12	30	39	21	12	M3×2.8	27	—	8.3	2.3	—	1.6	—	3.7
RSX 9WNM	12	30	50.7	23	24	M3×2.8	38.7	—	8.3	2.3	—	1.6	—	3.7
RSX 12WSM	14	40	30.5	28	—	M3×3.5	16.9	4.5	10	3	—	2	—	4
RSX 12WM	14	40	44.5	28	15	M3×3.5	30.9	4.5	10	3	—	2	—	4
RSX 12WNM	14	40	59.5	28	28	M3×3.5	45.9	4.5	10	3	—	2	—	4
RSX 15WSM	16	60	41.5	45	—	M4×4.5	24.9	5.6	12	3	4	—	PB107	4
RSX 15WM	16	60	55.5	45	20	M4×4.5	38.9	5.6	12	3	4	—	PB107	4
RSX 15WNM	16	60	74.5	45	35	M4×4.5	57.9	5.6	12	3	4	—	PB107	4

Note) Since stainless steel is used in the LM block, LM rail, and balls, these models are highly resistant to corrosion and environment. Using a lubrication hole for anything other than greasing may cause damage.

Model number coding

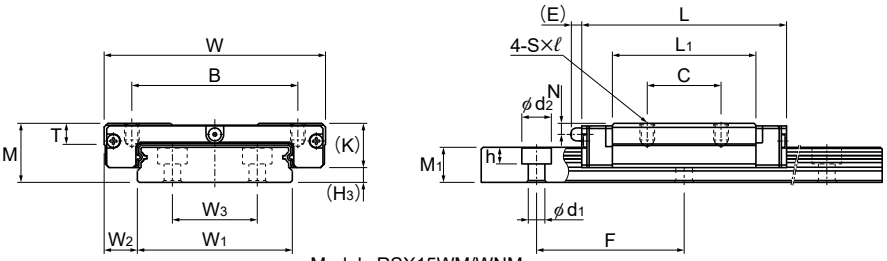
2 RSX12WM UU C1 +220L P M -II

- 2: No. of LM blocks used on the same rail (*1)
- RSX12WM: Model number
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3) — Normal (No symbol), Light preload (C1)
- +220L: LM rail length (in mm)
- P: Accuracy symbol (*4) — Normal grade (No Symbol)/High accuracy grade (H), Precision grade (P)
- M: Stainless steel LM rail
- -II: Symbol for No. of rails used on the same plane (*5)

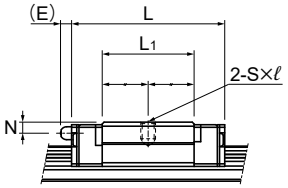
(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) See A1-13.

Note) This model number indicates that a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2 at a minimum).

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models RSX15WM/WNM



Model RSX15WSM

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment N·m*					Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	$W_1{}^{0}_{-0.02}$	W_2	W_3	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
	10	3.5	—	4	20	3×5.5×3	220	0.5	0.82	1.79	11.1	2.1	13	4.18	0.006	0.276
	10	3.5	—	4	20	3×5.5×3	220	0.64	1.17	3.54	19.6	4.15	23	5.97	0.008	0.276
	14	5.5	—	5.2	30	3.5×6×3.2	480	1.06	1.35	2.58	20	2.96	23.1	9.95	0.011	0.54
	14	5.5	—	5.2	30	3.5×6×3.2	480	1.63	2.51	8.08	46.9	9.32	54.2	18.5	0.018	0.54
	14	5.5	—	5.2	30	3.5×6×3.2	480	2.12	3.66	16.6	87.7	19.2	101	27	0.027	0.54
	18	6	—	7.5	30	3.5×6×4.5	1430	1.73	2.14	5.15	36.9	5.92	42.6	20.2	0.018	1.01
	18	6	—	7.5	30	3.5×6×4.5	1430	2.8	4.28	18.5	99.3	21.4	115	40.5	0.035	1.01
	18	6	—	7.5	30	3.5×6×4.5	1430	3.48	5.81	33.2	172	38.3	199	54.9	0.048	1.01
	24	8	—	8.5	40	4.5×8×4.5	2000	3.05	3.68	11.1	72.6	11.1	72.6	46.2	0.033	1.52
	24	8	—	8.5	40	4.5×8×4.5	2000	4.46	6.31	30	171	30	171	79.2	0.075	1.52
	24	8	—	8.5	40	4.5×8×4.5	2000	5.93	9.46	64.7	332	64.7	332	119	0.091	1.52
	42	9	23	9.5	40	4.5×8×4.5	2000	5.59	6.78	29	178	29	178	140	0.083	2.87
	42	9	23	9.5	40	4.5×8×4.5	2000	7.43	10.1	61.4	343	61.4	343	211	0.17	2.87
	42	9	23	9.5	40	4.5×8×4.5	2000	9.87	15.2	133	670	133	670	316	0.195	2.87

Note1) The maximum length under "Length* " indicates the standard maximum length of an LM rail. (See A1-262.)
Static permissible moment* 1 block: The static permissible moment with one LM block
2 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).
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A1-61 to calculate the load rating for loads in the reverse-radial direction or lateral direction.

- Reference bolt tightening torques when mounting an LM block for models RSX 5W and 7W are shown in the table below.

Reference Tightening Torque

Model No.	Model No. of screw	Screw depth (mm)	Reference tightening torque (N·m)*
RSX 5W	M2	1.5	0.4
RSX 7W	M2	2.8	0.4

* Tightening above the tightening torque affects accuracy.
Be sure to tighten at or below the defined tightening torque.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 2 shows the standard lengths and the maximum lengths of model RSX 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 dimension from the table. As the G and g dimensions increase, this portion becomes less stable, and the accuracy performance is severely impacted.

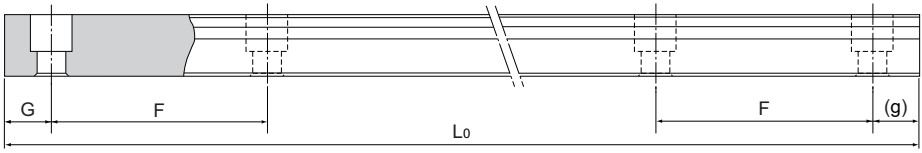


Table 2: Standard Lengths and Maximum Lengths of LM Rails for Model RSX

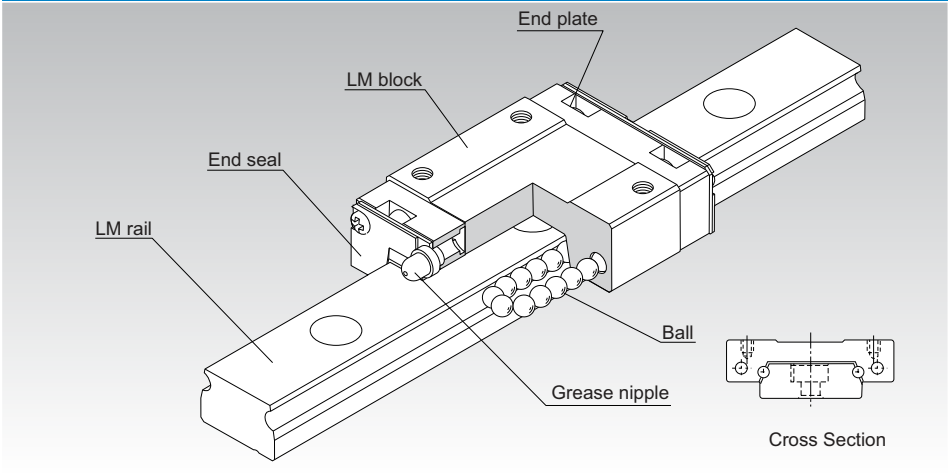
Unit: mm

Model No.	RSX 5	RSX 5W	RSX 7	RSX 7W	RSX 9	RSX 9W	RSX 12	RSX 12W	RSX 15	RSX 15W
LM rail standard lengths (L_0)	40 55 70 100 130 160	50 70 90 110 130 150 170	40 55 70 85 100 115 130	50 80 110 140 170 200 260 290	55 75 95 115 135 155 175 195 275 375	50 80 110 140 170 200 260 290 320	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 390 470 550	70 110 150 190 230 270 310 350 390 430 470 550 670 870	110 150 190 230 270 310 430 550 670 790
Standard pitch F	15	20	15	30	20	30	25	40	40	40
G,g	5	5	5	10	7.5	10	10	15	15	15
Max length	220	220	480	480	1240	1430	2000	2000	2000	2000

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.

RSR

Miniature LM Guide Model RSR



Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-74
Accuracy Standards A1-85
Shoulder Height of the Mounting Base and the Corner Radius A1-493
Reference Error Tolerance for the Mounting Surface A1-495
Flatness of the Mounting Surface A1-496
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in two 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.
Since balls circulate in a compact structure, the LM Block is able to provide infinite linear motion and thus infinite stroke.
The LM block is designed to have high rigidity in a limited space, and in combination with large-diameter balls, it demonstrates high rigidity in all directions.

Super Compact

This model is a highly reliable LM System because it is not susceptible to cage displacement, a problem common in cross-roller guides, ball slides, and other products with finite stroke.

Capable of Receiving a Load in Any Direction

This model is capable of receiving loads in all directions, and a single-rail guide can adequately operate under a small moment load. Model RSR-W, in particular, has a greater number of load-bearing balls and a broader LM rail to increase its rigidity against a moment. This allows it to achieve linear motion with a more compact structure and greater durability than a pair of parallel linear bushes.

Corrosion Prevention

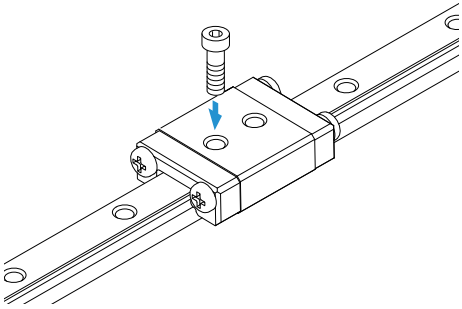
The LM rail, LM block, and balls are made of stainless steel, which has high corrosion resistance.

Types and Features

Model RSR-M

Dimensional Table⇒A1-268

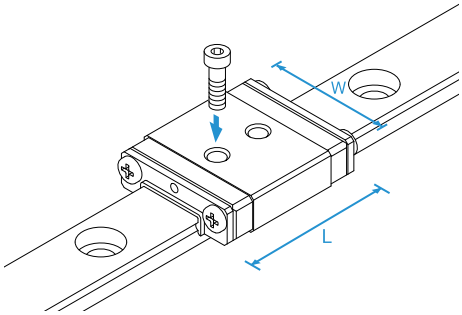
This model is the standard type.



Model RSR-WM

Dimensional Table⇒A1-268

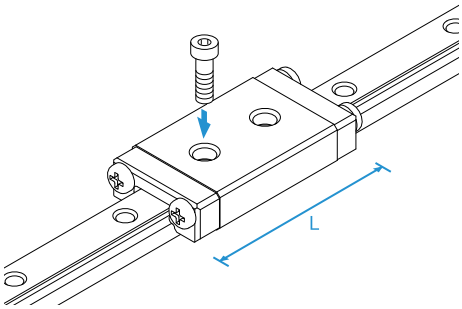
This model has a broader width (W), greater overall length (L), and greater load rating and permissible moment than the Model RSR-M.



Model RSR-N

Dimensional Table⇒A1-268

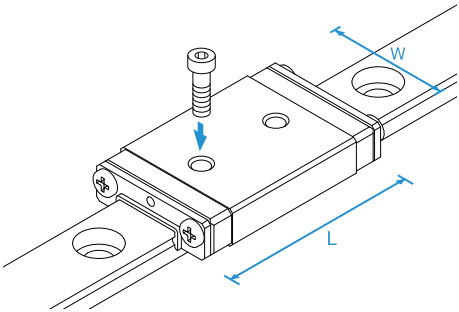
This model has a longer overall LM block length (L) and a greater load rating.



Model RSR-WN

Dimensional Table⇒A1-268

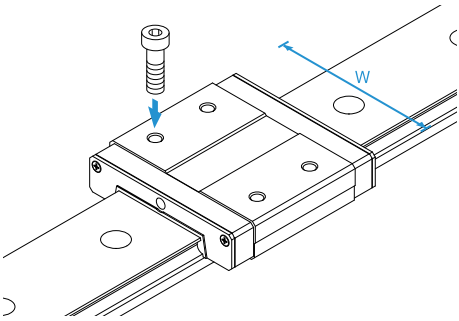
This model has a broader width (W), greater overall length (L), and greater load rating and permissible moment than the Model RSR-N.



Model RSR14WVM

Dimensional Table⇒A1-268

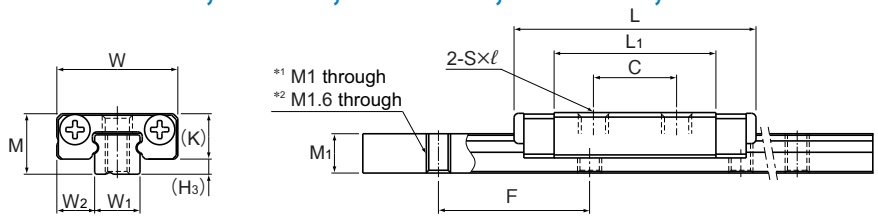
This model has a greater overall LM block width (W) and a greater permissible moment.



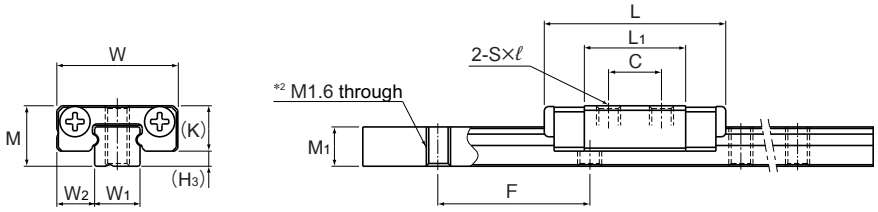
Accuracy of the Mounting Surface

Model RSR uses Gothic-arch grooves in the ball raceways. When two rails of RSR are used in parallel, any error in accuracy of the mounting surface may increase rolling resistance and negatively affect the smooth motion of the guide. For specific accuracy of the mounting surface, see Flatness of the Mounting Surface on A1-496.

Models RSR-M, RSR-N, RSR-WM, RSR-WN, and RSR-WVM



Models RSR2N, RSR3N



Model RSR3M

Model No.	Outer dimensions			LM block dimensions										H3
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	N	E	Lubrication hole d	Grease nipple	
RSR 2N RSR 2WN	3.2 4	6 10	12.4 16.7	—	4 6.5	M1.4 through M2 through	8.84 11.9	—	2.5 3	—	—	—	—	0.7 1
RSR 3M RSR 3N	4	8	12 16	—	3.5 5.5	M1.6 through M2 through	6.7 10.7	—	3	—	—	—	—	1
RSR 3WM RSR 3WN	4.5	12	14.9 19.9	—	4.5 8	M2 through	8.5 13.3	—	3.5	0.8	—	0.8	—	1
RSR 14WVM	15	50	50	35	18	M4×4.5	34.3	6	11.5	3	4	—	PB107	3.5

Note) Models RSR2 and 3 do not have a lubrication hole. When lubricating them, apply a lubricant directly to the LM rail raceways. Models RSR2N, 2WN, 3M, and 3N do not have a contamination protection seal.

Model number coding

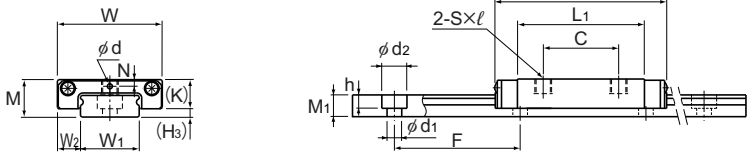
2 RSR3W M UU C1 +80L P M -II

- **2**: No. of LM blocks used on the same rail (*1)
- **RSR3W M**: Model number
- **UU**: Contamination protection accessory symbol (*2)
- **C1**: Radial clearance symbol (*3) Normal (No symbol) Light preload (C1)
- **+80L**: LM rail length (in mm)
- **P**: Accuracy symbol (*4) Normal grade (No Symbol)/Precision grade (P)
- **M**: Stainless steel LM rail
- **-II**: Symbol for No. of rails used on the same plane (*5)

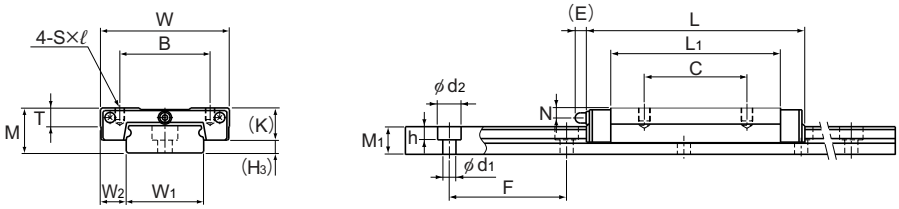
(*1) No symbol for 1 LM block. (*2) See A1-543. (*3) See A1-74. (*4) See A1-85. (*5) See A1-13.

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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models RSR2WN, RSR3WM/WN



Model RSR14WVM

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment N·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	W_1	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
	2 0 4 −0.03	2 3	2 2.6	8 10	—*1 1.8×2.8×0.75	200	0.214 0.395	0.384 0.682	0.564 1.336	2.994 7.32	0.564 1.336	2.994 7.32	0.442 1.501		0.0008 0.0020	0.029 0.075
	3 0 −0.02	2.5	2.6	10	—*2	220	0.18 0.3	0.27 0.44	0.293 0.726	2.11 4.33	0.293 0.726	2.11 4.33	0.45 0.73		0.0011 0.0016	0.055
	6 0 −0.02	3	2.6	15	2.4×4×1.5	335	0.25 0.39	0.47 0.75	0.668 1.57	4.44 9.06	0.668 1.57	4.44 90.6	1.48 2.36		0.002 0.003	0.12
	30 0 −0.05	10	9	40	4.5×7.5×5.3	1800	6.01	9.08	43.2	233	38.2	208	110		0.096	2

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-270**.)
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).
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel.
The stainless steel provides excellent corrosion and environmental resistance.
Please be aware that balls will fall out if the LM block is removed from the LM rail.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

● Recommended tightening torque when mounting the LM rail/block

Table 1 shows recommended bolt tightening torques when mounting the LM block and LM rail of models RSR2 and RSR3.

Table 1: Recommended Tightening Torques of Mounting Bolts

Model No.	Recommended tightening torque (N·m)		Remarks
	Block	Rail	Applicable bolt
RSR 2N	0.09	0.03	Flathead machine screw designed for use with precision equipment
RSR 2WN	0.28	0.138	
RSR 3M	0.09	0.09	Austenitic stainless steel hexagonal-socket-head type bolts
RSR 3N	0.19	0.09	
RSR 3WM/3WN	0.19	—	
	—	0.25	Cross-recessed head screws for precision equipment (No. 0 pan head screw, class 1)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 2 shows the standard and maximum lengths of the RSR model rail.

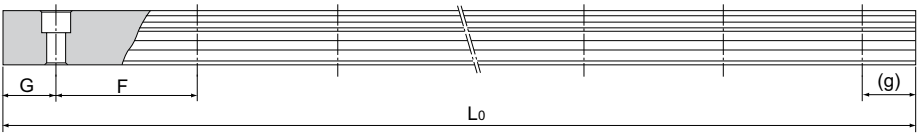


Table 2: Standard Lengths and Maximum Lengths of LM Rails for Model RSR/RSR-W

Unit: mm

Model No.	RSR2N	RSR2WN	RSR3	RSR3W	RSR14W
LM rail standard lengths (L_o)	32 40 56 80 104	40 60 70 80 100 180	30 40 60 80 100	40 55 70	110 150 190 230 270 310 430 550 670 790
Standard pitch F	8	10	10	15	40
G, g	4	5	5	5	15
Max length	200	200	220	335	1800

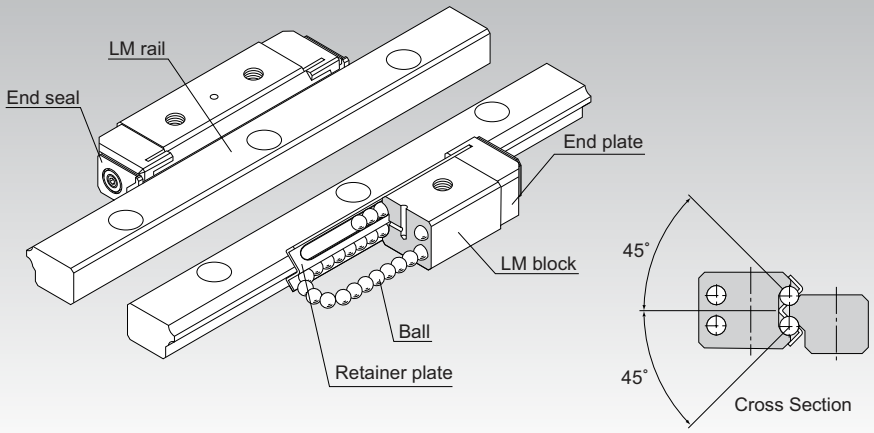
Note 1: The maximum length varies with accuracy grades. Contact THK for details.
Note 2: The LM rail mounting hole of model RSR3 is an M1.6 through hole.

Preventing the LM Block from Falling off of the LM Rail

In model RSR/RSR-W, the balls fall out if the LM block comes off the LM rail.
For this reason, LM Guide assemblies are delivered with a part which prevents the LM block from coming off the rail. If you remove this part when using the product, please take precautions to avoid overrunning the blocks off of the rail.

HR

Separate Type (4-Way Equal Load) LM Guide Model HR



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Example of Clearance Adjustment	A1-275
Accuracy Standards	A1-83
Shoulder Height of the Mounting Base and the Corner Radius	A1-492
Reference Error Tolerance for the Mounting Surface	A1-495
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Balls roll in two 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. Since retainer plates hold the balls, they will not fall out.
Each of the two rows of balls that circulate through the LM rail contact the raceway at a 45° angle. With this angular contact structure, installing one set (a combination of two LM rails and LM blocks on the same plane) on a flat surface allows the system to bear an equal load in all four directions (radial, reverse-radial, and horizontal directions). In addition, because the cross-sectional height is low, this linear motion guide configuration provides stability in a compact form.
Clearance adjustments are relatively easy to perform, and the product is highly capable of absorbing mounting error.

Easy Installation

With Model HR, it is easier to adjust clearance and achieve accuracy than with cross-roller guides.

Self-Adjustment Capability

Even with poor parallelism or level between the two rails, the self-adjustment capability in the front-to-front configuration of THK's unique circular-arc grooves (DF set) absorbs mounting error and achieves smooth linear motion, even under a preload.

4-Way Equal Load

When the two rails are mounted in parallel, each row of balls is placed at a contact angle of 45° so that the load ratings 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 various orientations.

Cross-Sectional Dimensions Approximate to Cross-Roller Guides

Since Model HR utilizes end caps for recirculation, it is not susceptible to the cage displacement that occurs in cross-roller guides. In addition, the cross-sectional shape of Model HR is similar to that of cross-roller guides, and the two product types are interchangeable.

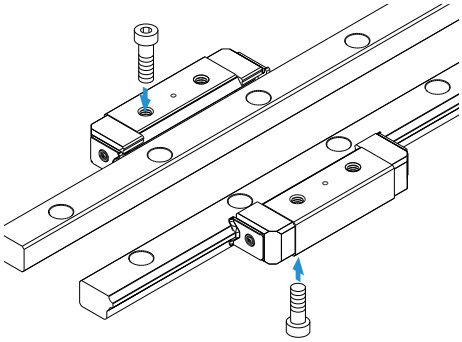
Stainless Steel Type also Available

A special type whose LM block, LM rail, and balls are made of stainless steel is also available.

Model HR - Heavy-Load Type

Dimensional Table⇒A1-278

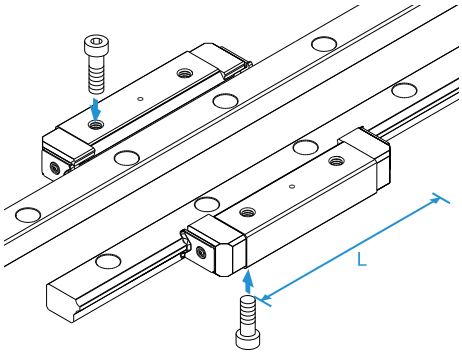
The LM blocks can be mounted from the top and the bottom.



Model HR-T - Super-Heavy Load Type

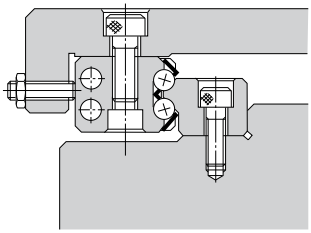
Dimensional Table⇒A1-278

This model has the same cross-sectional shape as model HR, but has a greater overall LM block length (L) and a higher load rating.

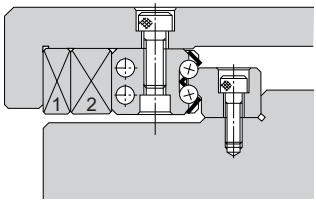


Example of Clearance Adjustment

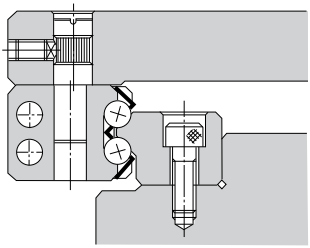
Design the clearance adjustment bolt so that it presses the center of the side face of the LM block.



a. Using an adjustment screw
Normally, an adjustment screw is used to press the LM block.



b. Using tapered gibs
When high accuracy and high rigidity are required, use tapered gibs 1) and 2).



c. Using an eccentric pin
A type using an eccentric pin to adjust the clearance is also available.

Comparable Cross-Roller Guide Model Numbers

Each type of LM Guide Model HR has cross-sectional dimensions approximate to those of a corresponding cross-roller guide model.

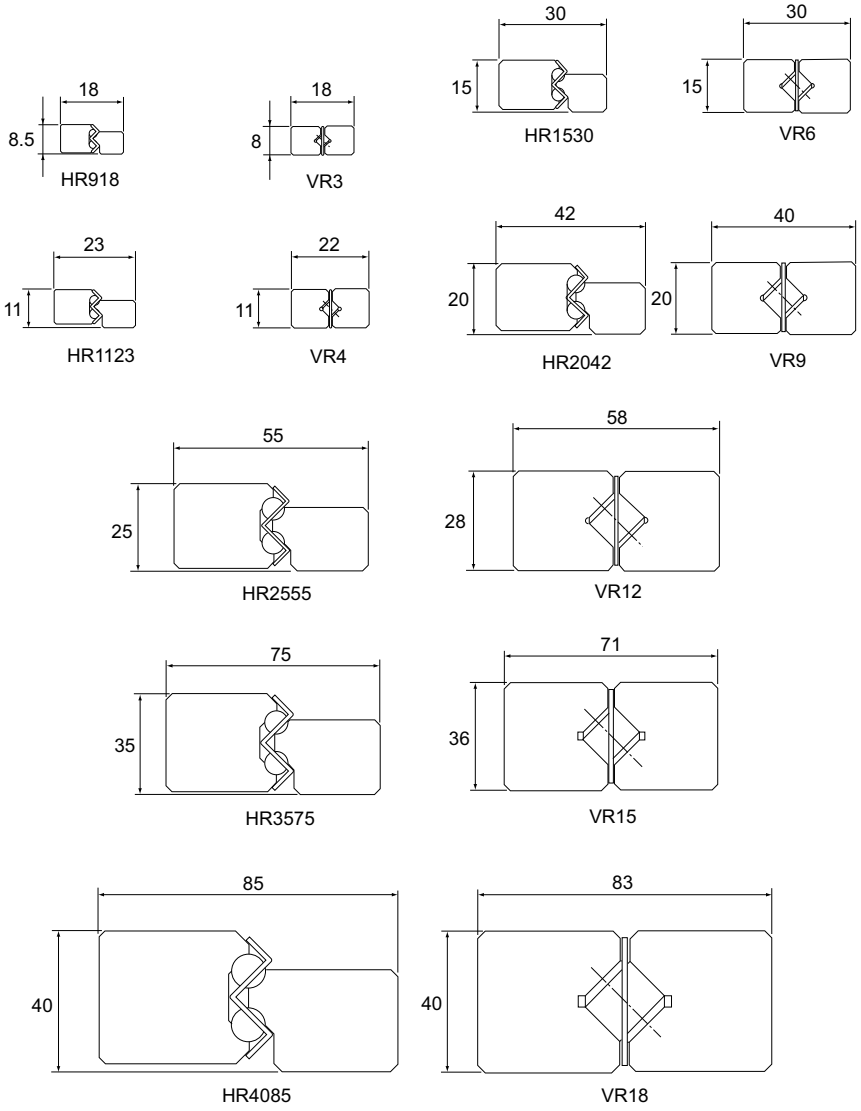
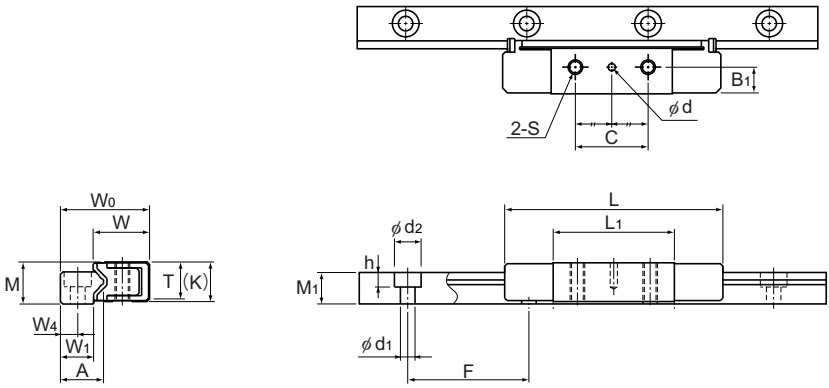


Fig. 1

Models HR, HR-T, HR-M, and HR-TM



Models HR918 and 918M

Model No.	Outer dimensions				LM block dimensions									
	Height	Width		Length									Lubrication hole	
	M	W	W_0	L	B_1	C	H	S	h_2	L_1	T	K	d	D_1
HR 918 HR 918M	8.5	11.4	18	45	5.5	15	—	M3	—	25	7.5	8	1.5	—
HR 1123 HR 1123M	11	13.7	23	52	7	15	2.55	M3	3	30	9.5	10	2	5
HR 1530 HR 1530M	15	19.2	30	69	10	20	3.3	M4	3.5	40	13	14	2	6.5
HR 2042 HR 2042M	20	26.3	42	91.6	13	35	5.3	M6	5.5	56.6	17.5	19	3	10
HR 2042T HR 2042TM	20	26.3	42	110.7	13	50	5.3	M6	5.5	75.7	17.5	19	3	10
HR 2555 HR 2555M	25	33.3	55	121	16	45	6.8	M8	7	80	22.5	24	3	11
HR 2555T HR 2555TM	25	33.3	55	146.4	16	72	6.8	M8	7	105.4	22.5	24	3	11

Model number coding

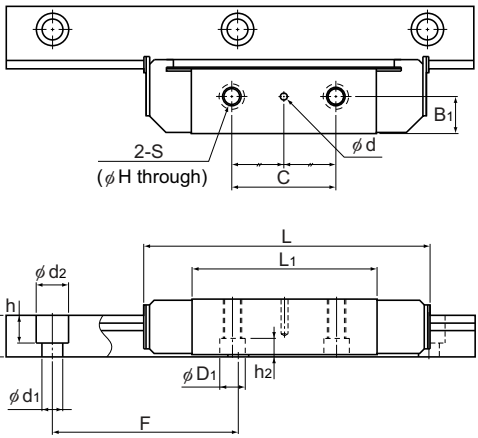
2 HR2555 UU M +1000L P T M

- **2**: No. of LM blocks used on the same rail
- **HR2555**: Model number
- **UU**: Contamination protection accessory symbol (*1)
- **M**: Stainless steel LM block
- **+1000L**: LM rail length (in mm)
- **P**: Accuracy symbol (*2)
  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
- **M**: Stainless steel LM rail

(*1) See contamination protection accessory on A1-543. (*2) See A1-83.

Note) One set of model HR means a combination of two LM rails and LM blocks used on the same plane.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models HR1123 to 2555M/T/TM

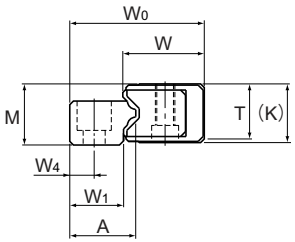
Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*				Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		LM block	LM rail
	W_1	W_4	A	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	kg	kg/m
	6.7	3.5	8.7	6.5	25	3×5.5×3	300 (300)	2.82	3.48	0.0261	0.194	0.0261	0.194	0.01	0.3
	9.5	5	11.6	8	40	3.5×6×4.5	500 (500)	4.09	4.93	0.0472	0.311	0.0472	0.311	0.03	0.5
	10.7	6	13.5	11	60	3.5×6×4.5	1600 (800)	7.56	8.77	0.112	0.733	0.112	0.733	0.08	1
	15.6	8	19.5	14.5	60	6×9.5×8.5	2200 (1000)	17	18.2	0.325	2.01	0.325	2.01	0.13	1.8
	15.6	8	19.5	14.5	60	6×9.5×8.5	2200 (1000)	20.8	24.3	0.56	3.16	0.56	3.16	0.26	1.8
	22	10	27	18	80	9×14×12	3000 (1000)	33.2	35.1	0.897	5.04	0.897	5.04	0.43	3.2
	22	10	27	18	80	9×14×12	3000 (1000)	40	45.9	1.49	7.8	1.49	7.8	0.5	3.2

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-282.)
Static permissible moment* 1 block: the static permissible moment value with two LM rails, one LM block per rail, used on the same plane
Double blocks: static permissible moment when two LM blocks are in close contact with each other on two LM rails used on the same plane
A moment in the M_C direction can be received if two rails are used in parallel. However, since it depends on the distance between the two rails, it has been omitted.
Total block length L : The total block length L shown in the table is the length with the dust-proof parts (code: UU).
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel.
The stainless steel provides excellent corrosion and environmental resistance.

Options⇒A1-503

Models HR, HR-T, HR-M, and HR-TM



Model No.	Outer dimensions				LM block dimensions									
	Height	Width		Length									Lubrication hole	
	M	W	W_0	L	B_1	C	H	S	h_2	L_1	T	K	d	D_1
HR 3065 HR 3065T	30	40.3	65	145 173.5	19	50 80	8.6	M10	9	90 118.5	27.5	29	4	14
HR 3575 HR 3575T	35	44.9	75	154.8 182.5	21.5	60 92.5	10.5	M12	12	103.8 131.5	32	34	4	18
HR 4085 HR 4085T	40	50.4	85	177.8 215.9	24	70 110	12.5	M14	13	120.8 158.9	36	38	4	20
HR 50105 HR 50105T	50	63.4	105	227 274.5	30	85 130	14.5	M16	15.5	150 197.5	45	48	5	23
HR 60125	60	74.4	125	329	35	160	18	M20	18	236	55	58	5	26

Model number coding

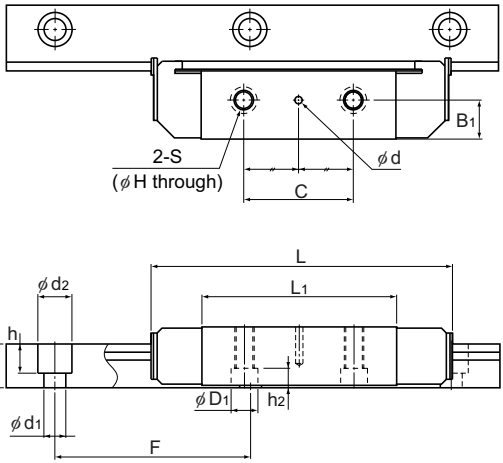
2 HR4085T UU +1500L P T

- **2**: No. of LM blocks used on the same rail
- **HR4085T**: Model number
- **UU**: Contamination protection accessory symbol (*1)
- **+1500L**: LM rail length (in mm)
- **P**: Accuracy symbol (*2)
  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

(*1) See contamination protection accessory on A1-543. (*2) See A1-83.

Note) One set of model HR means a combination of two LM rails and LM blocks used on the same plane.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*				Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		LM block	LM rail
	W_1	W_4	A	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	kg	kg/m
	25	12	31.5	22.5	80	9×14×12	3000	42.6 51.5	44.4 58.1	1.27 2.12	7.71 11.7	1.27 2.12	7.71 11.7	0.7 0.9	4.6
	30.5	14.5	37	26	105	11×17.5×14	3000	53.5 64.4	54.8 71.7	1.75 2.91	10.1 15.2	1.75 2.91	10.1 15.2	1.05 1.4	6.4
	35	16	42.5	29	120	14×20×17	3000	78.8 95.1	78.9 103	3.02 5.02	16.6 25.7	3.02 5.02	16.6 25.7	1.53 1.7	8
	42	20	51.5	37	150	18×26×22	3000	127 153	123 161	5.89 9.81	33.1 51.3	5.89 9.81	33.1 51.3	3.06 3.5	12.1
	51	25	65	45	180	22×32×25	3000	226	232	16	89.5	16	89.5	7.5	19.3

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-282.)
Static permissible moment* 1 block: the static permissible moment value with two LM rails, one LM block per rail, used on the same plane
Double blocks: static permissible moment when two LM blocks are in close contact with each other on two LM rails used on the same plane
A moment in the M_C direction can be received if two rails are used in parallel. However, since it depends on the distance between the two rails, it has been omitted.
Total block length L : The total block length L shown in the table is the length with the dust-proof parts (code: UU).
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel.
The stainless steel provides excellent corrosion and environmental resistance.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model HR 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.

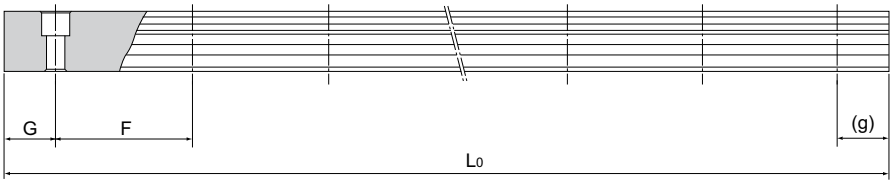


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HR — Unit: mm

Model No.	HR 918	HR 1123	HR 1530	HR 2042	HR 2555	HR 3065	HR 3575	HR 4085	HR 50105	HR 60125
LM rail standard lengths (L_o)	70 120 220 295	110 230 310 390	160 280 340 460 580	220 280 340 460 640	280 440 600 760 1000 1240	280 440 600 760 1000 1240	570 885 1200 1620 2040 2460	780 1020 1260 1500 1980 2580	1270 1570 2020 2620	1530 1890 2250 2610
Standard pitch F	25	40	60	60	80	80	105	120	150	180
G, g	10	15	20	20	20	20	22.5	30	35	45
Max length	300 (300)	500 (500)	1600 (800)	2200 (1000)	3000 (1000)	3000	3000	3000	3000	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 made models.

Accessories

Dedicated Mounting Bolt

Normally, when mounting the LM block on the side that will be used for clearance adjustment, use the tapped hole provided on the LM block to secure it as shown in Fig. 2.

The holes of the bolt (d_1 and D_1) must be machined so that they are larger by the amount of the adjustment allowance.

If structural reasons require a mounting method similar to Fig. 3, the dedicated mounting bolt as shown in Fig. 4 is required for securing the LM block. Be sure to specify that the dedicated mounting bolt is required when ordering the LM Guide.

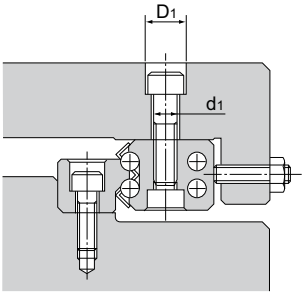


Fig. 2

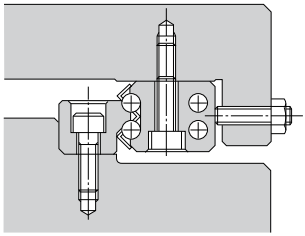


Fig. 3

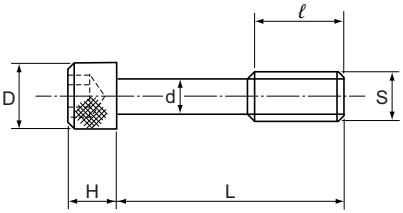


Fig. 4

Table 2: Dedicated Mounting Bolt Unit: mm

Model No.	S	d	D	H	L	ℓ	Supported model number
B 3	M3	2.4	5.5	3	17	5	HR 1530
B 5	M5	4.1	8.5	5	22	7	HR 2042
B 6	M6	4.9	10	6	28	9	HR 2555
B 8	M8	6.6	13	8	34	12	HR 3065
B 10	M10	8.3	16	10	39	15	HR 3575
B 12	M12	10.1	18	12	45	18	HR 4085
B 14	M14	11.8	21	14	55	21	HR 50105
B 16	M16	13.8	24	16	66	24	HR 60125

Lubrication Hole

Lubrication for Model HR

The LM block has a lubrication hole in the center of its top face. To provide lubrication through this hole, the table must be machined to also have a lubrication hole as shown in Fig. 5 and attach a grease nipple or the like. When using oil lubrication, it is necessary to identify the lubrication route. Contact THK for details.

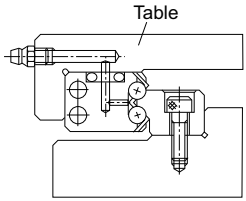
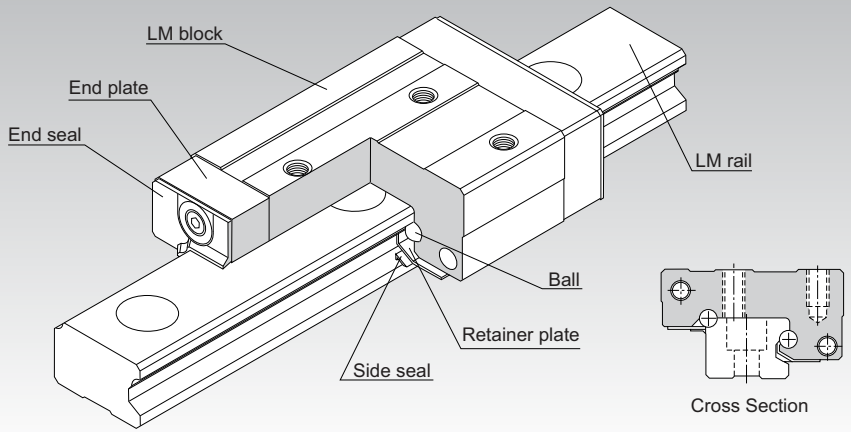


Fig. 5: Example of Machining a Lubrication Hole

GSR

Separate Type (Radial) LM Guide Model GSR



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Example of Clearance Adjustment	A1-289
Accuracy Standards	A1-84
Shoulder Height of the Mounting Base and the Corner Radius	A1-492
Reference Error Tolerance for the Mounting Surface	A1-495
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Balls roll in two 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. Since retainer plates hold the balls, they will not fall out.
Because the top face of the LM block is inclined, clearance is eliminated and an appropriate preload is applied simply by securing the LM block with mounting bolts.
Model GSR has a special contact structure using circular-arc grooves. This increases self-adjusting capability and makes GSR an optimal model for places associated with difficulty establishing high accuracy and for general industrial machinery.
* Model GSR cannot be used in single-axis applications.

Interchangeability

Both the LM block and LM rail are interchangeable and can be stored separately. Therefore, it is possible to store a long-size LM rail and cut it to a desired length before using it.

Compact

Model GSR's low center of gravity and low overall height help reduce the size of machines.

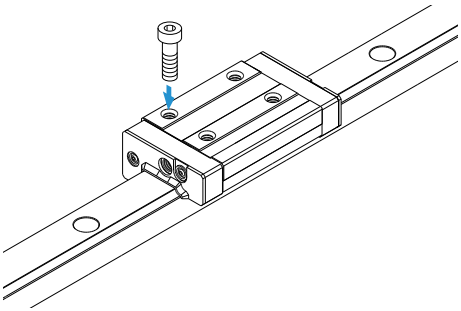
Capable of Receiving a Load in any Direction

The ball contact angle is designed so that this model can receive a load in any direction. As a result, it can be used in places where a reverse-radial load, lateral load, or a moment in any direction is applied.

Model GSR-T

Dimensional Table⇒A1-290

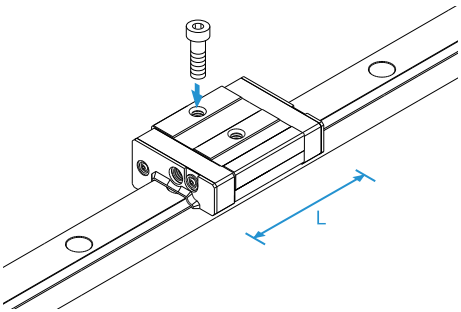
This model is the standard type.



Model GSR-V

Dimensional Table⇒A1-290

This is a space-saving type that has the same cross-sectional shape as GSR-T, but has a shorter overall LM block length (L).



Example of Clearance Adjustment

By providing a shoulder on the side face of each LM block and pressing either LM block with a bolt, a preload can be applied and the rigidity increased.

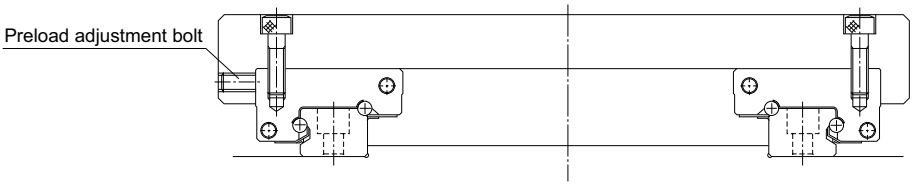
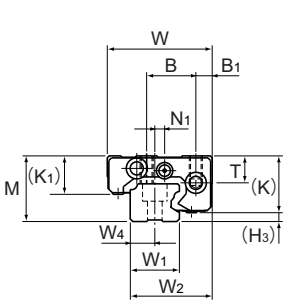
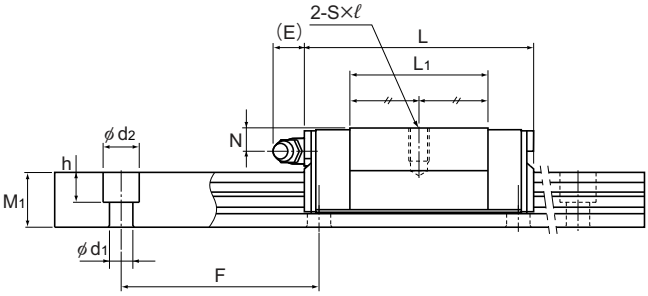


Fig. 1: Example of Adjusting a Preload with a Push Bolt

Models GSR-T and GSR-V



Model GSR15T/V



Models GSR15 to 25V

Model No.	Outer dimensions			LM block dimensions												H_3
	Height M	Width W	Length L	B_1	B	C	S×ℓ	L_1	T	K	K_1	N	N_1	E	Grease nipple	
GSR 15V GSR 15T	20	32	47.1 59.8	5	15	— 26	M4×7	27.5 40.2	8.25	16.8	12	4.5	3	5.5	PB107	3.2
GSR 20V GSR 20T	24	43	58.1 74	7	20	— 30	M5×8	34.3 50.2	9.7	20.6	13.6	5	—	12	B-M6F	3.4
GSR 25V GSR 25T	30	50	69 88	7	23	— 40	M6×10	41.2 60.2	12.7	25.4	16.8	7	—	12	B-M6F	4.6
GSR 30T	33	57	103	8	26	45	M8×12	70.3	14.6	28.5	18	7	—	12	B-M6F	4.5
GSR 35T	38	68	117	9	32	50	M8×15	80.3	15.6	32.5	20.5	8	—	12	B-M6F	5.5

Model number coding

Combination of LM rail and LM block

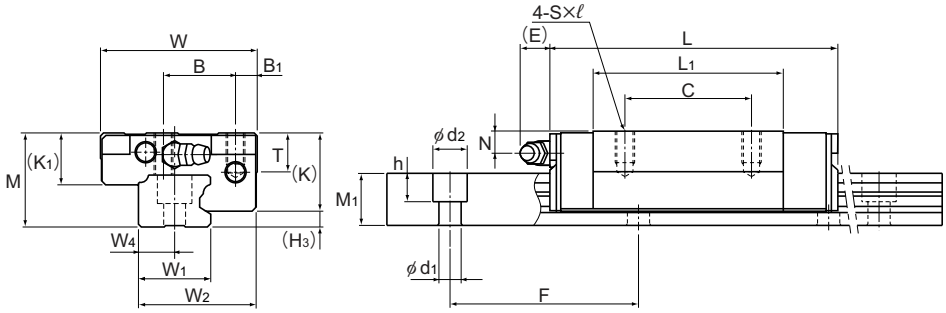
GSR25 T 2 UU +1060L H T K

- GSR25: Model number
- T: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- +1060L: LM rail length (in mm)
- H: Accuracy symbol (*2) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)
- T: Symbol for LM rail jointed use
- K: Symbol for tapped-hole LM rail type

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-84**.

Note) One set of model GSR: This model number indicates that a single-rail unit constitutes one set.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models GSR20 to 35T, Models GSR20V, and 25V

Models GSR15 to 35T

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment kN·m*				Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		LM block	LM rail
	W_1	W_2	W_4	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	kg	kg/m
	15	25	7.5	11.5	60	4.5×7.5×5.3	2000	6.51 8.42	6.77 9.77	0.0305 0.0606	0.19 0.337	0.0264 0.0523	0.165 0.29	0.08 0.13	1.2
	20	33	10	13	60	6×9.5×8.5	3000	10.5 13.6	10.6 15.3	0.06 0.118	0.368 0.652	0.052 0.102	0.318 0.562	0.17 0.25	1.8
	23	38	11.5	16.5	60	7×11×9	3000	15.5 20	15.2 22	0.102 0.205	0.625 1.11	0.0891 0.176	0.541 0.961	0.29 0.5	2.6
	28	44.5	14	19	80	9×14×12	3000	27.8	29.9	0.325	1.77	0.28	1.52	0.6	3.6
	34	54	17	22	80	11×17.5×14	3000	37	39.1	0.485	2.63	0.419	2.27	1	5

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-292.)
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
A moment in the M_C direction can be received if two rails are used in parallel. However, since it depends on the distance between the two rails, it has been omitted.
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 A1-517 or A1-539)
For oil lubrication, be certain to contact THK with the mounting orientation.
(Mounting orientation: see A1-12, Lubricant: see A24-2)
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A1-61 to calculate the load rating for loads in the reverse radial direction or lateral direction.

Model number coding

LM block

GSR25 T UU

- GSR25: Model number
- T: Type of LM block
- UU: Contamination protection accessory symbol (*1)

LM rail

GSR25 -1060L H K

- GSR25: Model number
- -1060L: LM rail length (in mm)
- H: Symbol for tapped-hole LM rail type
- K: Accuracy symbol (*2)
  - Normal grade (No Symbol)
  - High accuracy grade (H)
  - Precision grade (P)

(*1) See contamination protection accessory on A1-543. (*2) See A1-84.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model GSR variations.
For customers requiring a large quantity of rails in different lengths, it is more economical to prepare a stock of LM rail of the maximum length and cut the rail to the desired length as necessary.

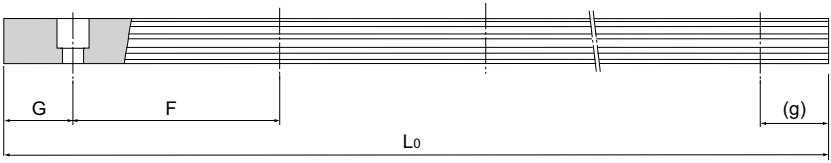


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model GSR

Unit: mm

Model No.	GSR 15	GSR 20	GSR 25	GSR 30	GSR 35
LM rail standard lengths (L_0)	460 820 1060 1600	460 820 1060 1600	460 820 1060 1600	1240 1720 2200 3000	1240 1720 2200 3000
Standard pitch F	60	60	60	80	80
G, g	20	20	20	20	20
Max length	2000	3000	3000	3000	3000

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

Tapped-Hole Type LM Rail

- Since the bottom of the LM rail has a tapped hole, this model can easily be installed on a steel H-beam or channel.
- Since the top face of the LM rail has no mounting hole, it provides a better seal and prevents the entrance of foreign material (e.g., cutting chips).

(1) As shown in Fig. 2, a tapered washer is also available that allows GSR to be mounted on a steel flange.
(2) For model number coding, see **A1-290** to **A1-291**.

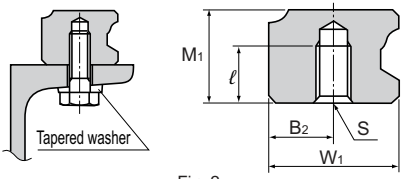


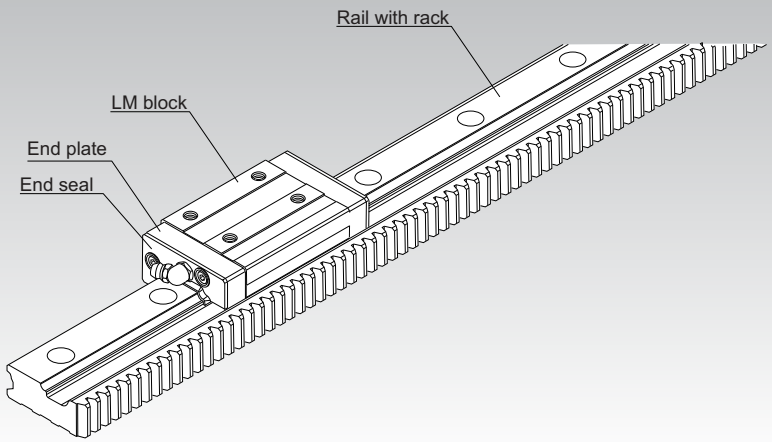
Fig. 2

Table 2: Tap Profile and Depth at Each Position

Model No.	W_1	B_2	M_1	S×ℓ
GSR 15	15	7.5	11.5	M4×7
GSR 20	20	10	13	M5×8
GSR 25	23	11.5	16.5	M6×10
GSR 30	28	14	19	M8×12
GSR 35	34	17	22	M10×14

GSR-R

Separate Type (Radial) LM Guide Model GSR-R



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Accuracy Standards	A1-84
Shoulder Height of the Mounting Base and the Corner Radius	A1-492
Reference Error Tolerance for the Mounting Surface	A1-495
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Balls roll in two 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. Since retainer plates hold the balls, they will not fall out.
Because the top face of the LM block is inclined, clearance is eliminated and an appropriate preload is applied simply by securing the LM block with mounting bolts.
Model GSR-R is based on model GSR, but has rack teeth on the LM rail. This facilitates the design and assembly of drive mechanisms.
* Model GSR-R cannot be used in single-axis applications.

Reduced Machining and Assembly Costs

Integrating the LM rail (linear guide) and rack (drive) into a single-piece structure reduces labor and time for machining the rack mounting surface, assembling, and adjusting the guide system, and thus significantly reduces costs.

Design with Ease

The travel distance per turn of the pinion is specified by the integer value. This makes it easy to calculate the travel distance per pulse when the LM Guide is used in combination with a stepping motor or servomotor.

Space Saving

Since a rack is included on the rail, machine size can be reduced.

Long Stroke

The end faces of the LM rail are machined for jointed use. To obtain a long stroke, simply joint LM rails of the standard length.

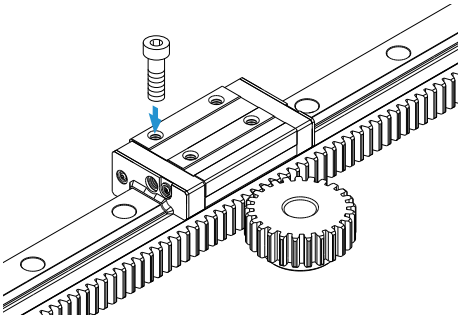
High Durability

The rack teeth have a width equal to the LM rail height. The rack uses high-grade steel with proven performance and the tooth surface is heat-treated to ensure high durability.

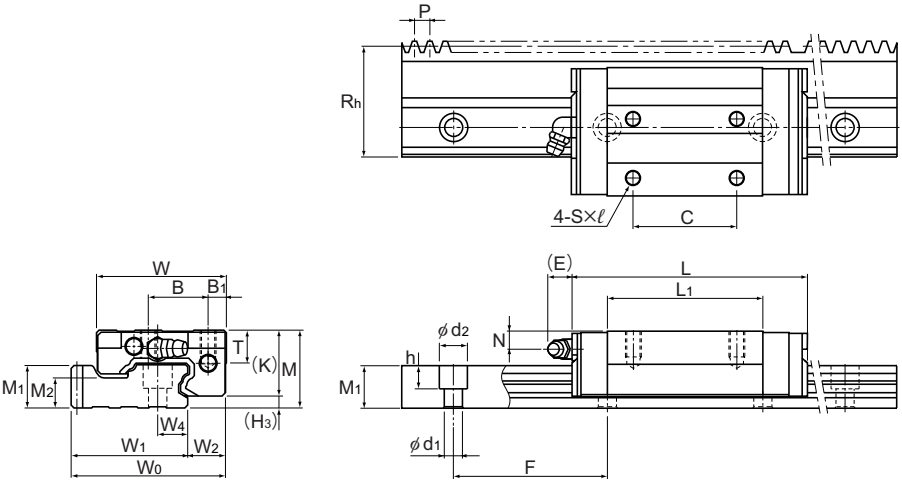
Model GSR-R (Rail with Rack)

Dimensional Table⇒A1-298

Since the thrust load on the pinion shaft can be kept low due to rack-pinion meshing, it is easy to design systems with pinion shaft bearings and tables that are not so rigid.



Model GSR-R



Model GSR-T-R

Model No.	Rack			Outer dimensions				LM block dimensions										H3
	Reference pitch dimension P	Module	Pitch line height Rh	Height M	Width W	W0	Length L	B1	B	C	S×ℓ	L1	T	K	N	E	Grease nipple	
GSR 25V-R GSR 25T-R	6	1.91	43	30	50	59.91	69 88	7	23	— 40	M6×10	41.2 60.2	12.7	25.4	7	12	B-M6F	4.6
GSR 30T-R	8	2.55	48	33	57	67.05	103	8	26	45	M8×12	70.3	14.6	28.5	7	12	B-M6F	4.5
GSR 35T-R	10	3.18	57	38	68	80.18	117	9	32	50	M8×15	80.3	15.6	32.5	8	12	B-M6F	5.5

Note) A special type with a module pitch is also available. Contact THK for details.
For checking the pinion strength, see **A1-302**.

Model number coding

Single-rail LM Guide

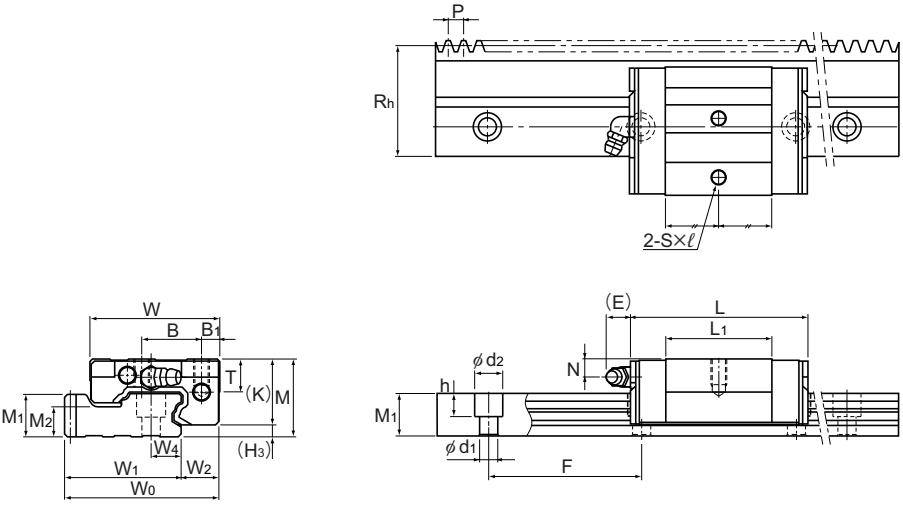
GSR25T 2 UU +5000L H R T

- GSR25T: Model number
- 2: No. of LM blocks
- UU: Contamination protection accessory symbol (*1)
- +5000L: LM rail length (in mm)
- H: Accuracy symbol (*2) Normal grade (No Symbol)/High accuracy grade (H)
- R: Symbol for rail with rack type (R: Symbol for rail with rack type)
- T: Symbol for LM rail jointed use

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-84**.

Note) This model number indicates that a single-rail unit constitutes one set.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model GSR25V-R

Unit: mm

LM rail dimensions								Basic load rating		Static permissible moment kN·m*				Mass	
										M_A		M_B			
Width			Height	Pitch				C	C_0					LM block	LM rail
W_1	W_2	W_4	M_1	F	M_2	$d_1 \times d_2 \times h$		kN	kN	1 block	Double blocks	1 block	Double blocks	kg	kg/m
44.91	15	11.5	16.5	60	11.5	7×11×9		15.5 20	15.2 22	0.102 0.205	0.625 1.11	0.0891 0.176	0.541 0.961	0.29 0.5	4.7
50.55	16.5	14	19	80	12	9×14×12		27.8	29.9	0.325	1.77	0.28	1.52	0.6	5.9
60.18	20	17	22	80	14.5	11×17.5×14		37	39.1	0.485	2.63	0.419	2.27	1	8.1

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-300**.)
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
A moment in the M_C direction can be received if two rails are used in parallel. However, since it depends on the distance between the two rails, it has been omitted.
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 A**1-517** or A**1-539**)
For oil lubrication, be certain to contact THK with the mounting orientation. (Mounting orientation: see A**1-12**, Lubricant: see A**24-2**)
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Model number coding

LM block

GSR25T UU

- GSR25T: Model number
- UU: Contamination protection accessory symbol (*1)

Rail with rack

GSR25-2004L H R

- H: Accuracy symbol (*2) Normal grade (No Symbol) High accuracy grade (H)
- R: Symbol for rail with rack type

(*1) See contamination protection accessory on A**1-543**. (*2) See A**1-84**.

Options⇒A**1-503**

Standard Lengths of LM Rails

Table 1 shows the standard LM rail lengths of model GSR-R variations.

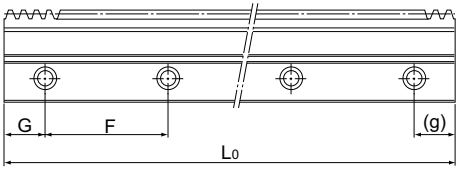


Table 1: Standard Lengths of LM Rails for Model GSR-R

Unit: mm

Model No.	GSR 25-R		GSR 30-R		GSR 35-R	
LM rail Standard lengths (L_0)	1500	2004	1504	2000	1500	2000
Standard pitch F	60	60	80	80	80	80
G, g	30	42	32	40	30	40

Rack and Pinion

Joining Two or More Rails

The end faces of rails with built-in racks are machined to facilitate jointed rail installation by leaving a clearance between rails after assembly.
Use of a special jig as shown in Fig. 1 will make the connection easier.
(THK also offers the rack-aligning jig.)

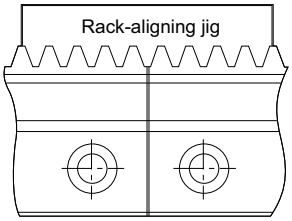


Fig. 1: Rack Connection Method

Reworking the Pinion Hole

Only the teeth of the type with a reworkable pinion hole (type C) are heat-treated. The hole and keyway can therefore be reworked by the user to the desired diameter and shape.
When reworking the pinion hole, be sure to take the following into account.
The material of the type with a reworkable hole diameter (type C): S45C

(1) When chucking the teeth of a type with a reworkable hole diameter, use a jaw scroll chuck or something like it to maintain the tooth profile.
(2) The pinion is produced using the center of the hole as a reference point. The center of the hole should therefore be used as a reference point when the pinion is aligned.
When checking the pinion runout, refer to the boss sides.
(3) Keep the reworked hole diameter within roughly 60 to 70% of the boss diameter.

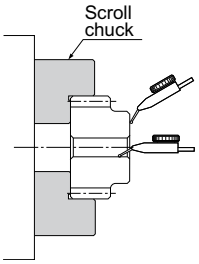


Fig. 2

Lubricating the Rack and Pinion

To ensure smooth sliding on tooth surfaces and prevent wear, the teeth should be provided with a lubricant.

Note1) Use a lubricant of the same type of thickener as that contained in the LM Guide.
Note2) Unpredictable wear may occur in the rack and pinion according to load conditions and lubrication status. Contact THK when undertaking design.

Checking Strength

The strength of the assembled rack and pinion must be checked in advance.

(1) Calculate the maximum thrust acting on the pinion.

(2) Divide the permissible power transmission capacity of the pinion to be used (Table 1) by an overload factor (Table 2).

(3) By comparing the thrust acting on the pinion obtained in step 1 with the pinion power transmission capacity obtained in step 2, make sure the applied thrust does not exceed the permissible power transmission capacity.

Example Calculation

When Model GSR-R is used in a horizontal conveyance system receiving a medium impact (assuming external load to be zero):

● Conditions

Subject model No. (pinion)	GP6-20A
Mass (table + work)	m = 100 kg
Speed	v = 1 m/s
Acceleration/deceleration time	T_1 = 0.1 s

● Consideration

(1) Calculating the maximum thrust

Calculated the thrust during acceleration/deceleration.

$$Fmax = m \cdot \frac{v}{T_1} = 1\ kN$$

(2) Permissible power transmission capacity of the pinion

$$Pmax = \frac{\text{Permissible power transmission capacity (see Table 1)}}{\text{Overload factor (see Table 2)}} = \frac{2.33}{1.25} = 1.86\ kN$$

(3) Comparison between the maximum thrust and the permissible power transmission capacity of the pinion

Fmax < Pmax

Therefore, it is judged that the subject model number can be used.

Table 1: Permissible Power Transmission Capacity

Unit: kN

Model No.	Permissible power transmission capacity	Supported model
GP 6-20A	2.33	GSR 25-R
GP 6-20C	2.05	
GP 6-25A	2.73	
GP 6-25C	2.23	
GP 8-20A	3.58	GSR 30-R
GP 8-20C	3.15	
GP 8-25A	4.19	
GP 8-25C	3.42	
GP10-20A	5.19	GSR 35-R
GP10-20C	4.57	
GP10-25A	6.06	
GP10-25C	4.96	

Table 2: Overload Factor

Impact from the motor	Impact from the driven machine		
	Uniform load	Medium impact	Large impact
Uniform load (electric motor, turbine, hydraulic motor, etc.)	1.0	1.25	1.75

(Excerpt from JGMA401-01)

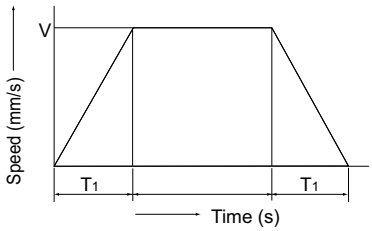
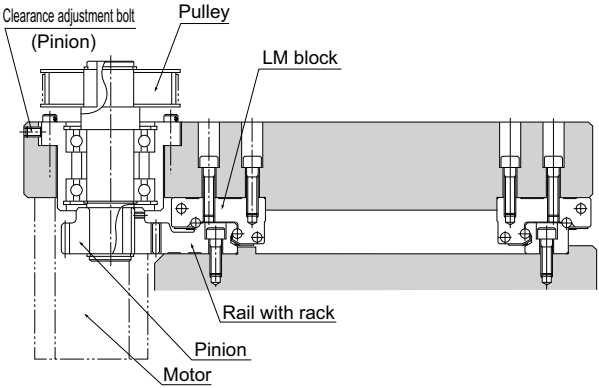
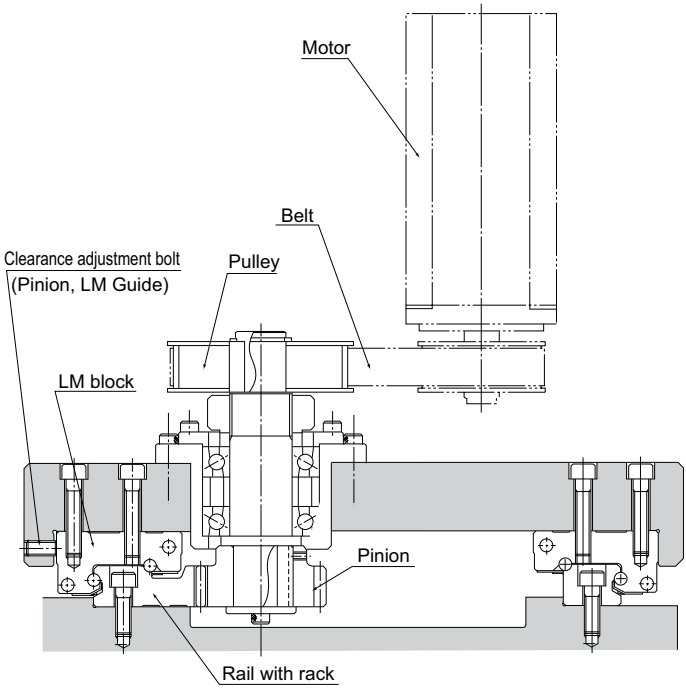


Fig. 3

Example of Installing Model GSR-R with a Table

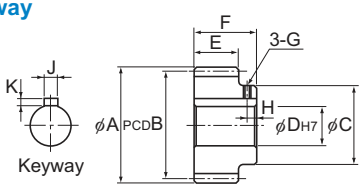




Rack and Pinion Dimensional Drawing

Pinion for rack - type A

Type with a worked keyway



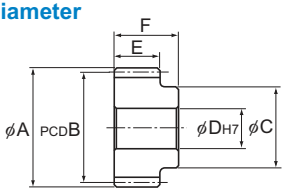
Unit: mm

Model No.	Pitch	Number of teeth	Tip circle diameter A	Meshing PCD B	Boss diameter C	Hole diameter D	Tooth width E	Overall length F	G	H	Keyway J×K	Supported model numbers
GP6-20A	6	20	42.9	39	30	18	16.5	24.5	M3	4	6×2.8	GSR 25-R
GP6-25A		25	51.9	48	35	18						
GP8-20A	8	20	57.1	52	40	20	19	26	M3	5	8×3.3	GSR 30-R
GP8-25A		25	69.1	64	40	20			M4			
GP10-20A	10	20	70.4	64	45	25	22	30	M4	5	8×3.3	GSR 35-R
GP10-25A		25	86.4	80	60	25					10×3.3	

Note1) When placing an order, specify the model number from the table.
Note2) Non-standard pinions with different numbers of teeth are also available upon request. Contact THK for details.

Pinion for rack - type C

Type with a reworkable hole diameter

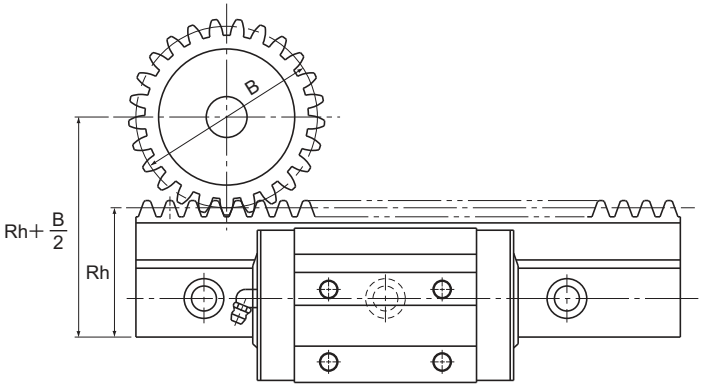


Unit: mm

Model No.	Pitch	Number of teeth	Tip circle diameter A	Meshing PCD B	Boss diameter C	Hole diameter D	Tooth width E	Overall length F	Supported model numbers
GP 6-20C	6	20	42.9	39	30	12	16.5	24.5	GSR 25-R
GP 6-25C		25	51.9	48	35	15			
GP 8-20C	8	20	57.1	52	40	18	19	26	GSR 30-R
GP 8-25C		25	69.1	64	40	18			
GP10-20C	10	20	70.4	64	45	18	22	30	GSR 35-R
GP10-25C		25	86.4	80	60	18			

Note1) When placing an order, specify the model number from the table.
Note2) Non-standard pinions with different numbers of teeth are also available upon request. Contact THK for details.

Dimensions when the LM rail is used in combination with a pinion

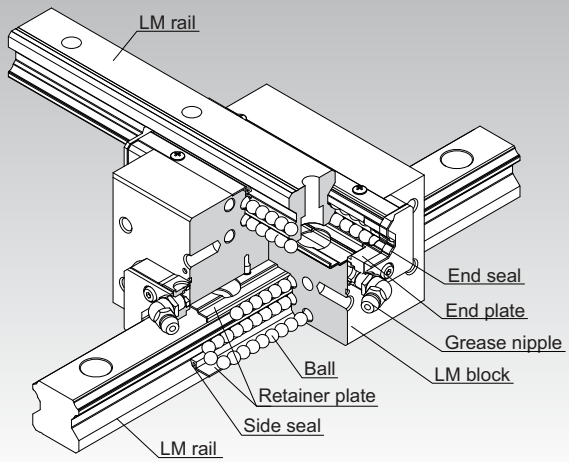


Unit: mm

Model GSR model No.	Pinion model No.	LM rail pitch line height Rh	Pinion meshing PCD B	Rh+B/2
GSR 25-R	GP 6-20A	43	39	62.5
	GP 6-20C			
	GP 6-25A		48	67
	GP 6-25C			
GSR 30-R	GP 8-20A	48	52	74
	GP 8-20C			
	GP 8-25A		64	80
	GP 8-25C			
GSR 35-R	GP 10-20A	57	64	89
	GP 10-20C			
	GP 10-25A		80	97
	GP 10-25C			

CSR

Cross LM Guide Model CSR



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-74
Accuracy Standards	A1-82
Shoulder Height of the Mounting Base and the Corner Radius	A1-487
Reference Error Tolerance for the Mounting Surface	A1-494
Dimensions of Each Model with Options Attached	A1-517

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. Since retainer plates hold the balls, they will not fall out even if the LM block is removed from the LM rail.
This LM Guide has two rails intersecting at right angles integrated back-to-back into a single block with the same internal structure as the proven LM Guide Model HSR. It is machined with high precision so that the error in the perpendicularity of the six faces of the LM block is within 2 μm per 100 mm. The two rails are also machined with high precision in relative straightness. This results in extremely high orthogonal accuracy. Because an orthogonal LM System can be achieved with the Model CSR alone, conventional saddles are no longer necessary, enabling simplified X-Y motion and a compact structure.

4-Way Equal Load

Each row of balls is placed at a contact angle of 45° so that the load ratings 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.

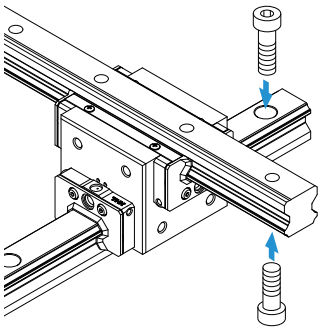
High Rigidity

Since the balls are well balanced in four rows, this model is able to withstand moments, and it achieves smooth linear motion even when a preload is applied to increase the rigidity.
The rigidity of the single LM block is 50% higher than that of a combination of two conventional HSR LM blocks secured back-to-back with bolts, making this model optimal for building an X-Y table that requires high rigidity.

Model CSR-S

Dimensional Table⇒A1-310

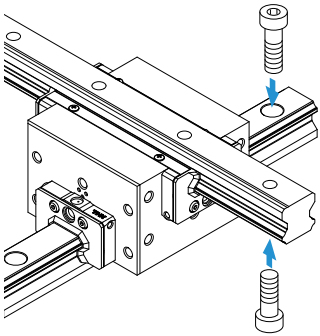
This model is the standard type.



Model CSR

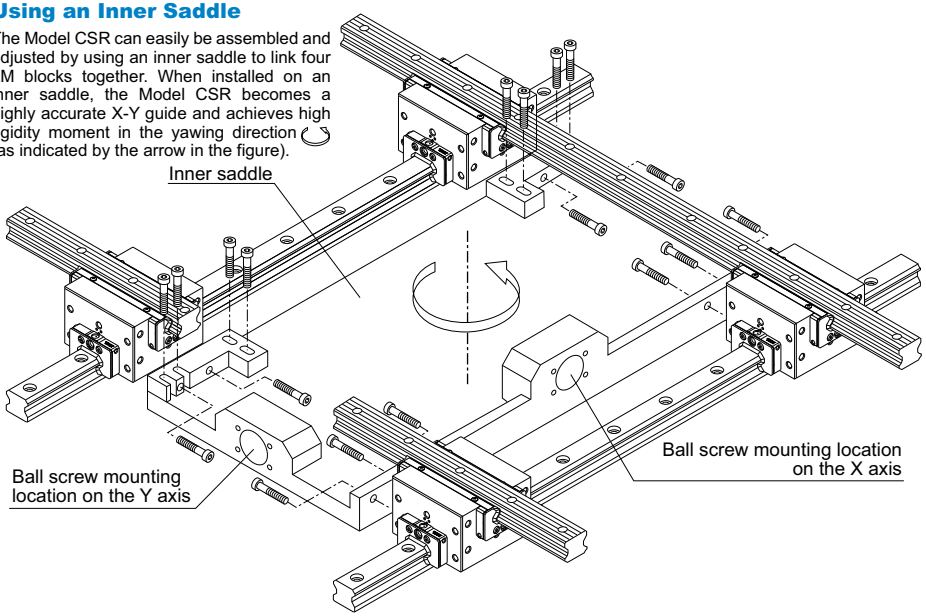
Dimensional Table⇒A1-310

It has a longer overall LM block length (L) and a greater load rating.

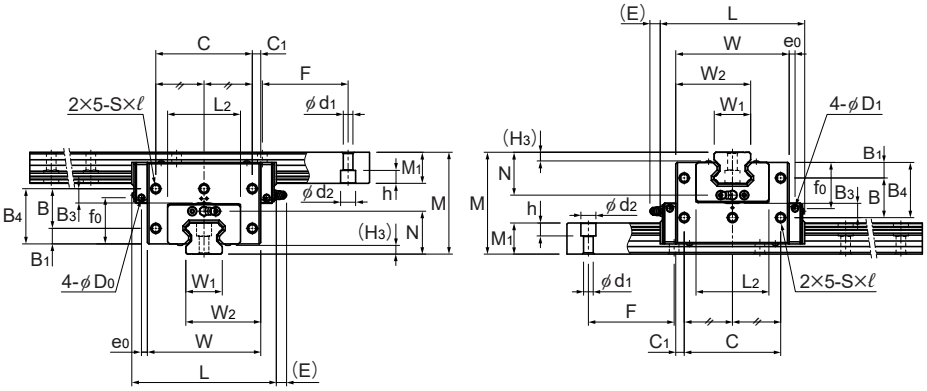


Using an Inner Saddle

The Model CSR can easily be assembled and adjusted by using an inner saddle to link four LM blocks together. When installed on an inner saddle, the Model CSR becomes a highly accurate X-Y guide and achieves high rigidity moment in the yawing direction (as indicated by the arrow in the figure).



Model CSR



Models CSR20 to 45

Model No.	Outer dimensions			LM block dimensions													
	Height	Width	Length														Grease nipple
	M	W	L	B_1	B_3	B_4	B	C	C_1	S×ℓ	L_2	N	E	e_0	f_0	D_0	
CSR 15	47	38.8	56.6	—	11.0	34.8	—	20	9.4	M4×6	32	19.7	5.5	3.2	22.1	3	PB1021B
CSR 20S CSR 20	57	50.8 66.8	74 90	— 13	12.7 7.2	42.5 37	— 24	30 56	10.4 5.4	M5×8	42	25	12	3.1	24.8	3	B-M6F
CSR 25S CSR 25	70	59.5 78.6	83.1 102.2	— 18	16.4 8.4	52 44	— 26	34 64	12.75 7.3	M6×10	46	30	12	3.5	30.5	3	B-M6F
CSR 30S CSR 30	82	70.4 93	98 120.6	— 21	19.4 11.4	61 53	— 32	40 76	15.2 8.5	M6×10	58	35	12	5.2	38.2	5.2	B-M6F
CSR 35	95	105.8	134.8	24	13.3	61	37	90	7.9	M8×14	68	40	12	5.5	43.1	5.2	B-M6F
CSR 45	118	129.8	170.8	30	15.4	75	45	110	9.9	M10×15	84	50	16	6.4	53.1	5.2	B-PT1/8

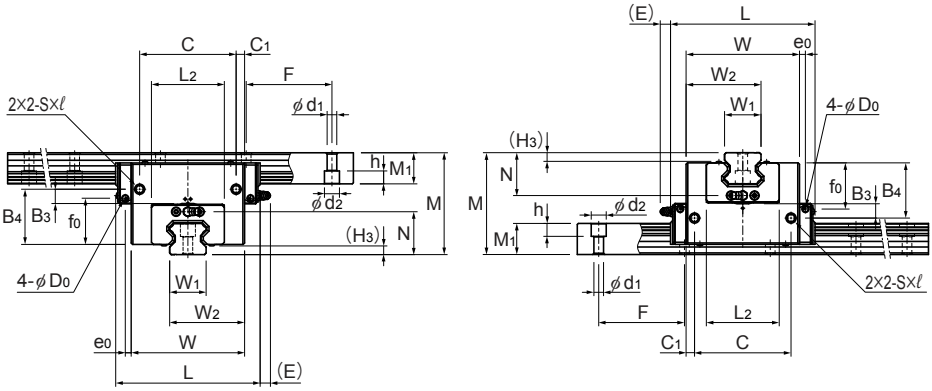
Model number coding

4 CSR25 UU C0 +1200/1000L P

- **4**: Total No. of LM blocks
- **CSR25**: Model number
- **UU**: Contamination protection accessory symbol (*1)
- **C0**: Radial clearance symbol (*2) Normal (No symbol)/Light preload (C1) Medium preload (C0)
- **+1200/1000L**: LM rail length on the X axis (in mm) / LM rail length on the Y axis (in mm)
- **P**: Accuracy symbol (*3) Precision grade (P)/Super precision grade (SP) Ultra precision grade (UP)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-82**.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com

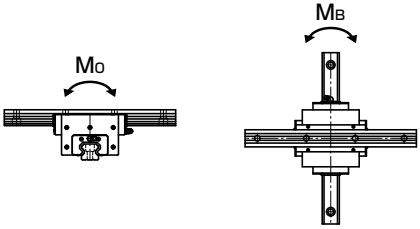


Models CSR15, 20S to 30S

Unit: mm

		LM rail dimensions						Basic load rating		Static permissible moment*		Mass	
	H_3	Width W_1 ±0.05	W_2	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Length* Max	C kN	C_0 kN	M_0 kN·m	M_B kN·m	LM block kg	LM rail kg/m
	4.7	15	26.9	15	60	4.5×7.5×5.3	3000	10.9	15.7	0.0945	0.0945	0.34	1.5
	4	20	35.4 43.4	18	60	6×9.5×8.5	3000	19.8 23.9	27.4 35.8	0.218 0.307	0.218 0.363	0.73 1.3	2.3
	5.5	23	41.25 50.8	22	60	7×11×9	3000	27.6 35.2	36.4 51.6	0.324 0.518	0.324 0.627	1.2 2.2	3.3
	7	28	49.2 60.5	26	80	9×14×12	3000	40.5 48.9	53.7 70.2	0.599 0.852	0.599 0.995	2 3.6	4.8
	7.5	34	69.9	29	80	9×14×12	3000	65	91.7	1.37	1.49	5.3	6.6
	10	45	87.4	38	105	14×20×17	3090	100	135	2.59	2.59	9.8	11

Note1)The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-312**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
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 **A1-517** or **A1-539**)
Note2)The Model CSR is not available with an upper surface lubrication hole.



Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model CSR variations.
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.

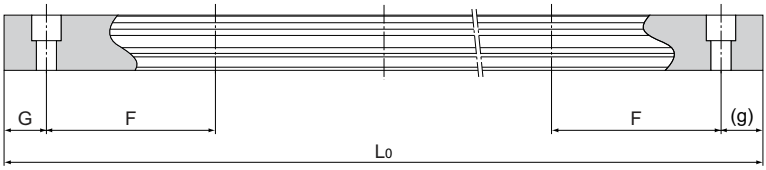


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model CSR

Unit: mm

Model No.	CSR 15	CSR 20	CSR 25	CSR 30	CSR 35	CSR 45
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600 1720 1840 1960 2080 2200	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 2200 2320 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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
Standard pitch F	60	60	60	80	80	105
G, g	20	20	20	20	20	22.5
Max length	3000	3000	3000	3000	3000	3090

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

Tapped-Hole Type LM Rail

CSR model rails also include a type where the LM rail is tapped from the bottom. With the X-axis LM rail having tapped holes, this model can be secured with bolts from the top.

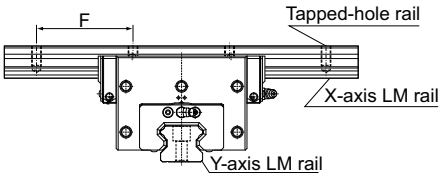


Table 2: Dimensions of the LM Rail Tap Unit: mm

Model No.	S_1	Effective tap depth ℓ_1
15	M5	8
20	M6	10
25	M6	12
30	M8	15
35	M8	17
45	M12	24

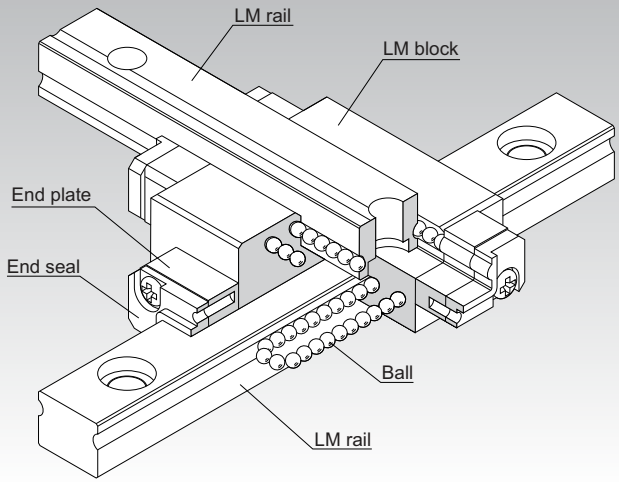
Model number coding

4CSR25UUC0+1200LP K /1000LP

Symbol for
tapped-hole LM rail type

MX

Miniature Cross LM Guide Model MX



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-74
Accuracy Standards	A1-86
Shoulder Height of the Mounting Base and the Corner Radius	A1-488
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Balls roll in two 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. This model has two Miniature LM Guide Model RSR rails intersecting at right angles integrated back-to-back into a single block. The Model MX alone achieves an extremely low-profile orthogonal LM System, eliminating the need for conventional saddles and enabling a more compact structure.

4-Way Equal Load

Each row of balls is placed at a contact angle of 45° so that the load ratings 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.

LM Rail with Tapped Holes

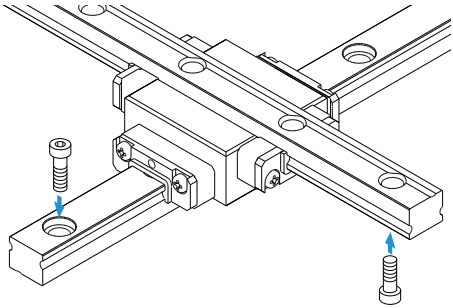
There are two types of the LM rail: one designed to be mounted from the top with bolts, and a semi-standard type whose bottom face has tapped holes, allowing the rail to be mounted from the bottom.

Types and Features

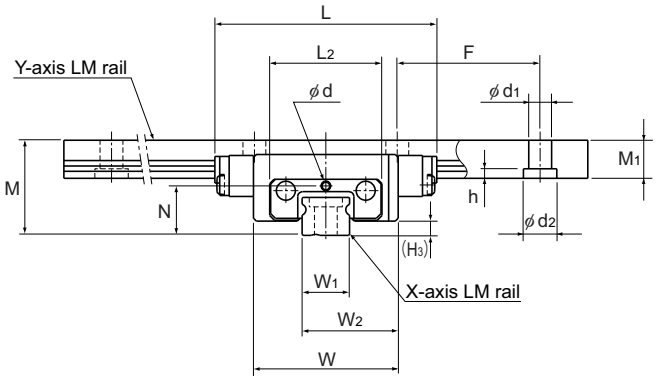
Model MX

Dimensional Table⇒A1-316

Model MX is divided into two types: RSR5 cross type and RSR7W cross type.



Model MX



Model No.	Outer dimensions			LM block dimensions			
	Height M	Width W	Length L	L_2	N	Lubrication hole d	H_3
MX 5M	10	15.2	23.3	11.8	5.2	0.8	1.5
MX 7WM	14.5	30.2	40.8	24.6	7.4	1.2	2

Model number coding

4 MX7W M UU C1 +120L P M / 100L P T M

- 4: Total No. of LM blocks
- MX7W M: Model number
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)
- +120L: LM rail length on the X axis (in mm)
- P: Accuracy symbol (*3) Normal grade (No Symbol) Precision grade (P)
- M: LM rail is made of stainless steel
- 100L: LM rail length on the Y axis (in mm)
- P: Symbol for LM rail jointed use
- T: LM rail is made of stainless steel
- M

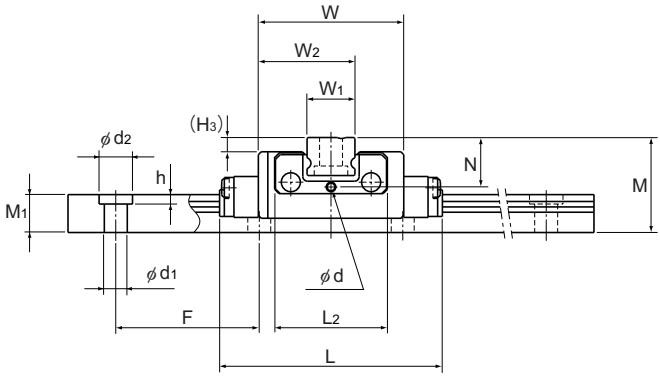
(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-86**.

Note) If the product is of the semi-standard type that uses tapped holes in the LM rail for mounting, include a “K” in the model number after the accuracy symbol.

Example: 4MX7WMUUC1+120LP K M/100LP K TM

Add symbol "K"

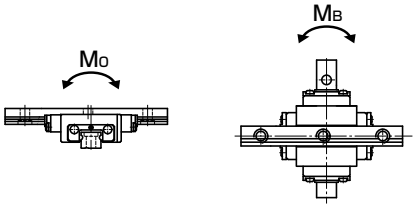
Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



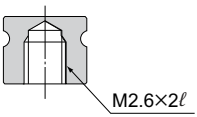
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment* N·m		Mass	
	Width W_1	W_2	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Length* Max	C kN	C_0 kN	M_0	M_B	LM block kg	LM rail kg/m
	$5\ ^{0}_{-0.02}$	10.1	4	15	2.4×3.5×1	200	0.59	1.1	2.57	2.57	0.01	0.14
	$14\ ^{0}_{-0.025}$	22.1	5.2	30	3.5×6×3.2	400	2.04	3.21	14.7	14.7	0.051	0.51

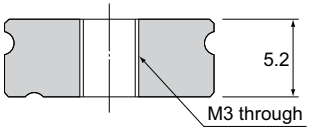
Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-318.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Total block length L : The total block length L shown in the table is the length with the dust-proof parts (code: UU).
The M in the model number symbol indicates that the LM block, LM rail and balls are made of stainless steel.
The stainless steel provides excellent corrosion and environmental resistance.
Please be aware that balls will fall out if the LM block is removed from the LM rail.



For the LM rail mounting holes, a semi-standard type with tapped holes in the LM rail is also available.



Model MX5M



Model MX7WM

When mounting the LM rail of model MX7WM, take into account the thread length of the mounting bolt in order to prevent the bolt end from sticking out of the top face of the LM rail.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model MX variations.

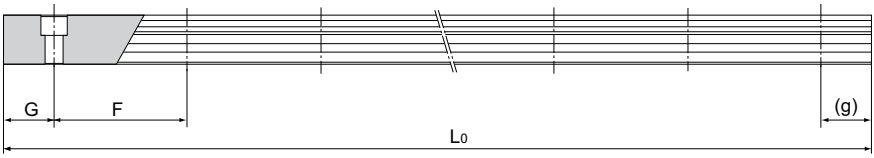


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model MX

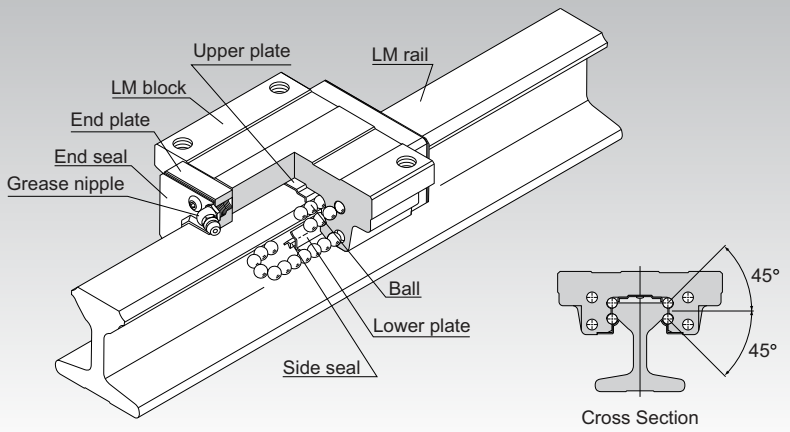
Unit: mm

Model No.	MX 5	MX 7W
LM rail standard lengths (L_0)	40 55 70 100 130 160	50 80 110 140 170 200 260 290
Standard pitch F	15	30
G, g	5	10
Max length	200	400

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

JR

Structural Beam LM Guide Model JR



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-81
Shoulder Height of the Mounting Base and the Corner Radius	A1-487
Reference Error Tolerance for the Mounting Surface	A1-494
Dimensions of Each Model with Options Attached	A1-517

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. Since retainer plates hold the balls, they will not fall out even if the LM block is removed from the LM rail.
The Model JR uses the same LM block as the Model HSR, which has a proven track record. The LM rail has a cross-sectional shape with high flexural rigidity, and therefore can be used as a structural component.
Unlike a conventional LM Guide, whose LM rail is secured to a mounting surface with bolts when installed, model JR's LM rail is integrated with the mounting base while retaining the same upper structure as LM Guide Model HSR. The lower part of the LM rail has a hardness of 25HRC or less, making it easy to cut and enabling the rail to be welded.
When welding the rail, we recommend using welding rods compliant with JIS D 5816 (suggested manufacturer and model number: Kobelco LB-52).

4-Way Equal Load

Each row of balls is placed at a contact angle of 45° so that the load ratings 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.

Can be Mounted Even Under Rough Conditions

Since the center of the cross-section of the LM rail is slightly thinner, even if the parallelism between two rails is not precise the LM rail is capable of absorbing the error by bending inward or outward.

Cross-Sectional Shape with High Flexural Rigidity

The LM rail has a cross-sectional shape with high flexural rigidity, and therefore can be used as a structural component in applications. In addition, even when the LM rail is partially fastened or supported in cantilever, the distortion is minimal.

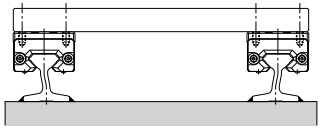


Fig. 1

Geometric Moment of Inertia of the LM Rail

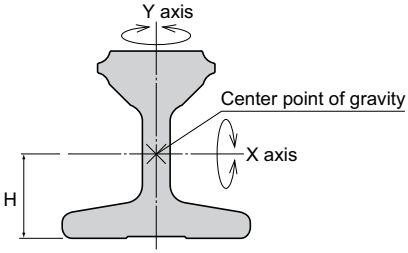


Fig. 2

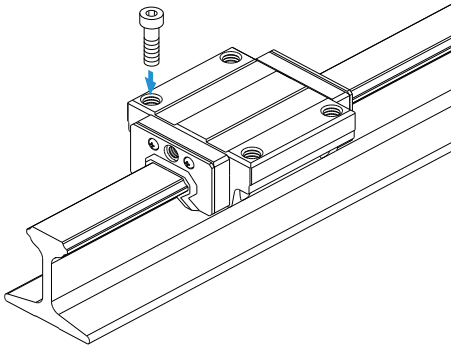
	Geometric moment of inertia I (×10⁵ mm⁴)		Section modulus Z (×10⁴ mm³)		Height of gravitational center H (mm)
	About X axis	About Y axis	About X axis	About Y axis	
JR 25	1.9	0.51	0.69	0.21	19.5
JR 35	4.26	1.32	1.43	0.49	24.3
JR 45	12.1	3.66	3.31	1.04	33.1
JR 55	27.6	6.54	5.89	1.4	43.3

Types and Features

Model JR-A

Dimensional Table⇒A1-324

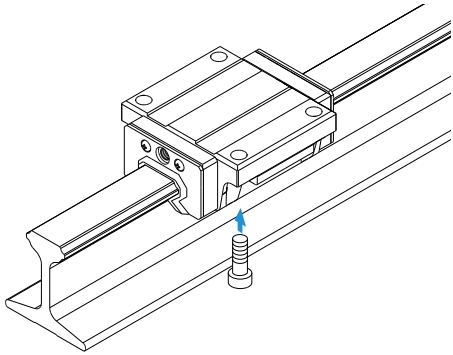
The flange of its LM block has tapped holes.



Model JR-B

Dimensional Table⇒A1-324

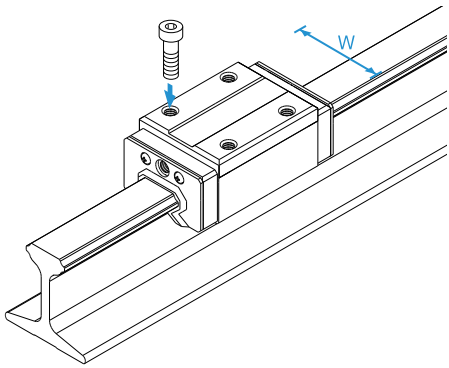
The flange of the LM block has through holes. It is used in places where the table cannot have through holes for mounting bolts.



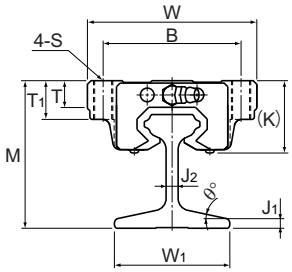
Model JR-R

Dimensional Table⇒A1-324

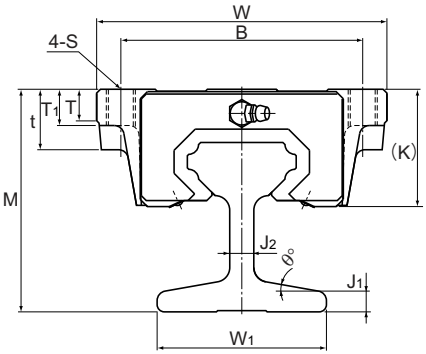
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Models JR-A, JR-B, and JR-R



Models JR25 and 35A



Models JR45 and 55A

Model No.	Outer dimensions			LM block dimensions											
	Height	Width	Length												Grease nipple
	M	W	L	B	C	H	S×ℓ	L_1	t	T	T_1	K	N	E	
JR 25A	61	70		57	45	—	M8*		—	11	16	30.5	6		
JR 25B	61	70	83.1	57	45	7	—	59.5	16	11	10	30.5	6	12	B-M6F
JR 25R	65	48		35	35	—	M6×8		—	9	—	34.5	10		
JR 35A	73	100		82	62	—	M10*		—	12	21	40	8		
JR 35B	73	100	113.6	82	62	9	—	80.4	21	12	13	40	8	12	B-M6F
JR 35R	80	70		50	50	—	M8×12		—	11.7	—	47.4	15		
JR 45A	92	120		100	80	—	M12*		25	13	15	50	10		
JR 45B	92	120	145	100	80	11	—	98	25	13	15	50	10	16	B-PT1/8
JR 45R	102	86		60	60	—	M10×17		—	15	—	59.4	20		
JR 55A	114	140		116	95	—	M14*		29	13.5	17	57	11		
JR 55B	114	140	165	116	95	14	—	118	29	13.5	17	57	11	16	B-PT1/8
JR 55R	124	100		75	75	—	M12×18		—	20.5	—	67	21		

Note) "*"indicates a through hole.

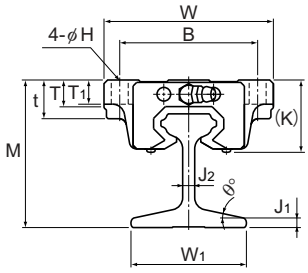
Model number coding

JR35 R 2 UU +1000L T

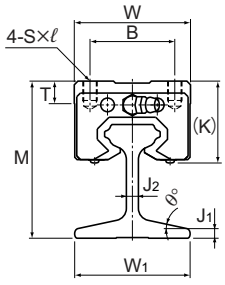
- JR35: Model number
- R: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- +1000L: LM rail length (in mm)
- T: Symbol for LM rail jointed use

(*1) See contamination protection accessory on A1-543

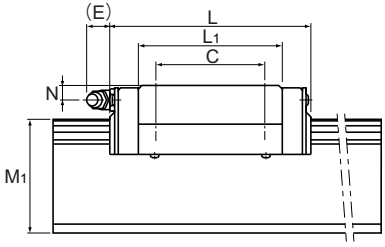
Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model JR-B



Model JR-R



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width				Height	Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	W_1	J_1	J_2	θ°	M_1	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	48	4	5	12	47	2000	27.6	36.4	0.324	1.8	0.324	1.8	0.366	0.59 0.59 0.54	4.2
	54	7	8	10	54	4000	53.9	70.2	0.895	4.51	0.895	4.51	1.05	1.6 1.6 1.5	8.6
	70	8	10	10	70	4000	82.2	101	1.5	8.37	1.5	8.37	1.94	2.8 2.8 2.6	15.2
	93	4.8	11.6	12	90	4000	121	146	2.6	14.1	2.6	14.1	3.43	4.5 4.5 4.3	18.3

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-326**.)
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 **A1-517** or **A1-539**)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model JR variations. If the maximum length of the desired LM rail exceeds these values, jointed rails will be used. Contact THK for details.

Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model JR

Unit: mm

Model No.	JR 25	JR 35	JR 45	JR 55
LM rail standard lengths (L_0)	1000 1500 2000	1000 2000 4000	1000 2000 4000	1000 2000 4000
Max length	2000	4000	4000	4000

Note1) If jointed rails are not allowed and a greater length than the maximum values above is required, contact THK.
Note2) For jointing two or more rails, a metal fitting like the one shown in Fig. 3 is available. For the mounting method, see B1-99.

