

2. LIMON Linear Guideway Classification

In an effort to meet customer's requirement and service needs LIMON offers several different types of guides. We supply the H series which is suitable for CNC machineries, the E series for automation industries, the R series for high rigidity applications, and the miniature series MN/MW for medical devices and semiconductor equipment, also for high technology industries, LIMON has developed the H and E series with high speed and quiet characteristics.

(1) Types & series

Table 2-1 Types & Series

Series	Assembly Height	Load	Square	Flange	Drilled hole	Combination
			Tap hole	Tap hole		
H	High	Heavy Load	HH-CA	-	-	-
		Super Heavy Load	HH-HA	-	-	-
	Low	Heavy Load	HL-CA	HW-CA	HW-CB	HW-CC
		Super Heavy Load	HL-HA	HW-HA	HW-HB	HW-HC
E	Low	Medium Load	EH-SA	EW-SA	EW-SB	EW-SC
		Heavy Load	EH-CA	EW-CA	EW-CB	EW-CC
MN	-	Standard	MN-M-C-O	-	-	-
		Long	MN-M-H-O	-	-	-
MW	-	Standard	MW-M-C-O	-	-	-
		Long	MW-M-H-O	-	-	-
QH	High	Heavy Load	HH-CA	-	-	-
		Super Heavy Load	HH-HA	-	-	-
	Low	Heavy Load	-	QHW-CA	QHW-CB	QHW-CC
		Super Heavy Load	-	QHW-HA	QHW-HB	QHW-HC
QE	Low	Medium Load	QEH-SA	QEW-SA	QEW-SB	-
		Heavy Load	QEH-CA	QEW-CA	QEW-CB	-
R	High	Heavy Load	RH-CA	-	-	-
		Super Heavy Load	RH-HA	-	-	-
	Low	Heavy Load	RL-CA	-	-	RW-CC
		Super Heavy Load	RL-HA	-	-	RW-HC

2-1 H Series - Heavy Load Ball Type Linear Guideway

H series linear guideways are designed with load capacity and rigidity higher than other similar products with circular-arc groove and structure optimization. It features equal load ratings in the radial, reverse radial and lateral directions, and self-aligning to absorb installation-error. Thus, LIMON H series linear guideways can achieve a long life with high speed, high accuracy and smooth linear motion.

2-1-1 Features of H Series

(1) Self-aligning capability

By design, the circular-arc groove has contact points at 45 degrees. H series can absorb most installation errors due to surface irregularities and provide smooth linear motion through the elastic deformation of rolling elements and the shift of contact points. Self-aligning capability, high accuracy and smooth operation can be obtained with an easy installation.

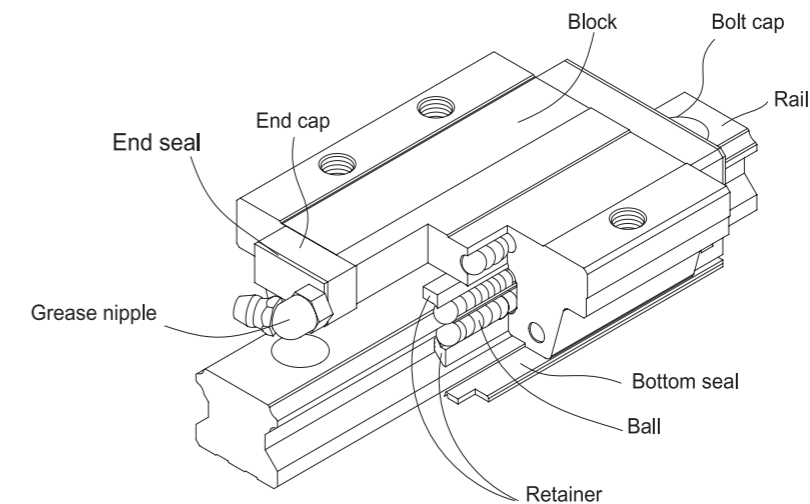
(2) Interchangeability

Because of precision dimensional control, the dimensional tolerance of H series can be kept in a reasonable range, which means that any blocks and any rails in a specific series can be used together while maintaining dimensional tolerance. And a retainer is added to prevent the balls from falling out when the blocks are removed from the rail.

(3) High rigidity in all four directions

Because of the four-row design, the H series linear guideway has equal load ratings in the radial, reverse radial and lateral directions. Furthermore, the circular-arc groove provides a wide-contact width between the balls and the groove raceway allowing large permissible loads and high rigidity.

2-1-2 Construction of H Series

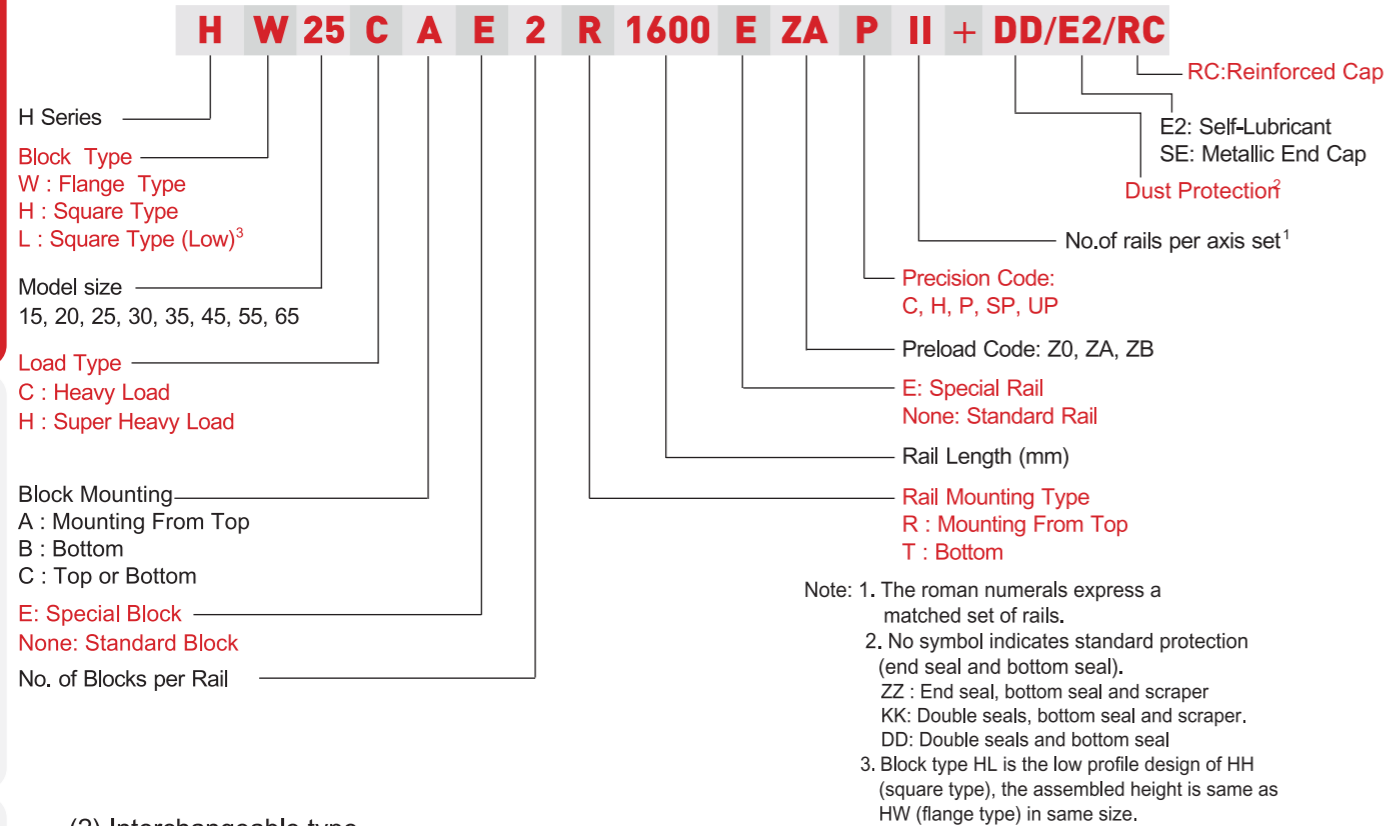


- Rolling circulation system: Block, Rail, End Cap and Retainer
- Lubrication system: Grease Nipple and Piping Joint
- Dust protection system: End seal, Bottom Seal, Bolt Cap, Double Seals and Scraper

2-1-3 Model Number of H Series

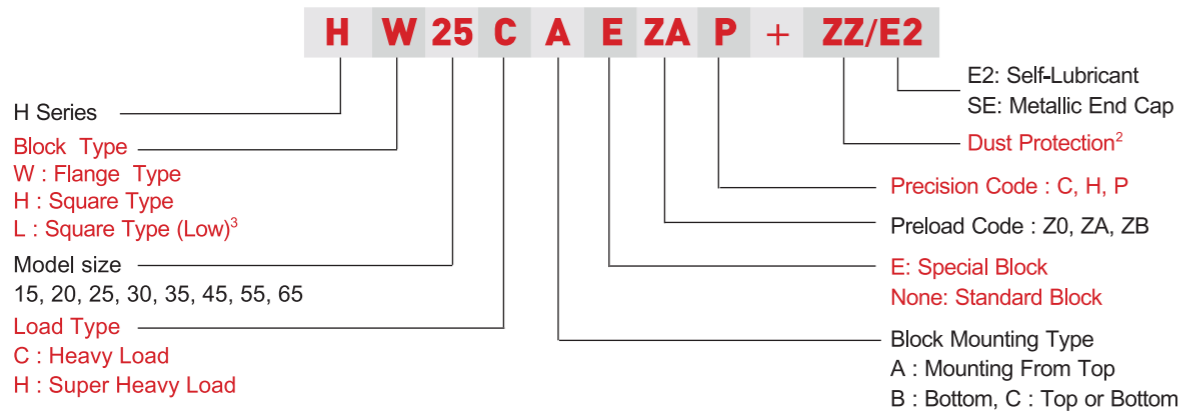
H series guideways can be classified into non-interchangeable and interchangeable types. The sizes are identical. The only difference between the two types is that the interchangeable type of blocks and rails can be freely exchanged, and their accuracy can reach up to P class. The model number of H series contains the size, type, accuracy class, preload class, etc..

