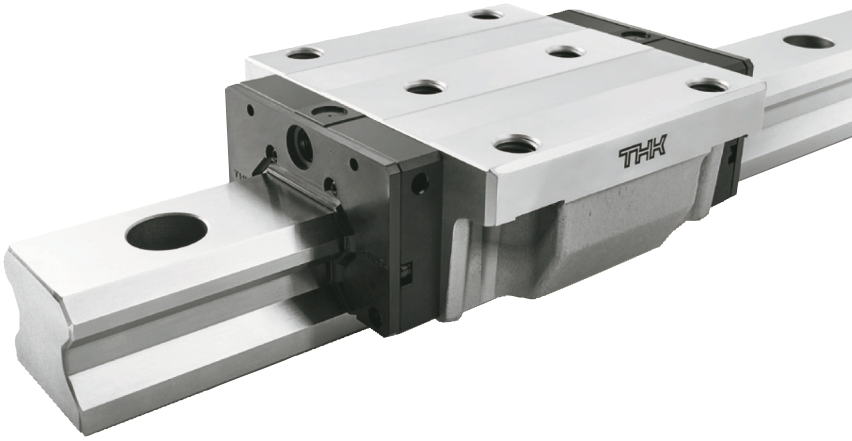
Neu!
Ab Lager Duisburg lieferbar.

ROLLENFÜHRUNG HRX



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Bewegungstechnik

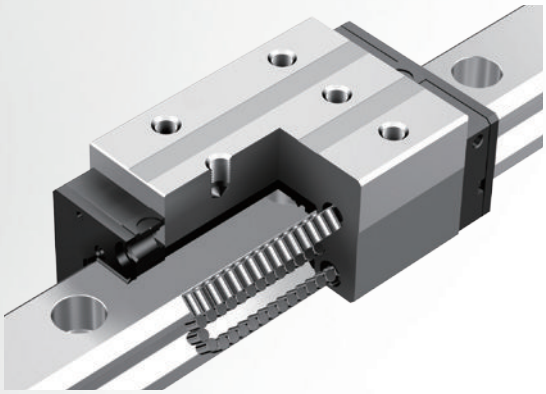
Model HRX

Roller Type LM Guide

LM Guide suitable for ultra-high rigidity and ultra-heavy loads

Feature 1 Ultra-High Rigidity and Ultra-Heavy Loads p. 3

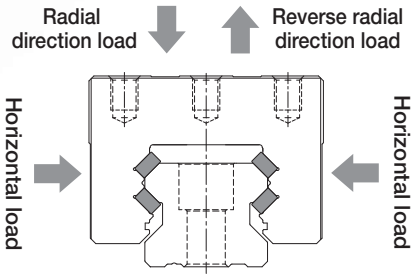
The HRX is an LM Guide that uses rollers as a rolling element for higher rigidity. Also, compared to our existing roller products, we have extended the length of the metal LM block and increased the number of load-bearing rollers to achieve an improved static load rating.



Internal structure of the HRX

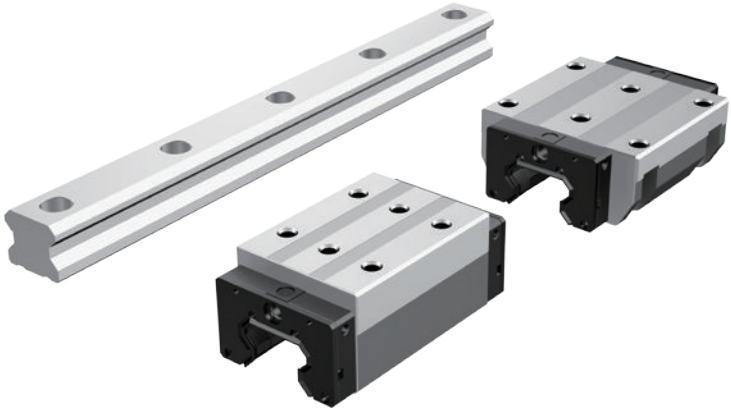
Feature 2 4-Way Equal Load p. 3

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



Feature 3 LM Blocks and LM Rails Available for Individual Sale p. 15

The HRX lineup features interchangeable products that can meet specifications by freely combining LM blocks and LM rails of the same model number.
See p. 15 for details.



Roller Type LM Guide Model HRX

Feature 1 Ultra-High Rigidity and Ultra-Heavy Loads

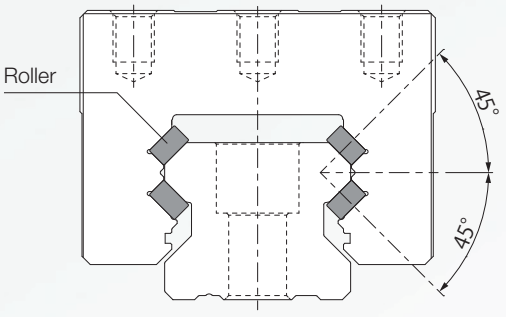
For the HRX, in order to achieve an improved basic static load rating, we have extended the length of the metal LM block and increased the number of load-bearing rollers.

LM Block Overall Length and Basic Static Load Rating

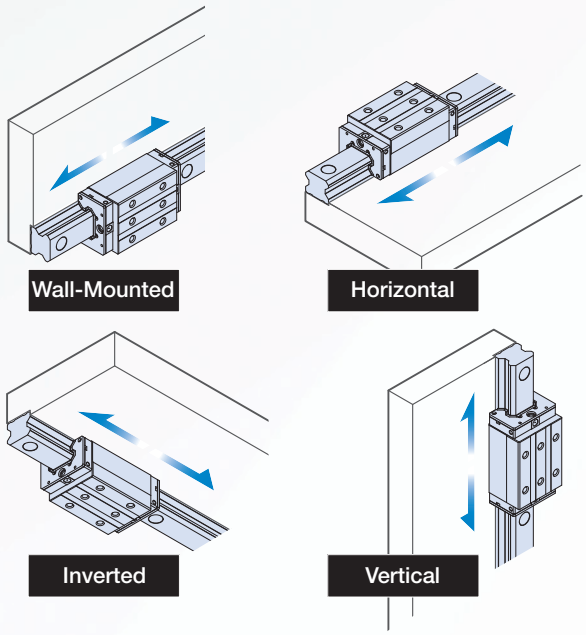
Model No.		Length of metal LM block L_1		Basic static load rating C_0	
		Our existing roller products	HRX	Our existing roller products	HRX
#25	C/R	65.5	75.4	57.5	73.1
	LC/LR	85.1	92.2	75	89.3
#30	C/R	75	84	82.5	104.7
	LC/LR	99	108.5	108	135.2
#35	C/R	82.2	92.2	119	150.1
	LC/LR	112.2	120.2	165	195.7
#45	C/R	107	115.7	192	250.4
	LC/LR	142	150.7	256	326.7
#55	C/R	129.2	143.2	266	369.9
	LC/LR	179.2	192.7	366	497.9
#65	C/R	171.7	195.7	441	567
	LC/LR	229.8	260.7	599	756

Feature 2 4-Way Equal Load

The Model HRX is designed to have an equal basic load rating on the LM block for all four directions.
(*Four directions: radial, reverse radial, left, and right)
As a result, this model can be used in any orientation, enabling a wide variety of applications.