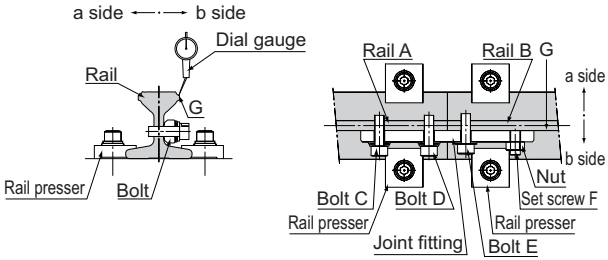
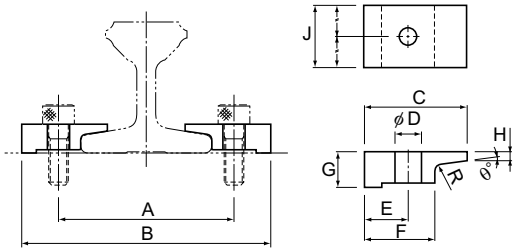


Fig. 3

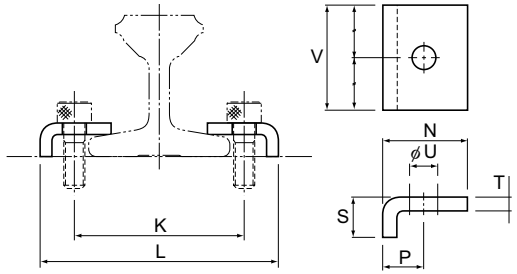
Model JB Frame for LM Rail Clamps



Unit: mm

Model No.	Mounting dimensions		Clamper dimensions									Bolt used
	A	B	C	D	E	F	G	H	R	J	θ°	
JB 25	57	78	25	7	10.5	15	10	3.8	R2	25	10	M6
JB 35	72	102	35	9	15	24	12	3.1	R2	32	8	M8
JB 45	90	130	45	11	20	30	16	5.4	R2	40	8	M10
JB 55	115	155	50	14	20	30	17	8.2	R2	50	10	M12

Model JT Steel Plate for LM Rail Clamps

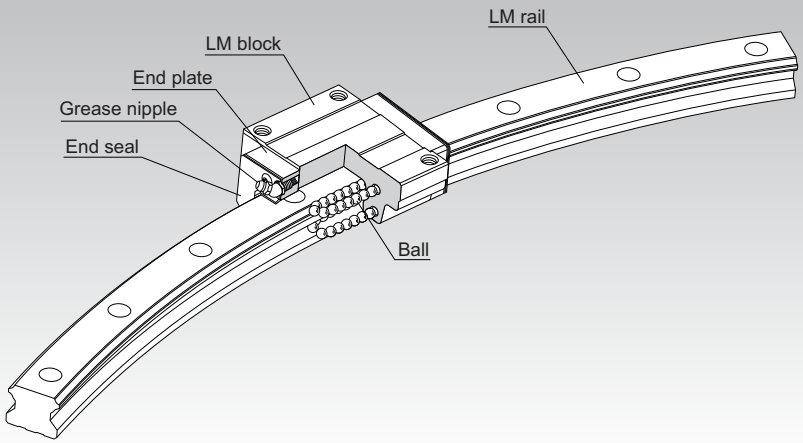


Unit: mm

Model No.	Mounting dimensions		Clamper dimensions						Bolt used
	K	L	N	P	S	T	U	V	
JT 25	57	79	25	11	10	4	7	25	M6
JT 35	65	91	27	13	13	4.5	9	40	M8
JT 45	84	114	33	15	16	6	11	50	M10
JT 55	110	148	50	19	15	6	14	50	M12

HCR

Curved LM Guide Model HCR



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-81
Shoulder Height of the Mounting Base and the Corner Radius	A1-489
Dimensions of Each Model with Options Attached	A1-517

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.
The curved guide is capable of achieving highly accurate circular motion. It is a novel product with the same basic structure as the successful LM Guide Model HSR, which can bear an equal load in four directions.

Freedom of Design

Multiple LM blocks can individually move on the same rail. By arranging LM blocks on the load points, efficient structural design is achieved.

Shortened Assembly Time

This model allows clearance-free, highly accurate circular motion as opposed to sliding guides or cam followers. You can easily assemble this model simply by mounting the LM rail and LM blocks with bolts.

Allows Circular Motion of 5 m or Longer

It allows circular motion of 5 m or longer, which is impossible with swivel bearings.
In addition, use of this model makes it easy to assemble, disassemble, and reassemble equipment that moves in a circular path.

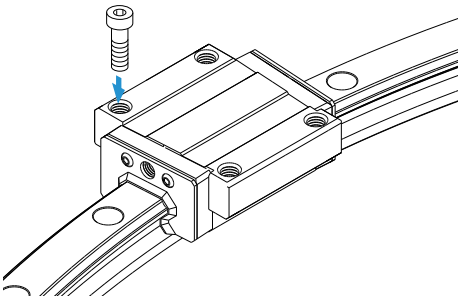
Capable of Receiving a Load in Any Direction

This model is capable of receiving loads in all directions since it has the same basic structure as Model HSR.

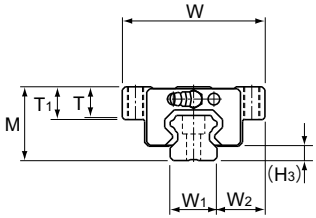
Model HCR

Dimensional Table⇒A1-332

The flange of its LM block has tapped holes.



Curved LM Guide Model HCR



Model No.	Outer dimensions			LM block dimensions									H_3
	Height M	Width W	Length L	B	C	S	L_1	T	T_1	N	E	Grease nipple	
HCR 12A+60/100R	18	39	44.6	32	18	M4	30.5	4.5	5	3.4	3.5	PB107	3.1
HCR 15A+60/150R	24	47	54.5	38	24	M5	38.8	10.3	11	4.5	5.5	PB1021B	4.8
HCR 15A+60/300R			55.5		28								
HCR 15A+60/400R			55.8		28								
HCR 25A+60/500R	36	70	81.6	57	45	M8	59.5	14.9	16	6	12	B-M6F	7
HCR 25A+60/750R			82.3										
HCR 25A+60/1000R			82.5										
HCR 35A+60/600R	48	100	107.2	82	58	M10	80.4	19.9	21	8	12	B-M6F	8.5
HCR 35A+60/800R			107.5										
HCR 35A+60/1000R			108.2										
HCR 35A+60/1300R			108.5										
HCR 45A+60/800R	60	120	136.7	100	70	M12	98	23.9	25	10	16	B-PT1/8	11.5
HCR 45A+60/1000R			137.3										
HCR 45A+60/1200R			137.3										
HCR 45A+60/1600R			138										
HCR 65A+60/1000R	90	170	193.8	142	106	M16	147	34.9	37	19	16	B-PT1/8	15
HCR 65A+60/1500R			195.4										
HCR 65A+45/2000R			195.9										
HCR 65A+45/2500R			196.5										
HCR 65A+30/3000R			196.5										

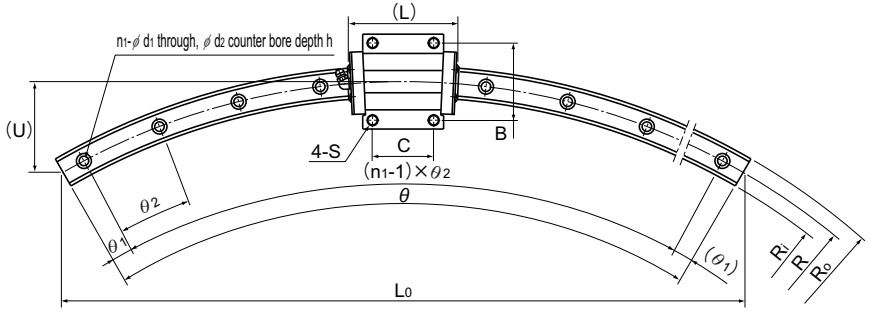
Model number coding

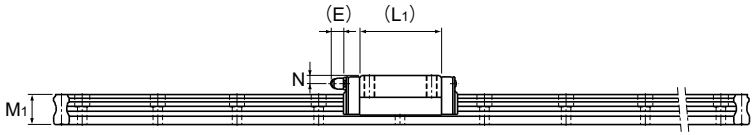
HCR25A 2 UU C1 +60 / 1000R H 6 T

- HCR25A: Model number
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1)
- +60: Curved LM Guide center angle
- 1000R: LM rail radius (in mm)
- H: Accuracy symbol (*3) — Normal grade (No Symbol), High accuracy grade (H)
- 6: Number of LM rail joints used on one axis (*4)
- T: Symbol for LM rail jointed use (*5)

(*1) See A1-543 (contamination protection accessories). (*2) See A1-75. (*3) See A1-81.
(*4) Number of LM rails used for one arc. Contact THK for details.
(*5) When using joined LM rails for models HCR15 to 65, the end seal utilized for dust-proofing options will be a low-resistance end seal.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com





Unit: mm

LM rail dimensions													Basic load rating		Static permissible moment kN·m*					Mass	
					Width		Height						C	C0	MA		MB		MC	LM block	LM rail
R	R0	Ri	L0	U	W1	W2	M1	d1×d2×h	n1	θ°	θ1°	θ2°	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
100	106	94	100	13.4	12	13.5	11	3.5×6×5	3	60	7	23	4.7	8.53	0.0409	0.228	0.0409	0.228	0.0445	0.08	0.83
150	157.5	142.5	150	20.1					3		7	23	6.66	10.8							
300	307.5	292.5	300	40	15	16	15	4.5×7.5×5.3	5	60	6	12	8.33	13.5	0.0805	0.457	0.0805	0.457	0.0844	0.2	1.5
400	407.5	392.5	400	54					7		3	9	8.33	13.5							
500	511.5	488.5	500	67					9		2	7									
750	761.5	738.5	750	100	23	23.5	22	7×11×9	12	60	2.5	5	19.9	34.4	0.307	1.71	0.307	1.71	0.344	0.59	3.3
1000	1011.5	988.5	1000	134					15		2	4									
600	617	583	600	80					7		3	9									
800	817	783	800	107	34	33	29	9×14×12	11	60	2.5	5.5	37.3	61.1	0.782	3.93	0.782	3.93	0.905	1.6	6.6
1000	1017	983	1000	134					12		2.5	5									
1300	1317	1283	1300	174					17		2	3.5									
800	822.5	777.5	800	107					8		2	8									
1000	1022.5	977.5	1000	134	45	37.5	38	14×20×17	10	60	3	6	60	95.6	1.42	7.92	1.42	7.92	1.83	2.8	11
1200	1222.5	1177.5	1200	161					12		2.5	5									
1600	1622.5	1577.5	1600	214					15		2	4									
1000	1031.5	968.5	1000	134					8	60	2	8									
1500	1531.5	1468.5	1500	201					10	60	3	6									
2000	2031.5	1968.5	1531	152	63	53.5	53	18×26×22	12	45	0.5	4	141	215	4.8	23.5	4.8	23.5	5.82	8.5	22.5
2500	2531.5	2468.5	1913	190					13	45	1.5	3.5									
3000	3031.5	2968.5	1553	102					10	30	1.5	3									

Note) 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

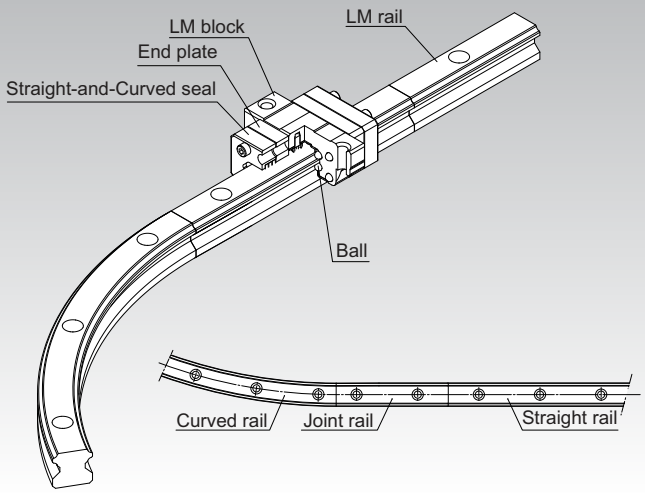
Total block length L : The total block length L shown in the table is the length with the dust proof parts, code UU or SS. If other contamination protection accessories or lubricant equipment are installed, the total block length will increase.
(See A1-517 or A1-539)

Please be aware that balls will fall out if the LM block is removed from the LM rail.
LM rail radii other than those shown in the table are also available. Contact THK for details.
The θ° in the table represents the maximum manufacturing angle. Exceeding this angle is normally done by using a joint; however, some products may have LM rails that exceed the maximum manufacturing angle. Contact THK for details.

Options⇒A1-503

HMG

Straight-and-Curved LM Guide Model HMG



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-80
Shoulder Height of the Mounting Base and the Corner Radius	A1-489
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

The Straight-and-Curved LM Guide Model HMG is a novel guide that allows the same type of LM blocks to continuously move on straight and curved rails by combining the technologies of the LM Guide Model HSR and the Curved LM Guide Model HCR. It achieves drastic cost reduction by eliminating the need for lifts and turntables, improving the efficiency and simplifying the structure of assembly and conveyance lines and inspection equipment.

Freedom of Design

It allows free combinations of straight and curved shapes.
Since LM blocks can smoothly transit between the straight and curved sections, various combinations of straight and curved rails can be joined into dynamic arrangements such as O, U, L, and S shapes.
In addition, HMG allows a large table to be mounted and a heavy object to be carried through combinations of multiple blocks on a single rail or 2 or more LM rails. Thus, it provides great freedom of design.

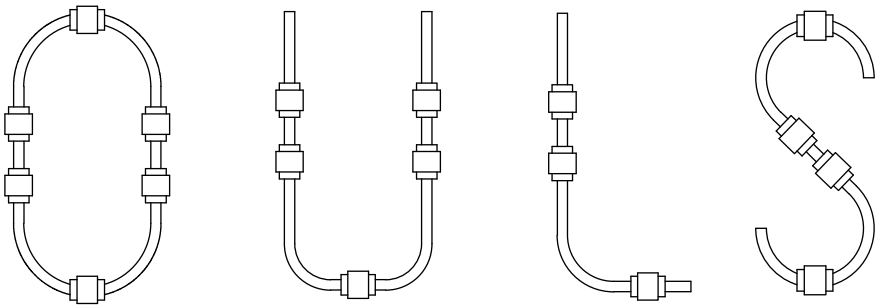


Fig. 1: Examples of Joining Rails into Different Shapes

Straight-and-Curved Seals

The Model HMG is available with seals that can be used for both straight and curved sections to prevent foreign materials from entering. These straight-and-curved seals provide sealing for both the straight and curved sections, preventing foreign materials from entering the unit.

Shortened Transportation Time

Unlike the shuttle method, using HMG units in a circulating system allows workpieces to be placed while other workpieces are being inspected or mounted, thus significantly improving process time. Increasing the number of tables can further shorten process time.

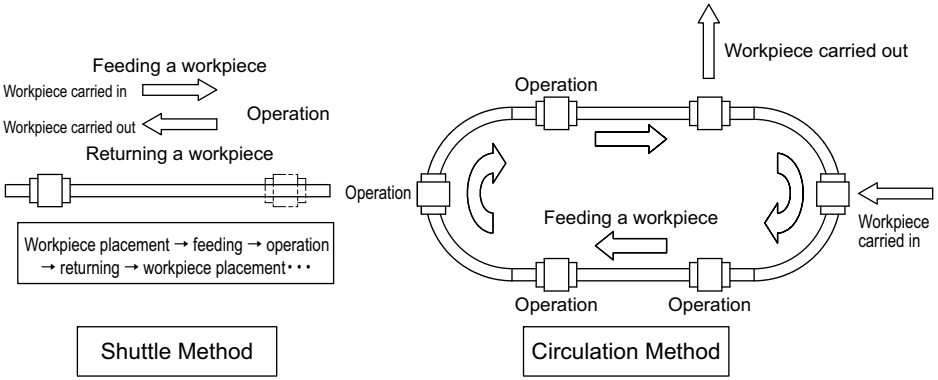


Fig. 2: Improved Process Time

Cost Reduction through a Simplified Mechanism

The combination of straight and curved rails eliminates lifts and turntables conventionally used for changing directions in conveyance and production lines. Therefore, use of HMG simplifies machines and eliminates a large number of parts, allowing the cost to be reduced. This also reduces the labor and time required for design.

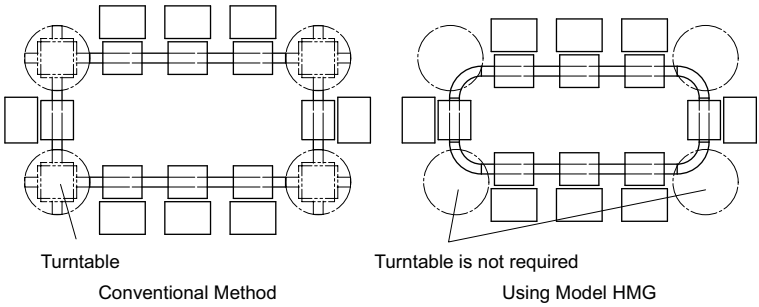


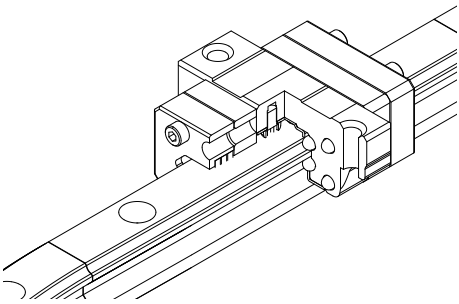
Fig. 3

Types and Features

Model HMG

Dimensional Table⇒A1-340

The flange of the LM block has tapped holes. It can be mounted from the top or the bottom.



Examples of Table Mechanisms

The Straight-and-Curved LM Guide Model HMG requires a rotating mechanism or a slide mechanism for the table to rotate the curved sections when 2 or more rails are used or when 2 or more LM blocks are connected on a single rail. Refer to Fig. 4 for examples of such mechanisms.

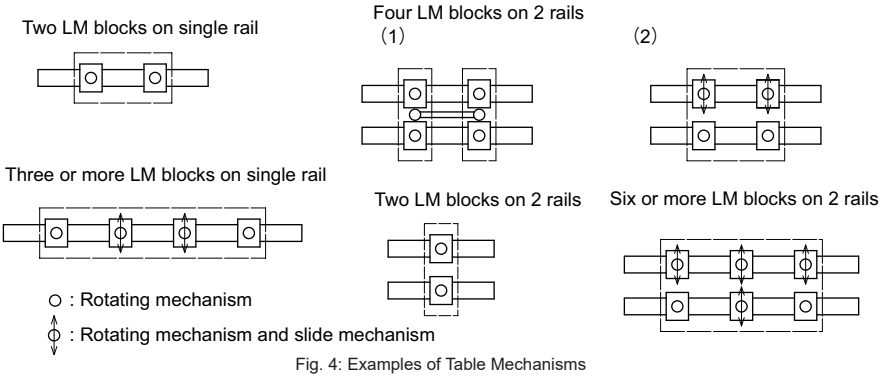


Fig. 4: Examples of Table Mechanisms

Fig. 5 shows examples of designing a table when units are used on multiple axes. HMG requires a rotating mechanism and a slide mechanism since the table is decentered when an LM block transits from a straight section to a curved section. The amount of decentering differs according to the radius of the curved section and the LM block span. Therefore, it is necessary to design the system in accordance with the corresponding specifications.

Fig. 6 shows detail drawings of the slide and rotating mechanisms. In the figure, LM Guide units are used in the slide mechanism and cross-roller rings in the rotating mechanism to achieve smooth sliding and rotating motions.

For driving the straight-and-curved guide, belt drives and chain drives are available.

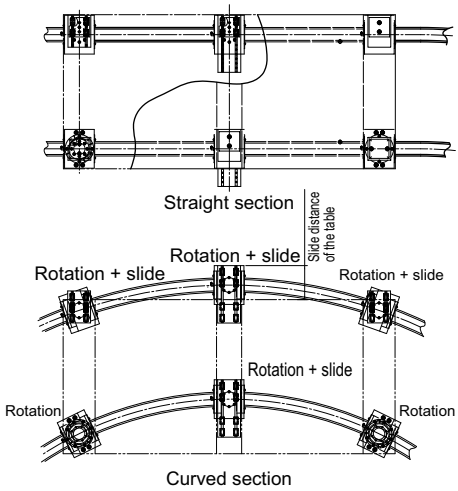


Fig. 5

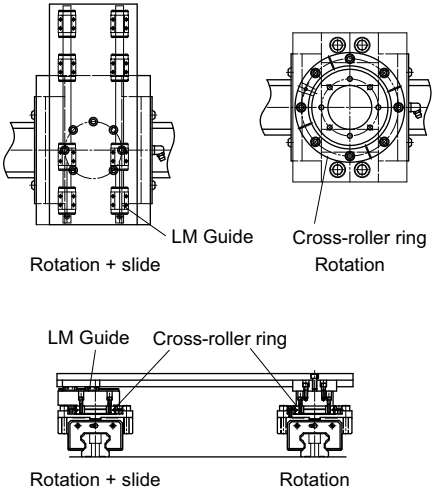
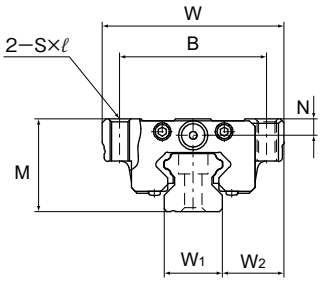
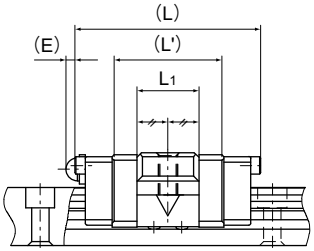


Fig. 6

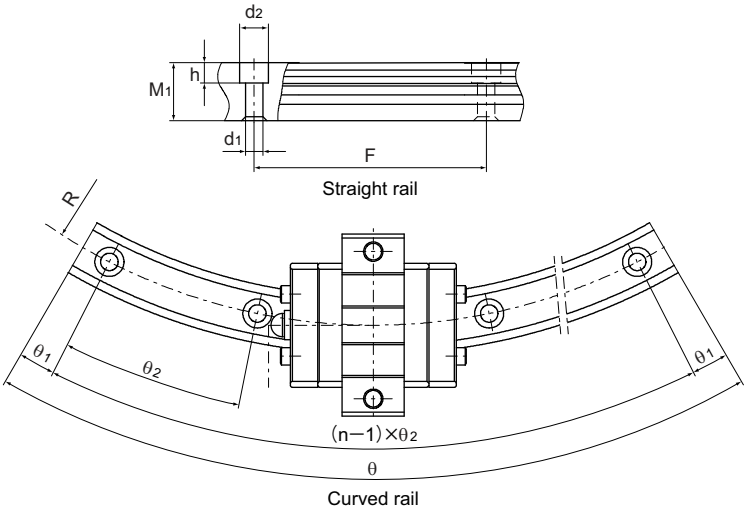
Model HMG





Model No.	Outer dimensions				LM block dimensions					LM rail dimensions			
										Straight rail			Height
	M	W	L	L´	B	S×ℓ	L_1	N	E	W_1	W_2	F	M_1
HMG 15A	24	47	48	28.8	38	M5×11	16	4.3	5.5	15	16	60	15
HMG 25A	36	70	62.2	42.2	57	M8×16	25.6	6	12	23	23.5	60	22
HMG 35A	48	100	80.6	54.6	82	M10×21	32.6	8	12	34	33	80	29
HMG 45A	60	120	107.6	76.6	100	M12×25	42.6	10	16	45	37.5	105	38
HMG 65A	90	170	144.4	107.4	142	M16×37	63.4	19	16	63	53.5	150	53

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

Mounting hole	Curved rail					Basic dynamic load rating (C)	Basic static load rating (C_0)	
$d_1 \times d_2 \times h$	R	n	θ°	θ_1°	θ_2°	Resultant load (C) kN	Straight section (C_0st) kN	Curved section (C_0r) kN
4.5×7.5×5.3	150	3	60	7	23	2.56	4.23	0.44
	300	5	60	6	12			
	400	7	60	3	9			
7×11×9	500	9	60	2	7	9.41	10.8	6.7
	750	12	60	2.5	5			
	1000	15	60	2	4			
9×14×12	600	7	60	3	9	17.7	19	11.5
	800	11	60	2.5	5.5			
	1000	12	60	2.5	5			
	1300	17	60	2	3.5			
14×20×17	800	8	60	2	8	28.1	29.7	18.2
	1000	10	60	3	6			
	1200	12	60	2.5	5			
	1600	15	60	2	4			
18×26×22	1000	8	60	2	8	66.2	66.7	36.2
	1500	10	60	3	6			
	2000	12	45	0.5	4			
	2500	13	45	1.5	3.5			
	3000	10	30	1.5	3			

Note) When a moment is applied where one LM block is specified per axis, the LM block may experience non-smooth motion. We recommend that multiple LM blocks be used per axis when a moment is applied.
Static permissible moment (straight/curved components): the static permissible moment value with 1 LM block (see Table 1)
Total block length L: The total block length L shown in the table is the length including the straight-curved seal (code: UU).

Table 1: Static Permissible Moments of Model HMG

Unit: kN·m

Model No.	M_A		M_B		M_C	
	Straight section	Curved section	Straight section	Curved section	Straight section	Curved section
HMG 15	0.008	0.007	0.008	0.01	0.027	0.003
HMG 25	0.1	0.04	0.1	0.05	0.11	0.07
HMG 35	0.22	0.11	0.22	0.12	0.29	0.17
HMG 45	0.48	0.2	0.48	0.22	0.58	0.34
HMG 65	1.47	0.66	1.47	0.73	1.83	0.94

Options⇒A1-503

Height Difference Specification for the Joint

Accuracy errors in LM rail installation will have an influence on the service life of the product. When installing the LM rail, take care to minimize the height difference in the joint within the specification indicated in Table 2. Particularly for joints between two curved rails, we recommend using a flushing piece like the one shown in Fig. 7 at the part where one curved rail meets the next. When using the flushing piece, place the fixed butt piece on the outer side, push the rail against the butt piece, and then adjust the level difference in the joint section by turning the adjustment screw from the inner side.

Table 2: Height Difference Specification for the Joint

Unit: mm

Model No.	Ball raceway, side face	Upper face	Maximum clearance of the joint section
15	0.01	0.02	0.6
25	0.01	0.02	0.7
35	0.01	0.02	1.0
45	0.01	0.02	1.3
65	0.01	0.02	1.3

Note) Place the pin on the outer circumference and the bolt on the inner circumference.

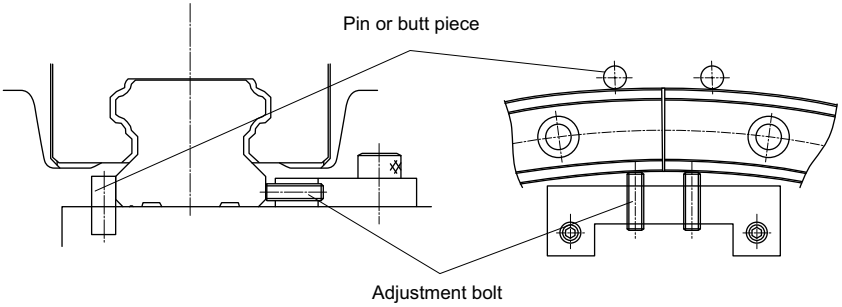


Fig. 7: Flush Piece

About the Curved Section

The curved section of model HMG has a clearance for a structural reason. Therefore, this model may not be used in applications where highly accurate feed is required. In addition, the curved section cannot withstand a large moment. When a large moment is applied, it is necessary to increase the number of LM blocks or LM rails. For permissible moment values, see Table 1 on **A1-341**.

Jointed LM Rail

Model HMG always requires a jointed rail where an LM block travels from the straight section to the curved section and where the curve is inverted such as an S curve. Take this into account when designing the system.

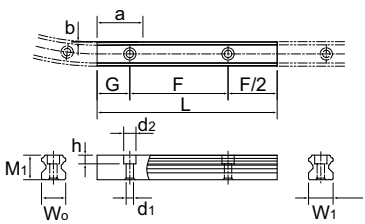


Table 3: Dimensions of the Jointed Rail

Unit: mm

Model No.	Dimensions of the jointed rail							
	Height	Pitch	Mounting hole	Width		Taper length	Taper depth	Radius
	M_1	F	$d_1 \times d_2 \times h$	W_1	W_0	a	b	R
15A	15	60	4.5×7.5×5.3	15	14.78	28	0.22	150
					14.89		0.11	300
					14.92		0.08	400
25A	22	60	7×11×9	23	22.83	42	0.17	500
					22.89		0.11	750
					22.92		0.08	1000
35A	29	80	9×14×12	34	33.77	54	0.23	600
					33.83		0.17	800
					33.86		0.14	1000
					33.9		0.1	1300
45A	38	105	14×20×17	45	44.71	76	0.29	800
					44.77		0.23	1000
					44.81		0.19	1200
					44.86		0.14	1600
65A	53	150	18×26×22	63	62.48	107	0.52	1000
					62.66		0.34	1500
					62.74		0.26	2000
					62.8		0.2	2500
					62.83		0.17	3000

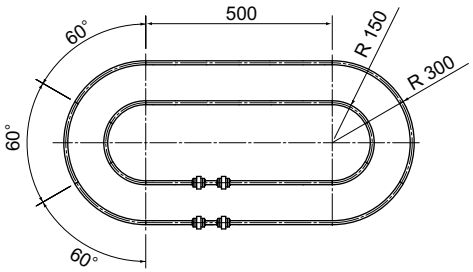


Fig. 8: Model No. Coding Example

Model number coding

When 2 rails are used

HMG15A 2 UU C1 +1000L T + 60/150R 6T + 60/300R 6T -Ⅱ

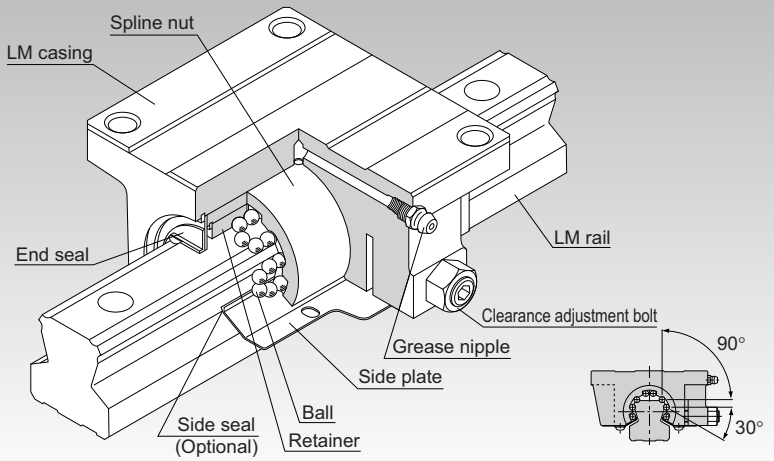
- HMG15A: Model number
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol — Normal (No symbol), Light preload (C1)
- +1000L: Overall linear LM rail length per rail
- T: Symbol for linear LM rail joint
- 60/150R: Center angle of one inner curved rail / Radius of inner curved rail
- 6T: No. of inner curved LM rails jointed
- 60/300R: Center angle of one outer curved rail / Radius of outer curved rail
- 6T: No. of outer curved LM rails jointed
- -Ⅱ: Symbol for No. of rails used on the same plane (*2)

(*1) See contamination protection accessory on A1-543. (*2) See A1-13.

Note) This model number indicates that an LM block and an LM rail constitute one set (i.e., the required number of sets when 2 rails are used is 2).
The standard Model HMG does not have a seal. To attach a seal, make sure to specify a straight-curved seal (code: UU). For the model number above, use Fig. 8.

NSR-TBC

Self-Aligning LM Guide Model NSR-TBC



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-487
Reference Error Tolerance for the Mounting Surface	A1-495
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Model NSR-TBC is the only LM Guide whose casing consists of two pieces instead of a single-piece LM block. The rigid, cast iron casing contains a cylindrical spline nut that is partially cut at an angle of 120°. This enables the model to self-align on the fitting surface with the casing, and reduces the required mounting precision.

Capable of Receiving a Load in Any Direction

NSR-TBC has four rows of balls. The balls are arranged in two rows on each shoulder of the LM rail, and can receive loads in all four directions: upward, downward, and in the lateral directions. Due to the self-aligning structure, however, a rotational moment (M_C) cannot be applied in a single-rail configuration.

Easy Installation and Accuracy Establishment

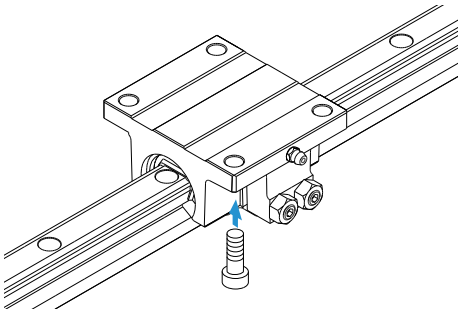
Model NSR-TBC is highly capable of performing self-adjustment and self-alignment. As a result, even if two rails are not mounted with precision, the LM casing absorbs the error and does not allow it to affect the traveling performance or reduce the machine's functionality.

Types and Features

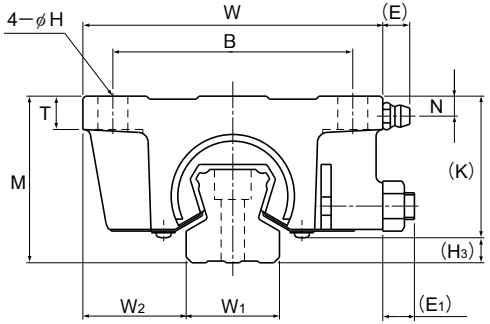
Model NSR-TBC

Dimensional Table⇒A1-346

The flange of the LM casing has through holes, allowing the LM Guide to be mounted from the bottom.



Model NSR-TBC



Model No.	Outer dimensions			LM casing dimensions									
	Height	Width	Length								Grease nipple		
	M	W	L	B	C	H	T	K	N	E	E_1		H_3
NSR 20TBC	40	70	67	55	50	6.6	8	34.5	5.5	8.5	7	A-M6F	5.5
NSR 25TBC	50	90	78	72	60	9	10	43.5	6	8.5	7.5	A-M6F	6.5
NSR 30TBC	60	100	90	82	72	9	12	51	8	8.5	9.5	A-M6F	9
NSR 40TBC	75	120	110	100	80	11	13	64	10	8.5	12	A-M6F	10.5
NSR 50TBC	82	140	123	116	95	14	15	74	9	15	15	A-PT1/8	8
NSR 70TBC	105	175	150	150	110	14	18	95.5	10	15	16.5	A-PT1/8	9.5

Model number coding

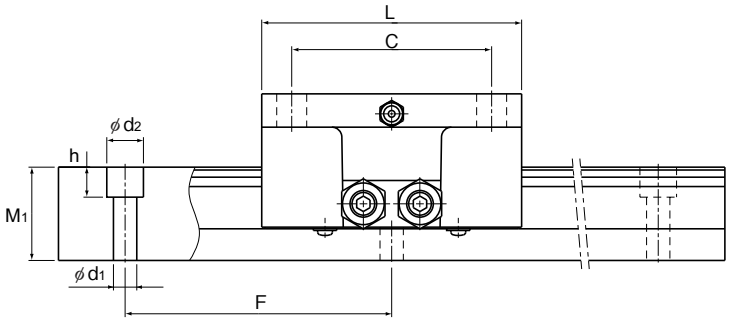
NSR50TBC 2 UU C1 +1200L P T -II

- NSR50TBC: Model number
- 2: No. of LM cases used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static Permissible Moment* kN·m		Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A	M_B	LM casing	LM rail
	W_1 ±0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	Max	kN	kN	Double casings	Double casings	kg	kg/m
	23	23.5	23	60	6×9.5×8.5	2200	9.41	18.6	0.31	0.27	0.62	3.1
	28	31	28	80	7×11×9	3000	14.9	26.7	0.53	0.46	1.13	4.7
	34	33	34.5	80	7×11×9	3000	22.5	38.3	0.85	0.74	1.8	7.2
	45	37.5	44.5	105	9×14×12	3000	37.1	62.2	1.7	1.5	3.5	12.2
	48	46	47.5	120	11×17.5×14	3000	55.1	87.4	2.7	2.4	5.2	14.3
	63	56	62	150	14×20×17	3000	90.8	152	9.8	4.9	9.4	27.6

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-348**.)
Static permissible moment* Double casings: the static permissible moment when two LM casings 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.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model NSR-TBC 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.

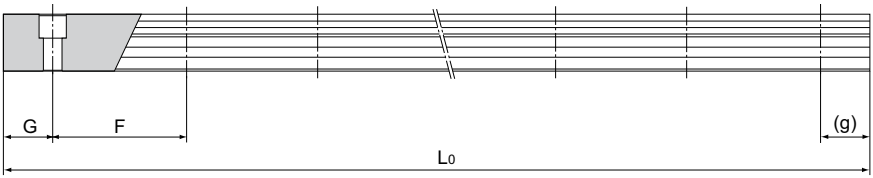


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model NSR-TBC

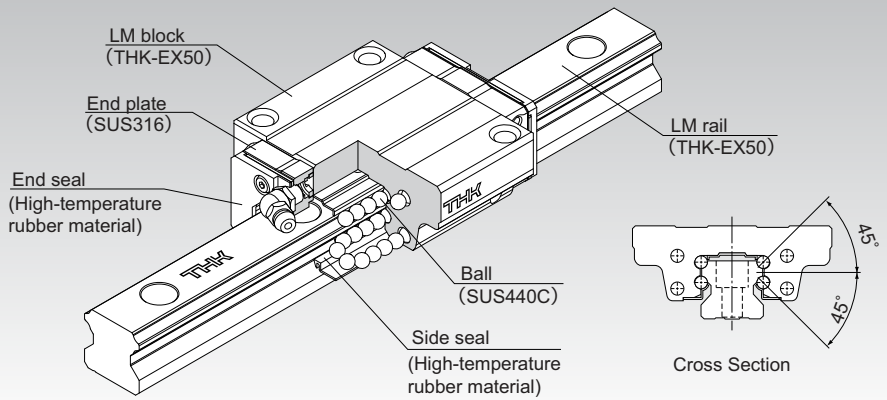
Unit: mm

Model No.	NSR 20TBC	NSR 25TBC	NSR 30TBC	NSR 40TBC	NSR 50TBC	NSR 70TBC
LM rail standard lengths (L_0)	220 280 340 460 640 820 1000 1240 1600	280 440 600 760 1000 1240 1640 2040 2520 3000	280 440 600 760 1000 1240 1640 2040 2520 3000	570 885 1200 1620 2040 2460 2985	780 1020 1260 1500 1980 2580 2940	1270 1570 2020 2620
Standard pitch F	60	80	80	105	120	150
G, g	20	20	20	22.5	30	35
Max length	2200	3000	3000	3000	3000	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.

HSR-M1

High-Temperature LM Guide Model HSR-M1



Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-74
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-489
Reference Error Tolerance for the Mounting Surface A1-494
Dimensions of Each Model with Options Attached A1-517

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

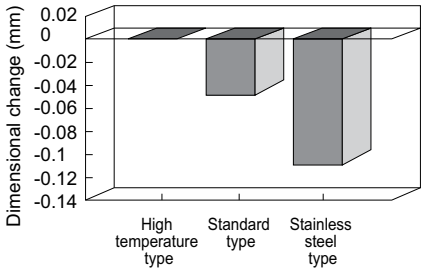
Since the LM block, LM rail, and balls use stainless steel, which is highly corrosion resistant, this model is optimal for clean room applications.

High-Temperature Grease

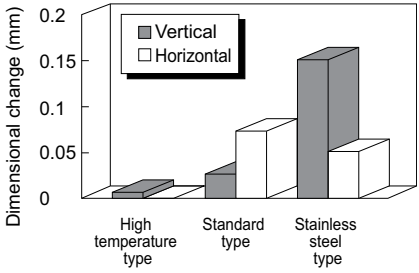
This model uses high-temperature grease that shows little grease-based fluctuation in rolling resistance even if the temperature changes from normal to high.

● 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

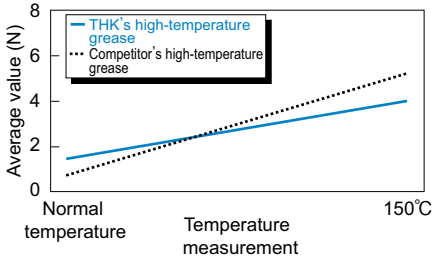


Curvature of the LM Rail

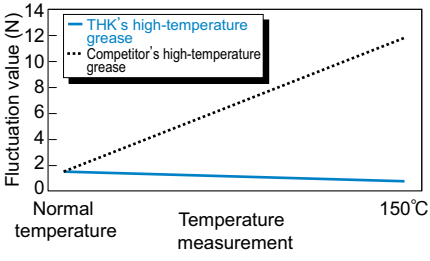
Note1) The above data on overall length and curvature indicate dimensional change when the LM rail is cooled to normal temperature after being heated at 150℃ for 100 hours.
Note2) The samples consist of high-temperature, standard, and stainless steel types of model HSR25 + 580L.

● 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

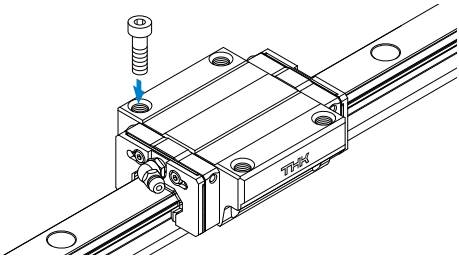
Specific heat capacity: 0.481 J/(g•K)
Thermal conductivity: 20.67 W/(m•K)
Average coefficient of linear expansion: 11.8×10^{-6}/℃

Types and Features

Model HSR-M1A

Dimensional Table⇒A1-356

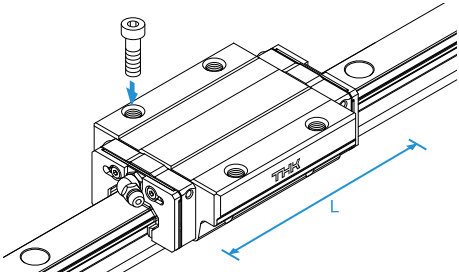
The flange of the LM block has tapped holes.



Model HSR-M1LA

Dimensional Table⇒A1-356

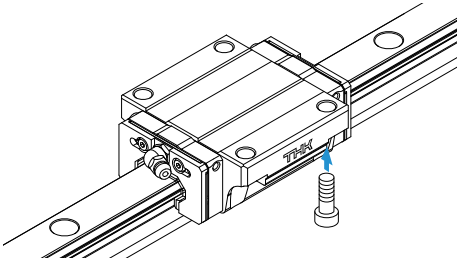
The LM block has the same cross-sectional shape as model HSR-M1A, but has a longer overall LM block length (L) and a greater load rating.



Model HSR-M1B

Dimensional Table⇒A1-358

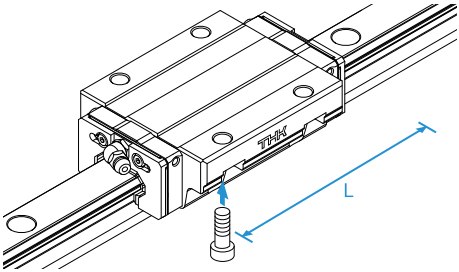
The flange of the LM block has through holes. It is used in places where the table cannot have through holes for mounting bolts.



Model HSR-M1LB

Dimensional Table⇒A1-358

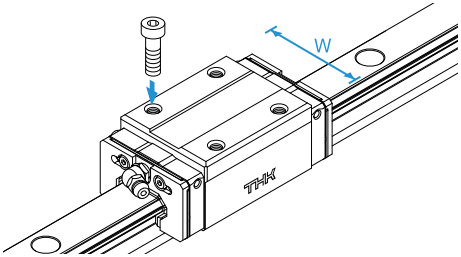
The LM block has the same cross-sectional shape as model HSR-M1B, but has a longer overall LM block length (L) and a greater load rating.



Model HSR-M1R

Dimensional Table⇒A1-360

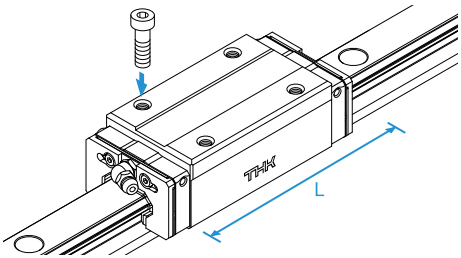
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Model HSR-M1LR

Dimensional Table⇒A1-360

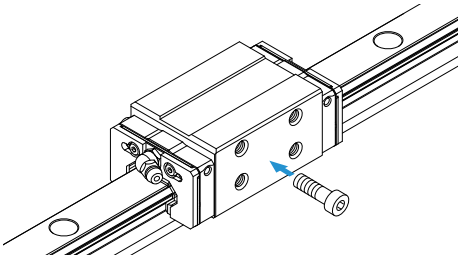
The LM block has the same cross-sectional shape as model HSR-M1R, but has a longer overall LM block length (L) and a greater load rating.



Model HSR-M1YR

Dimensional Table⇒A1-362

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.



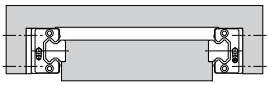


Fig. 1: Conventional Structure

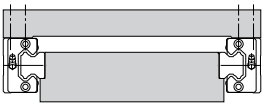
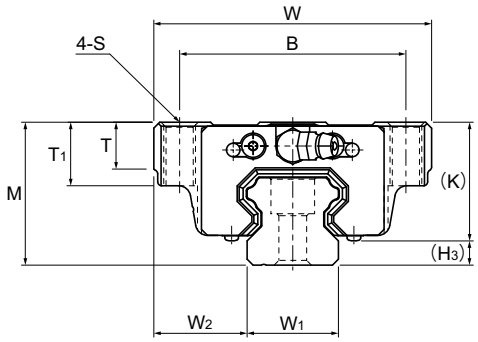


Fig. 2: Mounting Structure for Model HSR-M1YR

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-M1A and HSR-M1LA



Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S	L_1	T	T_1	K	N	E	Grease nipple	
HSR 15M1A	24	47	59.6	38	30	M5	38.8	6.5	11	19.3	4.3	5.5	PB1021B	4.7
HSR 20M1A HSR 20M1LA	30	63	76 92	53	40	M6	50.8 66.8	9.5	10	26	5	12	B-M6F	4
HSR 25M1A HSR 25M1LA	36	70	83.9 103	57	45	M8	59.5 78.6	11	16	30.5	6	12	B-M6F	5.5
HSR 30M1A HSR 30M1LA	42	90	98.8 121.4	72	52	M10	70.4 93	9	18	35	7	12	B-M6F	7
HSR 35M1A HSR 35M1LA	48	100	112 137.4	82	62	M10	80.4 105.8	12	21	40.5	8	12	B-M6F	7.5

Note) The length L of the high-temperature type LM Guide model HSR is longer than the normal type of model HSR. (Dimension L_1 is the same.)

Model number coding

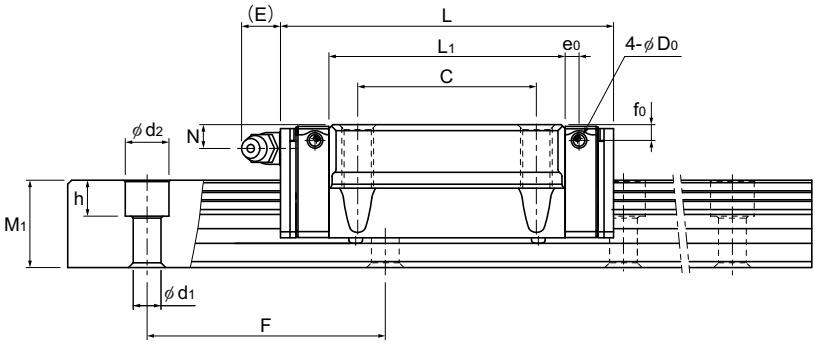
HSR25 M1 A 2 UU C1 +1240L P T -II

- HSR25: Model number
- M1: Symbol for high temperature type LM Guide
- A: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



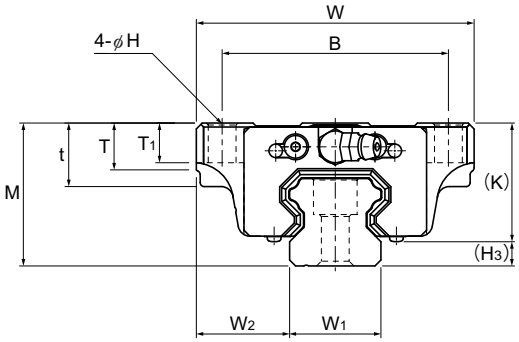
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	16	15	60	4.5×7.5×5.3	1240	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998	0.2	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	0.35 0.47	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	0.59 0.75	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	1.1 1.3	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	1.6 2	6.6

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-364.)
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.

Options⇒A1-503

Models HSR-M1B and HSR-M1LB



Model No.	Outer dimensions			LM block dimensions											H_3
	Height M	Width W	Length L	B	C	H	L_1	t	T	T_1	K	N	E	Grease nipple	
HSR 15M1B	24	47	59.6	38	30	4.5	38.8	11	6.5	7	19.3	4.3	5.5	PB1021B	4.7
HSR 20M1B HSR 20M1LB	30	63	76 92	53	40	6	50.8 66.8	—	9.5	10	26	5	12	B-M6F	4
HSR 25M1B HSR 25M1LB	36	70	83.9 103	57	45	7	59.5 78.6	16	11	10	30.5	6	12	B-M6F	5.5
HSR 30M1B HSR 30M1LB	42	90	98.8 121.4	72	52	9	70.4 93	18	9	10	35	7	12	B-M6F	7
HSR 35M1B HSR 35M1LB	48	100	112 137.4	82	62	9	80.4 105.8	21	12	13	40.5	8	12	B-M6F	7.5

Note) The length L of the high-temperature type LM Guide model HSR is longer than the normal type of model HSR. (Dimension L_1 is the same.)

Model number coding

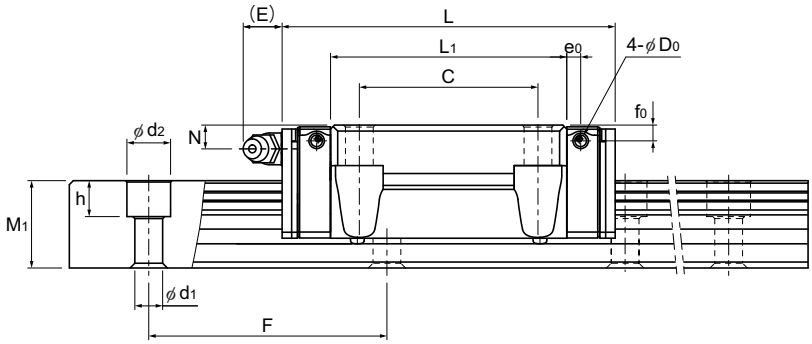
HSR20 M1 LB 2 UU C0 +1000L P T -II

- HSR20: Model number
- M1: Type of LM block
- LB: Symbol for high temperature type LM Guide
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +1000L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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 (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



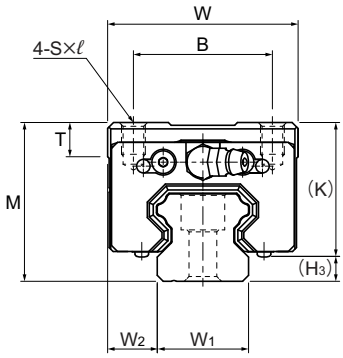
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	16	15	60	4.5×7.5×5.3	1240	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998	0.2	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	0.35 0.47	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	0.59 0.75	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	1.1 1.3	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	1.6 2	6.6

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-364.)
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.

Options⇒A1-503

Models HSR-M1R and HSR-M1LR



Model No.	Outer dimensions			LM block dimensions									
	Height	Width	Length								Grease nipple		
	M	W	L	B	C	S×ℓ	L_1	T	K	N	E		H_3
HSR 15M1R	28	34	59.6	26	26	M4×5	38.8	6	23.3	8.3	5.5	PB1021B	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	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	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	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	7.5

Note) The length L of the high-temperature type LM Guide model HSR is longer than the normal type of model HSR. (Dimension L_1 is the same.)

Model number coding

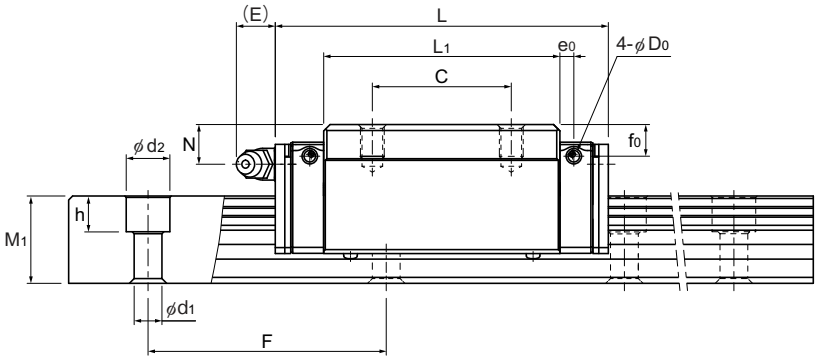
HSR35 M1 R 2 UU C0 +1080L P T -II

- HSR35: Model number
- M1: Type of LM block
- R: Symbol for high temperature type LM Guide
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +1080L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



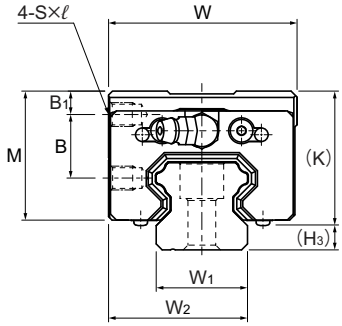
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	9.5	15	60	4.5×7.5×5.3	1240	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998	0.2	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	0.35 0.47	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	0.59 0.75	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	1.1 1.3	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	1.6 2	6.6

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-364.)
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.

Options⇒A1-503

Model HSR-M1YR



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

Note) The length L of the high-temperature type LM Guide model HSR-YR is longer than the normal type of model HSR-YR. (Dimension L_1 is the same.)

Model number coding

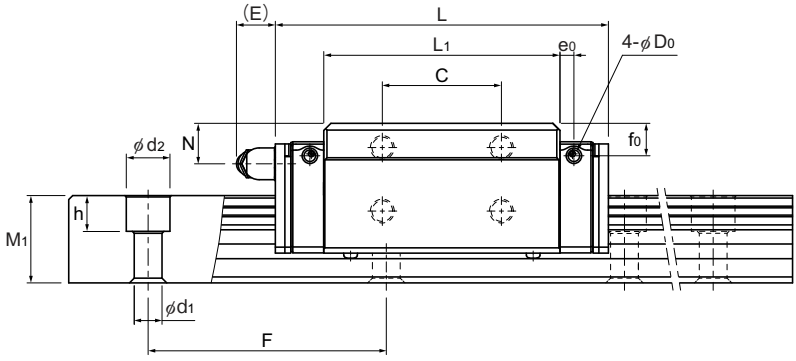
HSR25 M1 YR 2 UU C0 +1200L P T -II

- 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 (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-74**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double 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	0.2	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	0.35	2.3
	23	35	22	60	7×11×9	1500	27.6	36.4	0.324	1.8	0.324	1.8	0.366	0.59	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	1.3	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	1.6	6.6

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-364**.)
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.

Options⇒A1-503

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.

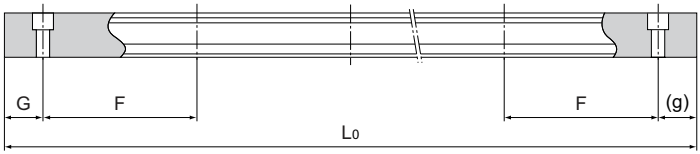


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HSR-M1

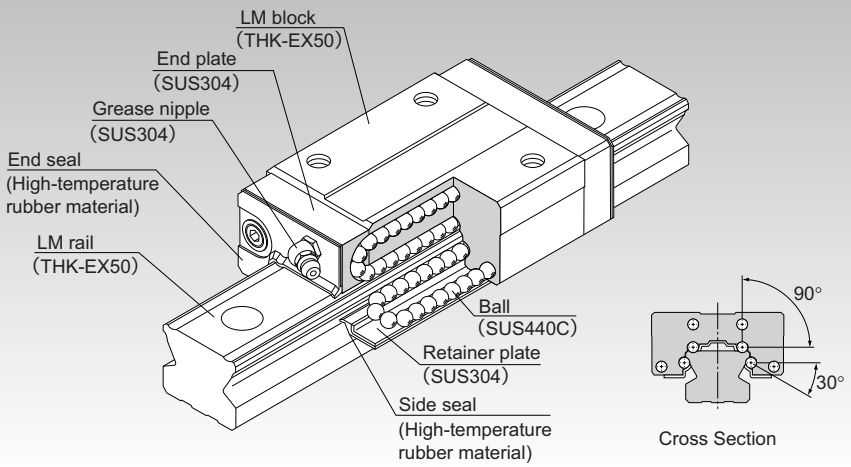
Unit: mm

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

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 values for HSR-M1 also apply to HSR-M1YR.

SR-M1

High-Temperature LM Guide Model SR-M1



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-74
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-487
Reference Error Tolerance for the Mounting Surface	A1-494
Dimensions of Each Model with Options Attached	A1-517

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.
Since it is a compactly designed model that has a low cross-sectional height and a ball contact structure that is suited to large loads in the radial direction, this model is optimal for horizontal guide units.
High-Temperature LM Guide Model SR-M1 is capable of being used at service temperatures 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.

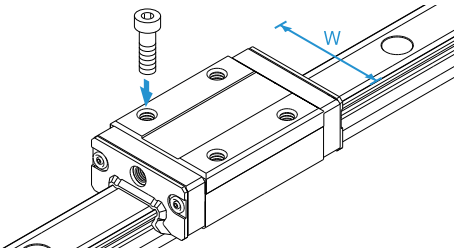
Thermal Characteristics of LM Rail and LM Block Materials

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

Model SR-M1W

Dimensional Table⇒A1-370

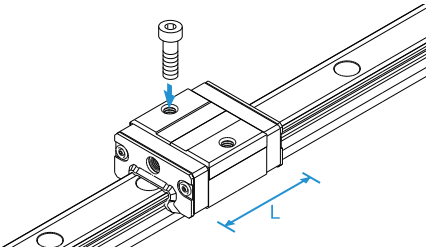
With this type, the LM block has a smaller width (W) and tapped holes.



Model SR-M1V

Dimensional Table⇒A1-370

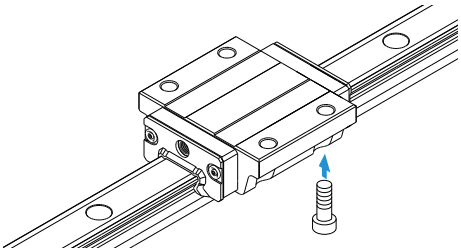
This is a space-saving type whose LM block has the same cross-sectional shape as model SR-M1W, but has a smaller overall LM block length (L).



Model SR-M1TB

Dimensional Table⇒A1-372

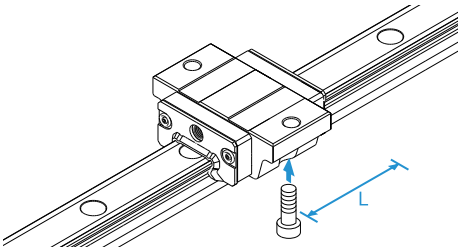
The LM block has the same height as model SR-M1W and can be mounted from the bottom.



Model SR- M1SB

Dimensional Table⇒A1-372

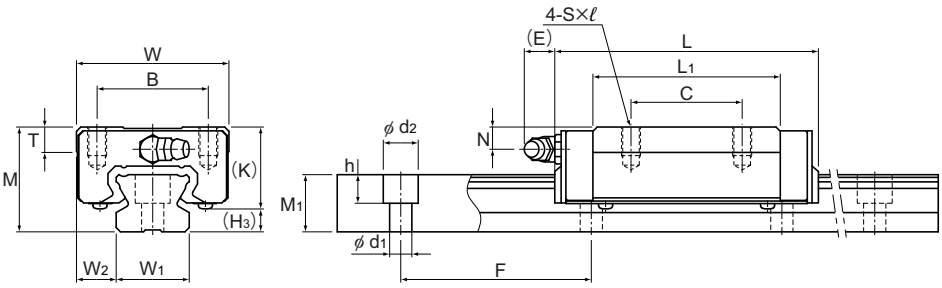
This is a space-saving type whose LM block has the same cross-sectional shape as model SR-M1TB, but has a smaller overall LM block length (L).



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 SR-M1W and SR-M1V



Model SR-M1W

Model No.	Outer dimensions			LM block dimensions									Grease nipple	H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E			
SR 15M1V SR 15M1W	24	34	40.4 57	26	— 26	M4×7	22.9 39.5	6	19.5	6	5.5	PB1021B	4.5
SR 20M1V SR 20M1W	28	42	47.3 66.2	32	— 32	M5×8	27.8 46.7	7.5	22	6	12	B-M6F	6
SR 25M1V SR 25M1W	33	48	59.2 83	35	— 35	M6×9	35.2 59	8	26	7	12	B-M6F	7
SR 30M1V SR 30M1W	42	60	67.9 96.8	40	— 40	M8×12	40.4 69.3	9	32.5	8	12	B-M6F	9.5
SR 35M1V SR 35M1W	48	70	77.6 111	50	— 50	M8×12	45.7 79	13	36.5	8.5	12	B-M6F	11.5

Model number coding

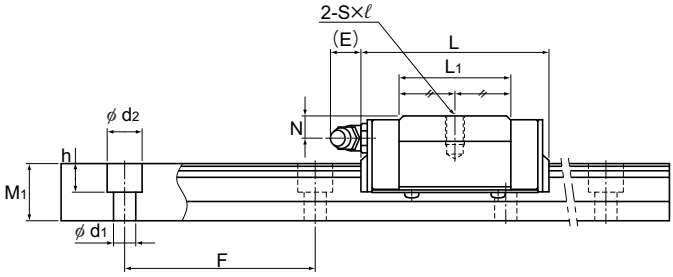
SR30 M1 W 2 UU C0 +1160L Y P T -II

- **SR30** — Model number
- **M1** — Symbol for high temperature type LM Guide
- **W** — Type of LM block
- **2** — No. of LM blocks used on the same rail
- **UU** — Contamination protection accessory symbol (*1)
- **C0** — Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- **+1160L** — LM rail length (in mm)
- **Y** — Applied to only 15 and 25
- **P** — Accuracy symbol (*3)
  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 (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model SR-M1V

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	15	9.5	12.5	60	3.5×6×4.5	1240	9.1 13.8	11.7 20.5	0.0344 0.0984	0.234 0.551	0.0215 0.0604	0.149 0.343	0.0694 0.122		0.12 0.2	1.2
	20	11	15.5	60	6×9.5×8.5	1500	13.4 19.2	17.2 28.6	0.064 0.167	0.396 0.887	0.0397 0.102	0.25 0.55	0.135 0.224		0.2 0.3	2.1
	23	12.5	18	60	7×11×9	1500	21.6 30.9	26.8 44.7	0.125 0.326	0.773 1.74	0.0774 0.2	0.488 1.08	0.245 0.408		0.3 0.4	2.7
	28	16	23	80	7×11×9	1500	29.5 45.6	34.4 64.4	0.173 0.564	1.15 2.92	0.108 0.346	0.735 1.8	0.376 0.703		0.5 0.8	4.3
	34	18	27.5	80	9×14×12	1500	40.9 60.4	46.7 81.8	0.275 0.785	1.79 4.27	0.171 0.482	1.14 2.65	0.615 1.08		0.8 1.2	6.4

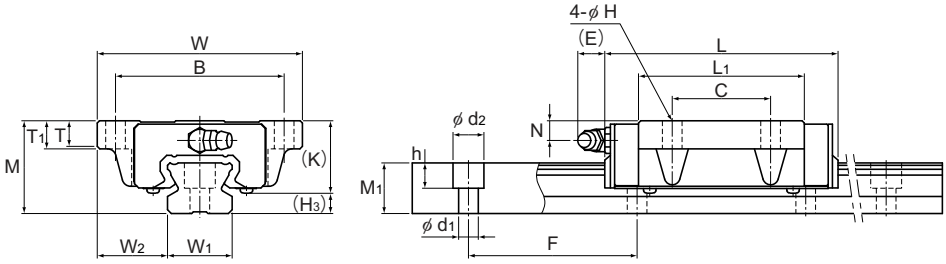
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-374.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
Total block length L : The total block length L shown in the table is the length with the dust proof parts, code UU or SS.
Note2) For models SR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SSR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A1-61 to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SR 15	For M3 (no symbol)	For M4 (symbol Y)
SR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Models SR-M1TB and SR-M1SB



Model SR-M1TB

Model No.	Outer dimensions			LM block dimensions									Grease nipple	H_3
	Height M	Width W	Length L	B	C	H	L_1	T	T_1	K	N	E		
SR 15M1SB SR 15M1TB	24	52	40.4 57	41	— 26	4.5	22.9 39.5	6.1	7	19.5	6	5.5	PB1021B	4.5
SR 20M1SB SR 20M1TB	28	59	47.3 66.2	49	— 32	5.5	27.8 46.7	8	9	22	6	12	B-M6F	6
SR 25M1SB SR 25M1TB	33	73	59.2 83	60	— 35	7	35.2 59	9	10	26	7	12	B-M6F	7
SR 30M1SB SR 30M1TB	42	90	67.9 96.8	72	— 40	9	40.4 69.3	8.7	10	32.5	8	12	B-M6F	9.5
SR 35M1SB SR 35M1TB	48	100	77.6 111	82	— 50	9	45.7 79	11.2	13	36.5	8.5	12	B-M6F	11.5

Model number coding

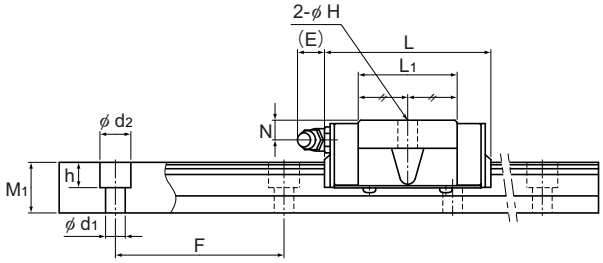
SR30 M1 W 2 UU C0 +1000L Y P T -II

- SR30: Model number
- M1: Symbol for high temperature type LM Guide
- W: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +1000L: LM rail length (in mm)
- Y: Applied to only 15 and 25
- P: Accuracy symbol (*3) 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 (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-74. (*3) See A1-79. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model SR-M1SB

Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*						Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block		kg	kg/m
	15	18.5	12.5	60	3.5×6×4.5	1240	9.1 13.8	11.7 20.5	0.0344 0.0984	0.234 0.551	0.0215 0.0604	0.149 0.343	0.0694 0.122		0.12 0.2	1.2
	20	19.5	15.5	60	6×9.5×8.5	1500	13.4 19.2	17.2 28.6	0.064 0.167	0.396 0.887	0.0397 0.102	0.25 0.55	0.135 0.224		0.2 0.3	2.1
	23	25	18	60	7×11×9	1500	21.6 30.9	26.8 44.7	0.125 0.326	0.773 1.74	0.0774 0.2	0.488 1.08	0.245 0.408		0.3 0.4	2.7
	28	31	23	80	7×11×9	1500	29.5 45.6	34.4 64.4	0.173 0.564	1.15 2.92	0.108 0.346	0.735 1.8	0.376 0.703		0.5 0.8	4.3
	34	33	27.5	80	9×14×12	1500	40.9 60.4	46.7 81.8	0.275 0.785	1.79 4.27	0.171 0.482	1.14 2.65	0.615 1.08		0.8 1.2	6.4

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-374.)
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.
Note2) For models SR15 and 25, two types of rails with different mounting hole dimensions are offered (see Table 1). When replacing this model with model SSR, pay attention to the mounting hole dimension of the LM rail. Contact THK for details.
Note3) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A1-61 to calculate the load rating for loads in the reverse radial direction or lateral direction.

Table 1: Rail Mounting Hole Dimensions

Model No.	Standard rail	Semi-standard rail
SR 15	For M3 (no symbol)	For M4 (symbol Y)
SR 25	For M6 (symbol Y)	For M5 (no symbol)

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model SR-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.

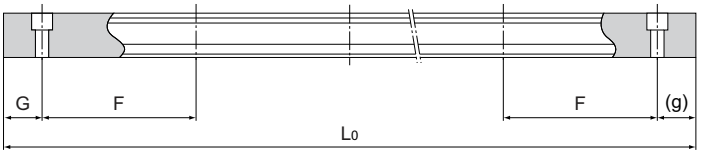


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model SR-M1

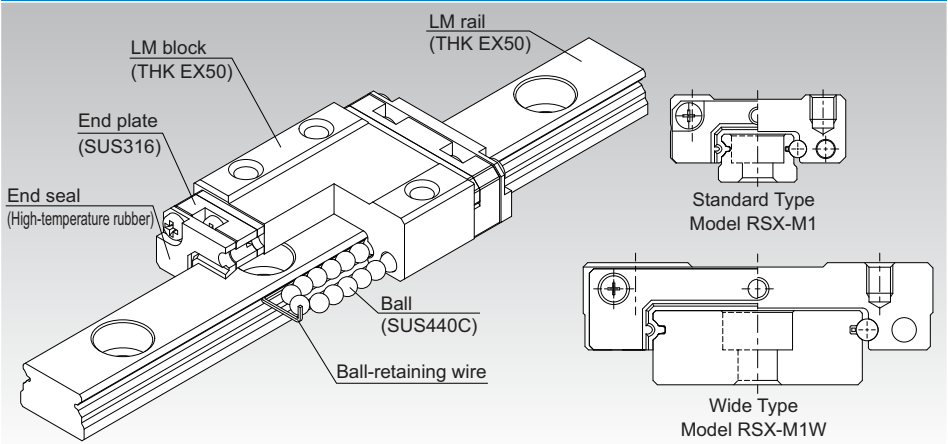
Unit: mm

Model No.	SR 15M1	SR 20M1	SR 25M1	SR 30M1	SR 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 1300 1360 1420	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 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	1500	1500	1500	1500

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.

RSX-M1

High-Temperature LM Guide Model RSX-M1



Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-73
Accuracy Standards A1-85
Shoulder Height of the Mounting Base and the Corner Radius A1-493
Reference Error Tolerance for the Mounting Surface A1-495
Flatness of the Mounting Surface A1-496
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in two 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.
Despite being compact, the product's ball contact structure is capable of receiving loads in all directions, and it can be used individually in locations with space limitations or where moments are applied.
The Miniature High-Temperature LM Guide Model RSX-M1 is capable of being used at service temperatures 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 levels.

Thermal Characteristics of LM Rail and LM Block Materials

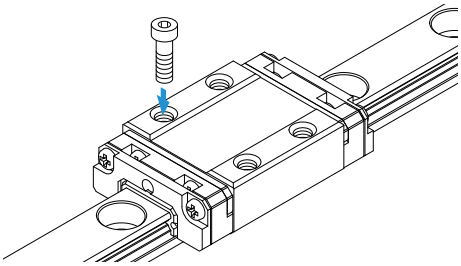
- Specific heat capacity: 0.481 J/(g•K)
- Thermal conductivity: 20.67 W/(m•K)
- Average coefficient of linear expansion: 11.8×10^{-6}/℃

Types and Features

Model RSX-M1

Dimensional Table⇒A1-380

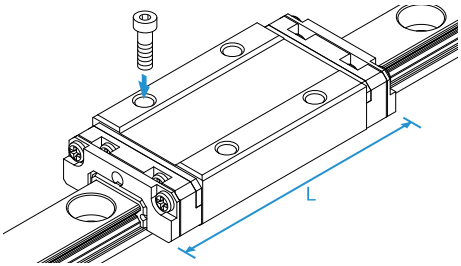
This model is the standard type.



Model RSX-M1N

Dimensional Table⇒A1-380

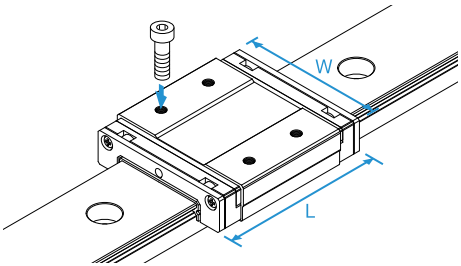
This type has a longer overall LM block length (L) and a higher load rating than the Model RSX-M1.



Model RSX-M1W

Dimensional Table⇒A1-382

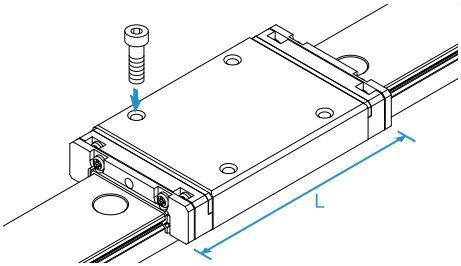
This type has a longer overall LM block length (L), a greater width, and a larger load rating and permissible moment than the Model RSX-M1.



Model RSX-M1WN

Dimensional Table⇒A1-382

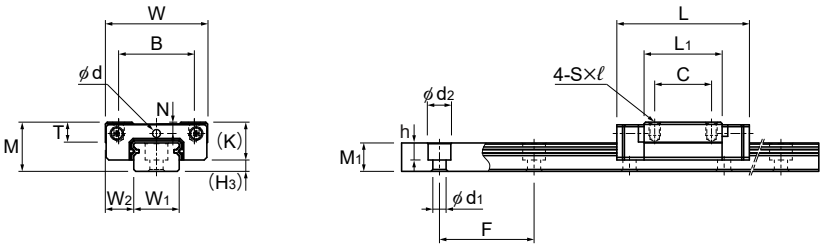
This type has a longer overall LM block length (L) and a higher load rating than the Model RSX-M1W.



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 RSX-M1 and RSX-M1N



Models RSX9M1, RSX12M1

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
RSX 9M1 RSX 9M1N	10	20	30.8 40.8	15	10 16	M3×2.8	19.8 29.8	—	7.8	2.4	—	1.6	—	2.2
RSX 12M1 RSX 12M1N	13	27	35 47.7	20	15 20	M3×3.5	20.6 33.3	5.3	10	3	—	2	—	3
RSX 15M1 RSX 15M1N	16	32	42.9 60.7	25	20 25	M3×4	25.7 43.5	5.8	12	3	4	—	PB107	4

Model number coding

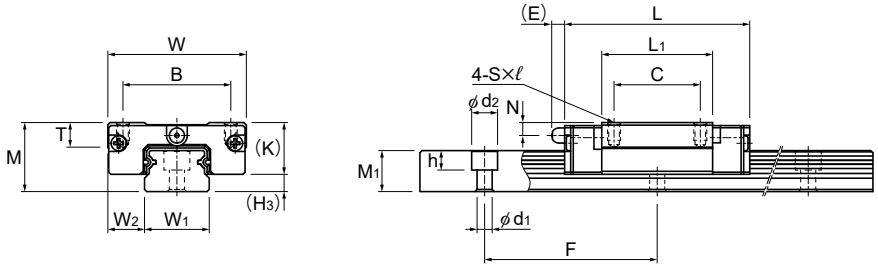
2 RSX15 M1 N UU C1 +230L P T -II

- **2**: No. of LM blocks used on the same rail (*1)
- **RSX15**: Model number
- **M1**: Symbol for high temperature type LM Guide
- **N**: Type of LM block
- **UU**: Contamination protection accessory symbol (*2)
- **C1**: Radial clearance symbol (*3) — Normal (No symbol), Light preload (C1)
- **+230L**: LM rail length (in mm)
- **P**: Accuracy symbol (*4) — Normal grade (No symbol)/High accuracy grade (H), Precision grade (P)
- **T**: Symbol for LM rail jointed use
- **-II**: Symbol for No. of rails used on the same plane (*5)

(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See A1-85. (*5) See A1-13.

Note) This model number indicates that a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2 at a minimum).

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model RSX15M1

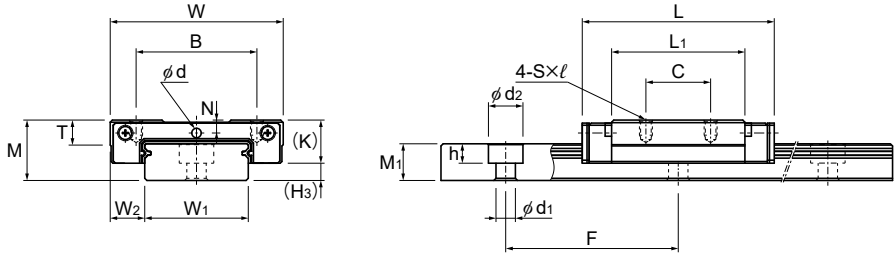
Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment N·m*						Mass	
	Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	W_1 $^{0}_{-0.02}$	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
	9	5.5	5.5	20	3.5×6×3.3	1240	2.22 2.94	3.06 4.59	9.87 21.1	57.9 111	11.4 24.4	66.9 128	14.1 21.1		0.018 0.024	0.32
	12	7.5	7.5	25	3.5×6×4.5	2000	3.36 4.72	4.21 6.83	14.2 34.8	92.5 195	14.2 34.8	92.5 195	27.6 44.7		0.037 0.047	0.65
	15	8.5	9.5	40	3.5×6×4.5	2000	5.59 8.27	6.78 11.8	29 82.1	186 432	29 82.1	186 432	48.1 84.3		0.069 0.089	0.96

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-384**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
2 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).
Please be aware that balls will fall out if the LM block is removed from the LM rail.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on A**1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models RSX-M1W and RSX-M1WN



Models RSX9M1W, RSX12M1W

Model No.	Outer dimensions			LM block dimensions										H_3
	Height	Width	Length								Lubrication hole	Grease nipple		
	M	W	L	B	C	S×ℓ	L_1	T	K	N	E	d		
RSX 9M1W RSX 9M1WN	12	30	39 50.7	21 23	12 24	M3×2.8	27 38.7	—	8.3	2.3	—	1.6	—	3.7
RSX 12M1W RSX 12M1WN	14	40	44.5 59.5	28	15 28	M3×3.5	30.9 45.9	4.5	10	3	—	2	—	4
RSX 15M1W RSX 15M1WN	16	60	55.5 74.5	45	20 35	M4×4.5	38.9 57.9	5.6	12	3	4	—	PB107	4

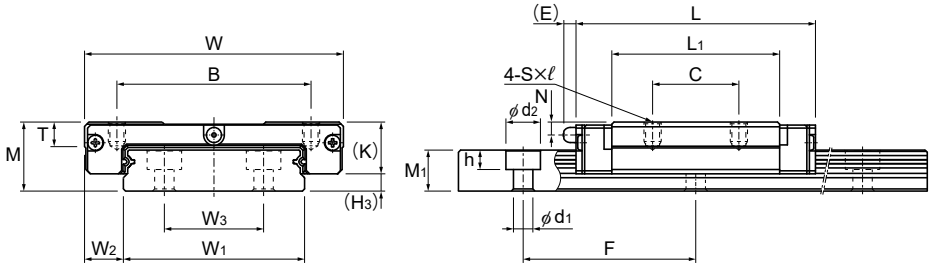
Model number coding

2 RSX12 M1 WN UU C1 +310L P T

- **2**: No. of LM blocks used on the same rail (*1)
- **RSX12**: Model number
- **M1**: Symbol for high temperature type LM Guide
- **WN**: Type of LM block
- **UU**: Contamination protection accessory symbol (*2)
- **C1**: Radial clearance symbol (*3) — Normal (No symbol), Light preload (C1)
- **+310L**: LM rail length (in mm)
- **P**: Accuracy symbol (*4) — Normal grade (No symbol)/High accuracy grade (H), Precision grade (P)
- **T**: Symbol for LM rail jointed use

(*1) No symbol for 1 LM block.
(*2) See contamination protection accessories on A1-543. (*3) See A1-73. (*4) See A1-85.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model RSX15M1W

Unit: mm

	LM rail dimensions							Basic load rating		Static permissible moment N·m*						Mass	
	Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	W_1 $^{0}_{-0.02}$	W_2	W_3	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
	18	6	—	7.5	30	3.5×6×4.5	1430	2.8 3.48	4.28 5.81	18.5 33.2	99.3 172	21.4 38.3	115 199	40.5 54.9		0.035 0.048	1.01
	24	8	—	8.5	40	4.5×8×4.5	2000	4.46 5.93	6.31 9.46	30 64.7	171 332	30 64.7	171 332	79.2 119		0.075 0.091	1.52
	42	9	23	9.5	40	4.5×8×4.5	2000	7.43 9.87	10.1 15.2	61.4 133	343 670	61.4 133	343 670	211 316		0.17 0.195	2.87

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-384**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
2 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).
Please be aware that balls will fall out if the LM block is removed from the LM rail.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard and maximum lengths of RSX-M1 model rails.

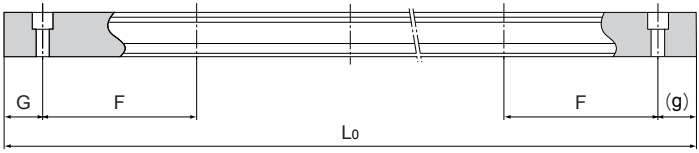


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model RSX-M1

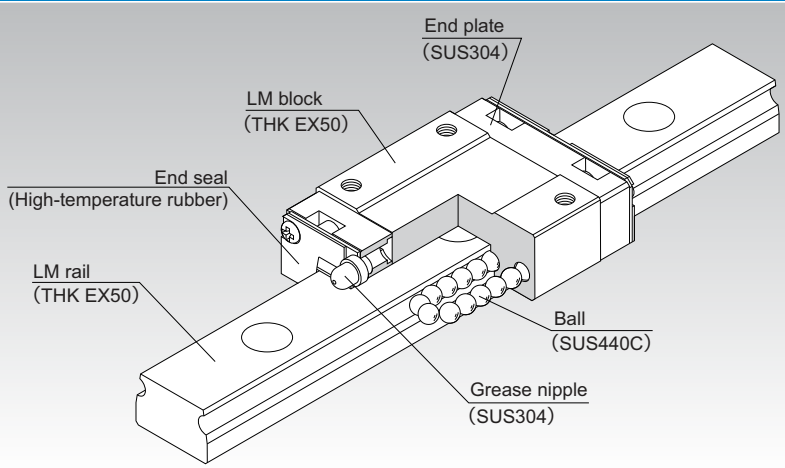
Unit: mm

Model No.	RSX 9M1	RSX 9M1W	RSX 12M1	RSX 12M1W	RSX 15M1	RSX 15M1W
LM rail standard lengths (L_o)	55 75 95 115 135 155 175 195 275 375	50 80 110 140 170 200 260 290 320	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 390 470 550	70 110 150 190 230 270 310 350 390 430 470 550 670 870	110 150 190 230 270 310 430 550 670 790
Standard pitch F	20	30	25	40	40	40
G, g	7.5	10	10	15	15	15
Max length	1240	1430	2000	2000	2000	2000

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

RSR-M1

High-Temperature LM Guide Model RSR-M1



Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-74
Accuracy Standards A1-85
Shoulder Height of the Mounting Base and the Corner Radius A1-493
Reference Error Tolerance for the Mounting Surface A1-495
Flatness of the Mounting Surface A1-496
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Balls roll in two 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.
The miniature High-Temperature LM Guide Model RSR-M1 is capable of being used at service temperatures 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 temperature changes from normal to high levels.

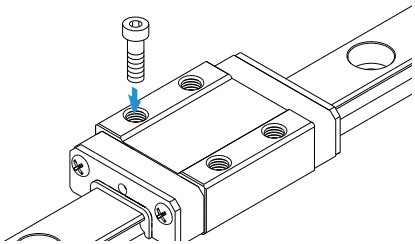
Thermal Characteristics of LM Rail and LM Block Materials

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

Models RSR-M1K, M1V

Dimensional Table⇒A1-390

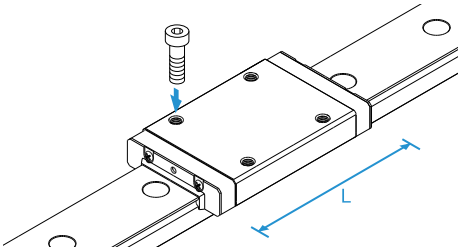
This model is the standard type.



Model RSR-M1N

Dimensional Table⇒A1-390

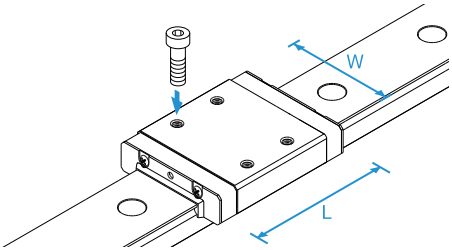
This model has a longer overall LM block length (L) and a greater load rating than standard types.



Model RSR-M1WV

Dimensional Table⇒A1-392

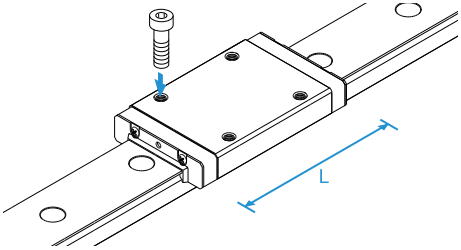
This model has a greater overall LM block length (L), broader width (W), and greater load rating and permissible moment than standard types.



Model RSR-M1WN

Dimensional Table⇒A1-392

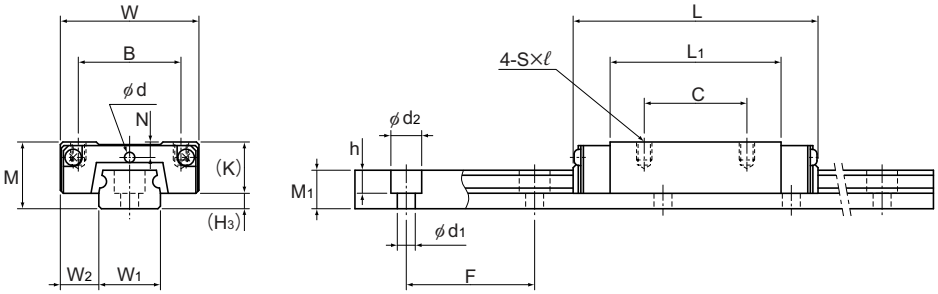
This model has a longer overall LM block length (L) and a greater load rating than standard types. It achieves the greatest load capacity among the high-temperature miniature LM Guide models.



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 RSR-M1K, RSR-M1V, and RSR-M1N



Models RSR9M1K/9M1N and RSR12M1V/M1N

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
RSR 9M1K RSR 9M1N	10	20	30.8 41	15	10 16	M3×3	19.8 29.8	—	7.8	—	—	—	—	2.2
RSR 12M1V RSR 12M1N	13	27	35 47.7	20	15 20	M3×3.5	20.6 33.3	—	10	3	—	2	—	3
RSR 15M1V RSR 15M1N	16	32	43 61	25	20 25	M3×4	25.7 43.5	—	12	3.5	3.6 3.7	—	PB107	4
RSR 20M1V RSR 20M1N	25	46	66.5 86.3	38	38	M4×6	45.2 65	5.7	17.5	5	6.4	—	A-M6F	7.5

Model number coding

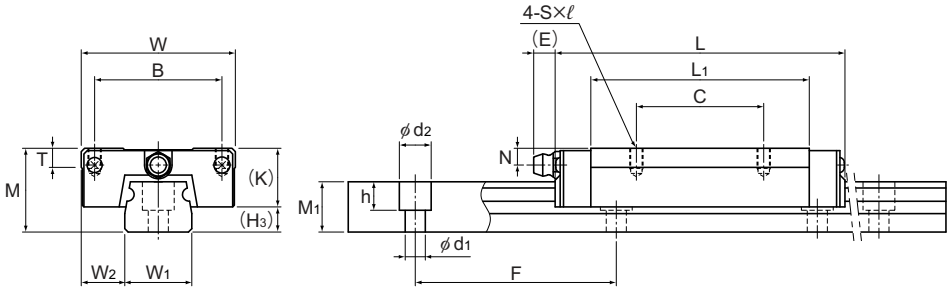
2 RSR15 M1 V UU C1 +230L P T -II

- **2**: No. of LM blocks used on the same rail (*1)
- **RSR15**: Model number
- **M1**: Symbol for high temperature type LM Guide
- **V**: Type of LM block
- **UU**: Contamination protection accessory symbol (*2)
- **C1**: Radial clearance symbol (*3) — Normal (No symbol), Light preload (C1)
- **+230L**: LM rail length (in mm)
- **P**: Accuracy symbol (*4) — Normal grade (No Symbol)/High accuracy grade (H), Precision grade (P)
- **T**: Symbol for LM rail jointed use
- **-II**: Symbol for No. of rails used on the same plane (*5)

(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-74. (*4) See A1-85. (*5) 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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models RSR15 and 20M1V/M1N

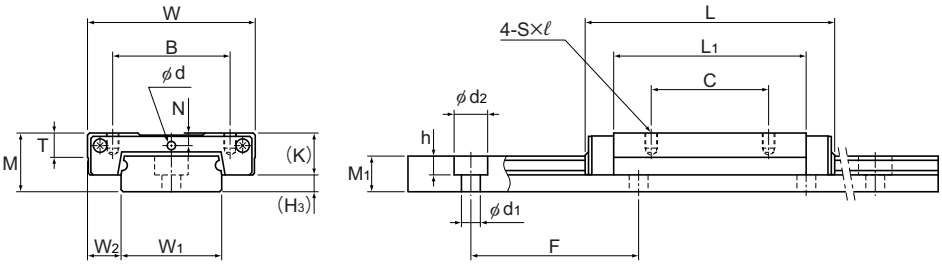
Unit: mm

LM rail dimensions							Basic load rating		Static permissible moment N·m*						Mass	
Width			Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
W_1		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
9	0 −0.02	5.5	5.5	20	3.5×6×3.3	1240	1.47 2.6	2.25 3.96	7.34 18.4	43.3 97	7.34 18.4	43.3 97	10.4 18.4		0.018 0.027	0.32
12	0 −0.025	7.5	7.5	25	3.5×6×4.5	1430	2.65 4.3	4.02 6.65	11.4 28.9	74.9 163	10.1 25.5	67.7 145	19.2 31.8		0.037 0.055	0.58
15	0 −0.025	8.5	9.5	40	3.5×6×4.5	1600	4.41 7.16	6.57 10.7	23.7 63.1	149 330	21.1 55.6	135 293	38.8 63		0.069 0.093	0.925
20	0 −0.03	13	15	60	6×9.5×8.5	1800	8.82 14.2	12.7 20.6	75.4 171	435 897	66.7 151	389 795	96.6 157		0.245 0.337	1.95

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-394**.)
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).
Please be aware that balls will fall out if the LM block is removed from the LM rail.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Models RSR-M1WV and RSR-M1WN



Models RSR9 and 12M1WV/M1WN

Model No.	Outer dimensions			LM block dimensions										H_3
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	Lubrication hole d	Grease nipple	
RSR 9M1WV RSR 9M1WN	12	30	39 50.7	21 23	12 24	M2.6×3 M3×3	27 38.7	—	7.8	2	—	1.6	—	4.2
RSR 12M1WV RSR 12M1WN	14	40	44.5 59.5	28	15 28	M3×3.5	30.9 45.9	4.5	10	3	—	2	—	4
RSR 15M1WV RSR 15M1WN	16	60	55.5 74.5	45	20 35	M4×4.5	38.9 57.9	5.6	12	3.5	3	—	PB107	4

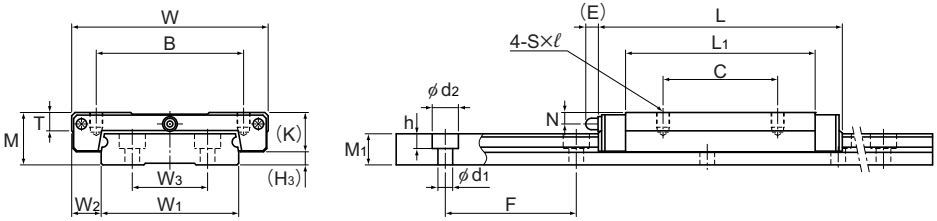
Model number coding

2 RSR12 M1 WN UU C1 +310L P T

- 2: No. of LM blocks used on the same rail (*1)
- RSR12: Model number
- M1: Symbol for high temperature type LM Guide
- WN: Type of LM block
- UU: Contamination protection accessory symbol (*2)
- C1: Radial clearance symbol (*3) Normal (No symbol) Light preload (C1)
- +310L: LM rail length (in mm)
- P: Accuracy symbol (*4) Normal grade (No Symbol)/High accuracy grade (H) Precision grade (P)
- T: Symbol for LM rail jointed use

(*1) No symbol for 1 LM block.
(*2) See contamination protection accessories on A1-543. (*3) See A1-74. (*4) See A1-85.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models RSR15M1WV/M1WN

Unit: mm

LM rail dimensions								Basic load rating		Static permissible moment N·m*						Mass	
Width				Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
W_1 $^{0}_{-0.05}$	W_2	W_3		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
18	6	—		7.5	30	3.5×6×4.5	1430	2.45 3.52	3.92 5.37	16 31	92.9 161	16 31	92.9 161	36 49.4		0.035 0.051	1.08
24	8	—		8.5	40	4.5×8×4.5	1600	4.02 5.96	6.08 9.21	24.5 53.9	138 274	21.7 47.3	123 242	59.5 90.1		0.075 0.101	1.5
42	9	23		9.5	40	4.5×8×4.5	1800	6.66 9.91	9.8 14.9	50.3 110	278 555	44.4 97.3	248 490	168 255		0.17 0.21	3

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-394**.)
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). Please be aware that balls will fall out if the LM block is removed from the LM rail.
Note2) The basic load rating in the dimension table is for a load in the radial direction. Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse radial direction or lateral direction.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard and maximum lengths of RSR M1 model rails.

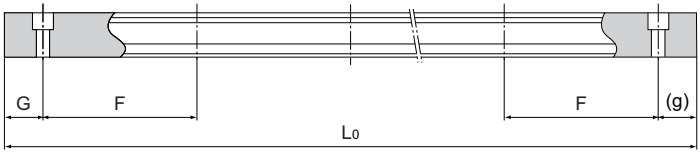


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model RSR-M1

Unit: mm

Model No.	RSR 9M1	RSR 9M1W	RSR 12M1	RSR 12M1W	RSR 15M1	RSR 15M1W	RSR 20M1
LM rail standard lengths (L_o)	55 75 95 115 135 155 175 195 275 375	50 80 110 140 170 200 260 290 320	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 390 470 550	70 110 150 190 230 270 310 350 390 430 470 550 670 870	110 150 190 230 270 310 430 550 670 790	220 280 340 460 640 880 1000
Standard pitch F	20	30	25	40	40	40	60
G, g	7.5	10	10	15	15	15	20
Max length	1240	1430	1430	1600	1600	1800	1800

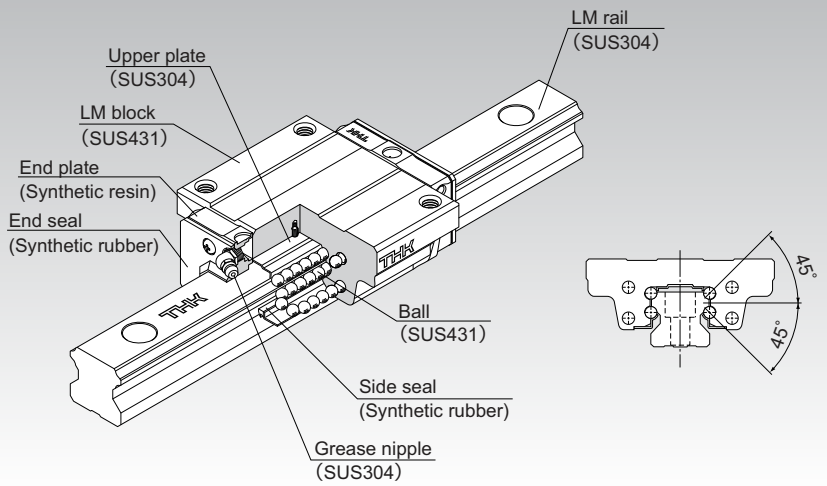
Note) The maximum length varies with accuracy grades. Contact THK for details.

Preventing the LM Block from Falling off of the LM Rail

In models RSR-M1/RSR-M1W, the balls fall out if the LM block comes off the LM rail.
For this reason, LM Guide assemblies are delivered with a part which prevents the LM block from coming off the rail. If you remove this part when using the product, please take precautions to avoid overrunning the blocks off of the rail.

HSR-M2

Corrosion-Resistant LM Guide Model HSR-M2



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-489
Reference Error Tolerance for the Mounting Surface	A1-494
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

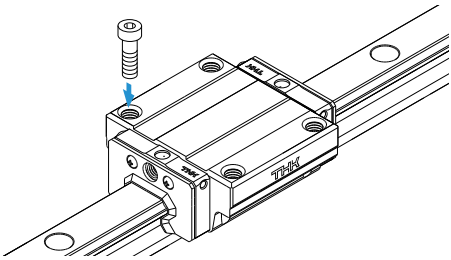
Balls roll in four rows of raceways precision-ground on an LM rail and an LM block, and end plates incorporated in the LM block allow the balls to circulate.
Each row of balls is placed at a contact angle of 45° so that the rated loads applied to the LM block are uniform in the four directions (radial, reverse-radial, and lateral directions), enabling the LM Guide to be used in all orientations.
The LM rail, LM block, and balls are made of highly corrosion-resistant stainless steel. The use of stainless steel in other metal components further contributes to superb corrosion resistance.

Types and Features

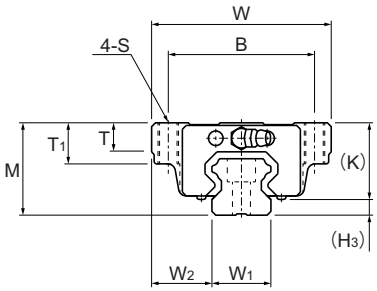
Model HSR-M2A

Dimensional Table⇒A1-398

The flange of its LM block has tapped holes.



Model HSR-M2A



Model No.	Outer dimensions			LM block dimensions										H3
	Height M	Width W	Length L	B	C	S	L1	T	T1	K	N	E	Grease nipple	
HSR 15M2A	24	47	56.6	38	30	M5	38.8	6.5	11	19.3	4.3	5.5	PB1021B	4.7
HSR 20M2A	30	63	74	53	40	M6	50.8	9.5	10	26	5	12	B-M6F	4
HSR 25M2A	36	70	83.1	57	45	M8	59.5	11	16	30.5	6	12	B-M6F	5.5

Note) A stainless steel end plate is available for the corrosion-resistant LM Guide. (symbol…I)

Model number coding

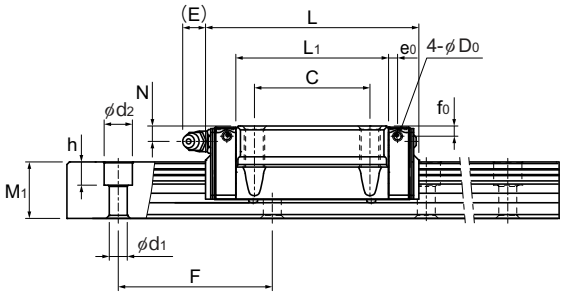
HSR20M2 A 2 UU C1 I +820L P T -II

- HSR20M2: Model number (high corrosion resistance type LM Guide)
- A: Type of LM block
- 2: No. of LM blocks used on the same rail
- UU: Contamination protection accessory symbol (*1)
- C1: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1)
- I: End plate is made of stainless steel
- +820L: LM rail length (in mm)
- P: Accuracy symbol (*3) 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 (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment N·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	16	15	60	4.5×7.5×5.3	1000	2.11	2.04	12.1	68.6	12.1	68.6	12.7	0.2	1.5
	20	21.5	18	60	6×9.5×8.5	1000	3.89	3.57	28.5	156	28.5	156	30.2	0.35	2.3
	23	23.5	22	60	7×11×9	1000	5.57	5.15	46.1	256.5	46.1	256.5	51.6	0.59	3.3

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-400**.)
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.
Please be aware that the basic load rating of the corrosion-resistant LM Guide is smaller than that of an ordinary stainless steel LM Guide.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model HSR-M2 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.

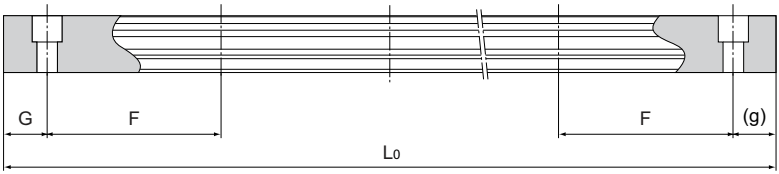


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HSR-M2

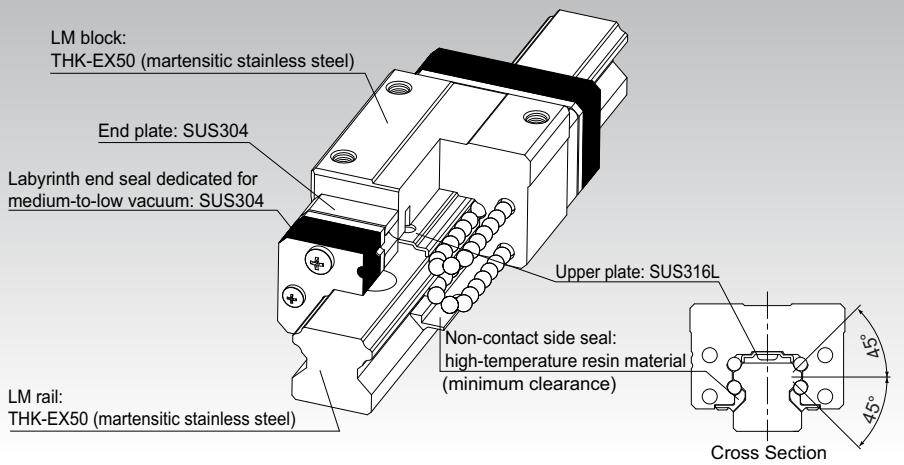
Unit: mm

Model No.	HSR 15M2	HSR 20M2	HSR 25M2
LM rail standard lengths (L_0)	160 280 460 640	280 460 640 820	280 460 640 820 1000
Standard pitch F	60	60	60
G and g	20	20	20
Max length	1000	1000	1000

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.

HSR-M1VV

Medium-to-Low Vacuum LM Guide Model HSR-M1VV



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-579**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-74
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-489
Reference Error Tolerance for the Mounting Surface	A1-494
Flatness of the Mounting Surface	A1-496
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

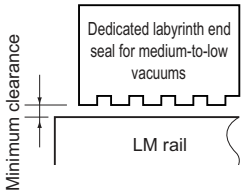
Features

- Operable in various environments at pressure between atmospheric pressure and vacuum (10^{-3} Pa).
- Capable of withstanding baking temperatures up to 200℃*
- Use of a newly developed dedicated labyrinth end seal for medium-to-low vacuums increases grease retention and allows extended use in a vacuum.
- Use of grease designed for medium-to-low vacuums achieves a stable rolling resistance.