(1) Non-interchangeable type

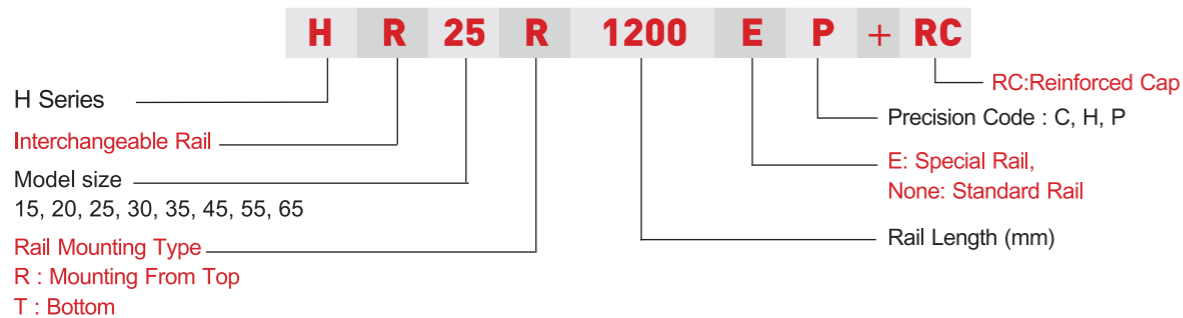


(2) Interchangeable type

□ Model Number of H Block



□ Model Number of H Rail



2-1-4 Types

(1) Block types

There're two types of blocks: flange and square. The flange type is suitable for heavy moment load application because of the lower assembly height and wider mounting surface.

Table 2-1-1 Block Types

Type	Model	Shape	Height (mm)	Rail Length (mm)	Main Application
Square	HH-CA HH-HA		28	100	<input type="checkbox"/> Machine Centers <input type="checkbox"/> NC Lathes <input type="checkbox"/> Grinding Machines <input type="checkbox"/> Precision Machining Machines <input type="checkbox"/> Heavy Cutting Machines <input type="checkbox"/> Automation Devices <input type="checkbox"/> Transportation Equipment <input type="checkbox"/> Measuring Equipment <input type="checkbox"/> Devices Requiring High Positional Accuracy
			90	4000	
Square	HL-CA HL-HA		24	100	<input type="checkbox"/> Machine Centers <input type="checkbox"/> NC Lathes <input type="checkbox"/> Grinding Machines <input type="checkbox"/> Precision Machining Machines <input type="checkbox"/> Heavy Cutting Machines <input type="checkbox"/> Automation Devices <input type="checkbox"/> Transportation Equipment <input type="checkbox"/> Measuring Equipment <input type="checkbox"/> Devices Requiring High Positional Accuracy
			70	4000	
Flange	HW-CA HW-HA		24	100	<input type="checkbox"/> Machine Centers <input type="checkbox"/> NC Lathes <input type="checkbox"/> Grinding Machines <input type="checkbox"/> Precision Machining Machines <input type="checkbox"/> Heavy Cutting Machines <input type="checkbox"/> Automation Devices <input type="checkbox"/> Transportation Equipment <input type="checkbox"/> Measuring Equipment <input type="checkbox"/> Devices Requiring High Positional Accuracy
			90	4000	
Flange	HW-CB HW-HB		24	100	<input type="checkbox"/> Machine Centers <input type="checkbox"/> NC Lathes <input type="checkbox"/> Grinding Machines <input type="checkbox"/> Precision Machining Machines <input type="checkbox"/> Heavy Cutting Machines <input type="checkbox"/> Automation Devices <input type="checkbox"/> Transportation Equipment <input type="checkbox"/> Measuring Equipment <input type="checkbox"/> Devices Requiring High Positional Accuracy
			90	4000	
Flange	HW-CC HW-HC		24	100	<input type="checkbox"/> Machine Centers <input type="checkbox"/> NC Lathes <input type="checkbox"/> Grinding Machines <input type="checkbox"/> Precision Machining Machines <input type="checkbox"/> Heavy Cutting Machines <input type="checkbox"/> Automation Devices <input type="checkbox"/> Transportation Equipment <input type="checkbox"/> Measuring Equipment <input type="checkbox"/> Devices Requiring High Positional Accuracy
			90	4000	

(2) Rail types

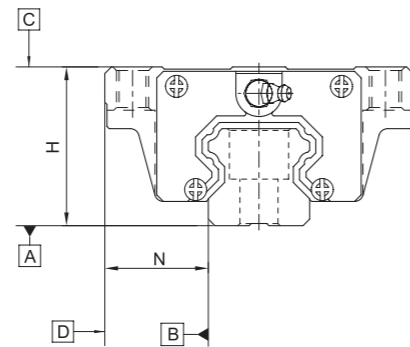
Besides the standard top mounting type, the bottom mounting type is also available.

Table 2-1-2 Rail Types



2-1-5 Accuracy

The accuracy of H series can be classified into normal (C), high (H), precision (P), super precision (SP), ultra precision (UP), five classes. Please choose the class by referring the accuracy of applied equipment.



(1) Accuracy of non-interchangeable guideways

Table 2-1-3 Accuracy Standards

Item	H - 15, 20				
	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
Dimensional tolerance of width N	± 0.1	± 0.03	0 -0.03	0 -0.015	0 -0.008
Variation of height H	0.02	0.01	0.006	0.004	0.003
Variation of width N	0.02	0.01	0.006	0.004	0.003
Running parallelism of block surface C to surface A	See Table 2-1-7				
Running parallelism of block surface D to surface B	See Table 2-1-7				

Table 2-1-4 Accuracy Standards

Item	H - 25, 30, 35				
	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
Dimensional tolerance of width N	± 0.1	± 0.04	0 -0.04	0 -0.02	0 -0.01
Variation of height H	0.02	0.015	0.007	0.005	0.003
Variation of width N	0.03	0.015	0.007	0.005	0.003
Running parallelism of block surface C to surface A	See Table 2-1-7				
Running parallelism of block surface D to surface B	See Table 2-1-7				

Table 2-1-5 Accuracy Standards

Item	H - 45, 55		
	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.05	± 0.025
Dimensional tolerance of width N	± 0.1	± 0.05	± 0.025
Variation of height H	0.03	0.015	0.007
Variation of width N	0.03	0.02	0.01
Running parallelism of block surface C to surface A	See Table 2-1-7		
Running parallelism of block surface D to surface B	See Table 2-1-7		

Table 2-1-6 Accuracy Standards

Item	H - 65		
	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.07	± 0.035
Dimensional tolerance of width N	± 0.1	± 0.07	± 0.035
Variation of height H	0.03	0.02	0.01
Variation of width N	0.03	0.025	0.015
Running parallelism of block surface C to surface A	See Table 2-1-7		
Running parallelism of block surface D to surface B	See Table 2-1-7		

(2) Accuracy of running parallelism

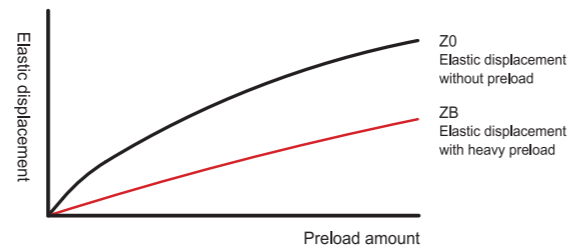
Table 2-1-7 Accuracy of Running Parallelism

Rail Length (mm)	Accuracy (μm)				
	C	H	P	SP	UP
~ 100	12	7	3	2	2
100 ~ 200	14	9	4	2	2
200 ~ 300	15	10	5	3	2
300 ~ 500	17	12	6	3	2
500 ~ 700	20	13	7	4	2
700 ~ 900	22	15	8	5	3
900 ~ 1,100	24	16	9	6	3
1,100 ~ 1,500	26	18	11	7	4
1,500 ~ 1,900	28	20	13	8	4
1,900 ~ 2,500	31	22	15	10	5
2,500 ~ 3,100	33	25	18	11	6
3,100 ~ 3,600	36	27	20	14	7
3,600 ~ 4,000	37	28	21	15	7

2-1-6 Preload

(1) Definition

A preload can be applied to each guideway. Oversized balls are used. Generally, a linear motion guideway has a negative clearance between groove and balls in order to improve stiffness and maintain high precision. The figure shows the load is multiplied by the preload, the rigidity is doubled and the deflection is reduced by one half. The preload no larger than ZA would be recommended for the model size under H20 to avoid an over-preload affecting the guideway's life.



(2) Preload classes

LIMON offers three classes of standard preload for various applications and conditions.