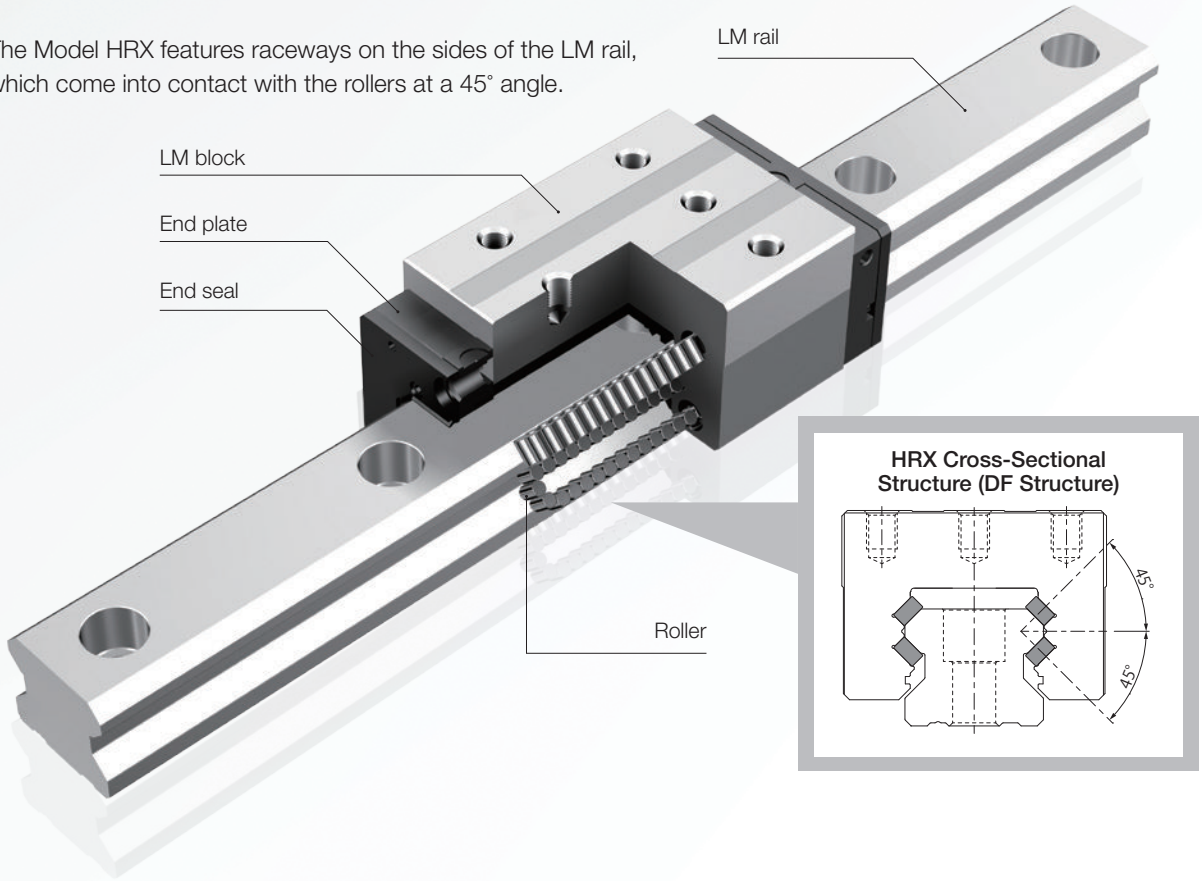
Uses a contact angle of 45° so that the basic load rating is equal in all directions: radial, reverse-radial, and horizontal.



This model is equally suited for use in a horizontal orientation and any other orientation.

Structure of the **HRX**

The Model HRX features raceways on the sides of the LM rail, which come into contact with the rollers at a 45° angle.



Lineup

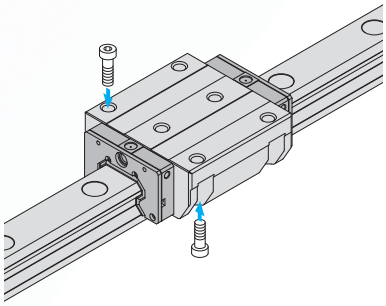
The Model HRX comes in six sizes ranging from 25 to 65, and a lineup of four block types is available: C/LC and R/LR. The Model HRX's dimensions conform to world-standard ISO specifications (ISO 12090-1:2011 Rolling Bearings).

Only #65R/LR height M differs from ISO dimensions.

Lineup

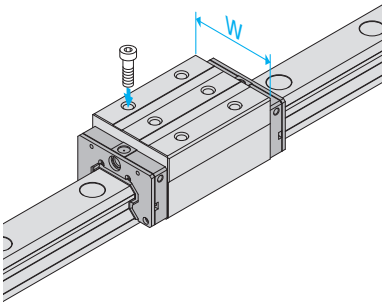
Block Type		HRX25	HRX30	HRX35	HRX45	HRX55	HRX65
Standard type	R	○	○	○	○	○	○
	C	○	○	○	○	○	○
Long type	LR	○	○	○	○	○	○
	LC	○	○	○	○	○	○

HRX-C/LC



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

HRX-R/LR



With this type, the LM block has a smaller width (W) and tapped holes.
It is ideal for compact designs.

Contamination Protection Accessories

It is necessary to prevent foreign materials from getting inside the product, as it will lead to abnormal wear and a shortened service life. If it is likely that foreign materials will get inside, it is important to select an effective sealing or contamination protection device suited to the environmental conditions.

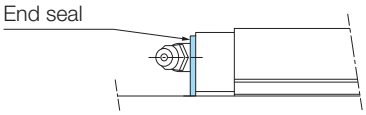
Seals

End seals made of synthetic rubber that are highly resistant to wear and side seals that further improve dust-proofing effectiveness are available. Use the symbols in the table to the right to specify if you need a contamination protection accessory.

Symbol	Contamination protection accessories
UU	End seals
SS	End seals + side seals + inner seals
DD	Double seals + side seals + inner seals
ZZ	End seals + side seals + inner seals + metal scrapers
KK	Double seals + side seals + inner seals + metal scrapers

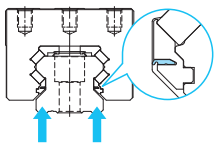
End Seal

Used in locations exposed to dust



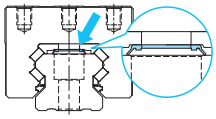
Side Seal

Used in locations where dust may enter the LM block from the side or bottom surfaces, such as vertical, horizontal, and inverted configurations



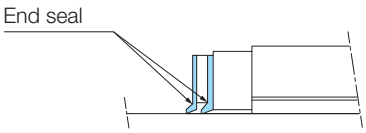
Inner Seal

Used in locations severely exposed to dust or cutting chips



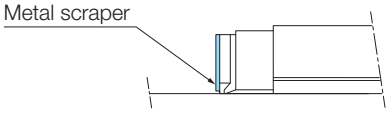
Double Seals

Used in locations exposed to dust



Metal Scraper (Non-Contact)

Used in locations where welding spatter may adhere to the LM rail



Seal Resistance Value

See the table below for the maximum seal resistance of SS seals per LM block when the product is lubricated.

Unit: N

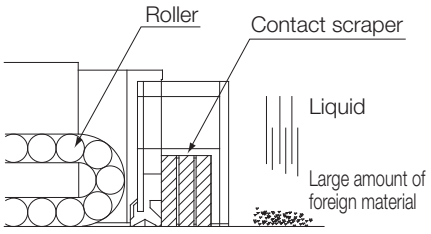
Model No.	Seal symbol	Maximum Seal Resistance
HRX25	SS	14
HRX30		15
HRX35		18
HRX45		23
HRX55		26
HRX65		32

Laminated Contact Scraper LaCS

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).

Features

- Because the three layers of scrapers fully contact the LM rail, LaCS is highly capable of removing minute foreign material.
- Low friction resistance is achieved through the use of oil-impregnated, self-lubricating synthetic foam rubber.

