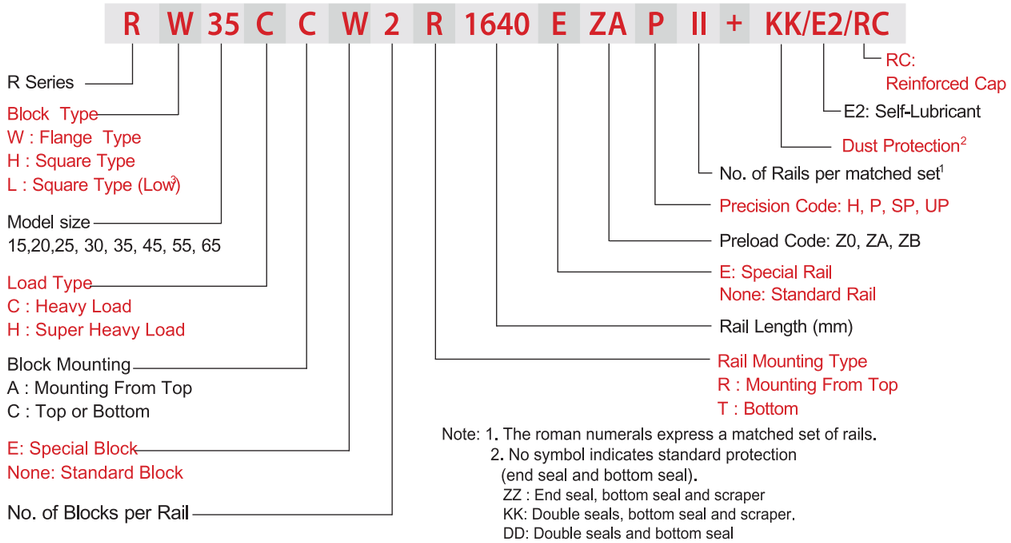
2-5-3 Model Number of R series

R 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 R series identifies the size, type, accuracy class, preload class, etc.

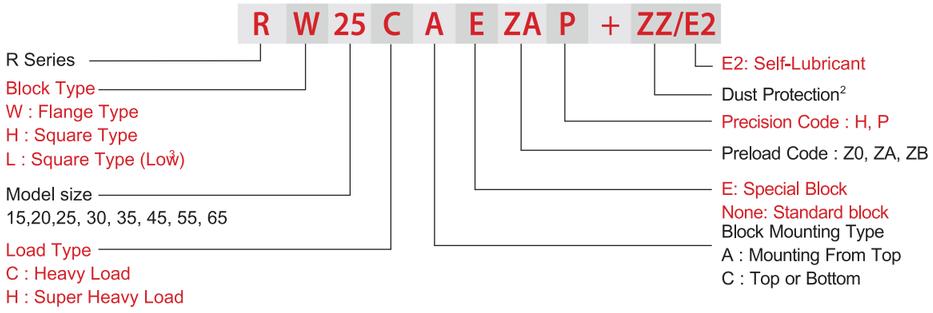
(1) Non-interchangeable type



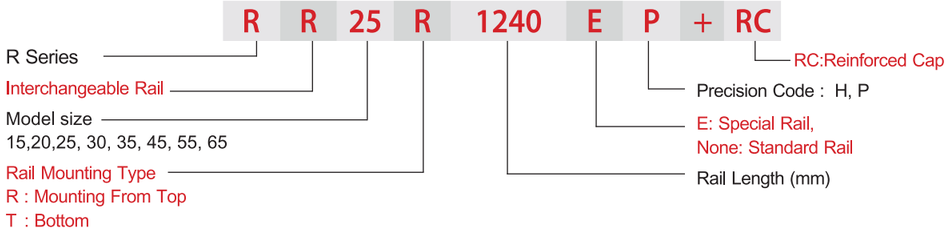
Note: 1. The roman numerals express a matched set of rails.
2. No symbol indicates standard protection (end seal and bottom seal).
ZZ : End seal, bottom seal and scraper
KK: Double seals, bottom seal and scraper.
DD: Double seals and bottom seal
3. Block type RL is the low profile design of RH (square type), the assembled height is same as RW (flange type) in same size.