Table 2-1-8 Preload Classes

Class	Code	Preload	Condition	Examples of Application
Light Preload	Z0	0~ 0.02C	Certain load direction, low impact, low precision required	Transportation devices, auto-packing machines, X-Y axis for general industrial machines, welding machines, welders
Medium Preload	ZA	0.05C~0.07C	High precision required	Machining centers, Z axis for general industrial machines, EDM, NC lathes, Precision X-Y tables, measuring equipment
Heavy Preload	ZB	0.10C~ 0.12C	High rigidity required, with vibration and impact	Machining centers, grinding machines, NC lathes, horizontal and vertical milling machines, Z axis of machine tools, Heavy cutting machines

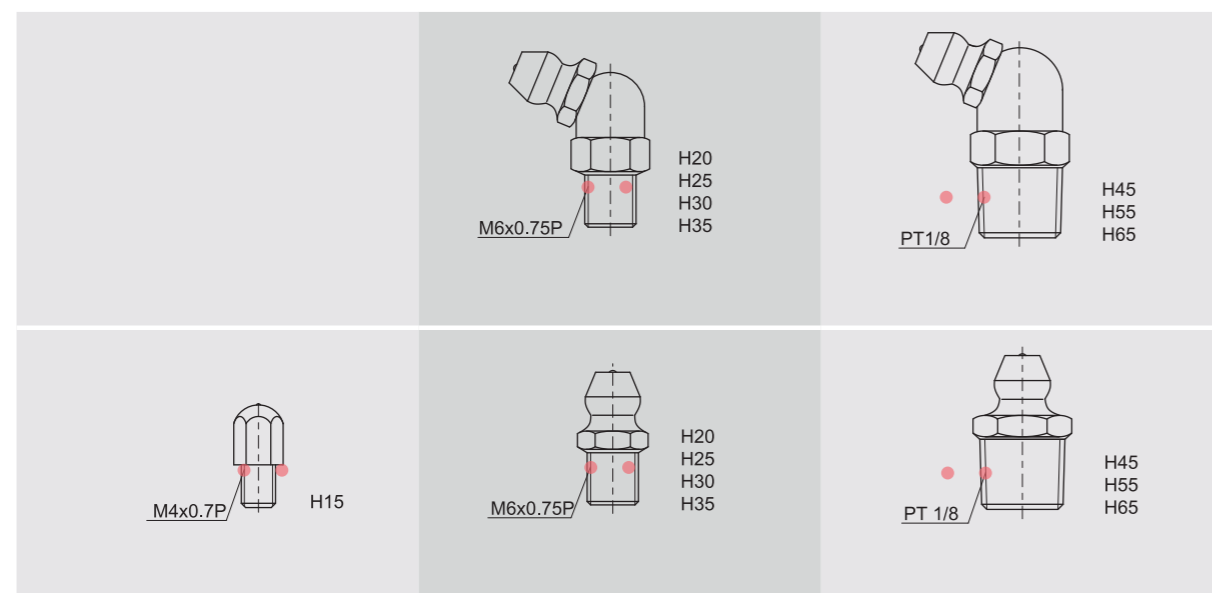
Class	Interchangeable Guideway	Non-Interchangeable Guideway
Preload classes	Z0, ZA	Z0, ZA, ZB

Note: The "C" in the preload column denotes basic dynamic load rating.

2-1-7 Lubrication

(1) Grease

- Grease nipple



- Mounting location

The standard location of the grease fitting is at both ends of the block, but the nipple can be mounted at each side of block. For lateral installation, we recommend that the nipple be mounted at the non-reference side, otherwise please contact us. It is possible to perform lubrication by using the oil-piping joint.

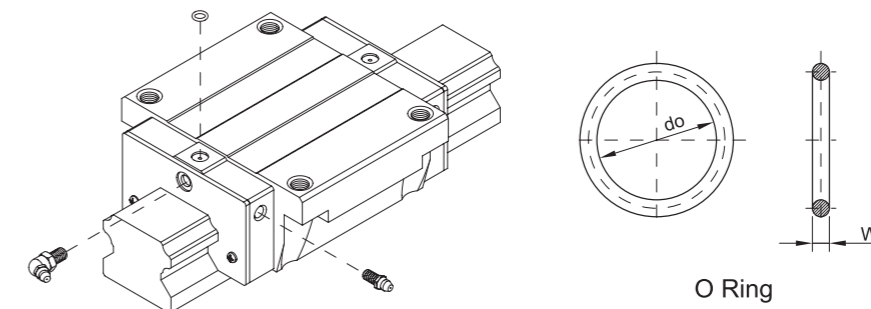
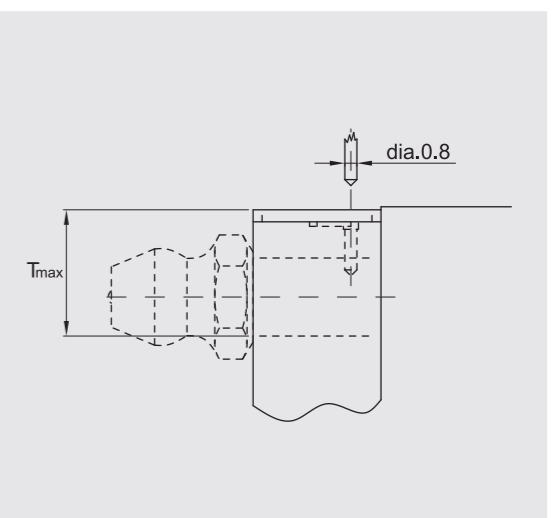


Table 2-1-9 O-Ring size and max. permissible depth for piercing

Size	O-Ring		Lube hole at top: max. permissible depth for piercing
	do (mm)	W (mm)	T _{max} (mm)
H15	2.5±0.15	1.5±0.15	3.75
H20	4.5±0.15	1.5±0.15	5.7
H25	4.5±0.15	1.5±0.15	5.8
H30	4.5±0.15	1.5±0.15	6.3
H35	4.5±0.15	1.5±0.15	8.8
H45	4.5±0.15	1.5±0.15	8.2
H55	4.5±0.15	1.5±0.15	11.8
H65	4.5±0.15	1.5±0.15	10.8



- The lubricant amount for a block filled with grease

Table 2-1-10 The lubricant Amount for a Block Filled with Grease

Size	Heavy load (cm ³)	Super heavy load (cm ³)	Size	Heavy load (cm ³)	Super heavy load (cm ³)
H15	1	-	H35	10	12
H20	2	3	H45	17	21
H25	5	6	H55	26	33
H30	7	8	H65	50	61

- Frequency of replenishment

Check the grease every 100 km, or every 3-6 months.

Oil refilling rate
Table 2-1-11

Size	Refilling rate (cm ³ /hr)	Size	Refilling rate (cm ³ /hr)
H15	0.2	H35	0.3
H20	0.2	H45	0.4
H25	0.3	H55	0.5
H30	0.3	H65	0.6

2-1-8 Dust Proof Accessories

(1) Codes of standard dust proof accessories

If the following accessories are needed, please add the code followed by the model number.

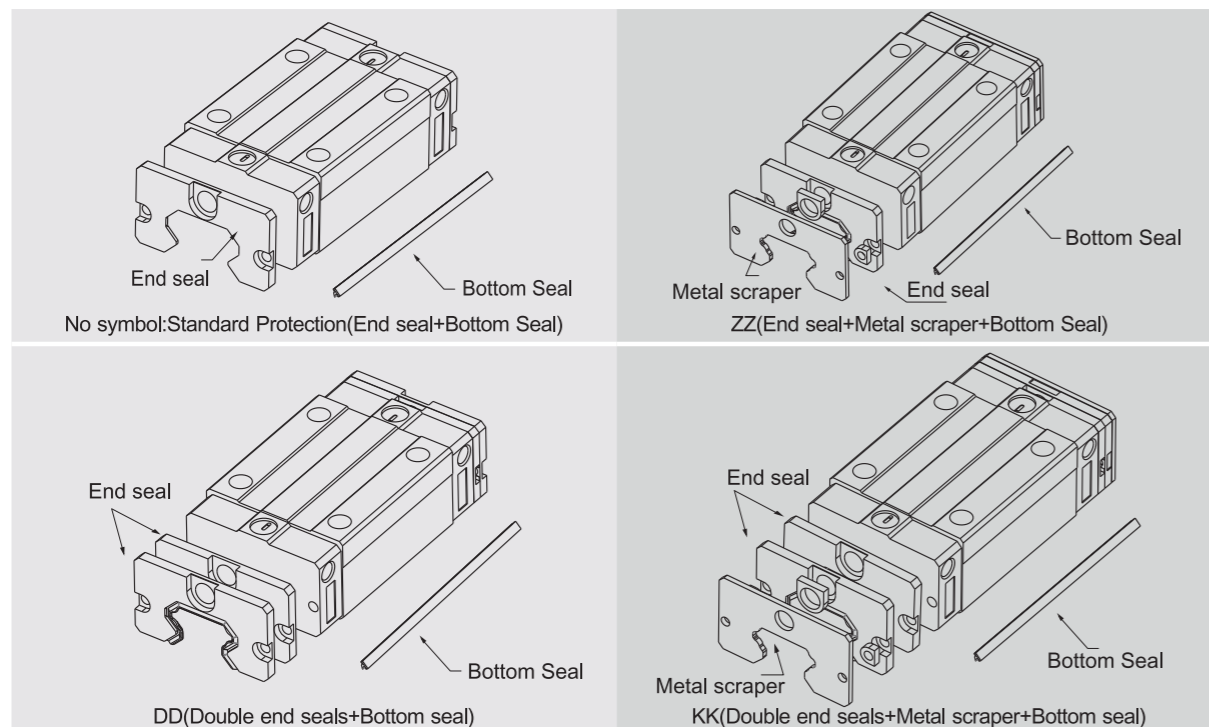


Table 2-1-12 Overall block length (L) unit:mm

Size	SS	ZZ	DD	KK
H15C	60.5	64.1	65.5	69.1
H20C	76.7	80.3	82.5	86.1
H20H	91.4	95	97.2	100.8
H25C	84	87.6	90	93.6
H25H	104.6	108.2	110.6	114.2
H30C	98.4	102	104.6	108.2
H30H	121.4	125	127.6	131.2
H35C	112.4	116	118.8	122.4
H35H	138.2	141.8	144.6	148.2
H45C	137.4	141	145.4	149
H45H	169.2	172.8	177.2	180.8

(4) Function of dust proof accessories

End seal and bottom seal

To prevent life reduction caused by iron chips or dust entering the block.