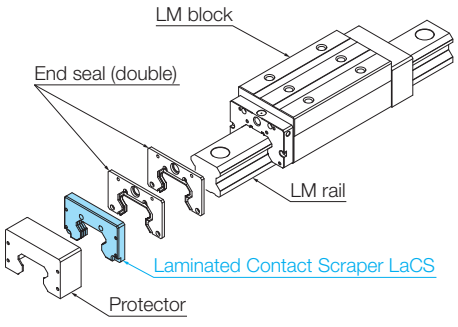


Structural Drawing

Maximum Resistance Value When LaCS Is Applied

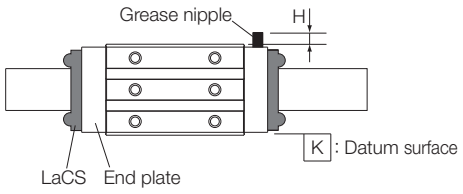
Unit: N

Model No.	Sliding resistance
HRX25	6.3
HRX30	7.2
HRX35	13
HRX45	18
HRX55	25
HRX65	34



External View

Symbol	Contamination protection accessories
SSHH	End seals + side seals + inner seals + LaCS
DDHH	Double seals + side seals + inner seals + LaCS
ZZHH	End seals + side seals + inner seals + LaCS + metal scrapers
KKHH	Double seals + side seals + inner seals + LaCS + metal scrapers
JJHH	End seals + side seals + inner seals + LaCS + protectors
TTHH	Double seal + side seals + inner seals + LaCS + protectors



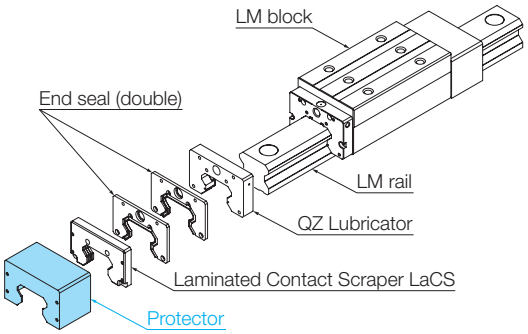
Location for Mounting the Side Grease Nipple

Model No.	Dimensional increase with a grease nipple (mm)	
	Side greasing	
	H	Nipple type
HRX25	6.9	A-M6F
HRX30	6.9	
HRX35	6.7	
HRX45	6.7	
HRX55	6.2	
HRX65	6.2	

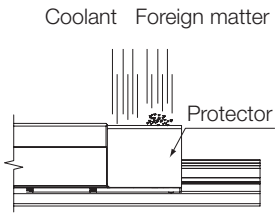
Contact THK if you desire a grease nipple mounting location other than the above.

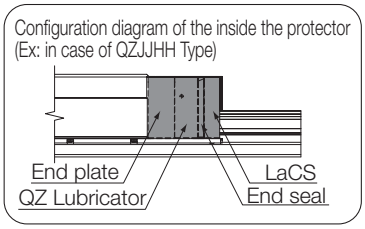
Protector

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



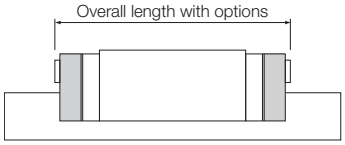
External View





The Overall LM Block Length with LaCS and Seals Attached

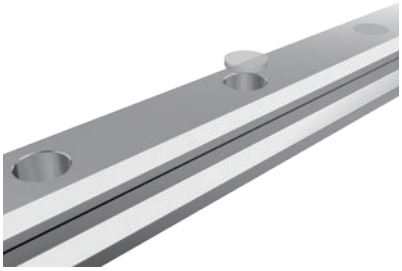
Unit: mm



Symbol	Overall length when options are attached											
	HRX25	HRX25L	HRX30	HRX30L	HRX35	HRX35L	HRX45	HRX45L	HRX55	HRX55L	HRX65	HRX65L
No Symbol	94.4	111.2	104	128.5	116.2	144.2	143.7	178.7	173.2	222.7	231.7	296.7
UU/SS	99.6	116.4	110.6	135.1	123.2	151.2	150.7	185.7	180.2	229.7	239.1	304.1
DD	104.8	121.6	117.2	141.7	130.2	158.2	157.7	192.7	187.2	236.7	246.5	311.5
ZZ	104.6	121.4	115.6	140.1	131.6	159.6	159.9	194.9	189.4	238.9	250.3	315.3
KK	109.8	126.6	122.2	146.7	138.6	166.6	166.9	201.9	196.4	245.9	257.7	322.7
SSHH	117.2	134	128.2	152.7	140.8	168.8	171.3	206.3	200.8	250.3	263.1	328.1
DDHH	122.4	139.2	134.8	159.3	147.8	175.8	178.3	213.3	207.8	257.3	270.5	335.5
ZZHH	122.2	139	133.2	157.7	149.2	177.2	180.5	215.5	210	259.5	274.3	339.3
KKHH	127.4	144.2	139.8	164.3	156.2	184.2	187.5	222.5	217	266.5	281.7	346.7
JJHH	122.2	139	133.2	157.7	149.2	177.2	180.3	215.3	209.8	259.3	274.1	339.1
TTHH	127.4	144.2	139.8	164.3	156.2	184.2	187.3	222.3	216.8	266.3	281.5	346.5

■ Dedicated Cap for LM Rail Mounting Holes

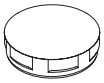
Using dedicated caps to cover the LM rail mounting holes helps prevent foreign material from entering the mounting holes and LM block.

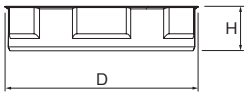


CV Cap

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.



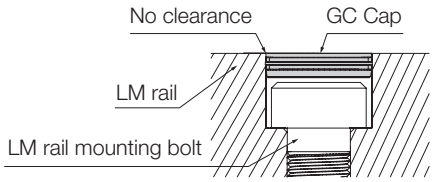


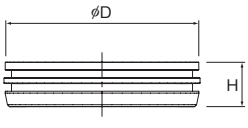
Applicable model	Cap model No.	Used bolts	Main dimensions (mm)	
			D	H
HRX25	CV6	M6	11.4	2.6
HRX30	CV8	M8	14.4	3.3
HRX35	CV8	M8	14.4	3.3
HRX45	CV12	M12	20.4	3.4
HRX55	CV14	M14	23.4	5.5
HRX65	CV16	M16	26.4	5.6

GC Cap

GC caps are made of metal. (They are RoHS compliant.)

GC caps adhere closer to the counterbore than CV caps, so there is no clearance once they are inserted.





Applicable model	Cap model No.	Used bolts	Main dimensions (mm)	
			D	H
HRX25	GC6	M6	11.36	2.5
HRX30	GC8	M8	14.36	3.5
HRX35	GC8	M8	14.36	3.5
HRX45	GC12	M12	20.36	4.6
HRX55	GC14	M14	23.36	5.0
HRX65	GC16	M16	26.36	5.0

Note 1) 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.

HRX35 LC 2 UU C0 + 1200L P GC
GC caps attached

Note 2) GC caps cannot be used with LM rails that have undergone surface treatment.
Note 3) LM rail mounting holes for GC caps are special. (The mouth is not chamfered.)
Note 4) Be careful not to injure your hand when inserting GC caps.
Note 5) Be sure to make the GC caps level with the upper surface of the LM rail and clean (wipe) that surface after insertion.
Note 6) Contact THK if this product will be used in special environments such as in a vacuum, or at very low or high temperatures.

Lubrication

Standard Grease

AFB-LF Grease is a general-purpose grease that provides excellent extreme pressure and mechanical stability properties through the use of a refined mineral oil base oil and a lithium-based consistency enhancer.

*Non-standard greases are also available. Contact THK for details.

AFB-LF Representative Physical Properties

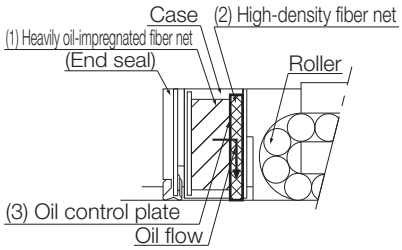
Item		Representative physical property	Testing method
Consistency enhancer		Lithium-based	
Base oil		Refined mineral oil	
Base oil kinematic viscosity: mm²/s (40℃)		170	JIS K 2220 23
Worked penetration (25˚C, 60 W)		275	JIS K 2220 7
Mixing stability (100,000 W)		345	JIS K 2220 15
Dropping point: ˚C		193	JIS K 2220 8
Evaporation volume: mass% (99˚C, 22 h)		0.4	JIS K 2220 10
Oil separation rate: mass% (100˚C, 24 h)		0.6	JIS K 2220 11
Copper plate corrosion (B method, 100˚C, 24 h)		Passed	JIS K 2220 9
Low-temperature torque: mN·m (-20℃)	Starting	130	JIS K 2220 18
	Rotational	51	
4-ball testing (welding load): N		3089	ASTM D2596
Operating temperature range: ˚C		-15 to 100	
Color		Yellowish brown	

QZ Lubricator

The QZ Lubricator feeds the right amount of lubricant to the LM rail raceway.
This allows an oil film to be constantly formed between the rollers and the raceway and significantly extends the lubrication maintenance interval.
The QZ Lubricator is made primarily of three components:

(1) a highly oil-impregnated fiber net (which stores lubricant),
(2) a high-density fiber net (which applies the lubricant to the raceways), and
(3) an oil control plate (which adjusts the amount of oil being applied).