(2) Interchangeable type

☐ Model Number of R Block



☐ Model Number of R Rail

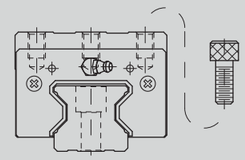
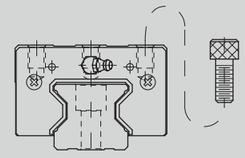
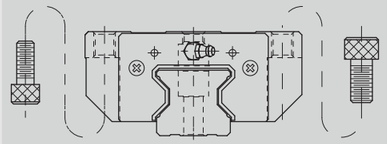


2-5-4 Types

(1) Block types

LIMON offers two types of guide blocks, flange and square type. Because of the low assembly height and large mounting surface, the flange type is excellent for heavy moment load applications.

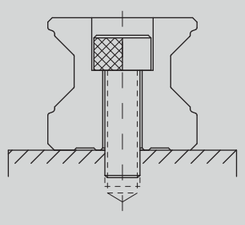
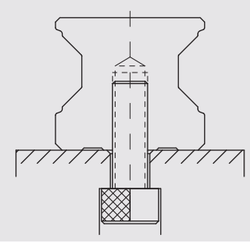
Table 2-5-1 Block Types

Type	Model	Shape	Height (mm)	Rail Length (mm)	Main Applications
Square	RH-CA RH-HA		28 ↓ 90	100 ↓ 4000	☐ Automation Systems ☐ Transportation equipment ☐ CNC machining centers ☐ Heavy duty cutting machines ☐ CNC grinding machines ☐ Injection molding machines ☐ Plano millers ☐ Devices requiring high rigidity ☐ Devices requiring high load capacity ☐ Electric discharge machines
Square	RL-CA RL-HA		24 ↓ 70	100 ↓ 4000	
Flange	RW-CC RW-HC		24 ↓ 90	100 ↓ 4000	

(2) Rail types

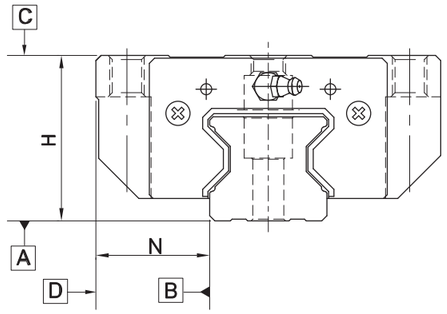
In addition to the standard top mounting type, LIMON also offers the bottom mounting type of rails.

Table 2-5-2 Rail Types

Mounting from Top	Mounting from Bottom
	

2-5-5 Accuracy

The accuracy of the R series can be classified into four classes: high (H), precision (P), super precision (SP) and ultra precision (UP). Customers may choose the class by referencing the accuracy requirements of the applied equipment.



(1) Accuracy of non-interchangeable

Table 2-5-3 Accuracy Standards

Unit: mm

Item	R - 15, 20			
Accuracy Classes	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.03	0 - 0.03	0 - 0.015	0 - 0.008
Dimensional tolerance of width N	± 0.03	0 - 0.03	0 - 0.015	0 - 0.008
Variation of height H	0.01	0.006	0.004	0.003
Variation of width N	0.01	0.006	0.004	0.003
Running parallelism of block surface C to surface A	See Table 2-5-11			
Running parallelism of block surface D to surface B	See Table 2-5-11			

Table 2-5-4 Accuracy Standards

Unit: mm

Item	R - 25, 30, 35			
Accuracy Classes	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.04	0 - 0.04	0 - 0.02	0 - 0.01
Dimensional tolerance of width N	± 0.04	0 - 0.04	0 - 0.02	0 - 0.01
Variation of height H	0.015	0.007	0.005	0.003
Variation of width N	0.015	0.007	0.005	0.003
Running parallelism of block surface C to surface A	See Table 2-5-11			
Running parallelism of block surface D to surface B	See Table 2-5-11			

Table 2-5-5 Accuracy Standards

Unit: mm

Item	R - 45, 55			
Accuracy Classes	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.05	0 - 0.05	0 - 0.03	0 - 0.02
Dimensional tolerance of width N	± 0.05	0 - 0.05	0 - 0.03	0 - 0.02
Variation of height H	0.015	0.007	0.005	0.003
Variation of width N	0.02	0.01	0.007	0.005
Running parallelism of block surface C to surface A	See Table 2-5-11			
Running parallelism of block surface D to surface B	See Table 2-5-11			