Double seals

Enhances the wiping effect, foreign matter can be completely wiped off.

Table 2-1-13 Dimensions of end seal

Size	Thickness (t1) (mm)	Size	Thickness (t1) (mm)
H15 ES	3	H35 ES	3.2
H20 ES	3.5	H45 ES	4.5
H25 ES	3.5	H55 ES	4.5
H30 ES	3.2	H65 ES	6

Scraper

The scraper removes high-temperature iron chips and larger foreign objects.

Table 2-1-14 Dimensions of scraper

Size	Thickness (t2) (mm)	Size	Thickness (t2) (mm)
H15 SC	1.5	H35 SC	1.5
H20 SC	1.5	H45 SC	1.5
H25 SC	1.5	H55 SC	1.5
H30 SC	1.5	H65 SC	1.5

Top Seal

Top seal can efficiently avoid dust from the surface of rail or tapping hole getting inside the block.

Bolt caps for rail mounting holes

Caps are used to cover the mounting holes to prevent chips or other foreign objects from collecting in the holes. The caps will be enclosed in each rail package.

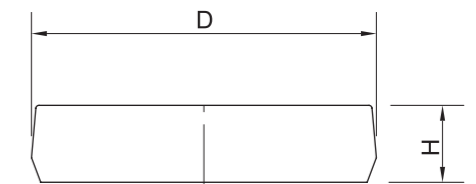
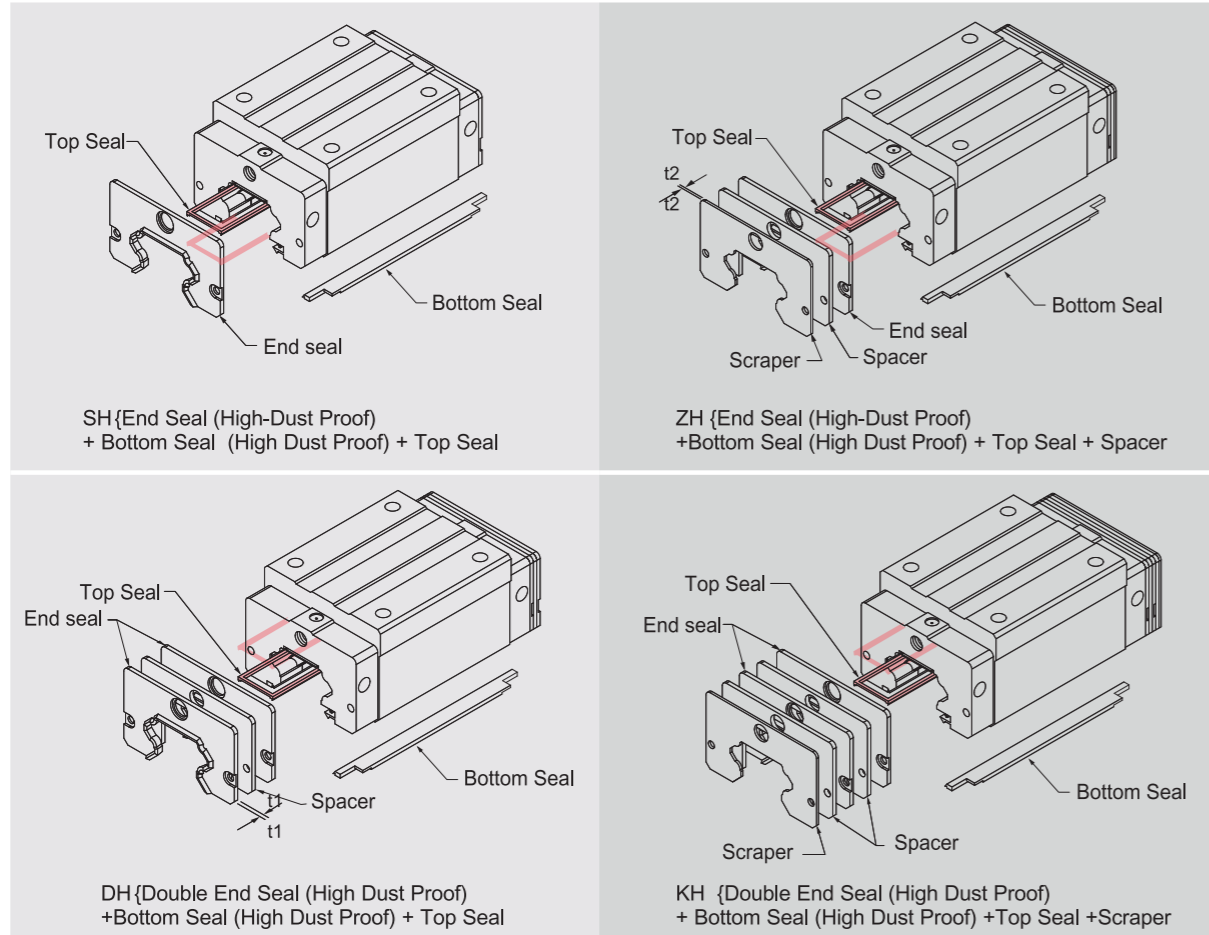


Table 2-1-15 Dimensions of Bolt Caps for Rail Mounting Holes

Rail size	Bolt size	Diameter(D) (mm)	Thickness(H) (mm)	Rail size	Bolt size	Diameter(D) (mm)	Thickness(H) (mm)
HR15	M4	7.65	1.1	HR35	M8	14.25	3.3
HR20	M5	9.65	2.2	HR45	M12	20.25	4.6
HR25	M6	11.2	2.5	HR55	M14	23.5	5.5
HR30	M8	14.25	3.3	HR65	M16	26.6	5.5

(2) Codes of high-dust proof accessories

LIMON develops many kinds of dust proof accessories for different application and working environment to avoid dust or debris. If the following accessories are needed, please add the code followed by the model number.



Note: 1. The available size for high dust proof accessories are HH20(C/H), 25(C/H), 30(C/H), 35(C/H) and 45C.
2. The value of friction force will increase 0.6~1.2 kgf.

2-1-9 Friction

The maximum value of resistance per end seal are as shown in the table.

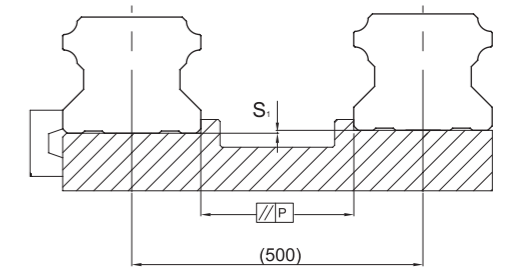
Table 2-1-16 Seal Resistance

Size	Resistance N (kgf)	Size	Resistance N (kgf)
H15	1 (0.1)	H35	3 (0.31)
H20	1.7 (0.1)	H45	4 (0.41)
H25	2 (0.2)	H55	5 (0.51)
H30	2.6 (0.27)	H65	6 (0.61)

Note: 1kgf=9.81N

2-1-10 The Accuracy Tolerance of Mounting Surface

(1) The accuracy tolerance of rail-mounting surface
Because of the Circular-arc contact design, the H linear guideway can compensate for some surface-error on installation and still maintain smooth linear motion. As long as the accuracy requirements for the mounting surface are followed, high accuracy and rigidity of linear motion of the guideway can be obtained without any difficulty. In order to satisfy the needs of fast installation and smooth movement, LIMON offers the normal clearance type of preload to customers of its high absorption ability of the deviation in mounting surface accuracy.



(2) The parallelism tolerance of reference surface (P)

Table 2-1-17 Max. Parallelism Tolerance (P)

unit: μm

Size	Preload classes		
	Z0	ZA	ZB
H15	25	18	13
H20	25	20	18
H25	30	22	20
H30	40	30	27
H35	50	35	30
H45	60	40	35
H55	70	50	45
H65	80	60	55

(3) The accuracy tolerance of reference surface height

Table 2-1-18 Max. Tolerance of Reference Surface Height (S_1)

unit: μm

Size	Preload classes		
	Z0	ZA	ZB
H15	130	85	35
H20	130	85	50
H25	130	85	70
H30	170	110	90
H35	210	150	120
H45	250	170	140
H55	300	210	170
H65	350	250	200

2-1-11 Cautions for Installation

(1) Shoulder heights and fillets

Improper shoulder heights and fillets of mounting surfaces will cause a deviation in accuracy and the interference with the chamfered part of the rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

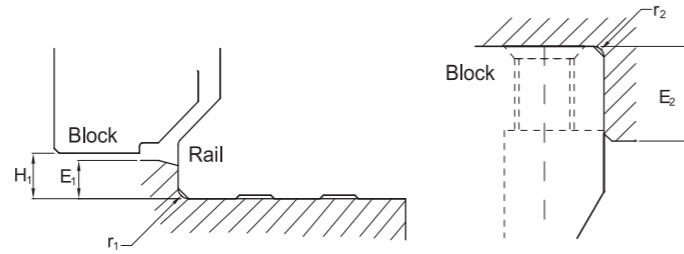


Table 2-1-19 Shoulder Heights and Fillets

Size	Max. radius of fillets r_1 (mm)	Max. radius of fillets r_2 (mm)	Shoulder height of the rail E_1 (mm)	Shoulder height of the block E_2 (mm)	Clearance under block H_1 (mm)
H15	0.5	0.5	3	4	4.3
H20	0.5	0.5	3.5	5	4.6
H25	1.0	1	5	5	5.5
H30	1.0	1	5	5	6
H35	1.0	1	6	6	7.5
H45	1.0	1	8	8	9.5
H55	1.5	1.5	10	10	13
H65	1.5	1.5	10	10	15