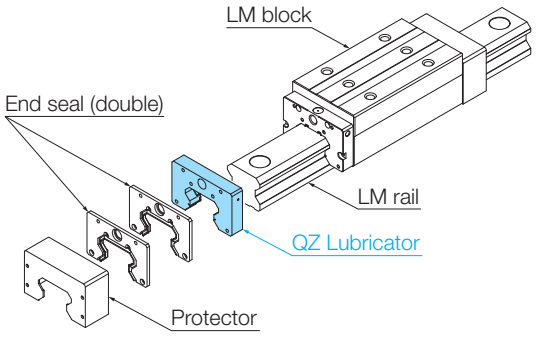
The lubricant is supplied from within the QZ Lubricator using the basic principle of capillary action, as used in felt-tip pens.



Structural Drawing

Features

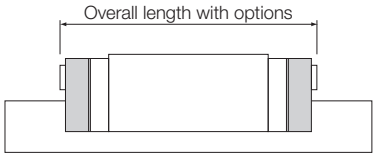
- Since it compensates for oil loss, the lubrication maintenance interval can be significantly extended.
- It is an eco-friendly lubrication system that does not contaminate the surrounding area, as it feeds the right amount of lubricant to the roller raceway.



External View

Symbol	Contamination protection accessories
QZUU	End seals + QZ
QZSS	End seals + side seals + inner seals + QZ
QZDD	Double seals + side seals + inner seals + QZ
QZZZ	End seals + side seals + inner seals + metal scrapers + QZ
QZKK	Double seals + side seals + inner seals + metal scrapers + QZ
QZSSHH	End seals + side seals + inner seals + LaCS + QZ
QZDDHH	Double seals + side seals + inner seals + LaCS + QZ
QZZZHH	End seals + side seals + inner seals + LaCS + metal scrapers + QZ
QZKKHH	Double seals + side seals + inner seals + LaCS + metal scrapers + QZ
QZJJHH	End seals + side seals + inner seals + LaCS + protectors + QZ
QZTTHH	Double seals + side seals + inner seals + LaCS + protectors + QZ

The Overall LM Block Length Dimension with QZ Lubricator and Seals Attached



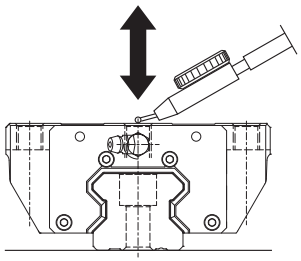
Unit: mm

Symbol	Overall length when options are attached											
	HRX25	HRX25L	HRX30	HRX30L	HRX35	HRX35L	HRX45	HRX45L	HRX55	HRX55L	HRX65	HRX65L
QZUU/QZSS	129.6	146.4	140.6	165.1	153.2	181.2	180.7	215.7	220.2	269.7	279.1	344.1
QZDD	134.8	151.6	147.2	171.7	160.2	188.2	187.7	222.7	227.2	276.7	286.5	351.5
QZZZ	134.6	151.4	145.6	170.1	161.6	189.6	189.9	224.9	229.4	278.9	290.3	355.3
QZKK	139.8	156.6	152.2	176.7	168.6	196.6	196.9	231.9	236.4	285.9	297.7	362.7
QZSSHH	147.2	164	158.2	182.7	170.8	198.8	201.3	236.3	240.8	290.3	303.1	368.1
QZDDHH	152.4	169.2	164.8	189.3	177.8	205.8	208.3	243.3	247.8	297.3	310.5	375.5
QZZZHH	152.2	169	163.2	187.7	179.2	207.2	210.5	245.5	250	299.5	314.3	379.3
QZKKHH	157.4	174.2	169.8	194.3	186.2	214.2	217.5	252.5	257	306.5	321.7	386.7
QZJJHH	152.2	169	163.2	187.7	179.2	207.2	210.3	245.3	249.8	299.3	314.1	379.1
QZTTHH	157.4	174.2	169.8	194.3	186.2	214.2	217.3	252.3	256.8	306.3	321.5	386.5

Radial Clearance Specifications

The Model HRX has one type of radial clearance (preload).
Medium preload (C0)

Radial Clearance



Radial Clearance Specifications Unit: μm

Applicable model	Medium preload (C0)
HRX25	-2 to -1
HRX30	-2 to -1
HRX35	-2 to -1
HRX45	-3 to -2
HRX55	-3 to -2
HRX65	-4 to -2

Accuracy Standards

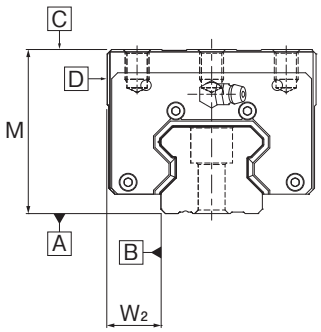
The accuracy of the LM Guide is specified for each model in terms of the dimensional tolerance for height and width, the difference between height and width in a pair, and running parallelism. (High accuracy grade/Precision grade)

Difference in Height (M)

Indicates the difference between the minimum and maximum values of height (M) of each LM Guide used on the same plane in combination.

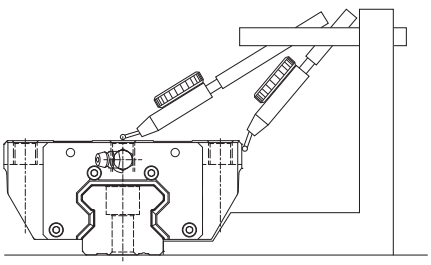
Difference in Width (W_2)

Indicates a difference between the minimum and maximum values of the width (W_2) between each of the LM blocks, mounted on one LM rail in combination, and the LM rail.



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 bolted to a reference surface.



Accuracy Standards Unit: mm

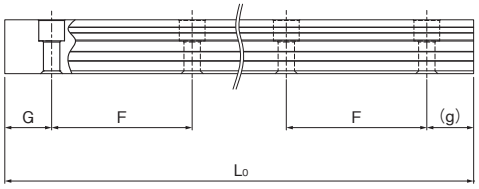
Model No.	Accuracy (symbol) Item	High accuracy grade (H)	Precision grade (P)
25, 30, 35	Dimensional tolerance in height (M)	±0.04	0 -0.04
	Difference in height (M)	0.015	0.007
	Dimensional tolerance in width (W_2)	±0.03	0 -0.03
	Difference in width (W_2)	0.015	0.007
	Running parallelism of surface C against surface A	See the table below for LM rail length and running parallelism by accuracy standard	
	Running parallelism of surface D against surface B	See the table below for LM rail length and running parallelism by accuracy standard	
45, 55	Dimensional tolerance in height (M)	±0.04	0 -0.05
	Difference in height (M)	0.015	0.007
	Dimensional tolerance in width (W_2)	±0.04	0 -0.04
	Difference in width (W_2)	0.015	0.007
	Running parallelism of surface C against surface A	See the table below for LM rail length and running parallelism by accuracy standard	
	Running parallelism of surface D against surface B	See the table below for LM rail length and running parallelism by accuracy standard	
65	Dimensional tolerance in height (M)	±0.04	0 -0.05
	Difference in height (M)	0.02	0.01
	Dimensional tolerance in width (W_2)	±0.04	0 -0.05
	Difference in width (W_2)	0.02	0.01
	Running parallelism of surface C against surface A	See the table below for LM rail length and running parallelism by accuracy standard	
	Running parallelism of surface D against surface B	See the table below for LM rail length and running parallelism by accuracy standard	

LM Rail Length and Running Parallelism by Accuracy Standard Unit: μm

Rail length (mm)		Running parallelism values	
Above	Or less	High accuracy grade (H)	Precision grade (P)
—	50	3	2
50	80	3	2
80	125	3	2
125	200	3.5	2
200	250	4	2.5
250	315	4.5	3
315	400	5	3.5
400	500	6	4.5
500	630	7	5
630	800	8.5	6
800	1000	9	6.5
1000	1250	11	7.5
1250	1600	12	8
1600	2000	13	8.5
2000	2500	14	9.5
2500	3090	16	11

Standard and Maximum Lengths of the LM Rail

The standard and maximum lengths of Model HRX LM rails are shown in the following table. 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, g dimensions from the table. As the G, g dimensions increase, that portion becomes less stable, and the accuracy may be negatively affected.