* If the baking temperature exceeds 100°C, multiply the basic load rating with the temperature coefficient.

Structure of the Dedicated Labyrinth End Seal for Medium-to-Low Vacuums

The dedicated labyrinth end seal for medium-to-low vacuums forms a multi-stage space as shown in the figure on the right to minimize the pressure difference between adjacent stages. This minimizes the outflow velocity of the oil inside the LM block. In addition, the seal will not affect the rolling resistance since it does not contact the LM rail.

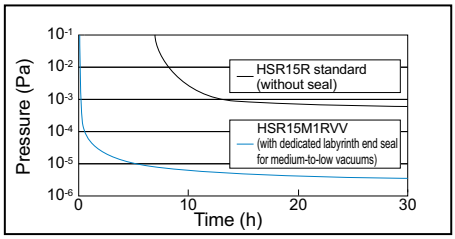


Achievable Vacuum Level

The medium-to-low vacuum LM Guide demonstrates excellent achievable vacuum levels.

Test temperature: 25℃ (±5℃)

	HSR15M1RVV	HSR15R (for reference)
Grease	Grease for medium-to-low vacuum	AFB-LF Grease
Seal	Labyrinth end seal dedicated for medium-to-low vacuum	None
End plate	Stainless steel	Resin

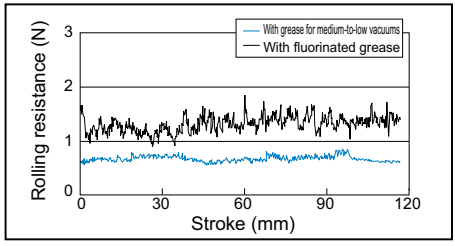


Achievable Vacuum Level

Rolling Resistance

The grease used in the medium-to-low vacuum LM Guide has a smaller rolling resistance than conventional fluorine grease and ensures stable rolling motion.

Specimen: HSR15M1RVV
Temperature: 25℃ (±5℃)
Pressure: atmospheric pressure



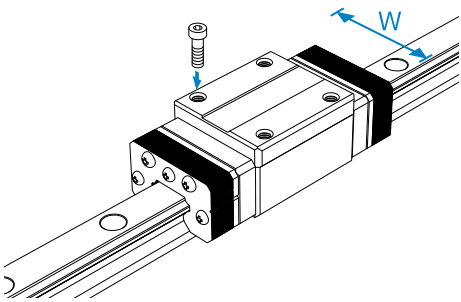
Rolling Resistance Fluctuation

Types and Features

Model HSR-M1RVV

Dimensional Table⇒A1-406

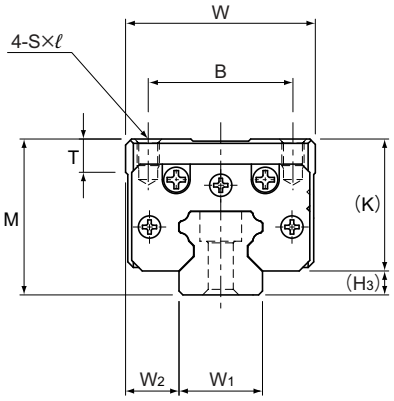
With this type, the LM block has a smaller width (W) and tapped holes. It is used in places where the space for table width is limited.



Design Precautions

If a large moment is applied to a system consisting of one LM rail or one LM block per shaft, the labyrinth end seal may contact the LM rail, which could affect the system's motion.
If a moment is applied, it is recommended to use two rails with two LM blocks per rail. Contact THK for details.

Model HSR-M1VV



Model No.	Outer dimensions			LM block dimensions						
	Height	Width	Length							
	M	W	L	B	C	S×ℓ	L_1	T	K	H_3
HSR15M1R-VV	28	34	75	26	26	M4×5	38.8	6	23.7	4.3

Model number coding

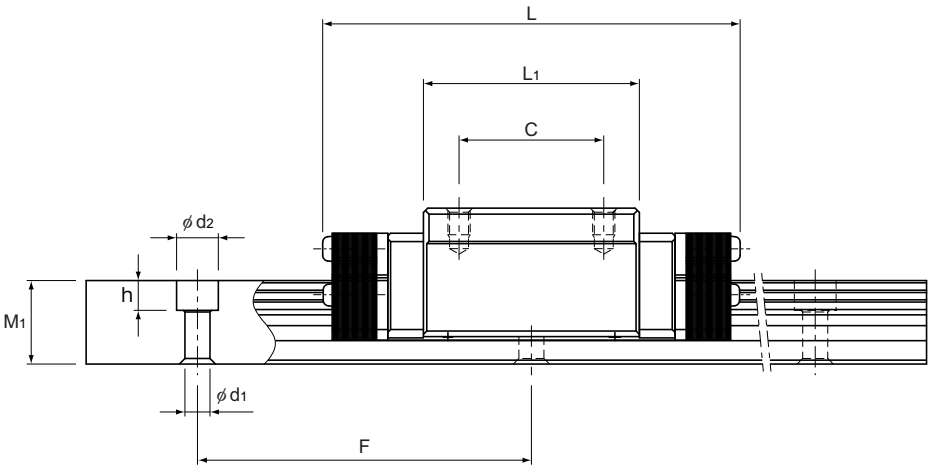
HSR15M1R 1 VV C1 +400L P -II

- HSR15M1R: Model No.
- 1: No. of LM blocks used on the same rail
- VV: Labyrinth seal symbol (*2)
- C1: Radial clearance symbol (*1)
- +400L: LM rail length (in mm)
- P: Accuracy symbol (*3)
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See **A1-74**. (*2) See **A1-403**. (*3) See **A1-79**. (*4) See **A1-13**.

Note1) The radial clearance, maximum LM rail length and accuracy class are equal to that of model HSR.
Note2) With this model, a single-rail unit constitutes one set. (I.e., the required number of sets when 2 rails are used in parallel is 2.)

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

	LM rail dimensions						Basic load rating		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	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	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	15	9.5	15	60	4.5×7.5×5.3	1240	10.9	15.7	0.0945	0.527	0.0945	0.527	0.0998	0.27	1.5

Note) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-408**.)
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: VV, with labyrinth end seal).
If a large moment is applied to a system consisting of one LM rail or one LM block per shaft, the labyrinth end seal may contact the LM rail, which could affect the system's motion.
If a moment is applied, it is recommended to use two rails with two LM blocks per rail.
Contact THK for details.

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard and maximum lengths for Model HSR-M1VV rails. If the maximum length of the desired LM rail exceeds these values, contact THK.
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.

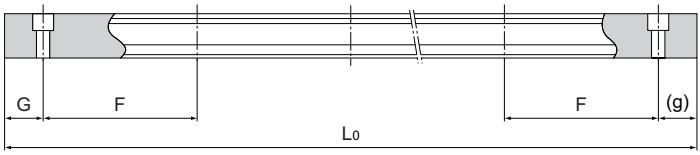


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model HSR-M1VV

Unit: mm

Model No.	HSR15M1R-VV
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240
Standard pitch F	60
G, g	20
Max length	1240

Note1) The maximum length varies with accuracy grades. Contact THK for details.
Note2) If a length greater than the above maximum is required, contact THK.

Structure and Features of the Caged Roller LM Guide

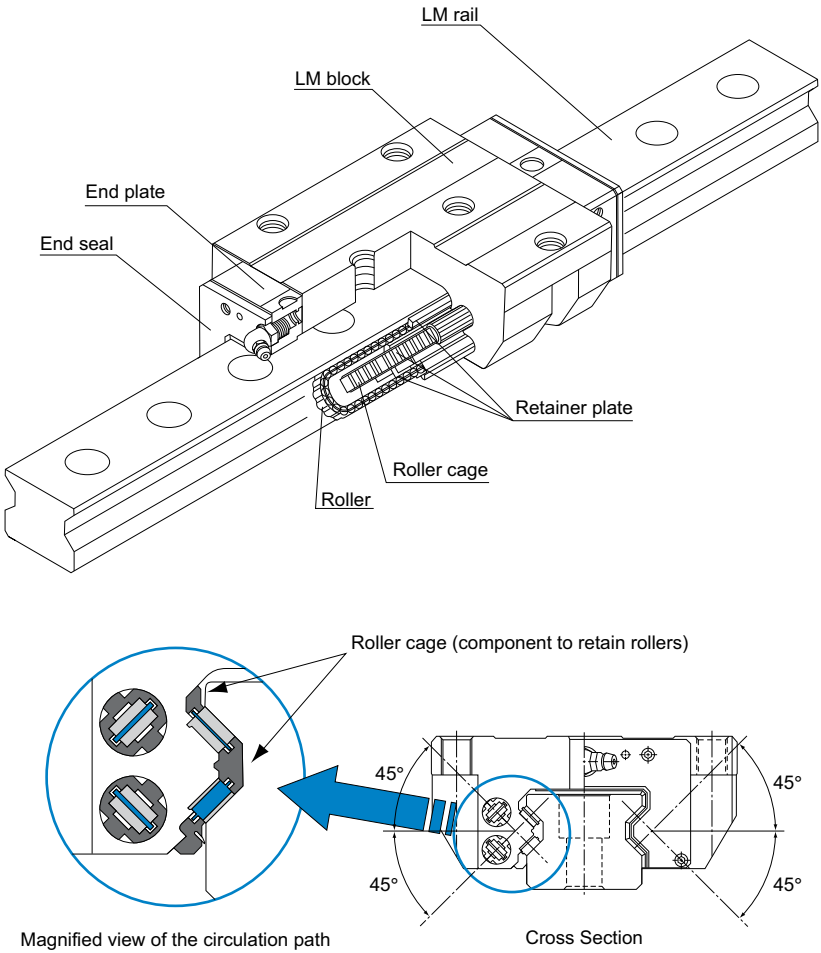
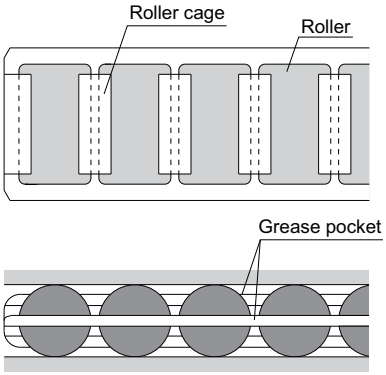


Fig. 1: Structural Drawing of the Caged Roller LM Guide Model SRG

The Caged Roller LM Guide is a roller guide that achieves low-friction, smooth motion, and long-term maintenance-free operation by using a roller cage. In addition, to ensure ultra-high rigidity, rollers with low elastic deformation and optimized diameter and length are used as the rolling elements. Furthermore, the lines of rollers are placed at a contact angle of 45° so that the same rated load is applied in all (radial, reverse-radial, and lateral) directions.

Advantages of the Caged Roller Technology

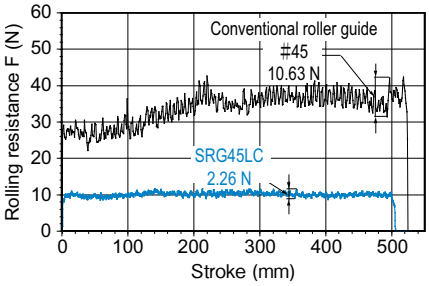
(1) Evenly arranged rollers circulate in a way that limits the front-to-back and side-to-side movements of the rollers, preventing the rollers from skewing and minimizing rolling resistance fluctuations. The end result is smooth and stable motion.
(2) The absence of friction between rollers and the retention of lubrication in grease pockets enable long-term maintenance-free operation.
(3) The absence of friction between rollers achieves low heat generation and superbly high speed.
(4) The absence of roller-to-roller collision achieves low noise and reduced running sound.



Smooth Motion

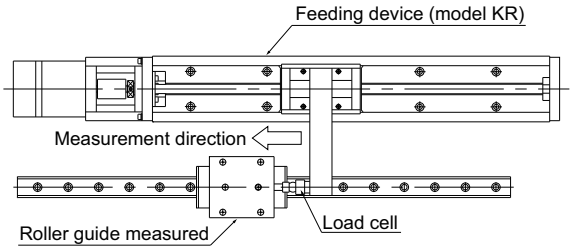
● **Rolling Resistance Data**

Evenly spaced and aligned rollers circulate, minimizing rolling resistance fluctuations and achieving smooth and stable motion.



Result of Measuring Rolling Resistance Fluctuations

Conditions
Feeding speed: 10 mm/s
Applied load: no load (one block)



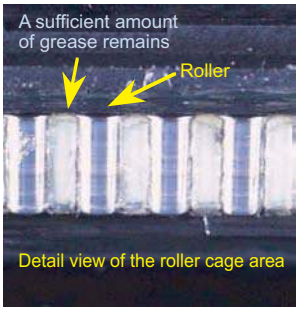
Rolling Resistance Measuring Machine

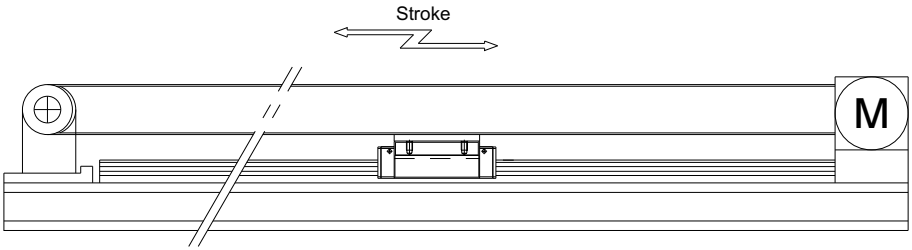
Long-Term Maintenance-Free Operation

● High-Speed Durability Test Data

Use of a roller cage eliminates friction between rollers, minimizes heat generation, and increases grease retention, thus achieving long-term maintenance-free operation.

Conditions
Model No.: SRG45LC
Magnitude of preload: clearance C0
Speed: 180 m/min
Acceleration: 1.5 G
Stroke: 2300 mm
Lubrication: Initial lubrication only
(THKAFB-LF Grease)





Test result: No anomaly observed after running 15,000 km

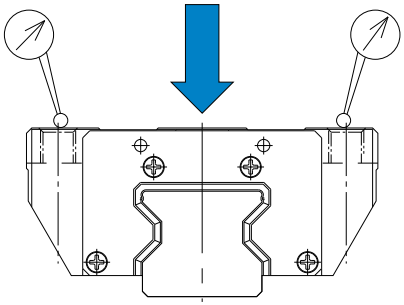
Result of High-Speed Durability Test

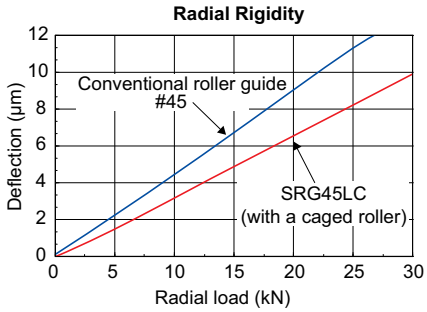
Ultra-High Rigidity

● High Rigidity Evaluation Data

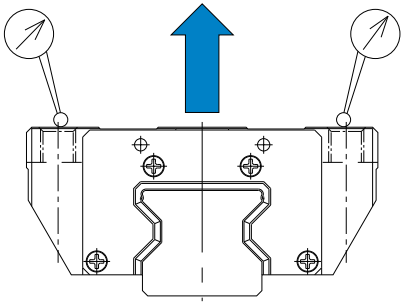
Preload SRG : radial clearance C0
Conventional type : radial clearance equivalent to C0

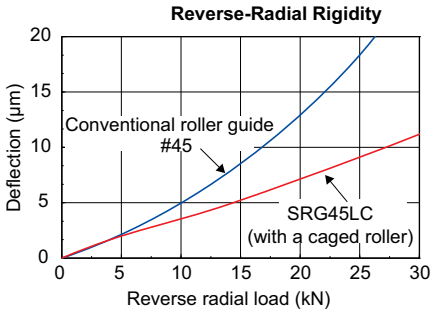
Radial Rigidity



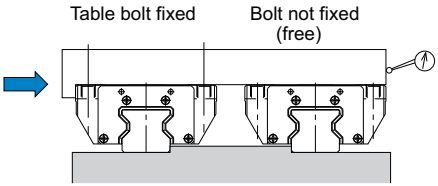


Reverse-Radial Rigidity

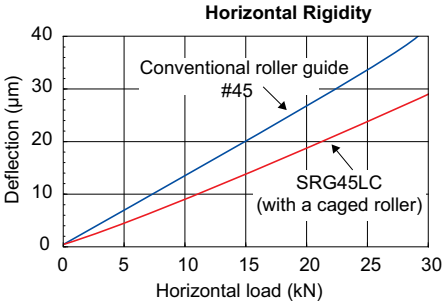




Horizontal Rigidity

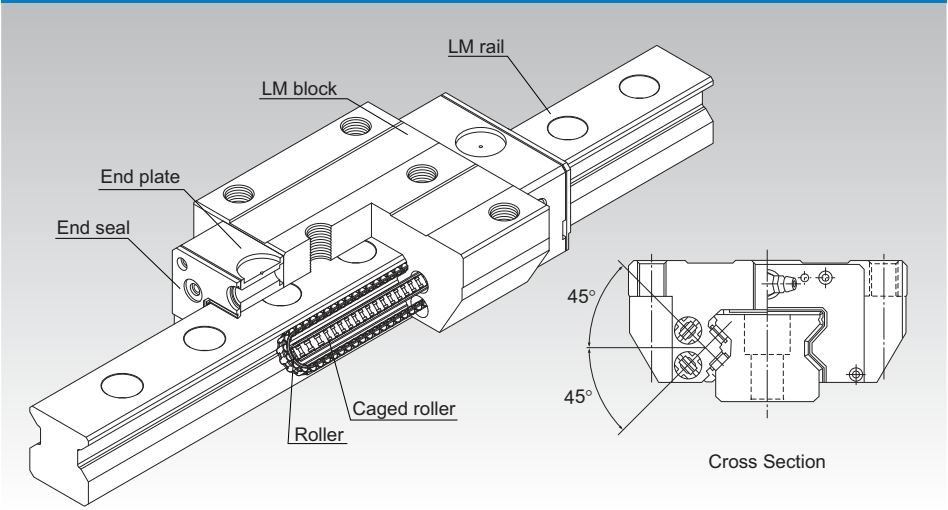


Rigidity is measured with the two axes placed in parallel and one of the axes not fixed with a bolt in order to not apply a moment.



SRG

Ultra-Rigid Caged Roller LM Guide Model SRG



*For the caged roller, see **A1-410**.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-75
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-490
Reference Error Tolerance for the Mounting Surface A1-419
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Rollers roll in four rows of raceways precision-ground on the LM rail and LM block, and roller cages and end plates incorporated in the LM block allow the balls to circulate.
The SRG is an ultra-rigid roller guide that uses roller cages to reduce friction, move smoothly, and achieve long-term maintenance-free operation.

Ultra-High Rigidity

Increased rigidity is achieved by using highly rigid rollers as the rolling elements and having the overall roller length more than 1.5 times greater than the roller diameter.

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 circulating, thus preventing the rollers from skewing as the block enters a loaded area. This minimizes rolling resistance fluctuation and achieves stable, smooth motion.

Long-Term Maintenance-Free Operation

Use of roller cages eliminates friction between rollers and increases grease retention, enabling long-term maintenance-free operation.

Global Standard Size

SRG is designed to have dimensions nearly equal to the Full-Ball LM Guide Model HSR, THK's pioneer LM System and the de facto global standard.

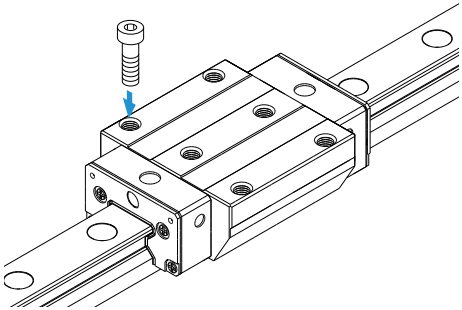
Wide Array of Options

Various options are available, including end seals, inner seals, side seals, Laminated Contact Scraper LaCS, protectors, side scrapers, High Chemical Resistance Fluorine Seal FS, and GC caps, to accommodate various usage environments.

Models SRG15XA, 20XA

Dimensional Table⇒A1-420

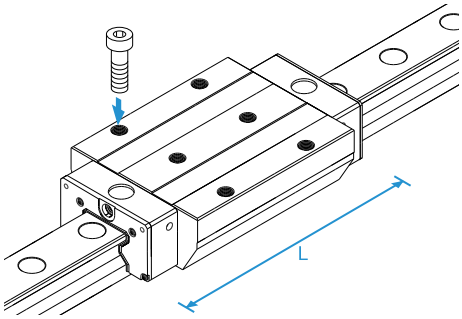
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.



Model SRG20XLA

Dimensional Table⇒A1-420

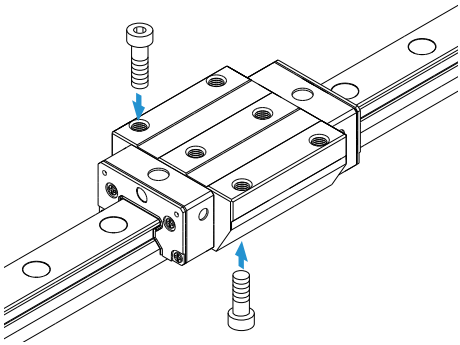
The LM block has the same cross-sectional shape as model SRG-A, but has a longer overall LM block length (L) and a greater load rating.



Model SRG-C

Dimensional Table⇒A1-420

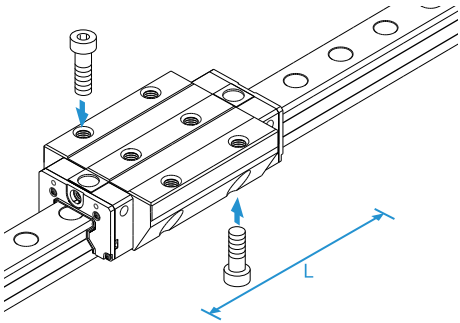
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.
It is used in places where the table cannot have through holes for mounting bolts.



Model SRG-LC

Dimensional Table⇒A1-420

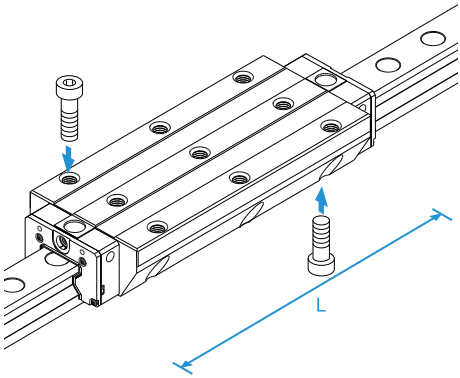
The LM block has the same cross-sectional shape as model SRG-C, but has a longer overall LM block length (L) and a greater load rating.



Model SRG-SLC

Dimensional Table⇒A1-422

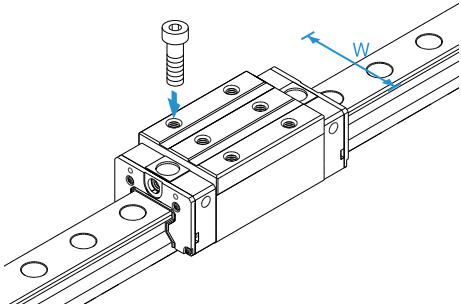
The LM block has the same cross-sectional shape as model SRG-LC, but has a longer overall LM block length (L) and a greater load rating.



Models SRG-V/R

Dimensional Table⇒A1-428

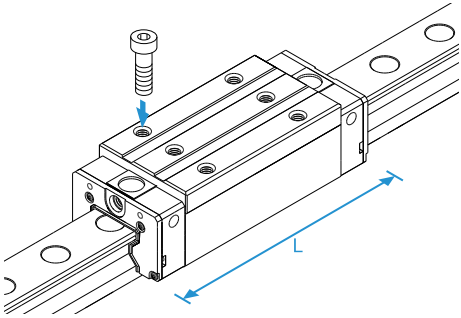
With this type, the LM block has a smaller width (W) and tapped holes.
It is used in places where the space for table width is limited.



Models SRG-LV/LR

Dimensional Table⇒A1-428

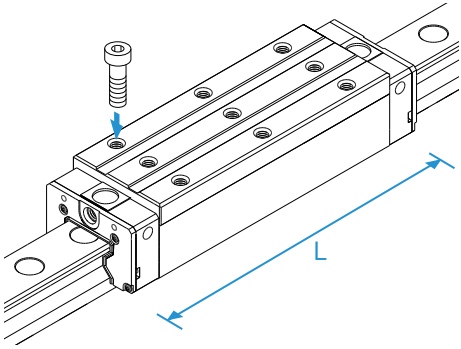
The LM block has the same cross-sectional shape as the Model SRG-V/R, but has a longer overall LM block length (L) and a greater load rating.



Models SRG-SLV/SLR

Dimensional Table⇒A1-430

The LM block has the same cross-sectional shape as the Model SRG-LV/LR, but has a longer overall LM block length (L) and a greater load rating.



SRG-G

Dimensional Table⇒A1-420 to A1-433

The SRG-G, a model equipped with uncaged, full-complement bearings, is also available. Due to its cageless design, however, the SRG-G's dynamic load rating is lower than that of standard SRG models. For specific data, please refer to the dimension tables in this catalog.

Reference Error Tolerance for the Mounting Surface

The Caged Roller LM Guide Model SRG features high rigidity because it uses rollers as its rolling element. It also contains a roller cage that prevents the rollers from skewing. However, high machining accuracy is required in the mounting surface. Large error on the mounting surface will affect the rolling resistance and the service life. The following shows the reference error tolerance according to the radial clearance.

Table 1: Reference Horizontal Error Tolerance (P) between Two Rails

Unit: μm

Radial clearance / Model No.	Normal	C1	C0
SRG 15X	5	3	3
SRG 20X	8	6	4
SRG 25X	9	7	5
SRG 30X	11	8	6
SRG 35	14	10	7
SRG 45	17	13	9
SRG 55	21	14	11
SRG 65	27	18	14
SRG 85	40	27	21
SRG 100	45	31	24

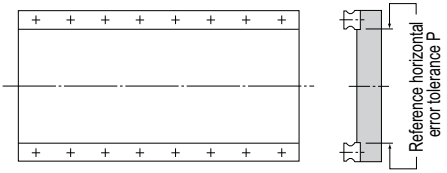


Fig. 1

Table 2: Reference Vertical Error Tolerance (X) between Two Rails

Unit: mm

Radial clearance	Normal	C1	C0
Reference vertical error tolerance X	0.0003a	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

Rail span when a = 500 mm

Reference vertical error tolerance $X = 0.0003 \times 500 = 0.15$

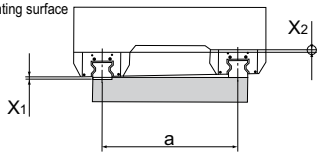


Fig. 2

Table 3: Reference Vertical Error Tolerance (Y) in the Axial Direction

Unit: mm

Reference vertical error tolerance Y	0.000036b

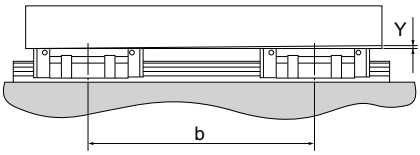
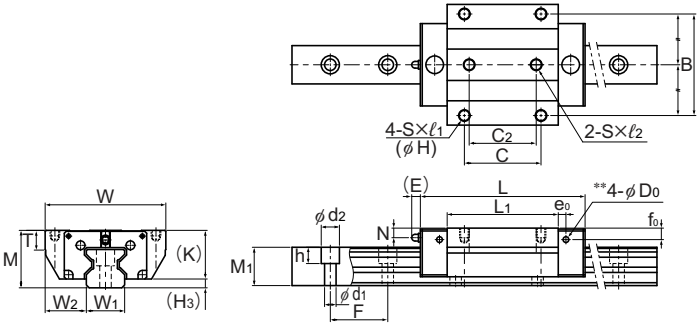


Fig. 3

Models SRG-A, SRG-LA, SRG-C, and SRG-LC



Models SRG15X and 20X A/LA

Model No.	Outer dimensions			LM block dimensions															Grease nipple
	Height M	Width W	Length L	B	C	C_2	S	H*	ℓ_1	ℓ_2	L_1	T	T_1*	K	N	E	e_0	f_0	D_0	
SRG 15XA SRG 15XGA	24	47	69.2	38	30	26	M5	(4.3)	8	7.5	45	7	(8)	20	4	4.5	4	6	2.9	PB107
SRG 20XA SRG 20XGA	30	63	86.2	53	40	35	M6	(5.4)	10	9	58	10	(10)	25.4	5	4.5	4	6	2.9	PB107
SRG 20XLA SRG 20XGLA	30	63	106.2	53	40	35	M6	(5.4)	10	9	78	10	(10)	25.4	5	4.5	4	6	2.9	PB107
SRG 25XC SRG 25XGC	36	70	95.1	57	45	40	M8	6.8	—	—	65.5	9.5	10	31.5	5.5	12	6	7.3	5.2	B-M6F
SRG 25XLC SRG 25XGLC	36	70	115.1	57	45	40	M8	6.8	—	—	85.5	9.5	10	31.5	5.5	12	6	7.3	5.2	B-M6F
SRG 30XC SRG 30XGC	42	90	111	72	52	44	M10	8.5	—	—	75	12	14	37	6.5	12	6	7.5	5.2	B-M6F
SRG 30XLC SRG 30XGLC	42	90	135	72	52	44	M10	8.5	—	—	99	12	14	37	6.5	12	6	7.5	5.2	B-M6F

Note) The SRG-G is equipped with uncaged, full-complement bearings.

Model number coding

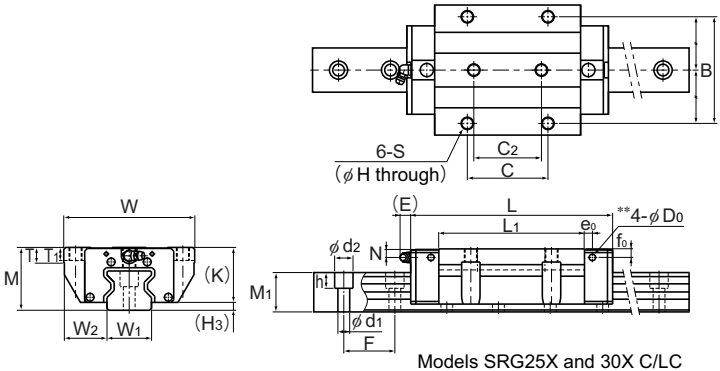
SRG30X LC 2 QZ TTHH C0 +1240L P Z T -II

- SRG30X: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3) — High accuracy grade (H)/Precision grade (P), Super precision grade (SP)/Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRG25X and 30X C/LC

Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C0	MA		MB		MC	LM block	LM rail
	H3	W1 0 -0.05	W2	M1	F	d1×d2×h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	4	15	16	15.5	30	4.5×7.5×5.3	3000	11.3 11.3	25.8 30.9	0.21 0.25	1.24 1.49	0.21 0.25	1.24 1.49	0.24 0.3	0.2	1.58
	4.6	20	21.5	20	30	6×9.5×8.5	3000	21 20.6	46.9 54.4	0.48 0.56	2.74 3.25	0.48 0.56	2.74 3.25	0.58 0.68	0.42	2.58
	4.6	20	21.5	20	30	6×9.5×8.5	3000	26.7 25.9	63.8 73.1	0.88 0.99	4.49 5.27	0.88 0.99	4.49 5.25	0.79 0.91	0.57	2.58
	4.5	23	23.5	23	30	7×11×9	3000	27.9 26.7	57.5 65	0.64 0.76	3.7 4.31	0.64 0.76	3.7 4.31	0.8 0.9	0.7	3.6
	4.5	23	23.5	23	30	7×11×9	3000	34.2 32.9	75 85	1.07 1.27	5.74 6.69	1.07 1.27	5.74 6.69	1.03 1.18	0.9	3.6
	5	28	31	26	40	9×14×12	3000	39.3 38.7	82.5 96.9	1.02 1.23	6.21 7.25	1.02 1.23	6.21 7.25	1.47 1.62	1.2	4.4
	5	28	31	26	40	9×14×12	3000	48.3 47.4	108 126	1.76 2.04	9.73 11.3	1.76 2.04	9.73 11.3	1.92 2.11	1.6	4.4

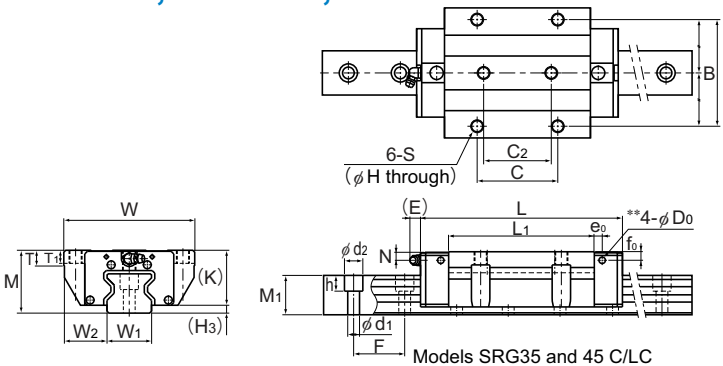
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-434.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A1-12, Lubricant: see A24-2)
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 A1-517 or A1-539)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See A1-436)
Note2) H*, T1* If the mounting holes (4 holes) of the LM block are machined with an inverted counterbore, these models can be mounted on the table from the top and the bottom as with the Model SRG-C.
The value in the parentheses represents a dimension if the mounting hole is machined with an inverted counterbore.
Contact THK for details.
Note3) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRG-C, SRG-LC, and SRG-SLC



Models SRG35 and 45 C/LC

Model No.	Outer dimensions			LM block dimensions																
	Height	Width	Length																	Grease nipple
	M	W	L	B	C	C_2	S	H	ℓ_1	ℓ_2	L_1	T	T_1	K	N	E	e_0	f_0	D_0	
SRG 35C SRG 35GC	48	100	125	82	62	52	M10	8.5	—	—	82.2	11.5	10	42	6.5	12	6	6	5.2	B-M6F
SRG 35LC SRG 35GLC	48	100	155	82	62	52	M10	8.5	—	—	112.2	11.5	10	42	6.5	12	6	6	5.2	B-M6F
SRG 35SLC SRG 35GSLC	48	100	180.8	82	100	—	M10	8.5	—	—	138	11.5	10	42	6.5	12	6	6	5.2	B-M6F
SRG 45C SRG 45GC	60	120	155	100	80	60	M12	10.5	—	—	107	14.5	15	52	10	16	7	7	5.2	B-PT1/8
SRG 45LC SRG 45GLC	60	120	190	100	80	60	M12	10.5	—	—	142	14.5	15	52	10	16	7	7	5.2	B-PT1/8
SRG 45SLC SRG 45GSLC	60	120	231.5	100	120	—	M12	10.5	—	—	183.5	14.5	15	52	10	16	7	7	5.2	B-PT1/8

Note) The SRG-G is equipped with uncaged, full-complement bearings.

Model number coding

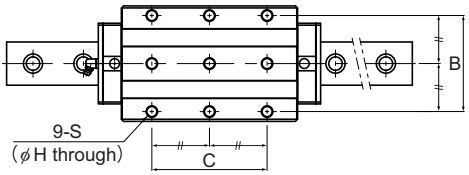
SRG45 LC 2 QZ TTHH C0 +1200L P Z T -II

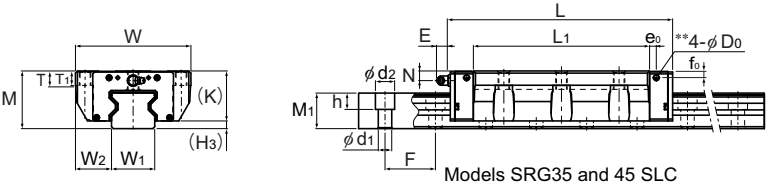
- SRG45: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
  - Heavy preload (CN1)
  - Super heavy preload (CN2)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - High accuracy grade (H)/Precision grade (P)/
  - Super precision grade (SP)/Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com





Models SRG35 and 45 SLC

Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	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
	6	34	33	30	40	9×14×12	3000	59.1 55.3	119 131	1.66 1.77	10.1 11.1	1.66 1.77	10.1 11.1	2.39 2.69	1.9	6.9
	6	34	33	30	40	9×14×12	3000	76 71.4	165 182	3.13 3.39	17 18.8	3.13 3.39	17 18.8	3.31 3.74	2.4	6.9
	6	34	33	30	40	9×14×12	3000	87.9 83.4	199 222	4.53 5	23.9 26.6	4.53 5	23.9 26.6	4.09 4.56	3.2	6.9
	8	45	37.5	37	52.5	14×20×17	3090	91.9 87.8	192 216	3.49 3.9	20 22.5	3.49 3.9	20 22.5	4.98 5.87	3.7	11.6
	8	45	37.5	37	52.5	14×20×17	3090	115 110	256 288	6.13 6.87	32.2 36.3	6.13 6.87	32.2 36.3	6.64 7.83	4.5	11.6
	8	45	37.5	37	52.5	14×20×17	3090	139 133	328 368	9.99 11.1	50 56	9.99 11.1	50 56	8.91 10	6.3	11.6

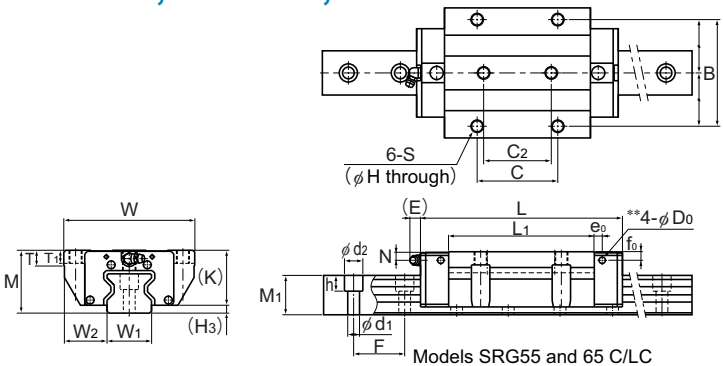
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-434**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-436**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRG-C, SRG-LC, and SRG-SLC



Models SRG55 and 65 C/LC

Model No.	Outer dimensions			LM block dimensions																
	Height	Width	Length																	Grease nipple
	M	W	L	B	C	C_2	S	H	ℓ_1	ℓ_2	L_1	T	T_1	K	N	E	e_0	f_0	D_0	
SRG 55C SRG 55GC	70	140	185	116	95	70	M14	12.5	—	—	129.2	17.5	18	60	12	16	9	8.5	5.2	B-PT1/8
SRG 55LC SRG 55GLC	70	140	235	116	95	70	M14	12.5	—	—	179.2	17.5	18	60	12	16	9	8.5	5.2	B-PT1/8
SRG 55SLC SRG 55GSLC	70	140	292	116	150	—	M14	12.5	—	—	236.2	17.5	18	60	12	16	9	8.5	5.2	B-PT1/8
SRG 65C SRG 65GC	90	170	244.9	142	110	82	M16	14.5	—	—	171.7	19.5	20	78.5	17	16	9	13.5	5.2	B-PT1/8
SRG 65LC SRG 65GLC	90	170	303	142	110	82	M16	14.5	—	—	229.8	19.5	20	78.5	17	16	9	13.5	5.2	B-PT1/8
SRG 65SLC SRG 65GSLC	90	170	380	142	200	—	M16	14.5	—	—	306.8	19.5	20	78.5	17	16	9	13.5	5.2	B-PT1/8

Note) The SRG-G is equipped with uncaged, full-complement bearings.

Model number coding

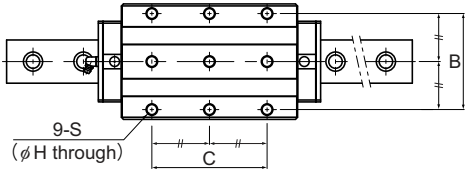
SRG65 LC 2 QZ TTHH C0 +1270L P Z T -II

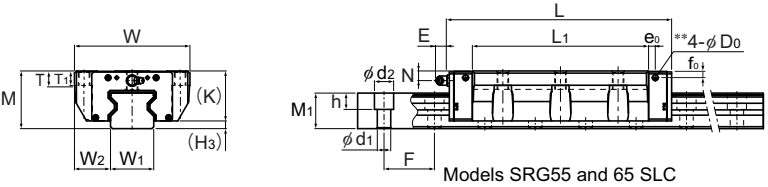
- SRG65: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
  - Heavy preload (CN1)
  - Super heavy preload (CN2)
- +1270L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - High accuracy grade (H)/Precision grade (P)/
  - Super precision grade (SP)/Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com





Models SRG55 and 65 SLC

Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	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
	10	53	43.5	43	60	16×23×20	3060	131 125	266 300	5.82 6.5	33 37.2	5.82 6.5	33 37.2	8.19 9.55	5.9	15.8
	10	53	43.5	43	60	16×23×20	3060	167 160	366 411	10.8 12.1	57 64	10.8 12.1	57 64	11.2 13.1	7.8	15.8
	10	53	43.5	43	60	16×23×20	3060	210 199	488 544	19.1 21	93.7 104	19.1 21	93.7 104	15.6 17.3	10.7	15.8
	11.5	63	53.5	54	75	18×26×22	3000	219 214	441 511	12.5 14.8	72.8 83.8	12.5 14.8	72.8 83.8	16.8 19.4	12.5	23.7
	11.5	63	53.5	54	75	18×26×22	3000	278 264	599 670	22.7 25.3	120 135	22.7 25.3	120 135	22.1 25.5	16.4	23.7
	11.5	63	53.5	54	75	18×26×22	3000	352 332	811 899	41.3 45.2	202 224	41.3 45.2	202 224	30.9 25.6	22.3	23.7

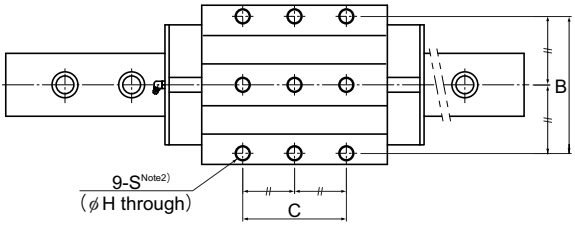
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-434**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-436**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

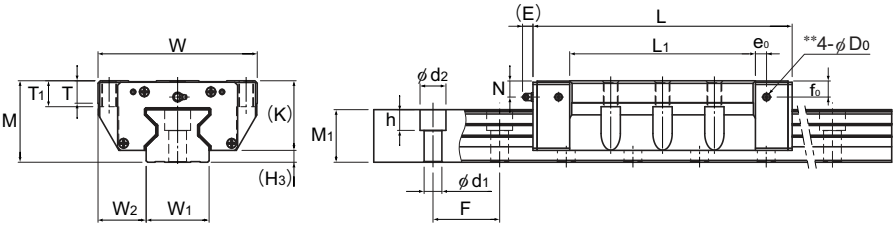
$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Model SRG-LC





Model SRG85LC

Model No.	Outer dimensions			LM block dimensions													Grease nipple
	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
SRG 100LC	120	250	395	220	200	M20	17.8	280.2	35	38	104	23	16	15	23	8.2	B-PT1/4

Model number coding

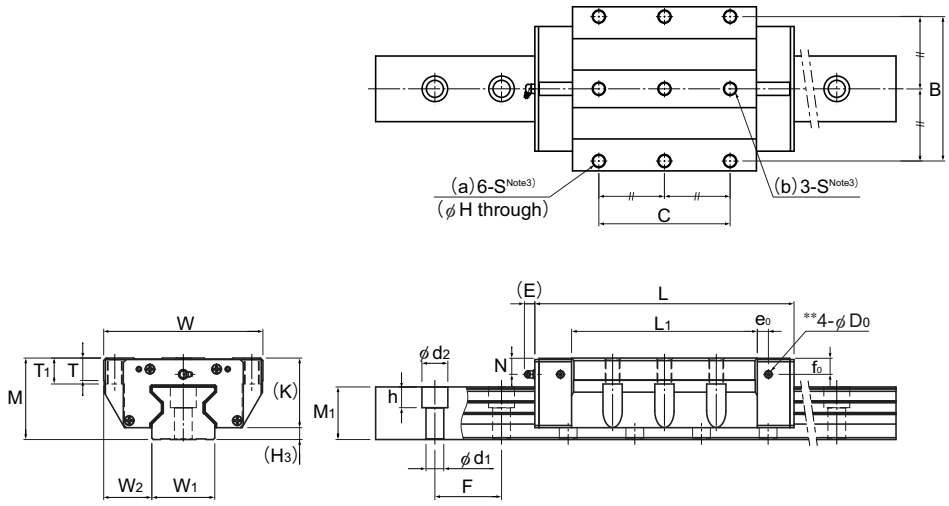
SRG85 LC 2 TT C0 +2610L P Z T -II

- SRG85: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- TT: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +2610L: LM rail length (in mm)
- P: Accuracy symbol (*3) Precision grade (P)/Super precision grade (SP) Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Model SRG100LC

Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*						Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	H_3	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
	16	85	65	71	90	24×35×28	3000	497	990	45.3	239	45.3	239	51.9		26.2	35.7
	16	100	75	77	105	26×39×32	3000	601	1170	60	319	60	319	72.3		37.6	46.8

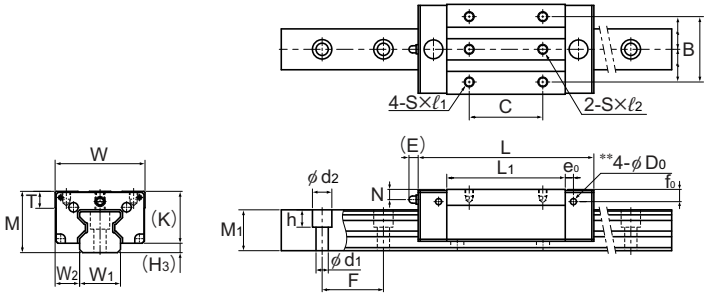
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-434**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. To obtain one, please contact THK.
** The diagram shows the side nipple pilot holes for when a grease nipple is desired for a product with LaCS or a QZ Lubricator. In all cases other than those indicated above, the side nipple pilot holes will not be through holes.
For grease nipple mount machining, contact THK. (See **A1-436**)
Note2) The LM block mounting holes (9 holes) of SRG85LC are all through holes (full thread).
Note3) The LM block mounting holes in part (a) (6 holes) of SRG100LC are through holes (full thread).
The LM block mounting holes in part (b) (3 holes) have effective thread depth of 22 mm.
Note4) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRG-V, SRG-LV, SRG-R, and SRG-LR



Models SRG15X and 20X V/LV

Model No.	Outer dimensions			LM block dimensions														Grease nipple
	Height M	Width W	Length L	B	C	S	ℓ	ℓ1	ℓ2	L1	T	K	N	E	e0	f0	D0	
SRG 15XV SRG 15XGV	24	34	69.2	26	26	M4	—	5	7.5	45	6	20	4	4.5	4	6	2.9	PB107
SRG 20XV SRG 20XGV	30	44	86.2	32	36	M5	—	7	9	58	8	25.4	5	4.5	4	6	2.9	PB107
SRG 20XLV SRG 20XGLV	30	44	106.2	32	50	M5	—	7	9	78	8	25.4	5	4.5	4	6	2.9	PB107
SRG 25XR SRG 25XGR	40	48	95.1	35	35	M6	9	—	—	65.5	9.5	35.5	9.5	12	6	11.3	5.2	B-M6F
SRG 25XLR SRG 25XGLR	40	48	115.1	35	50	M6	9	—	—	85.5	9.5	35.5	9.5	12	6	11.3	5.2	B-M6F
SRG 30XR SRG 30XGR	45	60	111	40	40	M8	10	—	—	75	12	40	9.5	12	6	10.5	5.2	B-M6F
SRG 30XLR SRG 30XGLR	45	60	135	40	60	M8	10	—	—	99	12	40	9.5	12	6	10.5	5.2	B-M6F

Note) The SRG-G is equipped with uncaged, full-complement bearings.

Model number coding

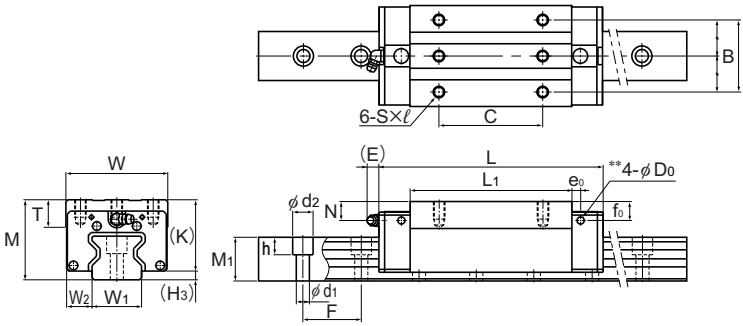
SRG30X LR 2 QZ TTHH C0 +1240L P Z T -II

- SRG30X: Model number
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - High accuracy grade (H)/Precision grade (P)
  - Super precision grade (SP)/Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRG25X and 30X R/LR

Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	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
	4	15	9.5	15.5	30	4.5×7.5×5.3	3000	11.3 11.3	25.8 30.9	0.21 0.25	1.24 1.49	0.21 0.25	1.24 1.49	0.24 0.3	0.15	1.58
	4.6	20	12	20	30	6×9.5×8.5	3000	21 20.6	46.9 54.4	0.48 0.56	2.74 3.25	0.48 0.56	2.74 3.25	0.58 0.68	0.28	2.58
	4.6	20	12	20	30	6×9.5×8.5	3000	26.7 25.9	63.8 73.1	0.88 0.99	4.49 5.27	0.88 0.99	4.49 5.25	0.79 0.91	0.38	2.58
	4.5	23	12.5	23	30	7×11×9	3000	27.9 26.7	57.5 65	0.64 0.76	3.7 4.31	0.64 0.76	3.7 4.31	0.8 0.9	0.6	3.6
	4.5	23	12.5	23	30	7×11×9	3000	34.2 32.9	75 85	1.07 1.27	5.74 6.69	1.07 1.27	5.74 6.69	1.03 1.18	0.8	3.6
	5	28	16	26	40	9×14×12	3000	39.3 38.7	82.5 96.9	1.02 1.23	6.21 7.25	1.02 1.23	6.21 7.25	1.47 1.62	0.9	4.4
	5	28	16	26	40	9×14×12	3000	48.3 47.4	108 126	1.76 2.04	9.73 11.3	1.76 2.04	9.73 11.3	1.92 2.11	1.2	4.4

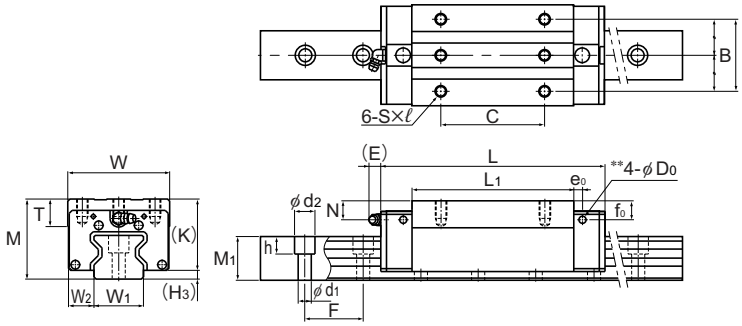
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-434**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. To obtain one, please contact THK.
** The diagram shows the side nipple pilot holes for when a grease nipple is desired for a product with LaCS or a QZ Lubricator. In all cases other than those indicated above, the side nipple pilot holes will not be through holes.
For grease nipple mount machining, contact THK. (See **A1-436**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRG-R, SRG-LR, and SRG-SLR



Models SRG35 and 45 R/LR

Model No.	Outer dimensions			LM block dimensions														Grease nipple
	Height M	Width W	Length L	B	C	S	ℓ	ℓ_1	ℓ_2	L_1	T	K	N	E	e_0	f_0	D_0	
SRG 35R SRG 35GR	55	70	125	50	50	M8	12	—	—	82.2	18.5	49	13.5	12	6	13	5.2	B-M6F
SRG 35LR SRG 35GLR	55	70	155	50	72	M8	12	—	—	112.2	18.5	49	13.5	12	6	13	5.2	B-M6F
SRG 35SLR SRG 35GSLR	55	70	180.8	50	100	M8	12	—	—	138	18.5	49	13.5	12	6	13	5.2	B-M6F
SRG 45R SRG 45GR	70	86	155	60	60	M10	20	—	—	107	24.5	62	20	16	7	17	5.2	B-PT1/8
SRG 45LR SRG 45GLR	70	86	190	60	80	M10	20	—	—	142	24.5	62	20	16	7	17	5.2	B-PT1/8
SRG 45SLR SRG 45GSLR	70	86	231.5	60	120	M10	20	—	—	183.5	24.5	62	20	16	7	17	5.2	B-PT1/8

Note) The SRG-G is equipped with uncaged, full-complement bearings.

Model number coding

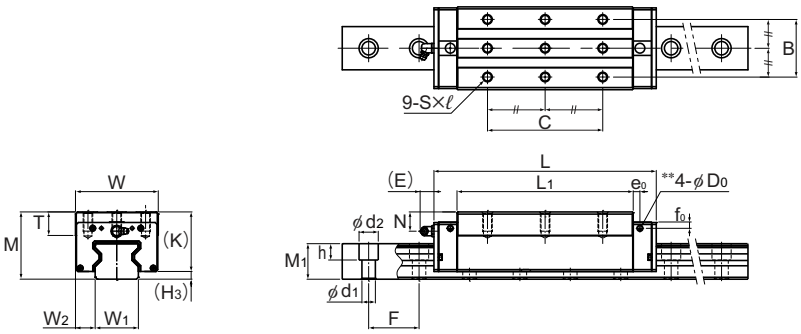
SRG45 LR 2 QZ TTHH C0 +1200L P Z T -II

- SRG45: Model number
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) — High accuracy grade (H)/Precision grade (P), Super precision grade (SP)/Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRG35 and 45 SLR

Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*						Mass	
		Width		Height	Pitch		Length*	C	C_0	M_A		M_B		M_C		LM block	LM rail
	H_3	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
	6	34	18	30	40	9×14×12	3000	59.1 55.3	119 131	1.66 1.77	10.1 11.1	1.66 1.77	10.1 11.1	2.39 2.69		1.6	6.9
	6	34	18	30	40	9×14×12	3000	76 71.4	165 182	3.13 3.39	17 18.8	3.13 3.39	17 18.8	3.31 3.74		2.1	6.9
	6	34	18	30	40	9×14×12	3000	87.9 83.4	199 222	4.53 5	23.9 26.6	4.53 5	23.9 26.6	4.09 4.56		2.6	6.9
	8	45	20.5	37	52.5	14×20×17	3090	91.9 87.8	192 216	3.49 3.9	20 22.5	3.49 3.9	20 22.5	4.98 5.87		3.2	11.6
	8	45	20.5	37	52.5	14×20×17	3090	115 110	256 288	6.13 6.87	32.2 36.3	6.13 6.87	32.2 36.3	6.64 7.83		4.1	11.6
	8	45	20.5	37	52.5	14×20×17	3090	139 133	328 368	9.99 11.1	50 56	9.99 11.1	50 56	8.91 10		5.4	11.6

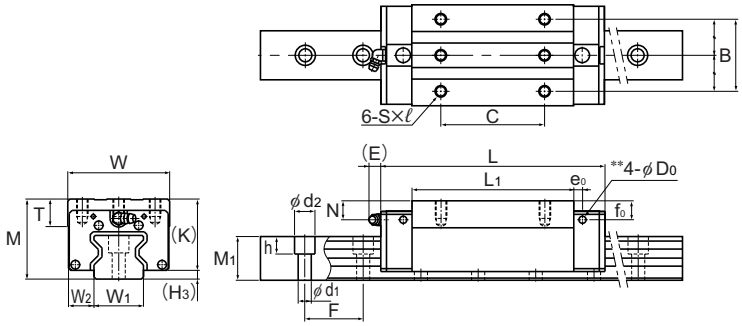
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-434.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A1-12, Lubricant: see A24-2)
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 A1-517 or A1-539)
The removing/mounting jig is not provided as standard. To obtain one, please contact THK.
** The diagram shows the side nipple pilot holes for when a grease nipple is desired for a product with LaCS or a QZ Lubricator. In all cases other than those indicated above, the side nipple pilot holes will not be through holes.
For grease nipple mount machining, contact THK. (See A1-436)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRG-R, SRG-LR, SRG-SLR, SRG-V, SRG-LV, and SRG-SLV



Models SRG55R/LR and 65V/LV

Model No.	Outer dimensions			LM block dimensions														Grease nipple
	Height M	Width W	Length L	B	C	S	ℓ	ℓ_1	ℓ_2	L_1	T	K	N	E	e_0	f_0	D_0	
SRG 55R SRG 55GR	80	100	185	75	75	M12	18	—	—	129.2	27.5	70	22	16	9	18.5	5.2	B-PT1/8
SRG 55LR SRG 55GLR	80	100	235	75	95	M12	18	—	—	179.2	27.5	70	22	16	9	18.5	5.2	B-PT1/8
SRG 55SLR SRG 55GSLR	80	100	292	75	150	M12	18	—	—	236.2	27.5	70	22	16	9	18.5	5.2	B-PT1/8
SRG 65V SRG 65GV	90	126	244.9	76	70	M16	20	—	—	171.7	19.5	78.5	17	16	9	13.5	5.2	B-PT1/8
SRG 65LV SRG 65GLV	90	126	303	76	120	M16	20	—	—	229.8	19.5	78.5	17	16	9	13.5	5.2	B-PT1/8
SRG 65SLV SRG 65GSLV	90	126	380	76	200	M16	20	—	—	306.8	19.5	78.5	17	16	9	13.5	5.2	B-PT1/8

Note) The SRG-G is equipped with uncaged, full-complement bearings.

Model number coding

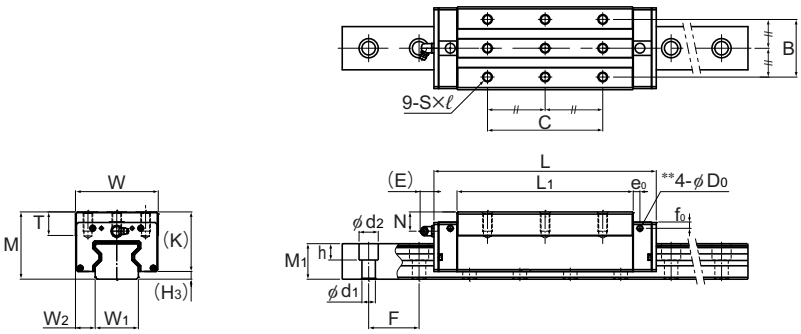
SRG65 LV 2 QZ TTHH C0 +1270L P Z T -II

- SRG65: Model number
- LV: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1270L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - High accuracy grade (H)/Precision grade (P)
  - Super precision grade (SP)/Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRG55SLR and 65SLV

Unit: mm

	H3	LM rail dimensions: Width W1 0 -0.05	W2	Height M1	Pitch F	d1×d2×h	Length* Max	Basic load rating*: C kN	C0 kN	Static permissible moment kN·m*: MA 1 block	MA Double blocks	MB 1 block	MB Double blocks	MC 1 block	Mass: LM block kg	LM rail kg/m
	10	53	23.5	43	60	16×23×20	3060	131 125	266 300	5.82 6.5	33 37.2	5.82 6.5	33 37.2	8.19 9.55	5	15.8
	10	53	23.5	43	60	16×23×20	3060	167 160	366 411	10.8 12.1	57 64	10.8 12.1	57 64	11.2 13.1	6.9	15.8
	10	53	23.5	43	60	16×23×20	3060	210 199	488 544	19.1 21	93.7 104	19.1 21	93.7 104	15.6 17.3	9.2	15.8
	11.5	63	31.5	54	75	18×26×22	3000	219 214	441 511	12.5 14.8	72.8 83.8	12.5 14.8	72.8 83.8	16.8 19.4	9	23.7
	11.5	63	31.5	54	75	18×26×22	3000	278 264	599 670	22.7 25.3	120 135	22.7 25.3	120 135	22.1 25.5	12.1	23.7
	11.5	63	31.5	54	75	18×26×22	3000	352 332	811 899	41.3 45.2	202 224	41.3 45.2	202 224	30.9 25.6	16.1	23.7

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A1-434.)
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
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A1-12, Lubricant: see A24-2)
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 A1-517 or A1-539)
The removing/mounting jig is not provided as standard. To obtain one, please contact THK.
** The diagram shows the side nipple pilot holes for when a grease nipple is desired for a product with LaCS or a QZ Lubricator. In all cases other than those indicated above, the side nipple pilot holes will not be through holes.
For grease nipple mount machining, contact THK. (See A1-436)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 4 shows the standard lengths and the maximum lengths of model SRG 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.

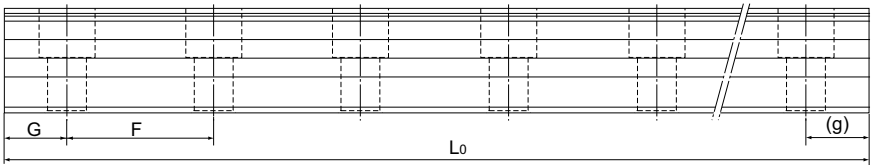


Table 4: Standard Lengths and Maximum Lengths of LM Rails for Model SRG

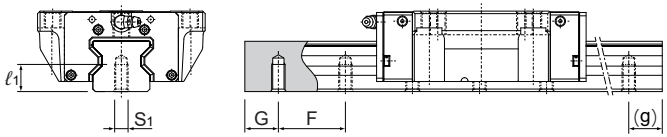
Unit: mm

Model No.	SRG 15X	SRG 20X	SRG 25X	SRG 30X	SRG 35	SRG 45	SRG 55	SRG 65	SRG 85	SRG 100
LM rail standard lengths (L_0)	160 220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1360 1480 1600 1720 1840 1960 2080 2200	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 2200 2320 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620	1530 1890 2250 2610	1340 1760 2180 2600
Standard pitch F	30	30	30	40	40	52.5	60	75	90	105
G, g	20	20	20	20	20	22.5	30	35	45	40
Max length	3000	3000	3000	3000	3000	3090	3060	3000	3000	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.

Tapped-Hole Type LM Rail

Model SRG 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) A tapped-hole LM rail is available only for products of Precision grade accuracy or lower.
(2) For standard pitches of the taps and the G and g dimensions, see **A1-434** on Table 4.

Table 5: Dimensions of the LM Rail Tap

Unit: mm

Model No.	S_1	Effective tap depth ℓ_1
SRG 15X	M4	8
SRG 20X	M5	10
SRG 25X	M6	12
SRG 30X	M8	16
SRG 35	M8	16
SRG 45	M12	24
SRG 55	M14	28
SRG 65	M16	32

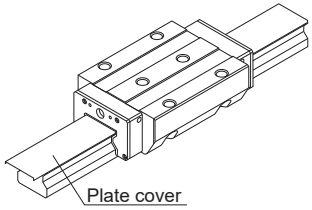
Model number coding

SRG30XC2UU+1000LP K

Symbol for tapped-hole LM rail type

Plate Cover

By covering the LM rail's mounting holes with ultra-thin stainless steel (SUS304) plates, the adhesion of the end seals increases drastically, helping prevent foreign materials and liquid from entering from the top of the LM rail. Contact THK for further details regarding mounting.



Note 1) The plate cover is not a standard specification for Model SRG. (Please note it is not possible to add just the plate cover afterwards.)
Note 2) The LM block must be removed from the LM rail when mounting. When doing this, a removing/mounting jig (see **A1-569**) is required. Please contact THK for details.
Note 3) Plate covers are available for models SRG 25X to 65.
Note 4) Plate covers cannot be used in combination with a tapped-hole LM rail.

Lubrication Hole

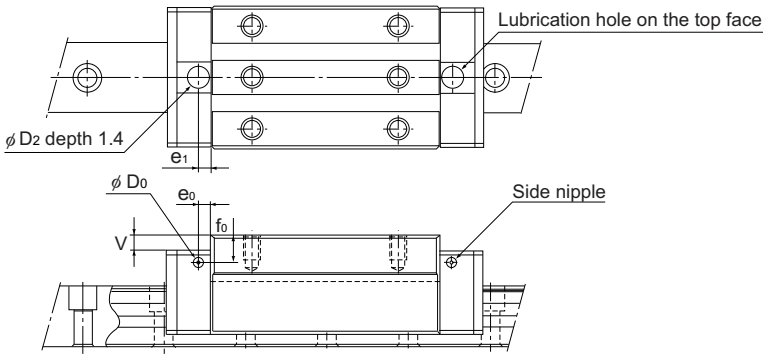
Lubrication Hole for Model SRG

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

When using the lubrication hole on the top face of models SRG-R, SRG-LR, and SRG-SLR, a separate lubrication adapter is required. Contact THK for details.

The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation. Be sure to let THK know the mounting orientation and the exact position in each LM block where the grease nipple or the piping joint should be attached.

For the mounting orientation and the lubrication, see **A1-12** and **A24-2**, respectively.



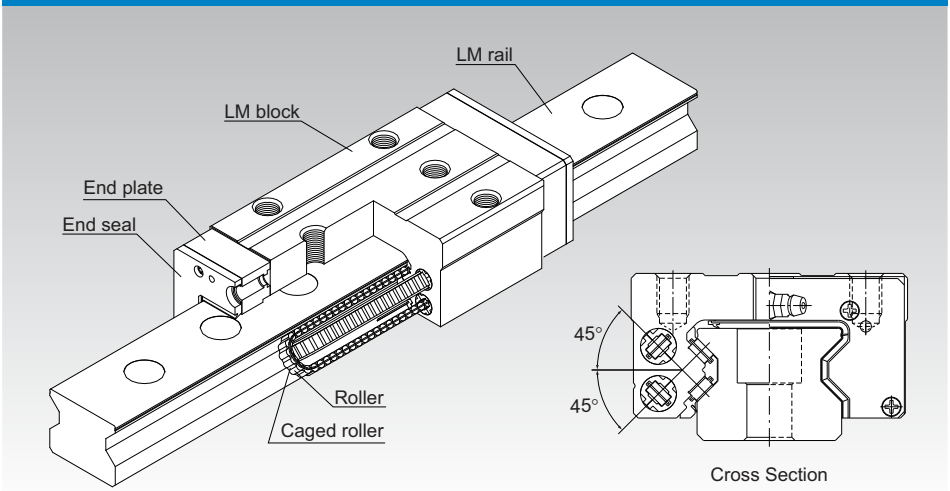
Unit: mm

Model No.		Pilot hole for side nipple			Applicable nipple	Lubrication hole on the top face			
		e_0	f_0	D_0		D_2	(O-ring)	V	e_1
SRG	15XA 15XV	4	6	2.9	PB107	9.2	(P6)	0.4	5.5
	20XA 20XLA	4	6	2.9	PB107	9.2	(P6)	0.4	6.5
	20XV 20XLV	4	6	2.9	PB107	9.2	(P6)	0.4	6.5
	25XC 25XLC	6	7.3	5.2	M6F	10.2	(P7)	0.4	6
	25XR 25XLR	6	11.3	5.2	M6F	10.2	(P7)	4.5	6
	30XC 30XLC	6	7.5	5.2	M6F	10.2	(P7)	0.4	6
	30XR 30XLR	6	10.5	5.2	M6F	10.2	(P7)	3.4	6
	35C 35LC 35SLC	6	6	5.2	M6F	10.2	(P7)	0.4	6
	35R 35LR 35SLR	6	13	5.2	M6F	10.2	(P7)	7.4	6
	45C 45LC 45SLC	7	7	5.2	M6F	10.2	(P7)	0.4	7
	45R 45LR 45SLR	7	17	5.2	M6F	10.2	(P7)	10.4	7
	55C 55LC 55SLC	9	8.5	5.2	M6F	10.2	(P7)	0.4	11
	55R 55LR 55SLR	9	18.5	5.2	M6F	10.2	(P7)	10.4	11
	65C 65LC 65SLC	9	13.5	5.2	M6F	10.2	(P7)	0.4	10
	65V 65LV 65SLV	9	13.5	5.2	M6F	10.2	(P7)	0.4	10
	85LC	15	22	8.2	PT1/8	13	(P10)	0.4	10
	100LC	15	23	8.2	PT1/8	13	(P10)	0.4	10

Note) Upper surface lubrication is oil lubrication only. Contact THK if you are considering using the lubrication hole on the top face for grease lubrication.

SRN

Ultra-Rigid, Low-Profile Caged Roller LM Guide Model SRN



*For the caged roller, see A1-410.

Selection Criteria A1-10
Design Highlights A1-478
Options A1-503
Model No. A1-571
Handling Precautions A1-577
Accessories for Lubrication A24-1
Mounting Procedure B1-89

Equivalent Moment Factor A1-43
Rated Loads in All Directions A1-61
Equivalent Factor in Each Direction A1-63
Radial Clearance A1-75
Accuracy Standards A1-79
Shoulder Height of the Mounting Base and the Corner Radius A1-490
Reference Error Tolerance for the Mounting Surface A1-442
Dimensions of Each Model with Options Attached A1-517

Structure and Features

Rollers roll in four rows of raceways precision-ground on the LM rail and LM block, and roller cages and end plates incorporated in the LM block allow the balls to circulate.
The SRN is an ultra-rigid roller guide that uses roller cages to allow low-friction, smooth motion and achieve long-term maintenance-free operation.

Ultra-High Rigidity

Increased rigidity is achieved by using highly rigid rollers as the rolling elements and having the overall roller length more than 1.5 times greater than the roller diameter.

4-Way Equal Load

Each row of rollers is arranged at a 45° contact angle so the LM block will have an equal load rating in all directions: radial, reverse-radial, and horizontal. This ensures high rigidity in all directions.

Smooth Motion through Skewing Prevention

The roller cage allows rollers to form an evenly spaced line while circulating, thus preventing the rollers from skewing as the block enters a loaded area. This minimizes rolling resistance fluctuation and achieves stable, smooth motion.

Long-Term Maintenance-Free Operation

Use of roller cages eliminates friction between rollers and increases grease retention, enabling long-term maintenance-free operation to be achieved.

Low-Profile, Low Center of Gravity

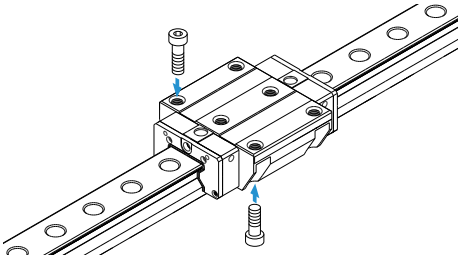
Because it has a lower total height than the Caged Roller LM Guide Model SRG, it is ideal for compact designs.

Types and Features

Model SRN-C

Dimensional Table⇒A1-444

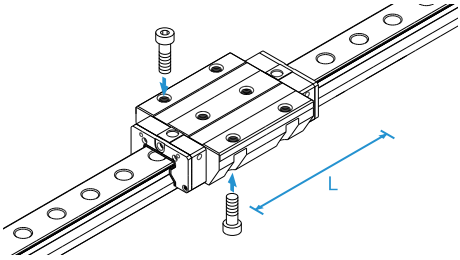
The flange of the LM block has tapped holes.
It can be mounted from the top or the bottom.
It is used in places where the table cannot have through holes for mounting bolts.



Model SRN-LC

Dimensional Table⇒A1-444

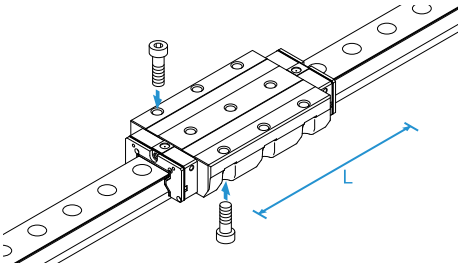
The LM block has the same cross-sectional shape as model SRN-C, but has a longer overall LM block length (L) and a greater load rating.



Model SRN-SLC

Dimensional Table⇒A1-444

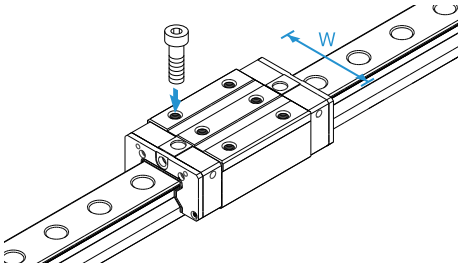
The LM block has the same cross-sectional shape as model SRN-LC, but has a longer overall LM block length (L) and a greater load rating.



Model SRN-R

Dimensional Table⇒A1-448

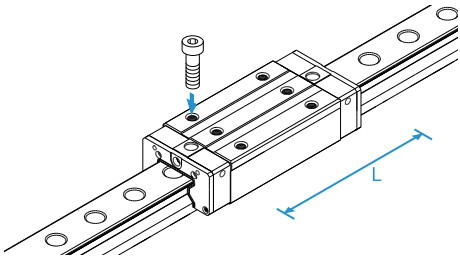
With this type, the LM block has a smaller width (W) and tapped holes.
It is used in places where the space for table width is limited.



Model SRN-LR

Dimensional Table⇒A1-448

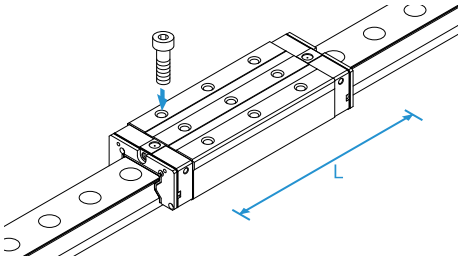
The LM block has the same cross-sectional shape as model SRN-R, but has a longer overall LM block length (L) and a greater load rating.



Model SRN-SLR

Dimensional Table⇒A1-448

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



SRN-G

Dimensional Table⇒A1-444 to A1-451

The SRN-G, a model equipped with uncaged, full-complement bearings, is also available. Due to its cageless design, however, the SRN-G's dynamic load rating is lower than that of standard SRN models. For specific data, please refer to the dimension tables in this catalog.

Reference Error Tolerance for the Mounting Surface

The Caged Roller LM Guide Model SRN features high rigidity because it uses rollers as its rolling element, and it also features a roller cage, which prevents the rollers from skewing. However, high machining accuracy is required in the mounting surface. If the error on the mounting surface is large, it will affect the rolling resistance and the service life. The following shows the reference error tolerance according to the radial clearance.

Table 1: Reference Horizontal Error Tolerance (P) between Two Rails

Unit: μm

Radial clearance / Model No.	Normal	C1	C0
SRN 35	14	10	7
SRN 45	17	13	9
SRN 55	21	14	11
SRN 65	27	18	14

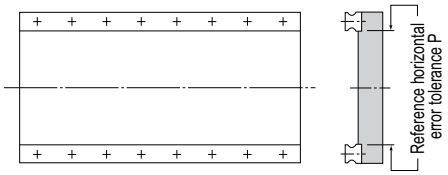


Fig. 1

Table 2: Reference Vertical Error Tolerance (X) between Two Rails

Unit: mm

Radial clearance	Normal	C1	C0
Reference vertical error tolerance X	0.0003a	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

Rail span when a = 500 mm

Reference vertical error tolerance $X = 0.0003 \times 500 = 0.15$

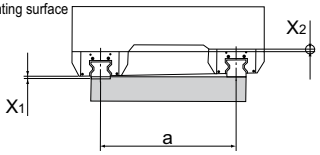


Fig. 2

Table 3: Reference Vertical Error Tolerance (Y) in the Axial Direction

Unit: mm

Reference vertical error tolerance Y	0.000036b

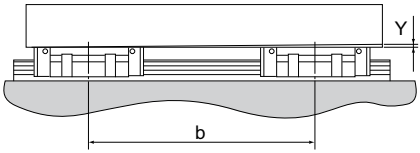
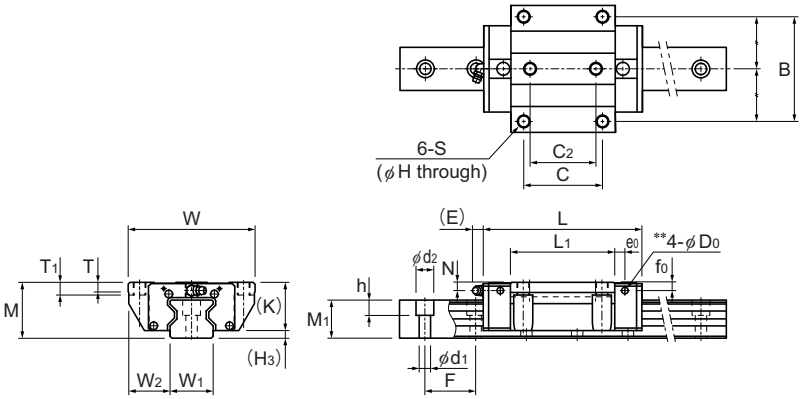


Fig. 3

Models SRN-C, SRN-LC, and SRN-SLC



Models SRN35 and 45 C/LC

Model No.	Outer dimensions			LM block dimensions															H3
	Height M	Width W	Length L	B	C	C2	S	H	L1	T	T1	K	N	E	e0	f0	D0	Grease nipple	
SRN 35C SRN 35GC	44	100	125	82	62	52	M10	8.5	82.2	11.6	10	38	6.5	12	8	7	5.2	B-M6F	6
SRN 35LC SRN 35GLC	44	100	155	82	62	52	M10	8.5	112.2	11.6	10	38	6.5	12	8	7	5.2	B-M6F	6
SRN 35SLC SRN 35GSLC	44	100	180.8	82	100	—	M10	8.5	138	11.7	10	38	6.5	12	8	7	5.2	B-M6F	6
SRN 45C SRN 45GC	52	120	155	100	80	60	M12	10.5	107	16.5	15	45	7	12	8.5	7.6	5.2	B-M6F	7
SRN 45LC SRN 45GLC	52	120	190	100	80	60	M12	10.5	142	16.5	15	45	7	12	8.5	7.6	5.2	B-M6F	7
SRN 45SLC SRN 45GSLC	52	120	231.5	100	120	—	M12	10.5	183.5	16.5	15	45	7	12	8.5	7.6	5.2	B-M6F	7

Note) The SRN-G is equipped with uncaged, full-complement bearings.

Model number coding

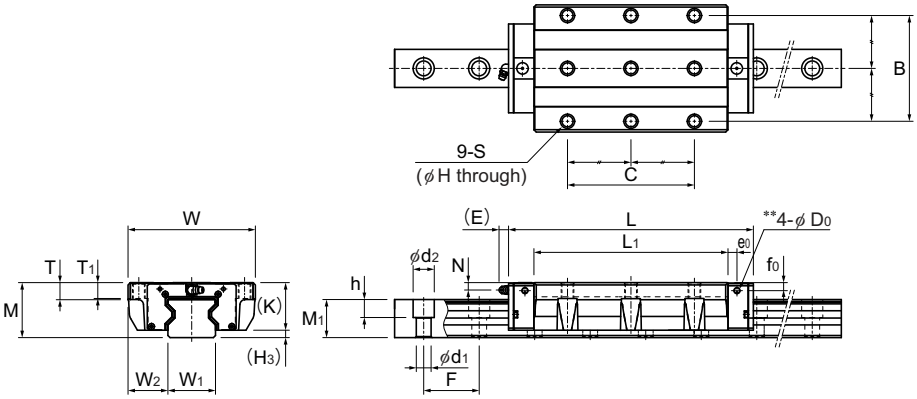
SRN45 C 2 QZ KK C0 +1200L P Z T -II

- SRN45: Model number
- C: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- KK: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
  - Heavy preload (CN1)
  - Super heavy preload (CN2)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - High accuracy grade (H)/Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRN35 and 45 SLC

Unit: mm

LM rail dimensions						Basic load rating*		Static permissible moment kN·m*						Mass	
								M_A		M_B		M_C			
Width W_1 0 -0.05	W_2	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Length* Max	C kN	C_0 kN	1 block	Double blocks	1 block	Double blocks	1 block		LM block kg	LM rail kg/m
34	33	30	40	9×14×12	3000	59.1 55.3	119 131	1.66 1.77	10.1 11.1	1.66 1.77	10.1 11.1	2.39 2.69		1.5	6.9
34	33	30	40	9×14×12	3000	76 71.4	165 182	3.13 3.39	17 18.8	3.13 3.39	17 18.8	3.31 3.74		2.3	6.9
34	33	30	40	9×14×12	3000	87.9 83.4	199 222	4.53 5	23.9 26.6	4.53 5	23.9 26.6	4.09 4.56		2.8	6.9
45	37.5	36	52.5	14×20×17	3090	91.9 87.8	192 216	3.49 3.9	20 22.5	3.49 3.9	20 22.5	4.98 5.87		3.1	11.3
45	37.5	36	52.5	14×20×17	3090	115 110	256 288	6.13 6.87	32.2 36.3	6.13 6.87	32.2 36.3	6.64 7.83		4.1	11.3
45	37.5	36	52.5	14×20×17	3090	139 133	328 368	9.99 11.1	50 56	9.99 11.1	50 56	8.91 10		5.4	11.3

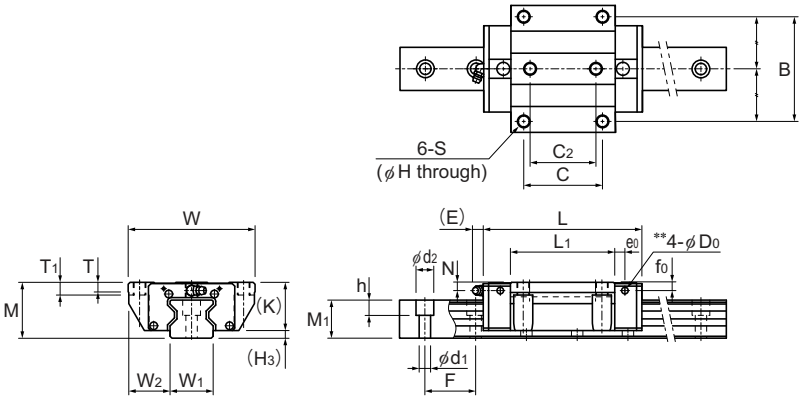
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-452**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-454**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRN-C, SRN-LC, and SRN-SLC



Models SRN55 and 65 C/LC

Model No.	Outer dimensions			LM block dimensions															H3
	Height M	Width W	Length L	B	C	C2	S	H	L1	T	T1	K	N	E	e0	f0	D0	Grease nipple	
SRN 55C SRN 55GC	63	140	185	116	95	70	M14	12.5	129	18.2	18	53	8	16	10	9.8	5.2	B-PT1/8	10
SRN 55LC SRN 55GLC	63	140	235	116	95	70	M14	12.5	179.2	18.2	18	53	8	16	10	9.8	5.2	B-PT1/8	10
SRN 55SLC SRN 55GSLC	63	140	292	116	150	—	M14	12.5	236.2	18.2	18	53	8	16	10	9.8	5.2	B-PT1/8	10
SRN 65C SRN 65GC	75	170	244.9	142	110	82	M16	14.5	171.7	21.2	20	65	14	16	9	13	5.2	B-PT1/8	10
SRN 65LC SRN 65GLC	75	170	303	142	110	82	M16	14.5	229.8	21.2	20	65	14	16	9	13	5.2	B-PT1/8	10
SRN 65SLC SRN 65GSLC	75	170	380	142	200	—	M16	14.5	306.8	21.2	20	65	14	16	9	13	5.2	B-PT1/8	10

Note) The SRN-G is equipped with uncaged, full-complement bearings.

Model number coding

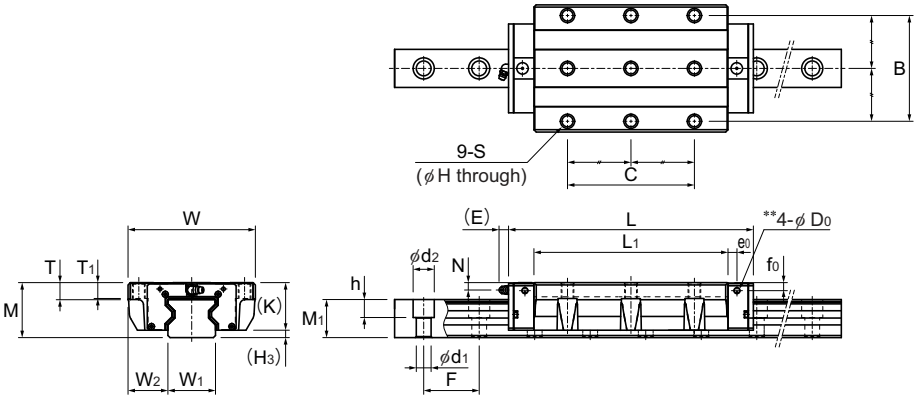
SRN65 C 2 QZ KK C0 +1270L P Z T -II

- SRN65: Model number
- C: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- KK: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
  - Heavy preload (CN1)
  - Super heavy preload (CN2)
- +1270L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - High accuracy grade (H)/Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRN55 and 65 SLC

Unit: mm

LM rail dimensions						Basic load rating*		Static permissible moment kN·m*						Mass	
								M_A		M_B		M_C			
Width W_1 0 -0.05	W_2	Height M_1	Pitch F	$d_1 \times d_2 \times h$	Length* Max	C kN	C_0 kN	1 block	Double blocks	1 block	Double blocks	1 block		LM block kg	LM rail kg/m
53	43.5	43	60	16×23×20	3060	131 125	266 300	5.82 6.5	33 37.2	5.82 6.5	33 37.2	8.19 9.55		5.1	15.8
53	43.5	43	60	16×23×20	3060	167 160	366 411	10.8 12.1	57 64	10.8 12.1	57 64	11.2 13.1		7.1	15.8
53	43.5	43	60	16×23×20	3060	210 199	488 544	19.1 21	93.7 104	19.1 21	93.7 104	15.6 17.3		9.4	15.8
63	53.5	49	75	18×26×22	3000	219 214	441 511	12.5 14.8	72.8 83.8	12.5 14.8	72.8 83.8	16.8 19.4		10.4	21.3
63	53.5	49	75	18×26×22	3000	278 264	599 670	22.7 25.3	120 135	22.7 25.3	120 135	22.1 25.5		13.9	21.3
63	53.5	49	75	18×26×22	3000	352 332	811 899	41.3 45.2	202 224	41.3 45.2	202 224	30.9 25.6		18.5	21.3

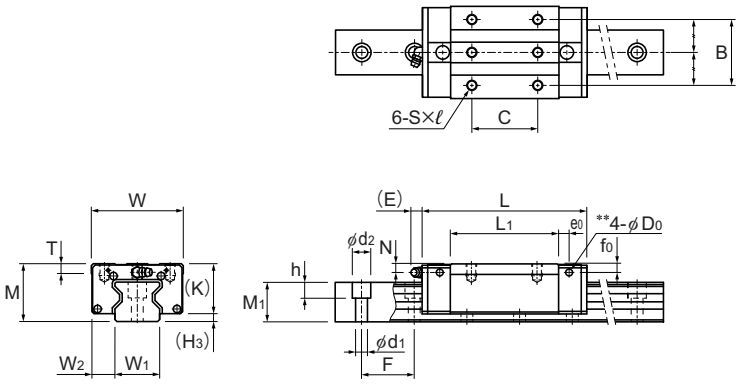
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-452**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-454**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRN-R, SRN-LR, and SRN-SLR



Models SRN35 and 45 R/LR

Model No.	Outer dimensions			LM block dimensions												H3
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	N	E	e0	f0	D0	Grease nipple	
SRN 35R SRN 35GR	44	70	125	50	50	M8×9	82.2	10.8	38	6.5	12	8	7	5.2	B-M6F	6
SRN 35LR SRN 35GLR	44	70	155	50	72	M8×9	112.2	10.8	38	6.5	12	8	7	5.2	B-M6F	6
SRN 35SLR SRN 35GSLR	44	70	180.8	50	100	M8×9	138	10.8	38	6.5	12	8	7	5.2	B-M6F	6
SRN 45R SRN 45GR	52	86	155	60	60	M10×11	107	10.8	45	7	12	8.5	7.6	5.2	B-M6F	7
SRN 45LR SRN 45GLR	52	86	190	60	80	M10×11	142	10.8	45	7	12	8.5	7.6	5.2	B-M6F	7
SRN 45SLR SRN 45GSLR	52	86	231.5	60	120	M10×11	183.5	10.8	45	7	12	8.5	7.6	5.2	B-M6F	7

Note) The SRN-G is equipped with uncaged, full-complement bearings.

Model number coding

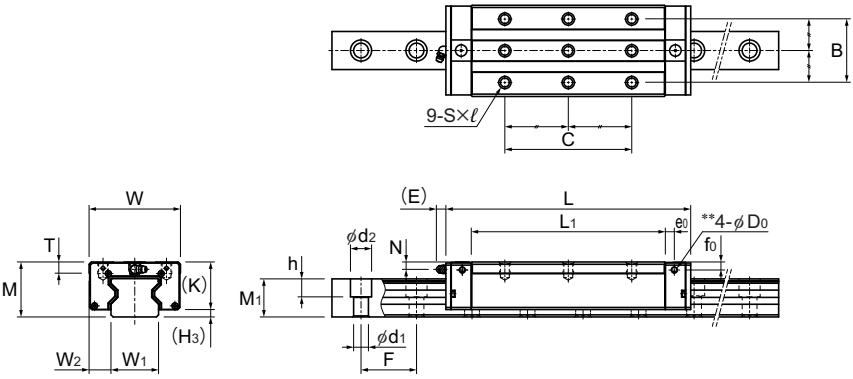
SRN45 LR 2 QZ KK C0 +1200L P Z T -II

- SRN45: Model number
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- KK: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) High accuracy grade (H)/Precision grade (P)/Super precision grade (SP) Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRN35 and 45 SLR

Unit: mm

LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
Width		Height	Pitch		Length*	C	C0	MA		MB		MC	LM block	LM rail
W1 0 -0.05	W2	M1	F	d1×d2×h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
34	18	30	40	9×14×12	3000	59.1 55.3	119 131	1.66 1.77	10.1 11.1	1.66 1.77	10.1 11.1	2.39 2.69	1.1	6.9
34	18	30	40	9×14×12	3000	76 71.4	165 182	3.13 3.39	17 18.8	3.13 3.39	17 18.8	3.31 3.74	1.5	6.9
34	18	30	40	9×14×12	3000	87.9 83.4	199 222	4.53 5	23.9 26.6	4.53 5	23.9 26.6	4.09 4.56	1.8	6.9
45	20.5	36	52.5	14×20×17	3090	91.9 87.8	192 216	3.49 3.9	20 22.5	3.49 3.9	20 22.5	4.98 5.87	2	11.3
45	20.5	36	52.5	14×20×17	3090	115 110	256 288	6.13 6.87	32.2 36.3	6.13 6.87	32.2 36.3	6.64 7.83	2.6	11.3
45	20.5	36	52.5	14×20×17	3090	139 133	328 368	9.99 11.1	50 56	9.99 11.1	50 56	8.91 10	3.4	11.3

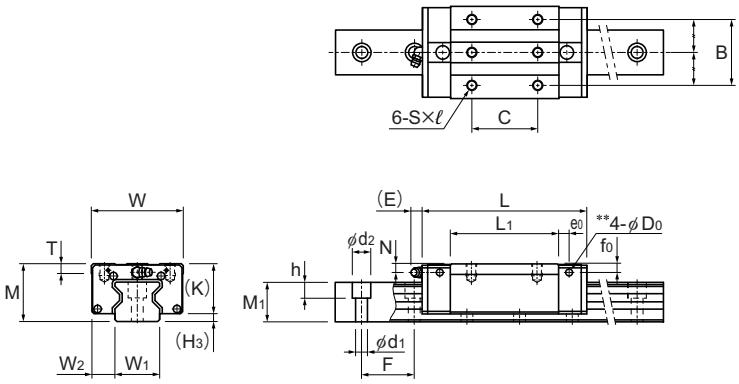
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-452**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
Double blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-454**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models SRN-R, SRN-LR, and SRN-SLR



Models SRN55 and 65 R/LR

Model No.	Outer dimensions			LM block dimensions												H3
	Height M	Width W	Length L	B	C	S×ℓ	L1	T	K	N	E	e0	f0	D0	Grease nipple	
SRN 55R SRN 55GR	63	100	185	75	75	M12×13	129	13.8	53	8	16	10	9.8	5.2	B-PT1/8	10
SRN 55LR SRN 55GLR	63	100	235	75	95	M12×13	179.2	13.8	53	8	16	10	9.8	5.2	B-PT1/8	10
SRN 55SLR SRN 55GSLR	63	100	292	75	150	M12×13	236.2	13.8	53	8	16	10	9.8	5.2	B-PT1/8	10
SRN 65R SRN 65GR	75	126	244.9	76	70	M16×16	171.7	19.5	65	14	16	9	13	5.2	B-PT1/8	10
SRN 65LR SRN 65GLR	75	126	303	76	120	M16×16	229.8	19.5	65	14	16	9	13	5.2	B-PT1/8	10
SRN 65SLR SRN 65GSLR	75	126	380	76	200	M16×16	306.8	19.5	65	14	16	9	13	5.2	B-PT1/8	10

Note) The SRN-G is equipped with uncaged, full-complement bearings.

Model number coding

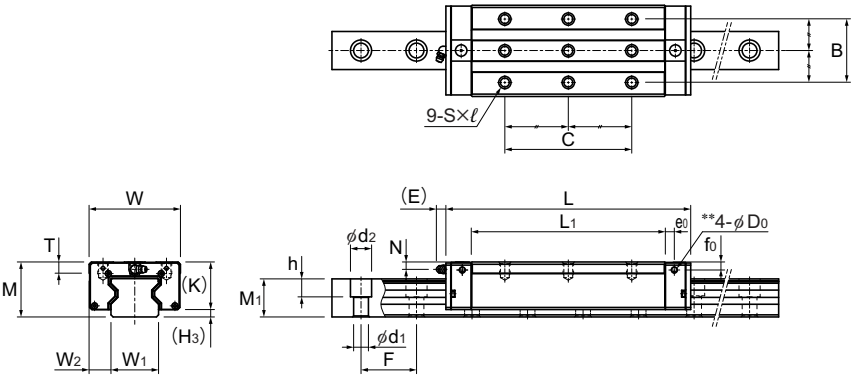
SRN65 LR 2 QZ KK C0 +1270L P Z T -II

- SRN65: Model number
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ lubricator
- KK: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- +1270L: LM rail length (in mm)
- P: Accuracy symbol (*3) High accuracy grade (H)/Precision grade (P)/Super precision grade (SP) Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on A1-543. (*2) See A1-75. (*3) See A1-79. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRN55 and 65 SLR

Unit: mm

	LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
	Width		Height	Pitch		Length*	C	C0	MA		MB		MC	LM block	LM rail
	W1 0 -0.05	W2	M1	F	d1×d2×h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	53	23.5	43	60	16×23×20	3060	131 125	266 300	5.82 6.5	33 37.2	5.82 6.5	33 37.2	8.19 9.55	3.3	15.8
	53	23.5	43	60	16×23×20	3060	167 160	366 411	10.8 12.1	57 64	10.8 12.1	57 64	11.2 13.1	4.6	15.8
	53	23.5	43	60	16×23×20	3060	210 199	488 544	19.1 21	93.7 104	19.1 21	93.7 104	15.6 17.3	5	15.8
	63	31.5	49	75	18×26×22	3000	219 214	441 511	12.5 14.8	72.8 83.8	12.5 14.8	72.8 83.8	16.8 19.4	7.1	21.3
	63	31.5	49	75	18×26×22	3000	278 264	599 670	22.7 25.3	120 135	22.7 25.3	120 135	22.1 25.5	9.4	21.3
	63	31.5	49	75	18×26×22	3000	352 332	811 899	41.3 45.2	202 224	41.3 45.2	202 224	30.9 25.6	12.6	21.3

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-452**.)
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
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-454**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 4 shows the standard lengths and the maximum lengths of model SRN 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.

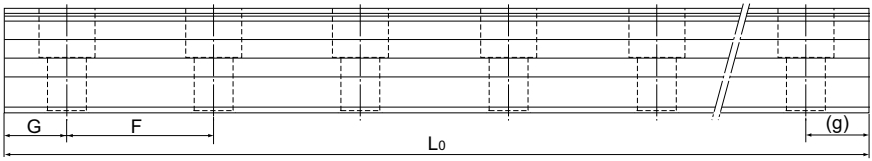


Table 4: Standard Lengths and Maximum Lengths of Model SRN LM Rails

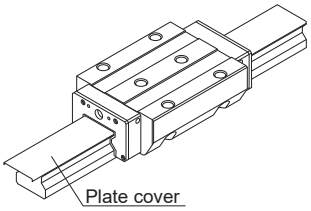
Unit: mm

Model No.	SRN 35	SRN 45	SRN 55	SRN 65
LM rail standard lengths (L_0)	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620
Standard pitch F	40	52.5	60	75
G, g	20	22.5	30	35
Max length	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.

Plate Cover

By covering the LM rail's mounting holes with ultra-thin stainless steel (SUS304) plates, the effectiveness of the end seals increases drastically, helping prevent foreign materials and liquid from entering from the top of the LM rail. Contact THK for further details regarding mounting.

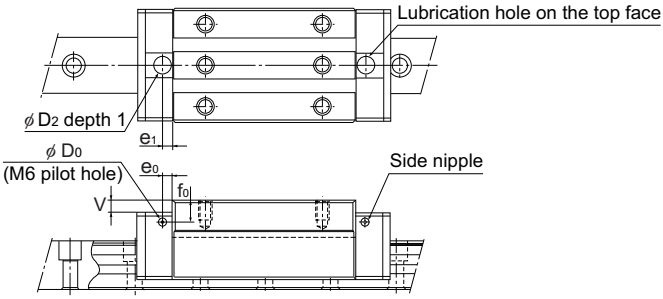


Note 1) The Model SRN with plate cover is not a standard specification. (Please note it is not possible to add just the plate cover afterwards.)
Note 2) The LM block must be removed from the LM rail when mounting. When doing this, a removing/mounting jig (see **A1-569**) is required. Please contact THK for details.
Note 3) Plate covers are available for models SRN 35 to 65.

Lubrication Hole

Lubrication Hole for Model SRN

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



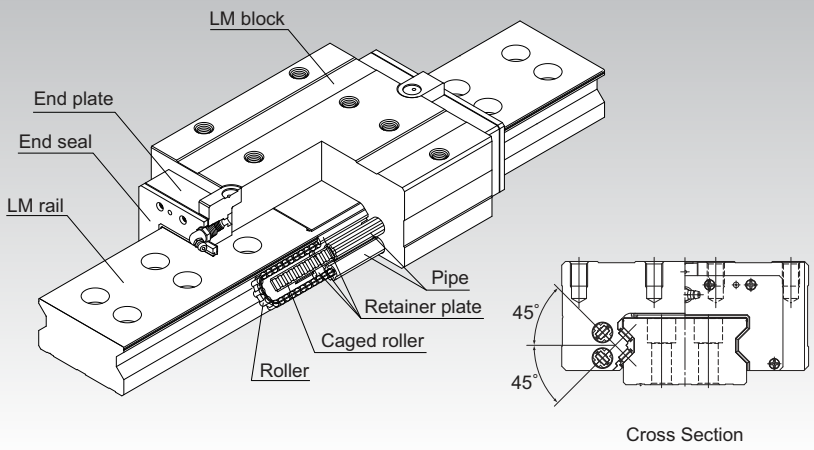
Unit: mm

Model No.		Pilot hole for side nipple			Applicable nipple	Lubrication hole on the top face			
		e_0	f_0	D_0		D_2	(O-ring)	V	e_1
SRN	35C 35LC 35SLC	8	7.0	5.2	M6F	10.2	(P7)	0.4	6
	35R 35LR 35SLR	8	7.0	5.2	M6F	10.2	(P7)	0.4	6
	45C 45LC 45SLC	8.5	7.6	5.2	M6F	10.2	(P7)	0.4	7
	45R 45LR 45SLR	8.5	7.6	5.2	M6F	10.2	(P7)	0.4	7
	55C 55LC 55SLC	10	9.8	5.2	M6F	10.2	(P7)	0.4	11
	55R 55LR 55SLR	10	9.8	5.2	M6F	10.2	(P7)	0.4	11
	65C 65LC 65SLC	9	13	5.2	M6F	10.2	(P7)	0.4	10
	65R 65LR 65SLR	9	13	5.2	M6F	10.2	(P7)	0.4	10

Note) Upper surface lubrication is oil lubrication only. Contact THK if you are considering using the lubrication hole on the top face for grease lubrication.

SRW

Ultra-Rigid, Wide Caged Roller LM Guide Model SRW



Cross Section

*For the caged roller, see A1-410.

Selection Criteria	A1-10
Design Highlights	A1-478
Options	A1-503
Model No.	A1-571
Handling Precautions	A1-577
Accessories for Lubrication	A24-1
Mounting Procedure	B1-89
Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-87
Shoulder Height of the Mounting Base and the Corner Radius	A1-490
Reference Error Tolerance for the Mounting Surface	A1-459
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Based on the Caged Roller LM Guide Model SRG, this model has a wider LM rail and two rows of LM rail mounting holes to achieve high mounting strength and mounting stability. It is an ultra-rigid roller guide that uses roller cages to allow low-friction, smooth motion, and long-term maintenance-free operation.

Ultra-High Rigidity

Since it has a wide rail and can be secured on the table using two rows of mounting bolts, the mounting strength is significantly increased. In addition, since the crosswise raceway distance (L) is large, Model SRW is structurally strong against a moment load (Mc moment) in the rolling direction. Increased rigidity is achieved by using rollers with low elastic deformation as its rolling elements and having the overall roller length more than 1.5 times greater than the roller diameter.

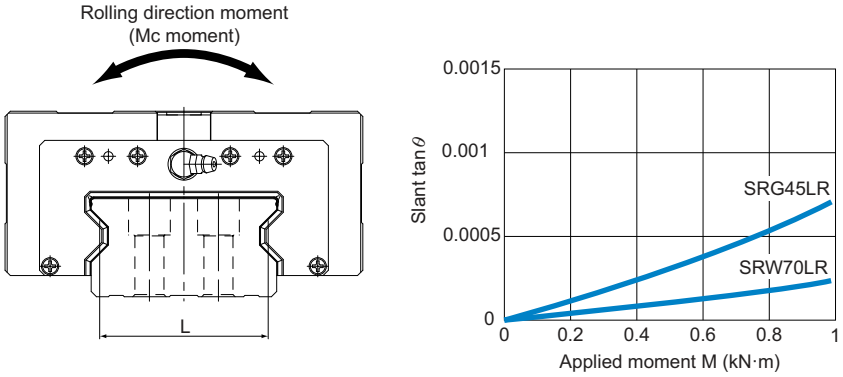


Fig. 1: Result of Comparison between Models SRW and SRG in Moment Rigidity in the Rolling Direction (Mc Moment)

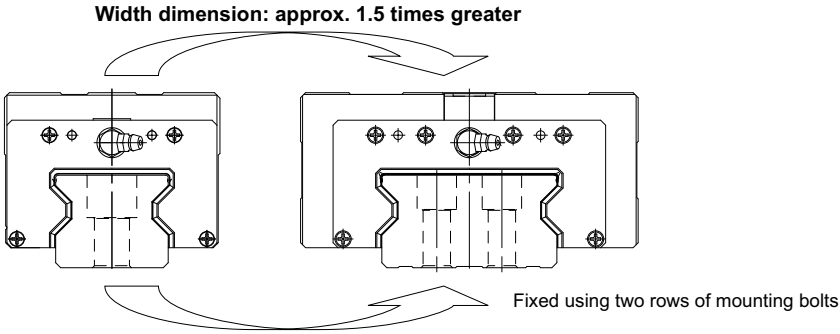


Fig. 2: Comparison between Models SRW and SRG in Cross Section

Smooth Motion through Skewing Prevention

The roller cage allows rollers to form an evenly spaced line while circulating, thus preventing the rollers from skewing as the block enters a loaded area. This minimizes rolling resistance fluctuation and achieves stable, smooth motion.