(2) Tightening Torque of Bolts for Installation

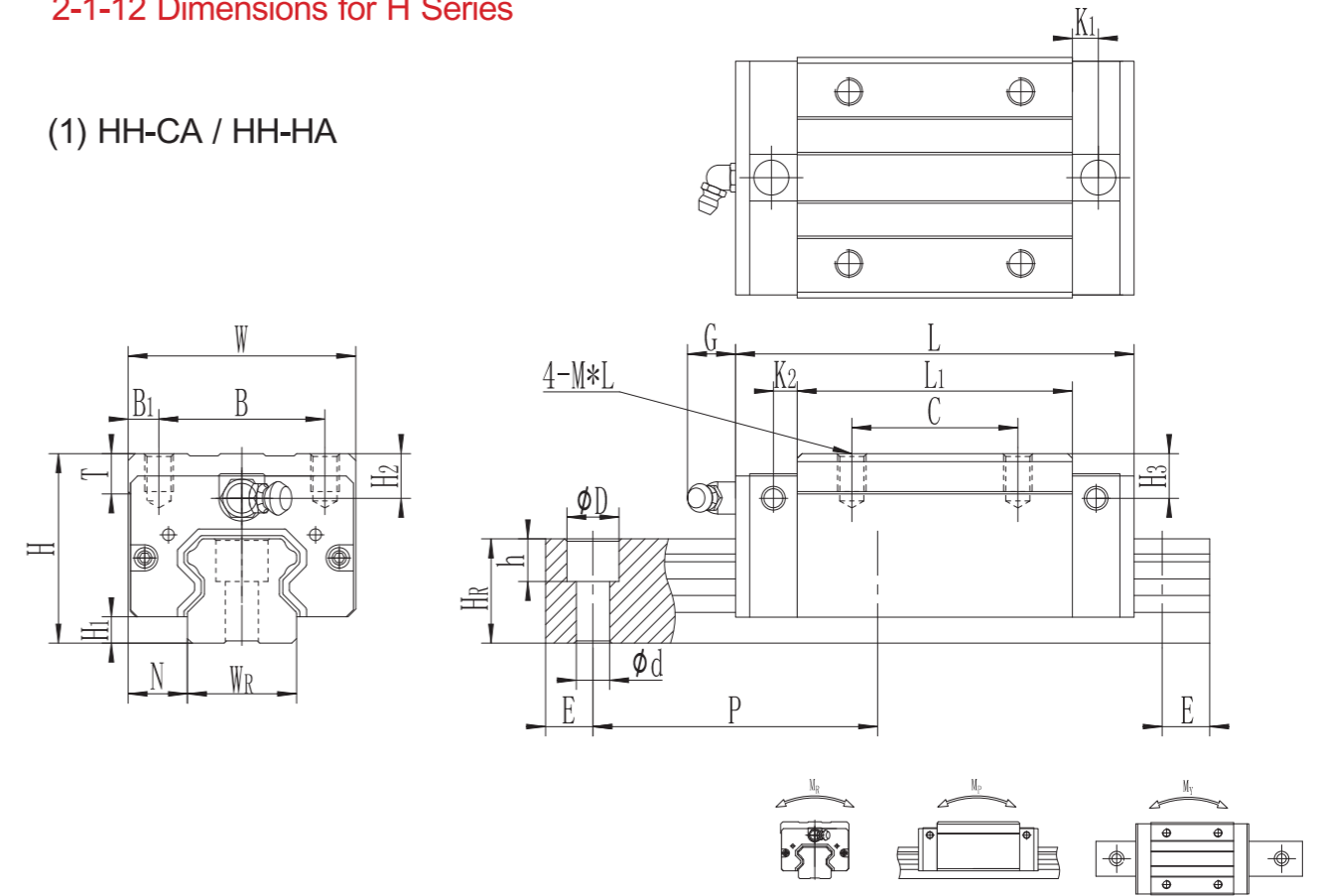
Improper tightening of bolts will seriously influence the accuracy of Linear Guideway installation. The following tightening torques for different sizes of bolts are recommended.

Table 2-1-20 Mounting Torque

Size	Bolt size	Torque N-cm (kgf-cm)		
		Iron	Casting	Aluminum
H15	M4×0.7P×16L	392 (40)	274 (28)	206 (21)
H20	M5×0.8P×16L	883 (90)	588 (60)	441 (45)
H25	M6×1P×20L	1373 (140)	921 (94)	686 (70)
H30	M8×1.25P×25L	3041 (310)	2010 (205)	1470 (150)
H35	M8×1.25P×25L	3041 (310)	2010 (205)	1470 (150)
H45	M12×1.75P×35L	11772 (1200)	7840 (800)	5880 (600)
H55	M14×2P×45L	15696 (1600)	10500 (1100)	7840 (800)
H65	M16×2P×50L	19620 (2000)	13100 (1350)	9800 (1000)