*If joint rails are not allowed, and a length greater than the maximum values is required, contact THK.

Standard Length and Maximum Length of the LM Rail

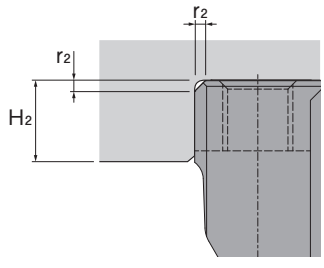
Unit: mm

Model No.	HRX25	HRX30, 35	HRX45	HRX55	HRX65
LM rail standard length (L_0)	220	280	570	780	1270
	280	360	675	900	1570
	340	440	780	1020	2020
	400	520	885	1140	2620
	460	600	990	1260	—
	520	680	1095	1380	—
	580	760	1200	1500	—
	640	840	1305	1620	—
	700	920	1410	1740	—
	760	1000	1515	1860	—
	820	1080	1620	1980	—
	940	1160	1725	2100	—
	1000	1240	1830	2220	—
	1060	1320	1935	2340	—
	1120	1400	2040	2460	—
	1180	1480	2145	2580	—
	1240	1560	2250	2700	—

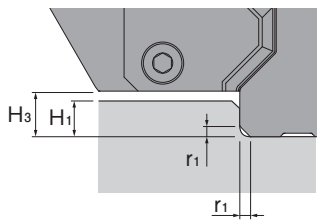
Model No.	HRX25	HRX30, 35	HRX45	HRX55	HRX65
LM rail standard length (L_0)	1300	1640	2355	2820	—
	1360	1720	2460	2940	—
	1420	1800	2565	3060	—
	1480	1880	2670	—	—
	1540	1960	2775	—	—
	1600	2040	2880	—	—
	1720	2200	2985	—	—
	1840	2360	3090	—	—
	1960	2520	—	—	—
	2080	2680	—	—	—
	2200	2840	—	—	—
	2320	3000	—	—	—
	2440	—	—	—	—
Standard pitch	60	80	105	120	150
G, g	20	20	22.5	30	35
Maximum length	3000	3000	3090	3060	3000

Shoulder Height of the Mounting Base and the Corner Radius

The mounting base for the LM rail and LM block has a reference surface on the side face to allow easy installation. The height of the datum shoulder varies based on the model. See below 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), to prevent interference with the chamfer of the LM rail or the LM block. The corner radius (r) varies based on the model. See below for details.



Shoulder for the LM Block



Shoulder for the LM Rail

Shoulder Height of the Mounting Base and the Corner Radius

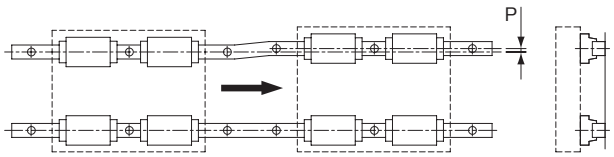
Unit: mm

Model No.	Corner radius (LM rail) r_1 (max)	Corner radius (LM block) r_2 (max)	Shoulder height (LM rail) H_1 (max)	Shoulder height (LM block) H_2 (max)	H_3
HRX25	1.0	1.0	4.0	5.0	5.0
HRX30	1.0	1.0	4.0	5.0	5.0
HRX35	1.0	1.0	5.5	6.0	6.5
HRX45	1.5	1.5	6.5	8.0	8.5
HRX55	1.5	1.5	9.0	10.0	11
HRX65	1.5	2.0	9.5	10.0	12

Error Allowance in the Mounting Surface

Error Allowance in Parallelism Between Two Rails

Misalignment of the mounting surface can impact the product life of an LM Guide. The table below shows the approximate value (P) of the error allowance in parallelism between two rails under normal use for each model number.

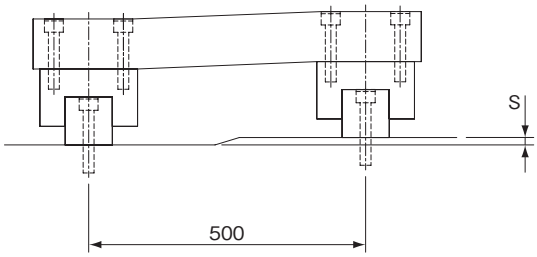


Unit: μm

Model No.	Medium preload (C0 clearance)
HRX25	7
HRX30	8
HRX35	9
HRX45	11
HRX55	13
HRX65	17

Error Allowance in Vertical Level Between Two Rails

The table below shows the value (S) of the error allowance in the vertical level between two rails spaced 500 mm apart, which is proportional to the distance between the rails.

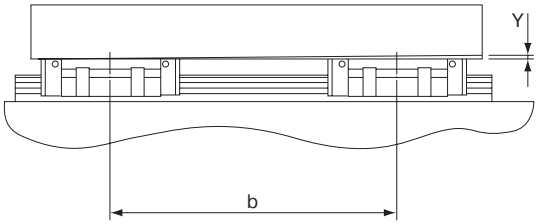


Unit: μm

Model No.	Medium preload (C0 clearance)
HRX25	70
HRX30	
HRX35	
HRX45	
HRX55	
HRX65	

Error Allowance in Level in the Axial Direction

The table below shows the value (Y) of the error allowance in vertical level of the block span (b), which is proportional to the block span (b).

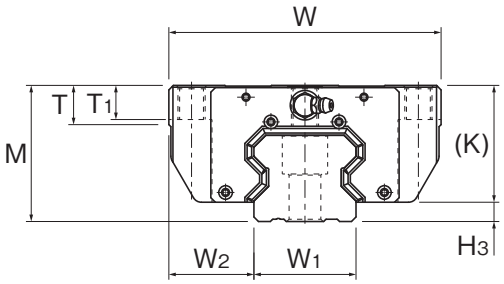


Unit: mm

Error allowance in the mounting surface (Y)	0.00004b

Specification Table

HRX-C/LC



Model No.		External dimensions			Block dimensions												Pilot hole for side nipple			Greasing hole on the top face			
		M	W	L	B	C	C_2	S	H	L_1	T	T_1	K	N	E	Grease nipple	e_0	f_0	D_0	D_2 (O-ring)	V	e_1	d_2
HRX25	C	36	70	99.6	57	45	40	M8 through	6.8	75.4	9.5	10	31	5.5	12	B-M6F	6	6.2	5.2	6.2	0.3	4.5	1
	LC	36	70	116.4	57	45	40	M8 through	6.8	92.2	9.5	10	31	5.5	12	B-M6F	6	6.2	5.2	6.2	0.3	4.5	1
HRX30	C	42	90	110.6	72	52	44	M10 through	8.5	84.0	12	14	37	8.2	12	B-M6F	6.2	9.5	5.2	6.2	0.4	4.5	1
	LC	42	90	135.1	72	52	44	M10 through	8.5	108.5	12	14	37	8.2	12	B-M6F	6.2	9.5	5.2	6.2	0.4	4.5	1
HRX35	C	48	100	123.2	82	62	52	M10 through	8.5	92.2	12	10	41.5	8	12	B-M6F	7.2	9.5	5.2	10.2	0.45	5.8	1
	LC	48	100	151.2	82	62	52	M10 through	8.5	120.2	12	10	41.5	8	12	B-M6F	7.2	9.5	5.2	10.2	0.45	5.8	1
HRX45	C	60	120	150.7	100	80	60	M12 through	10.5	115.7	17.3	15	51.5	8.75	16	B-PT1/8	7.5	7.75	5.2	10.2	0.45	6.9	1
	LC	60	120	185.7	100	80	60	M12 through	10.5	150.7	17.3	15	51.5	8.75	16	B-PT1/8	7.5	7.75	5.2	10.2	0.45	6.9	1
HRX55	C	70	140	180.2	116	95	70	M14 through	12.5	143.2	18.2	18	59	11.2	16	B-PT1/8	6.8	9.3	5.2	10.2	0.45	6.8	1
	LC	70	140	229.7	116	95	70	M14 through	12.5	192.7	18.2	18	59	11.2	16	B-PT1/8	6.8	9.3	5.2	10.2	0.45	6.8	1
HRX65	C	90	170	239.1	142	110	82	M16 through	14.5	195.7	22.3	20	78	18	16	B-PT1/8	8.65	16.6	5.2	10.2	0.45	8.65	1
	LC	90	170	304.1	142	110	82	M16 through	14.5	260.7	22.3	20	78	18	16	B-PT1/8	8.65	16.6	5.2	10.2	0.45	8.65	1