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 circulate, the grease pocket serves to provide the required amount of lubricant to the contact curvature of the spacer and the roller, thus achieving long-term maintenance-free operation.

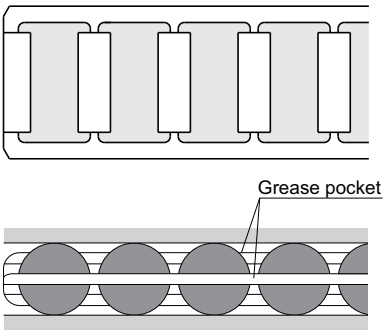


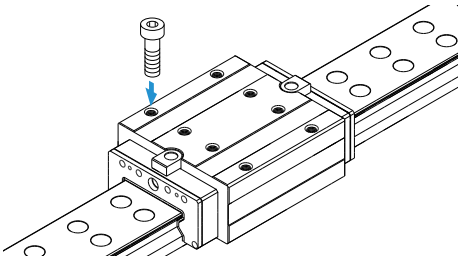
Fig. 3

Types and Features

Model SRW-LR

Dimensional Table⇒A1-460

The LM block has tapped holes.



Reference Error Tolerance for the Mounting Surface

The Caged Roller LM Guide Model SRW features high rigidity because it uses rollers as its rolling element, and it also features a roller cage, which prevents the rollers from skewing. However, high machining accuracy is required in the mounting surface. If the error on the mounting surface is large, it will affect the rolling resistance and the service life. The following shows the reference error tolerance according to the radial clearance.

Table 1: Reference Horizontal Error Tolerance (P) between Two Rails
Unit: μm

Radial clearance / Model No.	Normal	C1	C0
SRW 70	13	9	7
SRW 85	16	11	8
SRW 100	20	14	11
SRW 130	26	18	14
SRW 150	30	21	16

Table 2: Reference Vertical Error Tolerance (X) between Two Rails
Unit: mm

Radial clearance	Normal	C1	C0
Reference vertical error tolerance X	0.0002a	0.00014a	0.000072a

$X = X_1 + X_2$

X_1: Difference in rail mounting surface height

X_2: Difference in block mounting surface height

Example of calculation

When the rail span :

a = 500 mm

Reference vertical error tolerance

$X = 0.0002 \times 500$

$= 0.1$

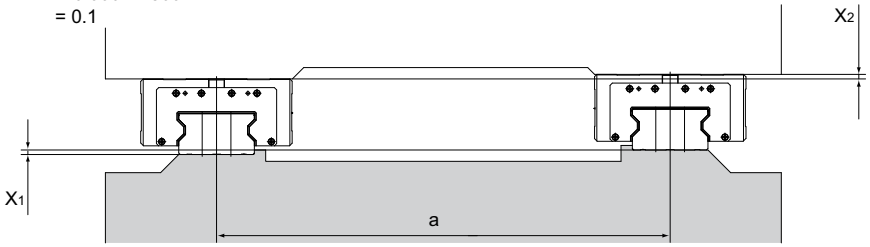


Fig. 5

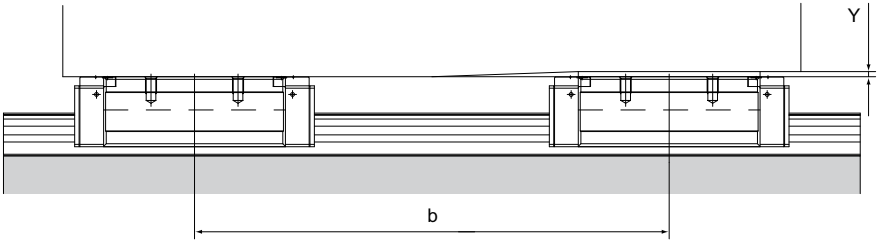


Fig. 6

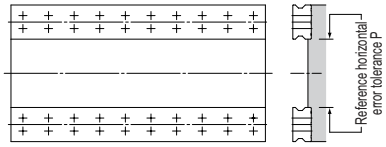
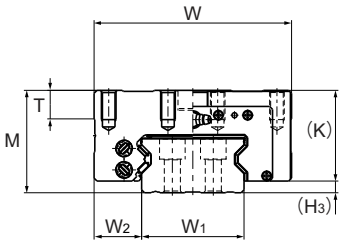


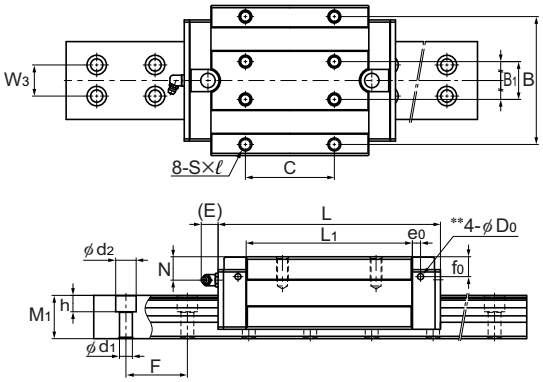
Fig. 4

Table 3: Reference Vertical Error Tolerance (Y) in the Axial Direction
Unit: mm

Reference vertical error tolerance Y	0.000036b

Model SRW-LR





Models SRW70 to 100LR

Model No.	Outer dimensions			LM block dimensions													H3
	Height M	Width W	Length L	B	B1	C	S×ℓ	L1	T	K	N	E	e0	f0	D0	Grease nipple	
SRW 70LR	70	135	190	115	34	80	M10×20	142	20	62	20	16	7	19	5.2	B-PT1/8	8
SRW 85LR	80	165	235	140	40	95	M12×19	179.2	28	70	22	16	9	19.5	5.2	B-PT1/8	10
SRW 100LR	100	200	303	172	50	110	M14×20	229.8	20	88.5	27	16	9	26	5.2	B-PT1/8	11.5
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 number coding

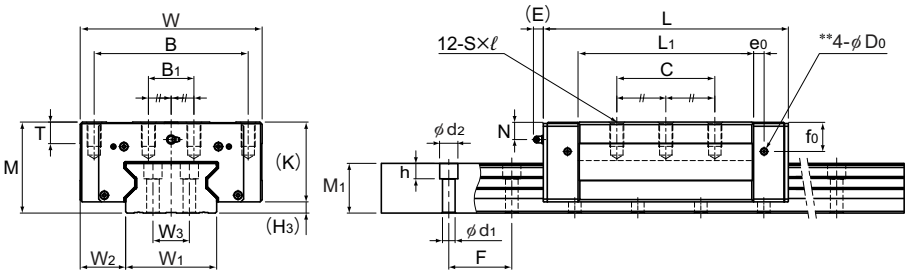
SRW70LR 2 QZ KKHH C0 +1200L P Z T -II

- SRW70LR: Model number
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3)
  - Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- Z: With plate cover
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-87**. (*4) See **A1-13**.

Note) Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Models SRW130 and 150LR

Unit: mm

	LM rail dimensions							Basic load rating*		Static permissible moment kN·m*					Mass	
	Width			Height	Pitch		Length*	C	C0	MA		MB		MC	LM block	LM rail
	W1 0 -0.05	W2	W3	M1	F	d1×d2×h	Max	kN	kN	1 block	Double blocks	1 block	Double blocks	1 block	kg	kg/m
	70	32.5	28	37	52.5	11×17.5×14	3090	115	256	6.13	32.2	6.13	32.2	10.2	6.3	18.6
	85	40	32	43	60	14×20×17	3060	167	366	10.8	57	10.8	57	17.5	11.0	26.7
	100	50	38	54	75	16×23×20	3000	278	599	22.7	120	22.7	120	33.9	21.6	35.9
	130	65	52	71	90	18×26×22	3000	497	990	45.3	239	45.3	239	74.2	41.7	61.0
	150	75	60	77	105	24×35×28	3000	601	1170	60	319	60	319	101.6	65.1	74.4

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-462**.)
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
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A**1-12**, Lubricant: see A**24-2**)
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 A**1-517** or A**1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See A**1-463**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50}=C\times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 4 shows the standard lengths and the maximum lengths of model SRW variations. If the maximum length of the desired LM rail exceeds these values, jointed rails will be used.
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.
If desiring jointed use of this model, be sure to indicate the overall length so that we can manufacture the product without leaving a level difference in the joint.

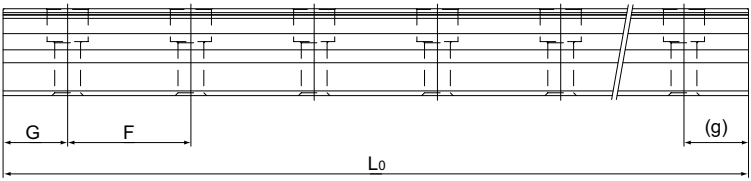


Table 4: Standard Lengths and Maximum Lengths of LM Rails for Model SRW

Unit: mm

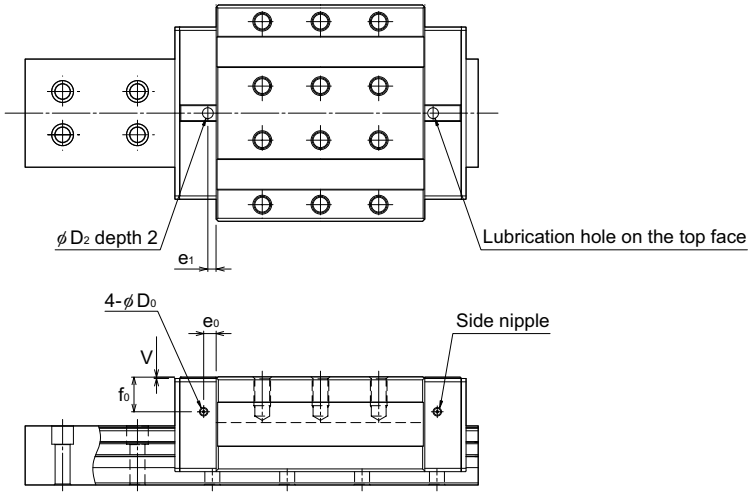
Model No.	SRW 70	SRW 85	SRW 100	SRW 130	SRW 150
LM rail standard lengths (L_0)	570 675 780 885 990 1095 1200 1305 1410 1515 1620 1725 1830 1935 2040 2145 2250 2355 2460 2565 2670 2775 2880 2985	780 900 1020 1140 1260 1380 1500 1620 1740 1860 1980 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620	1530 1890 2250 2610	1340 1760 2180 2600
Standard pitch F	52.5	60	75	90	105
G, g	22.5	30	35	45	40
Max length	3090	3060	3000	3000	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.

Lubrication Hole

Lubrication Hole for Model SRW

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



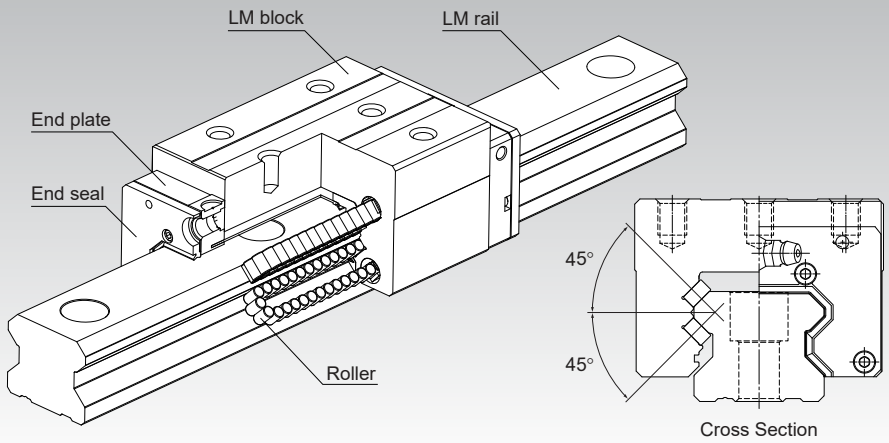
Unit: mm

Model No.		Pilot hole for side nipple			Applicable nipple	Lubrication hole on the top face			
		e_0	f_0	D_0		D_2	(O-ring)	V	e_1
SRW	70	7	17	5.2	M6F	13	(P10)	0.4	2.7
	85	9	18.5	5.2	M6F	13	(P10)	0.4	9.9
	100	9	23.5	5.2	M6F	13	(P10)	0.4	10.1
	130	15	42	8.2	PT1/8	13	(P10)	0.4	10
	150	15	53	8.2	PT1/8	13	(P10)	0.4	10

Note) Upper surface lubrication is oil lubrication only. Contact THK if you are considering using the lubrication hole on the top face for grease lubrication.

HRX

Super-Rigid Full-Roller LM Guide Model HRX



Selection Criteria	**A1-10**
Design Highlights	**A1-478**
Options	**A1-503**
Model No.	**A1-571**
Handling Precautions	**A1-577**
Accessories for Lubrication	**A24-1**
Mounting Procedure	**B1-89**

Equivalent Moment Factor	A1-43
Rated Loads in All Directions	A1-61
Equivalent Factor in Each Direction	A1-63
Radial Clearance	A1-75
Accuracy Standards	A1-79
Shoulder Height of the Mounting Base and the Corner Radius	A1-490
Reference Error Tolerance for the Mounting Surface	A1-468
Dimensions of Each Model with Options Attached	A1-517

Structure and Features

Rollers 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 rollers to circulate. Model HRX has a larger mounting surface tolerance than our conventional roller products due to the front-to-front raceways (DF set). Also, the extended length of the metal LM block and increased number of load-bearing rollers achieve an improved static load rating.

Super-High Rigidity

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

4-way Equal Load

Each row of rollers is arranged at a 45° contact angle so the LM block will have an equal load rating in all directions: radial, reverse-radial, and horizontal. This ensures high rigidity in all directions.

Smooth Motion through Skewing Prevention

The new guide mechanism prevents skewing as the block enters a loaded area. This minimizes rolling resistance fluctuation and achieves stable, smooth motion.

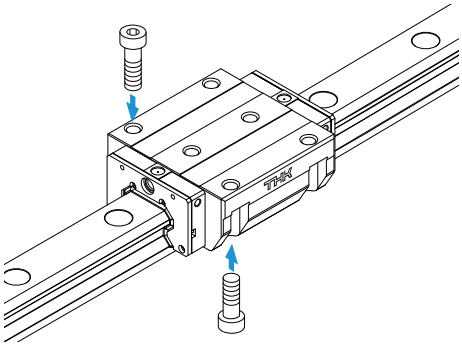
Global Standard Size

HRX 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.

Model HRX-C

Dimensional Table⇒A1-470

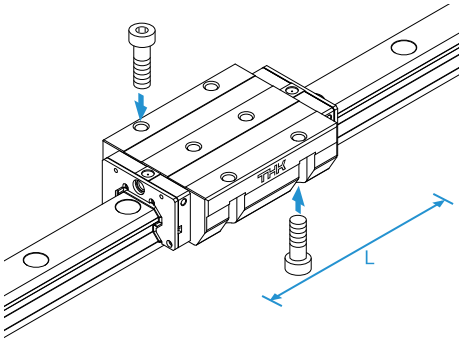
The flange of the LM block has tapped holes.
Can be mounted from the top or the bottom.
Used in places where the table cannot have through holes for mounting bolts.



Model HRX-LC

Dimensional Table⇒A1-470

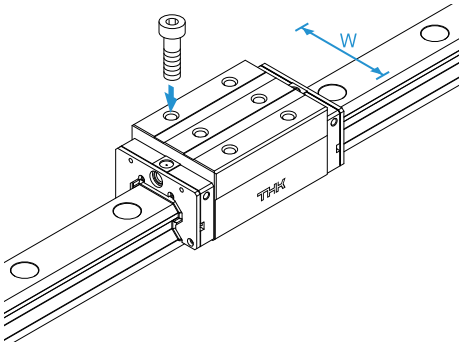
The LM block has the same cross-sectional shape as the Model HRX-C, but it has a longer overall LM block length (L) and a greater rated load.



Model HRX-R

Dimensional Table⇒A1-472

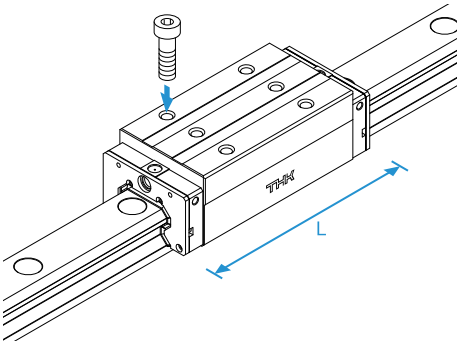
The LM block has a smaller width (W) and tapped holes.
Used in places where the space for table width is limited.



Model HRX-LR

Dimensional Table⇒A1-472

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



Static safety factor

To calculate a load applied to the LM Guide, the average load required for calculating the service life and the maximum load needed for calculating the static safety factor must be obtained first. In particular, if the system starts and stops frequently, if a cutting load acts on the system, or if a large moment caused by an overhanging load is applied, it may experience an unexpectedly large load. When selecting a model number, make sure that the desired model is capable of supporting the required maximum load (whether stationary or in motion). Table 1 shows reference values for the static safety factor.

Table 1: Reference Values for the (f_s) Static Safety Factor

Machine using the LM Guide	Load conditions	Lower limit of f_s
General industrial machinery	Without vibration or impact	3.0 to 6.0
	With vibration or impact	4.0 to 7.0
Machine tool	Without vibration or impact	3.0 to 6.0
	With vibration or impact	6.0 to 10.0

∗ The reference values for the static safety factor may vary depending on operating conditions such as the environment, lubrication status, mounting surface accuracy, and/or rigidity.

$$f_s = \frac{C_0}{P_{max}}$$

f_s : Static safety factor
C_0 : Basic static load rating (N)
P_{max} : Maximum applied load (N)

Reference Error Tolerance for the Mounting Surface

The Roller Type LM Guide Model HRX features high rigidity because it uses rollers as its rolling element. The new guide mechanism prevents roller skewing. However, high machining accuracy is required in the mounting surface. If the error of the mounting surface is large, it will affect the rolling resistance and the service life. The following shows the reference error tolerance according to the radial clearance.

Table 2: Reference Horizontal Error Tolerance (P) between Two Rails

Unit: μm

Radial Clearance / Model No.	C0
HRX25	7
HRX30	8
HRX35	9
HRX45	11
HRX55	13
HRX65	17

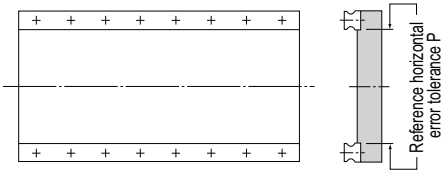


Fig. 1

Table 3: Reference Vertical Error Tolerance (X) between Two Rails

Unit: mm

Radial Clearance	C0
Reference vertical error tolerance X	0.00014a

$X = X_1 + X_2$ X_1 : Level difference on the rail mounting surface

X_2 : Level difference on the block mounting surface

Example of calculation

Rail span when a = 500 mm

Reference vertical error tolerance $X = 0.00014 \times 500 = 0.07$

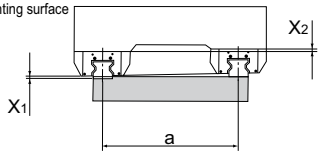


Fig. 2

Table 4: Reference Vertical Error Tolerance (Y) in the Axial Direction

Unit: mm

Reference vertical error tolerance Y	0.00004b

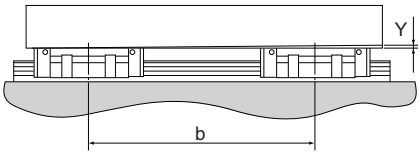
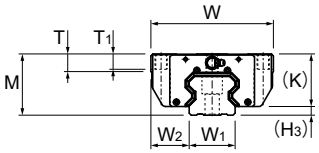


Fig. 3

Models HRX-C and HRX-LC



Model No.	Outer dimensions			LM block dimensions														
	Height	Width	Length															Grease nipple
	M	W	L	B	C	C_2	S	H	L_1	T	T_1	K	N	E	e_0	f_0	D_0	
HRX 25C HRX 25LC	36	70	99.6 116.4	57	45	40	M8	6.8	75.4 92.2	9.5	10	31	5.5	12	6	6.2	5.2	B-M6F
HRX 30C HRX 30LC	42	90	110.6 135.1	72	52	44	M10	8.5	84 108.5	12	14	37	8.2	12	6.2	9.5	5.2	B-M6F
HRX 35C HRX 35LC	48	100	123.2 151.2	82	62	52	M10	8.5	92.2 120.2	12	10	41.5	8	12	7.2	9.5	5.2	B-M6F
HRX 45C HRX 45LC	60	120	150.7 185.7	100	80	60	M12	10.5	115.7 150.7	17.3	15	51.5	8.75	16	7.5	7.8	5.2	B-PT1/8
HRX 55C HRX 55LC	70	140	180.2 229.7	116	95	70	M14	12.5	143.2 192.7	18.2	18	59	11.2	16	6.8	9.3	5.2	B-PT1/8
HRX 65C HRX 65LC	90	170	239.1 304.1	142	110	82	M16	14.5	195.7 260.7	22.3	20	78	18	16	8.7	16.6	5.2	B-PT1/8

Model number coding

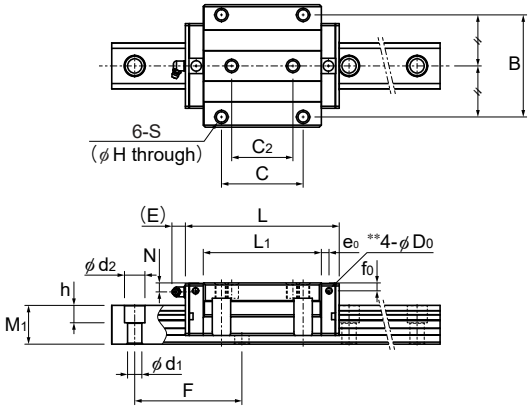
HRX45 LC 2 QZ SS C0 +1200L P T -II

- HRX45: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- SS: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) High accuracy grade (H)/Precision grade (P)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C_{100}	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	W_1 0 -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
	5	23	23.5	21.5	60	7×11×9	3000	26.3 30.8	73.1 89.3	0.92 1.37	4.84 6.86	0.92 1.37	4.84 6.86	0.57 0.69	0.84 1	3.2
	5	28	31	23.5	80	9×14×12	3000	39.4 48	105 135	1.48 2.44	7.72 12.1	1.48 2.44	7.72 12.1	1.03 1.33	1.4 1.9	4.4
	6.5	34	33	29	80	9×14×12	3000	56 68.9	150 196	2.33 3.92	11.6 18.6	2.33 3.92	11.6 18.6	1.81 2.36	1.9 2.5	6.3
	8.5	45	37.5	38	105	14×20×17	3090	94.3 116	250 327	4.85 8.17	23.9 38.4	4.85 8.17	23.9 38.4	3.84 5.01	3.5 4.6	10.9
	11	53	43.5	44	120	16×23×20	3060	135 170	370 498	8.86 15.9	42.3 72.7	8.86 15.9	42.3 72.7	6.86 9.24	5.8 7.9	15.6
	12	63	53.5	53	150	18×26×22	3000	206 257	567 756	18.4 32	86.5 147	18.4 32	86.5 147	12.3 16.4	13.3 17.9	22.6

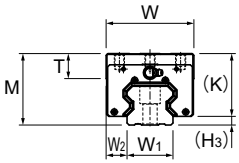
Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See **A1-474**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
2 blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)
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 **A1-517** or **A1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See **A1-476**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Models HRX-R and HRX-LR



Model No.	Outer dimensions			LM block dimensions											
	Height M	Width W	Length L	B	C	S×ℓ	L_1	T	K	N	E	e_0	f_0	D_0	Grease nipple
HRX 25R HRX 25LR	40	48	99.6 116.4	35	35 50	M6×7	75.4 92.2	9	35	9.5	12	6	10.2	5.2	B-M6F
HRX 30R HRX 30LR	45	60	110.6 135.1	40	40 60	M8×8	84 108.5	12	40	11.2	12	6.2	12.5	5.2	B-M6F
HRX 35R HRX 35LR	55	70	123.2 151.2	50	50 72	M8×10	92.2 120.2	18.5	48.5	15	12	7.2	16.5	5.2	B-M6F
HRX 45R HRX 45LR	70	86	150.7 185.7	60	60 80	M10×12.5	115.7 150.7	24.5	61.5	18.75	16	7.5	17.8	5.2	B-PT1/8
HRX 55R HRX 55LR	80	100	180.2 229.7	75	75 95	M12×15	143.2 192.7	27.5	69	21.2	16	6.8	19.3	5.2	B-PT1/8
HRX 65R HRX 65LR	100	126	239.1 304.1	76	70 120	M16×20	195.7 260.7	29.5	88	28	16	8.7	26.6	5.2	B-PT1/8

Model number coding

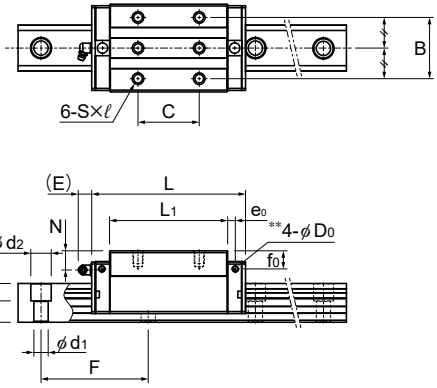
HRX45 LR 2 QZ SS C0 +1200L P T -II

- HRX45: Model number
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- SS: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*3) High accuracy grade (H)/Precision grade (P)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-75**. (*3) See **A1-79**. (*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.

Download data by searching for the corresponding model number on the Technical Support site. https://tech.thk.com



Unit: mm

		LM rail dimensions						Basic load rating*		Static permissible moment kN·m*					Mass	
		Width		Height	Pitch		Length*	C_{100}	C_0	M_A		M_B		M_C	LM block	LM rail
	H_3	W_1 0 -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
	5	23	12.5	21.5	60	7×11×9	3000	26.3 30.8	73.1 89.3	0.92 1.37	4.84 6.86	0.92 1.37	4.84 6.86	0.57 0.69	0.72 0.86	3.2
	5	28	16	23.5	80	9×14×12	3000	39.4 48	105 135	1.48 2.44	7.72 12.1	1.48 2.44	7.72 12.1	1.03 1.33	1.1 1.4	4.4
	6.5	34	18	29	80	9×14×12	3000	56 68.9	150 196	2.33 3.92	11.6 18.6	2.33 3.92	11.6 18.6	1.81 2.36	1.7 2.2	6.3
	8.5	45	20.5	38	105	14×20×17	3090	94.3 116	250 327	4.85 8.17	23.9 38.4	4.85 8.17	23.9 38.4	3.84 5.01	3.2 4.1	10.9
	11	53	23.5	44	120	16×23×20	3060	135 170	370 498	8.86 15.9	42.3 72.7	8.86 15.9	42.3 72.7	6.86 9.24	5.3 7.1	15.6
	12	63	31.5	53	150	18×26×22	3000	206 257	567 756	18.4 32	86.5 147	18.4 32	86.5 147	12.3 16.4	12 16	22.6

Note1) The maximum length under "Length*" indicates the standard maximum length of an LM rail. (See A**1-474**.)
Static permissible moment* 1 block: the static permissible moment with one LM block
2 blocks: static permissible moment when two LM blocks are in close contact with each other
For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.
(Mounting orientation: see A**1-12**, Lubricant: see A**24-2**)
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 A**1-517** or A**1-539**)
The removing/mounting jig is not provided as standard. Contact THK before use.
** 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. (See A**1-476**)
Note2) The basic dynamic load rating of the roller guide is a value based on a nominal life of 100 km.
The conversion to basic dynamic load rating for a nominal life of 50 km can be obtained from the following equation.

$$C_{50} = C \times 1.23$$

C_{50} : The basic dynamic load rating for a nominal load of 50 km
C : The basic dynamic load rating in the dimensional table

Options⇒A1-503

Standard Lengths and Maximum Lengths of LM Rails

Table 5 shows the standard and maximum lengths of the HRX 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.

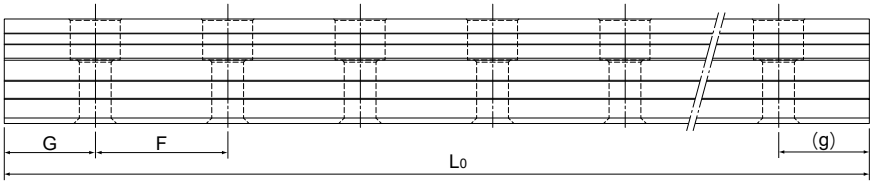


Table 5: Standard Lengths and Maximum Lengths of LM Rails for Model HRX

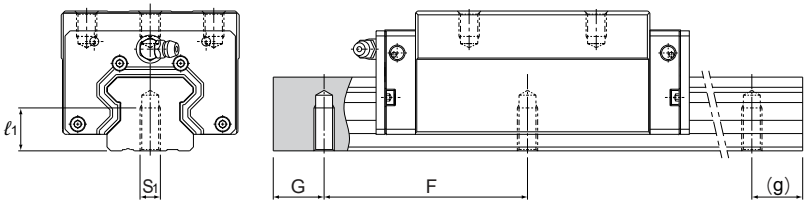
Unit: mm

Model No.	HRX 25	HRX 30	HRX 35	HRX 45	HRX 55	HRX 65
LM rail standard length (L_0)	220 280 340 400 460 520 580 640 700 760 820 940 1000 1060 1120 1180 1240 1300 1360 1420 1480 1540 1600 1720 1840 1960 2080 2200 2320 2440	280 360 440 520 600 680 760 840 920 1000 1080 1160 1240 1320 1400 1480 1560 1640 1720 1800 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 1800 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 2100 2220 2340 2460 2580 2700 2820 2940 3060	1270 1570 2020 2620
Standard pitch F	60	80	80	105	120	150
G,g	20	20	20	22.5	30	35
Max length	3000	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.

Tapped-Hole Type LM Rail

HRX 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.



For standard pitches of the taps and the G and g dimensions, see A1-474 on Table 5.

Table 6: Dimensions of the LM Rail Tap

Unit: mm

Model No.	S_1	Effective tap depth ℓ_1
HRX25	M6	12
HRX30	M8	15
HRX35	M8	17
HRX45	M12	24
HRX55	M14	24
HRX65	M20	30

Model number coding

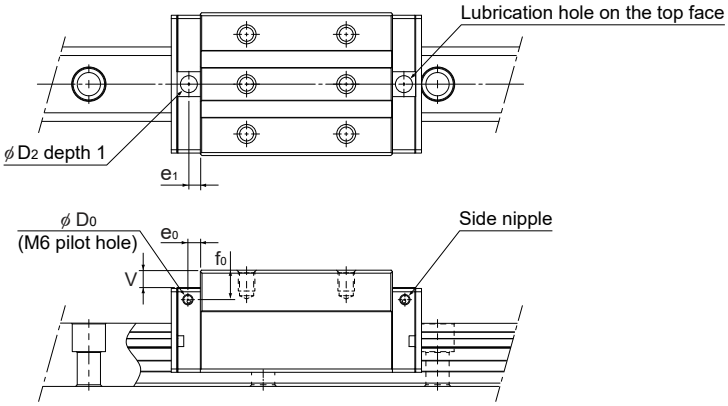
HRX45LR2SS+1200LP K

Symbol for tapped-hole LM rail type

Lubrication hole

Lubrication Hole for Model HRX

The Model HRX allows lubrication from both the side and top faces of the LM block. In order to prevent foreign material from entering the LM block, lubrication holes are not through holes in blocks with regular specifications. When using the lubrication hole, contact THK.



Unit: mm

Model No.		Pilot hole for side nipple			Applicable nipple	Lubrication hole on the top face			
		e_0	f_0	D_0		D_2	(O-ring)	V	e_1
HRX	25C 25LC	6	6.2	5.2	M6F	6.2	(P3)	0.3	4.5
	25R 25LR	6	10.2	5.2	M6F	6.2	(P3)	4.3	4.5
	30C 30LC	6.2	9.5	5.2	M6F	6.2	(P3)	0.4	4.5
	30R 30LR	6.2	12.5	5.2	M6F	6.2	(P3)	3.4	4.5
	35C 35LC	7.2	9.5	5.2	M6F	10.2	(P7)	0.4	5.8
	35R 35LR	7.2	16.5	5.2	M6F	10.2	(P7)	7.4	5.8
	45C 45LC	7.5	7.8	5.2	M6F	10.2	(P7)	0.4	6.9
	45R 45LR	7.5	17.8	5.2	M6F	10.2	(P7)	10.4	6.9
	55C 55LC	6.8	9.3	5.2	M6F	10.2	(P7)	0.4	6.8
	55R 55LR	6.8	19.3	5.2	M6F	10.2	(P7)	10.4	6.8
	65C 65LC	8.7	16.6	5.2	M6F	10.2	(P7)	0.4	8.7
	65R 65LR	8.7	26.6	5.2	M6F	10.2	(P7)	10.4	8.7

Note) Upper surface lubrication is oil lubrication only. Contact THK if you are considering using the lubrication hole on the top face for grease lubrication.

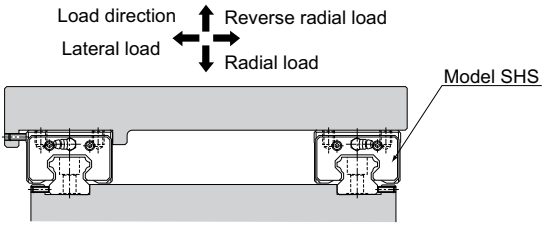
Designing the Guide System

THK offers various types of LM Guide in order to accommodate diverse operating conditions. Supporting ordinary horizontal, vertical, inverted, and slanted installation, as well as wall mounting and single-axis applications capable of receiving a moment, the wide array of LM Guide types makes it easy to obtain a linear guide system with a long service life and high rigidity while minimizing the required space for installation.
However, it is necessary to consider the position of the grease nipple or piping joint on the LM block in the context of the overall mounting orientation.
If the mounting orientation is other than horizontal, the lubricant may not reach the raceway completely. Be sure to let THK know the mounting orientation and the exact position in each LM block where a grease nipple or piping joint should be attached.
Even in an LM Guide with seals, the internal lubricant gradually seeps out during operation. Therefore, the system needs to be lubricated at an interval appropriate to the operating conditions.
For the mounting orientation and the lubrication, see A1-12 and A24-2, respectively.

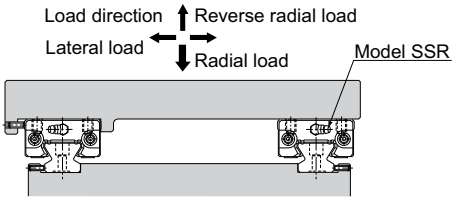
Examples of Guide System Arrangements

The following are representative guide systems and arrangements for installing an LM Guide. (For indication of the reference surface, see A1-501.)

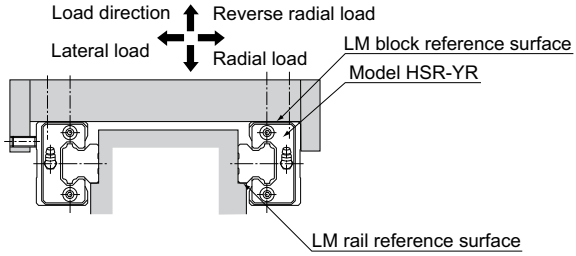
Double-rail configuration when high rigidity is required in all directions



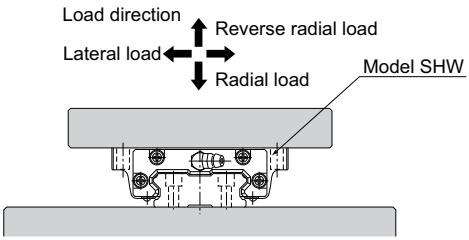
Double-rail configuration when high rigidity is required in the radial direction



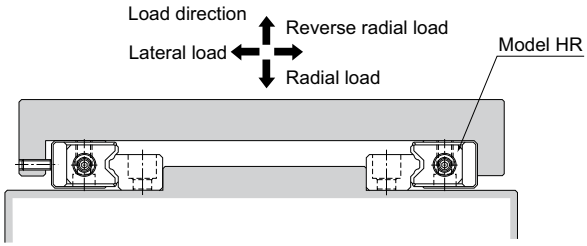
When high rigidity is required in all directions and the installation space is limited in height



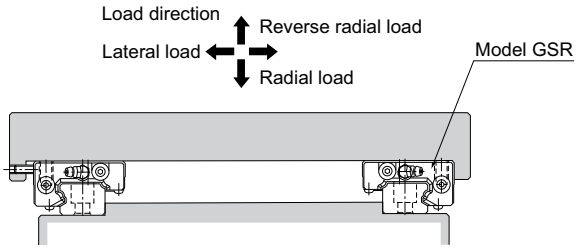
Single-rail configuration



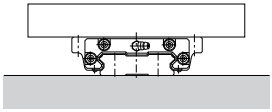
When the minimum possible height of the equipment is allowed (adjustable preload type)



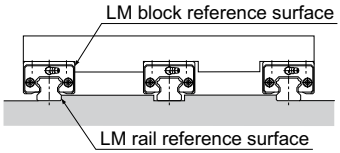
When a medium load is applied and the mounting surface is rough (preload, self-adjusting type)



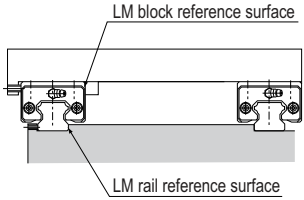
Single-rail configuration

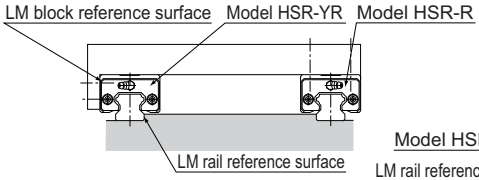


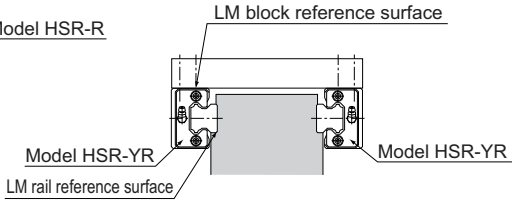
Triple-rail configuration

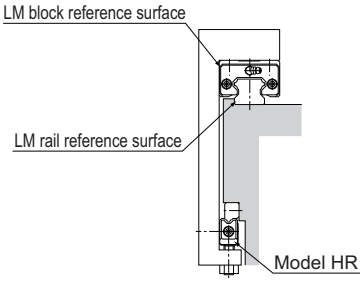


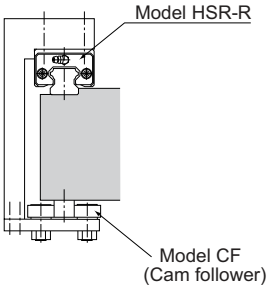
Double-rail configuration

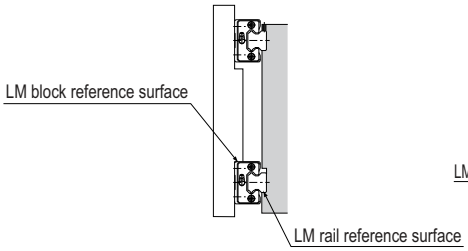


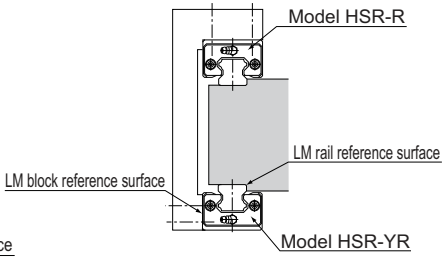




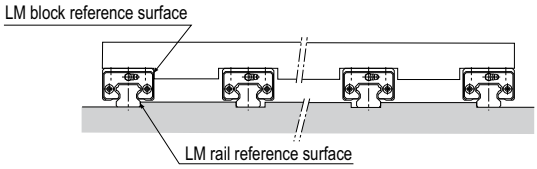


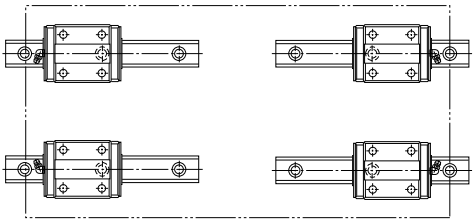


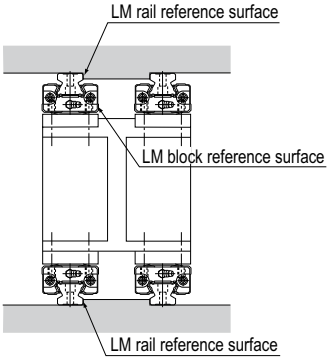


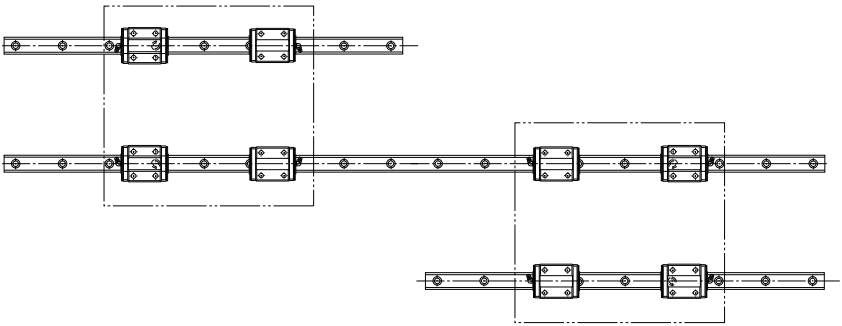


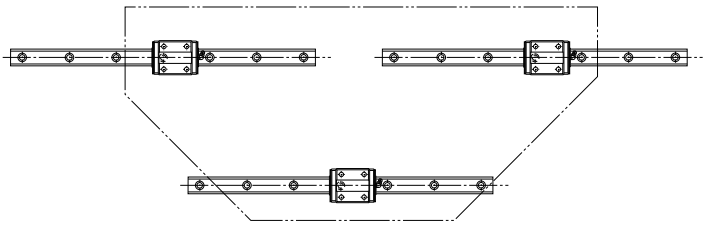
Multi-rail configuration







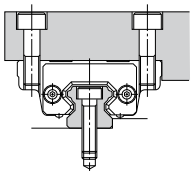
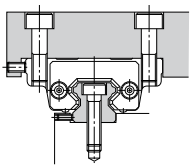
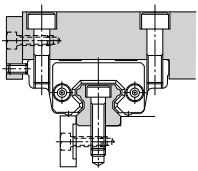
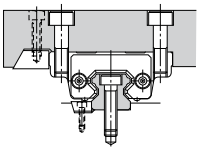




Methods for Securing an LM Guide Based on Operating Conditions

LM Guide models are categorized into two groups by their mounting space and structure: types that are mounted with bolts from the top, and types that are mounted from the bottom. LM rails are also divided into types secured with bolts and those secured with clamps (model JR). This wide array of types allows you to select a model that best suits your application.
There are several ways to mount an LM Guide as shown in Table 1. When the machine is subject to vibrations that may cause the LM rails or LM blocks to loosen, we recommend the securing method indicated by Fig. 1 on A1-484. (If two or more rails are used in parallel, only the LM block on the master rail should be secured from the side.) If this method is not applicable for a structural reason, hammer in knock pins to secure the LM blocks as shown in Table 2 on A1-484. When using knock pins, machine the top and bottom surfaces of the LM rail by 2 mm to 3 mm using a carbide end mill before drilling the holes since the surfaces are hardened.

Table 1: Major Securing Methods on the Master-Rail Side

(a) Secured only with side reference surfaces	(b) Secured with set screws
	
(c) Secured with a presser plate	**(d) Secured with tapered gibs**
	

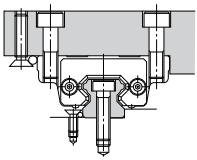
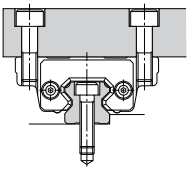
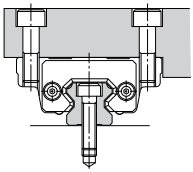
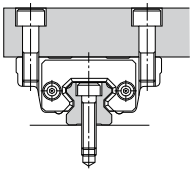
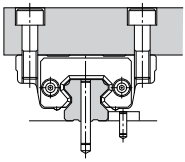
(e) Secured with pins


Table 2: Major Securing Methods on the Subsidiary-Rail Side

(a) Secured only with the side reference surface of the rail	(b) Secured only with the side reference surface of the block
	
(c) Secured without a side reference surface	**(d) Secured with dowel pins**
	

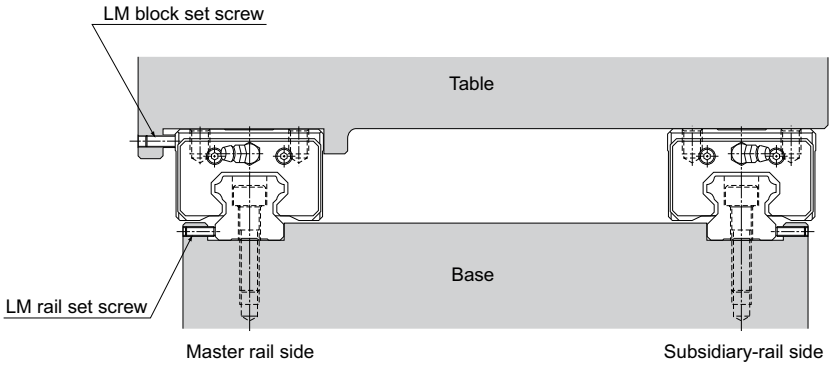
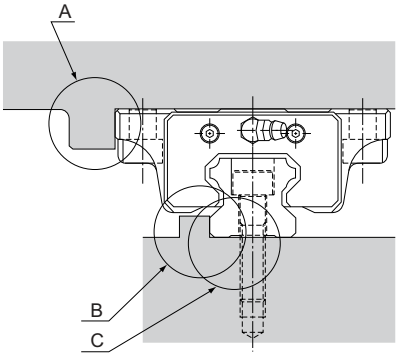


Fig. 1: When the Machine Receives Vibrations or Impacts

Designing a Mounting Surface

Designing a Mounting Surface

If particularly high accuracy is required for the machine to which an LM Guide is to be mounted, it is necessary to mount the LM rail with high accuracy. To achieve the desired accuracy, be sure to consider the following points when designing the mounting surface.



Corner Shape

If an LM rail or LM block is mounted to a surface that has corners machined with a larger curved radius than the chamfer dimension of the LM rail or LM block, then the surface of the rail or the block may not make proper contact with the mounting surface. Therefore, when designing a mounting surface, it is important to carefully read the description of the “corner shape” for the subject model. (Fig. 2)

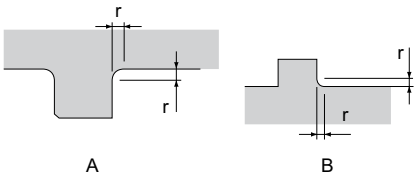


Fig. 2

Perpendicularity with the Reference Surface

If the perpendicularity between the surface to which the LM rail or LM block will be mounted and the reference surface is not accurate, then the surface of the rail or the block may not make proper contact with the reference surface. Therefore, it is important to take into account the error in the perpendicularity between the mounting surface and the reference surface. (Fig. 3)

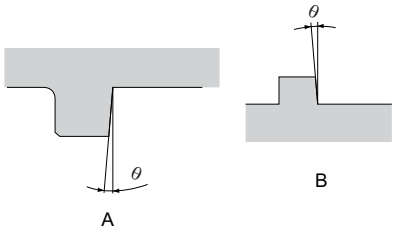


Fig. 3

Dimensions of the Reference Surface

When designing the reference surface, be sure to take its height and thickness into account. If the reference surface is too high, it may interfere with the LM block. If it is too low, the LM rail or the LM block may not closely contact the mounting surface depending on the chamfer of the rail or the block. Additionally, if the reference surface is too thin, the desired accuracy may not be obtained due to poor rigidity when a lateral load is applied or when performing positioning using a lateral mounting bolt. (Fig. 4)

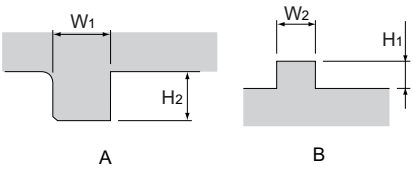


Fig. 4

Dimensional Tolerance between the Reference Surface and the Mounting Holes

If the dimensional tolerance between the reference surface for the LM rail or the LM block and the mounting holes is too large, the rail or the block may not closely contact the surface of the base when mounted.
Normally, the tolerance should be within ±0.1 mm depending on the model. (Fig. 5)

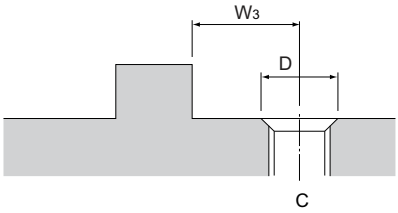


Fig. 5

Chamfer of the Tapped Mounting Hole

To mount the LM rail, the mounting surface needs to be tapped and the tapped hole has to be chamfered. If the chamfer of the tapped hole is too large or too small, it may affect the accuracy. (Fig. 6)

Guidelines for the chamfer dimension:
Chamfer diameter D = nominal diameter of the bolt + pitch

Example: Chamfer diameter D with M6 (pitch):
D = 6 + 1 = 7

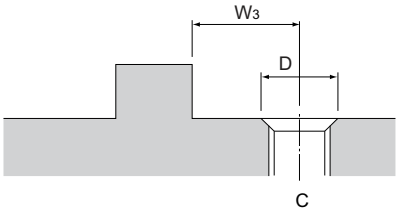
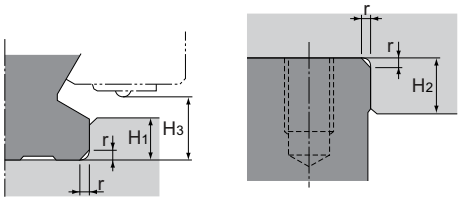


Fig. 6

Shoulder Height of the Mounting Base and the Corner Radius

Normally, the mounting base for the LM rail and the LM block has a reference surface on the side face of the shoulder of the base to allow for easy installation and highly accurate positioning.
The height of the reference surface shoulder varies with model numbers. See **A1-487** to **A1-493** for details.
The corner of the mounting shoulder must be machined to have a recess, or machined to be smaller than the “Corner radius r (max)” to prevent interference with the chamfer of the LM rail or the LM block.
The corner radius varies with model numbers. See **A1-487** to **A1-493** for details.



Shoulder for the LM Rail　　Shoulder for the LM Block (LM Casing)
Fig. 7

Models SR, SR-M1

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3
15	0.5	3.8	4	5.8
20	0.5	5	5	6
25	1	5.5	5	7
30	1	8	6	9.5
35	1	9	6	11.5
45	1	10	8	12.5
55	1.5	11	8	13.5
70	1.5	12	10	15
85	1.2	8	12	18.5
100	1.2	10	15	19
120	1.2	12	20	15
150	1.2	12	20	22

Model JR

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM block H_2
25	1	5
35	1	6
45	1	8
55	1.5	10

Model CSR

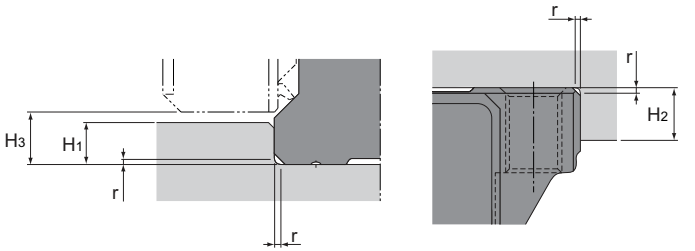
Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	H_3
15	0.5	3	4.7
20	0.5	3.5	4
25	1	5	5.5
30	1	5	7
35	1	6	7.5
45	1	8	10

Model NSR-TBC

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
20	1	5	5	5.5
25	1	6	6	6.5
30	1	7	6	9
40	1	7	8	10.5
50	1	7	8	8
70	1	7	10	9.5



Shoulder for the LM Rail　　Shoulder for the LM Block

Fig. 8

Model SHS

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
15	0.5	2.5	4	3
20	0.5	3.5	5	4.6
25	1	5	5	5.8
30	1	5	5	7
35	1	6	6	7.5
45	1	7.5	8	8.9
55	1.5	10	10	12.7
65	1.5	15	10	19

Models SVR/SVS and NR-X/NRS-X

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
25	0.5	4	5	5.5
30	1	5	5	7
35	1	6	6	9
45	1	8	8	11.6
55	1.5	10	10	14
65	1.5	10	10	15

Note: If the optional side scraper or protector is attached, dimensions H1 and H3 differ from that without the options. For the dimensions after they are attached, see **A1-512** to **A1-513**.

Model SCR

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	H_3
15	0.5	2.5	3
20	0.5	3.5	4.6
25	1	5	5.8
30	1	5	7
35	1	6	7.5
45	1	7.5	8.9
65	1.5	15	19

Models NR/NRS

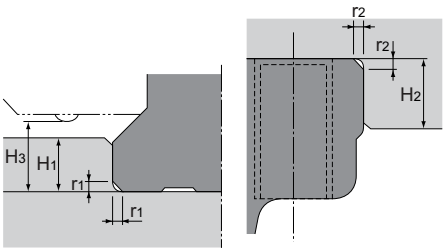
Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
75	1.5	12	12	15
85	1.5	14	14	17
100	2	16	16	20

Model MX

Unit: mm

Model No.	Corner radius for the LM rail r (max)	Shoulder height for the LM rail H_1	H_3
5	0.1	1.2	1.5
7W	0.1	1.7	2



Shoulder for the LM Rail　　Shoulder for the LM Block

Fig. 9

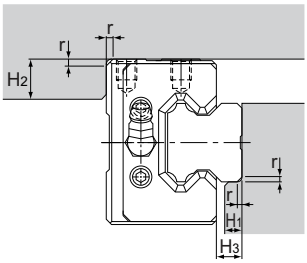


Fig. 10

Models HSR, HSR-M1, and HSR-M2

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
8	0.3	0.5	1.6	6	2.1
10	0.3	0.5	1.7	5	2.2
12	0.8	0.5	2.6	4	3.1
15	0.5	0.5	3	4	4.7
20	0.5	0.5	3.5	5	4
25	1	1	5	5	5.5
30	1	1	5	5	7
35	1	1	6	6	7.5
45	1	1	8	8	10
55	1.5	1.5	10	10	13
65	1.5	1.5	10	10	14
85	1.5	1.5	12	14	16
100	2	2	16	16	20
120	2.5	2.5	17	18	20
150	2.5	2.5	20	20	22

Model HCR

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3
12	0.8	0.5	2.6	6	3.1
15	0.5	0.5	3	4	4.8
25	1	1	5	5	7
35	1	1	6	6	8.5
45	1	1	8	8	11.5
65	1.5	1.5	10	10	15

Model HMG

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3
15	0.5	0.5	3	4	3.5
25	1	1	5	5	5.5
35	1	1	6	6	7.5
45	1	1	8	8	11
65	1.5	1.5	10	10	16

Model EPF

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3
7M	0.2	0.4	1	3	1.5
9M	0.2	0.6	1	5	1.5
12M	0.5	0.6	1.5	6	2
15M	0.5	0.8	2.5	6.8	3

Model HSR-YR

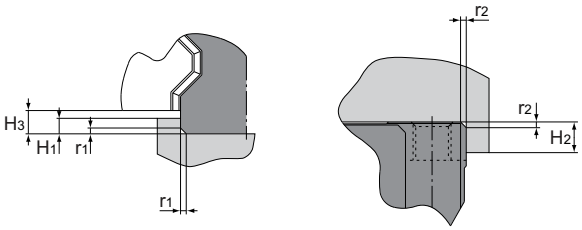
Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
15	0.5	3	4	3.5
20	0.5	3.5	5	4
25	1	5	5	5.5
30	1	5	5	7
35	1	6	6	7.5
45	1	8	8	10
55	1.5	10	10	13
65	1.5	10	10	14

Model HSR-M1VV

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3
15	0.5	0.5	3	4	4.3



Shoulder for the LM Rail　　Shoulder for the LM Block

Fig. 11

Model SRG

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
15X	0.5	0.5	2.5	4	4
20X	0.5	0.5	3.5	5	4.6
25X	1	1	3.5	5	4.5
30X	1	1	4	5	5
35	1	1	5	6	6
45	1.5	1.5	6	8	8
55	1.5	1.5	8	10	10
65	1.5	2	9	10	11.5
85	1.5	1.5	12	14	16
100	2	2	12	16	16

Note) If an optional side scraper or protector is attached, dimensions H_1 and H_3 differ from those without the options. For the dimensions after they are attached, see **A1-512** to **A1-513**.

Model SRN

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
35	1	1	5	6	6
45	1.5	1.5	6	8	7
55	1.5	1.5	8	10	10
65	1.5	2	8	10	10

Model SRW

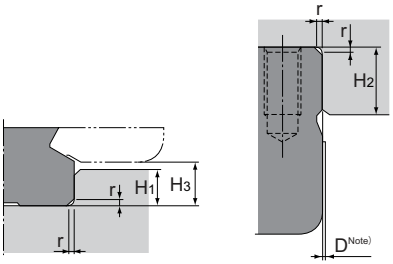
Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
70	1.5	1.5	6	8	8
85	1.5	1.5	8	10	10
100	1.5	2	9	10	11.5
130	1.5	1.5	12	14	16
150	2	2	12	16	16

Model HRX

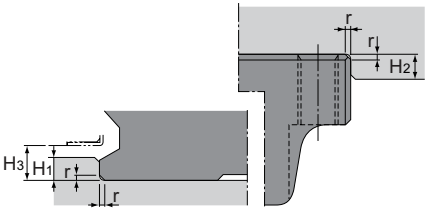
Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
25	1	1	4	5	5
30	1	1	4	5	5
35	1	1	5.5	6	6.5
45	1.5	1.5	6.5	8	8.5
55	1.5	1.5	9	10	11
65	1.5	2	9.5	10	12



Shoulder for the LM Rail　Shoulder for the LM Block

Fig. 12



Shoulder for the LM Rail　Shoulder for the LM Block

Fig. 13

Model SSR

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Maximum shoulder height for the LM block H_2	H_3	D
15 X	0.5	3.8	5.5	4.5	0.3
20 X	0.5	5	7.5	6	0.3
25 X	1	5.5	8	6.8	0.4
30 X	1	8	11.5	9.5	0.4
35 X	1	9	16	11.5	0.4

Note) When fitting the LM block against the reference surface, the resin layer may stick out from the overall width of the LM block by the dimension D. To avoid interference, machine the reference surface to have a recess or limit the reference surface shoulder's height below the dimension H_2.

Model SHW

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
12	0.5	1.5	4	2
14	0.5	1.5	5	2
17	0.4	2	4	2.5
21	0.4	2.5	5	3.3
27	0.4	2.5	5	3.5
35	0.8	3.5	5	4
50	0.8	3	6	4

Model HRW

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
12	0.5	1.5	4	2
14	0.5	1.5	5	2
17	0.4	2	4	2.5
21	0.4	2.5	5	3
27	0.4	2.5	5	3
35	0.8	3.5	5	4
50	0.8	3	6	3.4
60	1	5	8	6.5

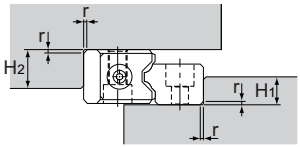


Fig. 14

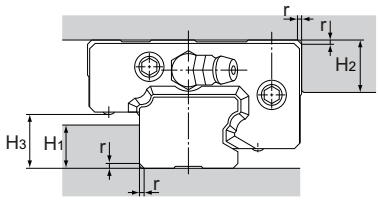


Fig. 15

Model HR

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2
918	0.3	5	6
1123	0.5	6	7
1530	0.5	8	10
2042	0.5	11	15
2555	1	13	18
3065	1	16	20
3575	1	18	26
4085	1.5	21	30
50105	1.5	26	32
60125	1.5	31	40

Model GSR

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
15	0.6	7	7	8
20	0.8	9	8	10.4
25	0.8	11	11	13.2
30	1.2	11	13	15
35	1.2	13	14	17.5

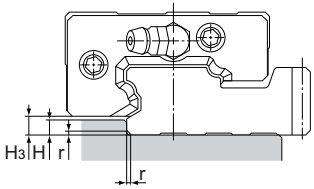
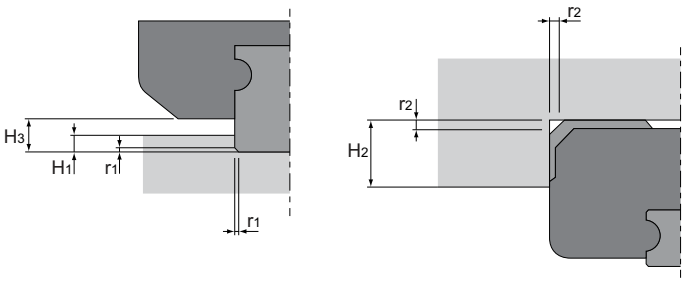


Fig. 16

Model GSR-R

Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H	H_3
25	0.8	4	4.5
30	1.2	4	4.5
35	1.2	4.5	5.5



Shoulder for the LM Rail　　Shoulder for the LM Block

Fig. 17

Model SRS

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
5 M/N	0.1	0.3	1.2	2	1.5
5 WM/ WN	0.1	0.2	1.2	2.5	1.5
7 S/M/N	0.1	0.2	0.9	3.3	1.3
7 WS/ WM/WN	0.1	0.1	1.4	3.8	1.8
9 XS/ XM/XN	0.1	0.3	1.1	4.5	1.5
9 WS/ WM/WN	0.1	0.5	2.5	4.9	2.9
12 S/M/N	0.3	0.2	1.5	5.7	2.1
12 WS/ WM/WN	0.3	0.3	2.5	5.7	3
15 S/M/N	0.3	0.4	2.2	6.5	2.7
15 WS/ WM/WN	0.3	0.3	2.2	6.5	2.7
20 M	0.3	0.5	3	8.7	3.4
25 M	0.5	0.5	4.5	10.5	5

Models RSX and RSX-M1

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
5	0.1	0.3	1.2	2	1.5
5W	0.1	0.2	1.2	2.9	1.5
7	0.1	0.2	0.9	2.4	1.5
7W	0.1	0.1	1.4	2.9	2
9	0.1	0.3	1.1	3.3	2.2
9W	0.1	0.5	2.5	3.3	3.7
12	0.3	0.3	1.5	5.3	3
12W	0.3	0.3	2.5	5.8	4
15	0.3	0.4	2.2	5.8	4
15W	0.3	0.3	2.2	5.7	4

Model RSR

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
2 N	0.1	0.3	0.6	2.3	0.7
2 WN	0.1	0.3	0.9	2.9	1
3 M/N/ WM/WN	0.1	0.3	0.8	1.2	1
14 WVM	0.3	0.3	3.2	5	3.5

Model RSR-M1

Unit: mm

Model No.	Corner radius for the LM rail r_1 (max)	Corner radius for the LM block r_2 (max)	Shoulder height for the LM rail H_1	Shoulder height for the LM block H_2	H_3
9 M1K/ M1N	0.3	0.5	1.9	3	2.2
9 M1WV/ M1WN	0.1	0.1	3.9	3	4.2
12 M1V/ M1N	0.3	0.3	1.4	4	3
12 M1WV/ M1WN	0.3	0.3	3.7	4	4
15 M1V/ M1N	0.3	0.3	2.3	5	4
15 M1WV/ M1WN	0.3	0.3	3.7	5	4
20 M1V/ M1N	0.5	0.5	5.5	5	7.5

Reference Error Tolerance for the Mounting Surface

The self-aligning capability of the LM Guide allows for smooth straight motion even when there is a slight distortion or error on the mounting surface.

Reference Horizontal Error Tolerance between Two Rails

Mounting surface error may affect the service life of the LM Guide. The following tables show the approximate reference horizontal error tolerance (P) between two rails in general use.

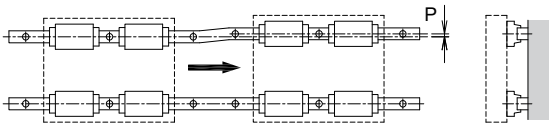


Fig. 18: Reference Horizontal Error Tolerance (P) between Two Rails

Models SHS, SCR, HSR, CSR, HSR-M1, HSR-M2, and HSR-M1VV

Unit: μm

Model No.	Normal clearance	Clearance C1	Clearance C0
8	13	10	—
10	16	12	—
12	20	15	—
15	25	18	—
20	25	20	18
25	30	22	20
30	40	30	27
35	50	35	30
45	60	40	35
55	70	50	45
65	80	60	55
85	90	75	70
100	100	90	85
120	120	110	100
150	140	130	115

Model JR

Unit: μm

Model No.	—
25	100
35	200
45	300
55	400

Models SSR, SR, and SR-M1

Unit: μm

Model No.	Normal clearance	Clearance C1	Clearance C0
15	35	25	—
20	40	30	25
25	50	35	30
30	60	40	35
35	70	50	45
45	80	60	55
55	100	70	65
70	110	80	65
85	120	90	80
100	130	100	90
120	140	110	100
150	150	120	110

Models SVR, NR-X, and NR

Unit: μm

Model No.	Normal clearance	Clearance C1	Clearance C0
25	21	15	14
30	28	21	19
35	35	25	21
45	42	28	25
55	49	35	32
65	56	42	39
75	60	47	44
85	63	53	49
100	70	63	60

Models SVS, NRS-X, and NRS

Unit: μm

Model No.	Normal clearance	Clearance C1	Clearance C0
25	15	11	10
30	20	15	14
35	25	18	15
45	30	20	18
55	35	25	23
65	40	30	28
75	43	34	31
85	45	38	35
100	50	45	43

Models SHW and HRW

Unit: μm

Model No.	Normal clearance	Clearance C1	Clearance C0
12	13	10	—
14	16	12	—
17	20	15	—
21	25	18	—
27	25	20	—
35	30	22	20
50	40	30	27
60	50	35	30

Models SRS, RSX, RSR, RSX-M1, and RSR-M1

Unit: μm

Model No.	Normal clearance	Clearance C1
2	2	—
3	2	—
5	2	—
7	3	—
9	4	3
12	9	5
14	10	6
15	10	6
20	13	8
25	15	10

Model HR

Unit: μm

Model No.	Normal clearance	Clearance C1	Clearance C0
918	10	7	—
1123	14	8	—
1530	18	12	—
2042	20	15	14
2555	35	24	20
3065	38	26	22
3575	42	28	24
4085	50	35	30
50105	55	42	38
60125	65	55	50

Models GSR and GSR-R

Unit: μm

Model No.	—
15	30
20	40
25	50
30	60
35	70

Model NSR-TBC

Unit: μm

Model No.	Normal clearance	Clearance C1
20	50	40
25	70	50
30	80	60
40	90	70
50	110	80
70	130	90

Flatness of the Mounting Surface

Mounting surface error may affect the service life of the LM Guide. The reference values for the mounting surface flatness of models SRS, RSR, and RSR-W (for general use) are indicated here. Note that the service life of models not shown here may also be affected if the mounting surface is not flat.

Model SRS

Unit: mm

Model No.	Flatness error
5	0.015/200
7	0.025/200
9	0.035/200
12	0.050/200
15	0.060/200
20	0.070/200
25	0.070/200

Models RSX, RSR, RSX-M1, and RSR-M1

Unit: mm

Model No.	Flatness error
2	0.012/200
3	0.012/200
5	0.015/200
7	0.025/200
9	0.035/200
12	0.050/200
14	0.060/200
15	0.060/200
20	0.110/200

Note 1) As many factors can affect the mounting precision, we recommend using values 70% or less than those shown.
Note 2) The figures shown apply to normal clearances. When using two or more rails with clearance C1, we recommend using 50% or less of the values shown.

Reference Vertical Error Tolerance between Two Rails

Mounting surface error may affect the service life of the LM Guide. The table shows the value (X) of the reference vertical error tolerance in the axial direction for rail span (a), which is proportional to the rail span (a).

$X = X_1 + X_2$

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

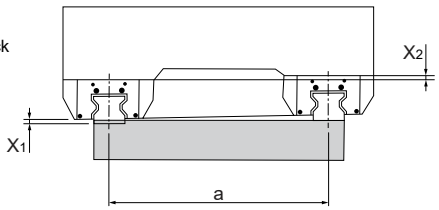


Fig. 19: Reference Vertical Error Tolerance (X) between Two Rails

Models SHS, HSR, SCR, CSR, HSR-M1, HSR-M2, and HSR-M1VV

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
8	0.0003a	0.0002a	—
10	0.0003a	0.0002a	—
12	0.0003a	0.0002a	—
15	0.0006a	0.0005a	—
20	0.0006a	0.0005a	0.0004a
25	0.0006a	0.0005a	0.0004a
30	0.0006a	0.0005a	0.0004a
35	0.0006a	0.0005a	0.0004a
45	0.0006a	0.0005a	0.0004a
55	0.0006a	0.0005a	0.0004a
65	0.0006a	0.0005a	0.0004a
85	0.001a	0.0009a	0.0008a
100	0.001a	0.0009a	0.0008a
120	0.001a	0.0009a	0.0008a
150	0.001a	0.0009a	0.0008a

Models SSR, SR, and SR-M1

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
15	0.0008a	0.0007a	—
20	0.0008a	0.0007a	0.0006a
25	0.0008a	0.0007a	0.0006a
30	0.0008a	0.0007a	0.0006a
35	0.0008a	0.0007a	0.0006a
45	0.0008a	0.0007a	0.0006a
55	0.0008a	0.0007a	0.0006a
70	0.0008a	0.0007a	0.0006a
85	0.0011a	0.001a	0.0009a
100	0.0011a	0.001a	0.0009a
120	0.0011a	0.001a	0.0009a
150	0.0011a	0.001a	0.0009a

Models SVR, NR-X, and NR

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
25	0.00038a	0.00028a	0.00018a
30	0.00038a	0.00028a	0.00018a
35	0.00038a	0.00028a	0.00018a
45	0.00038a	0.00028a	0.00018a
55	0.00038a	0.00028a	0.00018a
65	0.00038a	0.00028a	0.00018a
75	0.00045a	0.00035a	0.00025a
85	0.00045a	0.00035a	0.00025a
100	0.00045a	0.00035a	0.00025a

Model JR

Unit: mm

Model No.	—
25	0.002a
35	0.002a
45	0.002a
55	0.002a

Models SVS, NRS-X, and NRS

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
25	0.00045a	0.00035a	0.00025a
30	0.00045a	0.00035a	0.00025a
35	0.00045a	0.00035a	0.00025a
45	0.00045a	0.00035a	0.00025a
55	0.00045a	0.00035a	0.00025a
65	0.00045a	0.00035a	0.00025a
75	0.00063a	0.00053a	0.00043a
85	0.00063a	0.00053a	0.00043a
100	0.00063a	0.00053a	0.00043a

Models SRS, RSX, RSR, RSX-M1, and RSR-M1

Unit: mm

Model No.	Normal clearance	Clearance C1
3	0.000075a	—
5	0.0001a	—
7	0.000125a	—
9	0.000175a	0.00003a
12	0.00025a	0.00006a
14	0.0003a	0.0001a
15	0.0003a	0.0001a
20	0.00035a	0.00015a
25	0.0004a	0.0002a

Models SHW and HRW

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
12	0.00044a	0.00034a	—
14	0.00044a	0.00034a	—
17	0.00044a	0.00034a	—
21	0.00044a	0.00034a	—
27	0.00044a	0.00034a	—
35	0.00044a	0.00034a	0.00024a
50	0.00044a	0.00034a	0.00024a
60	0.00044a	0.00034a	0.00024a

Model HR

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
918	0.00009a	0.00003a	—
1123	0.0001a	0.00004a	—
1530	0.00018a	0.00012a	—
2042	0.00018a	0.00012a	0.0001a
2555	0.0003a	0.0002a	0.00017a
3065	0.00033a	0.00022a	0.00019a
3575	0.00035a	0.00024a	0.0002a
4085	0.00042a	0.0003a	0.00024a
50105	0.00049a	0.00035a	0.00028a
60125	0.00056a	0.0004a	0.00034a

Models GSR and GSR-R

Unit: mm

Model No.	—
15	0.00048a
20	0.0006a
25	0.00072a
30	0.00084a
35	0.00096a

Model NSR-TBC

Unit: mm

Model No.	Normal clearance	Clearance C1
20	0.0006a	0.00042a
25	0.00072a	0.00048a
30	0.00084a	0.00054a
40	0.00108a	0.00072a
50	0.0012a	0.00084a
70	0.00132a	0.00096a

Reference Vertical Error Tolerance in the Axial Direction

Mounting surface error may affect the service life of the LM Guide. The table below shows the value (Y) of the reference vertical error tolerance in the axial direction for block span (b), which is proportional to the block span (b).

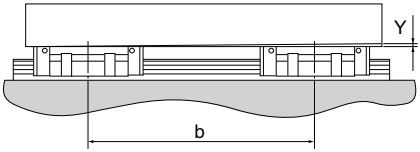


Fig. 20: Reference Vertical Error Tolerance (Y) in the Axial Direction

Models SHS, SCR, HSR, CSR, HSR-M1, HSR-M2, and HSR-M1VV

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
8	0.00006b	0.00004b	—
10	0.00006b	0.00004b	—
12	0.00006b	0.00004b	—
15	0.00012b	0.0001b	—
20	0.00012b	0.0001b	0.00008b
25	0.00012b	0.0001b	0.00008b
30	0.00012b	0.0001b	0.00008b
35	0.00012b	0.0001b	0.00008b
45	0.00012b	0.0001b	0.00008b
55	0.00012b	0.0001b	0.00008b
65	0.00012b	0.0001b	0.00008b
85	0.0002b	0.00018b	0.00016b
100	0.0002b	0.00018b	0.00016b
120	0.0002b	0.00018b	0.00016b
150	0.0002b	0.00018b	0.00016b

Models SSR, SR, and SR-M1

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
20	0.00016b	0.00014b	0.00012b
25	0.00016b	0.00014b	0.00012b
30	0.00016b	0.00014b	0.00012b
35	0.00016b	0.00014b	0.00012b
45	0.00016b	0.00014b	0.00012b
55	0.00016b	0.00014b	0.00012b
65	0.00016b	0.00014b	0.00012b
70	0.00016b	0.00014b	0.00012b
85	0.00022b	0.0002b	0.00018b
100	0.00022b	0.0002b	0.00018b
120	0.00022b	0.0002b	0.00018b
150	0.00022b	0.0002b	0.00018b

Models SVR, NR-X, and NR

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
25	0.00008b	0.00006b	0.00004b
30	0.00008b	0.00006b	0.00004b
35	0.00008b	0.00006b	0.00004b
45	0.00008b	0.00006b	0.00004b
55	0.00008b	0.00006b	0.00004b
65	0.00008b	0.00006b	0.00004b
75	0.00009b	0.00007b	0.00005b
85	0.00009b	0.00007b	0.00005b
100	0.00009b	0.00007b	0.00005b

Models SVS, NRS-X, and NRS

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
25	0.00009b	0.00007b	0.00005b
30	0.00009b	0.00007b	0.00005b
35	0.00009b	0.00007b	0.00005b
45	0.00009b	0.00007b	0.00005b
55	0.00009b	0.00007b	0.00005b
65	0.00009b	0.00007b	0.00005b
75	0.00012b	0.0001b	0.00008b
85	0.00012b	0.0001b	0.00008b
100	0.00012b	0.0001b	0.00008b

Models SHW and HRW

Unit: mm

Model No.	Normal clearance	Clearance C1	Clearance C0
12	0.00009b	0.00007b	0.00005b
14	0.00009b	0.00007b	0.00005b
17	0.00009b	0.00007b	0.00005b
21	0.00009b	0.00007b	0.00005b
27	0.00009b	0.00007b	0.00005b
35	0.00009b	0.00007b	0.00005b
50	0.00009b	0.00007b	0.00005b
60	0.00009b	0.00007b	0.00005b

Model JR

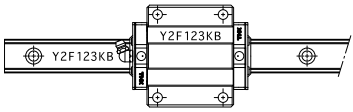
Unit: mm

Model No.	—
25	0.00012b
35	0.00012b
45	0.00012b
55	0.00012b
60	0.00012b

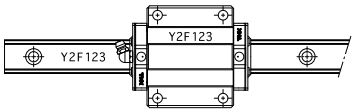
Master LM Guide Indicators and Combined Use

Master LM Guide Indicators

All LM rails mounted on the same plane are marked with the same serial number. The LM rail marked with “KB” after the serial number is the master LM rail. The LM block on the master LM rail has its reference surface finished to a designated precision, allowing it to serve as the positioning reference for tables (see Fig. 21). Normal grade LM Guides are not marked with “KB.” Therefore, any one of the LM rails having the same serial number can be used as the master LM rail.



Master LM Guide



Subsidiary LM Guide

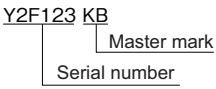
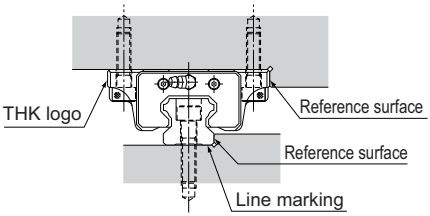


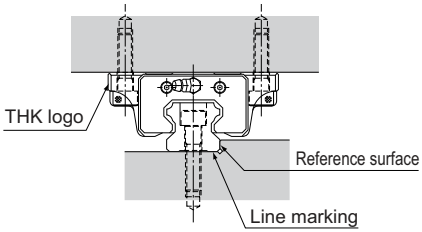
Fig. 21: Master and Subsidiary LM Guides Units (e.g. Model HSR-C)

Reference Surface Indicators

In the LM Guide, the reference surface of the LM block is opposite the surface marked with the THK logo, and that of the LM rail is on the surface marked with a line (see Fig. 22). Please specify if it is necessary to reverse the reference surface of the LM rail and block or if the grease nipple must be oriented in the opposite direction.



Master LM Guide



Subsidiary LM Guide

Fig. 22: Markings on the Reference Surface

Serial Number Marking and Combined Use of an LM Rail and LM Blocks

An LM rail and LM block(s) used in combination must have the same serial number. When removing an LM block from the LM rail and reinstalling the LM block, make sure that they have the same serial number and the numbers are oriented in the same direction (see Fig. 23).

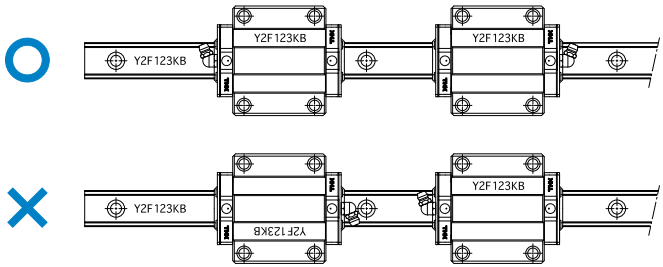


Fig. 23: Serial Number Marking and Combined Use of an LM Rail and LM Blocks (e.g. Model HSR-C)

Use of Jointed Rails

When a long LM rail is ordered, two or more rails will be jointed together to the desired length. When jointing rails, make sure that the joint match marks shown in Fig. 24 are correctly positioned.
When two LM Guide units with jointed rails are to be arranged parallel to each other, they will be manufactured so that they have axial symmetry (are mirror images of each other) as a set.

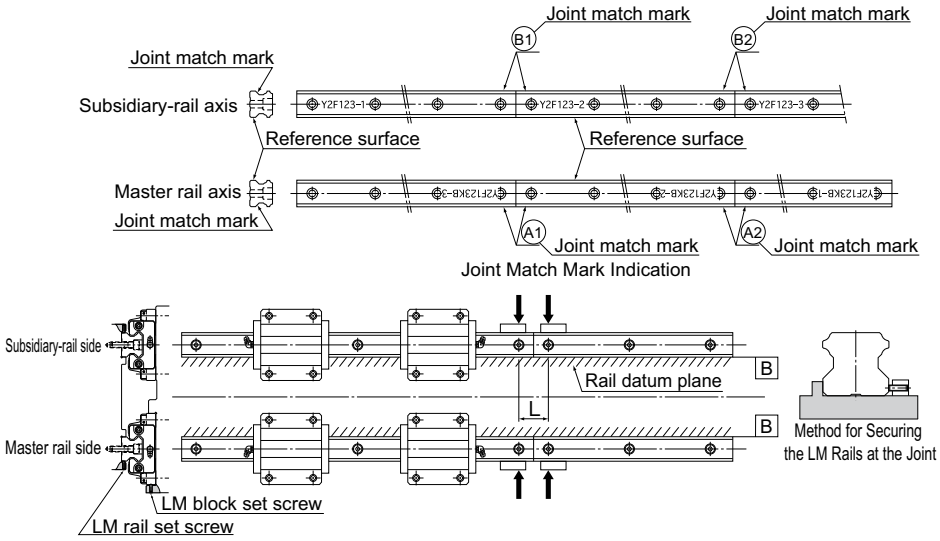


Fig. 24: Use of Jointed Rails

LM Guide

Options

Table of Supported Options by Models

Model No.		Type	Contamination protection												
			End seal	Side seal	Inner seal	End seal + side seal (+ inner seal)	Double seals + side seal (+ inner seal)	End seal + side seal (+ inner seal) + metal scraper	Double seals + side seal (+ inner seal) + metal scraper	LaCS	Side scraper	End seal + protector	Double seals + protector	Low-resistance end seal	
		Symbol	UU	—	—	SS	DD	ZZ	KK	HH	YY	JJ	TT	LL	
Caged Ball	SHS	15 to 65	○	○	○	○★	○	○	○	○	—	—	—	—	
	SSR	15 to 35	○★	○	—	○	○	○	○	○	—	—	—	—	
	SVR/SVS	25 to 65	○	○	○	○	○	○	○	○	○	○	○	—	
	SHW	12, 14	○	○	—	○	—	—	—	○	—	—	—	—	
		17	○	○	—	○	○	○	○	○	—	—	—	—	
		21 to 50	○	○	○	○	○	○	○	○	—	—	—	—	
	SRS	5	○★	—	—	—	—	—	—	—	—	—	—	—	
		7	○★	○	—	○	—	—	—	—	—	—	—	—	
		9 to 25	○★	○	—	○	—	—	—	○	—	—	—	—	
	SCR	15 to 65	○	○	○	○	○	○	○	○	—	—	—	—	
	EPF	7 to 15	—	—	—	—	—	—	—	—	—	—	—	—	
Full-Ball	HSR	8, 10, 12	○	—	—	—	—	—	—	—	—	—	—	—	
		15, 20, 25	○	○	—	○★	○	○★7	○★7	○	—	—	—	○	
		30, 35	○	○	—★7	○★	○	○	○	○	—	—	—	○	
		45, 55, 65	○	○	—★7	○★	○	○	○	○	—	—	—	○	
		85	○	○	—★7	○★	○	○	○	○	—	—	—	—	
		100, 120, 150	○	○	—	○★	—	—	—	—	—	—	—	—	
	SR	15 to 25	○	○	—	○	○	○★8	○★8	—	—	—	—	○	
		30 to 70	○	○	—	○	○	○	○	—	—	—	—	—	
		85 to 150	○	○	—	○	—	—	—	—	—	—	—	—	
	NR-X/NRS-X	25 to 65	○	○	○	○	○	○	○	○	○	○	○	—	
	NR/NRS	75, 85	○	○	○	○	○	○	○	○	—	—	—	—	
		100	○	○	○	○	○★9	○★9	○★9	○★9	—	—	—	—	
	HRW	12, 14	○★	○	—	○	—	—	—	—	—	—	—	—	
		17, 21	○★	—	—	—	○★10	○★10	○★10	—	—	—	—	—	
		27 to 60	○★	○	—	○	○	○	○	—	—	—	—	—	

*1 Model SHS : Dedicated GC cap --- not applicable to model 15, Stainless steel LM Guide --- applicable only to models 15 through 25
*2 Model SSR : Dedicated GC cap --- applicable to all models except model SSR15,
Stainless steel LM Guide --- applicable to XV, XW
*3 Models SVR and SVS : GG, PP --- applicable to models 25 and 30
*4 Model SHW : GG, PP --- applicable to models SHW21 and 27, Dedicated GC cap --- applicable to models SHW35, 50,
Dedicated CV cap --- applicable to models SHW35, 50
*5 Model SRS : Dedicated C cap --- applicable to models SRS9W, 12, 15, 20, 25,
Dedicated CV cap --- applicable to models SRS20, 25
*6 Model SCR : Dedicated GC cap --- applicable to all models except model SCR15,
Dedicated CV cap --- applicable to all models except model SCR15
*7 Model HSR : ZZ, KK --- grease nipple cannot be attached to model 15,
GG --- applicable to model 25,
Steel tape SP --- applicable to models 15 to 100,
Dedicated C cap --- applicable to models 12 to 100,
Dedicated GC cap --- applicable to models 20 to 100,
Dedicated LM cover --- applicable to models 25 to 55,
Inner seal --- applicable to models 30 to 85,
Dedicated CV cap --- applicable to all models except model 15,
Side nipple --- applicable to all models except 45YR, 55YR
*8 Model SR : ZZ, KK --- grease nipple cannot be attached to models SR15, 20,
Dedicated cap C --- applicable to models SR15 to 85, Dedicated cap GC --- applicable to models SR20 to 120.
Stainless steel LM Guides --- applicable to models SR15 to 35,
Dedicated cap CV --- applicable to all models except models SR15, 20, 100, 120, 150
*9 Model NR/NRS : DD, KK --- NR/NRS100 cannot be equipped with a standard grease nipple. Please contact THK if a grease nipple is required.
ZZ, HH --- Side nipple required for NR/NRS100.
Plate cover SV --- Compatible with NR/NRS75. Dedicated GC caps --- Compatible with all models except NR/NRS75.

Symbols in the table ○: Applicable △: Applicable depending on model (see note)
★: Recommended by THK (standard stock item)

														Lubrication		Corrosion prevention	
	Low-resistance end seal + side seal	LiCS	LiCS + side seal (+ inner seal)	High chemical resistance fluorine seal	Plate cover SV	Steel tape SP	Dedicated CV cap	Dedicated C cap	Dedicated GC cap	Dedicated bellows	Dedicated LM cover	Tapped-hole LM rail type	QZ Lubricator	End plate with side nipple	AP-HC, AP-C, AP-CF	Stainless steel LM Guide
	RR	GG	PP	FS	Z	Z	—	—	—	—	TPH (dedicated for HSR)	K	QZ	—	F	M
	—	○	○	—	—	○	○	○	△*1	○	—	○	○	○	○	△*1
	—	○	○	—	—	○	○	○	△*2	○	—	○	○	○	○	△*2
	—	△*3	△*3	—	—	○	○	○	○	○	—	—	○	○	○	—
	—	—	—	—	—	—	—	○	—	—	—	—	○	—	—	○
	—	—	—	—	—	—	—	○	—	○	—	—	○	—	○	○
	—	△*4	△*4	—	—	—	△*4	○	△*4	○	—	—	○	—	○	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○
	—	—	—	—	—	—	—	—	—	—	—	—	○	—	—	○
	—	—	—	—	—	—	△*5	△*5	—	—	—	—	○	—	—	○
	—	—	—	—	—	—	△*6	○	△*6	—	—	○	○	○	○	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	△*7	—	—	—	—	—	—	○	○
	○	△*7	—	—	—	○	△*7	○	△*7	○	△*7	○	○	○	○	○
	○	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○
	○	—	—	—	—	○	○	○	○	○	△*7	○	○	△*7	○	—
	—	—	—	—	—	○	—	○	○	○	—	—	○	—	○	—
	—	—	—	—	—	△*7	—	△*7	△*7	—	—	—	—	—	○	—
	○	—	—	—	—	○	△*8	○	△*8	○	—	○	—	—	○	○
	—	—	—	—	—	○	○	○	○	○	—	△	—	—	○	△*8
	—	—	—	—	—	—	△*8	△*8	△*8	—	—	—	—	—	○	—
	—	—	—	—	—	○	○	○	○	○	—	—	○	○	○	—
	—	—	—	—	△*9	○	—	○	△*9	○	—	—	—	○	○	—
	—	—	—	—	—	○	—	○	○	○	—	—	○	○	○	—
	—	—	—	—	—	—	—	△*10	—	—	—	—	—	—	○	○
	—	—	—	—	—	—	—	○	—	○	—	—	—	—	○	○
	—	—	—	—	—	—	△*10	○	△*10	△*10	—	—	—	—	○	△*10

*10 Model HRW: DD, KK --- grease nipple cannot be attached to model 17 only. Side seals cannot be attached to models 17 and 21 only.
ZZ --- side seals cannot be attached to models 17 and 21 only.
Dedicated C cap --- applicable to models 14 to 60,
Dedicated GC cap --- applicable to models 35, 50, 60,
Dedicated bellows --- applicable to models 17 to 50,
Stainless steel LM Guide --- applicable to models 12 to 35,
Dedicated CV cap --- applicable to models 35, 50, 60 only

Note) Grease nipples are not installed when there is a QZ Lubricator.
Contact THK if you want to use a grease nipple for a model with a QZ.

Model No.		Type	Contamination protection												
			End seal	Side seal	Inner seal	End seal + side seal (+ inner seal)	Double seals + side seal (+ inner seal)	End seal + side seal (+ inner seal) + metal scraper	Double seals + side seal (+ inner seal) + metal scraper	LaCS	Side scraper	End seal + protector	Double seals + protector	Low-resistance end seal	
		Symbol	UU	—	—	SS	DD	ZZ	KK	HH	YY	JJ	TT	LL	
Full-Ball	RSX	5, 5W, 7, 7W	○	—	—	—	—	—	—	—	—	—	—	—	
		9, 9W, 12, 12W, 15, 15W	○	—	—	—	—	—	—	—	—	—	—	—	
	RSR	2, 3	—	—	—	—	—	—	—	—	—	—	—	—	
		3W, 14	○	—	—	—	—	—	—	—	—	—	—	—	
	HR	918 to 2555	○	—	—	—	—	—	—	—	—	—	—	—	
		3065 to 60125	○	—	—	—	—	—	—	—	—	—	—	—	
	GSR	15 to 35	○*	○	—	○	○	○	○	—	—	—	—	—	
	GSR-R	25 to 35	○	○	—	○	○	○	○	—	—	—	—	—	
	CSR	15 to 25	○	○	—	○	○	○*16	○*16	—	—	—	—	○	
		30 to 45	○	○	○	○	○	○	○	—	—	—	—	○	
	MX	5, 7	○	—	—	—	—	—	—	—	—	—	—	—	
	JR	25 to 55	○	○	—	○	○	○	○	—	—	—	—	—	
	HCR	12	○	—	—	—	—	—	—	—	—	—	—	—	
		15 to 65	○	○	—	○	○	○*17	○*17	—	—	—	—	○*17	
	HMG	15 to 65	○*18	—	—	—	—	—	—	—	—	—	—	—	
	NSR	20 to 70	○	○	—	○	—	—	—	—	—	—	—	—	
	HSR-M1	15 to 35	○	○	—	○	—	—	—	—	—	—	—	—	
	SR-M1	15 to 35	○	○	—	○	—	—	—	—	—	—	—	—	
	RSX-M1	9, 9W, 12, 12W, 15, 15W	○	—	—	—	—	—	—	—	—	—	—	—	
	RSR-M1	9, 12W, 15W	○	—	—	—	—	—	—	—	—	—	—	—	
		9W, 12, 15, 20	○	—	—	—	—	—	—	—	—	—	—	—	
	HSR-M2	15 to 25	○	○	—	○	—	—	—	—	—	—	—	—	
Caged Roller	SRG	15X	○	○	○	○	○	—	—	—	—	—	—	—	
		20X, 25X, 30X	○	○	○	○	○	○	○	○	—	△*20	△*20	—	
		35, 45, 55, 65	○	○	○	○	○	○	○	○	○	○	○	—	
		85, 100	○	○	○	○	○*20	○	○	○	—	—	—	—	
	SRN	35 to 65	○	○	○	○	○	○	○	○	—	—	—	—	
	SRW	70 to 100	○	○	○	○	○	○	○	○	—	—	—	—	
		130, 150	○	○	○	○	○	○	○	—	—	—	—	—	
FullRoller	HRX	25 to 65	○	○	○	○	○	○	○	○	—	○	○	—	

*11 Model RSX : Dedicated C cap --- applicable to models 9W, 12, and 15 only
*12 Model RSR : Dedicated C cap --- applicable to model RSR14W
*13 Model HR : Dedicated C cap --- applicable to models HR1123 to 50105,
Dedicated GC cap --- applicable to models HR2042 to 50105,
Dedicated CV cap --- applicable to models HR2042 to 50105
*14 Model GSR : Dedicated GC cap --- applicable to all models except model GSR15,
Dedicated CV cap --- applicable to all models except model GSR15
*15 Model GSR-R : AP-HC treatment of rack rail is not applicable
*16 Model CSR : ZZ, KK --- grease nipple cannot be attached to model CSR15,
Dedicated GC cap --- applicable to all models except model CSR15,
Dedicated CV cap --- applicable to all models except model CSR15
*17 Model HCR : ZZ, KK --- grease nipple cannot be attached to Model HCR15.
When using joint LM rails, the dust-proofing seal must be a low-resistance seal (contamination protection code: LL).
Dedicated CV caps--- applicable to all models except Model HCR15.
*18 Model HMG : Dedicated GC caps --- applicable to Model HMG25,
Dedicated CV caps --- applicable to all models except Model HMG15, straight-and-curved seal (code: UU).

Symbols in the table ○: Applicable △: Applicable depending on model (see note)
★: Recommended by THK (standard stock item)

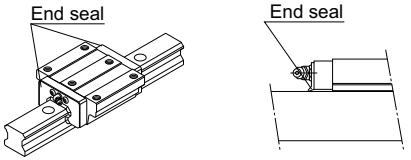
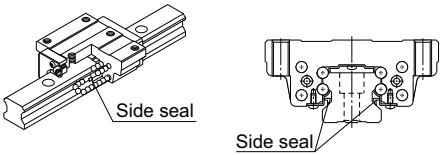
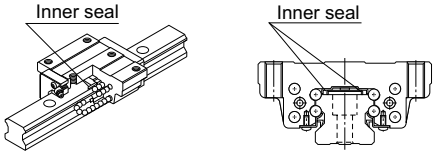
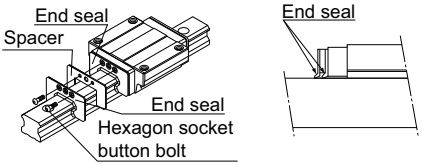
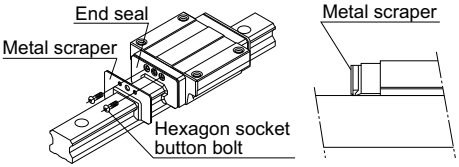
													Lubrication		Corrosion prevention	
	Low resistance end seal + side seal	LiCS	LiCS + side seal (+ inner seal)	High chemical resistance fluorine seal	Plate cover	Steel tape SP	Dedicated CV cap	Dedicated C cap	Dedicated GC cap	Dedicated bellows	Dedicated LM cover	Tapped-hole LM rail type	QZ Lubricator	End plate with side nipple	AP-HC, AP-C, AP-CF	Stainless steel LM Guide
	RR	GG	PP	FS	Z	Z	—	—	—	—	TPH (dedicated for HSR)	K	QZ	—	F	M
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○	○
	—	—	—	—	—	—	—	○*11	—	—	—	—	—	—	○	○
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○	○
	—	—	—	—	—	—	—	△*12	—	—	—	—	—	—	○	○
	—	—	—	—	—	—	△*13	△*13	△*13	—	—	—	—	—	○	○
	—	—	—	—	—	—	△*13	△*13	△*13	—	—	—	—	—	○	—
	—	—	—	—	—	—	△*14	○	△*14	—	—	—	—	—	○	—
	—	—	—	—	—	—	—	○	○	—	—	—	—	—	△*15	—
	○	—	—	—	—	—	△*16	○	△*16	—	—	○	—	—	○	—
	○	—	—	—	—	—	○	○	○	—	—	○	—	—	○	—
	—	—	—	—	—	—	—	—	—	—	—	○	—	—	○	○
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	○	—	—	—	—	—	△*17	—	—	—	—	—	—	—	○	—
	—	—	—	—	—	—	△*18	○	△*18	—	—	—	—	—	○	—
	—	—	—	—	—	—	○	○	○	○	—	—	—	—	○	—
	—	—	—	—	—	—	—	○*19	—	—	—	—	—	—	○	
	—	—	—	—	—	—	—	○*19	—	—	—	—	—	—	○	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	—	—	—	—	—	—	—	○*19	—	—	—	—	—	—	○	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○	
	—	—	—	—	—	—	—	○	—	—	—	—	—	—	○	
	—	○	○	—	—	—	—	○	—	○	—	○	○	○	○*20	—
	—	○	○	—	△*20	—	○	○	○	○	—	○	○	○	○*20	—
	—	—	—	○	○*20	—	○	○	○	○	—	○	○	○	○*20	—
	—	—	—	—	○*20	—	—	○	○	○	—	—	○	○	○*20	—
	—	—	—	—	○*21	—	○	○	○	—	—	—	○	○	○*21	—
	—	—	—	—	○	—	○	○	○	○	—	—	○	○	○*22	—
	—	—	—	—	—	—	△*22	○	○	○	—	—	○	○	○*22	—
	—	—	—	—	—	○	○	○	○	○	—	○	○	○	○*23	—

*19 Model HSR/SR/RSR-M1 (for High Temperatures) : Dedicated cap C — only work at room temperature
*20 Model SRG : DD --- side nipple required for Model 100.
JJ, TT --- suitable for models 30X to 65
Plate cover (see A1-436) --- suitable for models 25X to 65,
AP-HC surface treatment is not available
*21 Model SRN : Plate cover SV — suitable for models 35 to 65
Plate cover (see A1-453) — suitable for models 35 to 65,
AP-HC surface treatment is not available
*22 Model SRW : Dedicated CV caps --- applicable to Model SRW130 only,
AP-HC surface treatment is not available
*23 Model HRX : AP-HC surface treatment is not available

Note) Grease nipples are not installed when there is a QZ Lubricator.
Contact THK if you want to use a grease nipple for a model with a QZ.

Seal and Metal Scraper

- For the supported models, see the table of options by model number on A1-504.
- For the LM block length (dimension L) with seals attached, see A1-517 to A1-525.
- For the maximum seal resistance, see A1-531 to A1-533.

Item name	Schematic diagram/mounting location	Purpose/location of use
End seal		Used in locations exposed to dust
Side seal		Used in locations where dust may enter the LM block from the side or bottom surface, such as vertical, horizontal, and inverted mounts
Inner seal		Used in locations exposed to extremely large amounts of dust or cutting chips
Double seals		Used especially in locations exposed to large amounts of dust or cutting chips
Metal scraper (non-contact)		Used in locations where welding spatter may adhere to the LM rail

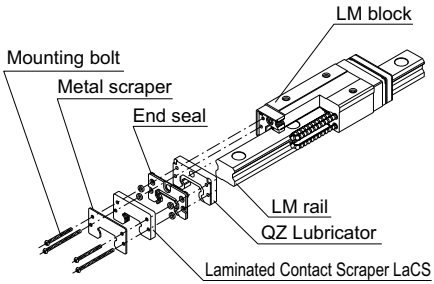
Symbol	Contamination protection accessories
UU	With end seal
SS	With end seal + side seal + inner seal*
DD	With double seals + side seal + inner seal*
ZZ	With end seal + side seal + inner seal* + metal scraper
KK	With double seals + side seal + inner seal* + metal scraper

* Some models are not equipped with inner seals (see A**1-504**).

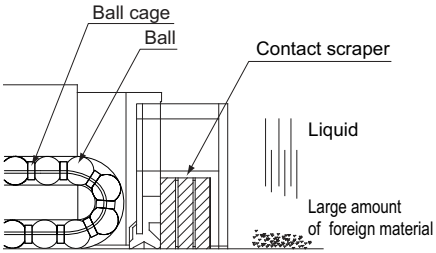
Laminated Contact Scraper LaCS

●For the supported models, see the table of options by model number on A1-504.
●For the LM block length (dimension L) with LaCS attached, see A1-517 to A1-525.
●For the resistance of LaCS, see A1-534.
●For notes regarding how to handle the LaCS, refer to A1-580.

For locations with an adverse environment, Laminated Contact Scraper LaCS is available.
LaCS removes minute foreign material adhering to the LM rail in multiple stages and prevents it from entering the LM block with a laminated contact structure (3-layer scraper).



External View



Structural Drawing

Features

- Since the 3 layers of scrapers fully contact the LM rail, LaCS is highly capable of removing minute foreign material.
- Since it uses oil-impregnated, foam synthetic rubber with a self-lubricating function, low friction resistance is achieved.

Symbol	Contamination protection accessories
SSHH	With end seal + side seal + inner seal*1 + LaCS
DDHH	With double seals + side seal + inner seal *1 + LaCS
ZZHH	With end seal + side seal + inner seal *1 + metal scraper + LaCS
KKHH	With double seals + side seal + inner seal *1 + metal scraper + LaCS
JJHH*2	With end seal + side seal + inner seal*1 + LaCS + protector (serving also as metal scraper)
TTHH*2	With double seals + side seal + inner seal*1 + LaCS + protector (serving also as metal scraper)

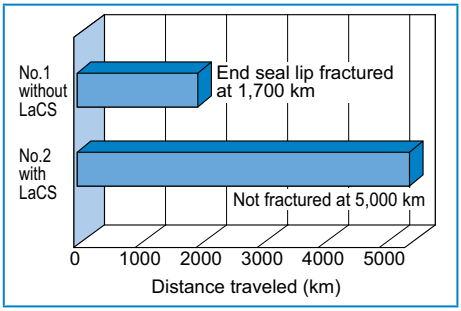
*1 Some models are not equipped with inner seals (see A1-504).
*2 JJHH and TTHH are only available for models SVR/SVS, NR-X/NRS-X, SRG, and HRX.
Note) For models SVR/SVS, NR-X/NRS-X, SRG, and HRX with HH specifications (with LaCS), a protector (A1-513) can be installed.
Contact THK if you want to use the protector with other options.