2-1-12 Dimensions for H Series

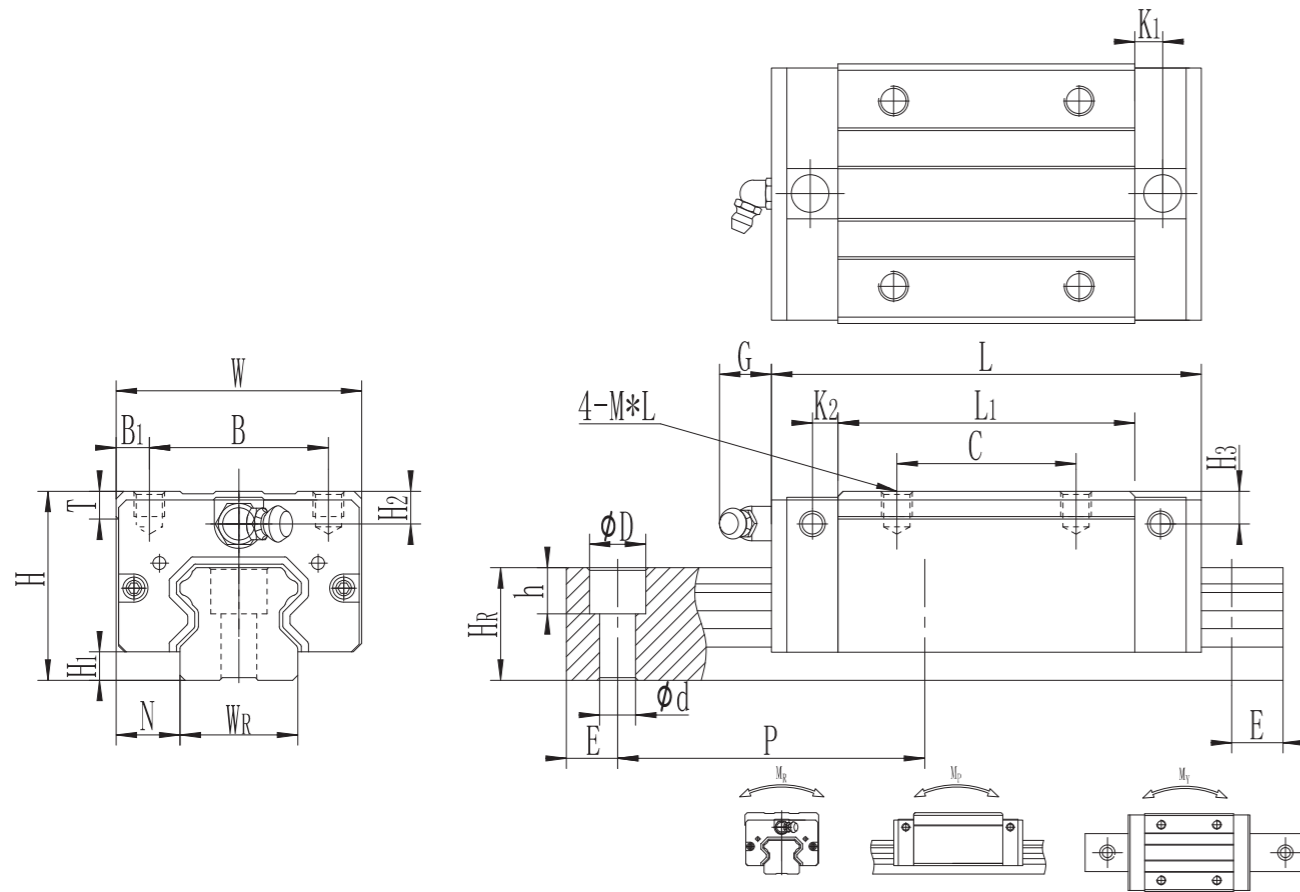
(1) HH-CA / HH-HA



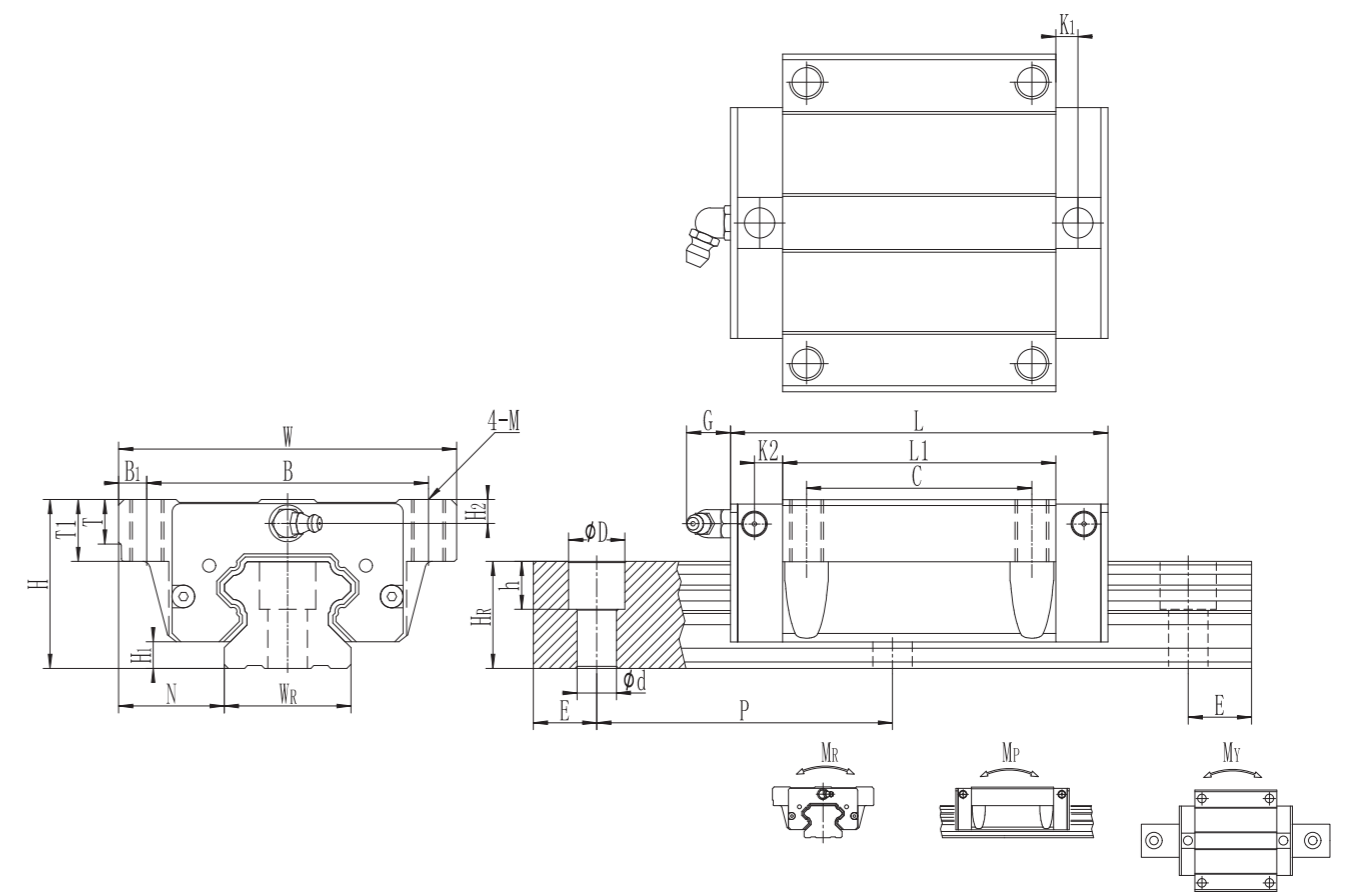
Model No.	Dimensions of Assembly (mm)		Dimensions of Block(mm)													Dimensions of Rail (mm)					Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating C(KN)	Basic Static Load Rating CO (KN)	Static Rated Moment			Weight						
	H	H1	N	W	B	B1	C	L1	L	K1	K2	G	M*1	T	H2	H3	WR	HR	D	h				d	P	E	MR (KN-m)	MP (KN-m)	MY (KN-m)	Block kg	Rail kg/m		
HH15CA	28	4.4	9.5	34	26	4	26	39.5	61.1	3.35	4.75	5.5	M4×5	6	8	8	15	15	7.5	5.3	4.5	60	20	M4×16	10.59	16.19	0.11	0.09	0.09	0.20	1.42		
HH20CA	30	4.3	12	44	32	6	36	50.5	76.5	5	6	12	M5×6	8	6	6	20	17.5	9.5	8.5	6	60	20	M5×16	17.2	25.6	0.25	0.18	0.18	0.33	2.2		
HH20HA							50	65.2	91.2																								
HH25CA	40	5.6	12.5	48	35	6.5	35	58	82	5	6	12	M6×8	8	10	9.5	23	22	11	9	7	60	20	M6×20	25.11	36.42	0.41	0.32	0.32	0.53	3.25		
HH25HA							50	78.6	102.6																								
HH30CA	45	6	16	60	40	10	40	70	98	6.5	5.5	12	M8×10	8.5	10	9	28	26	14	12	9	80	20	M8×25	34.93	49.58	0.58	0.5	0.5	0.90	4.49		
HH30HA							60	93	121																								
HH35CA	55	7.4	18	70	50	10	50	80	112	5.5	6.5	12	M8×12	10.2	16	15	34	29	14	12	9	80	20	M8×25	48.5	57.6	1.08	0.78	0.78	1.50	6.36		
HH35HA							72	105.8	137.8																								
HH45CA	70	9.5	20.5	86	60	13	60	97	137	4.8	8	13	M10×17	16	21	20	45	38	20	17	14	105	22.5	M12×35	75.26	100.2	1.8	1.35	1.35	2.75	10.45		
HH45HA							80	128.8	168.8																								
HH55CA	80	13	23.5	100	75	12.5	75	117.7	161.7	6	11	13	M12×18	17.5	22	29	53	44	23	20	16	120	30	M14×45	112.33	145.64	3.59	2.5	2.5	4.20	15.12		
HH55HA							95	155.8	199.8																								
HH65CA	90	15	31.5	126	76	25	70	144.2	194.2	6	14	13	M16×20	25	35	35	63	53	26	22	18	150	35	M16×50	160.22	210.37	6.45	4.18	4.18	9.25	21.25		
HH65HA							120	203.6	253.6																								

Note : 1 kgf = 9.81 N

(2) HL-CA / HL-HA



(3) HW-CA / HW-HA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)												Dimensions of Rail (mm)					Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating C(KN)	Basic Static Load Rating C0(KN)	Static Rated Moment			Weight				
	H	H ₁	N	W	B	B ₁	C	L ₁	L	K ₁	K ₂	G	M	T	H ₂	H ₃	W _R	H _R	D	h				d	P	E	M _R (KN-m)	M _P (KN-m)	M _Y (KN-m)	Block (kg)	Rail (kg/m)
HL15CA	24	4.4	9.5	34	26	4	26	39.5	61.1	3.35	4.75	5.5	M4×4	6	4	4	15	15	7.5	5.3	4.5	60	20	M4×16	10.59	16.19	0.11	0.09	0.09	0.20	1.42
HL25CA	36	5.6	12.5	48	35	6.5	35	58	82	5	6	12	M6×6	8	6	5.5	23	22	11	9	7	60	20	M6×20	25.11	36.42	0.41	0.32	0.32	0.53	3.25
HL25HA							50	78.6	102.6																						
HL30CA	42	6	16	60	40	10	40	70	98	6.5	5.5	12	M8×10	8.5	7	6	28	26	14	12	9	80	20	M8×25	34.93	49.58	0.58	0.5	0.5	0.90	4.49
HL30HA							60	93	121																						
HL35CA	48	7.4	18	70	50	10	50	80	112	5.5	6.5	12	M8×9	10.2	9	8	34	29	14	12	9	80	20	M8×25	48.5	57.6	1.08	0.78	0.78	1.50	6.36
HL35HA							72	105.8	137.8																						
HL45CA	60	9.5	20.5	86	60	13	60	97	137	4.8	8	13	M10×13	16	11	10	45	38	20	17	14	105	22.5	M12×35	75.26	100.2	1.8	1.35	1.35	2.75	10.45
HL45HA							80	128.8	168.8																						
HL55CA	70	13	23.5	100	75	12.5	75	117.7	161.7	6	11	13	M12×18	17.5	12	19	53	44	23	20	16	120	30	M14×45	112.33	145.64	3.59	2.5	2.5	4.20	15.12
HL55HA							95	155.8	199.8																						