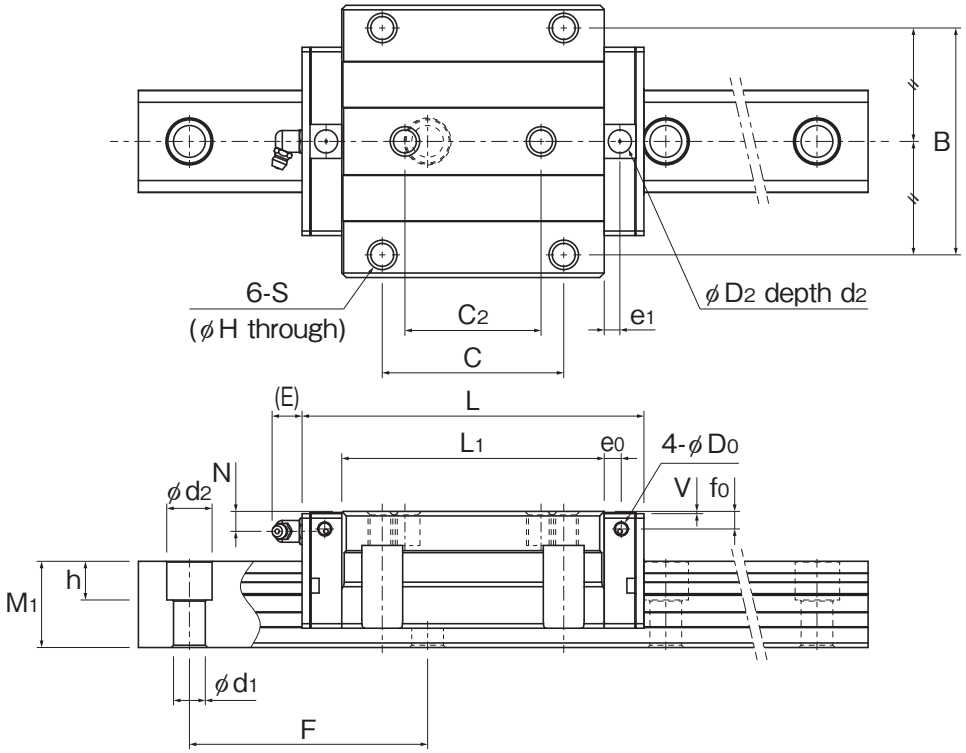
Model Number Coding

Select an option Fixed symbol

HRX45 LC 2 SS C0 + 1200L P T -II

- HRX45: Model number
- LC: LM block type (see p. 4)
- 2: Number of LM blocks used on a single rail
- SS: Contamination protection accessory symbol
- C0: Radial clearance symbol
- 1200L: LM rail length
- P: Accuracy symbol (H: High accuracy grade, P: Precision grade)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane

Note) Please contact THK if you wish to order LM rails and LM blocks separately.



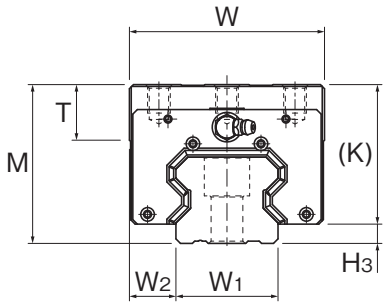
Unit: mm

	H_3	Rail dimensions					Basic load rating (kN)		Static permissible moment (kN·m)*					Weight	
		W_1 $^{0}_{-0.05}$	W_2	M_1	F	$d_1 \times d_2 \times h$	C_{100}	C_0	M_A		M_B		M_C	LM block	LM rail
									1 block	2 blocks	1 block	2 blocks		(kg)	(kg/m)
	5	23	23.5	21.5	60	7×11×9	26.3	73.1	0.92	4.84	0.92	4.84	0.57	0.84	3.25
	5	23	23.5	21.5	60	7×11×9	30.8	89.3	1.37	6.86	1.37	6.86	0.69	1.03	3.25
	5	28	31	23.5	80	9×14×12	39.4	104.7	1.48	7.72	1.48	7.72	1.03	1.48	4.42
	5	28	31	23.5	80	9×14×12	48.0	135.2	2.44	12.06	2.44	12.06	1.33	1.93	4.42
	6.5	34	33	29	80	9×14×12	56.0	150.1	2.33	11.59	2.33	11.59	1.81	1.93	6.33
	6.5	34	33	29	80	9×14×12	68.9	195.7	3.92	18.60	3.92	18.60	2.36	2.55	6.33
	8.5	45	37.5	38	105	14×20×17	94.3	250.4	4.85	23.90	4.85	23.90	3.84	3.51	10.9
	8.5	45	37.5	38	105	14×20×17	116.0	326.7	8.17	38.44	8.17	38.44	5.01	4.64	10.9
	11	53	43.5	44	120	16×23×20	134.5	369.9	8.86	42.34	8.86	42.34	6.86	5.85	15.6
	11	53	43.5	44	120	16×23×20	169.5	497.9	15.86	72.70	15.86	72.70	9.24	7.96	15.6
	12	63	53.5	53	150	18×26×22	205.5	567.0	18.43	86.49	18.43	86.49	12.27	13.34	22.6
	12	63	53.5	53	150	18×26×22	257.0	756.0	32.04	146.69	32.04	146.69	16.35	17.94	22.6

*Static permissible moment 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks in close contact with each other

Specification Table

HRX-R/LR



Model No.		External dimensions			Block dimensions									Pilot hole for side nipple			Greasing hole on the top face			
		M	W	L	B	C	S×ℓ	L_1	T	K	N	E	Grease nipple	e_0	f_0	D_0	D_2 (O-ring)	V	e_1	d_2
HRX25	R	40	48	99.6	35	35	M6×7	75.4	9	35	9.5	12	B-M6F	6	10.2	5.2	6.2	4.3	4.5	1
	LR	40	48	116.4	35	50	M6×7	92.2	9	35	9.5	12	B-M6F	6	10.2	5.2	6.2	4.3	4.5	1
HRX30	R	45	60	110.6	40	40	M8×8	84.0	12	40	11.2	12	B-M6F	6.2	12.5	5.2	6.2	3.4	4.5	1
	LR	45	60	135.1	40	60	M8×8	108.5	12	40	11.2	12	B-M6F	6.2	12.5	5.2	6.2	3.4	4.5	1
HRX35	R	55	70	123.2	50	50	M8×10	92.2	18.5	48.5	15	12	B-M6F	7.2	16.5	5.2	10.2	7.45	5.8	1
	LR	55	70	151.2	50	72	M8×10	120.2	18.5	48.5	15	12	B-M6F	7.2	16.5	5.2	10.2	7.45	5.8	1
HRX45	R	70	86	150.7	60	60	M10×12.5	115.7	24.5	61.5	18.75	16	B-PT1/8	7.5	17.75	5.2	10.2	10.45	6.9	1
	LR	70	86	185.7	60	80	M10×12.5	150.7	24.5	61.5	18.75	16	B-PT1/8	7.5	17.75	5.2	10.2	10.45	6.9	1
HRX55	R	80	100	180.2	75	75	M12×15	143.2	27.5	69	21.2	16	B-PT1/8	6.8	19.3	5.2	10.2	10.45	6.8	1
	LR	80	100	229.7	75	95	M12×15	192.7	27.5	69	21.2	16	B-PT1/8	6.8	19.3	5.2	10.2	10.45	6.8	1
HRX65	R	100	126	239.1	76	70	M16×20	195.7	29.5	88	28	16	B-PT1/8	8.65	26.6	5.2	10.2	10.45	8.65	1
	LR	100	126	304.1	76	120	M16×20	260.7	29.5	88	28	16	B-PT1/8	8.65	26.6	5.2	10.2	10.45	8.65	1