Table 2-5-6 Accuracy Standards

Unit: mm

Item	R - 65			
Accuracy Classes	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.07	0 - 0.07	0 - 0.05	0 - 0.03
Dimensional tolerance of width N	± 0.07	0 - 0.07	0 - 0.05	0 - 0.03
Variation of height H	0.02	0.01	0.007	0.005
Variation of width N	0.025	0.015	0.01	0.007
Running parallelism of block surface C to surface A	See Table 2-5-11			
Running parallelism of block surface D to surface B	See Table 2-5-11			

(2) Accuracy of interchangeable

Table 2-5-7 Accuracy Standards

Unit: mm

Item	R - 15, 20	
Accuracy Classes	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.03	± 0.015
Dimensional tolerance of width N	± 0.03	± 0.015
Variation of height H	0.01	0.006
Variation of width N	0.01	0.006
Running parallelism of block surface C to surface A	See Table 2-5-11	
Running parallelism of block surface D to surface B	See Table 2-5-11	

Table 2-5-8 Accuracy Standards

Unit: mm

Item	R - 25, 30, 35	
Accuracy Classes	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.04	± 0.02
Dimensional tolerance of width N	± 0.04	± 0.02
Variation of height H	0.015	0.007
Variation of width N	0.015	0.007
Running parallelism of block surface C to surface A	See Table 2-5-11	
Running parallelism of block surface D to surface B	See Table 2-5-11	

Table 2-5-9 Accuracy Standards

Unit: mm

Item	R - 45, 55	
Accuracy Classes	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.05	± 0.025
Dimensional tolerance of width N	± 0.05	± 0.025
Variation of height H	0.015	0.007
Variation of width N	0.02	0.01
Running parallelism of block surface C to surface A	See Table 2-5-11	
Running parallelism of block surface D to surface B	See Table 2-5-11	

Table **2-5-10** Accuracy Standards

Unit: mm

Item	R - 65	
Accuracy Classes	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.07	± 0.035
Dimensional tolerance of width N	± 0.07	± 0.035
Variation of height H	0.02	0.01
Variation of width N	0.025	0.015
Running parallelism of block surface C to surface A	See Table 2-5-11	
Running parallelism of block surface D to surface B	See Table 2-5-11	

(3) Accuracy of running parallelism

Table 2-5-11 Accuracy of Running Parallelism

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

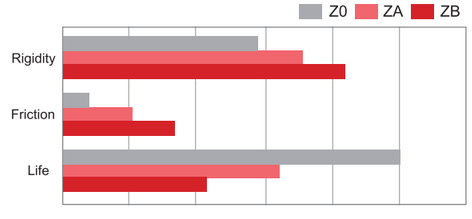
2-5-6 Preload

A preload can be applied to each guideway using oversized rollers. Generally, a linear motion guideway has negative clearance between the raceway and rollers to improve stiffness and maintain high precision. The R series linear guideway offers three standard preloads for various applications and conditions.

Table 2-5-12

Class	Code	Preload	Condition
Light Preload	Z0	0.02C~ 0.04C	Certain load direction, low impact, low precision required
Medium Preload	ZA	0.07C~0.09C	High rigidity required, high precision required
Heavy Preload	ZB	0.12C~ 0.14C	Super high rigidity required, with vibration and impact

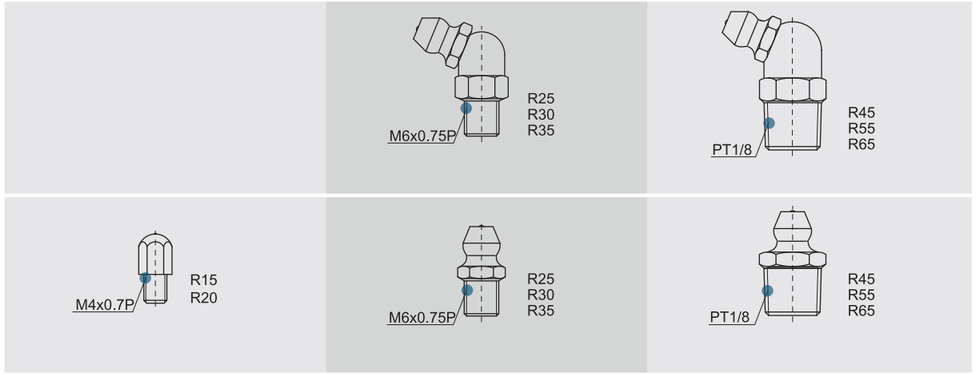
The figure shows the relationship between the rigidity, friction and nominal life. A preload no larger than ZA would be recommended for smaller model sizes to avoid over-preload affecting the life of the guideway.