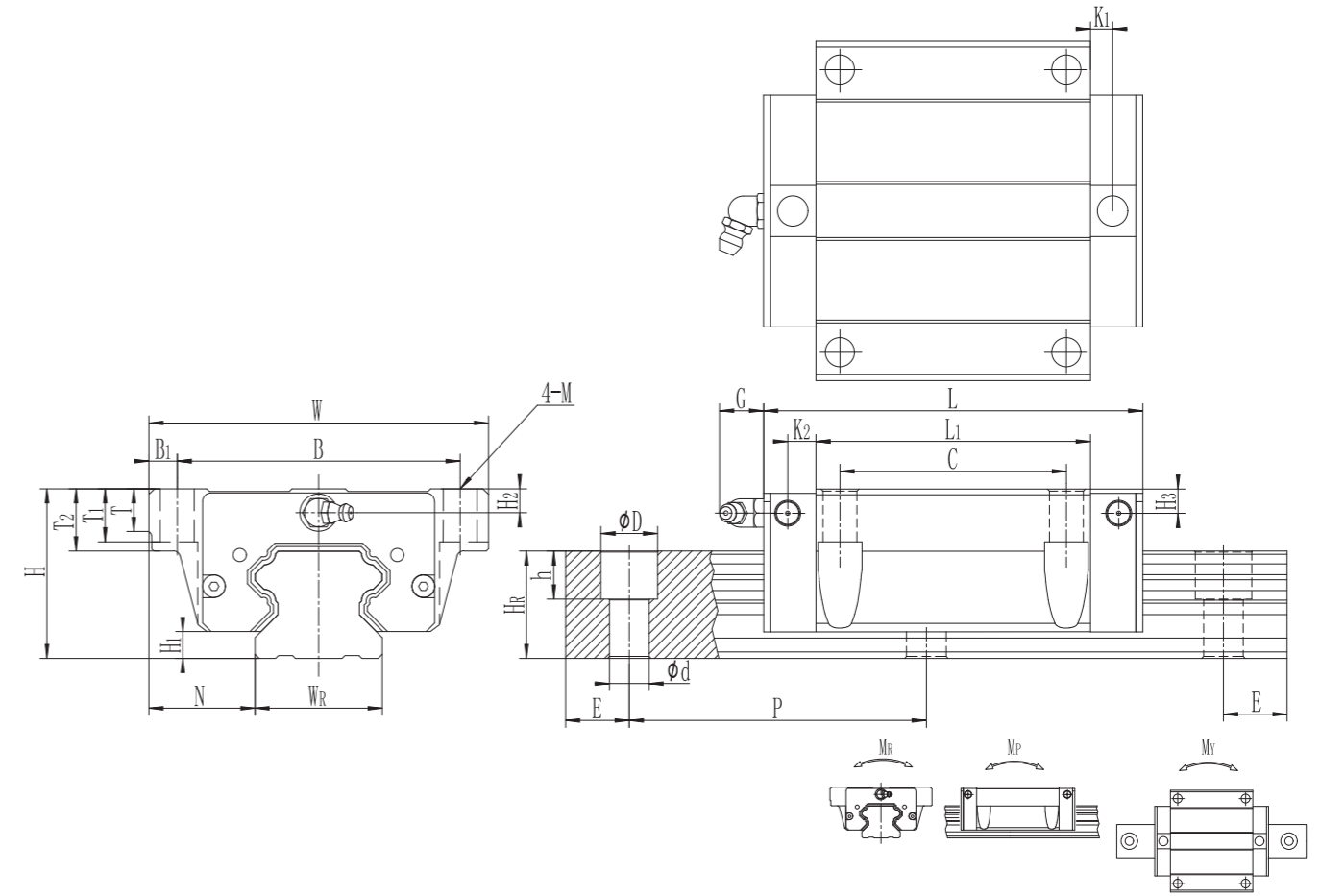
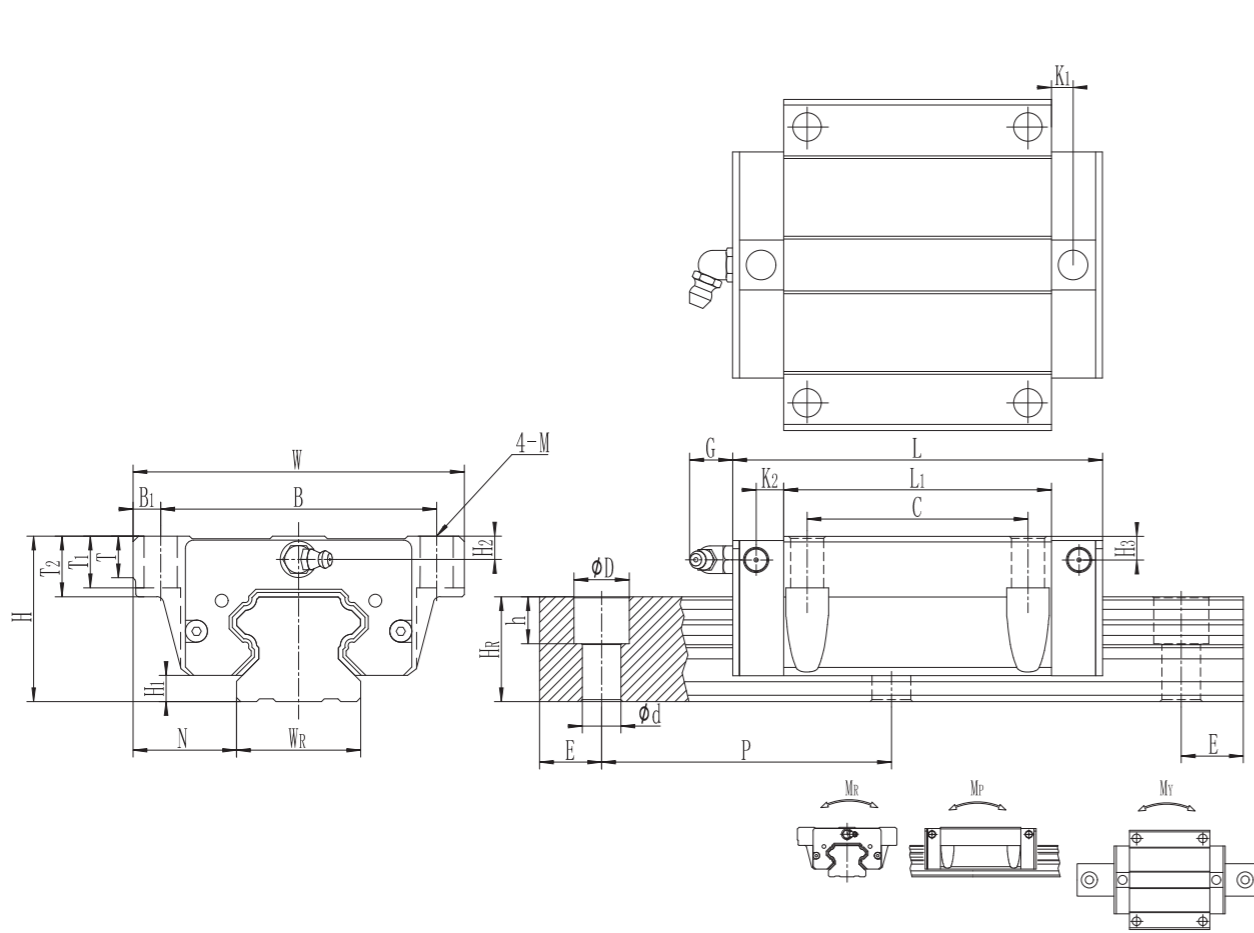
Note : 1 kgf = 9.81 N

Model No.	Dimensions of Assembly (mm)			Dimensions of Block(mm)												Dimensions of Rail (mm)					Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating C(KN)	Basic Static Load Rating C0(KN)	Static Rated Moment			Weight					
	H	H ₁	N	W	B	B ₁	C	L ₁	L	K ₁	K ₂	G	M	T	T ₁	H ₂	H ₃	W _R	H _R	D				h	d	P	E	M _R (KN-m)	M _P (KN-m)	M _Y (KN-m)	Block (kg)	Rail (kg/m)
HW15CA	24	4.4	16	47	38	4.5	30	39.5	61.1	3.35	4.75	5.5	M5	6	8.9	4	4	15	15	7.5	5.3	4.5	60	20	M4×16	10.59	16.19	0.11	0.09	0.09	0.20	1.42
HW20CA	30	4.3	21.5	63	53	5	40	50.5	76.5	5	6	12	M6	8	10	6	6	20	17.5	9.5	8.5	6	60	20	M5×16	17.2	25.6	0.25	0.18	0.18	0.33	2.2
HW20HA							65.2	91.2																								
HW25CA	36	5.6	23.5	70	57	6.5	45	58	82	5	6	12	M8	8	14	6	5.5	23	22	11	9	7	60	20	M6×20	25.11	36.42	0.41	0.32	0.32	0.53	3.25
HW25HA							78.6	102.6																								
HW30CA	42	6	31	90	72	9	52	70	98	6.5	5.5	12	M10	8.5	16	7	6	28	26	14	12	9	80	20	M8×25	34.93	49.58	0.58	0.5	0.5	0.90	4.49
HW30HA							93	121																								
HW35CA	48	7.4	33	100	82	9	62	80	112	5.5	6.5	12	M10	10	18	9	8	34	29	14	12	9	80	20	M8×25	48.5	57.6	1.08	0.78	0.78	1.50	6.36
HW35HA							105.8	137.8																								
HW45CA	60	9.5	37.5	120	100	10	80	97	137	4.8	8	13	M12	15	22	11	10	45	38	20	17	14	105	22.5	M12×35	75.26	100.2	1.8	1.35	1.35	2.75	10.45
HW45HA							128.8	168.8																								
HW55CA	70	13	43.5	140	116	12	95	117.7	161.7	6	11	13	M14	17.5	26.5	12	19	53	44	23	20	16	120	30	M14×45	112.33	145.64	3.59	2.5	2.5	4.20	15.12
HW55HA							155.8	199.8																								
HW65CA	90	15	53.5	170	142	14	110	144.2	194.2	6	14	13	M16	25	37.5	15	15	63	53	26	22	18	150	35	M16×50	160.22	210.37	6.45	4.18	4.18	9.25	21.25
HW65HA							203.6	253.6																								