● Test in an environment with a water-soluble coolant

Test environment: water-soluble coolant

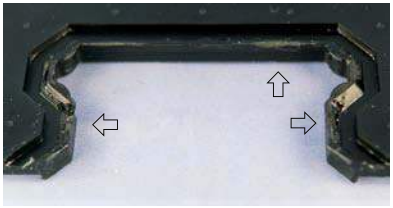
Item		Description
Tested model	No.1	SHS45R1SS+3000L (end seal only)
	No.2	SHS45R1SSHH+3000L (end seal and LaCS)
Maximum speed		200 m/min
Environmental conditions		Coolant spray amount: 5 times per 24 h

Test results



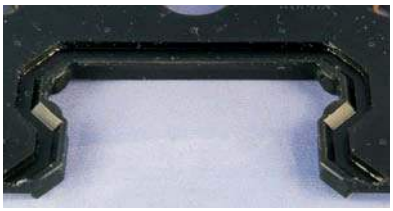
Magnified view of the end seal lip

No. 1: without LaCS - lip fractured at 1,700 km



⇦Areas marked with arrow are fractured

No. 2: with LaCS - no anomaly observed after traveling 5,000 km



Lip has not been fractured

● Test in an environment with minute foreign material

Test environment: minute foreign material

Item		Description
Tested model	No.1	Caged Ball LM Guide #45R (DD+600L) double seals only
	No.2	Caged Ball LM Guide #45R (HH+600L) LaCS only
Max speed/ acceleration		60 m/min, 1 G
External load		9.6 kN
Foreign material conditions		Type: FCD450#115 (particle diameter: 125 μm or less)
		Spray amount: 1 g/1 h (Total: 120 g)

Test results: amount of foreign material entering the raceway

Seal configuration		Mass (g) of foreign material entering the raceway
Double-seal configuration (2 layers of end seals)	Tested model 1	0.3
	Tested model 2	0.3
	Tested model 3	0.3
LaCS	Tested model 1	0
	Tested model 2	0
	Tested model 3	0

No. 1 Traveled 100 km (double-seal configuration)



Large amount of foreign matter has entered the raceway

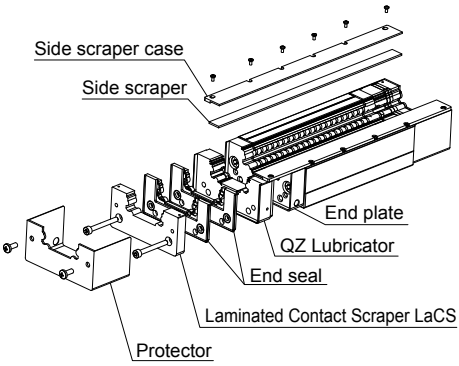
No. 2 Traveled 100 km (LaCS only)



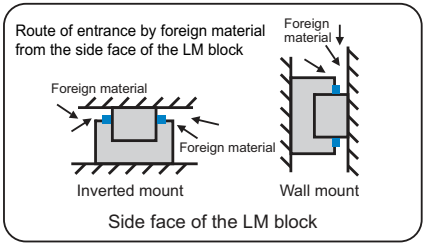
No foreign matter entering the raceway observed

Side Scraper

- Applicable models: models SVR/SVS, NR-X/NRS-X, and SRG
- For the resistance of side scraper, see A1-535.
- For the LM block length (dimension L) with side scrapers attached, see A1-517.
- For notes regarding how to handle the side scraper, see A1-580.

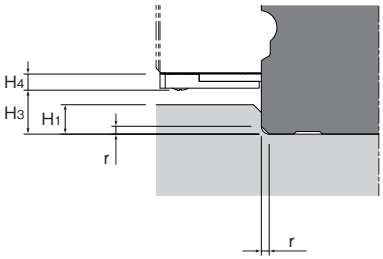


External View
(Ex: in case of QZTTHHYY type)



Features

- Minimizes foreign material entering from the side of the LM Guide in a harsh environment.
- Provides dust protection in inverted or wall-mounted orientations.



Side view of the LM block after the side scraper is mounted

Note) The side scraper is not sold alone.

Shoulder Height of the Mounting Surface and Corner Radius of Model SVR/SVS or NR-X/NRS-X After Mounting Side Scraper

Unit: mm

Model No.	Corner radius r (max)	Shoulder height of the LM rail H_1	H_3	Side scraper thickness H_4
25	0.5	2	2.9	2.6
30	1	3.5	4.4	
35	1	5.5	6.4	
45	1	8	9	
55	1.5	10.5	11.4	
65	1.5	11	12.3	

Shoulder Height of the Mounting Surface and Corner Radius of Model SRG After Mounting Side Scraper

Unit: mm

Model No.	Corner radius r (max)	Shoulder height of the LM rail H_1	H_3	Side scraper thickness H_4
35	1	3	4	2
45	1	3.5	5.5	2.5
55	1.5	5.5	7.5	2.5
65	1.5	6	8.5	3

Model number coding

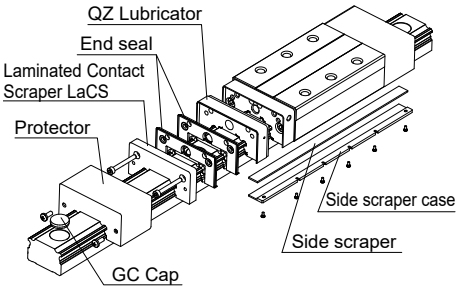
SVR45 LR 1 QZ JJHH YY C1 +1200L

With side scraper*

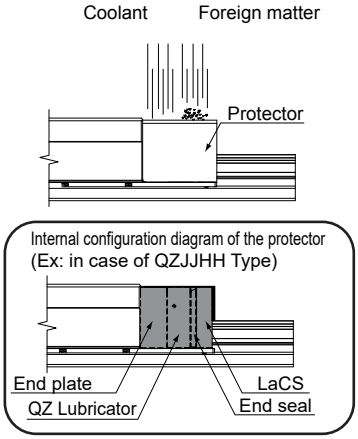
* The side scraper can accommodate various options of dust control accessories and lubrication accessories. For details, contact THK.

Protector

- Applicable models: models SVR/SVS, NR-X/NRS-X, SRG, and HRX
- HH type (with LaCS) for models SVR/SVS, NR-X/NRS-X, SRG, and HRX is provided with the protector.
- For the LM block length (dimension L) with protectors attached, see A1-517.

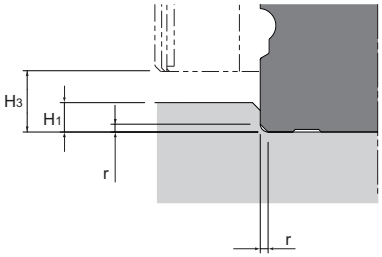


External View
(Ex: in case of QZTTHHYY type)



Features

- The protector minimizes the entrance of foreign material even in harsh environments where foreign material such as fine particles and liquids are present.



Side view of the LM block after the protector is mounted

The Shoulder Height of the Mounting Surface and Corner Radius of Model SVR/SVS or NR-X/NRS-X After Protector is Mounted

Unit: mm

Model No.	Corner radius r (max)	Shoulder height of the LM rail H_1	H_3
25	0.5	4	5.5
30	1	5	7
35	1	6	9
45	1	8	11.6
55	1.5	10	14
65	1.5	10	15

The shoulder height of the mounting surface and the corner radius after the protector of model HRX is mounted

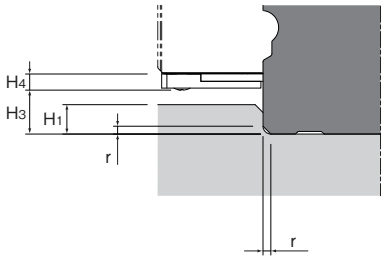
Unit: mm

Model No.	Corner radius r (max)	Shoulder height for the LM rail H_1	H_3
25	1	4	5
30	1	4	5
35	1	5.5	6.5
45	1.5	6.5	8.5
55	1.5	9	11
65	1.5	9.5	12

Shoulder Height of the Mounting Surface and Corner Radius After the Protector of Model SRG is Mounted

Unit: mm

Model No.	Corner radius r (max)	Shoulder height of the LM rail H_1	H_3
30X	1	4	5
35	1	5	6
45	1.5	6	8
55	1.5	8	10
65	1.5	9	11.5



Side view of the LM block after the protector and side scraper are mounted

Shoulder Height of the Mounting Surface and Corner Radius of Model SVR/SVS or NR-X/NRS-X After Protector and Side Scraper are Mounted

Unit: mm

Model No.	Corner radius r (max)	Shoulder height of the LM rail H_1	H_3	Side scraper thickness H_4
25	0.5	2	2.9	2.6
30	1	3.5	4.4	
35	1	5.5	6.4	
45	1	8	9	
55	1.5	10.5	11.4	
65	1.5	11	12.3	

Shoulder Height of the Mounting Surface and Corner Radius of Model SRG after Protector and Side Scraper are Mounted

Unit: mm

Model No.	Corner radius r (max)	Shoulder height of the LM rail H_1	H_3	Side scraper thickness H_4
35	1	3	4	2
45	1	3.5	5.5	2.5
55	1.5	5	7	3
65	1.5	6	8.5	3

Note1) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note2) Contact THK if you want to use the protector with other options.

Light-Resistance Contact Seal LiCS

●For the supported models, see the table of options by model number on A1-504.
●For the LM block length (dimension L) with LiCS attached, see A1-528.
●For the resistance of LiCS, see A1-535.
●For notes regarding how to handle the LiCS, see A1-581.

LiCS is a light sliding resistance contact seal. It is effective in removing dust on the raceway and retaining a lubricant such as grease. It achieves extremely low drag and smooth, stable motion.

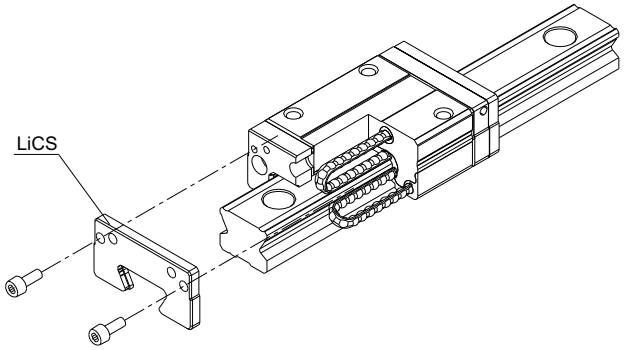


Fig. 1: Structural Drawing of SSR + LiCS

Features

Light-Resistance Contact Seal LiCS is a seal that uses a light-resistance material in its sealing element and contacts the LM rail raceway to achieve low drag resistance. It is optimal for applications where low drag resistance is required in a clean environment, such as semiconductor-related devices, inspection devices, and OA equipment.

- Since the sealing element contacts the LM rail raceway, it is effective in removing dust on the raceway.
- Use of oil-impregnated, expanded synthetic rubber, which has excellent self-lubricating properties, achieves low drag resistance.

Model number coding

SSR20 XW 2 GG C1 +600L P -II

- SSR20: LM Guide model number
- XW: Type of LM block
- 2: No. of LM blocks used on the same rail
- GG: With LiCS seal on both ends
- C1: Radial clearance symbol
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +600L: 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)
- -II: Symbol for No. of rails used on the same plane

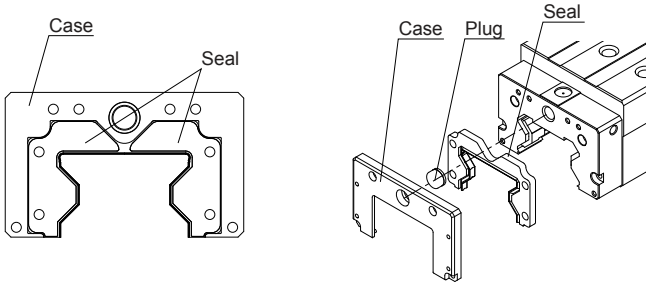
Symbol	Contamination protection accessories
GG	LiCS
PP	With LiCS + side seal + inner seal*

* Some models are not equipped with inner seals (see A1-504).

High Chemical Resistance Fluorine Seal FS

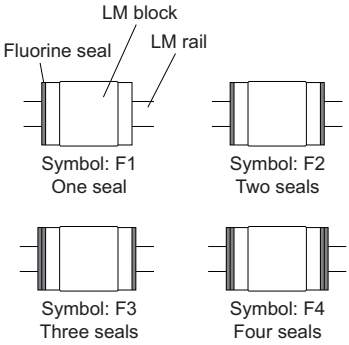
- Applicable models: models SRG35, SRG45, SRG55, and SRG65
- For the LM block length (L dimension) with fluorine seals attached, see A1-530.
- For the resistance value of the fluorine seal, see A1-535.
- For precautions on using the fluorine seal, see A1-581.

The fluorine seal is made of fluororubber and has excellent chemical resistance.
The fluorine seal can be inserted from the upper surface of the LM rail and is easy to install.



Components/Structure

Symbol	Contamination protection accessories
F2	Fluorine seals + side seals + inner seals
FZ2	Fluorine seals + side seals + inner seals + metal scrapers
FJ2	Fluorine seals + side seals + inner seals + protectors
F4	Fluorine seals (double) + side seals + inner seals
FZ4	Fluorine seals (double) + side seals + inner seals + metal scrapers
FJ4	Fluorine seals (double) + side seals + inner seals + protectors
QZF2	Fluorine seals + side seals + inner seals + QZ
QZFZ2	Fluorine seals + side seals + inner seals + metal scrapers + QZ
QZFJ2	Fluorine seals + side seals + inner seals + QZ + protectors
QZF4	Fluorine seals (double) + side seals + inner seals + QZ
QZFZ4	Fluorine seals (double) + side seals + inner seals + metal scrapers + QZ
QZFJ4	Fluorine seals (double) + side seals + inner seals + QZ + protectors



Standard Assemblies

Model number coding

When purchasing in a set with an LM Guide
(Example) SRG45LR2QZ **F2** C0 + 1200LZ-Ⅱ
Fluorine seal symbol (see the standard assemblies diagram)

*Contact THK if you require seals on individual blocks in configurations that differ from those in the standard assemblies diagram.

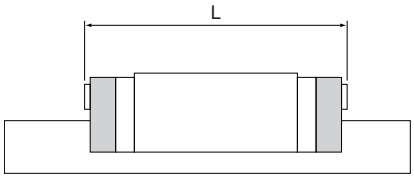
When purchasing fluorine seals individually
(Example) SRG45-F1-Z
Fluorine seal symbol (F1 only for individual purchase)

*Individual purchases come in a set with the fluorine seal, a case, and a plug.

Note1) If this product will be used in special environments, such as in a vacuum or at very low or high temperatures, contact THK.
Note2) This seal cannot be used in combination with an end seal or a Laminated Contact Scraper (LaCS).
Note3) Even with specifications for fluorine seals, use a bellows or cover to prevent machining chips and coolant from entering the product.

Dimensions of Each Model with Options Attached

The LM Block Length (Dimension L) with LaCS and Seals Attached



Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
SHS	15C/V/R	64.4	64.4	69.8	66.8	72.2	78.6	84	79.8	85.2
	15LC/LV	79.4	79.4	84.8	81.8	87.2	93.6	99	94.8	100.2
	20C/V	79	79	85.4	83	89.4	93.6	100	96	102.4
	20LC/LV	98	98	104.4	102	108.4	112.6	119	115	121.4
	25C/V/R	92	92	101.6	100.4	107.6	112	119.2	114.4	121.6
	25LC/LV/LR	109	109	118.6	117.4	124.6	129	136.2	131.4	138.6
	30C/V/R	106	106	116	113.8	122.4	129.4	138	131.8	140.4
	30LC/LV/LR	131	131	141	138.8	147.4	154.4	163	156.8	165.4
	35C/V/R	122	122	134.8	132.4	142.2	148	157.8	150.4	160.2
	35LC/LV/LR	152	152	164.8	162.4	172.2	178	187.8	180.4	190.2
	45C/V/R	140	140	152.8	151.2	161	169	178.8	172.2	182
	45LC/LV/LR	174	174	186.8	185.2	195	203	212.8	206.2	216
	55C/V/R	171	171	186.6	184.2	195.4	202	213.2	205.2	216.4
	55LC/LV/LR	213	213	228.6	226.2	237.4	244	255.2	247.2	258.4
	65C/V	221	221	238.6	236.2	248.6	258	270.4	261.2	273.6
	65LC/LV	272	272	289.6	287.2	299.6	309	321.4	312.2	324.6
SSR	15XV/XSB	40.3	40.3	47.3	44.9	50.7	59.5	65.3	60.7	66.5
	15XW/XTB	56.9	56.9	63.9	61.5	67.3	76.1	81.9	77.3	83.1
	20XV/XSB	47.7	47.7	54.6	53.4	60.3	67.7	74.6	70.1	77
	20XW/XTB	66.5	66.5	73.4	72.2	79.1	86.5	93.4	88.9	95.8
	25XV/XSB	60	60	67.4	65.7	73.1	80	87.4	82.4	89.8
	25XW/XTB	83	83	90.4	88.7	96.1	103	110.4	105.4	112.8
	30XV/XSB	66.7	66.7	74.8	72.4	80.5	90.7	98.8	93.1	101.2
	30XW/XTB	97	97	105.1	102.7	110.8	121	129.1	123.4	131.5
	35XV/XSB	77.5	77.5	86.5	84.3	93.3	103.5	112.5	105.9	114.9
	35XW/XTB	110.9	110.9	119.9	117.7	126.7	136.9	145.9	139.3	148.3
SHW	12CAM/CRM	37	37	—	—	—	48	—	—	—
	12HRM	50.4	50.4	—	—	—	61.4	—	—	—
	14CAM/CRM	45.5	45.5	—	—	—	60.7	—	—	—
	17CAM/CRM	51	51	54	53.4	56.4	66.2	69.2	67.4	70.4
	21CA/CR	59	59	64	63.2	68.2	75.6	80.6	77.2	82.2
	27CA/CR	72.8	72.8	78.6	77.8	83.6	89.4	95.2	91.8	97.6
	35CA/CR	107	107	114.4	112	119.4	129	136.4	131.4	138.8
	50CA/CR	141	141	149.2	147.4	155.6	166	174.2	168.4	176.6

Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
SRS	5M	16.9	—	—	—	—	—	—	—	—
	5N	20.1	—	—	—	—	—	—	—	—
	5WM	22.1	—	—	—	—	—	—	—	—
	5WN	28.1	—	—	—	—	—	—	—	—
	7S	19	19	—	—	—	—	—	—	—
	7M	23.4	23.4	—	—	—	—	—	—	—
	7N	31	31	—	—	—	—	—	—	—
	7WS	22.5	22.5	—	—	—	—	—	—	—
	7WM	31	31	—	—	—	—	—	—	—
	7WN	40.9	40.9	—	—	—	—	—	—	—
	9XS	21.5	21.5	—	—	—	33.1	—	—	—
	9XM	30.8	30.8	—	—	—	42.4	—	—	—
	9XN	40.8	40.8	—	—	—	52.4	—	—	—
	9WS	26.5	26.5	—	—	—	38.1	—	—	—
	9WM	39	39	—	—	—	50.6	—	—	—
	9WN	50.7	50.7	—	—	—	62.3	—	—	—
	12S	25	25	—	—	—	36.6	—	—	—
	12M	34.4	34.4	—	—	—	46	—	—	—
	12N	47.1	47.1	—	—	—	58.7	—	—	—
	12WS	30.5	30.5	—	—	—	42.1	—	—	—
	12WM	44.5	44.5	—	—	—	56.1	—	—	—
	12WN	59.5	59.5	—	—	—	71.1	—	—	—
	15S	32	32	—	—	—	46.2	—	—	—
	15M	43	43	—	—	—	57.2	—	—	—
	15N	60.8	60.8	—	—	—	75	—	—	—
	15WS	41.5	41.5	—	—	—	55.7	—	—	—
	15WM	55.5	55.5	—	—	—	69.7	—	—	—
	15WN	74.5	74.5	—	—	—	88.7	—	—	—
	20M	50	50	—	—	—	65.2	—	—	—
	25M	77	77	—	—	—	92.6	—	—	—
SCR	15S	64.4	64.4	69.8	66.8	72.2	78.9	84.4	79.9	85.2
	20S	79	79	85.4	83	89.4	94	100	96	102.5
	20	98	98	104.4	102	108.4	113	119	115	121.5
	25	109	109	118.6	117.4	124.6	129	136.2	131.4	138.6
	30	131	131	141	138.8	147.4	154.4	163	156.8	165.4
	35	152	152	164.8	162.4	172.2	178	187.8	180.4	190.2
	45	174	174	186.8	185.2	195	203	212.8	206.2	216
	65	272	272	289.6	287.2	299.6	309	321.4	312.2	324.6

Dimensions of Each Model with Options Attached

Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
HSR	8RM	24	—	—	—	—	—	—	—	—
	10RM	31	—	—	—	—	—	—	—	—
	12RM	45	—	—	—	—	—	—	—	—
	15C/R/YR	56.6	56.6	61.8	58.2*	63.4*	76	81.2	77.2	82.4
	15LC/LR	74.6	74.6	79.8	76.2	81.4	94	99.2	95.2	100.4
	20C/R/CA/CB/YR	74	74	80.6	76.6	83.2	92	98.6	95.2	101.8
	20LC/LR/HA/HB	90	90	96.6	92.6	99.2	108	114.6	111.2	117.8
	25C/R/CA/CB/YR	83.1	83.1	90.7	86.7	94.3	101	108.6	105.3	112.9
	25LC/LR/HA/HB	102.2	102.2	109.8	105.8	113.4	120.1	127.7	124.4	132
	30C/R/CA/CB/YR	98	98	105.6	101.6	109.2	119.9	127.5	124.2	131.8
	30LC/LR/HA/HB	120.6	120.6	128.2	124.2	131.8	142.5	150.1	146.8	154.4
	35C/R/CA/CB/YR	109.4	109.4	117	113	120.6	132.4	140	135.6	143.2
	35LC/LR/HA/HB	134.8	134.8	142.4	138.4	146	157.8	165.4	161	168.6
	45C/R/CA/CB/XYR/YR	138.9	138.9	146.1	144.1	151.3	168	175.2	171.2	178.4
	45LC/LR/HA/HB	170.7	170.7	177.9	175.9	183.1	199.8	207	203	210.2
	55C/R/CA/CB/XYR/YR	162.9	162.9	170.1	168.1	175.3	192.6	199.8	195.8	203
	55LC/LR/HA/HB	201	201	208.2	206.2	213.4	230.7	237.9	233.9	241.1
	65XC/XR/XCA/XCB/XYR	190.5	190.5	197.7	195.3	202.5	224.3	231.5	227.5	234.7
	65XLC/XLR/XHA/XHB	250	250	257.2	254.8	262	283.8	291	287	294.2
	85R/A/B/CA/CB/YR	245.6	245.6	252.8	252.4	259.6	278.8	286	283.4	290.6
	85LR/LA/LB/HA/HB	303	303	310.2	309.8	317	336.2	343.4	340.8	348
	100HR/HA/HB	334	334	—	—	—	—	—	—	—
	120HR/HA/HB	365	365	—	—	—	—	—	—	—
	150HR/HA/HB	396	396	—	—	—	—	—	—	—
SR	15W/TB	57	57	62.2	58.4*	63.6*	—	—	—	—
	15V/SB	40.4	40.4	45.6	41.8*	47*	—	—	—	—
	20W/TB	66.2	66.2	72.8	70.6*	77.2*	—	—	—	—
	20V/SB	47.3	47.3	53.9	51.7*	58.3*	—	—	—	—
	25W/TB	83	83	90.6	87.4	95	—	—	—	—
	25V/SB	59.2	59.2	66.8	63.6	71.2	—	—	—	—
	30W/TB	96.8	96.8	104.4	99.4	107	—	—	—	—
	30V/SB	67.9	67.9	75.5	70.5	78.1	—	—	—	—
	35W/TB	111	111	118.6	113.6	121.2	—	—	—	—
	35V/SB	77.6	77.6	85.2	80.2	87.8	—	—	—	—
	45W/TB	126	126	134.6	129.4	138	—	—	—	—
	55W/TB	156	156	164.6	159.4	168	—	—	—	—
	70T	194.6	194.6	201.8	200.8	208	—	—	—	—
	85T	180	180	—	—	—	—	—	—	—
	100T	200	200	—	—	—	—	—	—	—
	120T	235	235	—	—	—	—	—	—	—
	150T	280	280	—	—	—	—	—	—	—

* Grease nipple cannot be installed.

Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
NR/NRS	75R/A/B	218	218	229	226.6	237.6	—	—	—	—
	75LR/LA/LB	274	274	285	282.6	293.6	—	—	—	—
	85R/A/B	246.7	246.7	257.7	256.1	267.1	—	—	—	—
	85LR/LA/LB	302.8	302.8	313.8	312.2	323.2	—	—	—	—
	100R/A/B	286.2	286.2	297.8	295.6	307.2	—	—	—	—
	100LR/LA/LB	326.2	326.2	337.8	335.6	347.2	—	—	—	—
HRW	12LRM	37	37	—	—	—	—	—	—	—
	14LRM	45.5	45.5	—	—	—	—	—	—	—
	17CA/CR	50.8	—	54	53.6	58.6	—	—	—	—
	21CA/CR	58.8	—	64.2	62.8	69	—	—	—	—
	27CA/CR	72.8	72.8	79	75.6	81.8	—	—	—	—
	35CA/CR	106.6	106.6	113.8	112	119.2	—	—	—	—
	50CA/CR	140.5	140.5	147.7	143.3	150.5	—	—	—	—
	60CA	158.9	158.9	169.7	165.1	175.9	—	—	—	—
RSX	5M	16.9	—	—	—	—	—	—	—	—
	5NM	20.1	—	—	—	—	—	—	—	—
	5WM	22.1	—	—	—	—	—	—	—	—
	5WNM	28.1	—	—	—	—	—	—	—	—
	7SM	19	—	—	—	—	—	—	—	—
	7M	23.4	—	—	—	—	—	—	—	—
	7NM	31	—	—	—	—	—	—	—	—
	7WSM	22.5	—	—	—	—	—	—	—	—
	7WM	31	—	—	—	—	—	—	—	—
	7WNM	40.9	—	—	—	—	—	—	—	—
	9SM	21.5	—	—	—	—	—	—	—	—
	9M	30.8	—	—	—	—	—	—	—	—
	9NM	40.8	—	—	—	—	—	—	—	—
	9WSM	26.5	—	—	—	—	—	—	—	—
	9WM	39	—	—	—	—	—	—	—	—
	9WNM	50.7	—	—	—	—	—	—	—	—
	12SM	25.6	—	—	—	—	—	—	—	—
	12M	35	—	—	—	—	—	—	—	—
	12NM	47.7	—	—	—	—	—	—	—	—
	12WSM	30.5	—	—	—	—	—	—	—	—
	12WM	44.5	—	—	—	—	—	—	—	—
	12WNM	59.5	—	—	—	—	—	—	—	—
	15SM	31.9	—	—	—	—	—	—	—	—
	15M	42.9	—	—	—	—	—	—	—	—
	15NM	60.7	—	—	—	—	—	—	—	—
	15WSM	41.5	—	—	—	—	—	—	—	—
	15WM	55.5	—	—	—	—	—	—	—	—
	15WNM	74.5	—	—	—	—	—	—	—	—
RSR	2M	—	—	—	—	—	—	—	—	—
	2N	—	—	—	—	—	—	—	—	—
	3M	—	—	—	—	—	—	—	—	—
	3N	—	—	—	—	—	—	—	—	—
	3WM	14.9	—	—	—	—	—	—	—	—
	3WN	19.9	—	—	—	—	—	—	—	—
	14WVM	50	—	—	—	—	—	—	—	—

Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
HR	918	45	—	—	—	—	—	—	—	—
	1123	52	—	—	—	—	—	—	—	—
	1530	69	—	—	—	—	—	—	—	—
	2042	91.6	—	—	—	—	—	—	—	—
	2042T	110.7	—	—	—	—	—	—	—	—
	2555	121	—	—	—	—	—	—	—	—
	2555T	146.4	—	—	—	—	—	—	—	—
	3065	145	—	—	—	—	—	—	—	—
	3065T	173.5	—	—	—	—	—	—	—	—
	3575	154.8	—	—	—	—	—	—	—	—
	3575T	182.5	—	—	—	—	—	—	—	—
	4085	177.8	—	—	—	—	—	—	—	—
	4085T	215.9	—	—	—	—	—	—	—	—
	50105	227	—	—	—	—	—	—	—	—
	50105T	274.5	—	—	—	—	—	—	—	—
	60125	329	—	—	—	—	—	—	—	—
GSR	15T	59.8	59.8	65*	65.8*	71*	—	—	—	—
	15V	47.1	47.1	52.3*	53.1*	58.3*	—	—	—	—
	20T	74	74	80.6	77.6	84.2	—	—	—	—
	20V	58.1	58.1	64.7	61.7	68.3	—	—	—	—
	25T	88	88	95	91.6	98.6	—	—	—	—
	25V	69	69	76	72.6	79.6	—	—	—	—
	30T	103	103	110.6	107.2	114.8	—	—	—	—
	35T	117	117	124.6	121.2	128.8	—	—	—	—
GSR-R	25T-R	88	88	95	91.6	98.6	—	—	—	—
	25V-R	69	69	76	72.6	79.6	—	—	—	—
	30T-R	103	103	110.6	107.2	114.8	—	—	—	—
	35T-R	117	117	124.6	121.2	128.8	—	—	—	—
CSR	15	56.6	56.6	61.8	58.2*	63.4*	—	—	—	—
	20S	74	74	80.6	76.6	83.2	—	—	—	—
	20	90	90	96.6	92.6	99.2	—	—	—	—
	25S	83.1	83.1	90.7	86.7	94.3	—	—	—	—
	25	102.2	102.2	109.8	105.8	113.4	—	—	—	—
	30S	98	98	105.6	101.6	109.2	—	—	—	—
	30	120.6	120.6	128.2	124.2	131.8	—	—	—	—
	35	134.8	134.8	142.4	138.4	146	—	—	—	—
	45	170.8	170.8	178	176	183.2	—	—	—	—
MX	5M	23.3	—	—	—	—	—	—	—	—
	7WM	40.8	—	—	—	—	—	—	—	—
JR	25A/B/R	83.1	83.1	90.7	89.4	97	—	—	—	—
	35A/B/R	113.6	113.6	125.6	122	134	—	—	—	—
	45A/B/R	145	145	159	150.8	164.8	—	—	—	—
	55A/B/R	165	165	175.4	170.4	180.8	—	—	—	—

* Grease nipple cannot be installed.

Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
HCR	12A+60/100R	44.6	—	—	—	—	—	—	—	—
	15A+60/150R	54.5	54.5	59.7	—	—	—	—	—	—
	15A+60/300R	55.5	55.5	60.7	57.1*	62.3*	—	—	—	—
	15A+60/400R	55.8	55.8	61	57.3*	62.5*	—	—	—	—
	25A+60/500R	81.6	81.6	89.2	85.5	93.1	—	—	—	—
	25A+60/750R	82.3	82.3	89.9	86	93.6	—	—	—	—
	25A+60/1000R	82.5	82.5	90.1	86.2	93.8	—	—	—	—
	35A+60/600R	107.2	107.2	114.8	111.2	118.8	—	—	—	—
	35A+60/800R	107.5	107.5	115.1	111.5	119.1	—	—	—	—
	35A+60/1000R	108.2	108.2	115.8	112	119.6	—	—	—	—
	35A+60/1300R	108.5	108.5	116.1	112.3	119.8	—	—	—	—
	45A+60/800R	136.7	136.7	143.9	142.1	149.2	—	—	—	—
	45A+60/1000R	137.3	137.3	144.5	142.7	149.9	—	—	—	—
	45A+60/1200R	137.3	137.3	144.5	142.7	149.9	—	—	—	—
	45A+60/1600R	138	138	145.2	143.3	150.5	—	—	—	—
	65A+60/1000R	193.8	193.8	201	199.4	206.6	—	—	—	—
	65A+60/1500R	195.4	195.4	202.6	200.8	208	—	—	—	—
	65A+45/2000R	195.9	195.9	203.1	201.3	208.5	—	—	—	—
	65A+45/2500R	196.5	196.5	203.7	201.8	209	—	—	—	—
	65A+30/3000R	196.5	196.5	203.7	201.8	209	—	—	—	—
HMG	15A	48	—	—	—	—	—	—	—	—
	25A	62.2	—	—	—	—	—	—	—	—
	35A	80.6	—	—	—	—	—	—	—	—
	45A	107.6	—	—	—	—	—	—	—	—
	65A	144.4	—	—	—	—	—	—	—	—
NSR-TBC	20TBC	67	—	—	—	—	—	—	—	—
	25TBC	78	—	—	—	—	—	—	—	—
	30TBC	90	—	—	—	—	—	—	—	—
	40TBC	110	110	—	—	—	—	—	—	—
	50TBC	123	123	—	—	—	—	—	—	—
	70TBC	150	150	—	—	—	—	—	—	—
HSR-M1	15M1A/M1B/M1R/M1YR	59.6	59.6	—	—	—	—	—	—	—
	20M1A/M1B/M1R/M1YR	76	76	—	—	—	—	—	—	—
	20M1LA/M1LB/M1LR	92	92	—	—	—	—	—	—	—
	25M1A/M1B/M1R/M1YR	83.9	83.9	—	—	—	—	—	—	—
	25M1LA/M1LB/M1LR	103	103	—	—	—	—	—	—	—
	30M1A/M1B/M1R/M1YR	98.8	98.8	—	—	—	—	—	—	—
	30M1LA/M1LB/M1LR	121.4	121.4	—	—	—	—	—	—	—
	35M1A/M1B/M1R/M1YR	112	112	—	—	—	—	—	—	—
	35M1LA/M1LB/M1LR	137.4	137.4	—	—	—	—	—	—	—
SR-M1	15M1W/M1TB	57	57	—	—	—	—	—	—	—
	15M1V/M1SB	40.4	40.4	—	—	—	—	—	—	—
	20M1W/M1TB	66.2	66.2	—	—	—	—	—	—	—
	20M1V/M1SB	47.3	47.3	—	—	—	—	—	—	—
	25M1W/M1TB	83	83	—	—	—	—	—	—	—
	25M1V/M1SB	59.2	59.2	—	—	—	—	—	—	—

*Grease nipple cannot be installed.

Unit: mm

Model No.		L								
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH
SR-M1	30M1W/M1TB	96.8	96.8	—	—	—	—	—	—	—
	30M1V/M1SB	67.9	67.9	—	—	—	—	—	—	—
	35M1W/M1TB	111	111	—	—	—	—	—	—	—
	35M1V/M1SB	77.6	77.6	—	—	—	—	—	—	—
RSX-M1	9M1	30.8	—	—	—	—	—	—	—	—
	9M1N	40.8	—	—	—	—	—	—	—	—
	9M1W	39	—	—	—	—	—	—	—	—
	9M1WN	50.7	—	—	—	—	—	—	—	—
	12M1	35	—	—	—	—	—	—	—	—
	12M1N	47.7	—	—	—	—	—	—	—	—
	12M1W	44.5	—	—	—	—	—	—	—	—
	12M1WN	59.5	—	—	—	—	—	—	—	—
	15M1	42.9	—	—	—	—	—	—	—	—
	15M1N	60.7	—	—	—	—	—	—	—	—
	15M1W	55.5	—	—	—	—	—	—	—	—
	15M1WN	74.5	—	—	—	—	—	—	—	—
RSR-M1	9M1K	30.8	—	—	—	—	—	—	—	—
	9M1N	41	—	—	—	—	—	—	—	—
	9M1WV	39	—	—	—	—	—	—	—	—
	9M1WN	50.7	—	—	—	—	—	—	—	—
	12M1V	35	—	—	—	—	—	—	—	—
	12M1N	47.7	—	—	—	—	—	—	—	—
	12M1WV	44.5	—	—	—	—	—	—	—	—
	12M1WN	59.5	—	—	—	—	—	—	—	—
	15M1V	43	—	—	—	—	—	—	—	—
	15M1N	61	—	—	—	—	—	—	—	—
	15M1WV	55.5	—	—	—	—	—	—	—	—
	15M1WN	74.5	—	—	—	—	—	—	—	—
	20M1V	66.5	—	—	—	—	—	—	—	—
	20M1N	86.3	—	—	—	—	—	—	—	—
HSR-M2	15M2A	56.6	56.6	—	—	—	—	—	—	—
	20M2A	74	74	—	—	—	—	—	—	—
	25M2A	83.1	83.1	—	—	—	—	—	—	—
SRN	35C/R	125	125	132.8	131.4	139.2	148.6	156.4	151	158.8
	35LC/LR	155	155	162.8	161.4	169.2	178.6	186.4	181	188.8
	35SLC/SLR	180.8	180.8	188.6	186.5	194.3	204.4	212.2	206.8	214.6
	45C/R	155	155	164.2	162.2	171.4	182	191.2	185.2	194.4
	45LC/LR	190	190	199.2	197.2	206.4	217	226.2	220.2	229.4
	45SLC/SLR	231.5	231.5	240.7	238	247.2	258.5	267.7	261.7	270.9
	55C/R	185	185	194.2	192.2	201.4	212	221.2	215.2	224.4
	55LC/LR	235	235	244.2	242.2	251.4	262	271.2	265.2	274.4
	55SLC/SLR	292	292	301.2	298.5	307.7	319	328.2	322.2	331.4
	65C/R	244.9	244.9	256.1	252.5	263.7	277.3	288.5	280.5	291.7
	65LC/LR	303	303	314.2	311.4	322.6	335.4	346.6	338.6	349.8
	65SLC/SLR	380	380	391.2	387.6	398.8	412.4	423.6	415.6	426.8
SRW	70LR	190	190	199.2	197.2	206.4	217	226.2	220.2	229.4
	85LR	235	235	244.2	242.2	251.4	262	271.2	265.2	274.4
	100LR	303	303	314.2	311.4	322.6	335.4	346.6	338.6	349.8
	130LR	350	350	361.2	361	372.2	—	—	—	—
	150LR	395	395	406.2	411	422.2	—	—	—	—

Unit: mm

Model No.		L										
		UU	SS	DD	ZZ	KK	SSHH	DDHH	ZZHH	KKHH	JJHH	TTHH
SVR/ SVS NR-X/ NRS-X	25R/C	82.8	82.8	88	89.2	94.4	96.8*	102.0*	—	—	102.5*	107.7*
	25LR/LC	102	102	107.2	108.4	113.6	116.0*	121.2*	—	—	121.7*	126.9*
	30R/C	98	98	104.6	104.4	111	115.2*	121.8*	—	—	120.9*	127.5*
	30LR/LC	120.5	120.5	127.1	126.9	133.5	137.7*	144.3*	—	—	143.4*	150.0*
	35R/C/RH/CH	109.5	109.5	116.5	117.1	124.1	126.7*	133.7*	—	—	133.5*	140.5*
	35LR/LC/LRH/LCH	135	135	142	142.6	149.6	152.2*	159.2*	—	—	159.0*	166.0*
	45R/C/RH/CH	138.2	138.2	145.2	146.6	153.6	158.2*	165.2*	—	—	165.8*	172.8*
	45LR/LC/LRH/LCH	171	171	178	179.4	186.4	191.0*	198.0*	—	—	198.6*	205.6*
	55R/C/RH/CH	163.3	163.3	168.4	169.8	176.8	182.4*	189.4*	—	—	191.1*	198.1*
	55LR/LC/LRH/LCH	200.5	200.5	205.6	207	214	219.6*	226.6*	—	—	228.3*	235.3*
	65R/C	186	186	191.8	194.2	201.6	208.8*	216.2*	—	—	217.5*	224.9*
	65LR/LC	246	246	251.8	254.2	261.6	268.8*	276.2*	—	—	277.5*	284.9*
SRG	15X A/V	69.2	69.2	71.2	—	—	—	—	—	—	—	—
	20X A/V	86.2	86.2	88.2	89.6	91.6	105.2*	107.2*	107.6*	109.6*	—	—
	20X LA/LV	106.2	106.2	108.2	109.6	111.6	125.2*	127.2*	127.6*	129.6*	—	—
	25X C/R	95.1	95.1	100.1	100.1	105.1	114.9*	119.9*	117.3*	122.3*	—	—
	25X LC/LR	115.1	115.1	120.1	120.1	125.1	134.9*	139.9*	137.3*	142.3*	—	—
	30X C/R	111	111	118	116	123	130.8*	137.8*	133.2*	140.2*	135	142
	30X LC/LR	135	135	142	140	147	154.8*	161.8*	157.2*	164.2*	159	166
	35C/R	125	125	132.8	130.7	138.5	142.6*	150.4*	151*	158.8*	151*	158.8*
	35LC/LR	155	155	162.8	160.7	168.5	172.6*	180.4*	181*	188.8*	181*	188.8*
	35SLC/SLR	180.8	180.8	188.6	186.5	194.3	198.4*	206.2*	206.8*	214.6*	206.8*	214.6*
	45C/R	155	155	164.2	161.5	170.7	175.6*	184.8*	184.8*	194*	184.6*	193.8*
	45LC/LR	190	190	199.2	196.5	205.7	210.6*	219.8*	219.8*	229*	219.6*	228.8*
	45SLC/SLR	231.5	231.5	240.7	238	247.2	252.1*	261.3*	261.3*	270.5*	261.1*	270.3*
	55C/R	185	185	194.2	191.5	200.7	205.6*	214.8*	214.8*	224*	214.6*	223.8*
	55LC/LR	235	235	244.2	241.5	250.7	255.6*	264.8*	264.8*	274*	264.6*	273.8*
	55SLC/SLR	292	292	301.2	298.5	307.7	312.6*	321.8*	321.8*	331*	321.6*	330.8*
	65C/V	244.9	244.9	256.1	252.5	263.7	268.9*	280.1*	280.1*	291.3*	279.9*	291.1*
	65LC/LV	303	303	314.2	310.6	321.8	327*	338.2*	338.2*	349.4*	338*	349.2*
	65SLC/SLV	380	380	391.2	387.6	398.8	404*	415.2*	415.2*	426.4*	415*	426.2*
	85LC	350	350	361.2	361	372.2	—	—	—	—	—	—
	100LC	395	395	406.2	411	422.2	—	—	—	—	—	—
HRX	25C/R	99.6	99.6	104.8	104.6	109.8	117.2	122.4	122.2	127.4	122.2	127.4
	25LC/LR	116.4	116.4	121.6	121.4	126.6	134	139.2	139	144.2	139	144.2
	30C/R	110.6	110.6	117.2	115.6	122.2	128.2	134.8	133.2	139.8	133.2	139.8
	30LC/LR	135.1	135.1	141.7	140.1	146.7	152.7	159.3	157.7	164.3	157.7	164.3
	35C/R	123.2	123.2	130.2	131.6	138.6	140.8	147.8	149.2	156.2	149.2	156.2
	35LC/LR	151.2	151.2	158.2	159.6	166.6	168.8	175.8	177.2	184.2	177.2	184.2
	45C/R	150.7	150.7	157.7	159.9	166.9	171.3	178.3	180.5	187.5	180.3	187.3
	45LC/LR	185.7	185.7	192.7	194.9	201.9	206.3	213.3	215.5	222.5	215.3	222.3
	55C/R	180.2	180.2	187.2	189.4	196.4	200.8	207.8	210	217	209.8	216.8
	55LC/LR	229.7	229.7	236.7	238.9	245.9	250.3	257.3	259.5	266.5	259.3	266.3
	65C/R	239.1	239.1	246.5	250.3	257.7	263.1	270.5	274.3	281.7	274.1	281.5
	65LC/LR	304.1	304.1	311.5	315.3	322.7	328.1	335.5	339.3	346.7	339.1	346.5

* The overall LM block length (L) of YY type (with side scraper) is also the same.

Note1) The standard overall length may include the dimension of the end seal depending on the model. If you are considering using a type without an end seal, contact THK for details.

Note2) It is recommended to use a protector with models SVR/SVS, NR-X/NRS-X, and SRG. Please contact THK regarding the dimensions for ZZHH and KKHH. See **A1-543** for details regarding the codes for the various options.

Model number coding

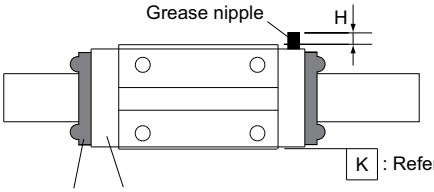
SHS25 LC 2 QZ KKHH C0 +1200L P Z T -II

- SHS25: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator (*1)
- KKHH: Contamination protection accessory symbol (*2)
- C0: Radial clearance symbol (*3)
  - Normal (No symbol)
  - Light preload (C1)
  - Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*4)
  - Normal grade (No Symbol)
  - High accuracy grade (H)
  - Precision grade (P)/Super precision grade (SP)
  - Ultra precision grade (UP)
- Z: With steel tape
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*5)

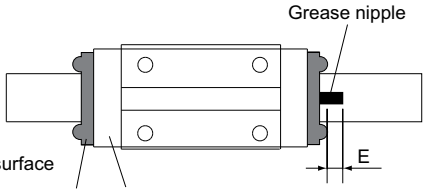
(*1) See A1-536. (*2) See A1-543. (*3) See A1-73. (*4) See A1-78. (*5) See A1-13.

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.)
Grease nipples are not installed when there is a QZ Lubricator.

Dimensional Increase with Grease Nipple (When LaCS is Attached)



Grease nipple mounting location
for models SHS, SSR, SVR/SVS, NR-X/NRS-X, SRG, and HRX



Grease nipple mounting location
for models SHW, SRS and HSR

Unit: mm

Model No.		Dimensional increase with grease nipple H	Nipple type
SHS	15C/LC	—	PB107
	15R/V/LV	4.7	PB107
	20C/LC	—	PB107
	20V/LV	4.5	PB107
	25C/LC	—	PB107
	25R/LR/V/LV	4.7	PB107
	30C/LC	—	A-M6F
	30R/LR/V/LV	7.4	A-M6F
	35C/LC	—	A-M6F
	35R/LR/V/LV	7.4	A-M6F
	45C/LC	—	A-M6F
	45R/LR/V/LV	7.7	A-M6F
	55C/LC	—	A-M6F
	55R/LR/V/LV	7.4	A-M6F
	65C/LC	—	A-M6F
	65V/LV	6.9	A-M6F
SSR	15XV/XW	4.4	PB107
	15XTB/XSB	—	PB107
	20XV/XW	4.6	PB107
	20XTB/XSB	—	PB107
	25XV/XW	4.5	PB107
	25XTB/XSB	—	PB107
	30XV/XW	5	PB1021B
	30XTB/XSB	—	PB1021B
	35XV/XW	5	PB1021B
	35XTB/XSB	—	PB1021B
SVR/SVS NR-X/ NRS-X*	25R/LR	5.5	PB1021B
	30R/LR	5.5	PB1021B
	35R/LR/RH/LRH	9	A-M6F
	45R/LR/RH/LRH	9	A-M6F
	55R/LR/RH/LRH	9	A-M6F
	65R/LR	12	A-PT1/8

Unit: mm

Model No.		Dimensional increase with grease nipple H	Nipple type
SRG	35C/LC/SLC	—	A-M6F
	35R/LR/SLR	7.2	A-M6F
	45C/LC/SLC	—	A-M6F
	45R/LR/SLR	7.2	A-M6F
	55C/LC/SLC	—	A-M6F
	55R/LR/SLR	7.2	A-M6F
	65C/LC/SLC	—	A-M6F
	65V/LV/SLV	6.2	A-M6F
HRX	25C/LC	—	A-M6F
	25R/LR	6.9	A-M6F
	30C/LC	—	A-M6F
	30R/LR	6.9	A-M6F
	35C/LC	—	A-M6F
	35R/LR	6.7	A-M6F
	45C/LC	—	A-M6F
	45R/LR	6.7	A-M6F
	55C/LC	—	A-M6F
	55R/LR	6.2	A-M6F
	65C/LC	—	A-M6F
	65R/LR	6.2	A-M6F

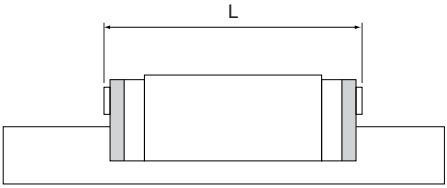
∗ The dimensional increase with a grease nipple when the side scraper and the protector are attached (SVR/SVS and SRG only) is also the same.

Unit: mm

Model No.		Dimensional increase with grease nipple E	Nipple type
SHW	21CA/CR	4.2	PB1021B
	27CA/CR	10.7	B-M6F
	35CA/CR	10	B-M6F
	50CA/CR	21	B-PT1/8
SRS	25	4	PB1021B
HSR	15R/YR	2.9	PB1021B
	15LC/LR	2.9	PB1021B
	20R/CA/CB/YR	9.4	B-M6F
	20LR/HA/HB	9.4	B-M6F
	25R/CA/CB/YR	9	B-M6F
	25LR/HA/HB	9	B-M6F
	30R/CA/CB/YR	9	B-M6F
	30LR/HA/HB	9	B-M6F
	35R/CA/CB/YR	8	B-M6F
	35LR/HA/HB	8	B-M6F

Note1) Contact THK if you desire a grease nipple mounting location other than the above.
Note2) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note3) When desiring a grease nipple for model SHW or SRS without QZ Lubricator, indicate “with grease nipple” when placing an order. (If not, a grease nipple will not be attached.)
Note4) Model HSR15 attached with ZZ or KK cannot have a grease nipple. Contact THK for details.

LM Block Length (Dimension L) with LiCS Attached



Unit: mm

Model No.		L	
		GG	PP
SSR	15XV/XSB	48.7	48.7
	15XW/XTB	65.3	65.3
	20XV/XSB	55.8	55.8
	20XW/XTB	74.6	74.6
	25XV/XSB	67.6	67.6
	25XW/XTB	90.6	90.6
	30XV/XSB	76.4	76.4
	30XW/XTB	106.7	106.7
	35XV/XSB	88.3	88.3
	35XW/XTB	121.7	121.7
SRG	15XA	77	77
	15XV	77	77

Model number coding

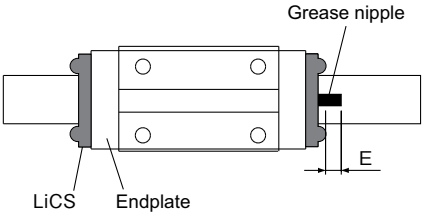
SSR20 XW 2 GG C1 +600L P T -II

- SSR20: Model number
- XW: Type of LM block
- 2: No. of LM blocks used on the same rail
- GG: With LiCS (*1)
- C1: Radial clearance symbol (*2) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +600L: LM rail length (in mm)
- P: Accuracy symbol (*3) — 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 (*4)

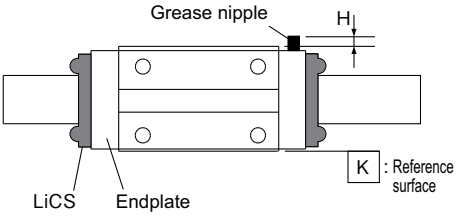
(*1) See A1-515 (*2) See A1-73 (*3) See A1-78 (*4) See A1-13

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.)
Grease nipples are not installed when there is a QZ Lubricator.

Dimensional Increase with Grease Nipple (When LiCS is Attached)



Model SSR
Location for mounting the grease nipple



Model SRG
Location for mounting the grease nipple

Unit: mm

Model No.		Dimensional increase with a grease nipple		Nipple type
		E	H	
SSR	15XV	2.9	—	PB1021B
	15XW/XTB	2.9	—	PB1021B
	20XV	9	—	B-M6F
	20XW/XTB	9	—	B-M6F
	25XV	9	—	B-M6F
	25XW/XTB	9	—	B-M6F
	30XV/XW	9	—	B-M6F
	30XTB/XSB	9	—	B-M6F
	35XV/XW	8	—	B-M6F
	35XTB/XSB	8	—	B-M6F
SRG	15XA	—	—*	PB107
	15XV	—	4.5	PB107

* Because this model features a flange, it projects beyond the block end surface.

Model number coding

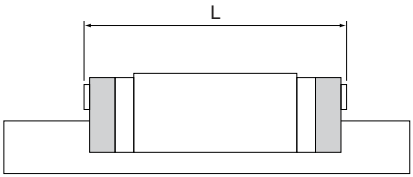
SSR20 XW 2 GG C1 +600L H -II

- SSR20: Model number
- XW: Type of LM block
- 2: No. of LM blocks used on the same rail
- GG: With LiCS (*1)
- C1: Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +600L: LM rail length (in mm)
- H: Accuracy symbol (*3)
  Normal grade (No Symbol)
  High accuracy grade (H)/Precision grade (P)
  Super precision grade (SP)/Ultra precision grade (UP)
- -II: Symbol for No. of rails used on the same plane (*4)

(*1) See A1-515 (*2) See A1-73 (*3) See A1-78 (*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.)
Grease nipples are not installed when there is a QZ Lubricator.

Overall Block Length with Fluorine Seals and Other Accessories Attached



Unit: mm

Model No.		L					
		F2	F4	FZ2	FZ4	FJ2	FJ4
		Fluorine seals	Fluorine seals (double)	Fluorine seals + metal scrapers	Fluorine seals (double) + metal scrapers	Fluorine seals + protectors	Fluorine seals (double) + protectors
SRG	35C/R	129	140.8	137.4	149.2	137.4	149.2
	35LC/LR	159	170.8	167.4	179.2	167.4	179.2
	35SLC/SLR	184.8	196.6	193.2	205	193.2	205
	45C/R	159	172.2	168.2	181.4	168	181.2
	45LC/LR	194	207.2	203.2	216.4	203	216.2
	45SLC/SLR	235.5	248.7	244.7	257.9	244.5	257.7
	55C/R	189	202.2	198.2	211.4	198	211.2
	55LC/LR	239	252.2	248.2	261.4	248	261.2
	55SLC/SLR	296	309.2	305.2	318.4	305	318.2
	65C/V	249.3	264.9	260.5	276.1	260.3	275.9
	65LC/LV	307.4	323	318.6	334.2	318.4	334
	65SLC/SLV	384.4	400	395.6	411.2	395.4	411

Model No.		L					
		QZF2	QZF4	QZFZ2	QZFZ4	QZFJ2	QZFJ4
		QZ + fluorine seals	QZ + fluorine seals (double)	QZ + fluorine seals + metal scrapers	QZ + fluorine seals (double) + metal scrapers	QZ + fluorine seals + protectors	QZ + fluorine seals (double) + protectors
SRG	35C/R	159	170.8	167.4	179.2	167.4	179.2
	35LC/LR	189	200.8	197.4	209.2	197.4	209.2
	35SLC/SLR	214.8	226.6	223.2	235	223.2	235
	45C/R	189	202.2	198.2	211.4	198	211.2
	45LC/LR	224	237.2	233.2	246.4	233	246.2
	45SLC/SLR	265.5	278.7	274.7	287.9	274.5	287.7
	55C/R	229	242.2	238.2	251.4	238	251.2
	55LC/LR	279	292.2	288.2	301.4	288	301.2
	55SLC/SLR	336	349.2	345.2	358.4	345	358.2
	65C/V	289.3	304.9	300.5	316.1	300.3	315.9
	65LC/LV	347.4	363	358.6	374.2	358.4	374
	65SLC/SLV	424.4	440	435.6	451.2	435.4	451

Maximum Seal Resistance

This shows the maximum resistance value of the seals per LM block with a lubricant applied.

Unit: N

Model No.		Seal symbol	Maximum seal resistance
SHS	15	SS	4.5
	20		7.0
	25		10.5
	30		17.0
	35		20.5
	45		30.0
	55		31.5
	65		43.0
SSR	15X	UU	2.0
	20X		2.6
	25X		3.5
	30X		4.9
	35X		6.3
SVR/SVS	25	SS	10
	30		14
	35		18
	45		22
	55		26
	65		31
SHW	12CA/CR	UU	1.0
	12HR		1.0
	14		1.2
	17		1.4
	21		4.9
	27		4.9
	35		9.8
	50		14.7
	12CA/CR	SS	1.4
	12HR		1.8
	14		1.8
	17		2.2
	21		6.9
	27		8.9
	35		15.8
	50		22.7

Unit: N

Model No.		Seal symbol	Maximum seal resistance
SRS	5M/5N	UU	0.06
	5WM/5WN		0.08
	7S	SS	0.14
	7M		0.16
	7N		0.19
	7WS		0.48
	7WM		0.52
	7WN		0.55
	9XS		0.15
	9XM		0.2
	9XN		0.25
	9WS		0.89
	9WM		0.95
	9WN		1
	12S		0.49
	12M		0.55
	12N		0.6
	12WS		1.21
	12WM		1.3
	12WN		1.35
	15S		0.92
	15M		1
	15N		1.1
	15WS		1.45
	15WM		1.55
	15WN		1.6
	20M		1.25
	25M		1.6
SCR	15	UU	2.5
	20		3
	25		5
	30		10
	35		12
	45		20
	65		30

Unit: N

Model No.		Seal symbol	Maximum seal resistance
HSR	8	UU	0.5
	10		0.8
	12		1.2
	15		2.0
	20		2.5
	25		3.9
	30		7.8
	35		11.8
	45		19.6
	55		19.6
	65		34.3
	85		34.3
SR	15	UU	2.5
	20		3.4
	25		4.4
	30		8.8
	35		11.8
	45		12.7
	55		15.7
	70		19.6
NR-X/ NRS-X	25	SS	10
	30		14
	35		18
	45		22
	55		26
	65		31
NR/NRS	75	UU	42
	85		42
	100		51
HRW	12	UU	0.2
	14		0.3
	17		2.9
	21		4.9
	27		4.9
	35		9.8
	50		14.7
	60		19.6
RSX	5	UU	0.04
	5W		0.05
	7		0.08
	7W		0.08
	9		0.1

Unit: N

Model No.		Seal symbol	Maximum seal resistance
RSX	9W	UU	0.1
	12		0.4
	12W		0.4
	15		0.8
	15W		0.8
RSR	14W	UU	1.2
HR	918	UU	0.5
	1123		0.7
	1530		1.0
	2042		2.0
	2555		2.9
	3065		3.4
	3575		3.9
	4085		4.4
	50105		5.9
	60125		9.8
GSR	15	UU	2.5
	20		3.1
	25		4.4
	30		6.3
	35		7.6
	25-R		4.4
	30-R		6.3
	35-R		7.6
CSR	15	UU	2.0
	20		2.5
	25		3.9
	30		7.8
	35		11.8
	45		19.6
MX	5	UU	0.06
	7W		0.4
JR	25	UU	3.9
	35		11.8
	45		19.6
	55		19.6
HCR	12	UU	1.2
	15		2.0
	25		3.9
	35		11.8
	45		19.6
	65		34.3

Unit: N

Model No.		Seal symbol	Maximum seal resistance
HMG	15	UU	3
	25		6
	35		8
	45		12
	65		40
NSR	20TBC	UU	4.9
	25TBC		4.9
	30TBC		6.9
	40TBC		9.8
	50TBC		14.7
	70TBC		24.5
HSR	15M1	UU	2.0
	20M1		2.5
	25M1		3.9
	30M1		7.8
	35M1		11.8
SR	15M1	UU	2.5
	20M1		3.4
	25M1		4.4
	30M1		8.8
	35M1		11.8
RSX-M1	9	UU	0.1
	9W		0.1
	12		0.4
	12W		0.4
	15		0.8
	15W		0.8
RSR	9M1	UU	0.1
	12M1		0.4
	15M1		0.8
	20M1		1.0
	9M1W		0.8
	12M1W		1.1
	15M1W		1.3
HSR	15M2	UU	2.0
	20M2		2.5
	25M2		3.9

Unit: N

Model No.		Seal symbol	Maximum seal resistance
SRG	15X	SS	13
	20X		18
	25X		19
	30X		22
	35		30
	45		30
	55		34
	65		40
	85		47
	100		53
SRN	35	SS	30
	45		30
	55		35
	65		40
SRW	70	SS	32
	85		37
	100		43
	130		50
	150		57
HRX	25	SS	14
	30		15
	35		18
	45		23
	55		26
	65		32

Maximum Resistance for LaCS

Unit: N

Model No.		Maximum resistance for LaCS
SHS	15	5.2
	20	6.5
	25	11.7
	30	18.2
	35	20.8
	45	26.0
	55	32.5
	65	39.0
SSR	15	5.9
	20	6.9
	25	8.1
	30	12.8
	35	15.1
SVR/SVS NR-X/NRS-X	25	8.1
	30	13.4
	35	15.5
	45	23.3
	55	28.6
	65	39.6
NR/NRS	85	52.7
NR	75	38.0
	100	65.0
SHW	12	2.6
	14	3.9
	17	3.9
	21	3.9
	27	6.5
	35	13.0
	50	19.5
SRS	9	2.3
	9W	3.3
	12	3.5
	12W	4.2
	15	5.1
	15W	7.5
	20	5.2
	25	7.8

Unit: N

Model No.		Maximum resistance for LaCS
SCR	15	5.2
	20	6.5
	25	11.7
	30	18.2
	35	20.8
	45	26.0
	65	39.0
HSR	15	3.8
	20	5.6
	25	7.5
	30	14.9
	35	22.4
	45	32.1
	55	36.5
	65	43.8
	85	69.5
SRG	20X	6.1
	25X	6.9
	30X	8.2
	35	9.1
	45	14.3
	55	18.2
	65	26.0
SRN	35	9.1
	45	14.3
	55	18.2
	65	22.1
SRW	70	32.8
	85	39.7
	100	58.3
HRX	25	6.3
	30	7.2
	35	13
	45	18
	55	25
	65	34

Note1) Each resistance value in the table only consists of that of LaCS, and does not include sliding resistances of seals and other accessories.
Note2) For the maximum service speed of LaCS, contact THK.
Note3) HH type (with LaCS) for models SVR/SVS and SRG is provided with the protector (see A1-513). Contact THK if you want to use the protector with other options.

Maximum Resistance for LiCS

Unit: N

Model No.		Maximum resistance for LiCS
SSR	15X	1
	20X	1.1
	25X	1.6
	30X	1.6
	35X	2
SRG	15X	0.7

Note) The value indicates the sliding resistance of two LiCS units per LM block and does not include the sliding resistances of the LM block and the side seals.

Maximum Seal Resistance of FS

Unit: N

Model No.		Seal symbol	Maximum seal resistance
SRG	35	Model F2	30
	45		30
	55		34
	65		40

Note) This is the sliding resistance of two fluorine seals and one inner seal on one LM block and excludes the sliding resistance of the block.

Maximum Resistance for the Side Scraper

Unit: N

Model No.		Maximum resistance for the side scraper (KKHHYY/TTHHYY Option)
SVR/ SVS NR-X/ NRS-X	25	4.4
	25L	5.2
	30	4.7
	30L	5.5
	35	4.6
	35L	5.5
	45	5.1
	45L	6.1
	55	5.3
	55L	6.3
	65	5.4
	65L	6.9

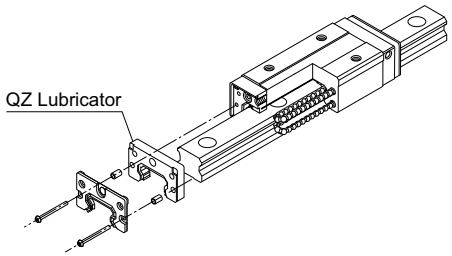
Unit: N

Model No.		Maximum resistance for the side scraper (DDHHYY Option)
SRG	35	2.9
	35L	3.4
	35SL	3.9
	45	4.7
	45L	5.6
	45SL	6.8
	55	5.5
	55L	6.8
	55SL	8.3
	65	7.2
	65L	8.7
	65SL	10.9

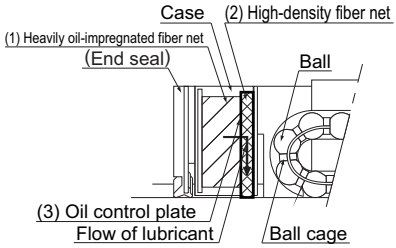
QZ Lubricator

●For the supported models, see the table of options by model number on A1-504.
●For the LM block length with QZ attached, see A1-539 to A1-542.
●For notes regarding how to handle the QZ, see A1-580.

The QZ Lubricator feeds the right amount of lubricant to the LM rail raceway. This allows an oil film to continuously be formed between the rolling element and the raceway, and drastically extends the lubrication and maintenance intervals.
The structure of the QZ Lubricator consists of three major components: (1) a heavily oil-impregnated fiber net (functions to store lubricant), (2) a high-density fiber net (functions to apply lubricant to the raceway) and (3) an oil-control plate (functions to adjust oil flow). The lubricant contained in the QZ Lubricator is primarily fed by capillary action, which is also used in devices such as felt-tip pens.



External View



Structural Drawing

Features

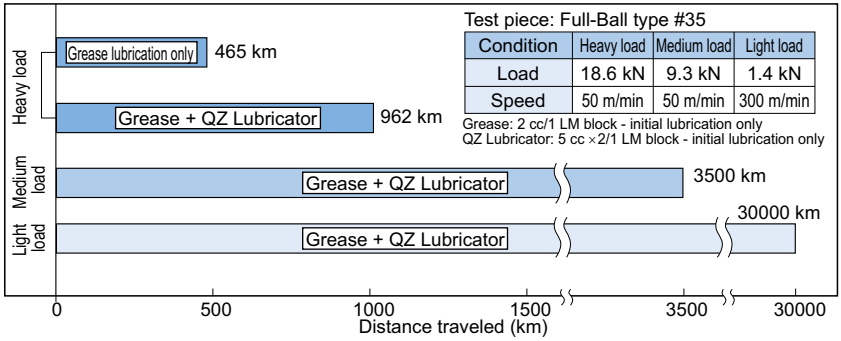
- Since it compensates for oil loss, the lubrication maintenance interval can be significantly extended.
- Because it feeds the appropriate amount of lubricant directly to the ball raceway, it is an environmentally-friendly lubrication system that does not contaminate the surrounding area.

Symbol	Contamination protection accessories
QZUU	With end seal + QZ
QZSS	With end seal + side seal + inner seal*1 + QZ
QZDD	With double seals + side seal + inner seal*1 + QZ
QZZZ	With end seal + side seal + inner seal*1 + metal scraper + QZ
QZKK	With double seals + side seal + inner seal*1 + metal scraper + QZ
QZGG	With LiCS + QZ
QZPP	With LiCS + side seal + inner seal*1 + QZ
QZSSHH	With end seal + side seal + inner seal*1 + LaCS + QZ
QZDDHH	With double seals + side seal + inner seal*1 + LaCS + QZ
QZZZHH	With end seal + side seal + inner seal*1 + metal scraper + LaCS + QZ
QZKKHH	With double seals + side seal + inner seal*1 + metal scraper + LaCS + QZ
QZJJHH*2	With end seal + side seal + inner seal*1 + LaCS + QZ + protector (serving also as metal scraper)
QZTTHH*2	With double seals + side seal + inner seal*1 + LaCS + QZ + protector (serving also as metal scraper)

*1 Some models are not equipped with inner seals (see A1-504).
*2 QZJJHH and QZTTHH are only available for models SVR/SVS, NR-X/NRS-X, SRG, and HRX.
Note1) For models SVR/SVS, NR-X/NRS-X, SRG, and HRX with HH specifications (with LaCS), a protector (A1-513) can be installed.
Contact THK if you want to use the protector with other options.
Note2) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

● Significantly Extended Maintenance Interval

Attaching a QZ Lubricator helps extend the maintenance interval throughout the whole load range from the light load area to the heavy load area.



Test piece: Full-Ball type #35

Condition	Heavy load	Medium load	Light load
Load	18.6 kN	9.3 kN	1.4 kN
Speed	50 m/min	50 m/min	300 m/min

Grease: 2 cc/1 LM block - initial lubrication only
QZ Lubricator: 5 cc ×2/1 LM block - initial lubrication only

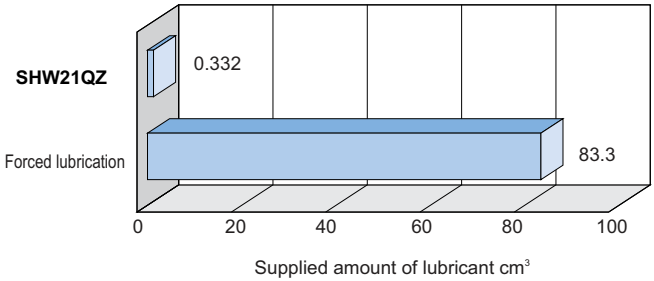
LM Guide Running Test without Replenishment of Lubricant

● Effective Use of Lubricant

Since the lubricator feeds the right amount of lubricant to the ball raceway, lubricant can be used efficiently.

Test speed: 300 m/min

Comparison of lubricant consumption after traveling 5,000 km



Amount of oil contained in QZ Lubricator
0.166 cm³/ 2 units
(attached to both ends of the LM block)
= 0.332 cm³

Compared

Forced lubrication
0.03 cm³/6 min×16667 min
= 83.3 cm³

Lubricant consumption is 1/250 that of forced lubrication

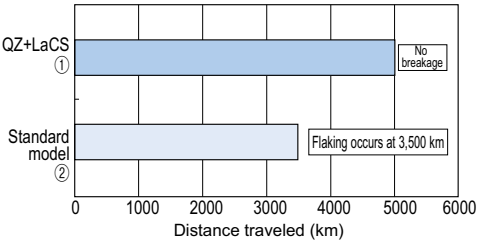
● Assists with Lubrication in Severe Environments

A 5,000 km durability test was conducted in severe environments (exposed to coolant and contaminants).

Test Conditions

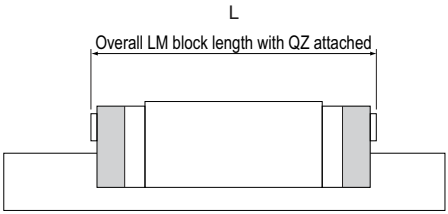
Model No.	① Caged Ball LM Guide #45	② Full-Ball type #45
Load	8 kN	6 kN
Speed	60 m/min	
Coolant	Immersed 48 h, dried 96 h	
Foreign material	Foundry dust (125 μm or less)	
Lubrication	AFA Grease + QZ	Super Multi 68 Oiling cycle: 0.1 cc/shot Periodically lubricated every 16 min

Test Results



Note: When using the LM System in a severe environment, use a combination of a QZ Lubricator and a Laminated Contact Scraper LaCS (see "Laminated Contact Scraper LaCS" on **A1-510**).

LM Block Length (Dimension L) with QZ Attached



Unit: mm

Model No.		L								
		QZUU	QZSS	QZDD	QZZZ	QZKK	QZSSHH	QZDDHH	QZZZHH	QZKKHH
SHS	15C/V/R	84.4	84.4	89.8	86.8	92.2	100	105.4	101.2	106.6
	15LC/LV	99.4	99.4	104.8	101.8	107.2	115	120.4	116.2	121.6
	20C/V	99	99	105.4	103	109.4	115.4	121.8	117.8	124.2
	20LC/LV	118	118	124.4	122	128.4	134.4	140.8	136.8	143.2
	25C/V/R	114.4	114.4	121.6	120.4	127.6	132	139.2	134.4	141.6
	25LC/LV/LR	131.4	131.4	138.6	137.4	144.6	149	156.2	151.4	158.6
	30C/V/R	127.4	127.4	136	133.8	142.4	149.4	158	151.8	160.4
	30LC/LV/LR	152.4	152.4	161	158.8	167.4	174.4	183	176.8	185.4
	35C/V/R	145	145	154.8	152.4	162.2	168	177.8	170.4	180.2
	35LC/LV/LR	175	175	184.8	182.4	192.2	198	207.8	200.4	210.2
	45C/V/R	173	173	182.8	181.2	191	199	208.8	202.2	212
	45LC/LV/LR	207	207	216.8	215.2	225	233	242.8	236.2	246
	55C/V/R	205.4	205.4	216.6	214.2	225.4	232	243.2	235.2	246.4
	55LC/LV/LR	247.4	247.4	258.6	256.2	267.4	274	285.2	277.2	288.4
	65C/V	256.2	256.2	268.6	266.2	278.6	288	300.4	291.2	303.6
	65LC/LV	307.2	307.2	319.6	317.2	329.6	339	351.4	342.2	354.6
SSR	15XV/XSB	59.3	59.3	65.1	62.7	68.5	75.5	81.3	76.7	82.5
	15XW/XTB	75.9	75.9	81.7	79.3	85.1	92.1	97.9	93.3	99.1
	20XV/XSB	66.2	66.2	73.1	72.1	79	83.7	90.6	86.1	93
	20XW/XTB	85	85	91.9	90.9	97.8	102.5	109.4	104.9	111.8
	25XV/XSB	82.6	82.6	90	88.4	95.8	100	107.4	102.4	109.8
	25XW/XTB	105.6	105.6	113	111.4	118.8	123	130.4	125.4	132.8
	30XV/XSB	89.4	89.4	97.5	95.1	103.2	110.7	118.8	113.1	121.2
	30XW/XTB	119.7	119.7	127.8	125.4	133.5	141	149.1	143.4	151.5
	35XV/XSB	100.9	100.9	109.9	107.9	116.9	123.5	132.5	125.9	134.9
	35XW/XTB	134.3	134.3	143.3	141.3	150.3	156.9	165.9	159.3	168.3
SHW	12CAM/CRM	47	47	—	—	—	58	—	—	—
	12HRM	60.4	60.4	—	—	—	71.4	—	—	—
	14CAM/CRM	55.5	55.5	—	—	—	70.7	—	—	—
	17CAM/CRM	63	63	66	65.4	68.4	78.2	81.2	79.4	82.4
	21CA/CR	75	75	80	78.6	83.6	91.6	96.6	93.2	98.2
	27CA/CR	92.8	92.8	98.6	97.2	103	109.4	115.2	111.8	117.6
	35CA/CR	127	127	134.4	132	139.4	149	156.4	151.4	158.8
	50CA/CR	161	161	169.2	167.4	175.6	186	194.2	188.4	196.6

Note: Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Unit: mm

Model No.		L								
		QZUU	QZSS	QZDD	QZZZ	QZKK	QZSSHH	QZDDHH	QZZZHH	QZKKHH
SRS	7S	29	29	—	—	—	—	—	—	—
	7M	33.4	33.4	—	—	—	—	—	—	—
	7N	41	41	—	—	—	—	—	—	—
	7WS	32.5	32.5	—	—	—	—	—	—	—
	7WM	41	41	—	—	—	—	—	—	—
	7WN	50.9	50.9	—	—	—	—	—	—	—
	9XS	31.5	31.5	—	—	—	43.1	—	—	—
	9XM	40.8	40.8	—	—	—	52.4	—	—	—
	9XN	50.8	50.8	—	—	—	62.4	—	—	—
	9WS	36.5	36.5	—	—	—	48.1	—	—	—
	9WM	49	49	—	—	—	60.6	—	—	—
	9WN	60.7	60.7	—	—	—	72.3	—	—	—
	12S	35	35	—	—	—	46.6	—	—	—
	12M	44.4	44.4	—	—	—	56	—	—	—
	12N	57.1	57.1	—	—	—	69.1	—	—	—
	12WS	40.5	40.5	—	—	—	52.1	—	—	—
	12WM	54.5	54.5	—	—	—	66.1	—	—	—
	12WN	69.5	69.5	—	—	—	81.1	—	—	—
	15S	44	44	—	—	—	58.2	—	—	—
	15M	55	55	—	—	—	69.2	—	—	—
	15N	72.8	72.8	—	—	—	87	—	—	—
	15WS	53.5	53.5	—	—	—	67.7	—	—	—
	15WM	67.5	67.5	—	—	—	81.7	—	—	—
	15WN	86.5	86.5	—	—	—	100.9	—	—	—
	20M	66	66	—	—	—	81.2	—	—	—
	25M	97	97	—	—	—	112.6	—	—	—
SCR	15S	84.4	84.4	89.8	86.8	92.2	100.4	105.4	101.4	106.9
	20S	99	99	105.4	103	109.4	115.5	122	118	124.5
	20	118	118	124.4	122	128.4	134.5	141	137	143.5
	25	131.4	131.4	138.6	137.4	144.6	149	156.2	151.4	158.6
	30	152.4	152.4	161	158.8	167.4	174.4	183	176.8	185.4
	35	175	175	184.8	182.4	192.2	198	207.8	200.4	210.2
	45	207	207	216.8	215.2	225	233	242.8	236.2	246
	65	307.2	307.2	319.6	317.2	329.6	339	351.4	342.2	354.6

Note: Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Unit: mm

Model No.		L										
		QZUU	QZSS	QZDD	QZZZ	QZKK	QZSSHH	QZDDHH	QZZZHH	QZKKHH	QZJJHH	QZTTHH
HSR	15C/R/YR	76.6	76.6	84.6	81.2	89.2	95.8	103.8	97	105	—	—
	15LC/LR	94.6	94.6	102.6	99.2	107.2	113.8	121.8	115	123	—	—
	20C/R/CA/CB/YR	93	93	101.2	98.8	107	110.4	118.6	112.8	121	—	—
	20LC/LR/HA/HB	109	109	117.2	114.8	123	126.4	134.6	128.8	137	—	—
	25C/R/CA/CB/YR	100.9	100.9	108.9	106.6	114.6	118.2	126.2	120.6	128.6	—	—
	25LC/LR/HA/HB	120	120	128	125.7	133.7	137.3	145.3	139.5	147.7	—	—
	30C/R/CA/CB/YR	115.8	115.8	123.8	121.5	129.5	137.1	145.1	139.5	147.5	—	—
	30LC/LR/HA/HB	138.4	138.4	146.4	144.1	152.1	159.7	167.7	162.1	170.1	—	—
	35C/R/CA/CB/YR	129	129	138.8	135.8	145.6	151.4	161.2	153.8	163.6	—	—
	35LC/LR/HA/HB	154.4	154.4	164.2	161.2	171	176.8	186.6	179.2	189	—	—
	45C/R/CA/CB/XYR/YR	168.5	168.5	178.3	176.7	186.5	197.4	207.2	200.6	210.4	—	—
	45LC/LR/HA/HB	200.3	200.3	210.1	208.5	218.3	229.2	239	232.4	242.2	—	—
	55C/R/CA/CB/XYR/YR	193.4	193.4	204.6	202.1	213.3	223.4	234.6	226.6	237.8	—	—
	55LC/LR/HA/HB	231.5	231.5	242.7	240.2	251.4	261.5	272.7	264.7	275.9	—	—
	65XC/XR/XCA/XCB/XYR	222.7	222.7	233.9	232.5	243.7	258.3	269.5	261.5	272.7	—	—
	65XLC/XLR/XHA/XHB	282.2	282.2	293.4	292	303.2	317.8	329	321	332.2	—	—
SRN	35C/R	155	155	162.8	163.4	171.2	178.6	186.4	181	188.8	—	—
	35LC/LR	185	185	192.8	193.4	201.2	208.6	216.4	211	218.8	—	—
	35SLC/SLR	210.8	210.8	218.6	219.2	227	234.4	242.2	236.8	244.6	—	—
	45C/R	185	185	194.2	194.2	203.4	212	221.2	215.2	224.5	—	—
	45LC/LR	220	220	229.2	229.2	238.4	247	256.2	250.2	259.4	—	—
	45SLC/SLR	261.5	261.5	270.7	270.7	279.9	288.5	297.7	291.7	300.9	—	—
	55C/R	225	225	234.2	234.2	243.4	252	261.2	255.2	264.4	—	—
	55LC/LR	275	275	284.2	284.2	293.4	302	311.2	305.2	314.4	—	—
	55SLC/SLR	332	332	341.2	341.2	350.4	359	368.2	362.2	371.4	—	—
	65C/R	284.9	284.9	296.1	296.1	307.3	317.3	328.5	320.5	331.7	—	—
	65LC/LR	343	343	354.2	354.2	370.4	380.4	391.6	378.6	389.8	—	—
	65SLC/SLR	420	420	431.2	431.2	442.4	452.4	463.6	455.6	466.8	—	—
SRW	70	220	220	229.2	229.2	238.4	247	256.2	250.2	259.4	—	—
	85	275	275	284.2	284.2	293.4	302	311.2	305.2	314.4	—	—
	100	343	343	354.2	354.2	370.4	380.4	391.6	378.6	389.8	—	—
SVS/ SVR NR-X/ NRS-X	25R/C	102.8	102.8	108	108.5	113.7	116.8	122.0	—	—	122.5*	127.7*
	25LR/LC	122	122	127.2	127.7	132.9	136.0	141.2	—	—	141.7*	146.9*
	30R/C	118	118	124.6	123.7	130.3	135.2	141.8	—	—	140.9*	147.5*
	30LR/LC	140.5	140.5	147.1	146.2	152.8	157.7	164.3	—	—	163.4*	170.0*
	35R/C/RH/CH	139.5	139.5	146.5	146.3	153.3	156.7	163.7	—	—	163.5*	170.5*
	35LR/LC/LRH/LCH	165	165	172	171.8	178.8	182.2	189.2	—	—	189.0*	196.0*
	45R/C/RH/CH	168.2	168.2	175.2	175.8	182.8	188.2	195.2	—	—	195.8*	202.8*
	45LR/LC/LRH/LCH	201	201	208	208.6	215.6	221.0	228.0	—	—	228.6*	235.6*
	55R/C/RH/CH	201.4	201.4	208.4	209.0	216.0	222.4	229.4	—	—	231.1*	238.1*
	55LR/LC/LRH/LCH	238.6	238.6	245.6	246.2	253.2	259.6	266.6	—	—	268.3*	275.3*
	65R/C	224.4	224.4	231.8	233.1	240.5	248.8	256.2	—	—	257.5*	264.9*
	65LR/LC	284.4	284.4	291.8	293.1	300.5	308.8	316.2	—	—	317.5*	324.9*

* The overall LM block length (L) of YY type (with side scraper) is also the same.

Note1) For models SVR/SVS, SRG, and HRX, we recommend attaching a protector. For the dimensions of QZZZHH and QZKKHH, contact THK. See A1-543 for details regarding the codes for the various options.

Note2) 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

Model No.		L										
		QZUU	QZSS	QZDD	QZZZ	QZKK	QZSSHH	QZDDHH	QZZZHH	QZKKHH	QZJJHH	QZTTHH
SRG	15X A/V	90.6	90.6	92.6	—	—	—	—	—	—	—	—
	20X A/V	107.6	107.6	109.6	111	113	125.2	127.2	127.6	129.6	—	—
	20X LA/LV	127.6	127.6	129.6	131	133	145.2	147.2	147.6	149.6	—	—
	25X C/R	125.1	125.1	130.1	130.1	135.1	144.9	151.3	147.3	153.7	—	—
	25X LC/LR	145.1	145.1	150.1	150.1	155.1	164.9	171.3	167.3	173.7	—	—
	30X C/R	141	141	148	146	153	160.8	169.2	164.6	171.6	165	172
	30X LC/LR	165	165	172	170	177	184.8	193.2	188.6	195.6	189	196
	35C/R	155	155	162.8	163.4	171.2	172.6	180.4	181	188.8	181*	188.8*
	35LC/LR	185	185	192.8	193.4	201.2	202.6	210.4	211	218.8	211*	218.8*
	35SLC/SLR	210.8	210.8	218.6	219.2	227	228.4	236.2	236.8	244.6	236.8*	244.6*
	45C/R	185	185	194.2	194.2	203.4	205.6	214.8	214.8	224	214.6*	223.8*
	45LC/LR	220	220	229.2	229.2	238.4	240.6	249.8	249.8	259	249.6*	258.8*
	45SLC/SLR	261.5	261.5	270.7	270.7	279.9	282.1	291.3	291.3	300.5	291.1*	300.3*
	55C/R	225	225	234.2	234.2	243.4	245.6	254.8	254.8	264	254.6*	263.8*
	55LC/LR	275	275	284.2	284.2	293.4	295.6	304.8	304.8	314	304.6*	313.8*
	55SLC/SLR	332	332	341.2	341.2	350.4	352.6	361.8	361.8	371	361.6*	370.8*
	65C/V	284.9	284.9	296.1	296.1	307.3	308.9	320.1	320.1	331.3	319.9*	331.1*
	65LC/LV	343	343	354.2	354.2	365.4	367	378.2	378.2	389.4	378*	389.2*
	65LC/SLV	420	420	431.2	431.2	442.4	444	455.2	455.2	466.4	455*	466.2*
HRX	25C/R	129.6	129.6	134.8	134.6	139.8	147.2	152.4	152.2	157.4	152.2	157.4
	25LC/LR	146.4	146.4	151.6	151.4	156.6	164	169.2	169	174.2	169	174.2
	30C/R	140.6	140.6	147.2	145.6	152.2	158.2	164.8	163.2	169.8	163.2	169.8
	30LC/LR	165.1	165.1	171.7	170.1	176.7	182.7	189.3	187.7	194.3	187.7	194.3
	35C/R	153.2	153.2	160.2	161.6	168.6	170.8	177.8	179.2	186.2	179.2	186.2
	35LC/LR	181.2	181.2	188.2	189.6	196.6	198.8	205.8	207.2	214.2	207.2	214.2
	45C/R	180.7	180.7	187.7	189.9	196.9	201.3	208.3	210.5	217.5	210.3	217.3
	45LC/LR	215.7	215.7	222.7	224.9	231.9	236.3	243.3	245.5	252.5	245.3	252.3
	55C/R	220.2	220.2	227.2	229.4	236.4	240.8	247.8	250	257	249.8	256.8
	55LC/LR	269.7	269.7	276.7	278.9	285.9	290.3	297.3	299.5	306.5	299.3	306.3
	65C/R	279.1	279.1	286.5	290.3	297.7	303.1	310.5	314.3	321.7	314.1	321.5
	65LC/LR	344.1	344.1	351.5	355.3	362.7	368.1	375.5	379.3	386.7	379.1	386.5

∗ The overall LM block length (L) of YY type (with side scraper) is also the same.

Note1) For models SVR/SVS, SRG, and HRX, we recommend attaching a protector. For the dimensions of QZZZHH and QZ-KKHH, contact THK. See A**1-543** for details regarding the codes for the various options.

Note2) Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring a grease nipple for a model attached with QZ, contact THK.

Model number coding

SHS25 LC 2 QZ KKHH C0 +1200L P Z T -II

- SHS25: Model number
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator (*1)
- KKHH: Contamination protection accessory symbol (*2)
- C0: Radial clearance symbol (*3) — Normal (No symbol), Light preload (C1), Medium preload (C0)
- +1200L: LM rail length (in mm)
- P: Accuracy symbol (*4) — Normal grade (No Symbol), High accuracy grade (H), Precision grade (P)/Super precision grade (SP), Ultra precision grade (UP)
- Z: With steel tape
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane (*5)

(*1) See A**1-536**. (*2) See A**1-543**. (*3) See A**1-73**. (*4) See A**1-78**. (*5) See A**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.)
Grease nipples are not installed when there is a QZ Lubricator.

List of Parts Symbols

- For supported model numbers, see the corresponding table of options by model number on **A1-504**.
- For the overall block length (dimension L) of each model with seal options attached, see **A1-517** to **A1-525**.
- For the overall block length (dimension L) with the QZ option attached, see **A1-539** to **A1-542**.

Symbols for Seals and Metal Scraper

Symbol	Configuration of seal and metal scraper
No Symbol	Without seal
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

* Some models are not equipped with inner seals.(See **A1-504**)

Symbols for QZ Lubricator and Laminated Contract Scraper LaCS

Symbol	Configuration of options	Example
＊＊HH	(Seal or metal scraper) + LaCS	UUHH
＊＊HHYY	(Seal or metal scraper) + LaCS + side scraper	DDHHYY
QZ＊＊	With QZ + (seal or metal scraper)	QZZZ
QZ＊＊HH	With QZ + (seal or metal scraper) + LaCS	QZZZHH
QZ＊＊HHYY	With QZ + (seal or metal scraper) + LaCS + side scraper	QZKKHHYY

Note1) ＊＊ in the table represents the symbol for a seal and metal scraper.
Note2) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Symbols for Light-Resistance Contact Seal LiCS

Symbol	Configuration of options
GG	LiCS
PP	With LiCS + side seal + inner seal*
QZGG	With QZ + LiCS
QZPP	With QZ + LiCS + side seal + inner seal*

* Some models are not equipped with inner seals.(See **A1-504**)

Note) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Symbols for High Chemical Resistance Fluorine Seal FS

Symbol	Configuration of options
F2	With fluorine seal + side seal + inner seal
FZ2	With fluorine seal + side seal + inner seal + metal scraper
FJ2	With fluorine seal + side seal + inner seal + protector
F4	With fluorine seals (double) + side seal + inner seal
FZ4	With fluorine seals (double) + side seal + inner seal + metal scraper
FJ4	With fluorine seals (double) + side seal + inner seal + protector
QZF2	With fluorine seal + side seal + inner seal + QZ
QZFZ2	With fluorine seal + side seal + inner seal + metal scraper + QZ
QZFJ2	With fluorine seal + side seal + inner seal + QZ + protector
QZF4	With fluorine seals (double) + side seal + inner seal + QZ
QZFZ4	With fluorine seals (double) + side seal + inner seal + metal scraper + QZ
QZFJ4	With fluorine seals (double) + side seal + inner seal + QZ + protector

Symbols for Protector

* Supported models: SVR/SVS, NR/NRS, NR-X/NRS-X, SRG, and HRX

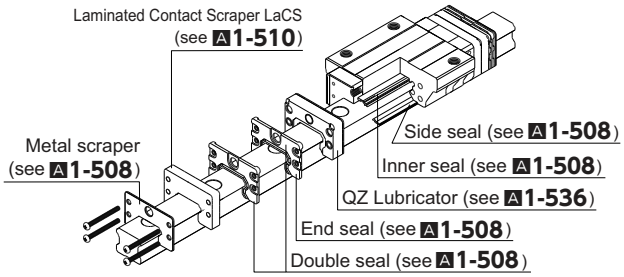
Symbol	Configuration of options
JJHH	With end seal + side seal + inner seal* + LaCS + protector (serves also as a metal scraper)
TTHH	With double seals + side seal + inner seal* + LaCS + protector (serves also as a metal scraper)
JJHHYY	With end seal + side seal + inner seal* + LaCS + protector (also has a metal scraper function) + side scraper*
TTHHYY	With double seals + side seal + inner seal* + LaCS + protector (also has a metal scraper function) + side scraper*
QZJJHH	With QZ + end seal + side seal + inner seal* + LaCS + protector (serves also as a metal scraper)
QZTTHH	With QZ + double seals + side seal + inner seal* + LaCS + protector (serves also as a metal scraper)
QZJJHHYY	With QZ + end seal + side seal + inner seal* + LaCS + protector (also has a metal scraper function) + side scraper*
QZTTHHYY	With QZ + double seals + side seal + inner seal* + LaCS + protector (also has a metal scraper function) + side scraper*

* Some models are not equipped with inner seals or side scrapers. (See A**1-504**)

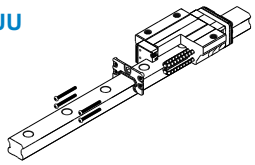
Note1) For models SVR/SVS, NR/NRS, NR-X/NRS-X, SRG, and HRX with HH specifications (with LaCS), a protector (A**1-513**) can be installed. The protector also acts as a metal scraper.
Contact THK if you want to use the protector with other options.

Note2) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

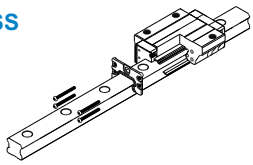
QZKKHH



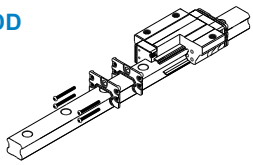
UU



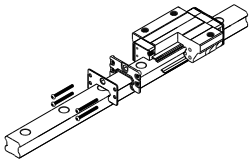
SS



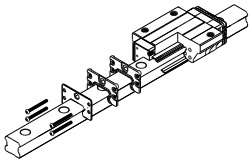
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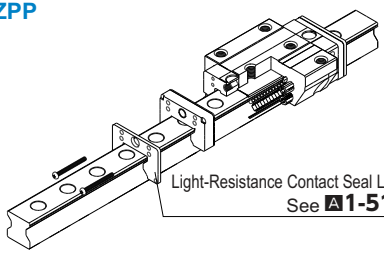
ZZ



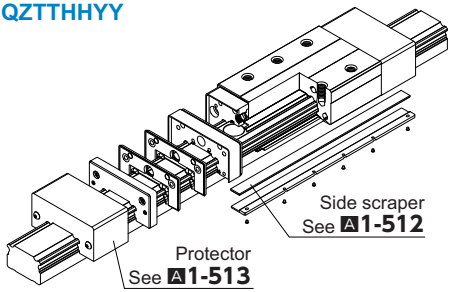
KK



QZPP



QZTTHHYY



SVR/SVS and SRG with the protector

Model number coding

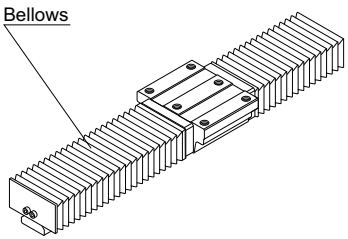
SVR45 LR 2 QZ TTHH C0 +1200L P T -II

- SVR45: Model No.
- LR: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- TTHH: Symbol for dust-proof accessory
- C0: Radial clearance symbol — Normal (No symbol)/ Light preload (C1) / Medium preload (C0)
- +1200L: 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

Note) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Dedicated Bellows

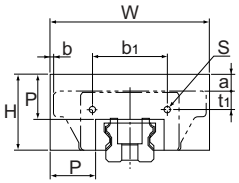
●For the supported models, see the table of options by model number on A1-504.
●For the dimensions of the dedicated bellows, see A1-547 to A1-558.

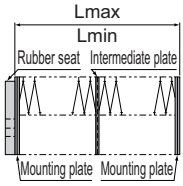
Item name	Schematic diagram/mounting location	Purpose/location of use
Dedicated bellows		Used in locations exposed to dust or cutting chips

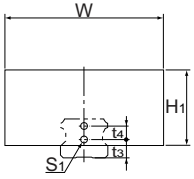
Bellows

Dedicated Bellows JSH for Model SHS

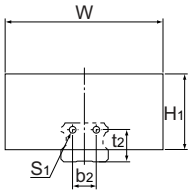
The table below shows the dimensions of dedicated bellows JSH for model SHS. Specify the corresponding model number of the desired bellows from the table.







Models SHS15 to 30



Models SHS35 to 65

Unit: mm

Model No.		Main dimensions												Supported model numbers	
		W	H	H_1	P	b_1	t_1 C	t_1 V	t_1 R	b_2	t_2	t_3	t_4		
JSH	15	53	26	26	15	22.4	4	4	8	—	—	8	—	SHS	15
	20	60	30	30	17	27.6	7.5	7.5	—	—	—	8	6		20
	25	75	36	36	20	38	9.1	9.1	13.1	—	—	9	7		25
	30	80	38	38	20	44	11	11	14	—	—	11	8		30
	35	86	40.5	40.5	20	50	11	11	18	20	21.5	—	—		35
	45	97	46	46	20	64.6	13.5	13.5	23.5	26	26.5	—	—		45
	55	105	48	48	20	68	13	13	23	30	31.5	—	—		55
	65	126	63	63	25	80	18	18	—	34	45	—	—		65

Unit: mm

Supported model numbers		Other dimensions								$\left(\frac{A\ \text{Lmax}}{\text{Lmin}}\right)$
		Mounting bolt		a			b			
		S	S_1	C	V	R	C	V	R	
SHS	15	*M2×10ℓ	M4×8ℓ	5	5	1	3	9.5	9.5	5
	20	M2.6×10ℓ	M3×6ℓ	5	5	—	–1.5	8	—	6
	25	M3×12ℓ	M3×6ℓ	6	6	2	2.5	13.5	13.5	7
	30	M3×15ℓ	M3×6ℓ	3	3	0	–5	10	10	7
	35	M4×15ℓ	M4×8ℓ	0	0	–7	–7	8	8	7
	45	M4×15ℓ	M4×8ℓ	–5	–5	–15	–11.7	5.5	5.5	7
	55	M5×20ℓ	M5×10ℓ	–9	–9	–19	–17.5	2.5	2.5	7
	65	M6×25ℓ	M6×12ℓ	–8	–8	—	–22	0	—	9

* Use tapping screws as the mounting screws on the LM block side of the JSH15.
Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) When using the bellows, lubrication is possible through methods such as a side nipple.
Note3) 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 the LM Guide.

Model number coding

JSH35 - 60/420

Model number of bellows for SHS35

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

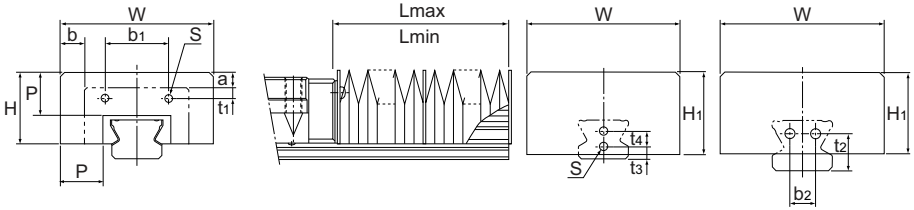
Note) The length of the bellows is calculated as follows.

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

$\text{Lmax} = \text{Lmin} \cdot A$ A: Extension rate

Dedicated Bellows JSSR-X for Model SSR

The table below shows the dimensions of dedicated bellows JSSR-X for model SSR. Specify the corresponding model number of the desired bellows from the table.



Models SSR15X to 25X Models SSR30X and 35X

Unit: mm

Model No.		Main dimensions														A (Lmax/Lmin)	Supported model numbers	
		W	H	H_1	P	b_1	t_1	b_2	t_2	t_3	t_4	Mounting bolt S	a	b XW/XV	b XTB			
JSSR	15X	51	24	26	15	20.5	4.7	—	—	8	—	M3×5ℓ	5	8.5	–0.5	5	SSR	15X
	20X	58	26	30	15	25	4.2	—	—	6	6	M3×5ℓ	4	8	–0.5	5		20X
	25X	71	33	38	20	29	5	—	—	6	7	M3×5ℓ	7	11.5	–1	7		25X
	30X	76	37.5	37.5	20	35	9	12	17	—	—	M4×6ℓ	3	8	—	7		30X
	35X	84	39	39	20	44	7	14	20	—	—	M5×10ℓ	2	7	—	7		35X

Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) When using the bellows, lubrication is possible through methods such as a side nipple.
Note3) 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 the LM Guide.

Model number coding

JSSR35X - 60/420

- JSSR35X: Model number of bellows for SSR35X
- 60/420: Dimensions of the bellows (length when compressed / length when extended)

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

$$Lmin = \frac{S}{(A-1)}$$ S: Stroke length (mm)

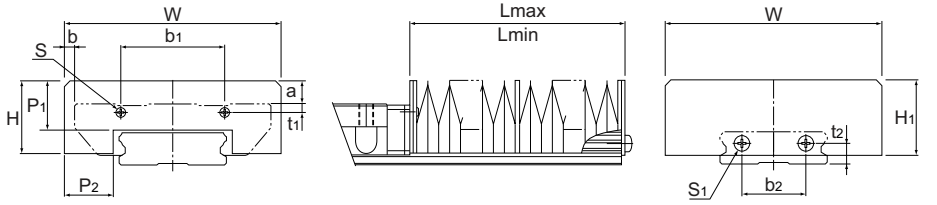
$Lmax = Lmin \cdot A$ A: Extension rate

Model JSV Dedicated Bellows for Models SVR/SVS/NR-X/NRS-X

For models SVR/SVS and NR-X/NRS-X, the model JSV simplified bellows is available. Contact THK for details.

Dedicated Bellows JSHW for Model SHW

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



Unit: mm

Model No.		Main dimensions									Supported model numbers	
		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
	21	75	25	26	17	17	35.8	2.9	22	7		21
	27	85	33.5	33.5	20	20	25	3.5	20	10		27
	35	120	35	35	20	20	75	7.5	40	13		35
	50	164	42	42	20	20	89.4	14	50	16		50

Unit: mm

Model No.		Other dimensions					$\left(\frac{A}{\frac{Lmax}{Lmin}}\right)$
		Mounting bolt		a	b		
		*S	S_1		Model CA	Model CR	
JSHW	17	M2×4ℓ	M3×6ℓ	8	4	9	5
	21	M2×5ℓ	M3×6ℓ	8	3.5	10.5	6
	27	M2.6×6ℓ	M3×6ℓ	10	2.5	11.5	7
	35	M3×8ℓ	M3×6ℓ	6	0	10	7
	50	M4×12ℓ	M4×8ℓ	—	1	17	7

Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) For lubrication when using the dedicated bellows, contact THK.
Note3) For the mounting bolts marked with "*", use tapping screws.
Note4) 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 the LM Guide.

Model number coding

JSHW21 - 60/360

Model number of bellows for SHW21

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

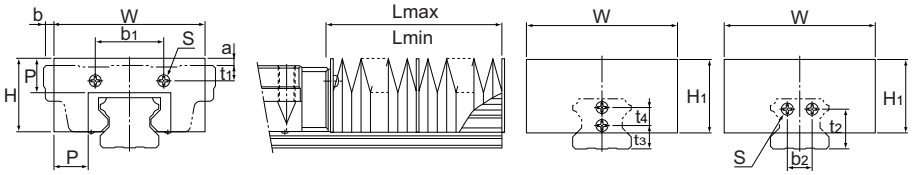
Note) The length of the bellows is calculated as follows.

$$Lmin = \frac{S}{(A-1)}$$ S: Stroke length (mm)

$Lmax = Lmin \cdot A$ A: Extension rate

Dedicated Bellows JH for Model HSR

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



Models HSR15 to 30 Models HSR35 to 85

Unit: mm

Model No.		Main dimensions																A (Lmax/Lmin)	Supported model numbers	
							t_1							a		b				
		W	H	H_1	P	b_1	A/B/C	R	b_2	t_2	t_3	t_4	Mounting bolt S	A/B/C	R	A/B/C	R			
JH	15	55	27	30	15	25	2.5	6.5	—	—	10	—	*M4×8ℓ	7.5	3.5	–4	–10.5	5	HSR	15
	20	66	32	35	17	34	5	5	—	—	6	8	M3×6ℓ	7	7	–1.5	–11	6		20
	25	78	38	38	20	30	7	11	—	—	10	8	M3×6ℓ	8.5	4.5	–4	–15	7		25
	30	84	42	42	20	40	8	11	—	—	11	10	M4×8ℓ	7	4	3	–12	7		30
	35	88	43	43	20	40	9	16	14	23	—	—	M4×8ℓ	4	—	6	–9	7		35
	45	100	51	51	20	58	10	20	20	29	—	—	M5×10ℓ	—	—	10	–7	7		45
	55	108	54	54	20	66	11	21	26	35	—	—	M5×10ℓ	—	—	16	–4	7		55
	65	132	68	68	20	80	19	19	32	42	—	—	M6×12ℓ	—	—	19	–3	7		65
	85	170	88	88	30	105	23	23	44	50	—	—	M6×12ℓ	—	—	22.5	–7	10		85

Note1) For the Model JH15 mounting bolt marked with an asterisk, mounting bolts are used only on the LM rail side, while the LM block side uses M2×5 (nominal) tapping screws.
Note2) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note3) When using the bellows, lubrication is possible through methods such as using a side nipple. However, a side nipple cannot be attached to HSR15 and HSR20, so please contact THK.
Note4) 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 the LM Guide.