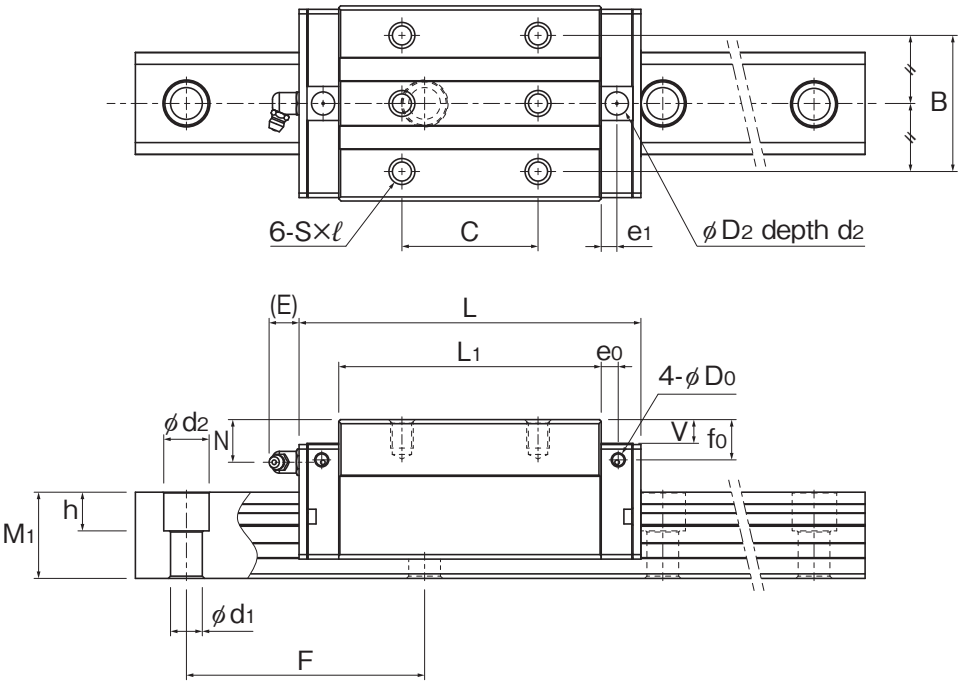
Model Number Coding

Select an option Fixed symbol

HRX45 LR 2 SS C0 + 1200L P T -II

- HRX45: Model number
- LR: LM block type (see p. 4)
- 2: Number of LM blocks used on a single rail
- SS: Contamination protection accessory symbol
- C0: Radial clearance symbol
- 1200L: LM rail length
- P: Accuracy symbol (H: High accuracy grade, P: Precision grade)
- T: Symbol for LM rail jointed use
- -II: Symbol for No. of rails used on the same plane

Note) Please contact THK if you wish to order LM rails and LM blocks separately.



Unit: mm

	H_3	Rail dimensions					Basic load rating (kN)		Static permissible moment (kN·m)*					Weight	
		W_1 0 -0.05	W_2	M_1	F	$d_1 \times d_2 \times h$	C_{100}	C_0	M_A		M_B		M_C	LM block	LM rail
									1 block	2 blocks	1 block	2 blocks		(kg)	(kg/m)
	5	23	12.5	21.5	60	7×11×9	26.3	73.1	0.92	4.84	0.92	4.84	0.57	0.72	3.25
	5	23	12.5	21.5	60	7×11×9	30.8	89.3	1.37	6.86	1.37	6.86	0.69	0.86	3.25
	5	28	16	23.5	80	9×14×12	39.4	104.7	1.48	7.72	1.48	7.72	1.03	1.16	4.42
	5	28	16	23.5	80	9×14×12	48.0	135.2	2.44	12.06	2.44	12.06	1.33	1.48	4.42
	6.5	34	18	29	80	9×14×12	56.0	150.1	2.33	11.59	2.33	11.59	1.81	1.73	6.33
	6.5	34	18	29	80	9×14×12	68.9	195.7	3.92	18.60	3.92	18.60	2.36	2.23	6.33
	8.5	45	20.5	38	105	14×20×17	94.3	250.4	4.85	23.90	4.85	23.90	3.84	3.20	10.9
	8.5	45	20.5	38	105	14×20×17	116.0	326.7	8.17	38.44	8.17	38.44	5.01	4.15	10.9
	11	53	23.5	44	120	16×23×20	134.5	369.9	8.86	42.34	8.86	42.34	6.86	5.31	15.6
	11	53	23.5	44	120	16×23×20	169.5	497.9	15.86	72.70	15.86	72.70	9.24	7.12	15.6
	12	63	31.5	53	150	18×26×22	205.5	567.0	18.43	86.49	18.43	86.49	12.27	12.06	22.6
	12	63	31.5	53	150	18×26×22	257.0	756.0	32.04	146.69	32.04	146.69	16.35	16.01	22.6

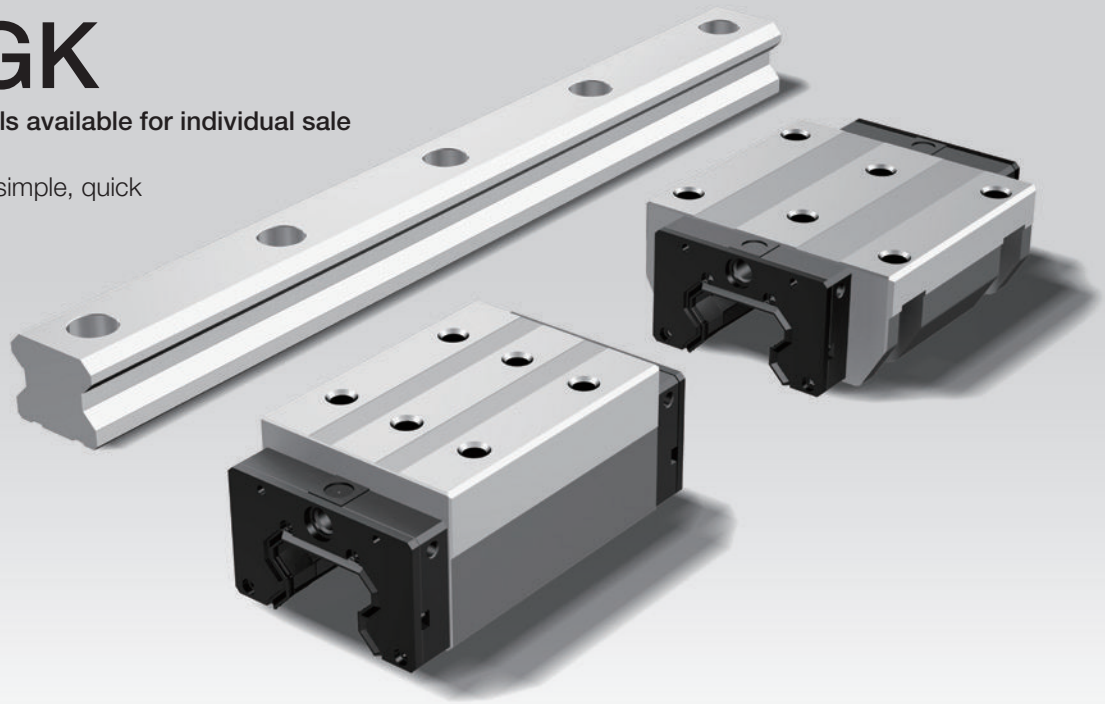
*Static permissible moment 1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks in close contact with each other

Feature 3 LM Blocks and LM Rails Available for Individual Sale

HRX-GK

LM blocks and LM rails available for individual sale

Flexible combinations, simple, quick



Lineup

Block type		HRX25	HRX30	HRX35	HRX45
Standard type	R	○	○	○	○
	C	○	○	○	○
Long type	LR	○	○	○	○
	LC	○	○	○	○

Please contact THK about HRX55 and HRX65.