Note : 1 kgf = 9.81 N

(4) HW-CB / HW-HB

(5) HW-CC / HW-HC



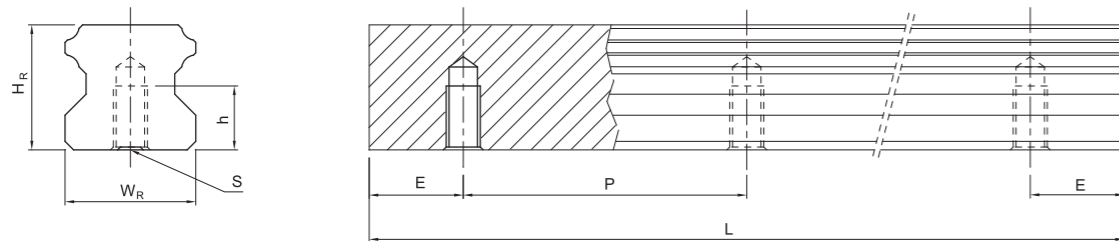
Model No.	Dimensions of Assembly (mm)			Dimensions of Block(mm)														Dimensions of Rail (mm)					Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating					Basic Static Load Rating					Static Rated Moment			Weight	
	H	H ₁	N	W	B	B ₁	C	L ₁	L	K ₁	K ₂	G	M	T	T ₁	T ₂	H ₂	H ₃	W _R	H _R	D	h		d	P	E	(mm)	C(KN)	C ₀ (KN)	M _R KN-m	M _P KN-m	M _Y KN-m	Block kg	Rail kg/m				
HW15CB	24	4.4	16	47	38	4.5	30	39.5	61.1	3.35	4.75	5.5	φ4.5	6	8.9	7	4	4	15	15	7.5	5.3	4.5	60	20	M4×16	10.59	16.19	0.11	0.09	0.09	0.20	1.42					
HW20CB	30	4.3	21.5	63	53	5	40	50.5	76.5		5	6	12	φ6	8	10	9	6	6	20	17.5	9.5	8.5	6	60	20	M5×16	17.2	25.6	0.25	0.18	0.18	0.33		2.2			
HW20HB								65.2	91.2																													
HW25CB	36	5.6	23.5	70	57	6.5	45	58	82		5	6	12	φ7	8	14	10	6	5.5	23	22	11	9	7	60	20	M6×20	25.11	36.42	0.41	0.32	0.32	0.53		3.25			
HW25HB								78.6	102.6																													
HW30CB	42	6	31	90	72	9	52	70	98		6.5	5.5	12	φ9	8.5	16	10	7	6	28	26	14	12	9	80	20	M8×25	34.93	49.58	0.58	0.5	0.5	0.90		4.49			
HW30HB								93	121																													
HW35CB	48	7.4	33	100	82	9	62	80	112		5.5	6.5	12	φ9	10	18	13	9	8	34	29	14	12	9	80	20	M8×25	48.5	57.6	1.08	0.78	0.78	1.50		6.36			
HW35HB								105.8	137.8																													
HW45CB	60	9.5	37.5	120	100	10	80	97	137		4.8	8	13	φ11	15	22	15	11	10	45	38	20	17	14	105	22.5	M12×35	75.26	100.2	1.8	1.35	1.35	2.75		10.45			
HW45HB								128.8	168.8																													
HW55CB	70	13	43.5	140	116	12	95	117.7	161.7		6	11	13	φ14	17.5	26.5	17	12	19	53	44	23	20	16	120	30	M14×45	112.33	145.64	3.59	2.5	2.5	4.20		15.12			
HW55HB								155.8	199.8																													
HW65CB	90	15	53.5	170	142	14	110	144.2	194.2		6	14	13	φ16	25	37.5	23	15	15	63	53	26	22	18	150	35	M16×50	160.22	210.37	6.45	4.18	4.18	9.25		21.25			
HW65HB								203.6	253.6																													

Note : 1 kgf = 9.81 N

Model No.	Dimensions of Assembly (mm)			Dimensions of Block(mm)														Dimensions of Rail (mm)					Mounting Bolt for Rail (mm)	Basic Dynamic Load Rating					Basic Static Load Rating					Static Rated Moment			Weight	
	H	H ₁	N	W	B	B ₁	C	L ₁	L	K ₁	K ₂	G	M	T	T ₁	T ₂	H ₂	H ₃	W _R	H _R	D	h		d	P	E	(mm)	C(KN)	C ₀ (KN)	M _R KN-m	M _P KN-m	M _Y KN-m	Block kg	Rail kg/m				
HW15CC	24	4.4	16	47	38	4.5	30	39.5	61.1	3.35	4.75	5	M5	6	7	8.9	4	4	15	15	7.5	5.3	4.5	60	20	M4×16	10.59	16.19	0.11	0.09	0.09	0.20	1.42					
HW20CC	30	4.3	21.5	63	53	5	40	50.5	76.5		5	6	12	M6	8	9	10	6	6	20	17.5	9.5	8.5	6	60	20	M5×16	17.2	25.6	0.25	0.18	0.18	0.33		2.2			
HW20HC								65.2	91.2																													
HW25CC	36	5.6	23.5	70	57	6.5	45	58	82		5	6	12	M8	8	10	14	6	5.5	23	22	11	9	7	60	20	M6×20	25.11	36.42	0.41	0.32	0.32	0.53		3.25			
HW25HC								78.6	102.6																													
HW30CC	42	6	31	90	72	9	52	70	98		6.5	5.5	12	M10	8.5	10	16	7	6	28	26	14	12	9	80	20	M8×25	34.93	49.58	0.58	0.5	0.5	0.90		4.49			
HW30HC								93	121																													
HW35CC	48	7.4	33	100	82	9	62	80	112		5.5	6.5	12	M10	10	13	18	9	8	34	29	14	12	9	80	20	M8×25	48.5	57.6	1.08	0.78	0.78	1.50		6.36			
HW35HC								105.8	137.8																													
HW45CC	60	9.5	37.5	120	100	10	80	97	137		4.8	8	13	M12	15	15	22	11	10	45	38	20	17	14	105	22.5	M12×35	75.26	100.2	1.8	1.35	1.35	2.75		10.45			
HW45HC								128.8	168.8																													
HW55CC	70	13	43.5	140	116	12	95	117.7	161.7		6	11	13	M14	17.5	17	26.5	12	19	53	44	23	20	16	120	30	M14×45	112.33	145.64	3.59	2.5	2.5	4.20		15.12			
HW55HC								155.8	199.8																													
HW65CC	90	15	53.5	170	142	14	110	144.2	194.2		6	14	13	M16	25	23	37.5	15	15	63	53	26	22	18	150	35	M16×50	160.22	210.37	6.45	4.18	4.18	9.25		21.25			
HW65HC								203.6	253.6																													

Note : 1 kgf = 9.81 N

(6) Dimensions for HR-T (Rail Mounting from Bottom)



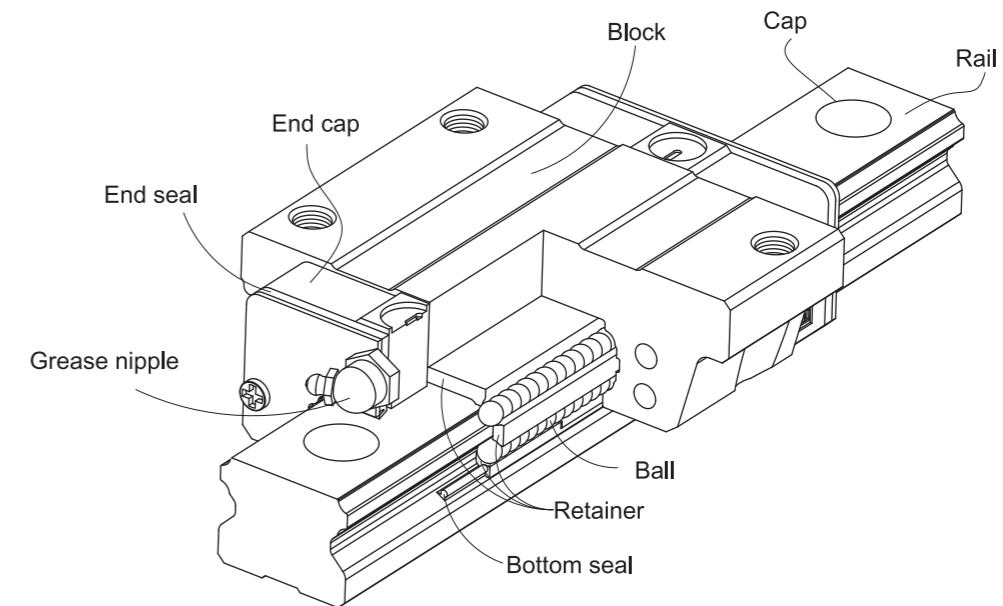
Model No.	Dimensions of Rail (mm)						Weight (kg/m)
	W _R	H _R	S	h	P	E	
HR15T	15	15	M5 x 0.8P	8	60	20	1.48
HR20T	20	17.5	M6 x 1P	10	60	20	2.29
HR25T	23	22	M6 x 1P	12	60	20	3.35
HR30T	28	26	M8 x 1.25P	15	80	20	4.67
HR35T	34	29	M8x1.25P	17	80	20	6.51
HR45T	45	38	M12 x 1.75P	24	105	22.5	10.87
HR55T	53	44	M14 x 2P	24	120	30	15.67
HR65T	63	53	M20 x 2.5P	30	150	35	21.73

2-2 E Series – Low Profile Ball Type Linear Guideway

2-2-1 Features of E Series

The design of the E series offers a low profile, high load capacity, and high rigidity. It also features an equal load rating in all four directions and self-aligning capability to absorb installation-error, allowing for higher accuracies. Additionally, the lower assembly height and the shorter length make the E series more suitable for high-speed, automation machines and applications where space is limited. The retainer is designed to hold the balls in the block even when it is removed from the rail.

2-2-2 Construction of E Series



- Rolling circulation system: Block, rail, end cap and retainer
- Lubrication system: Grease nipple and piping Joint
- Dust protection system: End seal, bottom seal, cap and scraper

2-2-3 Model Number of E Series

E series linear guideways are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of strict dimensional control, the interchangeable type linear guideways are a wise choice for customers when rails do not need to be matched for an axis. The model number of the E series identifies the size, type, accuracy class, preload class, etc.