2-5-7 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 in the side or the top 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 carry out the lubrication by using an oil-piping joint. The figure shows the locations of the grease fitting.

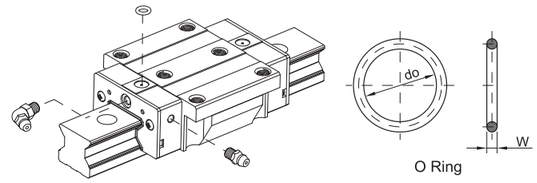
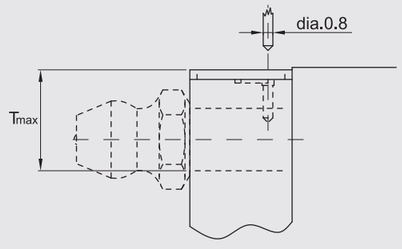


Table 2-5-13 O-Ring size and max. permissible depth for piercing

Size	O-Ring		Lube hole at top: max. permissible depth for piercing
	do (mm)	W (mm)	T_{max} (mm)
R15	2.5±0.15	1.5±0.15	3.45
R20	2.5±0.15	1.5±0.15	4
R25	7.5±0.15	1.5±0.15	5.8
R30	7.5±0.15	1.5±0.15	6.2
R35	7.5±0.15	1.5±0.15	8.65
R45	7.5±0.15	1.5±0.15	9.5
R55	7.5±0.15	1.5±0.15	11.6
R65	7.5±0.15	1.5±0.15	14.5



☐ The oil amount for a block filled with grease

Table 2-5-14 The oil amount for a block illed with grease

Size	Heavy Load(cm^3)	Super Heavy Load(cm^3)	Size	Heavy Load(cm^3)	Super Heavy Load(cm^3)
R15	3	-	R35	12	14
R20	5	6	R45	19	23
R25	7	8	R55	28	35
R30	9	10	R65	52	63

Frequency of replenishment

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

(2) Oil
The recommended viscosity of oil is about 32~150cSt. If you need to use oil-type lubrication, please inform us.

□ Oil feeding rate

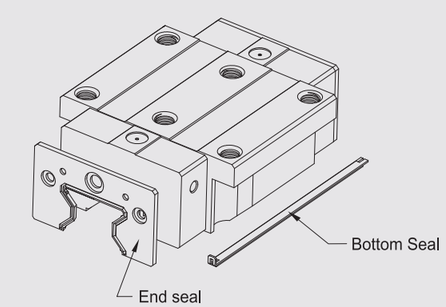
Table 2-5-15 oil feed rate

Size	Feed rate (cm^3/hr)
R15	0.14
R20	0.14
R25	0.167
R30	0.2
R35	0.23
R45	0.3
R55	0.367
R65	0.433

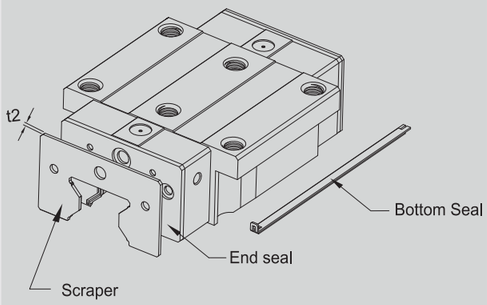
2-5-8 Dust Proof Accessories

(1) Codes of accessories
If the following accessories are needed, please add the code followed by the model number.