Model number coding

JH25 - 60/420

Model number of bellows for HSR25

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

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

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

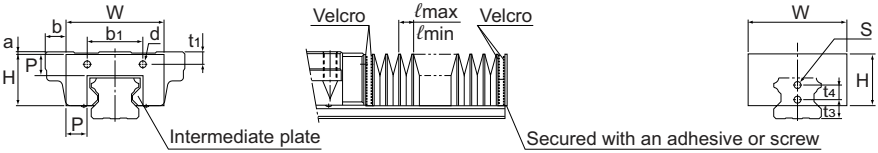
$L_{max} = L_{min} \cdot A$ A: Extension rate

Dedicated Bellows DH for Model HSR

For models HSR15, 20, and 25, bellows DH, which has the following features, is also available in addition to the dedicated bellows JH. Specify the corresponding model number of the desired bellows from the table.

● Features

(1) It has a width and height smaller than the conventional product so that no part of the bellows sticks out above the top face of the LM block. The extension rate is equal to or greater than that of the conventional type.
(2) It has an intermediate plate for each crest so that it will not easily lift and the bellows can be used when mounted vertically, to a wall, or diagonally.
(3) It is operable at high speeds, up to 120 m/min.
(4) Since Velcro can be used to install the bellows, a regular-size model can be cut to the desired length, or two or more regular-size bellows can be joined together.
(5) It can be installed using screws just as the Model JH. Please contact THK if you wish to use screws for installation.



Unit: mm

Model No.		Main dimensions																	Supported model numbers	
		W	H	P	b_1	t_1 C	t_1 R	t_3	t_4	d	s	a C	a R	b C	b R	ℓmax	ℓmin	Extension rate A		
DH	15X	35	19.5	8.5	25	2.5	6.5	10	—	ϕ2.5	ϕ5	0	4	6	–0.5	10	2.5	4	HSR	15
	20X	45	25	10	34	5	5	6	8	ϕ4	ϕ4	0	0	9	–0.5	13	2.5	5		20
	25X	52	29.5	12	30	7	11	10	8	ϕ3.5	ϕ3.5	0	4	9	–2	15	3	5		25

Note1) For lubrication when using the dedicated bellows, contact THK.
Note2) When using the bellows, lubrication is possible through methods such as using a side nipple. However, a side nipple cannot be attached to HSR15 and HSR20, so please contact THK.

Model number coding

DH20X - 50/250

Model number of bellows for HSR20
Dimensions of the bellows (length when compressed / length when extended)

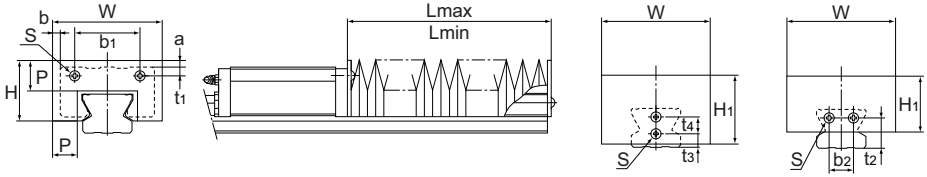
Note) The length of the bellows is calculated as follows.

$$L_{min} = \frac{(S+2A)}{(A-1)}$$ S: Stroke length (mm)

$L_{max} = (L_{min}-2)A$ A: Extension rate

Dedicated Bellows JS for Model SR

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



Models SR15 to 25 Models SR30 to 70

Unit: mm

Model No.		Main dimensions														A (Lmax/Lmin)	Supported model numbers	
		W	H	H_1	P	b_1	t_1	b_2	t_2	t_3	t_4	Mounting bolt S	a	b W/V	b TB/SB			
JS	15	51	24	26	15	22	3.4	—	—	8	—	M3×6ℓ	5	8.5	–0.5	5	SR	15
	20	58	26	30	15	25	4.2	—	—	6	6	M3×6ℓ	4	8	–0.5	5		20
	25	71	33	38	20	29	5	—	—	6	7	M3×6ℓ	7	11.5	–1	7		25
	30	76	37.5	37.5	20	42	5	12	17	—	—	M4×8ℓ	3	8	–7	7		30
	35	84	39	39	20	44	6.5	14	20	—	—	M5×10ℓ	1.5	7	–8	7		35
	45	95	47.5	47.5	20	60	8	22	27	—	—	M5×10ℓ	–1.5	5	–12.5	7		45
	55	108	55.5	55.5	25	70	10	24	28	—	—	M6×12ℓ	–0.5	4	–16	9		55
	70	144	67	67	30	90	13	34	35	—	—	M6×12ℓ	–3	9	—	10		70

Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) For lubrication when using the dedicated bellows, contact THK.
Note3) 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 the LM Guide.

Model number coding

JS55 - 60/540

Model number of bellows for SR55

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

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

$$Lmin = \frac{S}{(A-1)}$$ S: Stroke length (mm)

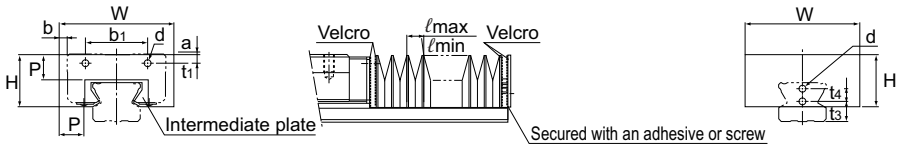
$Lmax = Lmin \cdot A$ A: Extension rate

Dedicated Bellows DS for Model SR

For models SR15, 20, and 25, bellows DS, which has the following features, is also available in addition to the dedicated bellows JS. Specify the corresponding model number of the desired bellows from the table.

● Features

(1) It has a width and height smaller than the conventional product so that no part of the bellows sticks out above the top face of the LM block. The extension rate is equal to or greater than that of the conventional type.
(2) It has an intermediate plate for each crest so that it will not easily lift and the bellows can be used when mounted vertically, to a wall, or diagonally.
(3) It is operable at high speeds, up to 120 m/min.
(4) Since Velcro can be used to install the bellows, a regular-size model can be cut to the desired length, or two or more regular-size bellows can be joined together.
(5) Can be installed using screws just as bellows JS.
In this case, a plate (thickness: 1.6 mm) must be placed between the bellows and the LM block. Please contact THK if you wish to use screws for installation.



Unit: mm

Model No.		Main dimensions																Supported model numbers	
											b				Extension rate		Factor		
		W	H	P	b_1	t_1	t_3	t_4	d	a	W/V	TB/SB	ℓmax	ℓmin	A	E	k		
DS	15	38	19	10	22	3.4	8	—	3.5	0	2	−7	13	2.5	5	2	1.3	SR	15
	20	49	22	10	25	4.2	6	6	4	0	3.5	−5	13	2.5	5	2	1.3		20
	25	56	26	12	29	5	6	7	4	0	4	−8.5	15	3	5	2	1.3		25

Note1) For lubrication when using the dedicated bellows, contact THK.
Note2) 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 the LM Guide.

Model number coding

DS20 - 50/250

- DS20: Model number of bellows for SR20
- 50/250: Dimensions of the bellows (length when compressed / length when extended)

Note) The maximum length of the bellows itself is calculated as follows.
Lmax (Lmin) = ℓmax (ℓmin) ×200
Example of calculating bellows dimensions:
When the stroke of model SR20 is: ℓs=530 mm

$$Lmin = \frac{\ell s}{(A-1)} = \frac{530}{4} = 132.5 \fallingdotseq 135$$

$$Lmax = A \cdot Lmin = 5 \times 135 = 675$$

Number of required crests n

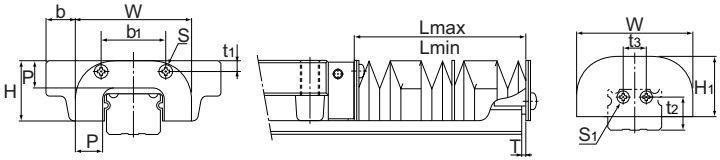
$$n = \frac{Lmax}{P \cdot k} = \frac{675}{10 \times 1.3} = 51.9 \fallingdotseq 52 \text{ crests}$$

$$Lmin = n \cdot \ell min + E = 52 \times 2.5 + 2 = 132$$

(E indicates the plate thickness of 2)
Therefore, the model number of the required bellows is DS20-132/675.

Simplified Bellows JN Dedicated for Models NR/NRS

For models NR/NRS, simplified bellows are available. For greater contamination protection, attach a telescopic cover outside the bellows after the bellows are mounted as depicted in Fig. 1.



Models NR/NRS 75 to 100

Unit: mm

Model No.		Main dimensions												A (Lmax/Lmin)	Supported model numbers	
										Mounting bolt		b A,LA B,LB	T			
		W	H	H_1	P	b_1	t_1	t_2	t_3	S	S_1					
JN	75	145	64	64	30	80	10.5	34.2	26	M6×12ℓ	M6×5ℓ	25	3.2	20	NR/NRS	75
	85	156	70.5	70.5	30	110	15.5	39.5	28	M6×12ℓ	M6×5ℓ	39.5	3.2	20		85
	100	200	82	82	35	140	15	40	34	M8×16ℓ	M6×5ℓ	30	3.2	20		100

Note1) Please contact THK if you will be using the simplified bellows in anything other than a horizontal orientation (i.e. vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) When using the bellows, lubrication is possible through methods such as a side nipple.
Note3) When using the bellows, the LM block and LM rail need to be machined so that the bellows can be mounted. Be sure to indicate that the bellows is required when ordering the LM Guide.

Model number coding

JN75 - 60/420

- JN75: Model number of bellows for NR/NRS
- 60/420: Dimensions of the bellows (length when compressed / length when extended)

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

$$Lmin = \frac{S}{(A-1)}$$ S: Stroke length (mm)

$Lmax = Lmin \cdot A$ A: Extension rate

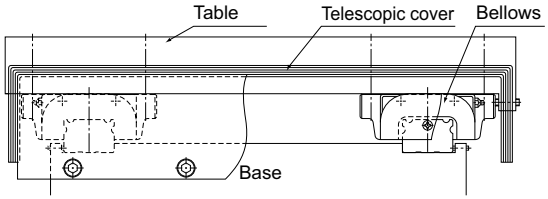
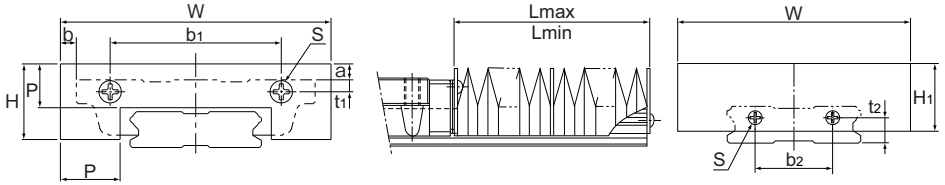


Fig. 1: Example of Mounting the Bellows

Dedicated Bellows JHRW for Model HRW

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



Unit: mm

Model No.		Main dimensions										b		A (Lmax/Lmin)	Supported model numbers	
		W	H	H_1	P	b_1	t_1	b_2	t_2	Mounting bolt S	a	Model CA	Model CR			
JHRW	17	68	22	23	15	43	3	18	6	*M3×6ℓ	8	4	9	5	HRW	17
	21	75	25	26	17	48	3	22	7	M3×6ℓ	8	3.5	10.5	6		21
	27	85	33.5	33.5	20	48	3	20	10	M3×6ℓ	10	2.5	11.5	7		27
	35	120	35	35	20	75	3.5	40	13	M3×6ℓ	6	0	10	7		35
	50	164	42	42	20	100	9	50	16	M4×8ℓ	–3	1	17	7		50

Note1) For model JHRW17's location marked with "*", mounting bolts are used only on the LM rail side while the LM block side uses M2.5 x 8 (nominal) tapping screws.
Note2) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note3) For lubrication when using the dedicated bellows, contact THK.
Note4) 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 the LM Guide.

Model number coding

JHRW21 - 60/360

Model number of bellows for HRW21

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

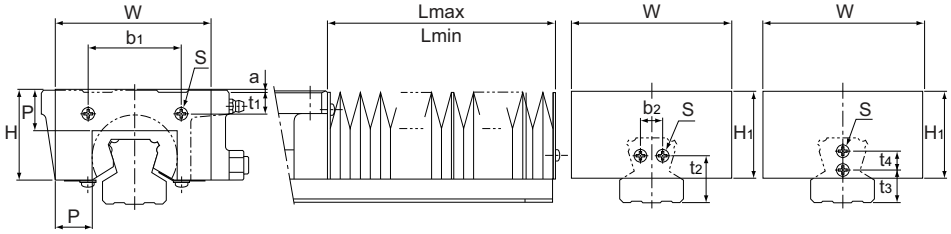
Note) The length of the bellows is calculated as follows.

$$Lmin = \frac{S}{(A-1)}$$ S: Stroke length (mm)

$Lmax = Lmin \cdot A$ A: Extension rate

Dedicated Bellows J for Model NSR-TBC

The table below shows the dimensions of dedicated bellows J for model NSR-TBC. Specify the corresponding model number of the desired bellows from the table.



Models NSR30 to 70TBC

Models NSR20 and 25TBC

Unit: mm

Model No.		Main dimensions												A (Lmax/Lmin)	Supported model numbers	
		W	H	H_1	P	b_1	t_1	b_2	t_2	t_3	t_4	Mounting bolt S	a			
J	20	65	39	43	20	26	8	—	—	9	8	M4×8ℓ	8	7	NSR	20TBC
	25	75	43	45	20	40	11	—	—	12	8	M4×8ℓ	3	7		25TBC
	30	85	46	46	20	50	12	12	25	—	—	M4×8ℓ	—	7		30TBC
	40	115	59	59	25	60	13	16	32	—	—	M5×10ℓ	—	9		40TBC
	50	115	66	66	25	75	11	20	32	—	—	M5×10ℓ	—	9		50TBC
	70	124	84	78	25	96	16	36	40	—	—	M6×12ℓ	—	9		70TBC

Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.

Note2) 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 the LM Guide.

Model number coding

J50 - 60/540

- J50: Model number of bellows for NSR50TBC
- 60/540: Dimensions of the bellows (length when compressed / length when extended)

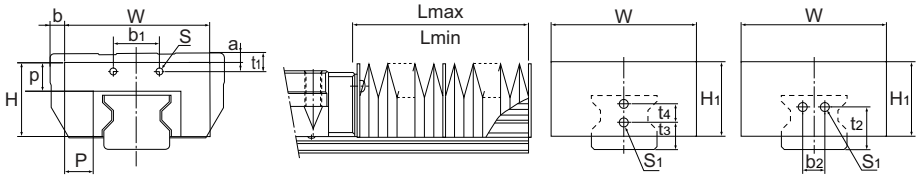
Note) The length of the bellows is calculated as follows.

$$Lmin = \frac{S}{(A-1)}$$ S: Stroke length (mm)

$Lmax = Lmin \cdot A$ A: Extension rate

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.



Models SRG15X to 30X Models SRG35 to 100

Unit: mm

Model No.		Main dimensions																		Supported model numbers	
		W	H	H_1	P	p	b_1	t_1		b_2	t_2	t_3	t_4	Screw size S	Mounting bolt S_1	a		b		A $\left(\frac{\text{Lmax}}{\text{Lmin}}\right)$		
								A/C	R/V							A/C	R/V	A/C	R/V			
JSRG	15	55	27	27	14.2	12.7	28	10.3	10.3	—	—	10.6	—	M2	M4	−7	−7	4	10.5	5	SRG	15X
	20	66	32	32	17	15	38.5	9.6	9.6	—	—	7.4	8	M2	M3	-6.6	-6.6	1.5	11	6		20X
	25	78	38	38	23	18	27.6	3.9	7.9	—	—	10	8	M2	M3×6ℓ	−6.5	−2.5	4	15	6		25X
	30	84	42	42	22	19	37.4	10.4	13.4	—	—	11	10	M3	M4×8ℓ	−5	−2	3	12	7		30X
	35	88	42	42	22	15	35	5	12	13	23	—	—	M3	M4×4ℓ	0	7	6	−9	5		35
	45	100	51	51	20	20	32	7	17	15	29	—	—	M3	M5×4ℓ	0	10	10	−7	7		45
	55	108	57	57	20	20	36	10	20	25	35	—	—	M3	M5×4ℓ	3	13	16	−4	7		55
	65	132	75.5	75.5	28.5	25	46	9	9	28	42	—	—	M4	M6×5ℓ	3	3	19	−3	9		65
	85	168	91	91	35.5	30	120	15	—	30	55	—	—	M6	M6×8ℓ	3	—	23.5	—	9		85
	100	198	100	100	43	33	152	13.3	—	36	60	—	—	M6	M6×8ℓ	4	—	26	—	9		100

Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) When using the bellows, lubrication is possible through methods such as a side nipple.
Note3) 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 the LM Guide.
Note4) In case of oil lubrication, be sure to let THK know the mounting orientation and the exact position in each LM block where the piping joint should be attached.
For the mounting orientation and the lubrication, see **A1-12** and **A24-2**, respectively.

Model number coding

JSRG35 - 60/420

Model number of bellows for SRG35

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

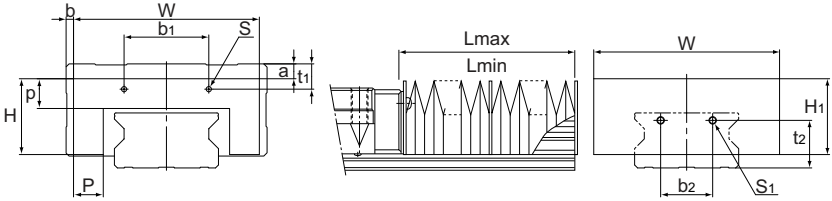
Note) The length of the bellows is calculated as follows.

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

Lmax = Lmin・A A: Extension rate

Dedicated Bellows JSRW 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.



Unit: mm

Model No.		Main dimensions													A (Lmax / Lmin)	Supported model numbers	
		W	H	H_1	P	p	b_1	t_1	b_2	t_2	Screw size S	Mounting bolt S_1	a	b			
JSRW	70	125	51	51	20	20	57	17	35	32	M3	M5×4L	10	5	7	SRW	70
	85	138	57	57	20	20	68	20	42	36	M3	M5×4L	13	13.5	7		85
	100	169	75.5	75.5	28.5	25	83	19	50	46	M4	M6×5L	13	15.5	9		100
	130	220	96	96	36.5	35	165	35	60	55	M6	M6×8L	18	20	9		130
	150	260	114	114	49	47	200	43.3	70	60	M6	M6×8L	20	20	9		150

Note1) When using the bellows, lubrication is possible through methods such as a side nipple.
Note2) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.

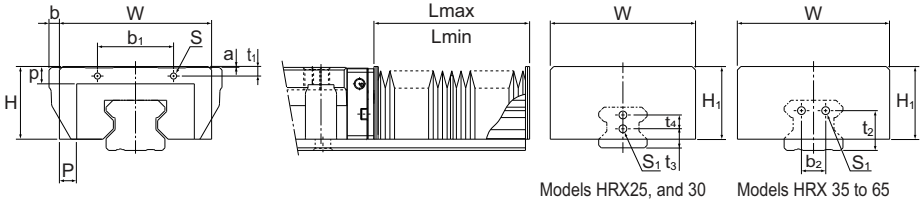
Model number coding

JSRW70 - 60/420

- JSRW70: Model number of bellows for SRW70
- 60/420: Dimensions of the bellows (length when compressed / length when extended)

Dedicated Bellows JHRX for Model HRX

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



Unit: mm

Model No.		Main dimensions																		A (Lmax/Lmin)	Supported model numbers	
		W	H	H_1	P	p	b_1	t_1 C	t_1 R	b_2	t_2	t_3	t_4	Screw size S	Mounting bolt S_1	a C	a R	b C	b R			
JHRX	25	78	38	38	16	15	29	3.7	7.7	—	—	10	8	M2	M3	−7	−3	−4	−15	6	HRX	25
	30	84	42	42	13.5	15	40	4	7	—	—	11	8	M2	M3	−5	−2	3	−12	7		30
	35	88	42	42	10	10	44	5	12	14	23	—	—	M3	M4	−0.5	6.5	6	−9	5		35
	45	100	51	51	20	12	52	5.2	15.2	20	29	—	—	M3	M5	0.5	10.5	10	−7	7		45
	55	108	57	57	20	13	54	7.3	17.3	26	35	—	—	M3	M5	2	12	16	−4	7		55
	65	132	75.5	75.5	25	20	80	9	19	32	42	—	—	M4	M6	2.5	12.5	19	−3	9		65

Note1) Please contact THK if you will be using the dedicated bellows in anything other than a horizontal orientation (i.e., vertical, wall-mounted, or inverted), or if you require heat-resistant specifications.
Note2) When using the bellows, lubrication is possible through methods such as a side nipple.
Note3) 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 the LM Guide.

Model number coding

JHRX25 - 60/360

- JHRX25: Model number of bellows for HRX25
- 60/360: Dimensions of the bellows (length when compressed / length when extended)

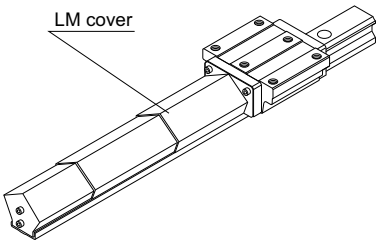
Note) The length of the bellows is calculated as follows.

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

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

Dedicated LM Cover

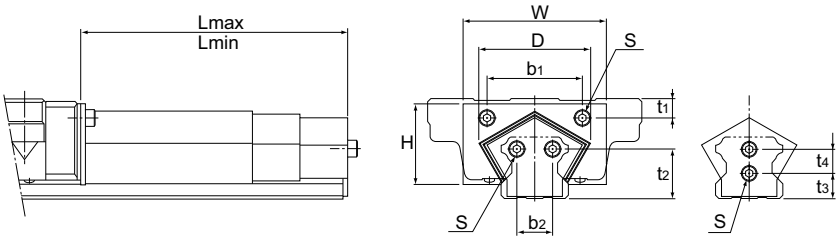
●For the supported models, see the table of options by model number on A1-504.
●For the dedicated LM cover dimensions, see A1-561.

Item name	Schematic diagram/mounting location	Purpose/location of use
Dedicated LM Cover		Used in locations exposed to dust or cutting chips Used in locations with high-temperature foreign material such as flying spatter

LM Cover

Dedicated LM Cover TPH for Model HSR

The tables below show the dimensions of the dedicated LM cover TPH for model HSR. Specify the corresponding model number of the desired bellows from the table.



Models HSR25 and 30

Unit: mm

Model No.		Main dimensions										Supported model numbers	
		W	D (max)	H	b_1	t_1	b_2	t_2	t_3	t_4	Mounting bolt S		
TPH	25	55	42	28	30	7	—	—	10	8	M3×6ℓ	HSR	25
	30	60	48	34	40	8	—	—	11	10	M4×8ℓ		30
	35	70	55	38	40	9	14	23	—	—	M4×8ℓ		35
	45	90	75	48	58	10	20	29	—	—	M5×10ℓ		45
	55	100	88	55	66	11	26	35	—	—	M5×10ℓ		55

Unit: mm

Model No.		Stage	L		Stroke
			min	max	
TPH	25	3	200	530	330
		3	150	380	230
		3	100	230	130
	30	3	250	680	430
		3	200	530	330
		3	150	380	230
	35	3	300	830	530
		3	250	680	430
		3	200	530	330
		3	150	380	230

Unit: mm

Model No.		Stage	L		Stroke
			min	max	
TPH	45	3	350	980	630
		3	300	830	530
		3	250	680	430
		3	200	530	330
	55	4	400	1460	1060
		4	350	1330	980
		4	300	1060	760
		4	250	860	610

Note1) For lubrication when using the dedicated LM cover, contact THK.
Note2) When using the dedicated LM cover, 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 the LM Guide.

Model number coding

TPH55 - 400/1460

- TPH55: Model number of LM cover for HSR55
- 400: Lmin (cover length when compressed)
- 1460: Lmax (cover length when extended)

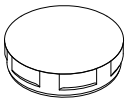
Dedicated Cap for LM Rail Mounting Holes

Using dedicated caps to cover the LM rail mounting holes helps prevent foreign material from entering the mounting holes and LM block.

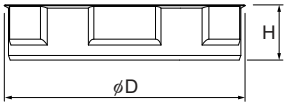


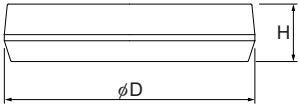
● CV Caps/C Caps

The caps are made of a special synthetic resin.
The CV cap is the successor to the C cap, and its new structure makes it easier to insert.



CV Cap





C Cap

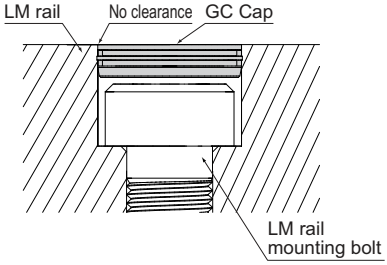
Dimensions and Supported Model Numbers

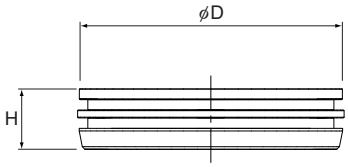
Model No.	Bolt used	Main dimensions(mm)		Supported model number																
		D	H	SSR	SR	SVR SVS NR-X NRS-X	NR NRS	SHS HSR SCR CSR HCR	HMG	SHW HRW	SRG SRN	SRW	GSR	HR	SRS RSR	SRS-W RSR-W	RSX	RSX-W	HRX	NSR-TBC
C3	M3	6.3	1.2	—	15	—	—	12	—	—	—	—	—	1123 1530	12 15	9	12 15	9	—	—
C4	M4	7.9	1	15Y	—	—	—	15	15	12*, 14, 17, 21, 27	15	—	15	—	—	14	—	—	—	—
CV5	M5	9.8	2.6	20 25	20 25	25	—	20	—	—	20	—	20	2042	20	—	—	—	—	20
CV6	M6	11.4	2.6	25Y 30	25Y 30	30	—	25	25	35	25	—	25	—	25	—	—	—	25	25 30
CV8	M8	14.4	3.3	35	35	35	—	30 35	35	50	30 35	—	30	2555 3065	—	—	—	—	30 35	40
CV10	M10	17.9	3.3	—	45	—	—	—	—	60	—	70	35	3575	—	—	—	—	—	50
CV12	M12	20.4	3.4	—	55	45	—	45	45	—	45	85	—	4085	—	—	—	—	45	70
CV14	M14	23.4	5.5	—	—	55	—	55	—	—	55	100	—	—	—	—	—	—	55	—
CV16	M16	26.4	5.6	—	70 85	65	—	65	65	—	65	130	—	50105	—	—	—	—	65	—
C20	M20	32.3	5.7	—	—	—	75	—	—	—	—	—	—	—	—	—	—	—	—	—
C22	M22	35.5	5.7	—	—	—	85	85	—	—	85	150	—	—	—	—	—	—	—	—
C24	M24	39.5	7.7	—	—	—	100	100	—	—	100	—	—	—	—	—	—	—	—	—

*#12 applies to SHW only.
Note1) Contact THK if this product will be used in special environments such as in a vacuum, at very low or high temperatures, or with coolants or corrosive solvents.
Note2) CV caps and C caps must be arranged separately from the LM Guide.
Note3) Contact THK if caps C5 to 16 are desired.

● GC Caps

GC caps are made of metal. (They are RoHS compliant.)
GC caps adhere closer to the counterbore than CV caps and C caps, so there is no clearance once they are inserted.





Dimensions and Supported Model Numbers

Model No.	Bolt used	Main dimensions(mm)		LM Guide model number												
		D	H	SSR	SR	SVR SVS NR-X NRS-X	NR NRS	SHS HSR HCR	SCR CSR	SHW HRW	SRG SRN	SRW	HRX	GSR	HR	NSR-TBC
GC5	M5	9.86	2.5	20	20	25	—	20	20	—	20	—	—	20	2042	20
GC6	M6	11.36	2.5	25Y 30	25Y 30	30	—	25	25	35	25	—	25	25	—	25 30
GC8	M8	14.36	3.5	35	35	35	—	30 35	30 35	50	30 35	—	30 35	30	2555 3065	40
GC10	M10	17.86	3.5	—	45	—	—	—	—	60	—	70	—	35	3575	50
GC12	M12	20.36	4.6	—	55	45	—	45	45	—	45	85	45	—	4085	70
GC14	M14	23.36	5	—	—	55	—	55	—	—	55	100	55	—	—	—
GC16	M16	26.36	5	—	70 85	65	—	65	65	—	65	130	65	—	50105	—
GC22	M22	35.36	5	—	—	—	85	85	—	—	85	150	—	—	—	—
GC24	M24	39.36	5	—	120	—	100	100	—	—	100	—	—	—	—	—

Note1) GC caps are only sold with an LM Guide. They are not sold separately.
The LM Guide model number code will have “GC” at the end when it is delivered.

(Example 1) Multiple axes: SVR45LR+1200L - Ⅱ GC
GC caps attached
Symbol for No. of rails used on the same plane (2 axes)

(Example 2) One axis: SVR45LR+1200L GC
GC caps attached

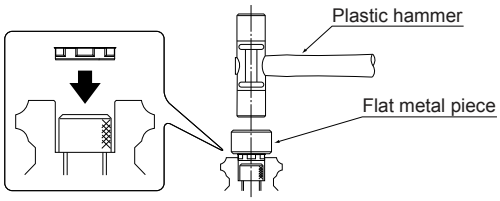
Note2) GC caps cannot be used with LM rails that are made of stainless steel or rails that have undergone surface treatment.
Note3) LM rail mounting holes for GC caps are special. (The mouth is not chamfered.)
Note4) Be careful not to injure your hand when inserting GC caps.
Note5) Be sure to make the GC caps level with the upper surface of the LM rail and clean (wipe) that surface after insertion.
Note6) If this product will be used in special environments, such as in a vacuum or at very low or high temperatures, contact THK.

● Guidelines for Use in Extreme Environments

Extreme environment		C cap CV cap	GC cap	Example applications
Foreign matter concentration: low	Metal powder, spatter	○	◎	Welding machines, robots
	Wood shavings, coolant (Environments that strip away oils)	○	◎	Woodworking machinery, washers
	Metal powder + coolant	○	◎	Lathes, machining centers
Foreign matter concentration: high	Metal powder, spatter	△	◎	Welding machines, robots
	Wood shavings, coolant (Environments that strip away oils)	△	◎	Woodworking machinery, washers
	Metal powder + coolant	△	◎	Lathes, machining centers

◎: Particularly effective; ○: Effective; △: Not particularly effective

● Cap Insertion Method



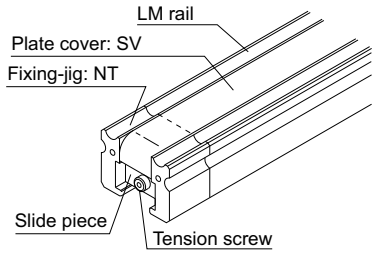
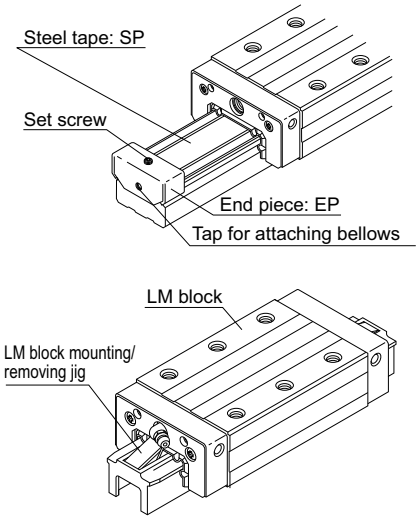
For best performance, caps must be inserted so that they are level with the rail surface. Have a flat alignment plate and plastic hammer available.

① Set the cap on the LM rail mounting hole and place the alignment plate on top.
② Use the plastic hammer to gradually drive the cap in until it is level with the upper surface of the LM rail.
③ As necessary, remove any slight burrs that appear.

* During installation or removal, burrs and small debris from the cap may scatter, so be sure to wear protective goggles and avoid using sharp tools during work.

Plate Cover SV and Steel Tape SP

●For the supported models, see the table of options by model number on A1-504.

Item name	Schematic diagram/mounting location	Purpose/location of use
Plate Cover SV		A plate cover is available as a means of essential contamination protection for LM Guide units intended for use in machine tools. By covering the LM rail mounting holes with ultra-thin stainless steel (SUS304), the plate cover SV drastically increases the effectiveness of the seal and prevents the penetration of coolant or cutting chips from the top face of the LM rail. For the mounting method, see A1-566. Note) When mounting the plate cover, the LM rail needs to be machined. Indicate that the plate cover is required when ordering the LM Guide.
Steel Tape SP		Steel tape is available as a means of essential contamination protection for LM Guide units intended for use in machine tools. By covering the LM rail mounting holes with ultra-thin stainless steel (SUS304), the steel tape SP drastically increases the effectiveness of the seal and prevents the penetration of coolant or cutting chips from the top face of the LM rail. (When mounting the steel tape, end piece EP can be used as a means to secure the cover.) For the mounting method, see A1-567. Note) When mounting the steel tape, the LM rail needs to be machined. Indicate that the steel tape is required when ordering the LM Guide.

Mounting Procedure for Plate Cover SV

(1) Attach slide pieces to the plate cover.
Place the slide pieces on the plate cover with their chamfered sides facing outward, hold the plate cover with the slide pieces and the securing plates, and then secure them with countersunk screws.

(2) Use an LM block mounting/removing jig to remove the LM block from the LM rail, and then mount the fixing-jigs onto the LM rail.

(3) Temporarily secure either slide piece.
Insert either slide piece into one of the fixing-jigs, then attach the slide piece to the LM rail's end face using the tension adjustment bolt and gently secure the bolt until the bolt head is inside the fixing-jig.

(4) Temporarily secure the other slide piece.
Temporarily secure the other slide piece in the same manner as above.

(5) Apply tension to the plate cover.
Apply tension to the plate cover by evenly securing the tension adjustment bolts on both ends of the LM rail. Make sure there is only a small difference between the H and H' dimensions in Fig. 5. If the difference is too large, one end may have insufficient interference.

(6) Mount the LM block on the LM rail.
Identify the reference surface of the LM rail and the LM block, then insert the LM rail into the LM block using the LM block mounting/removing jig.

Note1) When removing or mounting the LM block, use much care not to let the balls fall out.
Note2) The plate cover is an ultra-thin stainless steel (SUS304) plate. When handling it, use much care not to bend it.
Note3) The plate cover is available for model NR/NRS 75.

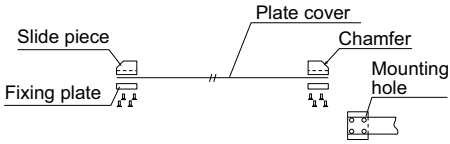


Fig. 1



Fig. 2

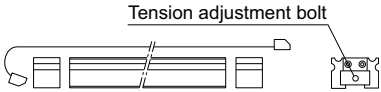


Fig. 3

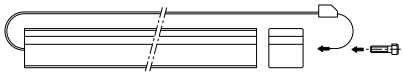

Fig. 4



Fig. 5

Mounting Procedure for Steel Tape SP

(1) Use an LM block mounting/removing jig to remove the LM block from the LM rail.
(2) Thoroughly degrease and clean the top face of the LM rail to which the steel tape is to be adhered. For degreasing, use an adequately volatile detergent (e.g., industrial alcohol).
(3) Carefully adhere the steel tape from the end with care not to let it bend or sag, while gradually peeling the release paper from the steel tape.
(4) Secure the steel tape to the rail by pressing it down and rubbing it. The adhesive strength increases with time. However, if you wish to remove the tape, it can be removed by pulling it upward from the end.
(5) Mount the LM block onto the LM rail using the LM block mounting/removing jig.
(6) Attach the end pieces on both ends of the LM rail and further secure the steel tape. When securing the end pieces, fasten only the set screw on the top face of each end piece.
(The tap on the end face of the end piece is used for mounting bellows.)

Note1) The set screw on the side face is used to lightly secure the bent steel tape. Be sure to stop fastening the screw as soon as it hits the end face, and do not force the screw further.
Note2) Since the steel tape is a thin steel plate, mishandling it may cause an accident such as cutting your finger. When handling it, take an effective safety measure such as wearing rubber gloves.

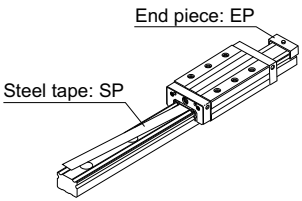


Fig. 6

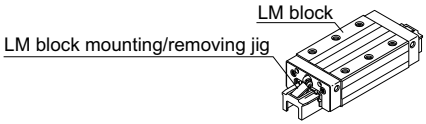


Fig. 7

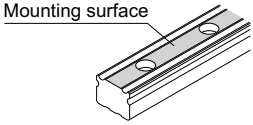


Fig. 8

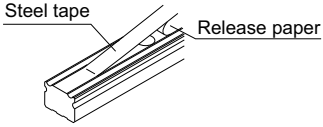


Fig. 9

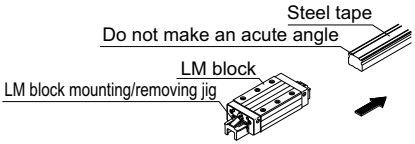


Fig. 10

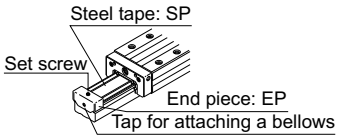


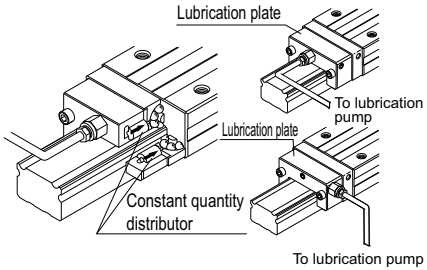
Fig. 11

Lubrication Adapter

An oil-only lubrication adapter is available for models NR/NRS.
Even if the LM Guide is installed in an orientation where oil lubrication is difficult, such as wall mount and inversed mount, the adapter is capable of feeding a constant quantity of lubricant to the four raceways.

Features

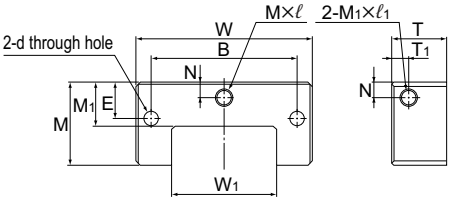
The dedicated lubrication adapter for models NR/NRS is built in with a constant quantity distributor. Therefore, the adapter can accurately feed a constant quantity of lubricant to each raceway regardless of the mounting orientation.
The adapter is economical since it constantly feeds the optimum amount of lubricant and can eliminate the supply of surplus lubricant.
To arrange the piping, simply connect an intermittent lubrication pump widely used for ordinary machine tools to the lubrication holes (M8) on the front and the side of the lubrication adapter.



Structural Drawing

Specifications

Viscosity range of lubricant used	32 to 64 mm²/s recommended
Discharge	0.03×4, 0.06×4 cc/1 shot
Diameter of pipe connected	ϕ 4, ϕ 6
Material	Aluminum alloy



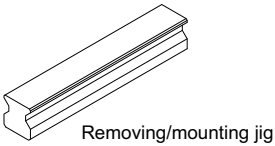
Dimensional Table

Unit: mm

Model No.	Main dimensions												Quantity per shot (cc)
	Width W	Height M	T	W_1	M_1	B	E	N	T_1	d	M×ℓ	$M_1 \times \ell_1$	
A30N	56	29	25	29	14.5	46	14	5	5.3	3.5	M8×8	M8×8	0.03×4
A35N	66	33	25	35	17	54	16.5	6	5.3	4.5	M8×8	M8×8	
A45N	81	38	25	48	20	67	16.5	7	7.8	6.6	M8×8	M8×8	
A55N	94	45.5	25	56	22	76	20.5	7	7.8	6.6	M8×8	M8×8	0.06×4
A65N	119	55.5	25	67	26.3	92	25.5	11.5	7.8	9	M8×8	M8×8	
A85N	147	68.5	25	92	34	114	32	15.5	7.8	9	M8×8	M8×8	

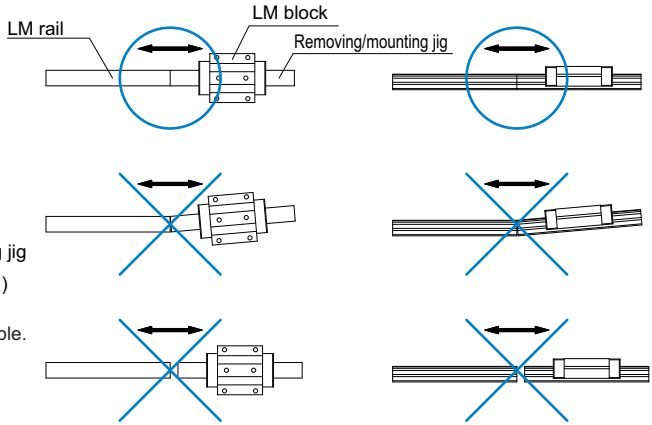
Removing/Mounting Jig

When assembling the guide, do not remove the LM block from the LM rail whenever possible. If removing the LM block is inevitable due to the plate cover type or the assembly procedure, be sure to use the removing/mounting jig.
Mounting the LM block without using the removing/mounting jig may cause rolling elements to fall from the LM block due to contamination by foreign material, damage to internal components, or slight inclination. Mounting the LM block with some of the rolling elements missing may also cause premature damage to the LM block.
When using the removing/mounting jig, fit its end directly to the end of the LM rail and do not incline the jig.
Depending on the model, a removing/mounting jig may not be available. If this is the case, use a spare LM rail. Contact THK for details.
If any of the rolling elements fall from the LM block, contact THK. Do not use the product in that condition.
Note that the removing/mounting jig is not included in the LM Guide package as standard. To obtain one, contact THK.



Removing/mounting jig
(Material: ABS resin)

This image shows one example.



End Piece EP

For models that can use the end piece, see the table below.
If removing the end piece when using the LM Guide, be sure that the LM block will not overshoot the rail.
The end piece can also be used as a fixing jig for steel tape protectors, and can also be used on LM rails of models SSR, SR, and HSR.

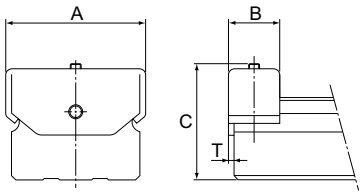


Fig. 1: End Piece EP for Models NR/NRS

Table 1: Dimensional Table for End Piece EP for Models NR/NRS
Unit: mm

Model No.	A	B	C	T
NR/NRS 25X	26	14	25	1.5
NR/NRS 30	31	14	31	1.5
NR/NRS 35	38	16	32.5	2
NR/NRS 45	49	18	41	2
NR/NRS 55	57	20	46.5	2
NR/NRS 65	69.4	22	59	3.2
NR/NRS 75	81.7	28	56	3.2
NR/NRS 85	91.4	22	68	3.2
NR/NRS 100	106.4	25	73	3.2

Model Number Coding

Model number configurations differ depending on the model features. Refer to the corresponding sample model number configuration.

LM Guide

● **Models SHS, SSR, SVR/SVS, SHW, HSR, SR, NR-X/NRS-X, NR/NRS, HRW, JR, NSR-TBC, HSR-M1, SR-M1, and HSR-M2**

SHS25 LC 2 QZ KKHH C0 F S +1240L P Z T F S -II

- SHS25: Model No.
- LC: Type of LM block
- 2: No. of LM blocks used on the same rail
- QZ: With QZ Lubricator
- KKHH: Contamination protection accessory symbol (*1)
- C0: Radial clearance symbol (*2) Normal (No symbol) Light preload (C1) Medium preload (C0)
- F: LM block with surface treatment (*3)
- S: LM block special feature symbol Standard (No Symbol)/E/S
- +1240L: LM rail length (in mm)
- P: Accuracy symbol (*4) Normal grade (No Symbol) High accuracy grade (H) Precision grade (P) Super precision grade (SP) Ultra precision grade (UP)
- Z: With steel tape
- T: Symbol for LM rail jointed use
- F: LM rail with surface treatment (*3)
- S: LM rail special feature symbol Standard (No Symbol)/E/S
- -II: Symbol for No. of rails used on the same plane (*5)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See B0-20. (*4) See A1-78. (*5) See A1-13.

Note1) 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.)
Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note2) Contact THK for details about the special features of LM blocks and LM rails.

● **Model EPF**

EPF7M 16 +55L P M

- EPF7M: Model No.
- 16: Guaranteed stroke (in mm)
- +55L: LM rail length (in mm)
- P: Accuracy symbol (*1)
- M: Rail material: Stainless steel (standard)

(*1) See A1-88.

Note) This model number indicates that a single-rail unit constitutes one set.

Roller Type LM Guide

● Models SRG, SRN, SRW, and HRX

SRG45 LC 2 QZ TTHH C0 F S +1200L P Z T F S -Ⅱ

- SRG45 — Model No.
- LC — Type of LM block
- 2 — No. of LM blocks used on the same rail
- QZ — With QZ Lubricator
- TTHH — Contamination protection accessory symbol (*1)
- C0 — Radial clearance symbol (*2)
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- F — LM block with surface treatment (*3)
- S — LM block special feature symbol
  Standard (No Symbol)/E/S
- +1200L — LM rail length (in mm)
- P — Accuracy symbol (*4)
  High accuracy grade (H)
  Precision grade (P)
  Super precision grade (SP)
  Ultra precision grade (UP)
- Z — With plate cover
- T — Symbol for LM rail jointed use
- F — LM rail with surface treatment (*3)
- S — LM rail special feature symbol
  Standard (No Symbol)/E/S
- -Ⅱ — Symbol for No. of rails used on the same plane (*5)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73.
(*3) See B0-20. (*4) See A1-78. (*5) See A1-13.

Note1) Models SRG15 to 65 are available in High Accuracy grade and above. Other models are only available in Precision grade and above. (Normal grade is not available.)
Model SRN is available in High Accuracy grade and above. (Normal grade is not available.)
Model SRW is available in precision grade and above. (Normal and high accuracy grade are not available.)
The Model HRX is only available in High Accuracy grade and Precision grade.
Note2) 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.)
Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note3) Contact THK for details about the special features of LM blocks and LM rails.

Miniature LM Guide

● Models SRS, RSX, RSR, RSX-M1, and RSR-M1

2 SRS20M QZ UU C1 F S +220L P M F S -Ⅱ

- 2 — No. of LM blocks used on the same rail (*1)
- SRS20M — Model No.
- QZ — With QZ Lubricator
- UU — Contamination protection accessory symbol (*2)
- C1 — Radial clearance symbol (*3)
  Normal (No symbol)
  Light preload (C1)
- F — LM block with surface treatment (*4)
- S — LM block special feature symbol
  Standard (No Symbol)/E/S
- +220L — LM rail length (in mm)
- P — Accuracy symbol (*5)
  Normal grade (No Symbol)
  High accuracy grade (H)
  Precision grade (P)
- M — Stainless steel LM rail
- F — LM rail with surface treatment (*4)
- S — LM rail special feature symbol
  Standard (No Symbol)/E/S
- -Ⅱ — Symbol for No. of rails used on the same plane (*6)

(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See B0-20. (*5) See A1-78. (*6) See A1-13.

Note1) 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.)
Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note2) Contact THK for details about the special features of LM blocks and LM rails.

Cross LM Guide

● Models SCR, CSR, and MX

4 SCR25 QZ KKHH C0 +1240/1000L P

- 4 — Total No. of LM blocks
- SCR25 — Model No.
- QZ — With QZ Lubricator
- KKHH — Contamination protection accessory symbol (*1)
- C0 — Radial clearance symbol (*2)
  Normal (No symbol)/Light preload (C1)
  Medium preload (C0)
- +1240/1000L — LM rail length on the X axis (in mm) / LM rail length on the Y axis (in mm)
- P — Accuracy symbol (*3)
  Precision grade (P)/Super precision grade (SP)
  Ultra precision grade (UP)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-78.

Note) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Separate Type LM Guide

● Model HR

2 HR2555 UU M +1000L P T M

- **2**: No. of LM blocks used on the same rail
- **HR2555**: Model No.
- **UU**: Contamination protection accessory symbol (*1)
- **M**: Stainless steel LM block
- **+1000L**: LM rail length (in mm)
- **P**: Symbol for LM rail jointed use
- **T**: Stainless steel LM rail
- **M**: Accuracy symbol (*2) Normal grade (No Symbol)/High accuracy grade (H)/Precision grade (P) Super precision grade (SP)/Ultra precision grade (UP)

(*1) See contamination protection accessory on A1-543. (*2) See A1-78.

Note) One set of model HR means a combination of two LM rails and LM blocks used on the same plane.

● Model GSR

● LM block

GSR25 T UU

- **GSR25**: Model number
- **T**: Type of LM block
- **UU**: Contamination protection accessory symbol (*1)

● LM rail

GSR25 -1060L H K

- **GSR25**: Model number
- **-1060L**: LM rail length (in mm)
- **H**: Symbol for tapped-hole LM rail type
- **K**: Accuracy symbol (*2) Normal grade (No Symbol) High accuracy grade (H) Precision grade (P)

(*1) See contamination protection accessory on A1-543. (*2) See A1-78.

● Combination of LM rail and LM block

GSR25 T 2 UU +1060L H T K

- **GSR25**: Model No.
- **T**: Type of LM block
- **2**: No. of LM blocks used on the same rail
- **UU**: Contamination protection accessory symbol (*1)
- **+1060L**: LM rail length (in mm)
- **H**: Symbol for LM rail jointed use
- **T**: Symbol for tapped-hole LM rail type
- **K**: Accuracy symbol (*2) Normal grade (No Symbol)/High accuracy grade (H)/Precision grade (P)

(*1) See contamination protection accessory on A1-543. (*2) See A1-78.

Note) One set of model GSR: This model number indicates that a single-rail unit constitutes one set.

Curved LM Guide

● Model HCR

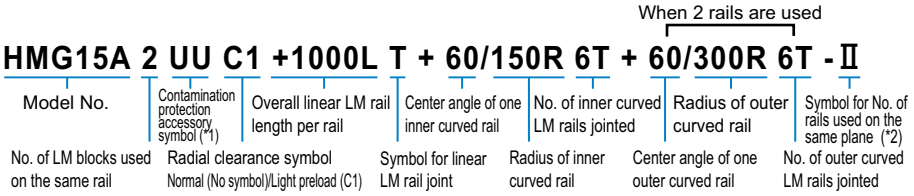
HCR25A 2 UU C1 +60 / 1000R H 6 T

- **HCR25A**: Model No.
- **2**: No. of LM blocks used on the same rail
- **UU**: Contamination protection accessory symbol (*1)
- **C1**: Radial clearance symbol (*2) Normal (No symbol)/Light preload (C1)
- **+60**: Curved LM Guide center angle
- **1000R**: LM rail radius (in mm)
- **H**: Accuracy symbol (*3) Normal grade (No Symbol)/High accuracy grade (H)
- **6**: Number of LM rail joints used on one axis (*4)
- **T**: Symbol for LM rail jointed use (*5)

(*1) See A1-543 (contamination protection accessories). (*2) See A1-73. (*3) See A1-78.
(*4) Number of LM rails used on one arc. Contact THK for details.
(*5) When using joined LM rails, the dust prevention seal must be a low-resistance seal (dust prevention code: LL).

Straight-and-Curved Guide

● Model HMG

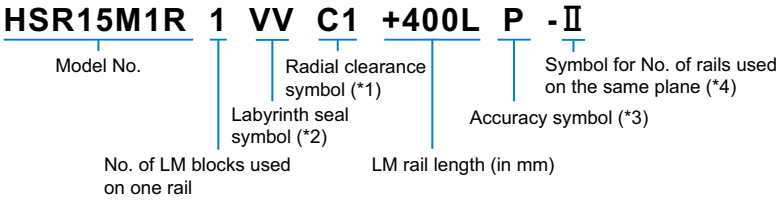


(*1) See contamination protection accessory on **A1-543**. (*2) See **A1-13.**

Note) This model number denotes one set consists of an LM block and LM rail. (i.e. If you are using 2 shafts, the required number of sets is 2.)
The standard Model HMG does not have a seal. To attach a seal, make sure to specify a straight-and-curved seal (code: UU).

LM Guide for Medium-to-Low Vacuums

● Model HSR-M1VV



(*1) See **A1-73**. (*2) See **A1-403**. (*3) See **A1-78**. (*4) See **A1-13**.

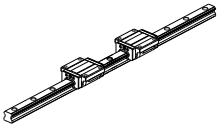
Note1) The radial clearance, maximum LM rail length and accuracy class are equal to that of Model HSR.
Note2) With this model, a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2).

Notes on Ordering

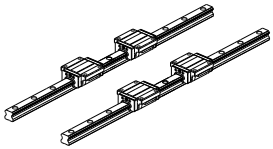
Order Units

Note that the number of items that constitute one set differs depending on the type of LM guide. Check the sample model number configurations and the accompanying notes.

- **Sample LM Guide Orders**

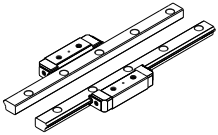


SHS25C2SSC1+640L 1 set



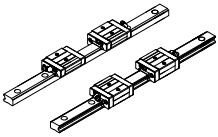
SHS25C2SSC1+640L-Ⅱ 2 sets

- **Sample Model HR Orders**



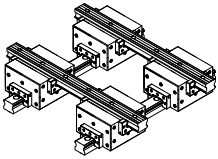
HR2555UU+600L 1 set

- **Sample Model GSR and GSR-R Orders**



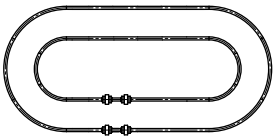
GSR25T2UU+1060L 2 sets

- **Sample Cross LM Guide Orders (SCR, CSR, and MX)**



4SCR25UU+1240/1000LP 1 set

- **Sample Model HMG Orders**



HMG15A 2 UU C1 +1000L T + 60/150R 6T + 60/300R 6T - Ⅱ 2 sets

Note) When ordering Model HMG, attach a reference diagram clearly showing the positioning of the LM block and LM rail.

Mounting Orientation and Lubrication Method

When placing an order, be sure to let THK know the mounting orientation and the exact position on each LM block where the grease nipple or the piping joint should be attached.
For the mounting orientation and the lubrication, see A1-12 and A24-2, respectively.

Supported Options

The supported options differ depending on the model number. Check the available options when ordering.
See A1-504.

Maximum Manufactured Lengths for LM Rails

Where a high degree of precision is required, limits apply to the maximum manufactured lengths for LM rails. In such situations, contact THK.

LM Guide Handling Precautions

Handling

(1) Please use at least two people to move any product weighing 20 kg or more, or use a cart or another method of conveyance. Otherwise, it may cause injury or damage the unit.
(2) Do not disassemble the parts. This will result in loss of functionality.
(3) Tilting an LM block or LM rail may cause it to fall by its own weight.
(4) Take care not to drop or strike the LM Guide. Otherwise, it may cause injury or damage the unit. Even if there is no outward indication of damage, a sudden impact could prevent the unit from functioning properly.
(5) When installing the LM Guide, be sure not to remove the LM block from the LM rail.
(6) Placing a hand inside the LM rail mounting hole may lead to the hand being caught between the block and rail and cause injury.
(7) Wear appropriate safety gear, such as protective gloves and safety shoes, when handling the product.

Precautions on Use

(1) Prevent foreign material, such as cutting chips or coolant, from entering the product. Failure to do so could damage the product.
(2) If the product is used in an environment where cutting chips, coolant, corrosive solvents, water, etc., may enter the product, use bellows, covers, etc., to prevent them from entering the product.
(3) Do not use the product at temperatures of 80℃ or higher. Unless the unit is specially designed to be heat-resistant, exposure to such temperatures may deform or damage plastic and rubber parts.
(4) If foreign materials such as cutting chips adhere to the product, replenish the lubricant after cleaning the product.
(5) Very small strokes can inhibit the formation of an oil film between the raceways and the areas of contact on the rolling elements, resulting in fretting. Therefore, be sure to use a type of grease with high fretting resistance properties if the stroke will be small. We recommend periodically allowing the nut to stroke a distance roughly equal to its length to help ensure that a film forms between the raceways and rolling elements.
(6) Do not forcibly drive a pin, key, or other positioning device into the product. This could create indentations on the raceway and impair the product's function.
(7) If the operation requires the LM block to be removed from the LM rail, please use a removing/mounting jig. (The removing/mounting jig is not provided as standard. To obtain one, contact THK.)
(8) When using a removing/mounting jig, align the ends of the LM rail and the jig and mount the block when the jig and rail are parallel.
(9) Take care to keep the LM block straight. Loading the block at an angle can introduce foreign matter, damage internal components, or cause balls to fall out.
(10) The LM block must contain all its internal rolling elements when mounted on the LM rail. Using a block with any balls or rollers removed may result in premature damage.
(11) If any of the rolling elements fall from the LM block, contact THK. Do not use the product in that condition.

(12) If the LM Guide breaks due to an accident or other cause, the block may come off of the rail and fall. For the safe use of these products, take precautions such as adding a mechanism to prevent the block from falling.
(13) For the bolt length, select a length that will leave a clearance at the bolt tip in relation to the effective tap depth.
(14) If the mounting material lacks sufficient rigidity or accuracy, the bearing load may be focused in one area, and bearing functionality will dramatically decrease. Therefore, carefully consider the rigidity and accuracy of the housing and base, and the strength of the securing bolts.
(15) When removing the LM block from the LM rail and then replacing the block, an LM block mounting/removing jig that facilitates such installation is available. Contact THK for details.

Lubrication

(1) Thoroughly remove anti-rust oil and apply lubricant before using the product.
(2) Do not mix different lubricants. Even greases containing the same type of thickening agent may, if mixed, interact negatively due to disparate additives or other ingredients.
(3) When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuums, and extreme heat or cold, use a lubricant suitable for its use/environment.
(4) When lubricating the product having no grease nipple or lubrication hole, apply grease directly on the raceway and stroke the product several times to let the grease spread inside.
(5) The consistency of grease changes according to the temperature. Take note that the slide resistance of the LM Guide may be affected by changes in viscosity.
(6) After lubrication, the slide resistance of the LM Guide may increase due to the stirring resistance of the grease. Be sure to perform a warm-up operation and allow the grease to break in sufficiently before operating the machinery.
(7) Excess grease may spatter after lubrication. Wipe off spattered grease as necessary.
(8) Grease deteriorates over time, which decreases the lubricity, so perform regular grease inspections and replenish grease based on frequency of use.
(9) Although the lubrication interval may vary according to operating conditions and the service environment, lubrication should be performed approximately every 100 km in travel distance (three to six months). The final greasing interval/amount should be set at the actual machine.
(10) The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation. For the mounting orientation and the lubrication, see B**1-28** and B**24-2**, respectively.
(11) When using oil lubrication, the lubricant may not be distributed throughout the LM block due to the mounting orientation of the block. Contact THK in advance for details.

Storage

When storing the LM Guide, pack it as designated by THK and store it indoors in a horizontal position away from high or low temperatures and high humidity.
Please note that if the product has been kept in storage for an extended period, the lubricant inside may have deteriorated. Please ensure that you replenish the lubricant before use.

Disposal

The product should be treated as industrial waste and disposed of appropriately.

Handling Precautions for LM Guide Models for Special Environments

LM Guide for Medium-to-Low Vacuums

Handling

(1) This product has been thoroughly cleaned and degreased and then sealed in moisture-proof packaging. If possible, open the package immediately prior to using the product.
(2) Once the packaging has been opened, store the product inside a clean, dry receptacle accompanied by silica gel or another drying agent. Do not use anti-rust oil or volatile corrosion inhibitor paper (or other VCI material) with this product.
(3) Wear protective rubber or vinyl gloves while handling this product and make sure the surrounding environment is relatively clean.

Handling Precautions for Optional Accessories for the LM Guide

QZ Lubricator for the LM Guide

For details regarding the QZ Lubricator, see A1-536.

Selection Precautions
Secure a stroke longer than the overall LM block with QZ Lubricator attached.

Handling
Take care not to drop or strike this product. Otherwise, it may cause injury or damage the unit.
Do not block the vent hole with grease or the like.
The QZ Lubricator supplies oil only to the raceway, so use it in combination with regular greasing/oil lubrication. If the product is used in an environment exposed to coolant, cutting chips, or other foreign material, oil on the raceway is lost easily. Accordingly, be sure to also use covers, bellows, etc.

Service Environment
Be sure the service temperature of this product is between -10℃ and 50℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.

Laminated Contact Scraper LaCS, Side Scraper for the LM Guide

For details regarding the LaCS, see A1-510. For details regarding the side scraper, see A1-512.

Handling
The lubricant impregnated into the scraper is used to increase its sliding capability. For lubrication of the LM Guide, attach a QZ Lubricator or grease nipple to the side face of the end plate of the LM block before providing a lubricant.
When using these products, be sure to attach C caps or a plate cover to the rail.

Service Environment
Be sure the service temperature of this product is between -20℃ and +80℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.

Notes on Product Functions
It is specifically designed to provide dust prevention capability to remove foreign material and liquid. To seal oil, an end seal is required.

Light Contact Seal LiCS for the LM Guide

For details regarding the LiCS, see A1-515.

Handling

The lubricant impregnated into LiCS is used to increase its sliding capability. For lubrication of the LM Guide, attach the grease nipple on the end plate of the LM block before providing a lubricant.

Service Environment

Be sure the service temperature of this product is between -20℃ and +80℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.
It only makes contact with the LM rail raceway. Do not use it in harsh environments.

High Chemical Resistance Fluorine Seal FS for the LM Guide

For details about the fluorine seal, see A1-516.

Handling

Be careful not to twist the seal portion when attaching the fluorine seal to the LM Guide. Also, do not store the product in a way that may deform the seal, such as by stacking it. This may cause damage or reduce the seal's functionality.

Service Environment

Be sure the service temperature of this product is between -20℃ and +80℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.

GC Cap

For details regarding the GC cap, see A1-563.

Handling

If GC caps are specified for the product, the edges of the LM rail mounting hole openings will be sharp. Take great care not to injure your fingers or hands while working.
When fitting GC caps, use a flat aligning tool to gradually punch the cap into the hole until it is level with the upper surface of the LM rail. Then run an oil stone over the rail until the upper surface of the rail and the GC caps are completely flat.
During installation or removal, burrs and small debris on the cap may scatter, so be sure to wear protective goggles and avoid using sharp tools during work.



LM Guide®

THK General Catalog

LM Guide

THK General Catalog

B Support Book

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Features of the LM Guide

Functions Required from a Linear Guide Surface

Large permissible load	Smooth motion with no clearance
Highly rigid in all directions	Superb high-speed performance
High positioning repeatability	Easy maintenance
Running accuracy can be obtained easily	Can be used in various environments
High accuracy can be maintained over a long period	

Features of the LM Guide

Large permissible load and high rigidity

Averages accuracy by absorbing mounting surface error

Ideal structure with four raceways, circular-arc grooves, and two-point contact

Superb error-absorbing capability with DF design

Low friction coefficient

Wide array of options (QZ lubricator, Laminated Contact Scraper LaCS, etc.)

As a result, the following features are achieved.

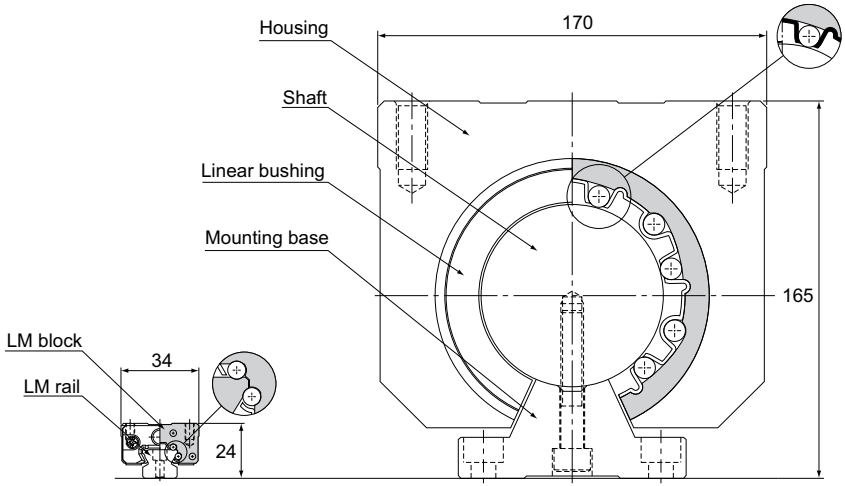
Easy maintenance
Improved productivity of the machine
Substantial energy savings
Low total cost
Higher accuracy of the machine
Higher efficiency in machine design

Large Permissible Load and High Rigidity

Large Permissible Load

The LM Guide has raceway grooves with a radius almost equal to the ball radius, which is a significant difference from products such as a linear bushing. Fig. 1 compares LM Guide units and linear bushings with similar basic dynamic load ratings. The marked difference in size indicates that more compact design can be achieved with the LM Guide.

This is because the structure of the curved groove (with a radius equal to 52% of the ball diameter) allows each ball to bear a load 13 times greater than it could in a structure in which the balls contact a flat surface. Since service life is proportional to the cube of the permissible load, this increased ball-bearing load translates into a service life that is approximately 2,200 times that of a linear bushing.



LM Guide Model SSR15XW
Basic dynamic load rating: 14.7 kN

Linear Bushing Model LM80 OP
Basic dynamic load rating: 7.35 kN

Fig. 1: Comparison between the LM Guide and the Linear Bushing

Table 1: Load Capacity per Ball (P and P_1)
Permissible contact surface pressure: 4,200 MPa

Ball diameter	R-groove (P)	Flat surface (P_1)	P/P_1
ϕ3.175 mm (1/8″)	0.90 kN	0.07 kN	13
ϕ4.763 mm (3/16″)	2.03 kN	0.16 kN	13
ϕ6.350 mm (1/4″)	3.61 kN	0.28 kN	13
ϕ7.938 mm (5/16″)	5.64 kN	0.44 kN	13
ϕ11.906 mm (15/32″)	12.68 kN	0.98 kN	13

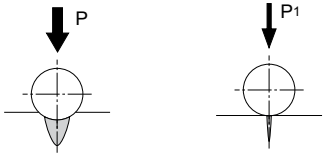


Fig. 2: Load Capacity per Ball

High Rigidity

The LM Guide is capable of bearing vertical and horizontal loads. Additionally, due to the circular-arc groove design, it is capable of carrying a preload as necessary to increase its rigidity.
When compared with a feed screw shaft system and a spindle in rigidity, the guide surface using an LM Guide has higher rigidity.

- **Example of comparing static rigidity between the LM Guide, a feed screw shaft system and a spindle**

(vertical machining center with the main shaft motor of 7.5 kW)

Components
LM Guide: SVR45LC/C0
(C0 clearance: preload = 11.11 kN)
Ball Screw: BNFN4010-5/G0
(G0 clearance: preload = 2.64 kN)
Spindle: general-purpose cutting spindle

Table 2: Comparison of Static Rigidity

Unit: N/μm

Components	X-axis direction	Y-axis direction	Z-axis direction
LM Guide	—	2400	9400 (radial) 7400 (reverse-radial)
Ball screw	330	—	—
Spindle	250	250	280

Note) The rigidity of the feed screw shaft system includes rigidity of the shaft end support bearing.

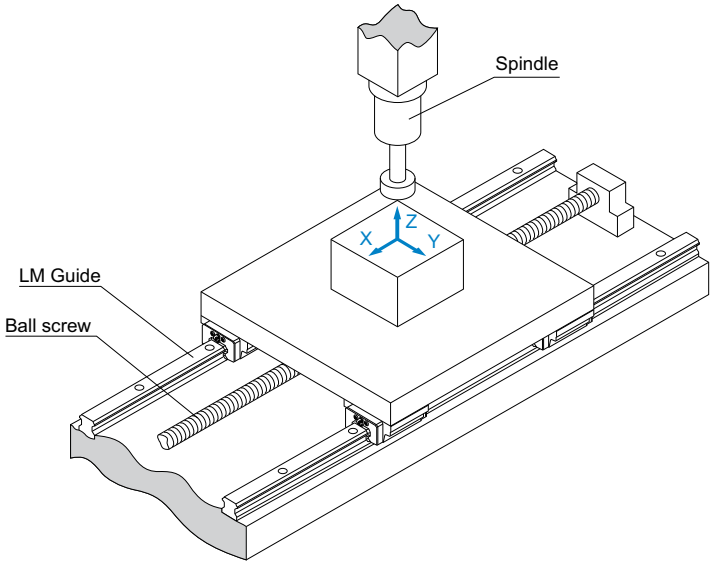
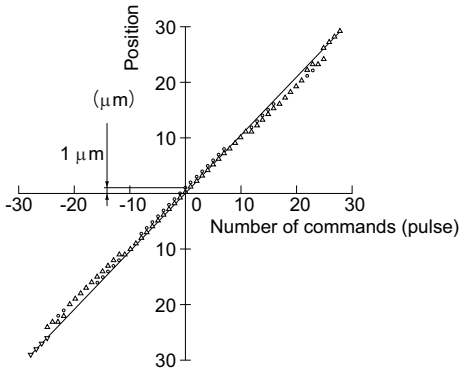


Fig. 3

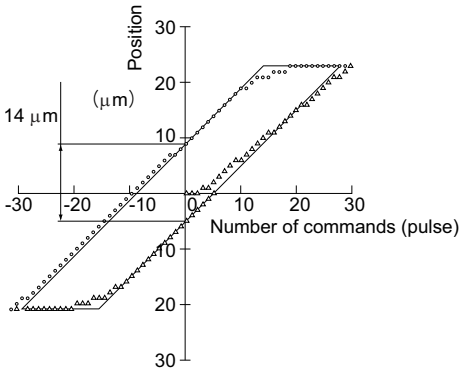
High Precision of Motion

Minimal Lost Motion

The LM Guide is provided with an ideal rolling mechanism. Therefore, the difference between dynamic and static friction is minimal and lost motion hardly occurs.



LM Guide Model HSR45



Square Slide + Turcite

(Measurements are taken with the single-axis table loaded with a 500 kg weight)

Fig. 4: Comparison of Lost Motion between an LM Guide and a Slide Guide

Table 3: Lost Motion Comparison

Unit: μm

Type	Clearance	Test method			
		As per JIS B 6330			Based on minimum unit feeding
		10 mm/min	500 mm/min	4000 mm/min	
LM Guide (HSR45)	C1 clearance (see table below)	2.3	5.3	3.9	0
	C0 clearance (see table below)	3.6	4.4	3.1	1
Square slide + turcite	0.02 mm	10.7	15	14.1	14
	0.005 mm	8.7	13.1	12.1	13

Radial Clearance of the LM Guide

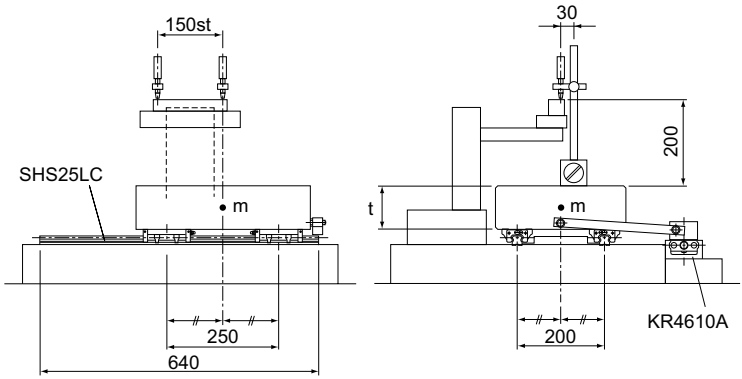
Unit: μm

Symbol	C1	C0
Radial clearance	–25 to –10	–40 to –25

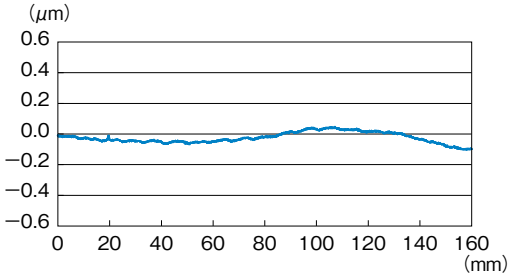
High Running Accuracy

Use of the LM Guide allows you to achieve high running accuracy.

Measurement method



Pitching accuracy



Yawing accuracy

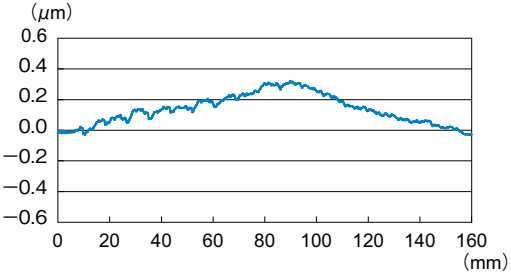


Fig. 5: Dynamic Accuracy of a Single-Axis Table

High Accuracy Maintained over a Long Period

The LM Guide employs an ideal rolling mechanism with negligible wear and high precision that is maintained over a long period of time. As shown in Fig. 6, when the LM Guide operates under both a preload and a normal load, more than 90% of the preload remains even after running 2,000 km.

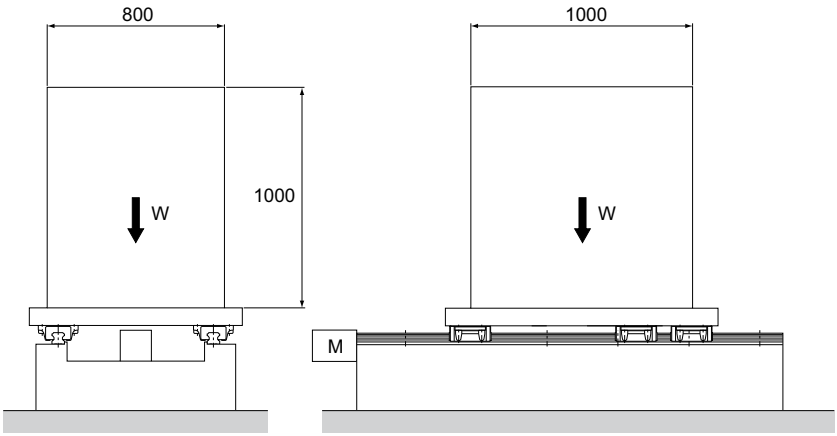


Fig. 6: Operating Conditions

Operating conditions
Model No. : HSR65L
Radial clearance
: C0 (preload: 15.7 kN)
Stroke : 1,050 mm
Speed : 15 m/min (stops 5 sec at both ends)
Acceleration/deceleration time in rapid motion
: 300 ms (acceleration: α = 0.833 m/s^2)
Mass : 6000 kg
Drive : Ball screw
Lubrication : Lithium soap-based grease No. 2
(greased every 100 km)

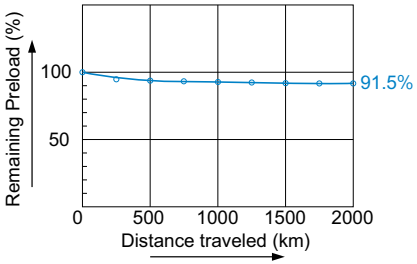


Fig. 7: Distance Traveled and Remaining Preload

Averages Accuracy by Absorbing Mounting Surface Error

The LM Guide contains highly spherical balls and has a self-contained structure with no clearance. In addition, because several LM rails can be used in parallel to form a multiple-axis guide system, the LM Guide is capable of averaging and absorbing straightness, flatness, or parallelism errors that might occur in the machining of the base to which the LM Guide is to be mounted or in the installation of the LM Guide.

The magnitude of the averaging effect varies according to the length or size of the misalignment, the preload applied on the LM Guide and the number of axes in the multiple-axis configuration. When misalignment is given to one of the LM rails of the table as shown in Fig. 8, the magnitude of misalignment and the actual dynamic accuracy of the table (straightness in the horizontal direction) are as shown in Fig. 9.

By applying such characteristics obtained with the averaging effect, you can easily establish a guide system with highly precise motion.

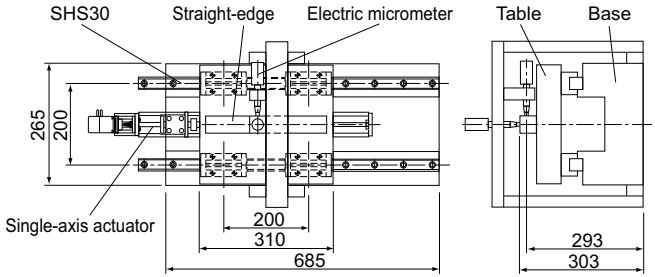


Fig. 8

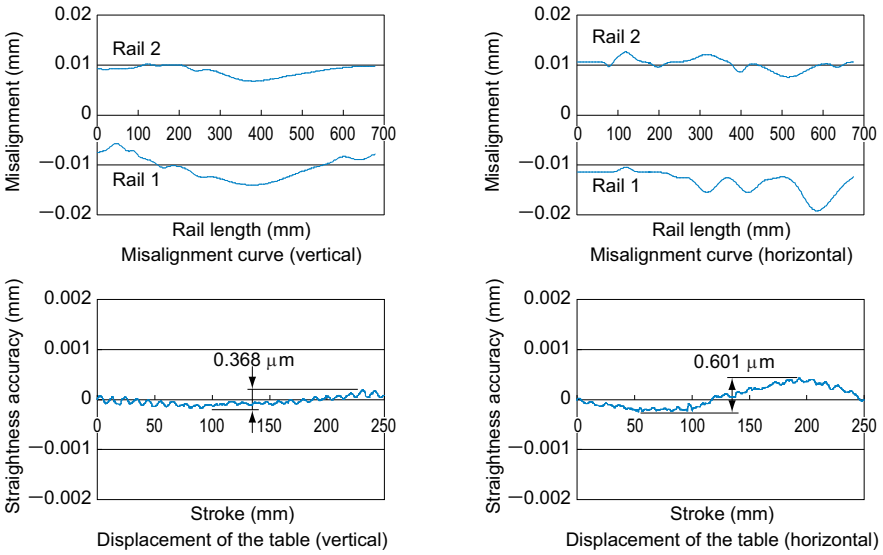


Fig. 9

Even on a roughly milled mounting surface, the LM Guide drastically increases the running accuracy of the top face of the table.

Installation Example

When comparing the mounting surface accuracy (a) and the table running accuracy (b), the results are:

Vertical	92.5 μm	→	15 μm	=	1/6
Horizontal	28 μm	→	4 μm	=	1/7

Table 4: Actual Measurement of Mounting Surface Accuracy
Unit: μm

Direction	Mounting surface		Straightness	Average (a)
Vertical	Bottom surface	A	80	92.5
		B	105	
Horizontal	Side surface	C	40	28
		D	16	

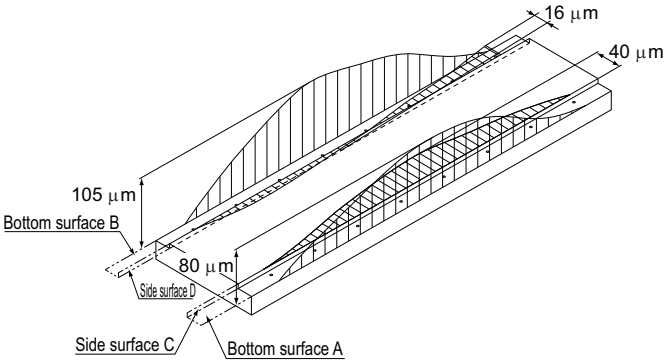


Fig. 10: Surface Accuracy of the LM Guide Mounting Base (Milled Surface Only)

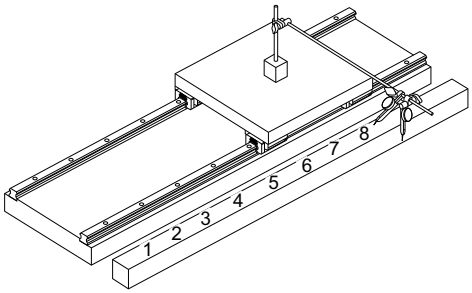


Fig. 11: Running Accuracy After the LM Guide Is Mounted

Table 5: Actual Measurement of Running Accuracy on the Table (Based on Measurement in Fig. 10 and Fig. 11)
Unit: μm

Direction	Measurement point								
	1	2	3	4	5	6	7	8	Straightness (b)
Vertical	0	+2	+8	+13	+15	+9	+5	0	15
Horizontal	0	+1	+2	+3	+2	+2	−1	0	4

Easy Maintenance

Unlike with sliding guides, the LM Guide does not incur uneven wear. As a result, sliding surfaces do not need to be reconditioned, and precision does not need to be altered. Regarding lubrication, sliding guides require forced circulation of a large amount of lubricant so as to maintain an oil film on the sliding surfaces, whereas the LM Guide only needs periodical replenishing of a small amount of grease or lubricant. This makes maintenance simple and also helps keep the work environment clean.

Substantial Energy Savings

As shown in Table 6, the LM Guide has a substantial energy saving effect.

Table 6: Comparative Data on Sliding and Rolling Characteristics

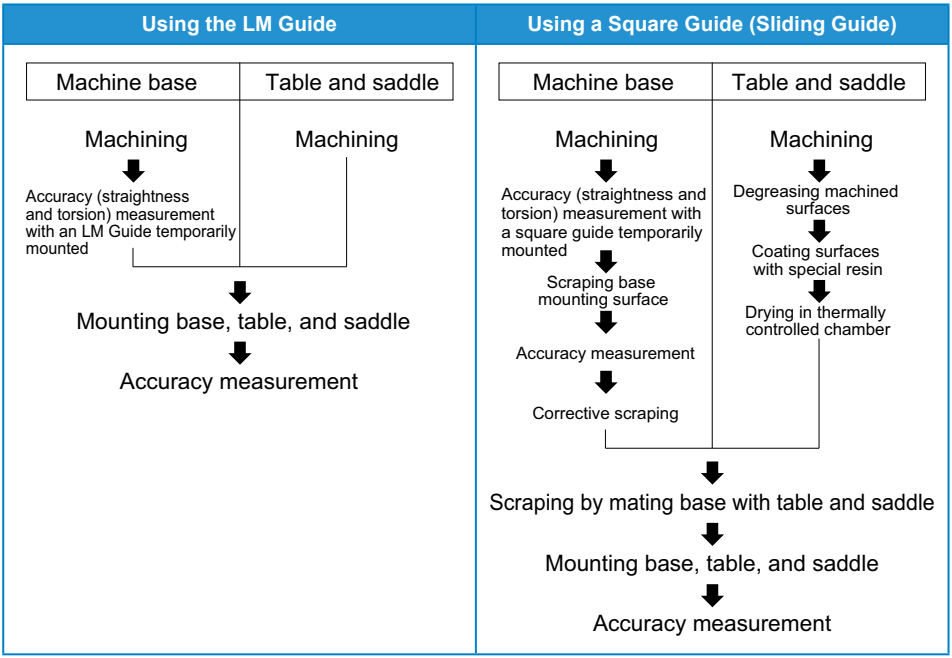
Machine specifications		
Type of machine	Single-axis surface grinding machine (sliding guide)	Three-axis surface grinding machine (rolling guide)
Overall length × overall width	13 m×3.2 m	12.6 m×2.6 m
Total mass	17000 kg	16000 kg
Table mass	5000 kg	5000 kg
Grinding area	0.7 m×5 m	0.7 m×5 m
Table guide	Rolling through V-V guide	Rolling through LM Guide installation
No. of grinding stone axes	Single axis (5.5 kW)	Three axes (5.5 kW + 3.7 kW x 2) Grinding capacity: 3 times greater

Table drive specifications			Ratio
Motor used	38.05 kW	3.7 kW	10.3
Drive hydraulic pressure	Bore diameter ϕ 160×1.2 MPa	Bore diameter ϕ 65×0.7 MPa	—
Thrust	23600 N	2270 N	10.4
Electric power consumption	38 kWH	3.7 kWH	10.3
Drive hydraulic pressure oil consumption	400 ℓ/year	250 ℓ/year	1.6
Lubricant consumption	60 ℓ/year (oil)	3.6 ℓ/year (grease)	16.7

Low Total Cost

Compared with a sliding guide, the LM Guide is easier to assemble and does not require highly skilled technicians to perform the adjustment work. This reduces assembly labor and allows machines and systems incorporating the LM Guide to be produced at a lower cost. The figure below shows an example of the difference in the assembly procedures for machining centers that use sliding guides and those that use LM Guides.
Normally, with a sliding guide, the surface on which the guide is installed must be ground to a very smooth finish. However, the LM Guide can offer high precision even if the surface is milled or planed. Using the LM Guide thus cuts down on machining labor and lowers machining costs as a whole.

Assembly Procedure for a Machining Center



When extremely high precision is not required (e.g., running accuracy), the LM Guide can be attached to the steel plate even if the black scale on it is not removed.

Ideal Structure with Four Raceways, Circular-Arc Grooves, and Two-Point Contact

The LM Guide has a self-adjusting capability that competitors' products do not have.
This feature is achieved by an ideal structure with four raceways, circular-arc grooves, and two-point contact.

Comparison of Characteristics between the LM Guide and Similar Products

LM Guide: structure with four raceways, circular-arc grooves, and two-point contact	Other Product: structure with two raceways, Gothic-arch grooves, and four-point contact
LM Guide Model HSR	**Two-row Gothic-arch groove product**

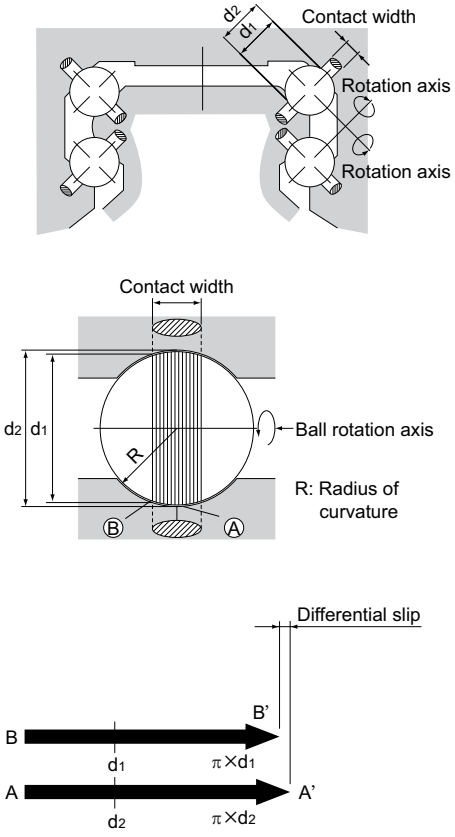


Fig. 12

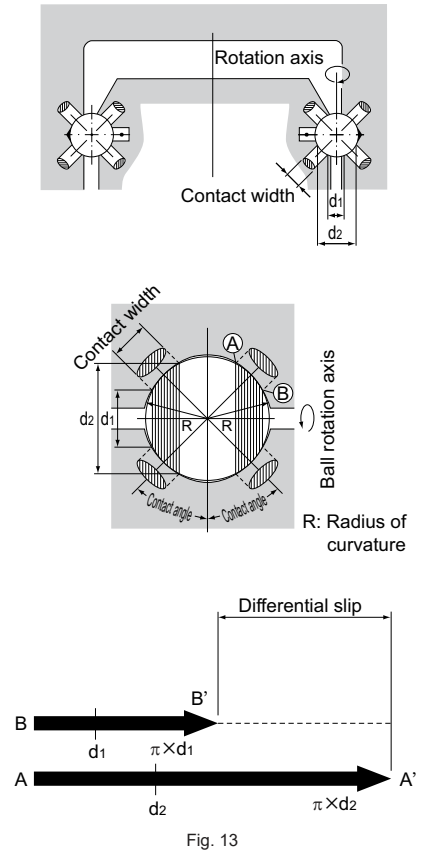


Fig. 13

As indicated in Fig. 12 and Fig. 13, for each revolution, the ball slips a distance equal to the difference between the circumference of the inner contact diameter (πd_1) and the circumference of the outer contact diameter (πd_2). (This slip is called differential slip.) If the difference is large, the ball rotates while slipping, the friction coefficient increases more than 10 times and the friction resistance steeply increases.

Structure with four raceways, circular-arc grooves, and two-point contact	Structure with two raceways, Gothic-arch grooves, and four-point contact
Smooth Motion	
Since the balls contact the raceway at two points in the load direction, as shown in Fig. 12 and Fig. 13 on B**1-19**, whether under preload or normal load, the difference between d_1 and d_2 is small, as is the differential slip, allowing a smooth rolling motion.	The difference between d_1 and d_2 in the contact area is large as shown in Fig. 12 and Fig. 13 on B**1-19**. Therefore, if any of the following occurs, the ball will generate differential slip, causing friction almost as large as sliding resistance and shortening the service life as a result of abnormal wear. (1) A preload is applied (2) A lateral load is applied. (3) If two or more rails are mounted and they are not properly aligned (4) If spinning occurs
Accuracy of the Mounting Surface	
In the ideal two-point contact structure, four rows of circular-arc grooves are given appropriate contact angles. With this structure, a light distortion of the mounting surface is absorbed within the LM block due to elastic deformation of the balls and moving of the contact points to allow unforced, smooth motion. This eliminates the need for a robust mounting base with high rigidity and accuracy for machinery such as conveyance systems.	In a product with Gothic-arch grooves, each ball contacts the groove at four points, which inhibits elastic deformation in the ball and prevents the contact points from moving (i.e., the product has no self-adjusting capability). Therefore, even a slight distortion of the mounting surface or an accuracy error of the rail bed cannot be absorbed, and smooth motion cannot be achieved. Accordingly, it is necessary to machine a highly rigid mounting base with high precision and mount a high precision rail.
Rigidity	
With two-point contact, even if a relatively large preload is applied, the rolling resistance does not abnormally increase and high rigidity can be obtained. Since differential slip occurs due to four-point contact, a sufficient preload cannot be applied and high rigidity cannot be obtained.	Since differential slip occurs due to the four-point contact, a sufficient preload cannot be applied and high rigidity cannot be obtained.
Load Rating	
Since the curvature radius of the ball raceway is 51% to 52% of the ball diameter, a large rated load can be obtained.	Since the curvature radius of the Gothic-arch groove has to be 55% to 60% of the ball diameter, the rated load is reduced to approximately 50% of that of the circular arc groove.
Difference in Rigidity	
As shown in Fig. 14, the rigidity widely varies according to the difference in curvature radius or difference in preload.	

Curvature Radius and Rigidity

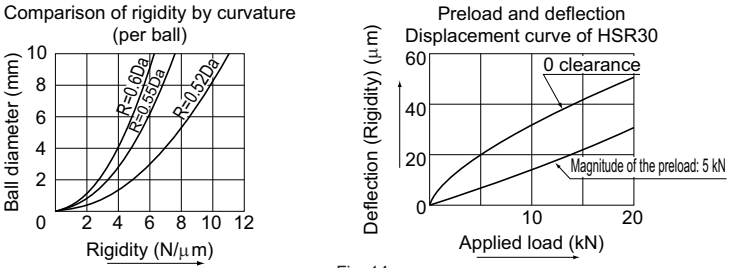


Fig. 14

Difference in Service Life
Since the load rating of the Gothic-arch groove is reduced to approximately 50% of that of the circular-arc groove, the service life also decreases to 87.5%.

Accuracy Error of the Mounting Surface and Test Data on Rolling Resistance

The difference between the contact structures translates into rolling resistance.
In the Gothic-arch groove contact structure, each ball makes contact at four points and differential slip or spinning occurs if a preload is applied to increase rigidity or if there is large error in the mounting precision. This sharply increases the rolling resistance and causes abnormal wear at an early stage.
The following are test data obtained by comparing an LM Guide with the four-raceway, circular-arc groove, two-point contact structure and a product with a two-raceway, Gothic-arch, four-point contact structure.

Sample

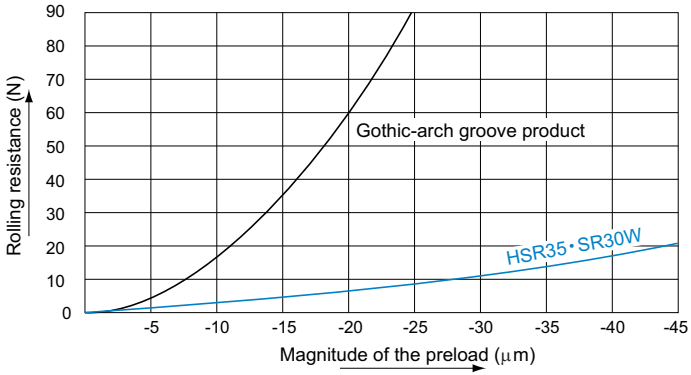
(1) LM Guide
SR30W (radial type) 2 sets
HSR35 (4-way equal-load type) 2 sets
(2) Two-row, Gothic-arch groove product
Type with dimensions similar to HSR30 2 sets

Conditions

Radial clearance: ±0 μm
Without seal
Without lubrication
Load: table mass of 30 kg

Data 1: Preload and Rolling Resistance

When a preload is applied, the rolling resistance of the Gothic-arch groove product steeply increases and differential slip occurs. Even under a preload, the rolling resistance of the LM Guide does not increase.



Data 2: Error in Parallelism between Two Axes and Rolling Resistance

As shown in Fig. 15, part of the rails mounted in parallel is displaced along the parallel axis and the rolling resistance at that point is measured.
With the Gothic-arch groove product, the rolling resistance is 34 N when the error in parallelism is 0.03 mm and 62 N when the error is 0.04 mm. These resistances are equivalent to the slip friction coefficients, indicating that the balls are in sliding contact with the groove.

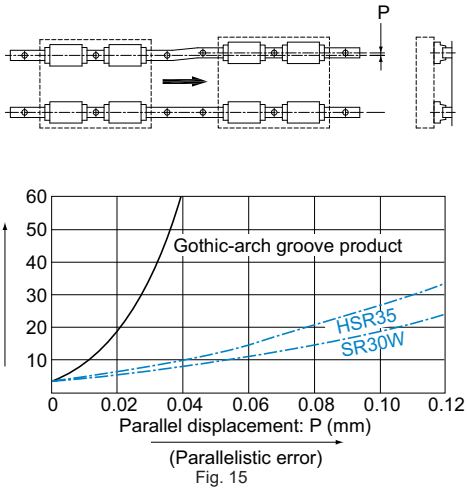
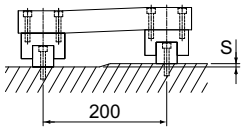
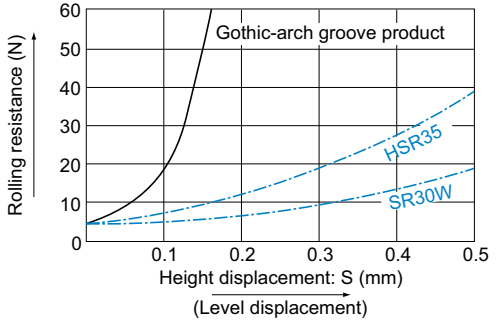


Fig. 15

Data 3: Difference between the Levels of the Top and Bottom Rails and Rolling Resistance

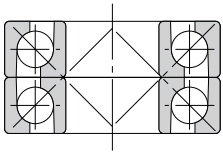
Displace the bottom of either rail vertically by S and create the height difference between the two axes. Then, measure the rolling resistance. If the LM Guide has a Gothic-arch groove, this will cause spinning. An LM Guide with a circular-arc groove is capable of absorbing the error caused by a height difference between rails as great as 0.3/200 mm, where its rolling resistance will not increase significantly.



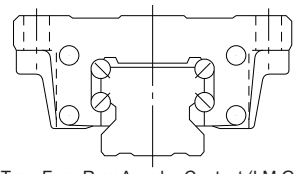


Superb Error-Absorbing Capability with DF Design

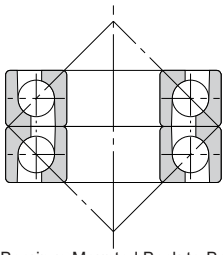
Since the LM Guide has a contact structure similar to the front-to-front mount of angular ball bearings, it has superb self-adjusting capability.



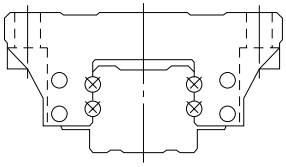
Angular Ball Bearings Mounted Front-to-Front (DF Type)
As the distance ℓ between the application points is small, the allowable tilt angle is large (it has high self-adjustment capability).



DF Type Four-Row Angular Contact (LM Guide)
It has an internal structure that will not be easily affected by inconsistencies on the mounting surface.

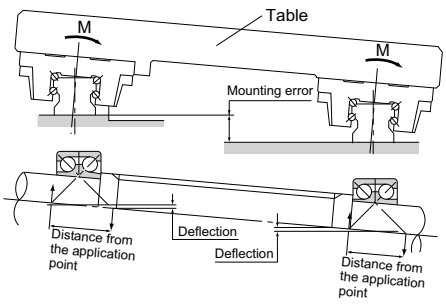
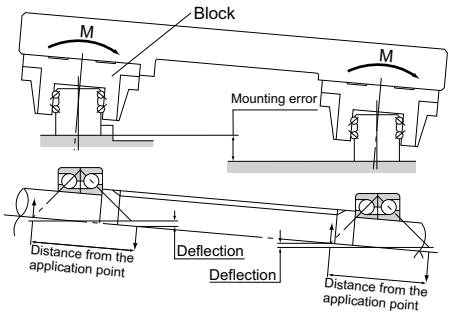


Angular Ball Bearings Mounted Back-to-Back (DB Type)
As the distance between the application points is large, the permissible tilt angle is small.

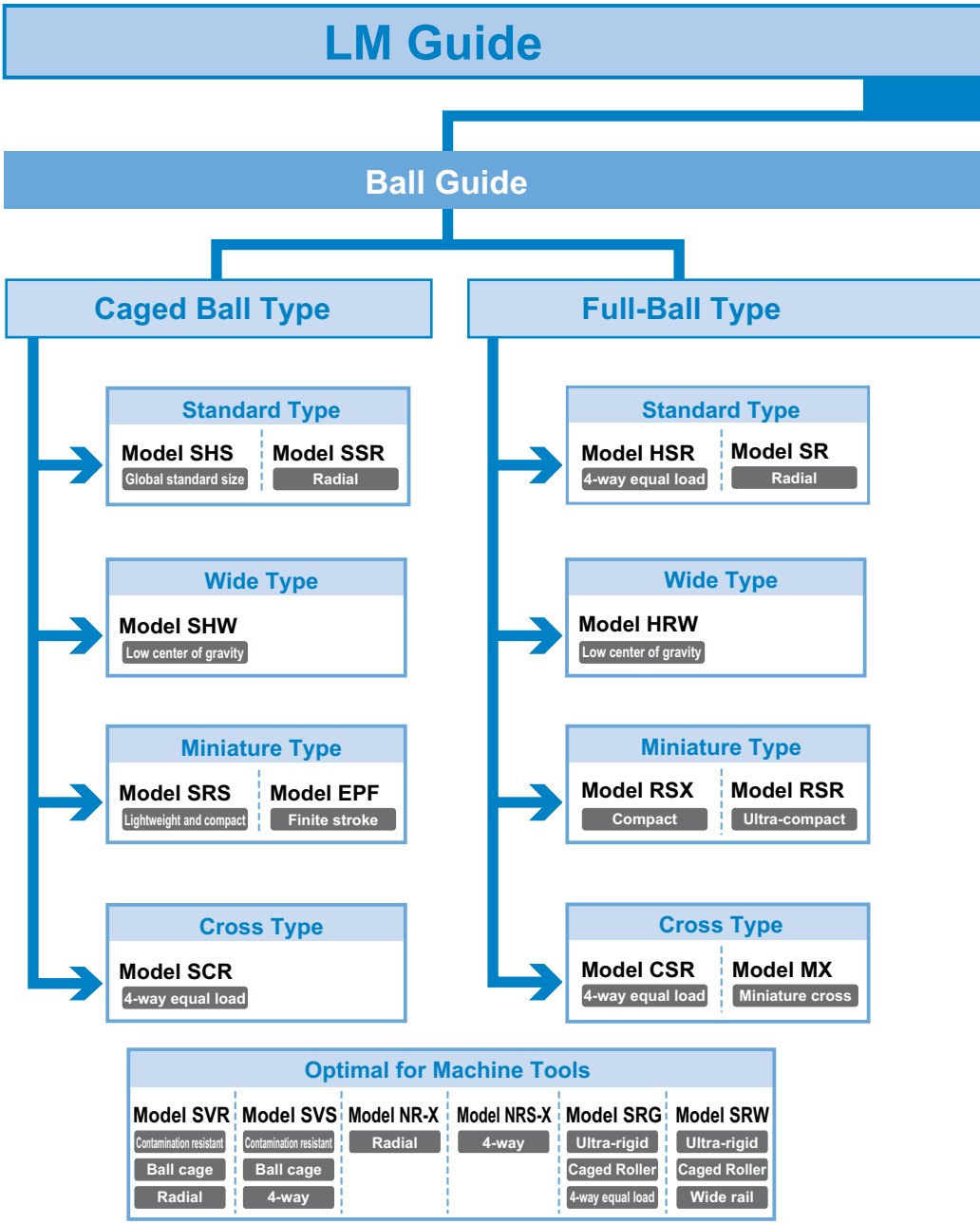


Four-Row Gothic-Arch Contact
It requires high mounting precision.

An LM ball guide mounted on a plane receives a moment (M) due to an error in flatness or level or a deflection of the table. Therefore, it is essential for the guide to have self-adjusting capability.

LM Guide Model HSR	Similar Product of a Competitor
	
Since the distance between the application points of the bearings is small, the internal load generated from inconsistencies in the mounting surface is small, allowing movement to remain smooth.	Since the distance from the application point of the bearing is large, the internal load generated from a mounting error is large, and the self-adjusting capability is small. With an LM ball guide having angular ball bearings mounted back-to-back, if there is an error in flatness or a deflection in the table, the internal load applied to the block is approximately six times greater than that of the front-to-front mount structure and the service life is much shorter. In addition, the fluctuation in sliding resistance is greater.