Model Number Coding

LM Rail

Select an option Fixed symbol

HRX45 - 3000L H (GK) RAIL

- HRX45: Model number
- 3000L: LM rail length
- H: Accuracy symbol (H: High accuracy grade, P: Precision grade)
- (GK) RAIL: GK series LM rail symbol

LM Block

HRX45 LR 1 SS C0 H (GK) BLOCK

- HRX45: Model number
- LR: LM block type
- 1: Number of LM blocks (1 only)
- SS: Contamination protection accessory symbol (SS only)
- C0: Radial clearance symbol
- H: Accuracy symbol (H: High accuracy grade, P: Precision grade)
- (GK) BLOCK: GK series LM block symbol

Accuracy Standards

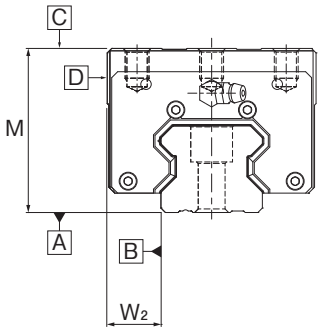
The accuracy of the LM Guide is specified for each model in terms of the dimensional tolerance for height and width, the difference between height and width in a pair, and running parallelism. (High accuracy grade/Precision grade)

Difference in Height (M)

Indicates the difference between the minimum and maximum values of height (M) of each LM Guide used on the same plane in combination.

Difference in Width (W_2)

Indicates a difference between the minimum and maximum values of the width (W_2) between each of the LM blocks, mounted on one LM rail in combination, and the LM rail.

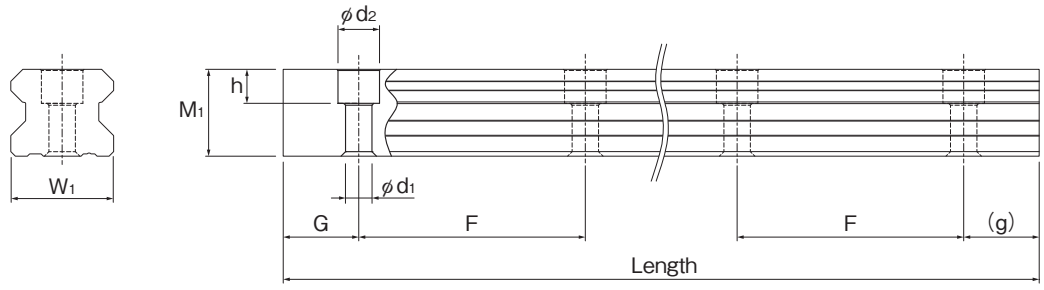


Accuracy standards

Unit: mm

Model No.	Accuracy (symbol) Item		High accuracy grade (H)	Precision grade (P)
25 30 35	Dimensional tolerance in height (M)		±0.04	0 -0.04
	Difference in height (M) dimension	Multiple blocks on a singe rail (1 set)	0.015	0.007
		Multiple blocks on multiple rails (Multiple sets)	0.03	0.025
	Dimensional tolerance in width (W_2)		±0.03	0 -0.03
	Difference in width (W_2)		0.015	0.007
	Running parallelism of surface C against surface A		See the table on p. 8 for LM rail length and running parallelism by accuracy standard.	
	Running parallelism of surface D against surface B		See the table on p. 8 for LM rail length and running parallelism by accuracy standard.	
45	Dimensional tolerance in height (M)		±0.04	0 -0.05
	Difference in height (M) dimension	Multiple blocks on a singe rail (1 set)	0.015	0.007
		Multiple blocks on multiple rails (Multiple sets)	0.03	0.025
	Dimensional tolerance in width (W_2)		±0.04	0 -0.04
	Difference in width (W_2)		0.015	0.007
	Running parallelism of surface C against surface A		See the table on p. 8 for LM rail length and running parallelism by accuracy standard.	
	Running parallelism of surface D against surface B		See the table on p. 8 for LM rail length and running parallelism by accuracy standard.	

Please contact THK about HRX55 and HRX65.



LM Rail Dimensions

Unit: mm

Model No.	Rail dimensions					Weight
	W_1	M_1	F	$d_1 \times d_2 \times h$	Length (G, g)	LM rail (kg/m)
HRX25	23	21.5	60	7×11×9	3000 (20, 40)	3.25
HRX30	28	23.5	80	9×14×12	3000 (20, 20)	4.42
HRX35	34	29	80	9×14×12	3000 (20, 20)	6.33
HRX45	45	38	105	14×20×17	3000 (20, 40)	10.9

Static Safety Factor

To calculate a load applied to the LM Guide, you must first obtain the average load required to determine the service life and the maximum load needed to determine the static safety factor. 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).
The reference values for the static safety factor are shown in the table to the right.

Reference Values for the Static Safety Factor (f_S)

Machine	Load conditions	Lower limit of f_S
General industrial machinery	Without vibrations or impacts	3.0 to 6.0
	With vibrations or impacts	4.0 to 7.0
Machine tools	Without vibrations or impacts	3.0 to 6.0
	With vibrations or impacts	6.0 to 10.0

*The reference values of the static safety factor may vary depending on usage conditions such as environment, lubrication status, mounting surface accuracy, and/or rigidity.

$$f_S = \frac{C_0}{P_{max}} \cdots\cdots (1)$$

f_S : Static safety factor
C_o : Basic static load rating (N)
P_{max} : Maximum applied load (N)

Nominal Life and Service Life Time

Calculating the Nominal Life

The nominal life (L_{10}) is obtained from the following formulas using the basic dynamic load rating (C) and the calculated load acting on the LM Guide (P_C). For this calculation, the basic dynamic load is to be based on a nominal life of 50 km in case of an LM Guide with balls, or 100 km in case of an LM Guide with rollers.

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

$$L_{10} = \left(\frac{C}{P_C}\right)^3 \times 50 \cdots\cdots (2)$$

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)

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

*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

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

- LM Guide with rollers

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

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

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 (4) and (5).

● Modified factor α

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

α : Modified factor
f_H : Hardness factor (See the general catalog for details)
f_T : Temperature factor (See the general catalog for details)
f_C : Contact factor (See the general catalog for details)
f_W : Load factor (See the general catalog for details)

● Modified nominal life L_{10m}

- LM Guide with balls

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^3 \times 50 \cdots\cdots (4)$$

- LM Guide with rollers

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^{\frac{10}{3}} \times 100 \cdots\cdots (5)$$

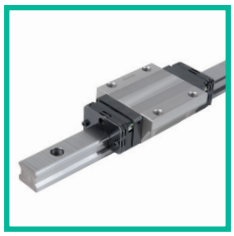
L_{10m} : Modified nominal life (km)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

Once the nominal life (L_{10}) has been obtained, the service life time can be obtained using the following formula if the stroke length and the number of cycles 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 : Cycles per minute (min^{-1})

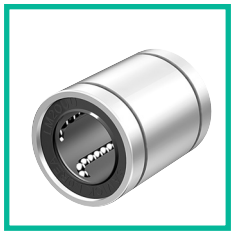
indunorm
Bewegungstechnik



THK-Linearführungen

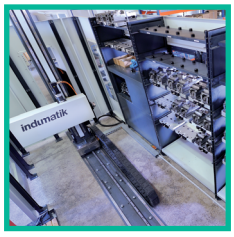
Laufrollen-Linearführungs-Systeme

Kugelgewindetriebe



Kugelbuchsen

Linearachsen
Achssysteme



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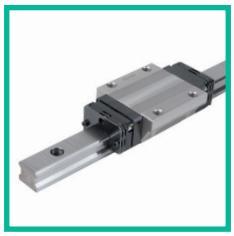
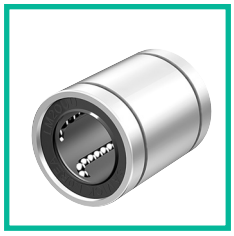


THK-Linearführungen

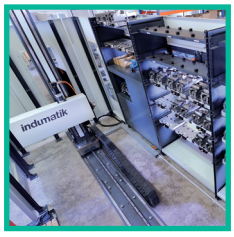
Stahl-Bogen-
Systeme

Kugelgewindetriebe



Kugelbuchsen

Linearachsen
Achssysteme



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