LM Guide Classification Table



Roller Guide

With a Caged Roller

Curved Type
- **Model HCR** — Curved type
- **Model HMG** — Straight-curved type

Separate Type
- **Model HR** — Heavy load
- **Model GSR** — Interchangeable, self-aligning
- **Model GSR-R** — Interchangeable, self-aligning; With rack

Model JR Type
- **Model JR** — Structural member rail; 4-way equal load

Self-aligning
- **Model NSR-TBC**

Standard Type
- **Model SRG** — Ultra-high rigidity
- **Model SRN** — Ultra-high rigidity; Low center of gravity

Wide Type
- **Model SRW** — Ultra-high rigidity

Full-Roller

Standard Type
- **Model HRX** — Super-high rigidity

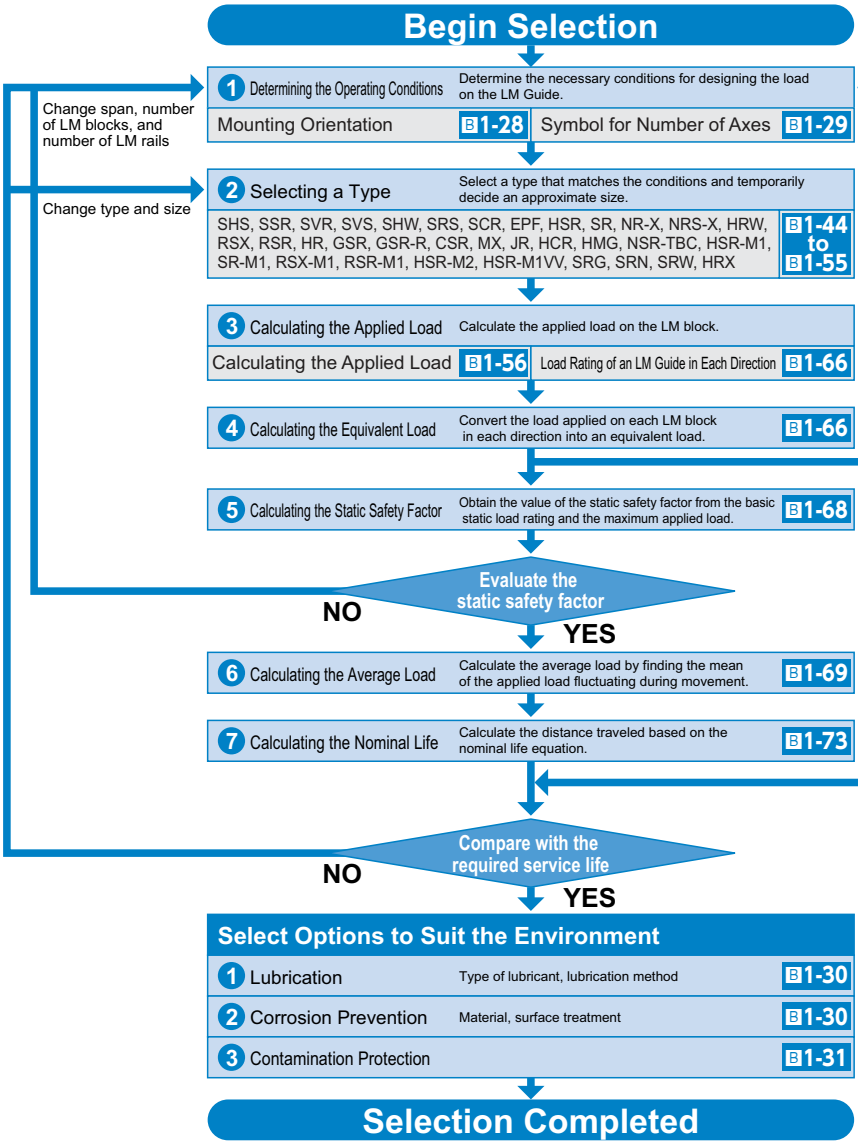
Models with Special Environment Specifications

Model HSR-M1	Model SR-M1	Model HSR-M2	Model RSX-M1	Model HSR-M1VV	Model RSR-M1
High temperature 4-way equal load	High temperature Radial	High corrosion resistance 4-way equal load	High temperature Compact	Medium-to-low vacuum 4-way equal load	High temperature Compact

Flowchart for Selecting an LM Guide

Steps for Selecting an LM Guide

The following flowchart can be used as reference for selecting an LM Guide.



- Space in which the guide will be used
- Dimensions (span, number of LM blocks, number of LM rails, thrust)
- Mounting orientation (horizontal, vertical, slant mount, wall mount, suspended)
- Magnitude, direction, and position of the working load
- Operating frequency (duty cycle)
- Speed (acceleration)
- Stroke length
- Required service life
- Precision of motion
- Environment
- In a special environment (vacuum, clean room, high temperature, environment exposed to contamination, etc.), it is necessary to take into account material, surface treatment, lubrication, and contamination protection.

Predicting the Rigidity

1	Selecting a Radial Clearance (Preload)	B1-85
2	Service Life with a Preload Considered	B1-86
3	Rigidity	B1-86
4	Radial Clearance Standard for Each Model	A1-73
5	Designing the Guide System	A1-478

Determining the Accuracy

1	Accuracy Standards	B1-87
2	Guidelines for Accuracy Grades by Machine Type	B1-88
3	Accuracy Standard for Each Model	A1-78~

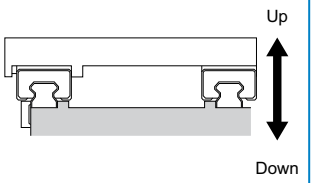
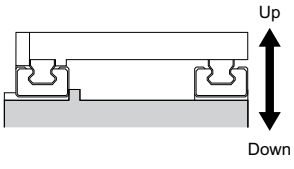
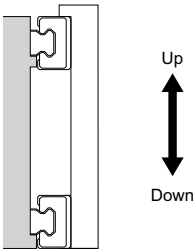
Determining the Operating Conditions

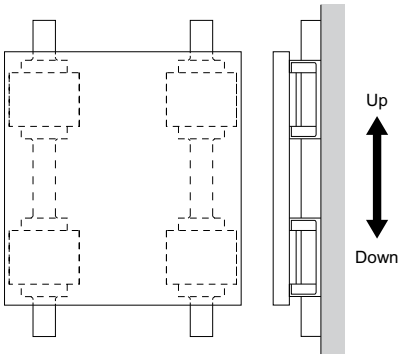
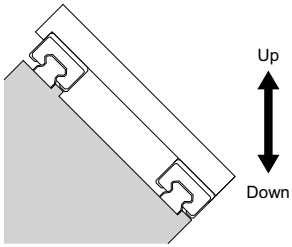
Operating Conditions of the LM Guide

Mounting Orientation

The LM Guide can be mounted in the following five orientations.
The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation. Be sure to let THK know the installation direction and the exact position in each LM block where the grease nipple or the piping joint should be attached.
For the lubrication, see A24-2.

Mounting Orientation

Horizontal (symbol: H)	Inverted (symbol: R)	Wall mount (symbol: K)
		

Vertical (symbol: V)	Slant mount (symbol: T)
	

Symbol for Number of Axes

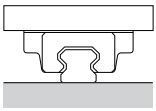
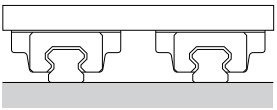
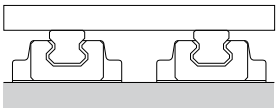
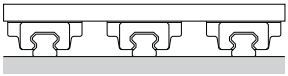
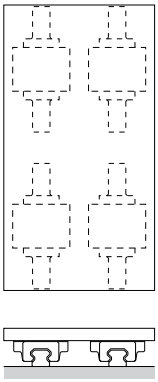
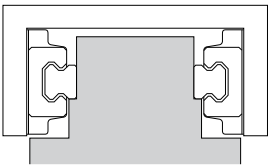
If two or more LM Guide units are used in a parallel combination on the same plane, specify in advance the number of the LM rails (symbol for number of axes) used in combination.
(For accuracy standards and radial clearance standards, see A1-78 and A1-73, respectively.)

Model number coding

SHS25C2SSCO+1000LP -II

- Model number (details are given on the corresponding page of the model)
- Symbol for number of axes ("II" indicates 2 axes. No symbol for a single axis)

Symbol for Number of Axes

Symbol for number of axes: none	Symbol for number of axes: II	Symbol for number of axes: II
Required number of axes: 1	Required number of axes: 2	Required number of axes: 2
	 Note: When placing an order, specify the number in multiples of 2 axes.	 Note: When placing an order, specify the number in multiples of 2 axes.
Symbol for number of axes: III	**Symbol for number of axes: IV**	**Other**
Required number of axes: 3	Required number of axes: 4	Required number of axes: 2
 Note: When placing an order, specify the number in multiples of 3 axes.	 Note: When placing an order, specify the number in multiples of 4 axes.	 Using 2 axes opposed to each other

Service Environment

● Lubrication

When using an LM System, it is necessary to provide effective lubrication. Using the product without lubrication may increase wear on the rolling elements and shorten the service life.
A lubricant has effects such as the following.
(1) Minimizes friction on moving elements to prevent seizure and reduce wear.
(2) Forms an oil film on the raceway to decrease stress acting on the surface and extend rolling fatigue life.
(3) Covers metal surfaces with an oil film to prevent the formation of rust.
To optimize an LM Guide's functionality, it is necessary to provide lubrication according to the operating conditions.
The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation.
Be sure to let THK know the mounting orientation and the exact position in each LM block where the grease nipple or the piping joint should be attached. For the mounting orientation and the lubrication, see B**1-28** and B**24-2**, respectively.
Even with an LM Guide with seals, the internal lubricant gradually seeps out during operation. Therefore, the system needs to be lubricated at an appropriate interval according to the operating conditions.

● Corrosion Prevention

■Determining a Material

Any LM System requires a material that suits the operating environment. For use in environments where corrosion resistance is required, some LM System models can use martensitic stainless steel. (Martensitic stainless steel can be used for LM Guide models SHS, SSR, SHW, SRS, HSR, SR, HRW, RSX, RSR, and HR.)
The HSR series includes HSR-M2, a highly corrosion-resistant LM Guide using anti-corrosive austenitic stainless steel. For details, see A**1-396**.

■Surface Treatment

The surfaces of the rails and shafts of the LM System can be treated for anti-corrosive or aesthetic purposes.
THK offers THK-AP treatment, which is the optimum surface treatment for the LM System.
There are roughly three types of THK-AP treatment: AP-HC, AP-C, and AP-CF. (See B**0-20**.)

● Contamination Protection

It is necessary to prevent foreign materials from getting inside the product, as it will lead to abnormal wear and a shortened service life. Therefore, when entrance of dust or other foreign material is a possibility, it is necessary to select a sealing device or contamination protection option suited to the operating environment and conditions.

THK offers contamination protection accessories for each model of the LM Guide, such as end seals made of a special synthetic rubber with high wear resistance, and side seals and inner seals that provide further contamination protection.

In addition, for applications in adverse environments, a Laminated Contact Scraper LaCS and dedicated bellows are available for various model numbers.

Also, THK offers dedicated caps designed to prevent cutting chips from entering the LM rail mounting holes.

When it is necessary to provide contamination protection for a ball screw in an environment exposed to cutting chips and moisture, we recommend using a telescopic cover that protects the whole system or a large bellows.

For the options, see B**1-103**.

Clean Room

In a clean environment, the generation of dust from the LM System has to be reduced and anti-rust oil cannot be used. Therefore, it is necessary to increase the corrosion resistance of the LM System. In addition, depending on the required level of cleanliness, a dust collector may be necessary.

Dust Generation from the LM System

■Measures to prevent dust generation resulting from spattering grease

THK AFE-CA, AFF, and L100 Grease
Use grease that produces little dust and is suited to a clean environment.

■Measures to reduce dust generation resulting from metallic abrasion

Caged Ball LM Guide
Dust generation can be reduced by using a Caged Ball LM Guide, which has no friction between balls and generates little metallic abrasion dust.

Corrosion Prevention

■Material-based measures

Stainless steel LM Guide
This LM Guide uses corrosion-resistant martensitic stainless steel.

Corrosion-resistant LM Guide
The LM rail uses austenitic stainless steel, which has a high corrosion-resistant effect.

■Surface treatment measures

THK AP-HC, AP-C, and AP-CF Treatment
The LM System is surface-treated to increase corrosion resistance.

Caged Ball LM Guide
Supported models: SHS SSR SVR/SVS SHW SRS SCR EPF

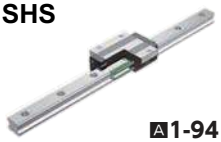
Caged Roller LM Guide
Supported models: SRG SRN SRW

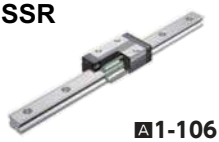
Stainless Steel LM Guide
Supported models: SHS SSR SHW SRS HSR SR HRW HR RSX RSR

Corrosion-Resistant LM Guide
Supported models: HSR-M2

Surface Treatment

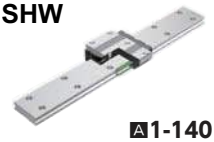
Grease

SHS

A1-94

SSR

A1-106

SVR/SVS

A1-120

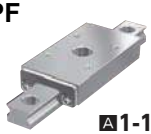
SHW

A1-140

SRS

A1-150

SCR

A1-166

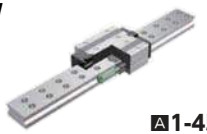
EPF

A1-174

SRG

A1-414

SRN

A1-438

SRW

A1-456

SHS

A1-94

SSR

A1-106

SHW

A1-140

SRS

A1-150

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

A1-272

RSX

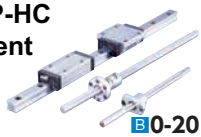
A1-252

RSR

A1-264

HSR-M2

A1-396

THK AP-HC Treatment

B0-20

THK AP-C Treatment

B0-20

THK AP-CF Treatment

B0-20

THK AFE-CA Grease

A24-13

THK AFF Grease

A24-15

L100 Grease

A24-25

Vacuum

In a vacuum environment, measures are required to prevent resin from emitting gas and grease from spattering. Anti-rust oil cannot be used, so it is necessary to select a product with high corrosion resistance.

■Measures to prevent resin from emitting gas

Stainless steel LM Guide

The end plate (ball circulation path normally made of resin) of the LM block is made of stainless steel to reduce emission of gas.

■Measures to prevent grease from evaporating

Vacuum grease

If a general-purpose grease is used in a vacuum environment, oil contained in the grease spatters and the grease loses lubricity. Therefore, use a vacuum grease made with low-vapor-pressure fluorine-based oil.

■Corrosion prevention

Stainless steel LM Guide

In a vacuum environment, use a corrosion-resistant stainless steel LM Guide.

High-temperature LM Guide

If high temperatures are predicted due to baking, use a high-temperature LM Guide, which is highly resistant to heat and corrosion.

Corrosion-resistant LM Guide

This LM Guide uses highly corrosion-resistant austenitic stainless steel in the LM rail.

High-Temperature LM Guide

Supported models: HSR-M1 SR-M1 RSX-M1 RSR-M1

LM Guide for Medium-to-Low Vacuums

Supported models: HSR-M1VV

Corrosion-Resistant LM Guide

Supported models: HSR-M2

Stainless Steel LM Guide

Supported models: HSR SR HRW HR RSX RSR

Vacuum Grease

HSR-M1

A1-350

SR-M1

A1-366

RSX-M1

A1-376

RSR-M1

A1-386

HSR-M1VV

A1-402

HSR-M2

A1-396

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

A1-272

RSX

A1-252

RSR

A1-264

Corrosion Prevention

As with clean room applications, it is necessary to increase corrosion resistance through material selection and surface treatment.

■Material-based measures

Stainless steel LM Guide

This LM Guide uses corrosion-resistant martensitic stainless steel.

Corrosion-resistant LM Guide

This LM Guide uses highly corrosion-resistant austenitic stainless steel in the LM rail.

■Surface treatment measures

THK AP-CF, AP-C, and AP-HC treatment

The LM system is surface-treated to increase corrosion resistance.

Stainless Steel LM Guide

Supported models: **SHS SSR SHW SRS HSR SR HRW HR RSX RSR**

Corrosion-Resistant LM Guide

Supported models: **HSR-M2**

Surface Treatment

SHS

A1-94

SSR

A1-106

SHW

A1-140

SRS

A1-150

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

A1-272

RSX

A1-252

RSR

A1-264

HSR-M2

A1-396

THK AP-CF Treatment

B0-20

THK AP-C Treatment

B0-20

THK AP-HC Treatment

B0-20

High Speed

In a high-speed environment, it is necessary to apply an optimal lubrication method that reduces heat generation during high-speed operation and increases grease retention.

■Measures to reduce heat generation

Caged Ball LM Guide

Use of a ball cage eliminates friction between balls to reduce heat generation. In addition, grease retention is increased, contributing to long service life and high-speed operation.

THK AFA Grease, AFJ Grease

It reduces heat generation in high speed operation and has superb lubricity.

■Measures to improve lubrication

QZ Lubricator

Continuous oil lubrication ensures that the lubrication and maintenance interval can be significantly extended. It also applies the right amount of oil to the raceway, making itself an eco-friendly lubrication system that does not contaminate the surrounding area.

Caged Ball LM Guide

Supported models: SHS SSR SVR/SVS SHW SRS SCR EPF

Caged Roller LM Guide

Supported models: SRG SRN SRW

QZ Lubricator

Grease

SHS

A1-94

SSR

A1-106

SVR/SVS

A1-120

SHW

A1-140

SRS

A1-150

SCR

A1-166

EPF

A1-174

SRG

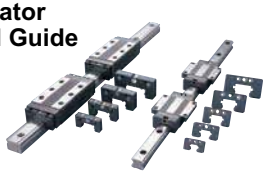
A1-414

SRN

A1-438

SRW

A1-456

QZ Lubricator for the LM Guide

A1-536

THK AFA Grease

A24-7

THK AFJ Grease

A24-21

High Temperature

In a high-temperature environment, dimensional variations caused by heat are problematic. Use a high-temperature LM Guide, which is heat resistant and has minimal dimensional variation when heated. Also, use a high-temperature grease.

■Heat resistance

High-temperature LM Guide

A special heat treatment to maintain dimensional stability minimizes dimensional variations due to heating and cooling.

■Grease

High-temperature grease

Use a high-temperature grease to maintain consistent rolling resistance in the LM System even at high temperatures.

Low Temperature

In a low-temperature environment, use an LM System with a minimal amount of resin components and a grease that minimizes fluctuations in rolling resistance, even at low temperature.

■Impact of low temperature on resin components

Stainless steel LM Guide

The end plate (ball circulation path normally made of resin) of the LM block is made of stainless steel.

■Corrosion prevention

THK AP-CF, AP-C, and AP-HC Treatment

The LM System is surface-treated to increase corrosion resistance.

■Grease

THK AFC Grease

This grease has little rolling resistance fluctuation even in cold temperatures.

Micro Motion

Micro strokes cause the oil film to break, resulting in poor lubrication and early wear. In such applications, select a grease with high oil film strength that can easily form an oil film.

■Grease

THK AFC Grease

AFC Grease is a urea-based grease that excels in oil film strength and wear resistance.

High-Temperature LM Guide

Supported models: HSR-M1 SR-M1 RSX-M1 RSR-M1 HSR-M1VV

High-Temperature Grease

Stainless Steel LM Guide

Supported models: SHS SSR SHW SRS HSR SR HRW HR RSX RSR

Surface Treatment

Low-Temperature Grease

Grease

HSR-M1

A1-350

SR-M1

A1-366

RSX-M1

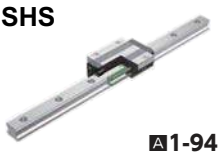
A1-376

RSR-M1

A1-386

HSR-M1VV

A1-402

SHS

A1-94

SSR

A1-106

SHW

A1-140

SRS

A1-150

HSR

A1-182

SR

A1-210

HRW

A1-242

HR

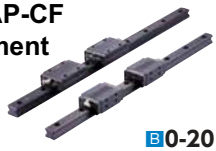
A1-272

RSX

A1-252

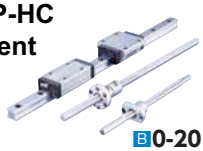
RSR

A1-264

THK AP-CF Treatment

B0-20

THK AP-C Treatment

B0-20

THK AP-HC Treatment

B0-20

THK AFC Grease

A24-11

THK AFC Grease

A24-11

Foreign Matter

If foreign matter enters the LM System, it will cause abnormal wear and shorten the service life. Therefore, it is necessary to prevent such entrance of foreign matter.
Especially in an environment containing small foreign matter or a water-soluble coolant that a telescopic cover or a bellows cannot block, it is necessary to attach a contamination protection accessory capable of efficiently removing foreign matter.

■Metal scraper

It removes relatively large foreign objects such as cutting chips, spatter, sand, or hard foreign materials that adhere to the LM rail.

■Laminated Contact Scraper LaCS

Unlike a metal scraper, it removes foreign matter while making contact with the LM rail. Therefore, it is more effective at preventing contamination by small foreign matter that is difficult to remove with conventional metal scrapers.

■QZ Lubricator

The QZ Lubricator is a lubrication system that feeds the right amount of lubricant to the ball raceway through direct contact with a highly oil-impregnated fiber net.

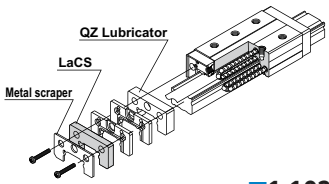
■Dedicated metal caps for LM rail mounting holes - GC caps

GC caps are metal caps that plug LM rail mounting holes (compliant with the RoHS Directives). In harsh environments they prevent the entrance of foreign material and coolant from the top face of the LM rail (mounting holes) and significantly increase contamination protection of the LM Guide if used with a dust seal.

■Protector

The protector minimizes the entrance of foreign material even in harsh environments where foreign material such as fine particles and liquids are present.

LM Guide
+Metal scraper
+Contact scraper LaCS
+GC cap etc.

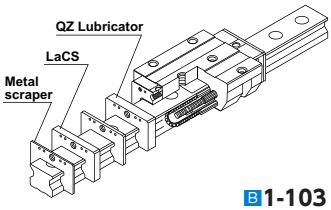


B1-103

Supported models

Caged Ball LM Guide
SHS SSR SVR/SVS SHW SRS
Full-Ball LM Guide
HSR NR-X/NRS-X

Roller Type LM Guide
+Metal scraper
+Contact scraper LaCS
+GC cap etc.



B1-103

Supported models

SRG HRX

Caged Ball LM Guide

SHS



A1-94

SSR



A1-106

SHW



A1-140

SRS



A1-150

SVR/SVS



Featuring the protector A1-120

Full-Ball LM Guide

HSR



A1-182

NR-X/NRS-X



A1-222

Caged Roller LM Guide

SRG



Featuring the protector A1-414

Full-Roller LM Guide

HRX

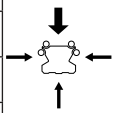
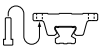
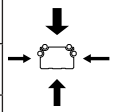


Featuring the protector A1-464

Selecting a Type

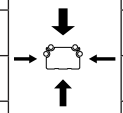
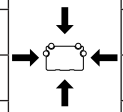
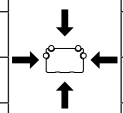
Types of LM Guide

THK offers the LM Guide in a wide array of standard types and dimensions so that you can select the optimal product for any application. The unit structure of the LM Guide allows for high running accuracy with no clearance simply by mounting the product to a flat surface with bolts. We have a proven track record and know-how in extensive applications.

Classification		Type		Dimensional table*	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
Radial type	Caged Ball LM Guide models		SSR-XW	▶A1-110		14.7 to 64.6	16.5 to 71.6
			SSR-XV	▶A1-112		9.1 to 48.3	9.7 to 46.7
			SSR-XTB	▶A1-114		14.7 to 64.6	16.5 to 71.6
			SSR-XSB	▶A1-116		9.1 to 48.3	9.7 to 46.7
	Full-Ball LM Guide models		SR-W	▶A1-216		13.8 to 411	20.5 to 537
			SR-M1W	▶A1-370		13.8 to 60.4	20.5 to 81.8
			SR-V	▶A1-216		9.1 to 40.9	11.7 to 46.7
			SR-M1V	▶A1-370		9.1 to 40.9	11.7 to 46.7
			SR-TB	▶A1-218		13.8 to 136	20.5 to 179
			SR-M1TB	▶A1-372		13.8 to 60.4	20.5 to 81.8
			SR-SB	▶A1-218		9.1 to 40.9	11.7 to 46.7
			SR-M1SB	▶A1-372		9.1 to 40.9	11.7 to 46.7
	Caged Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		SVR-C	▶A1-130		48 to 260	68 to 328
			SVR-LC	▶A1-130		57 to 340	86 to 481
			SVR-R	▶A1-126		48 to 260	68 to 328
			SVR-LR	▶A1-126		57 to 340	86 to 481
			SVR-CH	▶A1-136		90 to 177	115 to 238
			SVR-LCH	▶A1-136		108 to 214	159 to 312
			SVR-RH	▶A1-134		90 to 177	115 to 238
			SVR-LRH	▶A1-134		108 to 214	159 to 312

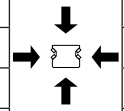
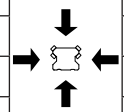
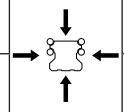
* For specification tables for each model, please see "A Product Descriptions."

	External dimensions (mm)		Features	Major applications
	Height	Width		
	24 to 48	34 to 70	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Thin and compact design with large radial load capacity • Superb in planar running accuracy • Superb capability to absorb mounting error • Stainless steel type also available as standard	• Surface grinder tables • Tool grinder tables • Electric discharge machines • Printed circuit board drilling machines • Chip mounters • High-speed transfer equipment • Robot travel units • Machining centers • NC lathes • Five axis milling machines • Conveyance systems • Pressing machine mold guides • Inspection equipment • Testing machines • Food-related machines • Medical equipment • 3D measuring instruments • Packaging machines • Injection molding machines • Woodworking machines • Ultra precision tables • Semiconductor/liquid crystal manufacturing equipment
	24 to 48	34 to 70		
	24 to 48	52 to 100		
	24 to 48	52 to 100		
	24 to 135	34 to 250	• Thin and compact design with a large radial load capacity • Superb planar running accuracy • Superb capability to absorb mounting error • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150℃, also available	
	24 to 48	34 to 70		
	24 to 48	34 to 70		
	24 to 48	34 to 70		
	24 to 68	52 to 140		
	24 to 48	52 to 100		
	24 to 48	52 to 100		
	24 to 48	52 to 100		
	31 to 75	72 to 170	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with large radial load capacity • High vibration resistance and impact resistance due to improved damping characteristics • Superb planar running accuracy	• Machining centers • NC lathes • Grinding machines • Five axis milling machines • Jig borers • Drilling machines • NC milling machines • Horizontal milling machines • Mold processing machines • Graphite working machines • Electric discharge machines • Wire-cut electric discharge machines
	31 to 75	72 to 170		
	31 to 75	50 to 126		
	31 to 75	50 to 126		
	48 to 70	100 to 140	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Large radial load capacity • High vibration resistance and impact resistance due to improved damping characteristics • Superb planar running accuracy • Has dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard	
	48 to 70	100 to 140		
	55 to 80	70 to 100		
	55 to 80	70 to 100		

Classification		Type		Dimensional table*	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
Radial type	Full-Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		NR-RX	▶A1-228		37.1 to 208.7	68.1 to 351.7
			NR-LRX	▶A1-228		45.4 to 268.9	90.8 to 505.5
			NR-CX	▶A1-232		37.1 to 208.7	68.1 to 351.7
			NR-LCX	▶A1-232		45.4 to 268.9	90.8 to 505.5
			NR-R	▶A1-228		271 to 479	610 to 1040
			NR-LR	▶A1-228		355 to 599	800 to 1300
			NR-A	▶A1-236		271 to 479	610 to 1040
			NR-LA	▶A1-236		355 to 599	800 to 1300
			NR-B	▶A1-238		271 to 479	610 to 1040
			NR-LB	▶A1-238		355 to 599	800 to 1300
4-way type	Caged Ball LM Guide Models for machine tools High-rigidity models for super-heavy loads		SVS-R	▶A1-128		37 to 199	52 to 251
			SVS-LR	▶A1-128		44 to 261	66 to 368
			SVS-C	▶A1-132		37 to 199	52 to 251
			SVS-LC	▶A1-132		44 to 261	66 to 368
			SVS-RH	▶A1-134		69 to 136	88 to 182
			SVS-LRH	▶A1-134		83 to 164	122 to 239
			SVS-CH	▶A1-136		69 to 136	88 to 182
			SVS-LCH	▶A1-136		83 to 164	122 to 239
	Full-Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		NRS-CX	▶A1-234		28.4 to 159.8	52.2 to 269.4
			NRS-LCX	▶A1-234		34.7 to 206	69.6 to 387.2
			NRS-RX	▶A1-230		28.4 to 159.8	52.2 to 269.4
			NRS-LRX	▶A1-230		34.7 to 206	69.6 to 387.2
4-way equal load type	Full-Ball LM Guide models for machine tools High-rigidity models for super-heavy loads		NRS-A	▶A1-236		212 to 376	431 to 737
			NRS-LA	▶A1-236		278 to 470	566 to 920
			NRS-B	▶A1-238		212 to 376	431 to 737
			NRS-LB	▶A1-238		278 to 470	566 to 920
			NRS-R	▶A1-230		212 to 376	431 to 737
			NRS-LR	▶A1-230		278 to 470	566 to 920

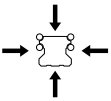
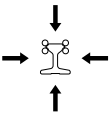
* For specification tables for each model, please see "A Product Descriptions."

	External dimensions (mm)		Features	Major applications
	Height	Width		
	31 to 75	50 to 126	• Low dust generation, low noise, and acceptable running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with large radial load capacity • High vibration resistance and impact resistance due to improved damping characteristics • Superb planar running accuracy	• Machining centers • NC lathes • Grinding machines • Five axis milling machines • Jig borers • Drilling machines • NC milling machines • Horizontal milling machines • Mold processing machines • Graphite working machines • Electric discharge machines • Wire-cut electric discharge machines
	31 to 75	50 to 126		
	31 to 75	72 to 170		
	31 to 75	72 to 170		
	83 to 105	145 to 200	• Super-heavy load capacity optimal for machine tools • High vibration resistance and impact resistance due to improved damping characteristics • Thin and compact design with large radial load capacity • Superb planar running accuracy	
	83 to 105	145 to 200		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	31 to 75	50 to 126	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with 4-way equal load capacity • High vibration resistance and impact resistance due to improved damping characteristics	
	31 to 75	50 to 126		
	31 to 75	72 to 170		
	31 to 75	72 to 170		
	55 to 80	70 to 100	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • 4-way type • High vibration resistance and impact resistance due to improved damping characteristics • Has dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard	
	55 to 80	70 to 100		
	48 to 70	100 to 140		
	48 to 70	100 to 140		
	31 to 75	72 to 170	• Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Super-heavy load capacity optimal for machine tools • Thin and compact design with 4-way equal load capacity • High vibration resistance and impact resistance due to improved damping characteristics	
	31 to 75	72 to 170		
	31 to 75	50 to 126		
	31 to 75	50 to 126		
	83 to 105	195 to 260	• Super-heavy load capacity optimal for machine tools • High vibration resistance and impact resistance due to improved damping characteristics • Thin and compact design with 4-way equal load capacity	
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	195 to 260		
	83 to 105	145 to 200		
	83 to 105	145 to 200		

Classification		Type		Dimensional table*	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
4-way equal load type	Caged Roller LM Guide models Ultra-heavy load, high-rigidity types		SRG-A, C	▶A1-420		11.3 to 219	25.8 to 511
			SRG-LA, LC	▶A1-420		25.9 to 601	63.8 to 1170
			SRG-SLC	▶A1-422		83.4 to 352	199 to 899
			SRG-R, V	▶A1-428		11.3 to 219	25.8 to 511
			SRG-LR, LV	▶A1-428		25.9 to 278	63.8 to 670
			SRG-SLR, SLV	▶A1-430		83.4 to 352	199 to 899
			SRN-C	▶A1-444		55.3 to 219	119 to 511
			SRN-LC	▶A1-444		71.4 to 278	165 to 670
			SRN-SLC	▶A1-444		83.4 to 352	199 to 899
			SRN-R	▶A1-448		55.3 to 219	119 to 511
			SRN-LR	▶A1-448		71.4 to 278	165 to 670
			SRN-SLR	▶A1-448		83.4 to 352	199 to 899
			SRW-LR	▶A1-460		115 to 601	256 to 1170
	Full-Roller LM Guide high-rigidity models for super-heavy loads		HRX-C	▶A1-470		26.3 to 205.5	73.1 to 567
			HRX-LC	▶A1-470		30.8 to 257	89.3 to 756
			HRX-R	▶A1-472		26.3 to 205.5	73.1 to 567
			HRX-LR	▶A1-472		30.8 to 257	89.3 to 756
	Caged Ball LM Guide models Heavy-load, high-rigidity types		SHS-C	▶A1-98		14.2 to 205	24.2 to 320
			SHS-LC	▶A1-98		17.2 to 253	31.9 to 408
			SHS-V	▶A1-100		14.2 to 205	24.2 to 320
			SHS-LV	▶A1-100		17.2 to 253	31.9 to 408
			SHS-R	▶A1-102		14.2 to 128	24.2 to 197
			SHS-LR	▶A1-102		36.8 to 161	64.7 to 259

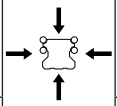
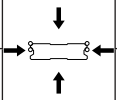
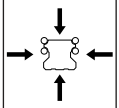
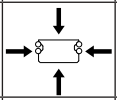
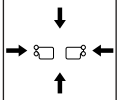
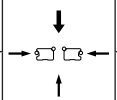
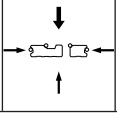
* For specification tables for each model, please see "A Product Descriptions."

	External dimensions (mm)		Features	Major applications
	Height	Width		
	24 to 90	47 to 170	• Long service life and long-term maintenance-free operation • Low noise and reduced running sound • Superb high-speed performance • Smooth motion due to prevention of rollers from skewing • Ultra-heavy load capacity optimal for machine tools	• Machining centers • NC lathes • Grinding machines • Five axis milling machines • Jig borers • Drilling machines • NC milling machines • Horizontal milling machines • Mold processing machines • Graphite working machines • Electric discharge machines • Wire-cut electric discharge machines
	30 to 120	63 to 250		
	48 to 90	100 to 170		
	24 to 90	34 to 126		
	30 to 90	44 to 126		
	55 to 90	70 to 126		
	44 to 75	100 to 170	• Long service life and long-term maintenance-free operation • Low noise and reduced running sound • Superb high-speed performance • Smooth motion due to prevention of rollers from skewing • Ultra-heavy load capacity optimal for machine tools • Low center of gravity and ultra-high rigidity	
	44 to 75	100 to 170		
	44 to 75	100 to 170		
	44 to 75	70 to 126		
	44 to 75	70 to 126		
	44 to 75	70 to 126		
	70 to 150	135 to 300		
	36 to 90	70 to 170	• Long service life • Superbly high speed • 4-way equal load type • Stable and smooth operation can be achieved by suppressing roller skew • Ultra-heavy load capacity optimal for machine tools	
	36 to 90	70 to 170		
	40 to 100	48 to 126		
	40 to 100	48 to 126		
	24 to 90	47 to 170	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Heavy load and high rigidity • Has dimensions nearly equal to the Full-Ball LM Guide Model HSR, the de facto global standard • Superb capability to absorb mounting error	• Machining centers • NC lathes • XYZ axes of heavy cutting machine tools • Grinding head feeding axes of grinding machines • Components requiring a heavy moment and high accuracy • NC milling machines • Horizontal milling machines • Gantry five-axis milling machines • Z axes of electric discharge machines • Wire-cut electric discharge machines • Car elevators • Food-related machines • Testing machines • Vehicle doors • Printed circuit board drilling machines • Automatic tool changers • Construction equipment • Shield machines • Semiconductor/liquid crystal manufacturing equipment
	24 to 90	47 to 170		
	24 to 90	34 to 126		
	24 to 90	34 to 126		
	28 to 80	34 to 100		
	28 to 80	34 to 100		

Classification		Type		Dimensional table*	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
4-way equal load type	Full-Ball LM Guide models Heavy-load, high-rigidity types		HSR-C/XC	▶A1-188		10.9 to 195	15.7 to 228
			HSR-LC/XLC	▶A1-188		14.2 to 249	22.9 to 323
			HSR-A	▶A1-200		304	355
			HSR-M1A	▶A1-356		10.9 to 53.9	15.7 to 70.2
			HSR-LA	▶A1-200		367	464
			HSR-M1LA	▶A1-356		23.9 to 65	35.8 to 91.7
			HSR-CA/XCA	▶A1-196		19.8 to 304	27.4 to 355
			HSR-HA/XHA	▶A1-196		23.9 to 518	35.8 to 728
			HSR-B	▶A1-200		304	355
			HSR-M1B	▶A1-358		10.9 to 53.9	15.7 to 70.2
			HSR-LB	▶A1-200		367	464
			HSR-M1LB	▶A1-358		23.9 to 65	35.8 to 91.7
			HSR-CB/XCB	▶A1-198		19.8 to 304	27.4 to 355
			HSR-HB/XHB	▶A1-198		23.9 to 518	35.8 to 728
			HSR-R/XR	▶A1-192		1.08 to 304	2.16 to 355
			HSR-M1R	▶A1-360		10.9 to 53.9	15.7 to 70.2
			HSR-LR/XLR	▶A1-192		23.9 to 367	35.8 to 464
			HSR-M1LR	▶A1-360		23.9 to 65	35.8 to 91.7
			HSR-HR	▶A1-202		441 to 518	540 to 728
	LM Guide for medium-to-low vacuums		HSR-M1VV	▶A1-406		10.9	15.7
	Full-Ball LM Guide models Side-mount types		HSR-YR/XYR	▶A1-194		10.9 to 195	15.7 to 228
			HSR-M1YR	▶A1-362		10.9 to 53.9	15.7 to 70.2
	Full-Ball LM Guide models Special LM rail types		JR-A	▶A1-324		27.6 to 121	36.4 to 146
			JR-B	▶A1-324		27.6 to 121	36.4 to 146
			JR-R	▶A1-324		27.6 to 121	36.4 to 146

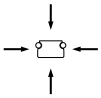
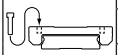
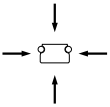
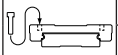
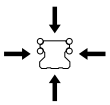
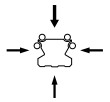
* For specification tables for each model, please see "A Product Descriptions."

	External dimensions (mm)		Features	Major applications
	Height	Width		
	24 to 90	47 to 170	• Heavy load and high rigidity • De facto global standard • Superb capability to absorb mounting error • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150℃, also available • Type M2, with high corrosion resistance, also available (Basic dynamic load rating: 2.33 to 5.57 kN) (Basic static load rating: 2.03 to 5.16 kN)	• Machining centers • NC lathes • XYZ axes of heavy cutting machine tools • Grinding head feeding axes of grinding machines • Components requiring a heavy moment and high accuracy • NC milling machines • Horizontal milling machines • Gantry five axis milling machines • Z axis of electric discharge machines • Wire-cut electric discharge machines • Car elevators • Food-related machines • Testing machines • Vehicle doors • Printed circuit board drilling machines • Automatic tool changers • Construction equipment • Shield machines • Semiconductor/liquid crystal manufacturing equipment
	24 to 90	47 to 170		
	110	215		
	24 to 48	47 to 100		
	110	215		
	30 to 48	63 to 100		
	30 to 110	63 to 215		
	30 to 145	63 to 350		
	110	215		
	24 to 48	47 to 100		
	110	215		
	30 to 48	63 to 100		
	30 to 110	63 to 215		
	30 to 145	63 to 350		
	11 to 110	16 to 156		
	28 to 55	34 to 70		
	30 to 110	44 to 156		
	30 to 55	44 to 70		
	120 to 145	250 to 266		
	28	34	• Can be used in a range of environments from atmospheric pressure to a vacuum of (10^{-3} [Pa]) • Allows baking temperatures of up to 200℃* * If the baking temperature exceeds 100℃, multiply the basic load rating with the temperature coefficient.	• Medical equipment • Semiconductor/liquid crystal manufacturing equipment
	28 to 90	33.5 to 124.5	• Mounting holes on the side faces of the LM block allow for easy mounting and reduced mounting height when using two units facing each other • Heavy load and high rigidity • Superb capability to absorb mounting error • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150℃, also available	• Cross rails of gantry machine tools • Z axes of woodworking machines • Z axes of measuring instruments • Components opposed to each other
	28 to 55	33.5 to 69.5		
	61 to 114	70 to 140	• The thin structure in the central part of the LM rail allows it to absorb error and achieve smooth motion if the parallelism between the two axes is poor • Since the LM rail has a highly rigid cross-sectional shape, it can be used as a structural component	• Automated warehouses • Garages • Gantry robots • FMS traveling rails • Elevators • Conveyance systems • Welding machines • Lifters • Cranes • Forklifts • Coating machines • Shield machines • Stage settings
	61 to 114	70 to 140		
	65 to 124	48 to 100		

Classification		Type		Dimensional table*	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
4-way equal load type	Caged Ball Cross LM Guide		SCR	▶A1-170		36.8 to 253	64.7 to 408
	Full-Ball LM Guide Orthogonal type		CSR	▶A1-310		10.9 to 100	15.7 to 135
	Caged Ball LM Guide models Wide types with low centers of gravity		SHW-CA	▶A1-144		4.31 to 70.2	5.66 to 91.4
			SHW-CR, HR	▶A1-146		4.31 to 70.2	5.66 to 91.4
	Full-Ball LM Guide models Wide types with low centers of gravity		HRW-CA	▶A1-246		5.53 to 80.3	9.1 to 109
			HRW-CR, LRM	▶A1-248		3.29 to 62.4	7.16 to 86.3
	Full-Ball Straight-and-curved Guide		HMG	▶A1-340		2.56 to 66.2	Straight section 4.23 to 66.7 Curved section 0.44 to 36.2
	Caged Ball LM Guide finite stroke		EPF	▶A1-178		0.90 to 3.71	1.60 to 5.88
	Full-Ball LM Guide models Separate types		HR, HR-T	▶A1-278		2.82 to 226	3.48 to 232
Interchangeable designs			GSR-T	▶A1-290		8.42 to 37	9.77 to 39.1
			GSR-V	▶A1-290		6.51 to 15.5	6.77 to 15.2
	Full-Ball LM Guide Integrated-rack LM rail type		GSR-R	▶A1-298		15.5 to 37	15.2 to 39.1

* For specification tables for each model, please see "A Product Descriptions."

	External dimensions (mm)		Features	Major applications
	Height	Width		
	70 to 180	88 to 226	• An XY orthogonal, single-piece LM block allows for a compact XY structure • The possibility of a saddle-less structure allows for machines with lightweight and compact design • Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance	• Low-center-of-gravity precision XY tables • NC lathes • Optical measuring instruments • Automatic lathes • Inspection equipment • Cartesian coordinate robots • Bonding machines • Wire-cut electric discharge machines • Hollow tables • Printed circuit board assemblers • Machine tool tables • Electric discharge machines • XY axes of horizontal machining centers
	47 to 118	38.8 to 129.8	• An XY orthogonal, single-piece LM block allows for a compact XY structure • The possibility of a saddle-less structure allows for machines with lightweight and compact design	
	12 to 50	40 to 162	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Wide, space-saving structure with a low center of gravity • Stainless steel type also available as standard	• Z axes of IC printed circuit board drilling machines • Z axes of small electric discharge machines • Loaders • Machining centers • NC lathes • Robots • Wire-cut electric discharge machines • APC • Semiconductor/liquid crystal manufacturing equipment • Measuring instruments • Wafer transfer equipment • Construction equipment • Railroad vehicles
	12 to 50	30 to 130		
	17 to 60	60 to 200	• 4-way equal load capacity, thin, and highly rigid • Wide, space-saving structure with a low center of gravity • Stainless steel type also available as standard	
	12 to 50	30 to 130		
	24 to 90	47 to 170	• Freedom of design • Cost reduction through simplified structure	• Large swivel bases • Pendulum cars for railroads • Pantagraphs • Control units • Optical measuring machines • Tool grinders • X-Ray machines • CT scanners • Medical equipment • Stage settings • Car elevators • Amusement machines • Turntables • Tool changers
	8 to 16	17 to 32	• Caged Ball effect through use of a retainer • Smooth movement with minimal rolling variation • 4-groove construction in a compact body	• Semiconductor manufacturing equipment • Medical equipment • Inspection equipment • Industrial machinery
	8.5 to 60	18 to 125	• Low-profile and highly rigid with a space-saving structure • Interchangeable with cross-roller guide • Adjustable preload • Stainless steel type also available as standard	• XYZ axes of electric discharge machines • Precision tables • XZ axes of NC lathes • Assembly robots • Conveyance systems • Machining centers • Wire-cut electric discharge machines • Tool changers • Woodworking machines
	20 to 38	32 to 68	• LM block and LM rail are both interchangeable • Adjustable preload • Capable of absorbing error in vertical level and horizontal parallelism	• Industrial robots • Various conveyance systems • Automated warehouses • Palette changers • Automatic tool changers • Door closing devices • Guides using molded aluminum bases • Welding machines • Coating machines • Car washing machines
	20 to 30	32 to 50		
	30 to 38	59.91 to 80.18	• Integrated-rack LM rail design eliminates assembly and adjustment work • Integrated-rack LM rail design enables a space-saving structure • Capable of supporting long strokes	

Classification		Type		Dimensional table*	Load capacity diagram	Basic load rating (kN)	
						Basic dynamic load rating	Basic static load rating
Miniature types	Caged Ball LM Guide models		SRS-S	▶A1-156		1.09 to 4.5	0.964 to 3.39
			SRS-M			0.439 to 16.5	0.468 to 20.2
			SRS-N			0.515 to 9.71	0.586 to 8.55
			SRS-WS	▶A1-160		1.38 to 6.64	1.35 to 5.94
			SRS-WM			0.584 to 9.12	0.703 to 8.55
			SRS-WN			0.746 to 12.4	0.996 to 12.1
	Full-Ball LM Guide models		RSX-SM	▶A1-258		0.95 to 4.01	1.16 to 4.24
			RSX-M	▶A1-258		1.16 to 5.59	1.54 to 6.78
			RSX-M1	▶A1-380		2.22 to 5.59	3.06 to 6.78
			RSX-NM	▶A1-258		0.45 to 8.27	0.70 to 11.87
			RSX-M1N	▶A1-380		2.94 to 8.27	4.59 to 11.87
			RSX-WSM	▶A1-260		1.06 to 5.59	1.35 to 6.78
			RSX-WM	▶A1-260		1.63 to 7.43	2.51 to 10.18
			RSX-M1W	▶A1-382		2.80 to 7.43	4.28 to 10.18
			RSX-WNM	▶A1-260		0.64 to 9.87	1.17 to 15.26
			RSX-M1WN	▶A1-382		3.48 to 9.87	5.81 to 15.26
			RSR-M	▶A1-268		0.18 to 8.82	0.27 to 12.7
			RSR-M1V	▶A1-390		1.47 to 8.82	2.25 to 12.7
			RSR-N	▶A1-268		0.3 to 14.2	0.44 to 20.6
			RSR-M1N	▶A1-390		2.6 to 14.2	3.96 to 20.6
	Full-Ball LM Guide models Wide types		RSR-WM/WV	▶A1-268		0.25 to 6.66	0.47 to 9.8
			RSR-M1WV	▶A1-392		2.45 to 6.66	3.92 to 9.8
			RSR-WN	▶A1-268		0.39 to 9.91	0.75 to 14.9
			RSR-M1WN	▶A1-392		3.52 to 9.91	5.37 to 14.9
	Full-Ball LM Guide Orthogonal type		MX	▶A1-316		0.59 to 2.04	1.1 to 3.21
Circular arc type	Full-Ball LM Guide		HCR	▶A1-332		4.7 to 141	8.53 to 215
Self-aligning type	Full-Ball LM Guide		NSR-TBC	▶A1-346		9.41 to 90.8	18.6 to 152

* For specification tables for each model, please see "A Product Descriptions."

	External dimensions (mm)		Features	Major applications
	Height	Width		
	8 to 16	17 to 32	• Long service life and long-term maintenance-free operation • Low dust generation, low noise, and reduced running sound • Superb high-speed performance • Smooth motion in all mounting orientations • Stainless steel type also available as standard • Lightweight and compact	• IC/LSI manufacturing machines • Hard disc drives • Slide units of OA equipment • Wafer transfer equipment • Printed circuit board assembly tables • Medical equipment • Electronic components of electron microscopes • Optical stages • Steppers • Plotting machines • IC bonding machine feed mechanisms • Inspection equipment
	6 to 25	17 to 48		
	6 to 16	12 to 32		
	9 to 16	25 to 60		
	6.5 to 16	17 to 60		
	8 to 16	17 to 32	• Lightweight and compact • Smooth motion in all mounting orientations • Stainless steel type also available as standard • Type M1, achieving max service temperature of 150˚C, also available	• IC/LSI manufacturing machines • Hard disc drives • Slide units of OA equipment • Wafer transfer equipment • Printed circuit board assembly tables • Medical equipment • Electronic components of electron microscopes • Optical stages • Steppers • Plotting machines • IC bonding machine feed mechanisms • Inspection equipment
	8 to 16	17 to 32		
	10 to 16	20 to 32		
	6 to 16	12 to 32		
	10 to 16	20 to 32		
	9 to 16	25 to 60		
	9 to 16	25 to 60		
	12 to 16	30 to 60		
	6.5 to 16	17 to 60		
	12 to 16	30 to 60		
	4 to 25	8 to 46	• Ultra-compact • Stainless steel type also available as standard • Long type with increased load capacity also offered as standard • Type M1, achieving max service temperature of 150˚C, also available	
	10 to 25	20 to 46		
	4 to 25	8 to 46		
	10 to 25	20 to 46		
	4.5 to 16	12 to 60	• Stainless steel type also available as standard • Long type with increased load capacity also offered as standard • Type M1, achieving max service temperature of 150˚C, also available	
	12 to 16	30 to 60		
	4.5 to 16	12 to 60		
	12 to 16	30 to 60		
	10 to 14.5	15.2 to 30.2	• An XY orthogonal, single-piece LM block allows for a compact XY structure • Stainless steel type also available as standard	• IC/LSI manufacturing machines • Inspection equipment • Slide units of OA equipment • Wafer transfer equipment • IC bonding machine feed mechanisms • Printed circuit board assembly tables • Medical equipment • Electronic components of electron microscopes • Optical stages
	18 to 90	39 to 170	• Circular motion guide in a 4-way equal load design • Highly accurate circular motion without play • Allows efficient design with the LM block placed in the load point • Easily achieves large circular motion	• Large swivel bases • Pendulum cars for railroads • Pantagraphs • Control units • Optical measuring machines • Tool grinders • X-Ray machines • CT scanners • Medical equipment • Stage settings • Car elevators • Amusement machines • Turntables • Tool changers
	40 to 105	70 to 175	• Self-aligns on the mounting surface allowing for use after rough installation • Adjustable preload • Can be mounted on a black steel plate	• XY axes of ordinary industrial machinery • Various conveyance systems • Automated warehouses • Palette changers • Automatic coating machines • Various welding machines

Calculating the Applied Load

The LM Guide is capable of receiving loads and moments in all directions whether they are generated by the mounting orientation and position, the location of the center of gravity of the moving object, the position of the thrust, the acceleration, or the cutting resistance.

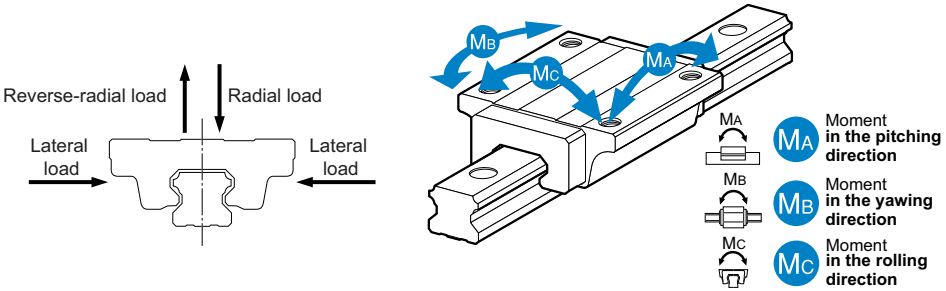


Fig. 1: Directions of the Loads Applied on the LM Guide

Calculating an Applied Load

Single-Axis Use

● **Moment Equivalence**

When the space to install the LM Guide is limited, you may have to use only one LM block, or two LM blocks in close contact with each other. In such a setting, the load distribution is not uniform. As a result, an excessive load is applied in localized areas (i.e., both ends) as shown in Fig. 2. Continued use under such conditions may result in flaking in those areas, consequently shortening the service life. In such a case, calculate the actual load by multiplying the moment value by any one of the equivalent-moment factors specified in Table 1 to Table 6 A1-43.

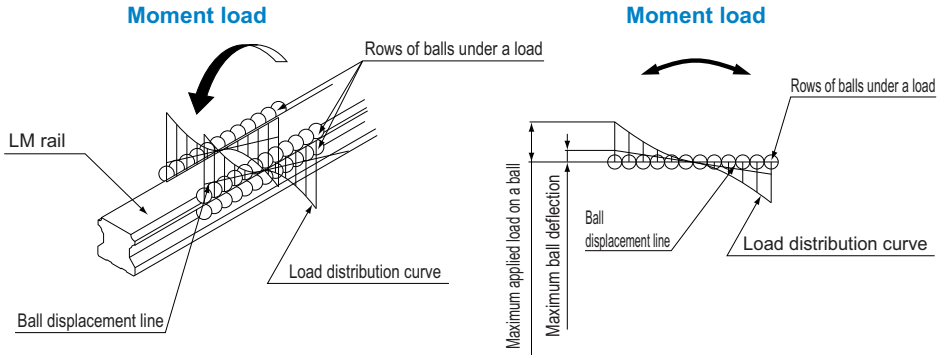


Fig. 2: Ball Load when a Moment is Applied

An equivalent-load equation applicable when a moment acts on an LM Guide is shown below.

$$P = K \cdot M$$

P : Equivalent load per LM Guide (N)
K : Equivalent moment factor
M : Applied moment (N·mm)

● Equivalent Factor

Since the rated load is equivalent to the permissible moment, the equivalent factor to be multiplied when equalizing the M_A, M_B, and M_C moments to the applied load per block is obtained by dividing the rated loads in the corresponding directions.

With models other than 4-way equal load types, however, the load ratings in the 4 directions differ from each other. Therefore, the equivalent factor values for the M_A and M_C moments also differ depending on whether the direction is radial or reverse radial.

■Equivalent Factors for the M_A Moment

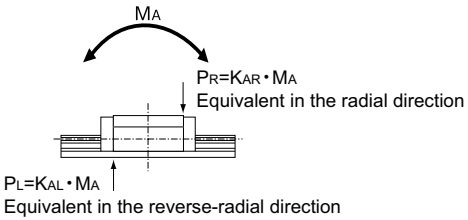


Fig. 3: Equivalent Factors for the M_A Moment

Equivalent factors for the M_A Moment

- Equivalent factor in the radial direction: $K_{AR}=\frac{C_0}{M_A}$
- Equivalent factor in the reverse-radial direction: $K_{AL}=\frac{C_{0L}}{M_A}$

$$\frac{C_0}{K_{AR}\cdot M_A}=\frac{C_{0L}}{K_{AL}\cdot M_A}=1$$

■Equivalent Factors for the M_B Moment

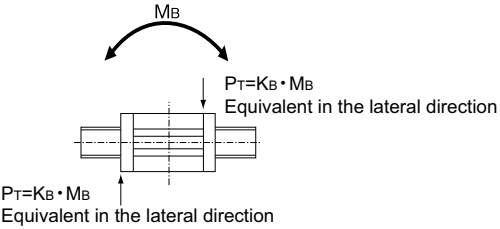


Fig. 4: Equivalent Factors for the M_B Moment

Equivalent factors for the M_B Moment

- Equivalent factor in the lateral directions: $K_B=\frac{C_{0T}}{M_B}$

$$\frac{C_{0T}}{K_B\cdot M_B}=1$$

■Equivalent Factors for the M_C Moment

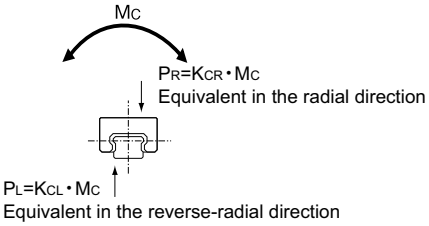


Fig. 5: Equivalent Factors for the M_C Moment

Equivalent factors for the M_C Moment

- Equivalent factor in the radial direction: $K_{CR}=\frac{C_0}{M_C}$
- Equivalent factor in the reverse-radial direction: $K_{CL}=\frac{C_{0L}}{M_C}$

$$\frac{C_0}{K_{CR}\cdot M_C}=\frac{C_{0L}}{K_{CL}\cdot M_C}=1$$

C_0	: Basic static load rating (radial direction)	(N)
C_{0L}	: Basic static load rating (reverse-radial direction)	(N)
C_{0T}	: Basic static load rating (lateral direction)	(N)
P_R	: Calculated load (radial direction)	(N)
P_L	: Calculated load (reverse-radial direction)	(N)
P_T	: Calculated load (lateral direction)	(N)

Example Calculations

When One LM Block is Used

Model No.: SSR20XV1

Gravitational acceleration g = 9.8 (m/s^2)
Mass m = 10 (kg)
ℓ_1 = 200 (mm)
ℓ_2 = 100 (mm)

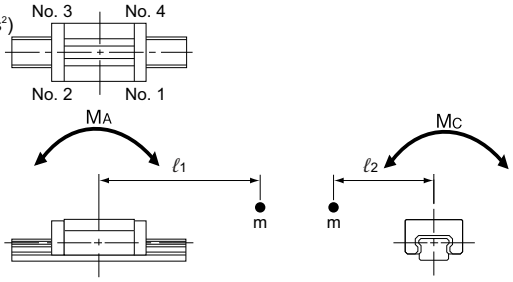


Fig. 6: When One LM Block is Used

No. 1 $P_1 = mg+K_{AR1}\cdot mg\cdot\ell_1+K_{CR}\cdot mg\cdot\ell_2 = 98+0.275\times98\times200+0.129\times98\times100 = 6752$ (N)
No. 2 $P_2 = mg-K_{AL1}\cdot mg\cdot\ell_1+K_{CR}\cdot mg\cdot\ell_2 = 98-0.137\times98\times200+0.129\times98\times100 = -1323$ (N)
No. 3 $P_3 = mg-K_{AL1}\cdot mg\cdot\ell_1-K_{CL}\cdot mg\cdot\ell_2 = 98-0.137\times98\times200-0.0644\times98\times100 = -3218$ (N)
No. 4 $P_4 = mg+K_{AR1}\cdot mg\cdot\ell_1-K_{CL}\cdot mg\cdot\ell_2 = 98+0.275\times98\times200-0.0644\times98\times100 = 4857$ (N)

When Two LM Blocks are Used in Close Contact with Each Other

Model No.: SVS25R2

Gravitational acceleration g = 9.8 (m/s^2)
Mass m = 5 (kg)
ℓ_1 = 200 (mm)
ℓ_2 = 150 (mm)

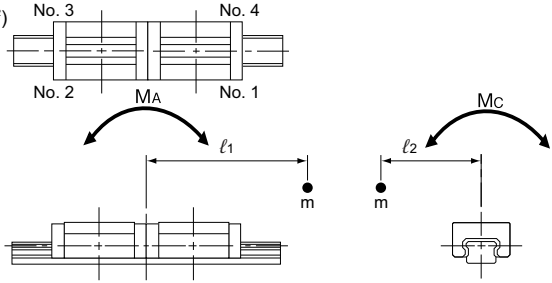


Fig. 7: When Two LM Blocks are Used in Close Contact with Each Other

No.1 $P_1 = \frac{mg}{2}+K_{AR2}\cdot mg\cdot\ell_1+K_{CR}\cdot\frac{mg\cdot\ell_2}{2} = \frac{49}{2}+0.0217\times49\times200+0.0995\times\frac{49\times150}{2} = 602.9$ (N)

No.2 $P_2 = \frac{mg}{2}-K_{AL2}\cdot mg\cdot\ell_1+K_{CR}\cdot\frac{mg\cdot\ell_2}{2} = \frac{49}{2}-0.0182\times49\times200+0.0995\times\frac{49\times150}{2} = 211.9$ (N)

No.3 $P_3 = \frac{mg}{2}-K_{AL2}\cdot mg\cdot\ell_1-K_{CL}\cdot\frac{mg\cdot\ell_2}{2} = \frac{49}{2}-0.0182\times49\times200-0.0835\times\frac{49\times150}{2} = -460.7$ (N)

No.4 $P_4 = \frac{mg}{2}+K_{AR2}\cdot mg\cdot\ell_1-K_{CL}\cdot\frac{mg\cdot\ell_2}{2} = \frac{49}{2}+0.0217\times49\times200-0.0835\times\frac{49\times150}{2} = -69.7$ (N)

Note1) Since an LM Guide used in vertical installation receives only a moment load, there is no need to apply a load force (mg).

Double-Axis Use

● Determining the Operating Conditions

Set the conditions needed to calculate the applied load and service life in hours for the LM System.

(1) Mass: m (kg)
(2) Direction of the working load
(3) Position of the working point (e.g., center of gravity): ℓ_2, ℓ_3, h_1 (mm)
(4) Thrust position: ℓ_4, h_2 (mm)
(5) LM system arrangement: ℓ_0, ℓ_1 (mm)
(No. of units and axes)
(6) Velocity diagram
Speed: V (mm/s)
Time constant: t_n (s)
Acceleration: α_n (mm/s^2)

$$(\alpha_n = \frac{V}{t_n})$$

(7) Duty cycle
Number of reciprocations per minute: N_1 (min^{-1})
(8) Stroke length: ℓ_s (mm)
(9) Average speed: V_m (m/s)
(10) Required service life in hours: L_h (h)

Gravitational acceleration g = 9.8 (m/s^2)

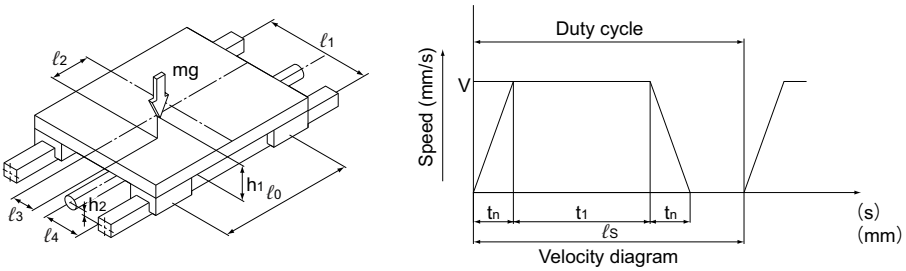


Fig. 8: Operating Conditions

● Applied Load Equation

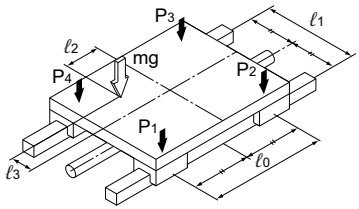
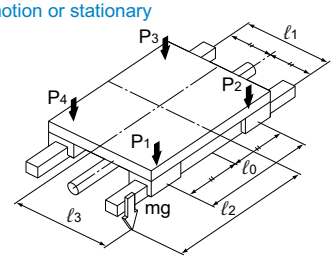
The load applied to the LM Guide varies with external forces such as the location of the center of gravity of the load, the position of the thrust, inertia generated by acceleration and deceleration during starts and stops, and cutting resistance.
In selecting an LM Guide, it is necessary to obtain the value of the applied load while taking into account these conditions.

Calculate the load applied to the LM Guide in each of the examples 1 to 10 shown below.

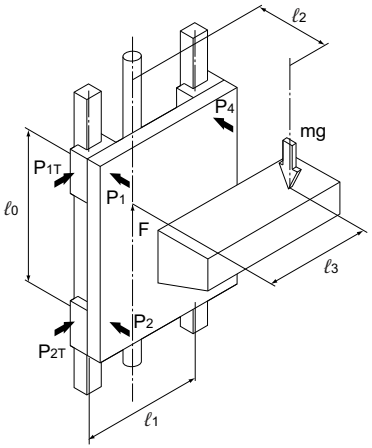
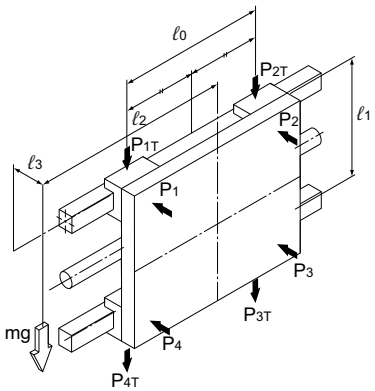
m	:	Mass	(kg)
ℓ_n	:	Distance	(mm)
F_n	:	External force	(N)
P_n	:	Applied load (radial/reverse-radial direction)	(N)
P_{nT}	:	Applied load (lateral directions)	(N)
g	:	Gravitational acceleration ($g = 9.8\ m/s^2$)	(m/s^2)
V	:	Speed	(m/s)
t_n	:	Time constant	(s)
α_n	:	Acceleration	(m/s^2)

$$(\alpha_n = \frac{V}{t_n})$$

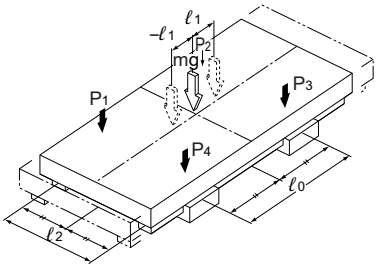
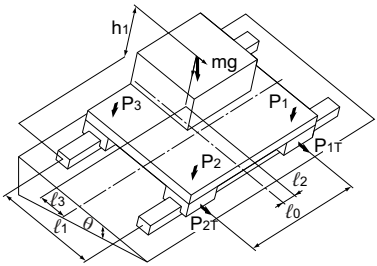
Example

	Operating conditions	Applied load equation
1	Horizontal mount (with the block moving) Uniform motion or stationary 	$P_1 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_2 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_3 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_4 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$
2	Horizontal mount, overhung (with the block moving) Uniform motion or stationary 	$P_1 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_2 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_3 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_4 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$

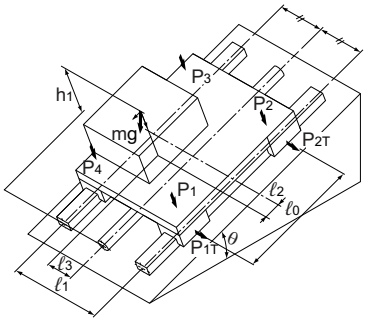
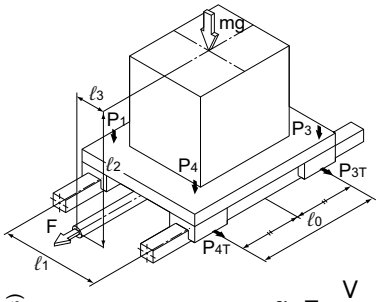
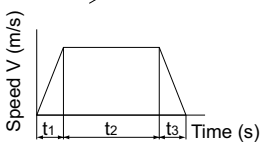
Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
3	**Vertical mount** **Uniform motion or stationary**  E.g.: Vertical axis of industrial robot, automatic coating machine, lifter	$P_1 = P_4 = -\frac{mg \cdot \ell_2}{2 \cdot \ell_0}$ $P_2 = P_3 = \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$ $P_{1T} = P_{4T} = \frac{mg \cdot \ell_3}{2 \cdot \ell_0}$ $P_{2T} = P_{3T} = -\frac{mg \cdot \ell_3}{2 \cdot \ell_0}$
4	**Wall mount** **Uniform motion or stationary**  E.g.: Travel axis of cross-rail loader	$P_1 = P_2 = -\frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_3 = P_4 = \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$ $P_{1T} = P_{4T} = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$ $P_{2T} = P_{3T} = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$

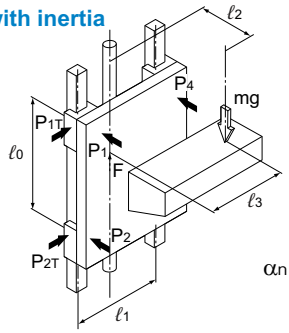
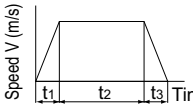
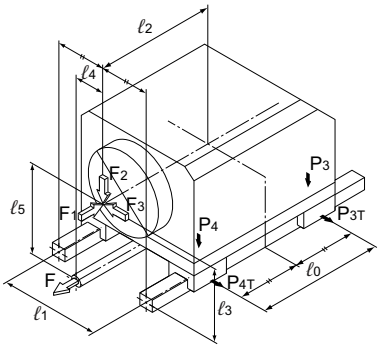
Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
5	**With the LM rails moving Horizontal mount**  E.g.: XY table sliding fork	P_1 to P_4 (max) $= \frac{mg}{4} + \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$ P_1 to P_4 (min) $= \frac{mg}{4} - \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$
6	**Lateral tilt mount**  E.g.: NC lathe carriage	$P_1 = + \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{1T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$ $P_2 = + \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{2T} = \frac{mg \cdot \sin\theta}{4} - \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$ $P_3 = + \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{3T} = \frac{mg \cdot \sin\theta}{4} - \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$ $P_4 = + \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$ $P_{4T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$

Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
7	**Longitudinal tilt mount**  E.g.: NC lathe tool rest	$P_1 = +\frac{mg\cdot\cos\theta}{4} + \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} - \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} + \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$ $P_{1T} = +\frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$ $P_2 = +\frac{mg\cdot\cos\theta}{4} - \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} - \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} - \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$ $P_{2T} = -\frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$ $P_3 = +\frac{mg\cdot\cos\theta}{4} - \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} + \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} - \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$ $P_{3T} = -\frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$ $P_4 = +\frac{mg\cdot\cos\theta}{4} + \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} + \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} + \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$ $P_{4T} = +\frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$
8	**Horizontal mount with inertia**  $\alpha_n = \frac{V}{t_n}$  Velocity diagram E.g.: Conveyance truck	During acceleration $P_1 = P_4 = \frac{mg}{4} - \frac{m\cdot\alpha_1\cdot\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{mg}{4} + \frac{m\cdot\alpha_1\cdot\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{m\cdot\alpha_1\cdot\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{m\cdot\alpha_1\cdot\ell_3}{2\cdot\ell_0}$ During uniform motion P_1 to $P_4 = \frac{mg}{4}$ During deceleration $P_1 = P_4 = \frac{mg}{4} + \frac{m\cdot\alpha_3\cdot\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{mg}{4} - \frac{m\cdot\alpha_3\cdot\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = -\frac{m\cdot\alpha_3\cdot\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = \frac{m\cdot\alpha_3\cdot\ell_3}{2\cdot\ell_0}$

Note) Load is positive in the direction of the arrow.

	Operating conditions	Applied load equation
9	**Vertical mount with inertia**  $\alpha_n = \frac{V}{t_n}$  Velocity diagram E.g.: Conveyance lift	During acceleration $P_1 = P_4 = -\frac{m(g+\alpha_1)\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{m(g+\alpha_1)\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{m(g+\alpha_1)\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{m(g+\alpha_1)\ell_3}{2\cdot\ell_0}$ During uniform motion $P_1 = P_4 = -\frac{mg\cdot\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{mg\cdot\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{mg\cdot\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{mg\cdot\ell_3}{2\cdot\ell_0}$ During deceleration $P_1 = P_4 = -\frac{m(g-\alpha_3)\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{m(g-\alpha_3)\ell_2}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{m(g-\alpha_3)\ell_3}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{m(g-\alpha_3)\ell_3}{2\cdot\ell_0}$
10	**Horizontal mount with external force**  E.g.: Drill unit, milling machine, lathe, machining center, and other cutting machines	Under force F_1 $P_1 = P_4 = -\frac{F_1\cdot\ell_5}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{F_1\cdot\ell_5}{2\cdot\ell_0}$ $P_{1T} = P_{4T} = \frac{F_1\cdot\ell_4}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{F_1\cdot\ell_4}{2\cdot\ell_0}$ Under force F_2 $P_1 = P_4 = \frac{F_2}{4} + \frac{F_2\cdot\ell_2}{2\cdot\ell_0}$ $P_2 = P_3 = \frac{F_2}{4} - \frac{F_2\cdot\ell_2}{2\cdot\ell_0}$ Under force F_3 $P_1 = P_2 = \frac{F_3\cdot\ell_3}{2\cdot\ell_1}$ $P_3 = P_4 = -\frac{F_3\cdot\ell_3}{2\cdot\ell_1}$ $P_{1T} = P_{4T} = -\frac{F_3}{4} - \frac{F_3\cdot\ell_2}{2\cdot\ell_0}$ $P_{2T} = P_{3T} = -\frac{F_3}{4} + \frac{F_3\cdot\ell_2}{2\cdot\ell_0}$

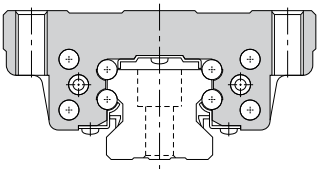
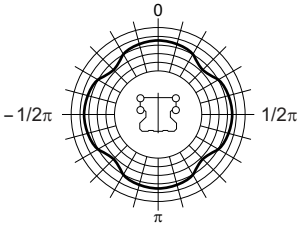
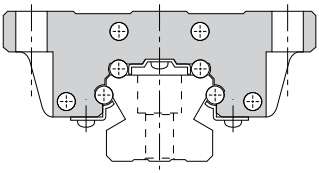
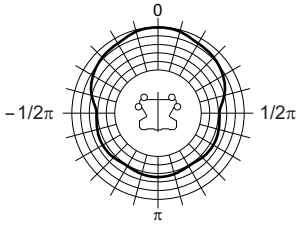
Note) Load is positive in the direction of the arrow.

Calculating the Equivalent Load

Load Ratings of an LM Guide in Each Direction

The LM Guide is categorized into roughly two types: the 4-way equal load type, which has the same load rating in the radial, reverse-radial, and lateral directions; and the radial type, which has a large load rating in the radial direction. With the radial type LM Guide, the load rating in the radial direction is different from that in the reverse-radial and lateral directions. The basic load rating in the radial direction is indicated in the specification table. The values in the reverse-radial and lateral directions are obtained from Table 7 on A1-61.

Load Ratings in Each Direction

Type	Load distribution curve
4-way equal load type 	
Radial type 	

Equivalent Load P_E

The LM Guide can bear loads and moments in all directions, including a radial load (PR), reverse-radial load (PL), and lateral loads (PT), simultaneously.

When two or more loads (e.g., radial load and lateral load) are simultaneously applied to the LM Guide, the service life and the static safety factor are calculated using equivalent load values obtained by converting all the loads into radial load or reverse-radial load.

Equivalent Load Equation

When the LM block receives loads simultaneously in the radial and lateral directions, or the reverse-radial and lateral directions, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_{R(L)} + Y \cdot P_T$$

P_E : Equivalent load (N)
·Radial direction
·Reverse-radial direction
P_L : Reverse-radial load (N)
P_T : Lateral load (N)
X,Y : Equivalent factor
(see Table 8 on A1-63)

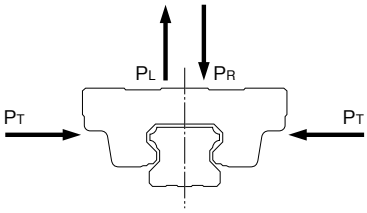


Fig. 9: Equivalent Load of the LM Guide

Calculating the Static Safety Factor

To calculate a load applied to the LM Guide, the average load required for calculating the service life and the maximum load needed for calculating the static safety factor must be obtained first. In particular, if the system starts and stops frequently, if a cutting load acts on the system, or if a large moment caused by an overhanging load is applied, it may experience an unexpectedly large load. When selecting a model number, make sure that the desired model is capable of receiving the required maximum load (whether stationary or in motion). Table 1 shows reference values for the static safety factor.

Table 1: Reference Values for the Static Safety Factor (f_s)

Machine using the LM Guide	Load conditions	Lower limit of f_s
General industrial machinery	Without vibrations or impacts	1.0 to 3.5
	With vibrations or impacts	2.0 to 5.0
Machine tool	Without vibrations or impacts	1.0 to 4.0
	With vibrations or impacts	2.5 to 7.0

When the radial load is large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_0}{P_R} \geqq f_S$
When the reverse-radial load is large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_{0L}}{P_L} \geqq f_S$
When the lateral loads are large	$\frac{f_H \cdot f_T \cdot f_C \cdot C_{0T}}{P_T} \geqq f_S$

f_S : Static safety factor
C_0 : Basic static load rating (radial direction) (N)
C_{0L} : Basic static load rating (reverse-radial direction) (N)
C_{0T} : Basic static load rating (lateral direction) (N)
P_R : Calculated load (radial direction) (N)
P_L : Calculated load (reverse-radial direction) (N)
P_T : Calculated load (lateral direction) (N)
f_H : Hardness factor (see Fig. 10 on B1-75)
f_T : Temperature factor (see Fig. 11 on B1-75)
f_C : Contact factor (see Table 2 on B1-75)

Calculating the Average Load

In cases where the load applied to each LM block fluctuates under different conditions, such as an industrial robot advancing while holding a workpiece with its arm then retreating with its arm empty, or a machine tool handling various workpieces, it is necessary to calculate the service life of the LM block while taking into account such fluctuating load conditions.
The average load (P_m) is the load under which the service life of the LM Guide is equivalent to that under varying loads applied to the LM blocks.

$$P_m = \sqrt[i]{\frac{1}{L} \cdot \sum_{n=1}^{n} (P_n{}^i \cdot L_n)}$$

P_m	: Average load	(N)
P_n	: Varying load	(N)
L	: Total travel distance	(mm)
L_n	: Distance traveled under load P_n	(mm)
i	: Constant determined by rolling element	

Note) The above equation or the equation (1) below applies when the rolling elements are balls.

(1) With stepwise load fluctuation

LM Guide Using Balls (i=3)

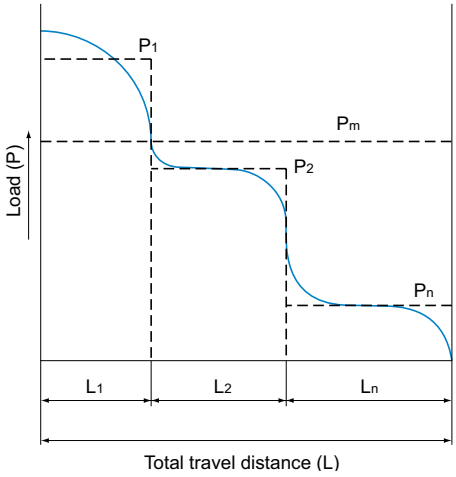
$$P_m = \sqrt[3]{\frac{1}{L}(P_1{}^3 \cdot L_1 + P_2{}^3 \cdot L_2 \cdots\cdots + P_n{}^3 \cdot L_n)} \quad \cdots\cdots\cdots\cdots (1)$$

P_m	: Average load	(N)
P_n	: Varying load	(N)
L	: Total travel distance	(mm)
L_n	: Distance traveled under P_n	(mm)

LM Guide Using Rollers ($i = \frac{10}{3}$)

$$P_m = \sqrt[\frac{10}{3}]{\frac{1}{L}(P_1{}^{\frac{10}{3}} \cdot L_1 + P_2{}^{\frac{10}{3}} \cdot L_2 \cdots\cdots + P_n{}^{\frac{10}{3}} \cdot L_n)} \quad \cdots\cdots\cdots\cdots (2)$$

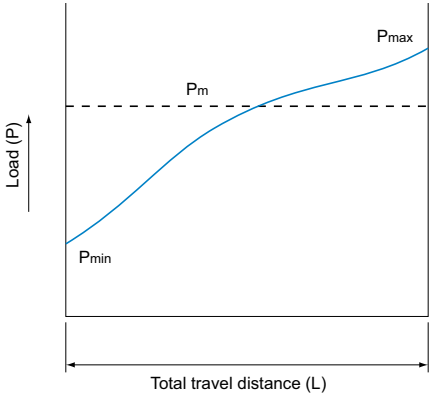
P_m	: Average load	(N)
P_n	: Varying load	(N)
L	: Total travel distance	(mm)
L_n	: Distance traveled under P_n	(mm)



(2) With monotone load fluctuation

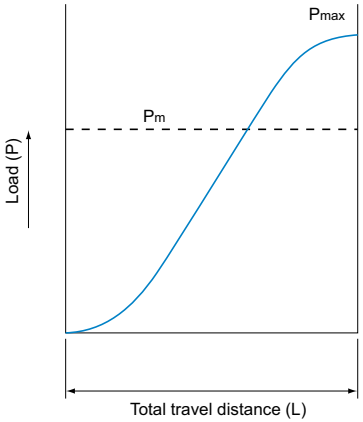
$$P_m \fallingdotseq \frac{1}{3}(P_{min} + 2 \cdot P_{max}) \quad \cdots\cdots (3)$$

P_{min} : Minimum load (N)
P_{max} : Maximum load (N)

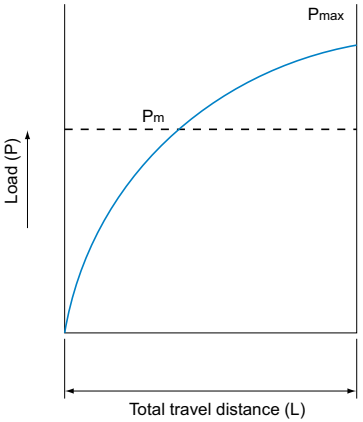


(3) With sinusoidal load fluctuation

(a) $P_m \fallingdotseq 0.65P_{max}$ ····· (4)

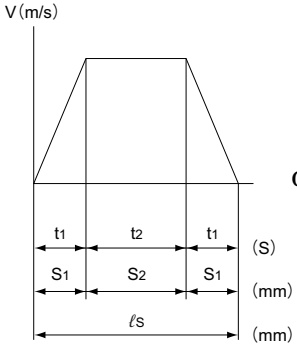


(b) $P_m \fallingdotseq 0.75P_{max}$ ····· (5)

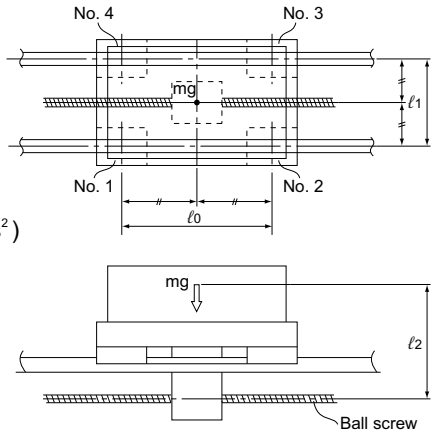


Example of Calculating the Average Load (1)
- with Horizontal Mount and Acceleration/Deceleration Considered -

Conditions



$$\alpha_1 = \frac{V}{t_1} \ (m/s^2)$$



Load Applied to the LM Block

●During uniform motion

$$P_1 = + \frac{mg}{4}$$

$$P_2 = + \frac{mg}{4}$$

$$P_3 = + \frac{mg}{4}$$

$$P_4 = + \frac{mg}{4}$$

●During acceleration

$$Pa_1 = P_1 + \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

$$Pa_2 = P_2 - \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

$$Pa_3 = P_3 - \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

$$Pa_4 = P_4 + \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

●During deceleration

$$Pd_1 = P_1 - \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

$$Pd_2 = P_2 + \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

$$Pd_3 = P_3 + \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

$$Pd_4 = P_4 - \frac{m \cdot \alpha_1 \cdot \ell_2}{2 \cdot \ell_0}$$

Average Load

$$P_{m1} = \sqrt[3]{\frac{1}{\ell_s}\left(Pa_1^3 \cdot s_1 + P_1^3 \cdot s_2 + Pd_1^3 \cdot s_3\right)}$$

$$P_{m2} = \sqrt[3]{\frac{1}{\ell_s}\left(Pa_2^3 \cdot s_1 + P_2^3 \cdot s_2 + Pd_2^3 \cdot s_3\right)}$$

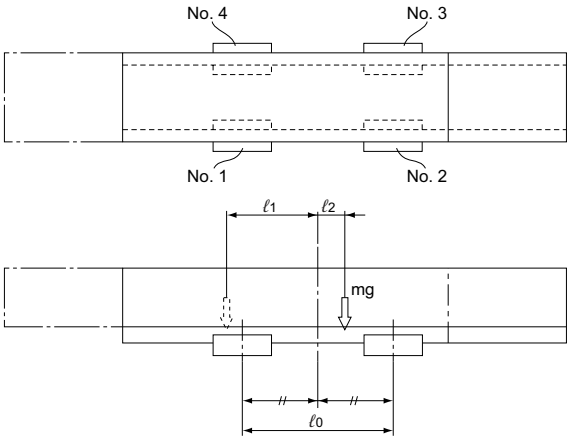
$$P_{m3} = \sqrt[3]{\frac{1}{\ell_s}\left(Pa_3^3 \cdot s_1 + P_3^3 \cdot s_2 + Pd_3^3 \cdot s_3\right)}$$

$$P_{m4} = \sqrt[3]{\frac{1}{\ell_s}\left(Pa_4^3 \cdot s_1 + P_4^3 \cdot s_2 + Pd_4^3 \cdot s_3\right)}$$

Note) Pa_n and Pd_n represent loads applied to each LM block. The suffix "n" indicates the block number in the diagram above.

Example of Calculating the Average Load (2) - When the Rails are Movable

Conditions



Load Applied to the LM Block

●At the left of the arm

$$P_{\ell 1} = + \frac{mg}{4} + \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$$

$$P_{\ell 2} = + \frac{mg}{4} - \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$$

$$P_{\ell 3} = + \frac{mg}{4} - \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$$

$$P_{\ell 4} = + \frac{mg}{4} + \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$$

●At the right of the arm

$$P_{r1} = + \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{r2} = + \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{r3} = + \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{r4} = + \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

Average Load

$$P_{m1} = \frac{1}{3}(2 \cdot |P_{\ell 1}| + |P_{r1}|)$$

$$P_{m2} = \frac{1}{3}(2 \cdot |P_{\ell 2}| + |P_{r2}|)$$

$$P_{m3} = \frac{1}{3}(2 \cdot |P_{\ell 3}| + |P_{r3}|)$$

$$P_{m4} = \frac{1}{3}(2 \cdot |P_{\ell 4}| + |P_{r4}|)$$

Note) $P_{\ell n}$ and P_{rn} represent loads applied to each LM block. The suffix "n" indicates the block number in the diagram above.

Calculating the Nominal Life

The service life of an LM Guide is subject to variations even under the same operational conditions. Therefore, it is necessary to use the nominal life defined below as a reference value for obtaining the service life of the LM Guide. The nominal life means the total travel distance that 90% of a group of units of the same LM Guide model can achieve without flaking (scale-like pieces on the metal surface) after individually running under the same conditions.

Calculating the Nominal Life

The nominal life (L_{10}) of an LM Guide is obtained from the following formula using the basic dynamic load rating (C), which is based on a reference distance of 50 km for an LM Guide with balls and 100 km for an LM Guide with rollers, and the calculated load acting on the LM Guide (P_C).

●LM Guide with balls (using a basic dynamic load rating based on a nominal life of 50 km)

$$L_{10} = \left(\frac{C}{P_C}\right)^3 \times 50 \quad \cdots\cdots\cdots\cdots (1)$$

L_{10} : Nominal life (km)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

●LM Guide with rollers (using a basic dynamic load rating based on a nominal life of 100 km)

$$L_{10} = \left(\frac{C}{P_C}\right)^{\frac{10}{3}} \times 100 \quad \cdots\cdots\cdots\cdots (2)$$

∗These nominal life formulas may not apply if the length of the stroke is less than or equal to twice the length of the LM block.

When comparing the nominal life (L_{10}), you must take into account whether the basic dynamic load rating was defined based on 50 km or 100 km. Convert the basic dynamic load rating based on ISO 14728-1 as necessary.

ISO-regulated basic dynamic load rating conversion formulas:

• LM Guide with balls

$$C_{100} = \frac{C_{50}}{1.26}$$

C_{50} : Basic dynamic load rating based on a nominal life of 50 km
C_{100} : Basic dynamic load rating based on a nominal life of 100 km

• LM Guide with rollers

$$C_{100} = \frac{C_{50}}{1.23}$$

Calculating the Modified Nominal Life

During use, an LM Guide may be subjected to vibrations and shocks as well as fluctuating loads, which are difficult to detect. In addition, the surface hardness of the raceways, the operating temperature, and having LM blocks arranged directly behind one another will have a decisive impact on the service life. Taking these factors into account, the modified nominal life (L_{10m}) can be calculated according to the following formulas (3) and (4).

●Modified factor α

$$\alpha = \frac{f_H \cdot f_T \cdot f_C}{f_W}$$

α : Modified factor
f_H : Hardness factor (see Fig. 10 on B**1-75**)
f_T : Temperature factor (see Fig. 11 on B**1-75**)
f_C : Contact factor (see Table 2 on B**1-75**)
f_W : Load factor (see Table 3 on B**1-76**)

●Modified nominal life L_{10m}

• LM Guide with balls

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^3 \times 50 \quad \cdots\cdots\cdots\cdots\cdots\cdots (3)$$

• LM Guide with rollers

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^{\frac{10}{3}} \times 100 \quad \cdots\cdots\cdots\cdots\cdots (4)$$

L_{10m} : Modified nominal life (km)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

Once the nominal life (L_{10}) has been obtained, the service life time can be obtained using the following equation if the stroke length and the number of reciprocations are constant.

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

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

f_H: Hardness Factor

To ensure that the LM Guide achieves optimum load capacity, the raceway hardness must be between 58 and 64 HRC.

If the hardness is lower than this range, the basic dynamic load rating and the basic static load rating decrease. Therefore, it is necessary to multiply each rating by the respective hardness factor (f_H).

Since the LM Guide has sufficient hardness, the f_H value for the LM Guide is normally 1.0 unless otherwise specified.

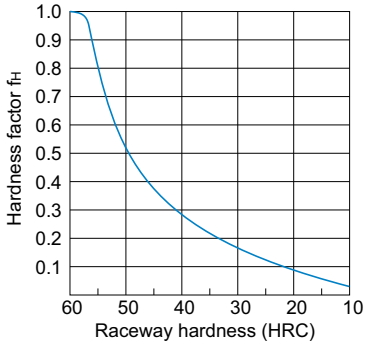


Fig. 10: Hardness Factor (f_H)

f_T: Temperature Factor

If the temperature of the operating environment surrounding the LM Guide exceeds 100°C, take into account the adverse effect of the high temperature and multiply the basic load ratings by the temperature factor indicated in Fig. 11.

In addition, the selected LM Guide must also be of a high-temperature type.

Note) An LM Guide not designed to withstand high temperatures should be used at 80°C or less. Please contact THK if application requirements exceed 80°C.

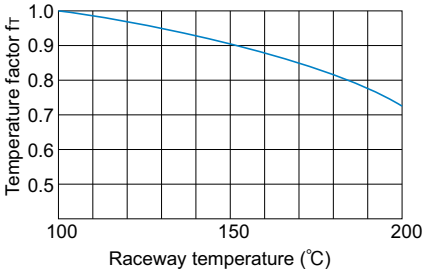


Fig. 11: Temperature Factor (f_T)

f_C: Contact Factor

When multiple LM blocks are used in close contact with each other, it is difficult to achieve uniform load distribution due to moment loads and mounting-surface accuracy. When using multiple blocks in close contact with each other, multiply the basic load rating (C or C_0) by the corresponding contact factor indicated in Table 2.

Note) If uneven load distribution is expected in a large machine, take into account the respective contact factor indicated in Table 2.

Table 2: Contact Factor (f_C)

Number of blocks used in close contact	Contact factor f_C
2	0.81
3	0.72
4	0.66
5	0.61
6 or greater	0.6
Normal use	1

f_w: Load Factor

In general, reciprocating machines tend to involve vibrations or impacts during operation. It is extremely difficult to accurately determine vibrations generated during high-speed operation and impacts that occur during frequent starts and stops. Therefore, where the effects of speed and vibration are estimated to be significant, divide the basic dynamic load rating (C) by a load factor selected from Table 3, which contains empirically obtained data.

Table 3: Load Factor (f_w)

Vibrations/ impacts	Speed (V)	f_w
Faint	Very low V≦0.25 m/s	1 to 1.2
Weak	Low 0.25 m/s<V≦1 m/s	1.2 to 1.5
Medium	Medium 1 m/s<V≦2 m/s	1.5 to 2
Strong	High V>2 m/s	2 to 3.5

Example of Calculating the Nominal Life (1) - with Horizontal Mount and High-Speed Acceleration

Conditions

Model No. : HSR35L
(basic dynamic load rating: C = 65.0 kN)
(basic static load rating: C_0 = 91.7 kN)

Mass : m_1 = 800 kg
m_2 = 500 kg

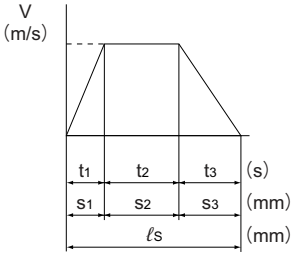
Speed : V = 0.5 m/s

Time : t_1 = 0.05 s
t_2 = 2.8 s
t_3 = 0.15 s

Acceleration : α_1 = 10 m/s^2
α_3 = 3.333 m/s^2

Stroke : ℓ_S = 1450 mm

Distance: ℓ_0 = 600 mm
ℓ_1 = 400 mm
ℓ_2 = 120 mm
ℓ_3 = 50 mm
ℓ_4 = 200 mm
ℓ_5 = 350 mm



Gravitational acceleration g = 9.8 (m/s^2)

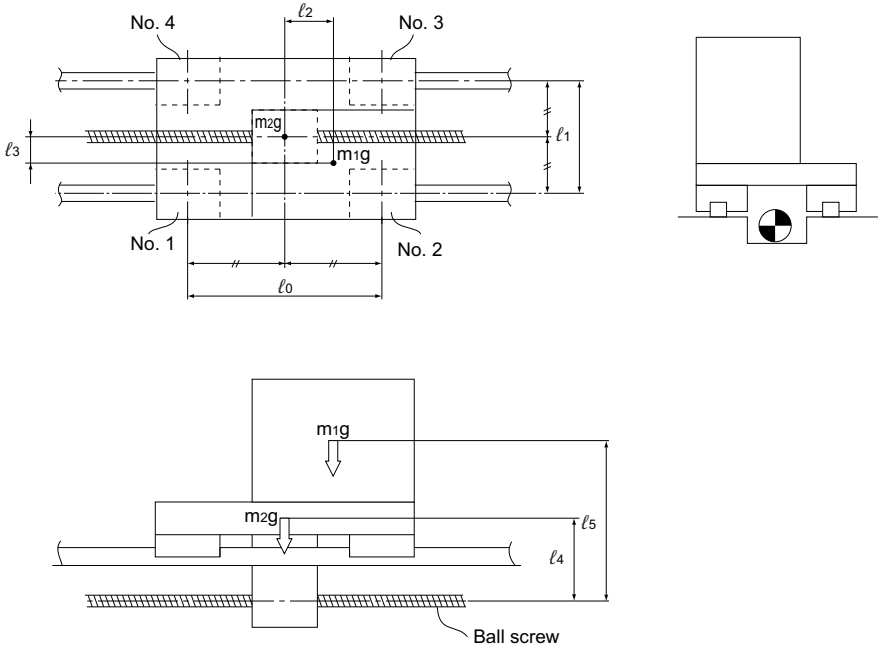


Fig. 12: Operating Conditions

Load Applied to the LM Block

Calculate the load applied to each LM block.

● **During uniform motion**

■Applied load in the radial direction P_n

$$P_1 = +\frac{m_1 g}{4} - \frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_1 g \cdot \ell_3}{2 \cdot \ell_1} + \frac{m_2 g}{4} = +2891\ \mathrm{N}$$

$$P_2 = +\frac{m_1 g}{4} + \frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_1 g \cdot \ell_3}{2 \cdot \ell_1} + \frac{m_2 g}{4} = +4459\ \mathrm{N}$$

$$P_3 = +\frac{m_1 g}{4} + \frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_1 g \cdot \ell_3}{2 \cdot \ell_1} + \frac{m_2 g}{4} = +3479\ \mathrm{N}$$

$$P_4 = +\frac{m_1 g}{4} - \frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_1 g \cdot \ell_3}{2 \cdot \ell_1} + \frac{m_2 g}{4} = +1911\ \mathrm{N}$$

● **During leftward acceleration**

■Applied load in the radial direction $P\ell a_n$

$$P\ell a_1 = P_1 - \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = -275.6\ \mathrm{N}$$

$$P\ell a_2 = P_2 + \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = +7625.6\ \mathrm{N}$$

$$P\ell a_3 = P_3 + \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = +6645.6\ \mathrm{N}$$

$$P\ell a_4 = P_4 - \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = -1255.6\ \mathrm{N}$$

■Applied load in the lateral direction $Pt\ell a_n$

$$Pt\ell a_1 = -\frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = -333.3\ \mathrm{N}$$

$$Pt\ell a_2 = +\frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = +333.3\ \mathrm{N}$$

$$Pt\ell a_3 = +\frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = +333.3\ \mathrm{N}$$

$$Pt\ell a_4 = -\frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = -333.3\ \mathrm{N}$$

● **During leftward deceleration**

■Applied load in the radial direction $P\ell d_n$

$$P\ell d_1 = P_1 + \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +3946.6\ \mathrm{N}$$

$$P\ell d_2 = P_2 - \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +3403.4\ \mathrm{N}$$

$$P\ell d_3 = P_3 - \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +2423.4\ \mathrm{N}$$

$$P\ell d_4 = P_4 + \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +2966.6\ \mathrm{N}$$

■Applied load in the lateral direction $Pt\ell d_n$

$$Pt\ell d_1 = + \frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = + 111.1\,N$$

$$Pt\ell d_2 = - \frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = - 111.1\,N$$

$$Pt\ell d_3 = - \frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = - 111.1\,N$$

$$Pt\ell d_4 = + \frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = + 111.1\,N$$

● During rightward acceleration

■Applied load in the radial direction Pra_n

$$Pra_1 = P_1 + \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = +6057.6\,N$$

$$Pra_2 = P_2 - \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = +1292.4\,N$$

$$Pra_3 = P_3 - \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = + 312.4\,N$$

$$Pra_4 = P_4 + \frac{m_1 \cdot \alpha_1 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_1 \cdot \ell_4}{2 \cdot \ell_0} = +5077.6\,N$$

■Applied load in the lateral direction $Ptra_n$

$$Ptra_1 = + \frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = + 333.3\,N$$

$$Ptra_2 = - \frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = - 333.3\,N$$

$$Ptra_3 = - \frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = - 333.3\,N$$

$$Ptra_4 = + \frac{m_1 \cdot \alpha_1 \cdot \ell_3}{2 \cdot \ell_0} = + 333.3\,N$$

● During rightward deceleration

■Applied load in the radial direction Prd_n

$$Prd_1 = P_1 - \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +1835.4\,N$$

$$Prd_2 = P_2 + \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +5514.6\,N$$

$$Prd_3 = P_3 + \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = +4534.6\,N$$

$$Prd_4 = P_4 - \frac{m_1 \cdot \alpha_3 \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_2 \cdot \alpha_3 \cdot \ell_4}{2 \cdot \ell_0} = + 855.4\,N$$

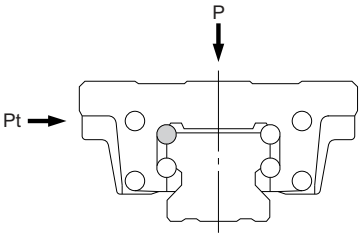
■Applied load in the lateral direction $Ptrd_n$

$$Ptrd_1 = -\frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = -111.1\ N$$

$$Ptrd_2 = +\frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = +111.1\ N$$

$$Ptrd_3 = +\frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = +111.1\ N$$

$$Ptrd_4 = -\frac{m_1 \cdot \alpha_3 \cdot \ell_3}{2 \cdot \ell_0} = -111.1\ N$$



Combined Radial and Thrust Load

The combined radial and thrust load is calculated for each block only on the groove where the load is greatest.

Under these operating conditions, for each block, the groove for which the load is greatest is groove 1.*1 Because groove 1 bears P*2>0 and Pt>0 loads, it is 0 N when P<0 and Pt<0 loads are applied.

When calculating for the groove that will bear P<0 and Pt<0 loads, use the absolute value of the load.

*1 The reason that groove 1 has the greatest load is that mass m_1 is applied unevenly to the table and is not distributed equally to all grooves in the block.
*2 P refers to the radial load that each groove bears.

● During uniform motion

$P_{E1} = P_1 = 2891$ N
$P_{E2} = P_2 = 4459$ N
$P_{E3} = P_3 = 3479$ N
$P_{E4} = P_4 = 1911$ N

● During leftward acceleration

$P_E\ell a_1 = |\ P\ell a_1\ | + |\ Pt\ell a_1\ | = 0$ N
$P_E\ell a_2 = |\ P\ell a_2\ | + |\ Pt\ell a_2\ | = 7958.9$ N
$P_E\ell a_3 = |\ P\ell a_3\ | + |\ Pt\ell a_3\ | = 6978.9$ N
$P_E\ell a_4 = |\ P\ell a_4\ | + |\ Pt\ell a_4\ | = 0$ N
$P\ell a_1$, $Pt\ell a_1$, $P\ell a_4$, and $Pt\ell a_4 = 0$ N

● During leftward deceleration

$P_E\ell d_1 = |\ P\ell d_1\ | + |\ Pt\ell d_1\ | = 4057.7$ N
$P_E\ell d_2 = |\ P\ell d_2\ | + |\ Pt\ell d_2\ | = 3403.4$ N
$P_E\ell d_3 = |\ P\ell d_3\ | + |\ Pt\ell d_3\ | = 2423.4$ N
$P_E\ell d_4 = |\ P\ell d_4\ | + |\ Pt\ell d_4\ | = 3077.7$ N
$Pt\ell d_2$ and $Pt\ell d_3 = 0$ N

● During rightward acceleration

$P_Era_1 = |\ Pra_1\ | + |\ Ptra_1\ | = 6390.9$ N
$P_Era_2 = |\ Pra_2\ | + |\ Ptra_2\ | = 1292.4$ N
$P_Era_3 = |\ Pra_3\ | + |\ Ptra_3\ | = 312.4$ N
$P_Era_4 = |\ Pra_4\ | + |\ Ptra_4\ | = 5410.9$ N
$Ptra_2$ and $Ptra_3 = 0$ N

● During rightward deceleration

$P_Erd_1 = |\ Prd_1\ | + |\ Ptrd_1\ | = 1835.4$ N
$P_Erd_2 = |\ Prd_2\ | + |\ Ptrd_2\ | = 5625.7$ N
$P_Erd_3 = |\ Prd_3\ | + |\ Ptrd_3\ | = 4645.7$ N
$P_Erd_4 = |\ Prd_4\ | + |\ Ptrd_4\ | = 855.4$ N
$Ptrd_1$ and $Ptrd_4 = 0$ N

Static Safety Factor

As indicated above, the maximum load is applied to the LM Guide during the leftward acceleration of the second LM block. Therefore, the static safety factor (f_S) is obtained by the following equation.

$$f_S = \frac{C_0}{P_E\ell a_2} = \frac{91.7 \times 10^3}{7958.9} = 11.5$$

Average Load P_{mn}

Obtain the average load applied to each LM block.

$$P_{m1} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_E\ell\, a_1^3\cdot S_1 + P_{E1}^3\cdot S_2 + P_E\ell\, d_1^3\cdot S_3 + P_E r a_1^3\cdot S_1 + P_{E1}^3\cdot S_2 + P_E r d_1^3\cdot S_3\right)}$$

$$= \sqrt[3]{\frac{1}{2\times 1450}(0\times 12.5+2891^3\times 1400+4057.7^3\times 37.5+6390.9^3\times 12.5+2891^3\times 1400+1835.4^3\times 37.5)}$$

$$= 2939.5\ \text{N}$$

$$P_{m2} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_E\ell\, a_2^3\cdot S_1 + P_{E2}^3\cdot S_2 + P_E\ell\, d_2^3\cdot S_3 + P_E r a_2^3\cdot S_1 + P_{E2}^3\cdot S_2 + P_E r d_2^3\cdot S_3\right)}$$

$$= \sqrt[3]{\frac{1}{2\times 1450}(7958.9^3\times 12.5+4459^3\times 1400+3403.4^3\times 37.5+1292.4^3\times 12.5+4459^3\times 1400+5625.7^3\times 37.5)}$$

$$= 4491.2\ \text{N}$$

$$P_{m3} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_E\ell\, a_3^3\cdot S_1 + P_{E3}^3\cdot S_2 + P_E\ell\, d_3^3\cdot S_3 + P_E r a_3^3\cdot S_1 + P_{E3}^3\cdot S_2 + P_E r d_3^3\cdot S_3\right)}$$

$$= \sqrt[3]{\frac{1}{2\times 1450}(6978.9^3\times 12.5+3479^3\times 1400+2423.4^3\times 37.5+312.4^3\times 12.5+3479^3\times 1400+4645.7^3\times 37.5)}$$

$$= 3519.7\ \text{N}$$

$$P_{m4} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_E\ell\, a_4^3\cdot S_1 + P_{E4}^3\cdot S_2 + P_E\ell\, d_4^3\cdot S_3 + P_E r a_4^3\cdot S_1 + P_{E4}^3\cdot S_2 + P_E r d_4^3\cdot S_3\right)}$$

$$= \sqrt[3]{\frac{1}{2\times 1450}(0\times 12.5+1911^3\times 1400+3077.7^3\times 37.5+5410.9^3\times 12.5+1911^3\times 1400+855.4^3\times 37.5)}$$

$$= 1983.7\ \text{N}$$

Nominal Life L_{10mn}

The nominal life of the four LM blocks is obtained from the corresponding nominal life equations shown below.

$$L_{10m1} = \left(\alpha\times\frac{C}{P_{m1}}\right)^3\times 50 = 160100\ \text{km}$$

$$L_{10m2} = \left(\alpha\times\frac{C}{P_{m2}}\right)^3\times 50 = 44900\ \text{km}$$

$$L_{10m3} = \left(\alpha\times\frac{C}{P_{m3}}\right)^3\times 50 = 93300\ \text{km}$$

$$L_{10m4} = \left(\alpha\times\frac{C}{P_{m4}}\right)^3\times 50 = 521000\ \text{km}$$

$$\alpha = \frac{1}{f_W}\ (\text{where } f_W = 1.5)$$

Therefore, the service life of the LM Guide used in a machine or equipment under the conditions stated above is equivalent to the nominal life of the second LM block, which is 44,900 km.

Example of Calculating the Nominal Life (2) - with Vertical Mount

Operating Conditions

Model No. : HSR25CA2SS+1500L-Ⅱ
(basic dynamic load rating: C = 27.6 kN)
(basic static load rating: C_0 = 36.4 kN)

Mass : m_0 = 100 kg
m_1 = 200 kg
m_2 = 100 kg

Stroke : ℓ_S = 1000 mm

Distance : ℓ_0 = 300 mm
ℓ_1 = 80 mm
ℓ_2 = 50 mm
ℓ_3 = 280 mm
ℓ_4 = 150 mm
ℓ_5 = 250 mm

The mass (m_0) is loaded only during ascent; it is removed during descent.

Gravitational acceleration g = 9.8 (m/s^2)

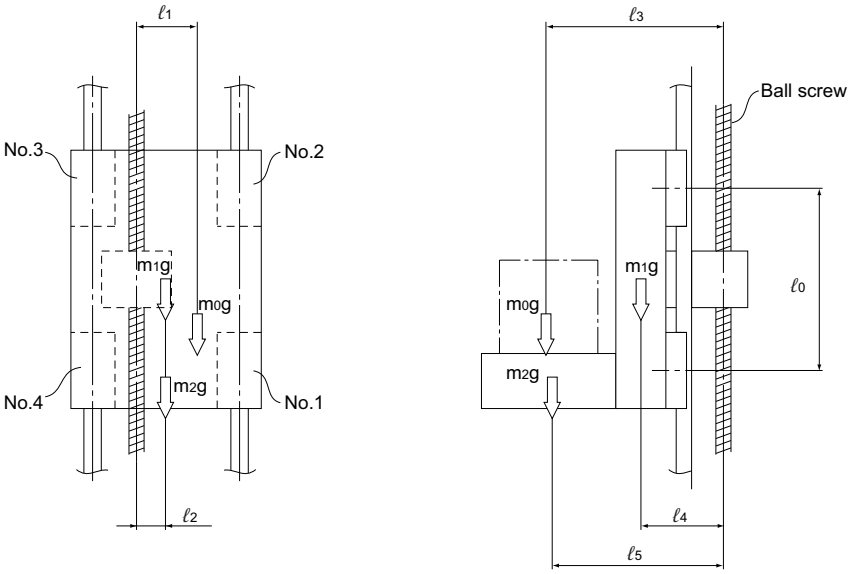


Fig. 13: Operating Conditions

Load Applied to the LM Block

● During Ascent

■Load applied to each LM block in the radial direction Pu_n during ascent

$$Pu_1 = +\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_0 g \cdot \ell_3}{2 \cdot \ell_0} = +1355.6\ \mathrm{N}$$

$$Pu_2 = -\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_0 g \cdot \ell_3}{2 \cdot \ell_0} = -1355.6\ \mathrm{N}$$

$$Pu_3 = -\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} - \frac{m_0 g \cdot \ell_3}{2 \cdot \ell_0} = -1355.6\ \mathrm{N}$$

$$Pu_4 = +\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} + \frac{m_0 g \cdot \ell_3}{2 \cdot \ell_0} = +1355.6\ \mathrm{N}$$

■Load applied to each LM block in the lateral direction Ptu_n during ascent

$$Ptu_1 = +\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_0 g \cdot \ell_1}{2 \cdot \ell_0} = +375.7\ \mathrm{N}$$

$$Ptu_2 = -\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_0 g \cdot \ell_1}{2 \cdot \ell_0} = -375.7\ \mathrm{N}$$

$$Ptu_3 = -\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_0 g \cdot \ell_1}{2 \cdot \ell_0} = -375.7\ \mathrm{N}$$

$$Ptu_4 = +\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_0 g \cdot \ell_1}{2 \cdot \ell_0} = +375.7\ \mathrm{N}$$

● During Descent

■Load applied to each LM block in the radial direction Pd_n during descent

$$Pd_1 = +\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} = +898.3\ \mathrm{N}$$

$$Pd_2 = -\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} = -898.3\ \mathrm{N}$$

$$Pd_3 = -\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} = -898.3\ \mathrm{N}$$

$$Pd_4 = +\frac{m_1 g \cdot \ell_4}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_5}{2 \cdot \ell_0} = +898.3\ \mathrm{N}$$

■Load applied to each LM block in the lateral direction Ptd_n during descent

$$Ptd_1 = +\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} = +245\ \mathrm{N}$$

$$Ptd_2 = -\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} = -245\ \mathrm{N}$$

$$Ptd_3 = -\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} - \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} = -245\ \mathrm{N}$$

$$Ptd_4 = +\frac{m_1 g \cdot \ell_2}{2 \cdot \ell_0} + \frac{m_2 g \cdot \ell_2}{2 \cdot \ell_0} = +245\ \mathrm{N}$$

Combined Radial and Thrust Load

● During Ascent

$P_{Eu1} = |P_{u1}| + |Pt_{u1}| = 1731.3$ N
$P_{Eu2} = |P_{u2}| + |Pt_{u2}| = 1731.3$ N
$P_{Eu3} = |P_{u3}| + |Pt_{u3}| = 1731.3$ N
$P_{Eu4} = |P_{u4}| + |Pt_{u4}| = 1731.3$ N

● During Descent

$P_{Ed1} = |Pd_1| + |Ptd_1| = 1143.3$ N
$P_{Ed2} = |Pd_2| + |Ptd_2| = 1143.3$ N
$P_{Ed3} = |Pd_3| + |Ptd_3| = 1143.3$ N
$P_{Ed4} = |Pd_4| + |Ptd_4| = 1143.3$ N

Static Safety Factor

The static safety factor (f_S) of the LM Guide used in a machine or equipment under the conditions stated above is obtained as follows.

$$f_S = \frac{C_0}{P_{EU2}} = \frac{36.4\times10^3}{1731.3} = 21.0$$

Average Load P_{mn}

Obtain the average load applied to each LM block.

$$P_{m1} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_{EU1}{}^3\cdot\ell_S + P_{Ed1}{}^3\cdot\ell_S\right)} = 1495.1 \text{ N}$$

$$P_{m2} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_{EU2}{}^3\cdot\ell_S + P_{Ed2}{}^3\cdot\ell_S\right)} = 1495.1 \text{ N}$$

$$P_{m3} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_{EU3}{}^3\cdot\ell_S + P_{Ed3}{}^3\cdot\ell_S\right)} = 1495.1 \text{ N}$$

$$P_{m4} = \sqrt[3]{\frac{1}{2\cdot\ell_S}\left(P_{EU4}{}^3\cdot\ell_S + P_{Ed4}{}^3\cdot\ell_S\right)} = 1495.1 \text{ N}$$

Nominal Life L_{10mn}

The nominal life of the four LM blocks is obtained from the corresponding nominal life equations shown below.

$$L_{10m1} = \left(\alpha\times\frac{C}{P_{m1}}\right)^3\times50 = 182000 \text{ km}$$

$$L_{10m2} = \left(\alpha\times\frac{C}{P_{m2}}\right)^3\times50 = 182000 \text{ km}$$

$$L_{10m3} = \left(\alpha\times\frac{C}{P_{m3}}\right)^3\times50 = 182000 \text{ km}$$

$$L_{10m4} = \left(\alpha\times\frac{C}{P_{m4}}\right)^3\times50 = 182000 \text{ km}$$

$$\alpha = \frac{1}{f_W} \text{ (where } f_W = 1.2)$$

Therefore, the service life of the LM Guide used in a machine or equipment under the conditions stated above is 182,000 km.

Predicting the Rigidity

Selecting a Radial Clearance (Preload)

Since the radial clearance of an LM Guide greatly affects the running accuracy, load carrying capacity, and rigidity of the LM Guide, it is important to select an appropriate clearance according to the application. In general, the service life and accuracy are favorably affected by selecting a negative clearance (i.e., applying a preload[1]) while taking into account possible vibrations and impacts generated from reciprocating motion.
For specific radial clearances, contact THK. We will help you select the optimal clearance according to the conditions.
The clearances of all LM Guide models (except models HR, GSR, and GSR-R, which are separate types) are adjusted as specified before shipment, and therefore they do not need further preload adjustment.

[1]Preload is an internal load applied in advance to the rolling elements (balls, rollers, etc.) of an LM block in order to increase its rigidity.

Table 4: Types of Radial Clearance

	Normal clearance	Clearance C1 (light preload)	Clearance C0 (medium preload)
Condition	● The loading direction is fixed, impact and vibrations are minimal and 2 rails are installed in parallel. ● Very high precision is not required, and the sliding resistance must be as low as possible.	● An overhang load or moment load is applied. ● The LM Guide is used in a single-rail configuration. ● Light load and high accuracy are required.	● High rigidity is required and vibrations and impact are applied. ● Heavy-cutting machine tools
Examples of applications	• Beam-welding machines • Book-binding machines • Automatic packaging machines • XY axes of general industrial machinery • Automatic sash-manufacturing machines • Welding machines • Flame cutting machines • Tool changers • Various kinds of material feeders	• Grinding machine table feed axes • Automatic coating machines • Industrial robots • Various kinds of high-speed material feeders • NC drilling machines • Vertical axes of general industrial machinery • Printed circuit board drilling machines • Electric discharge machines • Measuring instruments • Precision XY tables	• Machining centers • NC lathes • Grinding stone feed axes of grinding machines • Milling machines • Vertical/horizontal boring machines • Tool rest guides • Vertical axes of machine tools

Service Life with a Preload Considered

When using an LM Guide under a medium preload (clearance C0), it is necessary to calculate the service life while taking into account the magnitude of the preload.
To identify the appropriate preload for any selected LM Guide model, contact THK.

Rigidity

When a load is applied to an LM Guide, the bearings and LM block will undergo elastic deformation within the allowable load range. The ratio of displacement to applied load is referred to as “rigidity.” The radial internal clearance (preload) for the LM Guide can be specified in order to reduce displacement.
By using balls larger than the width of the raceway, they will naturally deform elastically as they roll, allowing the load to be maintained for longer while limiting displacement in the LM Guide.
The effect of the preload can be up to 2.8 times greater than the size of the preload itself. If that level is exceeded, the preload is released and the effect of the preload is lost.
When a preloaded LM Guide takes an external load, the displacement will be linear. The level of displacement will be approximately half that of an LM Guide with no preload.
The preload, in addition to reducing displacement, helps prevent premature failure due to vibration and impact/shock.

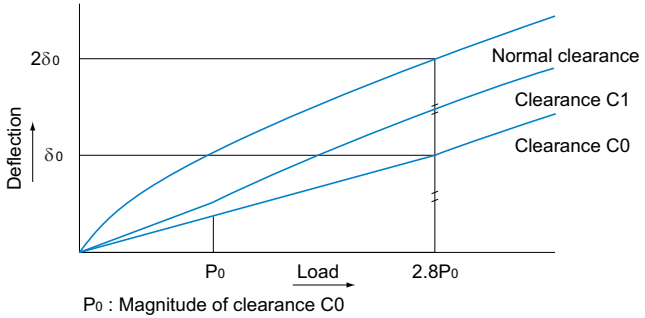


Fig. 14: Rigidity Data

$$K=\frac{P}{\delta}$$

K	: Rigidity value	(N/μm)
δ	: Deflection	(μm)
P	: Calculated load	(N)

Determining the Accuracy

Accuracy Standards

Accuracy of the LM Guide is specified in terms of running parallelism, dimensional tolerance for height and width, and height and width difference between a pair when two or more LM blocks are used on one rail or when two or more rails are mounted on the same plane.
For details, see “Accuracy Standards for Each Model” on A1-78 to A1-88.

Running Parallelism

Running parallelism refers to the tolerance for parallelism between the LM block and the LM rail datum surface when the LM block travels the whole length of the LM rail with the LM rail bolted to a reference surface.

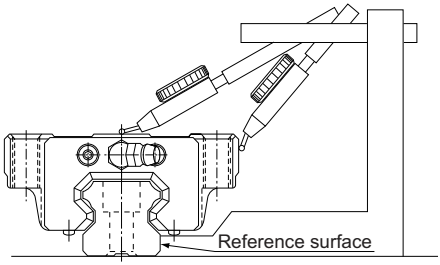


Fig. 15: Running Parallelism

Difference in Height M

The difference in height M indicates the difference between the minimum and maximum values of the height (M) of each of the LM blocks used together on the same plane.

Difference in Width W_2

The difference in width W_2 indicates the difference between the minimum and maximum values of the width (W_2) between an LM rail and each of the LM blocks mounted together on the LM rail.

Note 1) When two or more rails are used on the same plane in parallel, this applies only to the difference in width (W_2) and dimensional tolerance of the master rail. Please specify if you wish for it to apply to the difference in width and dimensional tolerance of the subsidiary rail as well. Master LM rails will have a serial number ending with “KB” printed on them. However, this is not the case for Normal grade products.

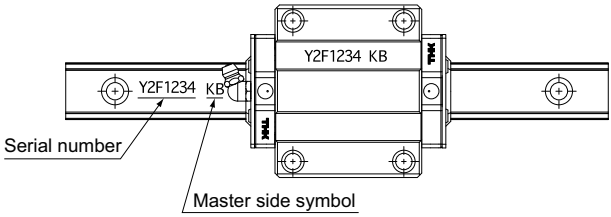


Fig. 16: Master LM Rail (E.g. Model HSR-C)

Note 2) Accuracy measurements each represent the average value of the central point or the central area of the LM block.
Note 3) If it is mounted on a less rigid base such as an aluminum base, the curve of the rail will affect the accuracy of the machine. Therefore, it is necessary to define straightness of the rail in advance.

Guidelines for Accuracy Grades by Machine Type

Table 5 shows guidelines for selecting an accuracy grade of the LM Guide according to the machine type.

Table 5: Guidelines for Accuracy Grades by Machine Type

Type of machine		Accuracy grades				
		Normal	H	P	SP	UP
Machine tools	Machining center			●	●	
	Lathe			●	●	
	Milling machine			●	●	
	Boring machine			●	●	
	Jig borer				●	●
	Grinding machine				●	●
	Electric discharge machine			●	●	●
	Punching press		●	●		
	Laser beam machine		●	●	●	
	Woodworking machine	●	●	●		
	NC drilling machine		●	●		
	Tapping center		●	●		
	Palette changer	●				
	ATC	●				
	Wire cutting machine			●	●	
	Dressing machine				●	●
Industrial robots	Cartesian coordinate	●	●	●		
	Cylindrical coordinate	●	●			
Semiconductor manufacturing equipment	Wire bonding machine			●	●	
	Prober				●	●
	Electronic component inserter		●	●		
	Printed circuit board drilling machine		●	●	●	
Other equipment	Injection molding machine	●	●			
	3D measuring instrument				●	●
	Office equipment	●	●			
	Conveyance system	●	●			
	XY table		●	●	●	
	Coating machine	●	●			
	Welding machine	●	●			
	Medical equipment	●	●			
	Digitizer		●	●	●	
	Inspection equipment			●	●	●

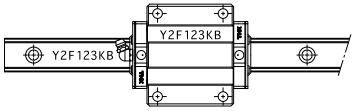
Normal : Normal grade
H : High Accuracy grade
P : Precision grade
SP : Super Precision grade
UP : Ultra Precision grade

Mounting the LM Guide

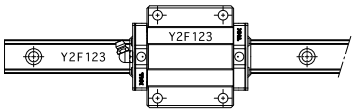
Master LM Guide Indicators and Combined Use

Master LM Guide Indicators

All LM rails mounted on the same plane are marked with the same serial number. The LM rail marked with “KB” after the serial number is the master LM rail. The LM block on the master LM rail has its reference surface finished to a designated precision, allowing it to serve as the positioning reference for tables (see Fig. 1).
Normal grade LM Guides are not marked with “KB.” Therefore, any one of the LM rails having the same serial number can be used as the master LM rail.



Master LM Guide



Subsidiary LM Guide

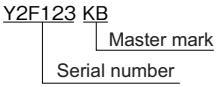
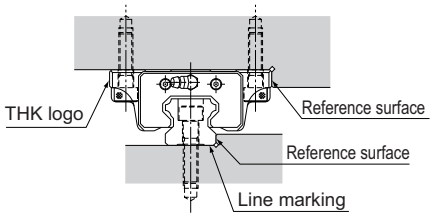


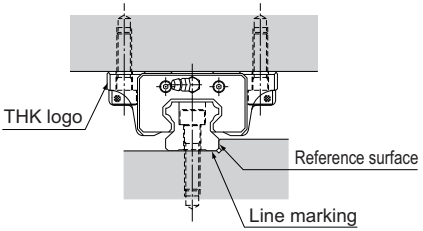
Fig. 1: Master and Subsidiary LM Guide Units (e.g. Model HSR-C)

Reference Surface Indicators

In the LM Guide, the reference surface of the LM block is opposite the surface marked with the THK logo, and that of the LM rail is on the surface marked with a line (see Fig. 2). Please specify if it is necessary to reverse the reference surface of the LM rail and block or if the grease nipple must be oriented in the opposite direction.



Master LM Guide



Subsidiary LM Guide

Fig. 2: Reference Surface Indicators

Serial Number Marking and Combined Use of an LM Rail and LM Blocks

An LM rail and LM block(s) used in combination must have the same serial number. When removing an LM block from the LM rail and reinstalling the LM block, make sure that they have the same serial number and the numbers are oriented in the same direction. (Fig. 3)

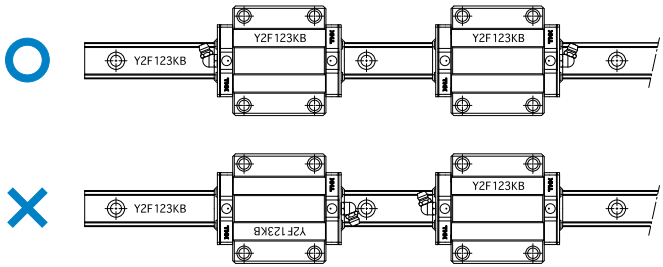


Fig. 3: Serial Number Marking and Combined Use of an LM Rail and LM Blocks (E.g. Model HSR-C)

Use of Jointed Rails

When a long LM rail is ordered, two or more rails will be jointed together to the desired length. When jointing rails, make sure that the joint match marks shown in Fig. 4 are correctly positioned.

When two LM Guide units with jointed rails are to be arranged parallel to each other, they will be manufactured so that they have axial symmetry (are mirror images of each other) as a set.

If a large load is applied near the LM rail joint, the LM rail may deflect and cause misalignment. Therefore, we recommend securely fastening the joint section by pressing the LM rail against the datum plane using a set screw or the like and keeping the L dimension as short as possible. (Fig. 4)

For details, contact THK.

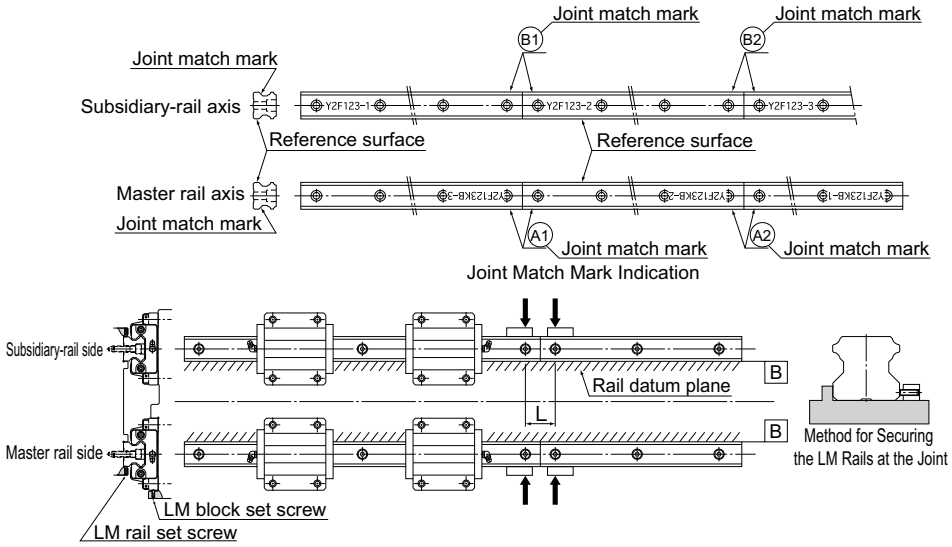


Fig. 4: Use of Jointed Rails

Mounting Procedure

LM Guide Mounting Example Requiring Rigidity and Accuracy Because of Impact Loads Applied to the Machine

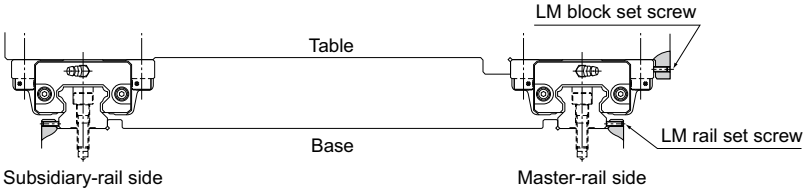


Fig. 5: When an Impact Load is Applied to the Machine

● Mounting the LM Rail(s)

(1) Be sure to remove burrs, dents, and dust from the mounting surface of the machine to which the LM Guide is to be mounted before installing the LM Guide. (Fig. 6)

Note) Since the LM Guide is coated with anti-rust oil, remove the oil from the reference surface by wiping it with washing oil before using the guide. Once the anti-rust oil has been removed, the reference surface is prone to rusting. We recommend applying low-viscosity spindle oil.

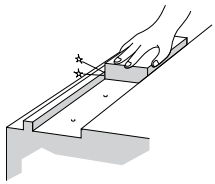


Fig. 6: Checking the Mounting Surface

(2) Gently place the LM rail onto the base, and temporarily secure the bolts so that the LM rail lightly contacts the mounting surface (align the line-marked side of the LM rail with the side reference-surface of the base). (Fig. 7)

Note) The bolts for securing the LM Guide must be clean. When placing the bolts into the mounting holes of the LM rail, check if the bolt holes are displaced. (Fig. 8) Forcibly tightening the bolt into a displaced hole may lower the accuracy.

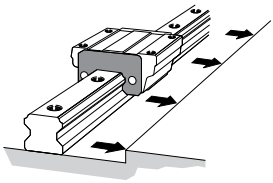


Fig. 7: Aligning the LM Rail with the Reference Surface

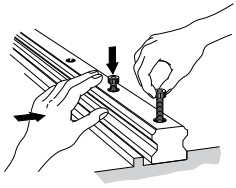


Fig. 8: Checking Slack in the Bolt

(3) Secure the LM rail set screws in order with a tightening force just enough to have the rail closely contact the side mounting surface. (Fig. 9)

(4) Tighten the mounting bolts at the designated torque using a torque wrench. (See Fig. 10, and Table 1 and Table 2 on B**1-101**.)

Note) To achieve stable accuracy when tightening the LM rail mounting bolts, tighten them in order from the center to the rail ends.

(5) Mount the other rail in the same manner to complete the installation of the LM rails.

(6) Hammer caps into the bolt holes on the top face of each LM rail until the top of the cap is flush with the top face of the rail.

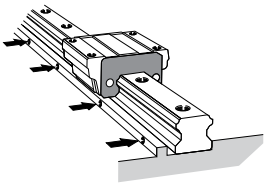


Fig. 9: Tightening the Set Screws

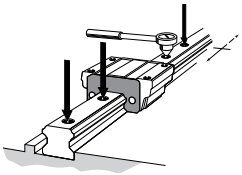


Fig. 10: Fully Fastening the Mounting Bolts

● Mounting the LM Blocks

(1) Gently place the table on the LM blocks and temporarily fasten the mounting bolts.

(2) Press the master side LM blocks to the side reference surface of the table using set screws and position the table. (See Fig. 5 on B**1-91**.)

(3) Fully fasten the mounting bolts on the master side and the subsidiary side to complete the installation.

Note) To evenly secure the table, tighten the mounting bolts in diagonal order as shown in Fig. 11.

This method saves time in establishing straightness of the LM rail and eliminates the need to machine securing dowel pins, thus drastically reducing the labor required for installation.

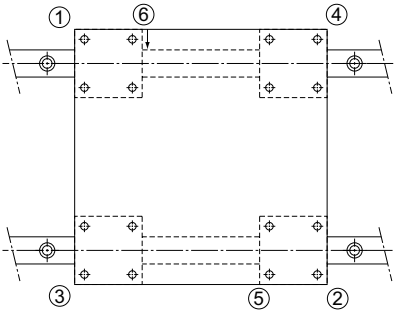


Fig. 11: Sequence for Tightening the LM Blocks

Example of Mounting the LM Guide When the Master LM Rail is not Provided with Set Screws

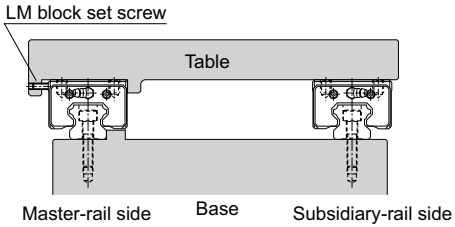


Fig. 12: When the Master LM Rail is not Provided with Set Screws

● Mounting the Master LM Rail

After temporarily fastening the mounting bolts, firmly press the LM rail to the side reference surface at the position of each mounting bolt using a small vice and fully fasten the bolt. Perform this in order from either rail end to the other. (Fig. 13)

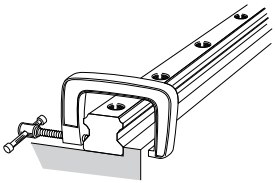


Fig. 13

● Mounting the Subsidiary LM Rail

To mount the subsidiary LM rail in parallel with the master LM rail, which has been correctly installed, we recommend adopting the methods below.

■Using a Straightedge

Place a straightedge between the two rails, and arrange it in parallel with the side reference surface of the master LM rail using a dial gauge. Then secure the mounting bolts in order while achieving straightness of the subsidiary rail with the straightedge as the reference by using the dial gauge. (Fig. 14)

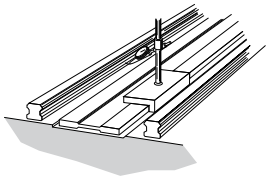


Fig. 14

■Using the Parallelism of the Table

Secure the two LM blocks on the master LM rail to the table (or a temporary table for measurement), and temporarily fasten the LM rail and the LM block on the subsidiary side to the base and the table. From a dial gauge stand fixed to the upper surface of the table, position the gauge so that it contacts the side face of the LM block on the subsidiary rail. Then beginning at one end of the rail, confirm the parallelism of the subsidiary rail by moving the table and fasten the bolts in order as you go. (Fig. 15)

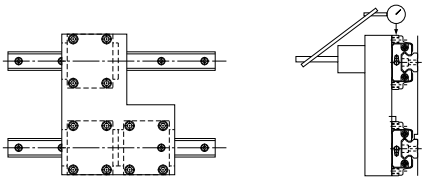


Fig. 15

■Having the Subsidiary LM Rail Follow the Master LM Rail

Place the table on the blocks of the correctly mounted master LM rail and the temporarily fastened subsidiary LM rail, and fully fasten the two LM blocks on the master rail and one of the two LM blocks on the subsidiary rail with bolts. Fully tighten the mounting bolts on the subsidiary LM rail in order while temporarily fastening the remaining LM block on the subsidiary LM rail. (Fig. 16)

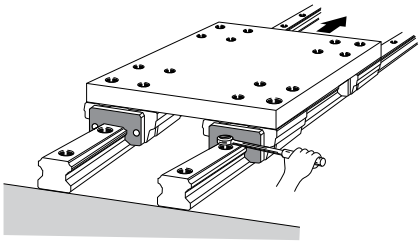


Fig. 16

■Using a Jig

Use a jig like the one shown in Fig. 17 to achieve parallelism between the reference surface on the subsidiary side and the side reference surface of the master side. Beginning at one end of the rail, confirm the parallelism at each mounting hole, and fully fasten the mounting bolts in order. (Fig. 17)

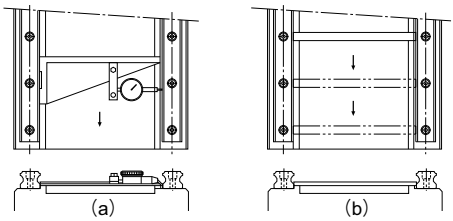


Fig. 17

Example of Mounting the LM Guide When the Master LM Rail Does not Have a Reference Surface

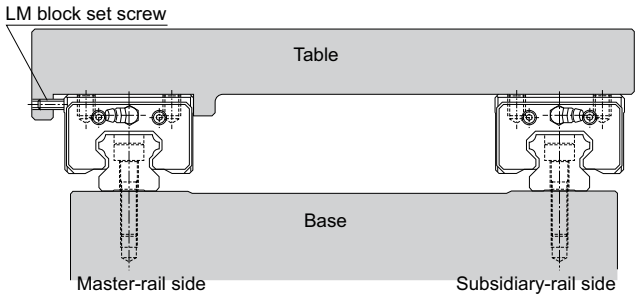


Fig. 18

● Mounting the Master LM Rail

■Using a Temporary Reference Surface

It is possible to achieve straightness of the LM rail by starting from one end and using a reference surface built into the base near the LM rail mounting position. In this method, two LM blocks must be joined together and attached to a measurement plate, as shown in Fig. 19.

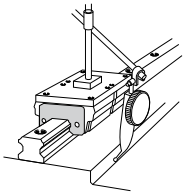


Fig. 19

■Using a Straightedge

After temporarily fastening the mounting bolts, use a dial gauge to check the straightness of the side reference surface of the LM rail from the rail end, and at the same time, fully fasten the mounting bolts. (Fig. 20)
To mount the subsidiary LM rail, follow the procedure described on B1-93.

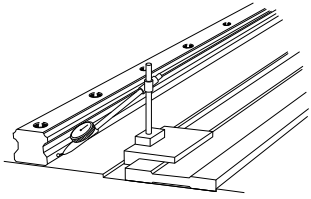


Fig. 20

Procedure for Assembling Model HR

The following procedure is recommended for assembling model HR.

(1) Use an oilstone to remove burrs or knots from the LM rail mounting surface on the base. (Fig. 21)

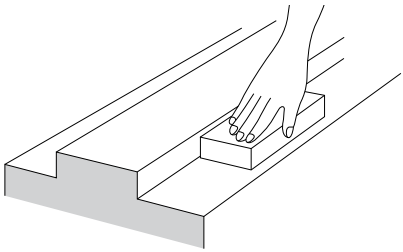


Fig. 21

(2) Use a small vice to press the two LM rails to the base so that they closely contact the reference surface, then tighten the mounting bolts to the recommended torque (see **B1-101**). (Fig. 22)
   a. Check if any of the bolts protrude.
   b. Use a torque wrench to tighten the bolts in order from the center to both ends.

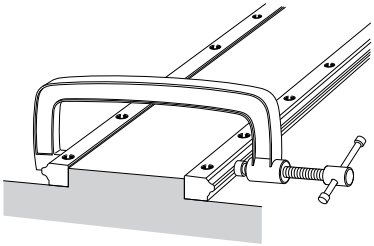


Fig. 22

(3) Mount the LM blocks on the table, then install them onto the LM rails. Be sure the mounting bolts for the LM blocks are temporarily fastened.

(4) Alternate between adjustment bolts to tighten them gradually and adjust the clearance. If a relatively large preload is applied in order to achieve high rigidity, control the tightening torque or the rolling resistance.
   a. It is preferable to use three clearance adjustment bolts for each LM block as shown in Fig. 23.
   b. For optimal clearance adjustment results, set the tightening torque of the two outside screws to approximately 90% of that of the center screw.

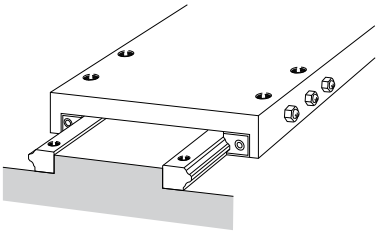


Fig. 23

(5) Secure each LM block by gradually tightening the two temporarily fastened LM block mounting bolts while sliding the table. (Fig. 24)

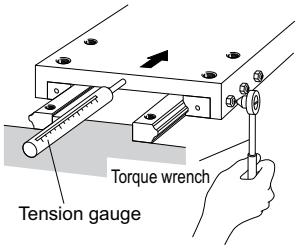
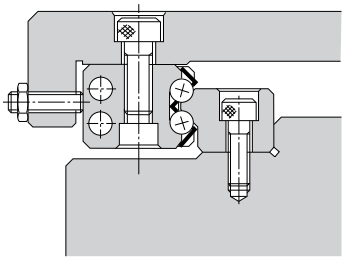


Fig. 24

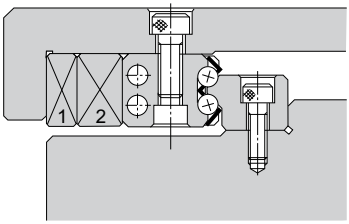
● **Example of Clearance Adjustment**

Design the clearance adjustment bolt so that it presses the center of the side face of the LM block.

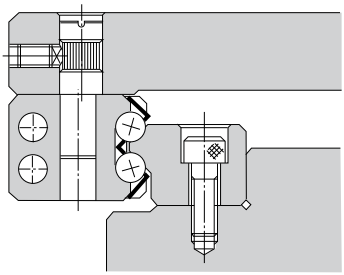
a. Using an adjustment screw
Normally, an adjustment screw is used to press the LM block.



b. Using tapered gibs
When high accuracy and high rigidity are required, use tapered gibs 1) and 2).



c. Using an eccentric pin
A type using an eccentric pin to adjust the clearance is also available.



Procedure for Assembling Model GSR

The procedure for assembling model GSR is as follows:

(1) Align the table with the reference surface of each LM block and fully fasten the mounting bolts to secure the blocks.
Both ends of the table must have a datum surface. (Fig. 25)

(2) Place LM rail A onto the base and align the rail with a straightedge.
Fully fasten the mounting bolts using a torque wrench. (Fig. 26)

(3) Temporarily secure LM rail B onto the base, then mount the blocks on the rail.
Temporarily fasten LM rail B while pressing it toward the LM blocks. (Fig. 27)

(4) Move the table a few strokes to warm up the LM blocks, then fully fasten LM rail B using a torque wrench. (Fig. 28)

If there are more GSR units to be assembled, we recommend producing a jig like the one shown in Fig. 29 first. You can easily mount LM rails while achieving parallelism of the LM rails using the jig.

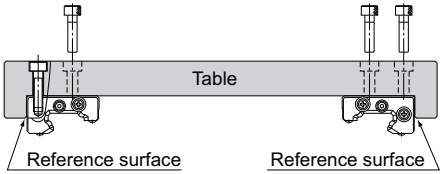


Fig. 25

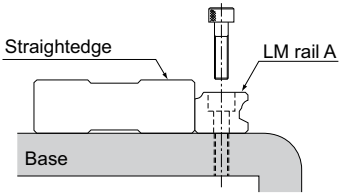


Fig. 26

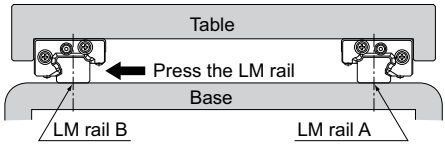


Fig. 27

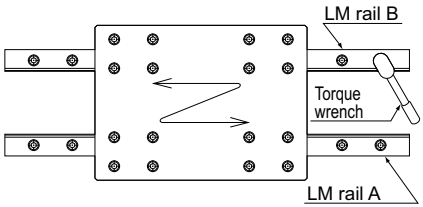


Fig. 28

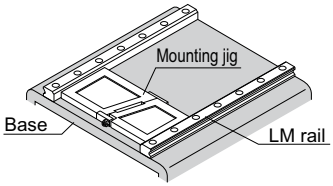


Fig. 29

Procedure for Assembling Model JR

● Mounting the LM Rails

When two LM rails are to be used in parallel as shown in Fig. 30, first secure one LM rail on the base, and place a dial gauge on the LM block. Then, place the pointer of the dial gauge on the side face and top face of the other LM rail to simultaneously adjust the parallelism and the level while mounting the rail.

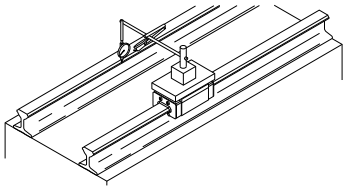


Fig. 30

● Jointing LM Rails

When two or more LM rails are to be jointed, a special metal fitting as shown in Fig. 31 is available. For such applications, specify this fitting when ordering the LM Guide (the rail will be tapped for attaching a joint fitting).

Installation Procedure

(1) Temporarily fasten the rail presser bolt.
(2) Secure rail A and the joint fitting with bolts C and D.
(3) Apply a dial gauge to side G of the joint between rails A and B. Adjust the left and right level differences using bolt E and set screw F on rail B.
If bolt E is tightened, rail B will move to the b side.
If set screw F is tightened, rail B will move to the a side.
(4) When the adjustment using set screw F is finished, secure set screw F with the nut.
(5) Adjust and secure the vertical direction using the rail presser.

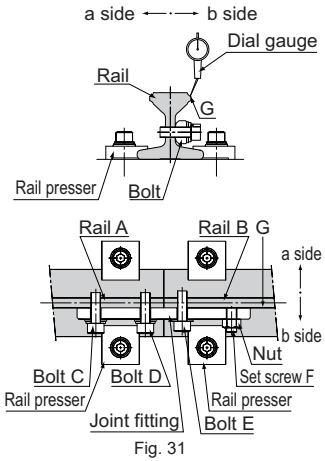


Fig. 31

● Welding the LM Rail

When welding the LM rail, it is best to weld the LM rail while clamping it at the welding point with a small vice or the like as shown in Fig. 32. For effective welding, we recommend the following welding conditions. (When welding the LM rail, take care to prevent spatter from contacting the LM rail raceway.)

Welding conditions
Preheating temperature: 200℃
Postheating temperature: 350℃
Note) If the temperature exceeds 750℃, the LM rail may be hardened again.

For shielded metal arc welding
Welding rod: LB-52 (Kobelco)

For carbon dioxide arc welding
Wire: YGW12
Electric current: 200 A

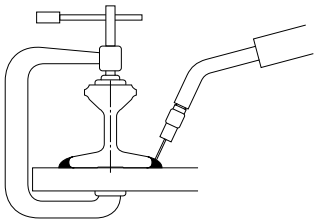


Fig. 32

Procedure for Assembling Model HCR

To install the LM rails of Curved Guide Model HCR, we recommend having some form of datum point (such as a pin) on the reference side (inside) of the LM rail, then pressing the LM rail to the datum point and securing it from the counter-reference surface with a presser plate or brace.

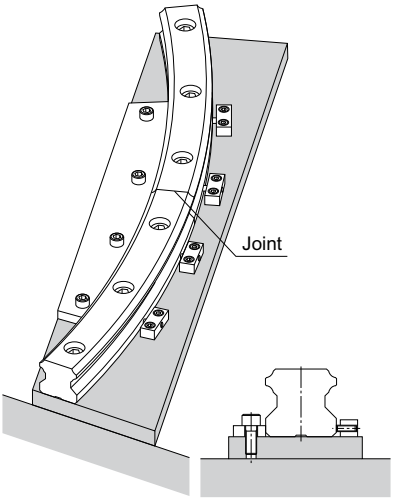


Fig. 33: Method for Securing the LM Rails at the Joint

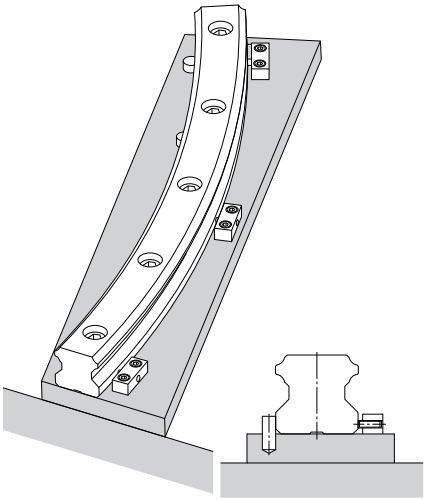
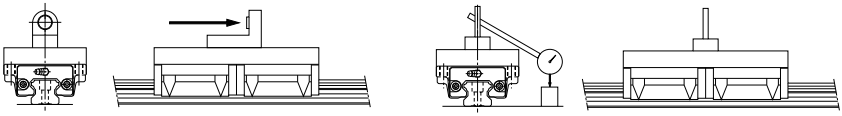


Fig. 34: Method for Securing the LM Rail Using a Pin as a Datum Point

Methods for Measuring Accuracy after Installation

When Measuring Running Accuracy for a Single Rail Application

When measuring running accuracy of the LM block, stable accuracy can be obtained by securing two LM blocks on an inspection plate, as shown in Fig. 35. When using a dial gauge, we recommend placing the straightedge as close as possible to the LM block in order to perform accurate measurement.



1) Measurement method using an auto-collimator　　2) Measurement method using a dial gauge

Fig. 35: Methods for Measuring Accuracy after Installation

Recommended Tightening Torque for LM Rails

LM rails for high-precision LM Guide units have their raceways ground and accuracy inspected while the rails are secured with bolts. When mounting a high-precision LM rail on a machine, we recommend using the corresponding tightening torque indicated in Table 1 or Table 2.

Table 1: Tightening Torques when Pan Head Screws are Used
Unit: N·cm

Screw model No.	Tightening torque	
	Not hardened	Hardened
M 2	17.6	21.6
M 2.3	29.4	35.3
M 2.6	44.1	52.9

Table 2: Tightening Torques when Hexagonal-Socket-Head Type Bolts are Used
Unit: N·cm

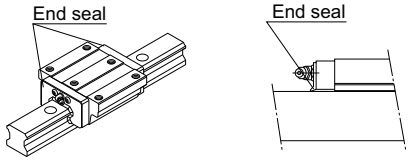
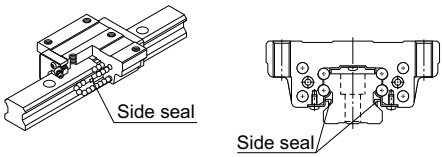
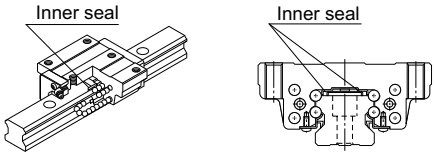
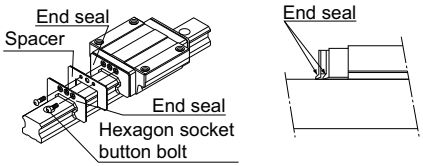
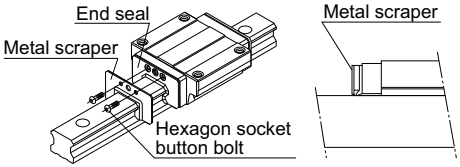
Screw model No.	Tightening torque		
	Steel	Cast iron	Aluminum
M 2	58.8	39.2	29.4
M 2.3	78.4	53.9	39.2
M 2.6	118	78.4	58.8
M 3	196	127	98
M 4	412	274	206
M 5	882	588	441
M 6	1370	921	686
M 8	3040	2010	1470
M 10	6760	4510	3330
M 12	11800	7840	5880
M 14	15700	10500	7840
M 16	19600	13100	9800
M 20	38200	25500	19100
M 22	51900	34800	26000
M 24	65700	44100	32800
M 30	130000	87200	65200

LM Guide

Options

Seal and Metal Scraper

- For supported model numbers, see the table of options by model number on A1-504.
- For the LM block length (dimension L) with seal attached, see A1-517 to A1-525.
- For the maximum seal resistance, see A1-531 to A1-533.

Item name	Schematic diagram/mounting location	Purpose/location of use
End seal		Used in locations exposed to dust
Side seal		Used in locations where dust may enter the LM block from the side or bottom surface, such as vertical, horizontal, and inverted mounts
Inner seal		Used in locations exposed to extremely large amounts of dust or cutting chips
Double seals		Used in locations exposed to excessive dust or cutting chips
Metal scraper (non-contact)		Used in locations where welding spatter may adhere to the LM rail

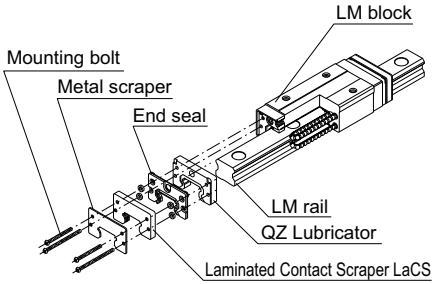
Symbol	Contamination protection accessories
UU	With end seal
SS	With end seal + side seal + inner seal*
DD	With double seals + side seal + inner seal*
ZZ	With end seal + side seal + inner seal* + metal scraper
KK	With double seals + side seal + inner seal* + metal scraper

* Some models are not equipped with inner seals.(See A1-504.)

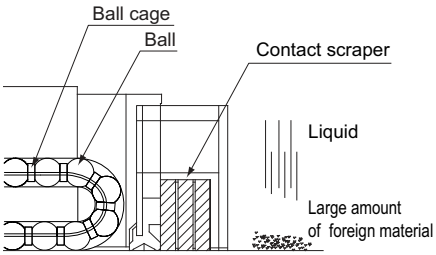
Laminated Contact Scraper LaCS

- For supported model numbers, see the table of options by model number on A1-504.
- For the LM block length (dimension L) with LaCS attached, see A1-517 to A1-525.
- For the resistance of LaCS, see A1-534.
- For notes regarding how to handle the LaCS, see B1-133.

For locations with an adverse environment, Laminated Contact Scraper LaCS is available.
LaCS removes minute foreign material adhering to the LM rail in multiple stages and prevents it from entering the LM block with a laminated contact structure (3-layer scraper).



External View



Structural Drawing

Features

- Since the 3 layers of scrapers fully contact the LM rail, LaCS is highly capable of removing minute foreign material.
- Since it uses oil-impregnated, foam synthetic rubber with a self-lubricating function, low friction resistance is achieved.

Symbol	Contamination protection accessories
SSHH	With end seal + side seal + inner seal*1 + LaCS
DDHH	With double seals + side seal + inner seal *1 + LaCS
ZZHH	With end seal + side seal + inner seal *1 + metal scraper + LaCS
KKHH	With double seals + side seal + inner seal *1 + metal scraper + LaCS
JJHH*2	With end seal + side seal + inner seal*1 + LaCS + protector (serving also as metal scraper)
TTHH*2	With double seals + side seal + inner seal*1 + LaCS + protector (serving also as metal scraper)

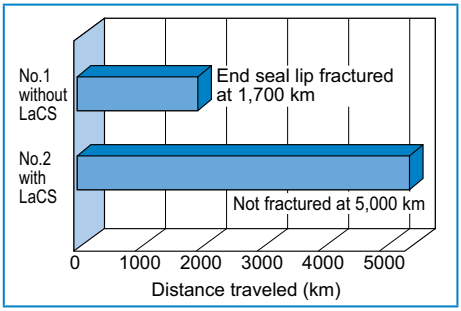
*1 Some models are not equipped with inner seals.(See A1-504)
*2 JJHH and TTHH are only available for models SVR/SVS, NR-X/NRS-X, SRG, and HRX.
Note) For models SVR/SVS, NR-X/NRS-X, SRG, and HRX with HH specifications (with LaCS), a protector (B1-109) can be installed.
Contact THK if you want to use the protector with other options.

● Test in an environment with a water-soluble coolant

Test environment: water-soluble coolant

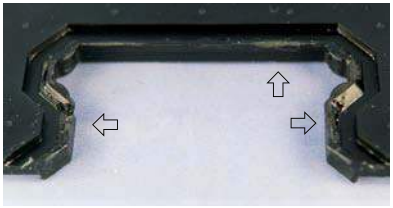
Item		Description
Tested model	No. 1	SHS45R1SS+3000L (end seal only)
	No. 2	SHS45R1SSHH+3000L (end seal and LaCS)
Maximum speed		200 m/min
Environmental conditions		Coolant spray amount: 5 times per 24 h

Test results



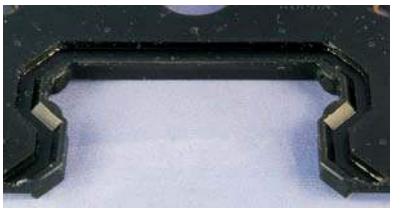
Magnified view of the end seal lip

No. 1: without LaCS - lip fractured at 1,700 km



⇦Areas marked with arrow are fractured

No. 2: with LaCS - no anomaly observed after traveling 5,000 km



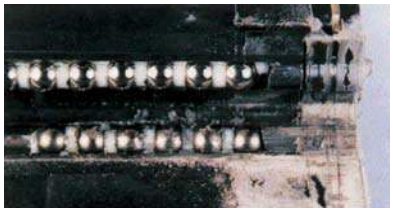
Lip has not been fractured

● Test in an environment with minute foreign material

Test environment: minute foreign material

Item		Description
Tested model	No. 1	Caged Ball LM Guide #45 (DD+600L) double seals only
	No. 2	Caged Ball LM Guide #45 (HH+600L) LaCS only
Max speed/ acceleration		60 m/min, 1 G
External load		9.6 kN
Foreign material conditions		Type: FCD450#115 (particle diameter: 125 μm or less)
		Spray amount: 1 g/1 h (Total: 120 g)

No. 1 Traveled 100 km (double-seal configuration)



Large amount of foreign matter has entered the raceway

Test results: Amount of foreign material entering the raceway

Seal configuration		Mass (g) of foreign material entering the raceway
Double-seal configuration (2 layers of end seals)	Tested model 1	0.3
	Tested model 2	0.3
	Tested model 3	0.3
LaCS	Tested model 1	0
	Tested model 2	0
	Tested model 3	0

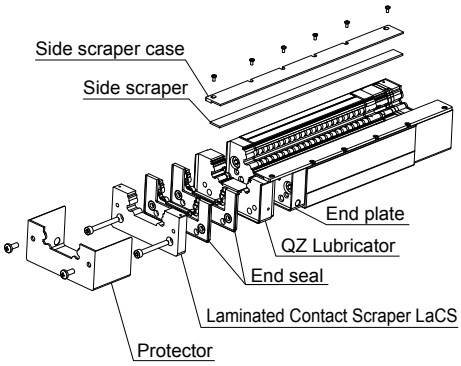
No. 2 Traveled 100 km (LaCS only)



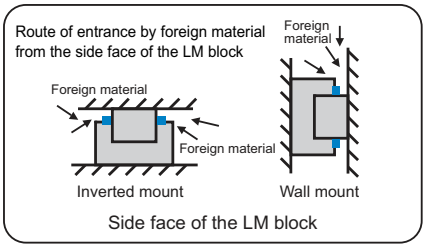
No foreign matter entering the raceway observed

Side Scraper

- Applicable models: models SVR/SVS, NR-X/NRS-X, and SRG
- For the resistance of the side scraper, see A1-535.
- For the LM block length (dimension L) with side scraper attached, see A1-517.
- For notes regarding how to handle the side scraper, see B1-133.



External View
(Ex: in case of QZTTHHYY type)



Features

- Minimizes foreign material entering from the side of the LM Guide in a harsh environment.
- Provides dust protection in inverted or wall-mounted orientations.

Model number coding

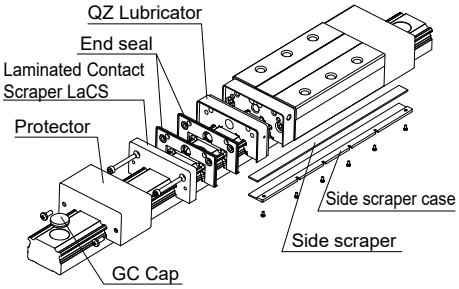
SVR45 LR 1 QZ JJHH YY C1 +1200L

YY: With side scraper*

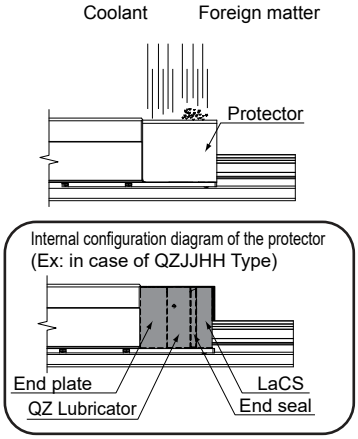
* The side scraper can accommodate various options of dust control accessories and lubrication accessories. For details, contact THK.

Protector

●Applicable models: models SVR/SVS, NR-X/NRS-X, SRG, and HRX
●HH type (with LaCS) for models SVR/SVS, NR-X/NRS-X, SRG, and HRX is provided with the protector.
●For the LM block length (dimension L) with protector attached, see A1-517.



External View
(Ex: in case of QZTTHHYY type)



Features

- The protector minimizes the entrance of foreign material even in harsh environments where foreign material such as fine particles and liquids are present.

Note1) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note2) Contact THK if you want to use the protector with other options.

Light-Resistance Contact Seal LiCS

- For supported model numbers, see the table of options by model number on A1-504.
- For the LM block length (dimension L) with LiCS attached, see A1-528.
- For the resistance of LiCS, see A1-535.
- For notes regarding how to handle the LiCS, see B1-134.

LiCS is a light sliding resistance contact seal. It is effective in removing dust on the raceway and retaining a lubricant such as grease. It achieves extremely low drag and smooth, stable motion.

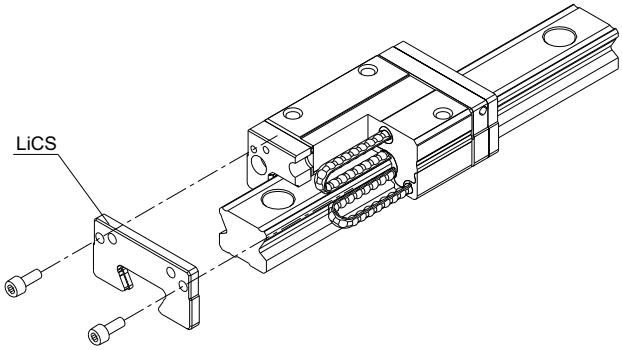


Fig. 1: Structural Drawing of SSR + LiCS

Features

Light-Resistance Contact Seal LiCS is a seal that uses a light-resistance material in its sealing element and contacts the LM rail raceway to achieve low drag resistance. It is optimal for applications where low drag resistance is required in a clean environment, such as semiconductor-related devices, inspection devices, and OA equipment.

- Since the sealing element contacts the LM rail raceway, it is effective in removing dust on the raceway.
- Use of oil-impregnated, expanded synthetic rubber, which has excellent self-lubricating properties, achieves low drag resistance.

Model number coding

SSR20 XW 2 GG C1 +600L P -II

- SSR20: LM Guide model number
- XW: Type of LM block
- 2: No. of LM blocks used on the same rail
- GG: With LiCS seal on both ends
- C1: Radial clearance symbol
  Normal (No symbol)
  Light preload (C1)
  Medium preload (C0)
- +600L: 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)
- -II: Symbol for No. of rails used on the same plane

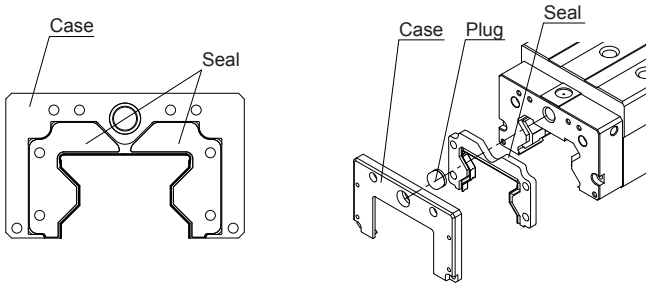
Symbol	Contamination protection accessories
GG	LiCS
PP	With LiCS + side seal + inner seal*

* Some models are not equipped with inner seals.(See A1-504)

High Chemical Resistance Fluorine Seal FS

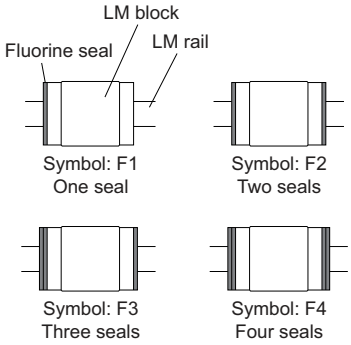
- Applicable models: models SRG35, SRG45, SRG55, and SRG65
- For the LM block length (L dimension) with a fluorine seal attached, see A1-530.
- For the resistance value of the fluorine seal, see A1-535.
- For precautions on using the fluorine seal, see B1-134.

The fluorine seal is made of fluororubber and has excellent chemical resistance.
The fluorine seal can be inserted from the upper surface of the LM rail and is easy to install.



Components/Structure

Symbol	Contamination protection accessories
F2	Fluorine seals + side seals + inner seals
FZ2	Fluorine seals + side seals + inner seals + metal scrapers
FJ2	Fluorine seals + side seals + inner seals + protectors
F4	Fluorine seals (double) + side seals + inner seals
FZ4	Fluorine seals (double) + side seals + inner seals + metal scrapers
FJ4	Fluorine seals (double) + side seals + inner seals + protectors
QZF2	Fluorine seals + side seals + inner seals + QZ
QZFZ2	Fluorine seals + side seals + inner seals + metal scrapers + QZ
QZFJ2	Fluorine seals + side seals + inner seals + QZ + protectors
QZF4	Fluorine seals (double) + side seals + inner seals + QZ
QZFZ4	Fluorine seals (double) + side seals + inner seals + metal scrapers + QZ
QZFJ4	Fluorine seals (double) + side seals + inner seals + QZ + protectors



Standard Assemblies

Model number coding

When purchasing in a set with an LM Guide
(Example) SRG45LR2QZ **F2** C0 + 1200LZ-Ⅱ
Fluorine seal symbol (see the standard assemblies diagram)

*Contact THK if you require seals on individual blocks in configurations that differ from those in the standard assemblies diagram.

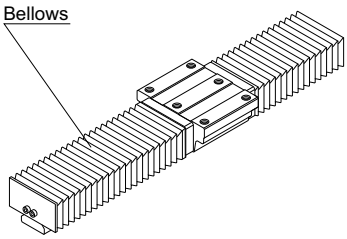
When purchasing fluorine seals individually
(Example) SRG45-F1-Z
Fluorine seal symbol (F1 only for individual purchase)

*Individual purchases come in a set with the fluorine seal, a case, and a plug.

Note1) If this product will be used in special environments, such as in a vacuum or at very low or high temperatures, contact THK.
Note2) This seal cannot be used in combination with an end seal or a Laminated Contact Scraper (LaCS).
Note3) Even with specifications for fluorine seals, use a bellows or cover to prevent machining chips and coolant from entering the product.

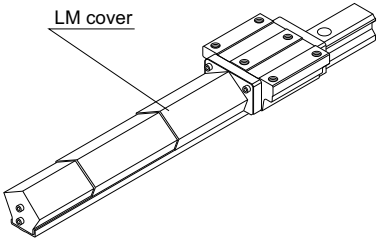
Dedicated Bellows

●For supported model numbers, see the table of options by model number on A1-504.
●For the dimensions of the dedicated bellows, see A1-547 to A1-558.

Item name	Schematic diagram/mounting location	Purpose/location of use
Dedicated bellows		Used in locations exposed to dust or cutting chips

Dedicated LM Cover

●For supported model numbers, see the table of options by model number on A1-504.
●For the dedicated LM cover dimensions, see A1-561.

Item name	Schematic diagram/mounting location	Purpose/location of use
Dedicated LM cover		Used in locations exposed to dust or cutting chips Used in locations with high temperature foreign material such as flying spatter

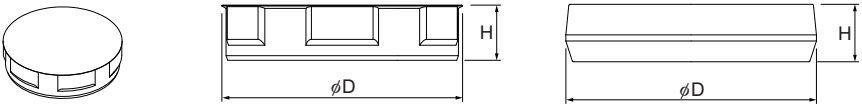
Dedicated Caps for LM Rail Mounting Holes

Using dedicated caps to cover the LM rail mounting holes helps prevent foreign material from entering the mounting holes and LM block.



● CV Caps and C Caps

The caps are made of a special synthetic resin.
The CV cap is the successor to the C cap, and its new structure makes it easier to insert.

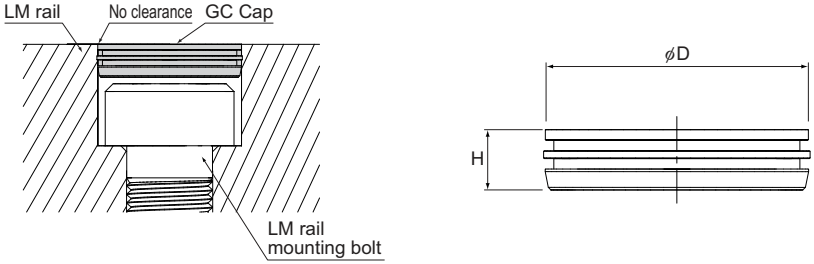


CV cap　　C cap

Note1) Contact THK if this product will be used in special environments such as in a vacuum, at very low or high temperatures, or with coolants or corrosive solvents.
Note2) CV caps and C caps must be acquired separately from the LM Guide.

● GC Caps

GC caps are made of metal. (They are RoHS compliant.)
GC caps adhere closer to the counterbore than CV caps and C caps, so there is no clearance once they are inserted.



Note1) GC caps are only sold with LM Guides. They are not sold separately.
The LM Guide model number code will have “GC” at the end when it is delivered.
(Example 1) Multiple axes: SVR45LR+1200L-Ⅱ GC
GC caps attached
Symbol for No. of rails used on the same plane (2 axes)

(Example 2) One axis: SVR45LR+1200L GC
GC caps attached

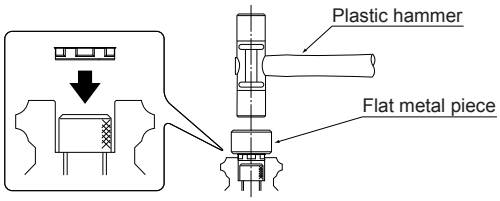
Note2) GC caps cannot be used with LM rails that are made of stainless steel or rails that have undergone surface treatment.
Note3) LM rail mounting holes for GC caps are special. (The mouth is not chamfered.)
Note4) Be careful not to injure your hand when inserting GC caps.
Note5) Be sure to make the GC caps level with the upper surface of the LM rail and clean (wipe) that surface after insertion.
Note6) If this product will be used in special environments, such as in a vacuum or at very low or high temperatures, contact THK.

● Guidelines for Use in Extreme Environments

Extreme environment		C caps CV caps	GC caps	Example applications
Foreign matter concentration: low	Metal powder, spatter	○	◎	Welding machines, robots
	Wood shavings, coolant (Environments that strip away oils)	○	◎	Woodworking machinery, washers
	Metal powder + coolant	○	◎	Lathes, machining centers
Foreign matter concentration: high	Metal powder, spatter	△	◎	Welding machines, robots
	Wood shavings, coolant (Environments that strip away oils)	△	◎	Woodworking machinery, washers
	Metal powder + coolant	△	◎	Lathes, machining centers

◎: Particularly effective ○: Effective △: Not particularly effective

● Cap Insertion Method

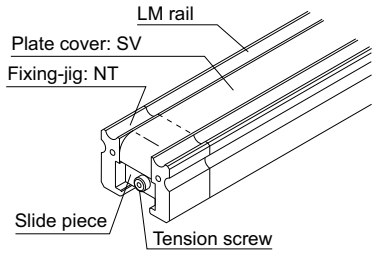
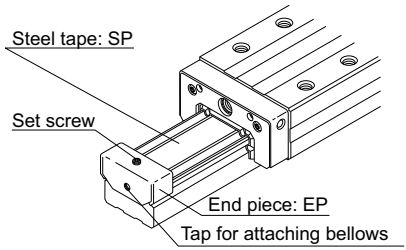
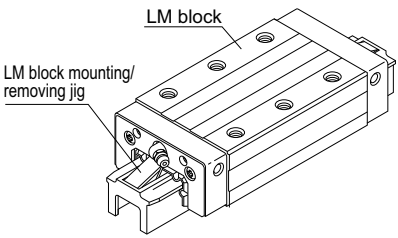


For best performance, caps must be inserted so that they are level with the rail surface. Have a flat alignment plate and plastic hammer available.

① Set the cap on the LM rail mounting hole and place the alignment plate on top.
② Use the plastic hammer to gradually drive the cap in until it is level with the upper surface of the LM rail.
③ As necessary, remove any slight burrs that appear.

Plate Cover SV and Steel Tape SP

●For supported model numbers, see the table of options by model number on A1-504.

Item name	Schematic diagram/mounting location	Purpose/location of use
Plate cover SV		A plate cover is available as a means of essential contamination protection for LM Guide units intended for use in machine tools. By covering the LM rail mounting holes with ultra-thin stainless steel (SUS304), the plate cover SV drastically increases the effectiveness of the seal and prevents the penetration of coolant or cutting chips from the top face of the LM rail. For the mounting method, see B1-116. Note) When mounting the plate cover, the LM rail needs to be machined. Indicate that the plate cover is required when ordering the LM Guide.
Steel tape SP	 	Steel tape is available as a means of essential contamination protection for LM Guide units intended for use in machine tools. By covering the LM rail mounting holes with ultra-thin stainless steel (SUS304), the steel tape SP drastically increases the effectiveness of the seal and prevents the penetration of coolant or cutting chips from the top face of the LM rail. (When mounting the steel tape, end piece EP can be used as a means to secure the cover.) For the mounting method, see B1-117. Note) When mounting the steel tape, the LM rail needs to be machined. Indicate that the steel tape is required when ordering the LM Guide.

Mounting Procedure for Plate Cover SV

(1) Attach slide pieces to the plate cover.
Place the slide pieces on the plate cover with their chamfered sides facing outward, hold the plate cover with the slide pieces and the securing plates, and then secure them with countersunk screws.

(2) Use an LM block mounting/removing jig to remove the LM block from the LM rail, and then mount the fixing-jigs onto the LM rail.

(3) Temporarily secure either slide piece.
Insert either slide piece into one of the fixing-jigs, then attach the slide piece to the LM rail's end face using the tension adjustment bolt and gently secure the bolt until the bolt head is inside the fixing-jig.

(4) Temporarily secure the other slide piece.
Temporarily secure the other slide piece in the same manner as above.

(5) Apply tension to the plate cover.
Apply tension to the plate cover by evenly securing the tension adjustment bolts on both ends of the LM rail. Make sure there is only a small difference between the H and H' dimensions in Fig. 5. If the difference is too large, one end may have insufficient interference.

(6) Mount the LM block on the LM rail.
Identify the reference surface of the LM rail and the LM block, then insert the LM rail into the LM block using the LM block mounting/removing jig.

Note1) When removing or mounting the LM block, be careful to not let the balls fall out.
Note2) The plate cover is an ultra-thin stainless steel (SUS304) plate. When handling it, be careful to avoid bending it.
Note3) The plate cover is available for model NR/NRS 75.

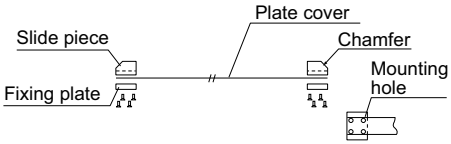


Fig. 1

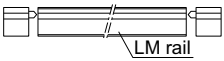


Fig. 2

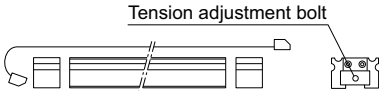


Fig. 3

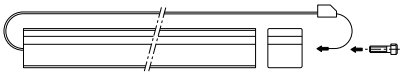


Fig. 4



Fig. 5

Mounting Procedure for Steel Tape SP

(1) Use an LM block mounting/removing jig to remove the LM block from the LM rail.
(2) Thoroughly degrease and clean the top face of the LM rail, to which the steel tape will be attached. For degreasing, use an adequately volatile detergent (e.g., industrial alcohol).
(3) Peel the release paper from the steel tape a little bit at a time while gradually adhering the tape from one end, taking care to not let it bend or sag.
(4) Secure the steel tape to the rail by pressing it down and rubbing it. The adhesive strength increases with time. However, if you wish to remove the tape, it can be removed by pulling it upward from the end.
(5) Mount the LM block onto the LM rail using the LM block mounting/removing jig.
(6) Attach the end pieces on both ends of the LM rail and further secure the steel tape. When securing the end pieces, fasten only the set screw on the top face of each end piece.
(The tap on the end face of the end piece is used for mounting bellows.)

Note1) The set screw on the side face is used to lightly secure the bent steel tape. Be sure to stop fastening the screw as soon as it hits the end face, and do not force the screw further.
Note2) Since the steel tape is a thin steel plate, mishandling it may cause an accident such as cutting your finger. When handling it, take effective safety measures such as wearing rubber gloves.

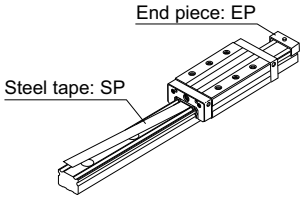


Fig. 6

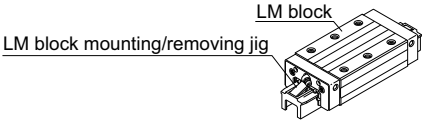


Fig. 7

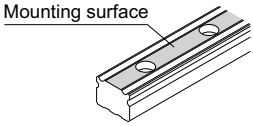


Fig. 8

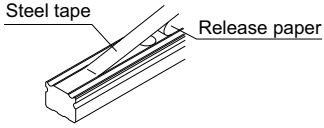


Fig. 9

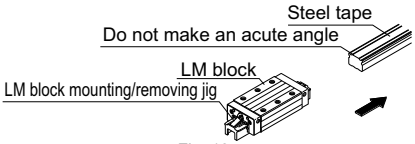


Fig. 10

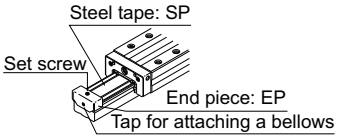
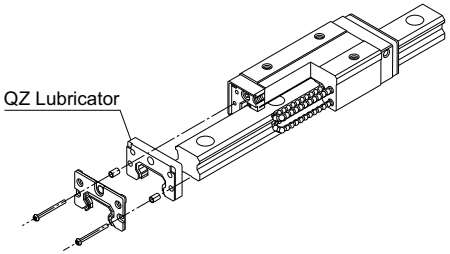


Fig. 11

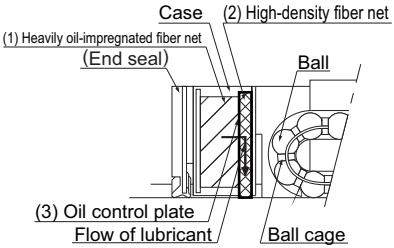
QZ Lubricator

●For supported model numbers, see the table of options by model number on A1-504.
●For the LM block length with QZ attached, see A1-539 to A1-542.
●For notes regarding how to handle the QZ, see B1-133.

The QZ Lubricator feeds the right amount of lubricant to the raceway on the LM rail. This allows an oil film to continuously form between the rolling element and the raceway, and it significantly extends the lubrication maintenance intervals.
The structure of the QZ Lubricator consists of three major components: (1) a heavily oil-impregnated fiber net (functions to store lubricant), (2) a high-density fiber net (functions to apply lubricant to the raceway) and (3) an oil-control plate (functions to adjust oil flow). The lubricant contained in the QZ Lubricator is primarily fed by capillary action, which is also used in devices such as felt-tip pens.



External View



Structural Drawing

Features

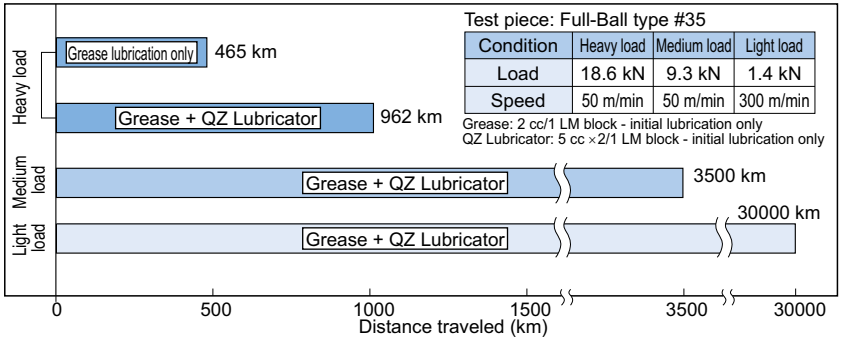
- Since it compensates for oil loss, the lubrication maintenance interval can be significantly extended.
- Because it feeds the appropriate amount of lubricant directly to the ball raceway, it is an environmentally-friendly lubrication system that does not contaminate the surrounding area.

Symbol	Contamination protection accessories
QZUU	With end seal + QZ
QZSS	With end seal + side seal + inner seal*1 + QZ
QZDD	With double seals + side seal + inner seal*1 + QZ
QZZZ	With end seal + side seal + inner seal*1 + metal scraper + QZ
QZKK	With double seals + side seal + inner seal*1 + metal scraper + QZ
QZGG	With LiCS + QZ
QZPP	With LiCS + side seal + inner seal*1 + QZ
QZSSHH	With end seal + side seal + inner seal*1 + LaCS + QZ
QZDDHH	With double seals + side seal + inner seal*1 + LaCS + QZ
QZZZHH	With end seal + side seal + inner seal*1 + metal scraper + LaCS + QZ
QZKKHH	With double seals + side seal + inner seal*1 + metal scraper + LaCS + QZ
QZJJHH*2	With end seal + side seal + inner seal*1 + LaCS + QZ + protector (serving also as metal scraper)
QZTTHH*2	With double seals + side seal + inner seal*1 + LaCS + QZ + protector (serving also as metal scraper)

*1 Some models are not equipped with inner seals. (See A1-504)
*2 QZJJHH and QZTTHH are only available for models SVR/SVS, NR-X/NRS-X, SRG, and HRX.
Note1) For models SVR/SVS, NR-X/NRS-X, SRG, and HRX with HH specifications (with LaCS), a protector (B1-109) can be installed.
Contact THK if you want to use the protector with other options.
Note2) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

● Significantly Extended Maintenance Interval

Attaching QZ Lubricator helps extend the maintenance interval throughout the whole load range from the light load area to the heavy load area.



Test piece: Full-Ball type #35

Condition	Heavy load	Medium load	Light load
Load	18.6 kN	9.3 kN	1.4 kN
Speed	50 m/min	50 m/min	300 m/min

Grease: 2 cc/1 LM block - initial lubrication only
QZ Lubricator: 5 cc ×2/1 LM block - initial lubrication only

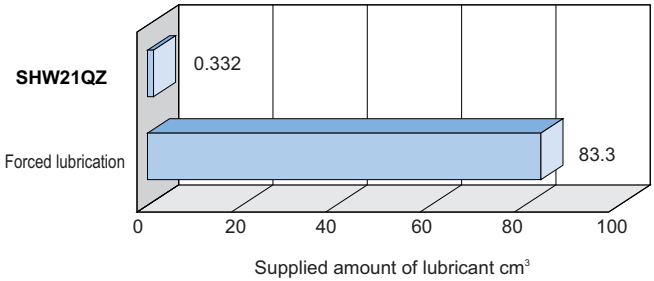
LM Guide Running Test without Replenishment of Lubricant

● Effective Use of Lubricant

Since the lubricator feeds the right amount of lubricant to the ball raceway, lubricant can be used efficiently.

Test speed: 300 m/min

Comparison of lubricant consumption after traveling 5,000 km



Amount of oil contained in QZ Lubricator
0.166 cm³/ 2 units
(attached to both ends of the LM block)
= 0.332 cm³

Compared

Forced lubrication
0.03 cm³/6 min×16667 min
= 83.3 cm³

Lubricant consumption is 1/250 that of forced lubrication

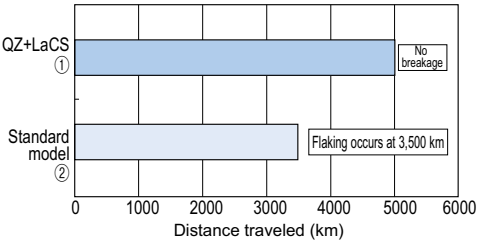
● Assists with Lubrication in Severe Environments

A 5,000 km durability test was conducted in severe environments (exposed to coolant and contaminants).

Test conditions

Model No.	① Caged Ball LM Guide #45	② Full-ball type #45
Load	8 kN	6 kN
Speed	60 m/min	
Coolant	Immersed 48 h, dried 96 h	
Foreign material	Foundry dust (125 μm or less)	
Lubrication	AFA Grease + QZ	Super Multi 68 Oiling cycle: 0.1 cc/shot Periodically lubricated every 16 min

Test results



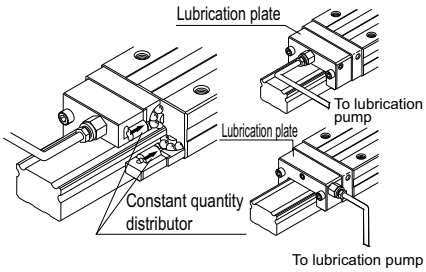
* When using the LM System in a severe environment, use a combination of a QZ Lubricator and a Laminated Contact Scraper LaCS (see “Laminated Contact Scraper LaCS” on B1-106) in combination.

Lubrication Adapter

An oil-only lubrication adapter is available for models NR/NRS.
Even if the LM Guide is installed in an orientation where oil lubrication is difficult, such as wall mount and inversed mount, the adapter is capable of feeding a constant quantity of lubricant to the four raceways.

Features

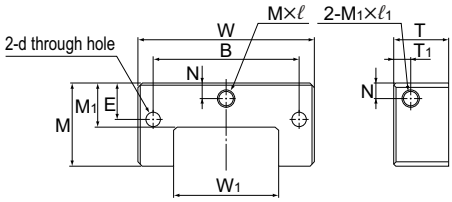
The dedicated lubrication adapter for models NR/NRS is built in with a constant quantity distributor. Therefore, the adapter can accurately feed a constant quantity of lubricant to each raceway regardless of the mounting orientation.
The adapter is economical since it constantly feeds the optimum amount of lubricant and can eliminate the supply of surplus lubricant.
To provide pipe arrangement, simply connect an intermittent lubrication pump widely used for ordinary machine tools to the lubrication holes (M8) on the front and the side of the lubrication adapter.



Structural Drawing

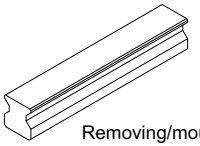
Specifications

Viscosity range of lubricant used	32 to 64 mm^2/s recommended
Discharge	0.03×4, 0.06×4 cc/1shot
Diameter of pipe connected	ϕ 4, ϕ 6
Material	Aluminum alloy



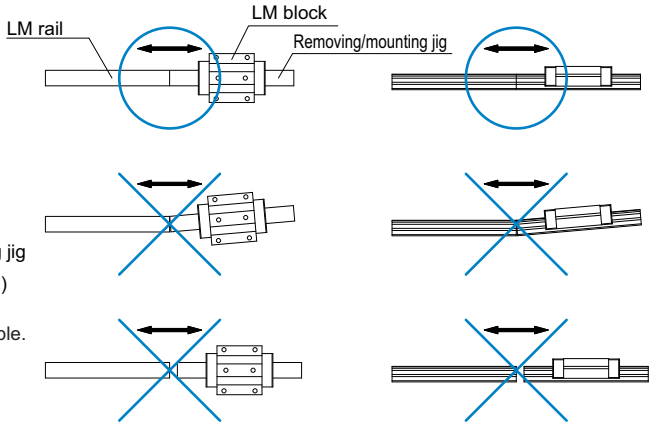
Removing/Mounting Jig

Do not remove the LM block from the LM rail during setup. If removing the LM block is inevitable due to the plate cover type or the assembly procedure, be sure to use the removing/mounting jig.
Mounting the LM block without using the removing/mounting jig may cause rolling elements to fall from the LM block due to contamination by foreign material, damage to internal components, or slight inclination. Mounting the LM block with some of the rolling elements missing may also cause premature damage to the LM block.
When using the removing/mounting jig, fit its end directly to the end of the LM rail and do not incline the jig.
If any of the rolling elements fall from the LM block, contact THK. Do not use the product in that condition.
Note that the removing/mounting jig is not included in the LM Guide package as standard. To obtain one, contact THK.



Removing/mounting jig
(Material: ABS resin)

This image shows one example.



End Piece EP

If removing the end piece when using the LM Guide, be sure that the LM block will not overshoot the rail.
The end piece can also be used as a fixing jig for steel tape protectors, and can also be used on LM rails of models SSR, SR, and HSR.

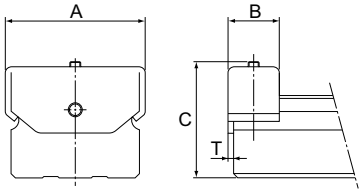


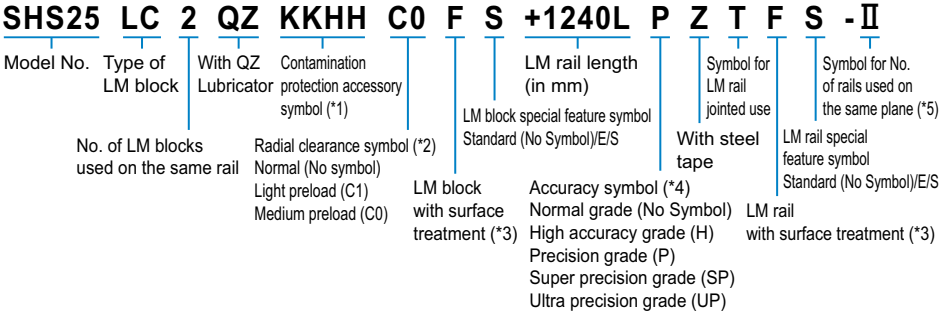
Fig. 1: End Piece EP for Models NR/NRS

Model Number Coding

Model number configurations differ depending on the model features. Refer to the corresponding sample model number configuration.

LM Guide

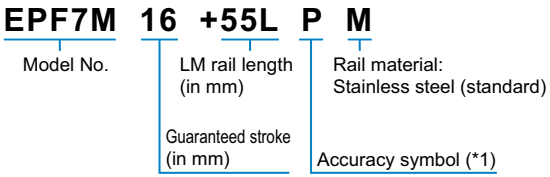
● **Models SHS, SSR, SVR/SVS, SHW, HSR, SR, NR-X/NRS-X, NR/NRS, HRW, JR, NSR-TBC, HSR-M1, SR-M1, and HSR-M2**



(*1) See contamination protection accessory on A1-543. (*2) See A1-73.
(*3) See B0-20. (*4) See A1-78. (*5) See A1-13.

Note1) 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.)
Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note2) Contact THK for details about the special features of LM blocks and LM rails.

● **Model EPF**



(*1) See A1-88.

Note)This model number indicates that a single-rail unit constitutes one set.

Roller Type LM Guide

● Models SRG, SRN, SRW, and HRX

SRG45 LC 2 QZ TTHH C0 F S +1200L P Z T F S -Ⅱ

- SRG45 — Model No.
- LC — Type of LM block
- 2 — No. of LM blocks used on the same rail
- QZ — With QZ Lubricator
- TTHH — Contamination protection accessory symbol (*1)
- C0 — Radial clearance symbol (*2): Normal (No symbol), Light preload (C1), Medium preload (C0)
- F — LM block with surface treatment (*3)
- S — LM block special feature symbol: Standard (No Symbol)/E/S
- +1200L — LM rail length (in mm)
- P — Accuracy symbol (*4): High accuracy grade (H), Precision grade (P), Super precision grade (SP), Ultra precision grade (UP)
- Z — With plate cover
- T — Symbol for LM rail jointed use
- F — LM rail with surface treatment (*3)
- S — LM rail special feature symbol: Standard (No Symbol)/E/S
- -Ⅱ — Symbol for No. of rails used on the same plane (*5)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73.
(*3) See B0-20. (*4) See A1-78. (*5) See A1-13.

Note1) Models SRG15 to 65 are available in High Accuracy grade and above. Other models are only available in Precision grade and above. (Normal grade is not available.)
Model SRN is available in high accuracy grade or above. (Normal grade is not available.)
Model SRW is available in precision grade and above. (Normal and high accuracy grade are not available.)
The Model HRX is only available in High Accuracy grade and Precision grade.
Note2) 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.)
Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note3) Contact THK for details about the special features of LM blocks and LM rails.

Miniature LM Guide

● Models SRS, RSX, RSR, RSX-M1, and RSR-M1

2 SRS20M QZ UU C1 F S +220L P M F S -Ⅱ

- 2 — No. of LM blocks used on the same rail (*1)
- SRS20M — Model No.
- QZ — With QZ Lubricator
- UU — Contamination protection accessory symbol (*2)
- C1 — Radial clearance symbol (*3): Normal (No symbol), Light preload (C1)
- F — LM block with surface treatment (*4)
- S — LM block special feature symbol: Standard (No Symbol)/E/S
- +220L — LM rail length (in mm)
- P — Accuracy symbol (*5): Normal grade (No Symbol), High accuracy grade (H), Precision grade (P)
- M — Stainless steel LM rail
- F — LM rail with surface treatment (*4)
- S — LM rail special feature symbol: Standard (No Symbol)/E/S
- -Ⅱ — Symbol for No. of rails used on the same plane (*6)

(*1) No symbol for 1 LM block. (*2) See contamination protection accessories on A1-543.
(*3) See A1-73. (*4) See B0-20. (*5) See A1-78. (*6) See A1-13.

Note1) 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.)
Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.
Note2) Contact THK for details about the special features of LM blocks and LM rails.

Cross LM Guide

● Models SCR, CSR, and MX

4 SCR25 QZ KKHH C0 +1240/1000L P

- 4 — Total No. of LM blocks
- SCR25 — Model No.
- QZ — With QZ Lubricator
- KKHH — Contamination protection accessory symbol (*1)
- C0 — Radial clearance symbol (*2): Normal (No symbol)/Light preload (C1), Medium preload (C0)
- +1240/1000L — LM rail length on the X axis (in mm) / LM rail length on the Y axis (in mm)
- P — Accuracy symbol (*3): Precision grade (P)/Super precision grade (SP), Ultra precision grade (UP)

(*1) See contamination protection accessory on A1-543. (*2) See A1-73. (*3) See A1-78.

Note) Grease nipples are not installed when there is a QZ Lubricator. Contact THK if you want to use a grease nipple for a model with a QZ.

Separate Type LM Guide

● Model HR

2 HR2555 UU M +1000L P T M

- **2**: No. of LM blocks used on the same rail
- **HR2555**: Model No.
- **UU**: Contamination protection accessory symbol (*1)
- **M**: Stainless steel LM block
- **+1000L**: LM rail length (in mm)
- **P**: Accuracy symbol (*2) 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
- **M**: Stainless steel LM rail

(*1) See contamination protection accessory on A1-543. (*2) See A1-78.

Note) One set of model HR means a combination of two LM rails and LM blocks used on the same plane.

● Model GSR

- LM block

GSR25 T UU

- **GSR25**: Model number
- **T**: Type of LM block
- **UU**: Contamination protection accessory symbol (*1)

- LM rail

GSR25 -1060L H K

- **GSR25**: Model number
- **-1060L**: LM rail length (in mm)
- **H**: Accuracy symbol (*2) Normal grade (No Symbol) High accuracy grade (H) Precision grade (P)
- **K**: Symbol for tapped-hole LM rail type

(*1) See contamination protection accessory on A1-543. (*2) See A1-78.

- Combination of LM rail and LM block

GSR25 T 2 UU +1060L H T K

- **GSR25**: Model No.
- **T**: Type of LM block
- **2**: No. of LM blocks used on the same rail
- **UU**: Contamination protection accessory symbol (*1)
- **+1060L**: LM rail length (in mm)
- **H**: Accuracy symbol (*2) Normal grade (No Symbol)/High accuracy grade (H)/Precision grade (P)
- **T**: Symbol for LM rail jointed use
- **K**: Symbol for tapped-hole LM rail type

(*1) See contamination protection accessory on A1-543. (*2) See A1-78.

Note) One set of model GSR: This model number indicates that a single-rail unit constitutes one set.

Curved LM Guide

● Model HCR

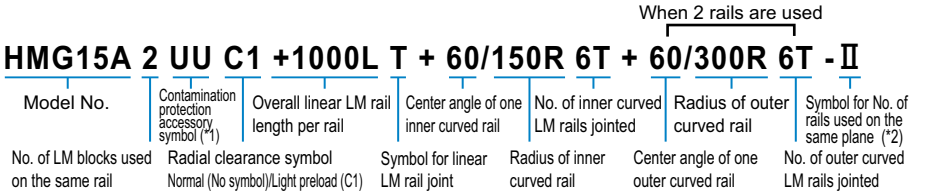
HCR25A 2 UU C1 +60 / 1000R H 6 T

- **HCR25A**: Model No.
- **2**: No. of LM blocks used on the same rail
- **UU**: Contamination protection accessory symbol (*1)
- **C1**: Radial clearance symbol (*2) Normal (No symbol)/Light preload (C1)
- **+60**: Curved LM Guide center angle
- **1000R**: LM rail radius (in mm)
- **H**: Accuracy symbol (*3) Normal grade (No Symbol)/High accuracy grade (H)
- **6**: Number of LM rail joints used on one axis (*4)
- **T**: Symbol for LM rail jointed use (*5)

(*1) See A1-543 (contamination protection accessories). (*2) See A1-73. (*3) See A1-78.
(*4) Number of LM rails used on one arc. Contact THK for details.
(*5) When using joined LM rails, the dust prevention seal must be a low-resistance seal (dust prevention code: LL).

Straight-and-Curved Guide

● Model HMG

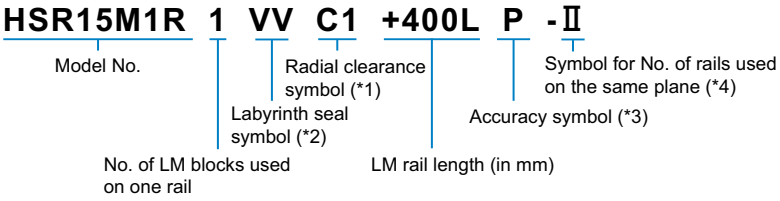


(*1) See contamination protection accessory on A1-543. (*2) See A1-13.

Note) This model number denotes one set consists of an LM block and LM rail. (i.e. If you are using 2 shafts, the required number of sets is 2.)
The standard Model HMG does not have a seal. To attach a seal, make sure to specify a straight-and-curved seal (code: UU).

LM Guide for Medium-to-Low Vacuums

● Model HSR-M1VV



(*1) See A1-73. (*2) See A1-403. (*3) See A1-78. (*4) See A1-13.

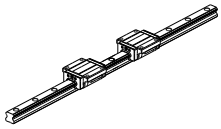
Note1) The radial clearance, maximum LM rail length and accuracy class are equal to that of Model HSR.
Note2) With this model, a single-rail unit constitutes one set (i.e., the required number of sets when 2 rails are used in parallel is 2).

Notes on Ordering

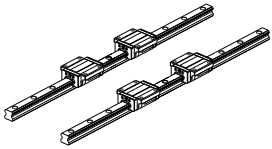
Order Units

Note that the number of items that constitute one set differs depending on the type of LM guide. Check the sample model number configurations and the accompanying notes.

- **Sample LM Guide Orders**

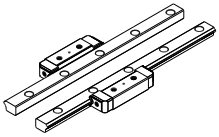


SHS25C2SSC1+640L 1 set



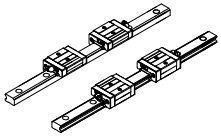
SHS25C2SSC1+640L-Ⅱ2 sets

- **Sample Model HR Orders**



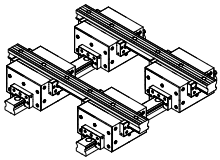
HR2555UU+600L 1 set

- **Sample Model GSR and GSR-R Orders**



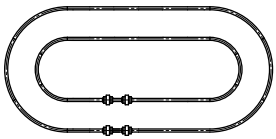
GSR25T2UU+1060L 2 sets

- **Sample Cross LM Guide Orders (SCR, CSR, and MX)**



4SCR25UU+1240/1000LP 1 set

- **Sample Model HMG Orders**



HMG15A 2 UU C1 +1000L T + 60/150R 6T + 60/300R 6T - Ⅱ 2 sets

Note) When ordering Model HMG, attach a reference diagram clearly showing the positioning of the LM block and LM rail.

Mounting Orientation and Lubrication Method

When placing an order, be sure to let THK know the mounting orientation and the exact position on each LM block where the grease nipple or the piping joint should be attached.
For the mounting orientation and the lubrication, see B**1-28** and B**24-2**, respectively.

Supported Options

The supported options differ depending on the model number. Check the available options when ordering.
See A**1-504**.

Maximum Manufactured Lengths for LM Rails

Where a high degree of precision is required, limits apply to the maximum manufactured lengths for LM rails. In such situations, contact THK.

LM Guide Handling Precautions

Handling

(1) Please use at least two people to move any product weighing 20 kg or more, or use a cart or another method of conveyance. Otherwise, it may cause injury or damage the unit.
(2) Do not disassemble the parts. This will result in loss of functionality.
(3) Tilting an LM block or LM rail may cause it to fall by its own weight.
(4) Take care not to drop or strike the LM Guide. Otherwise, it may cause injury or damage the unit. Even if there is no outward indication of damage, a sudden impact could prevent the unit from functioning properly.
(5) When installing the LM Guide, be sure not to remove the LM block from the LM rail.
(6) Placing a hand inside the LM rail mounting hole may lead to the hand being caught between the block and rail and cause injury.
(7) Wear appropriate safety gear, such as protective gloves and safety shoes, when handling the product.

Precautions on Use

(1) Prevent foreign material, such as cutting chips or coolant, from entering the product. Failure to do so could damage the product.
(2) If the product is used in an environment where cutting chips, coolant, corrosive solvents, water, etc., may enter the product, use bellows, covers, etc., to prevent them from entering the product.
(3) Do not use the product at temperatures of 80℃ or higher. Unless the unit is specially designed to be heat-resistant, exposure to such temperatures may deform or damage plastic and rubber parts.
(4) If foreign materials such as cutting chips adhere to the product, replenish the lubricant after cleaning the product.
(5) Very small strokes can inhibit the formation of an oil film between the raceways and the areas of contact on the rolling elements, resulting in fretting. Therefore, be sure to use a type of grease with high fretting resistance properties if the stroke will be small. We recommend periodically allowing the nut to stroke a distance roughly equal to its length to help ensure that a film forms between the raceways and rolling elements.
(6) Do not forcibly drive a pin, key, or other positioning device into the product. This could create indentations on the raceway and impair the product's function.
(7) If the operation requires the LM block to be removed from the LM rail, please use a removing/mounting jig. (The removing/mounting jig is not provided as standard. To obtain one, contact THK.)
(8) When using a removing/mounting jig, align the ends of the LM rail and the jig and mount the block when the jig and rail are parallel.
(9) Take care to keep the LM block straight. Loading the block at an angle can introduce foreign matter, damage internal components, or cause balls to fall out.
(10) The LM block must contain all its internal rolling elements when mounted on the LM rail. Using a block with any balls or rollers removed may result in premature damage.
(11) If any of the rolling elements fall from the LM block, contact THK. Do not use the product in that condition.

(12) If the LM Guide breaks due to an accident or other cause, the block may come off of the rail and fall. For the safe use of these products, take precautions such as adding a mechanism to prevent the block from falling.
(13) For the bolt length, select a length that will leave a clearance at the bolt tip in relation to the effective tap depth.
(14) If the mounting material lacks sufficient rigidity or accuracy, the bearing load may be focused in one area, and bearing functionality will dramatically decrease. Therefore, carefully consider the rigidity and accuracy of the housing and base, and the strength of the securing bolts.
(15) When removing the LM block from the LM rail and then replacing the block, an LM block mounting/removing jig that facilitates such installation is available. Contact THK for details.

Lubrication

(1) Thoroughly remove anti-rust oil and apply lubricant before using the product.
(2) Do not mix different lubricants. Even greases containing the same type of thickening agent may, if mixed, interact negatively due to disparate additives or other ingredients.
(3) When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuums, and extreme heat or cold, use a lubricant suitable for its use/environment.
(4) When lubricating the product having no grease nipple or lubrication hole, apply grease directly on the raceway and stroke the product several times to let the grease spread inside.
(5) The consistency of grease changes according to the temperature. Take note that the slide resistance of the LM Guide may be affected by changes in viscosity.
(6) After lubrication, the slide resistance of the LM Guide may increase due to the stirring resistance of the grease. Be sure to perform a warm-up operation and allow the grease to break in sufficiently before operating the machinery.
(7) Excess grease may spatter after lubrication. Wipe off spattered grease as necessary.
(8) Grease deteriorates over time, which decreases the lubricity, so perform regular grease inspections and replenish grease based on frequency of use.
(9) Although the lubrication interval may vary according to operating conditions and the service environment, lubrication should be performed approximately every 100 km in travel distance (three to six months). The final greasing interval/amount should be set at the actual machine.
(10) The lubricant may not reach the raceway if the LM Guide is not installed in a horizontal orientation. For the mounting orientation and the lubrication, see B**1-28** and B**24-2**, respectively.
(11) When using oil lubrication, the lubricant may not be distributed throughout the LM block due to the mounting orientation of the block. Contact THK in advance for details.

Storage

When storing the LM Guide, pack it as designated by THK and store it indoors in a horizontal position away from high or low temperatures and high humidity.
Please note that if the product has been kept in storage for an extended period, the lubricant inside may have deteriorated. Please ensure that you replenish the lubricant before use.

Disposal

The product should be treated as industrial waste and disposed of appropriately.

Handling Precautions for LM Guide Models for Special Environments

LM Guide for Medium-to-Low Vacuums

Handling

(1) This product has been thoroughly cleaned and degreased and then sealed in moisture-proof packaging. If possible, open the package immediately prior to using the product.
(2) Once the packaging has been opened, store the product inside a clean, dry receptacle accompanied by silica gel or another drying agent. Do not use anti-rust oil or volatile corrosion inhibitor paper (or other VCI material) with this product.
(3) Wear protective rubber or vinyl gloves while handling this product and make sure the surrounding environment is relatively clean.

Handling Precautions for Optional Accessories for the LM Guide

QZ Lubricator for the LM Guide

For details regarding the QZ Lubricator, see B1-118.

Selection Precautions

Secure a stroke longer than the overall LM block with QZ Lubricator attached.

Handling

Take care not to drop or strike this product. Otherwise, it may cause injury or damage the unit.
Do not block the vent hole with grease or the like.
The QZ Lubricator supplies oil only to the raceway, so use it in combination with regular greasing/oil lubrication. If the product is used in an environment exposed to coolant, cutting chips, or other foreign material, oil on the raceway is lost easily. Accordingly, be sure to also use covers, bellows, etc.

Service Environment

Be sure the service temperature of this product is between -10℃ and 50℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.

Laminated Contact Scraper LaCS, Side Scraper for the LM Guide

For details regarding the LaCS, see B1-106. For details regarding the side scraper, see B1-108.

Handling

The lubricant impregnated into the scraper is used to increase its sliding capability. For lubrication of the LM Guide, attach a QZ Lubricator or grease nipple to the side face of the end plate of the LM block before providing a lubricant.
When using these products, be sure to attach C caps or a plate cover to the rail.

Service Environment

Be sure the service temperature of this product is between -20℃ and +80℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.

Notes on Product Functions

It is specifically designed to provide dust prevention capability to remove foreign material and liquid. To seal oil, an end seal is required.

Light Contact Seal LiCS for the LM Guide

For details regarding the LiCS, see B1-110.

Handling

The lubricant impregnated into LiCS is used to increase its sliding capability. For lubrication of the LM Guide, attach the grease nipple on the end plate of the LM block before providing a lubricant.

Service Environment

Be sure the service temperature of this product is between -20℃ and +80℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.
It only makes contact with the LM rail raceway. Do not use it in harsh environments.

High Chemical Resistance Fluorine Seal FS for the LM Guide

For details about the fluorine seal, see B1-111.

Handling

Be careful not to twist the seal portion when attaching the fluorine seal to the LM Guide. Also, do not store the product in a way that may deform the seal, such as by stacking it. This may cause damage or reduce the seal's functionality.

Service Environment

Be sure the service temperature of this product is between -20℃ and +80℃. Do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.

GC Cap

For details regarding the GC cap, see B1-113.

Handling

If GC caps are specified for the product, the edges of the LM rail mounting hole openings will be sharp. Take great care not to injure your fingers or hands while working.
When fitting GC caps, use a flat aligning tool to gradually punch the cap into the hole until it is level with the upper surface of the LM rail. Then run an oil stone over the rail until the upper surface of the rail and the GC caps are completely flat.
During installation or removal, burrs and small debris on the cap may scatter, so be sure to wear protective goggles and avoid using sharp tools during work.