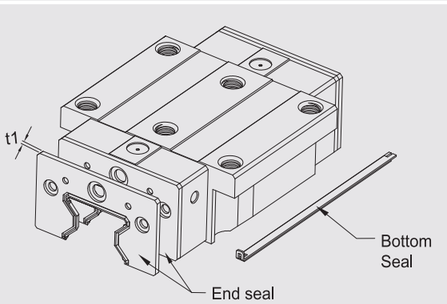
Table 2-5-16



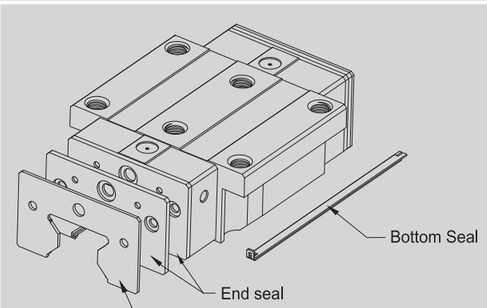
No symbol: Standard Protection (End seal + Bottom Seal)



ZZ (End seal + Bottom Seal + Scraper)



DD (Double seals + Bottom Seal)



KK (Double seals + Bottom Seal + Scraper)

(2) End seal and bottom seal
To prevent life reduction caused by iron chips or dust entering the block.

(3) Double seals
Enhances the wiping effect, foreign matter can be completely wiped off.

Table 2-5-17 Dimensions of end seal

Size	Thickness (t1) (mm)	Size	Thickness (t1) (mm)
R15 ES	2.2	R35 ES	2.5
R20 ES	2.2	R45 ES	3.6
R25 ES	2.2	R55 ES	3.6
R30 ES	2.4	R65 ES	4.4

(4) Scraper
The scraper removes high-temperature iron chips and larger foreign objects.

Table 2-5-18 Dimensions of scraper

Size	Thickness (t2) (mm)	Size	Thickness (t2) (mm)
R15 SC	1.0	R35 SC	1.5
R20 SC	1.0	R45 SC	1.5
R25 SC	1.0	R55 SC	1.5
R30 SC	1.5	R65 SC	1.5

(5) 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 2-5-19 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)
RR 15	M4	7.65	1.1	RR 35	M8	14.2	3.3
RR 20	M5	9.65	2.2	RR 45	M12	20.25	4.6
RR 25	M6	11.15	2.5	RR 55	M14	23.5	5.5
RR 30	M8	14.2	3.3	RR 65	M16	26.6	5.5

(6) Dimensions of block equipped with the dustproof parts

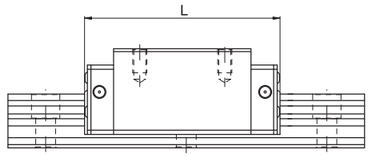


Table 2-5-20 Overall block length

unit: mm

Size	Overall block length (L)			
	SS	ZZ	DD	KK
R15C	68.0 (70.4)	70.0 (74.4)	72.4 (74.8)	74.4 (78.8)
R20C	86.0 (88.4)	88.0 (92.4)	90.4 (92.8)	92.4 (96.8)
R20H	106.0 (108.4)	108.0 (112.4)	110.4 (112.8)	112.4 (116.8)
R25C	97.9 (101.5)	99.9 (105.9)	102.3 (105.9)	104.3 (110.3)
R25H	114.4 (118)	116.4 (122.4)	118.8 (122.4)	120.8 (126.8)
R30C	109.8 (113.4)	112.8 (118.8)	114.6 (118.2)	117.6 (123.6)
R30H	131.8 (135.4)	134.8 (140.8)	136.6 (140.2)	139.6 (145.6)
R35C	124.0 (129.4)	127.0 (135.0)	129.0 (134.4)	132.0 (140.0)
R35H	151.5 (156.9)	154.5 (162.5)	156.5 (161.9)	159.5 (167.5)
R45C	153.2 (156.4)	156.2 (164.2)	160.4 (163.6)	163.4 (171.4)
R45H	187.0 (190.2)	190.0 (198.0)	194.2 (197.4)	197.2 (205.2)
R55C	183.7 (186.9)	186.7 (194.7)	190.9 (194.1)	193.9 (201.9)
R55H	232.0 (235.2)	235.0 (243.0)	239.2 (242.4)	242.2 (250.2)
R65C	232.0 (236.0)	235.0 (245.0)	240.8 (244.8)	243.8 (253.8)
R65H	295.0 (299.0)	298.0 (308.0)	303.8 (307.8)	306.8 (316.8)

Note : The marking of "( )" denotes the maximum block length with screws, lips of end seals, etc.

2-5-9 Friction

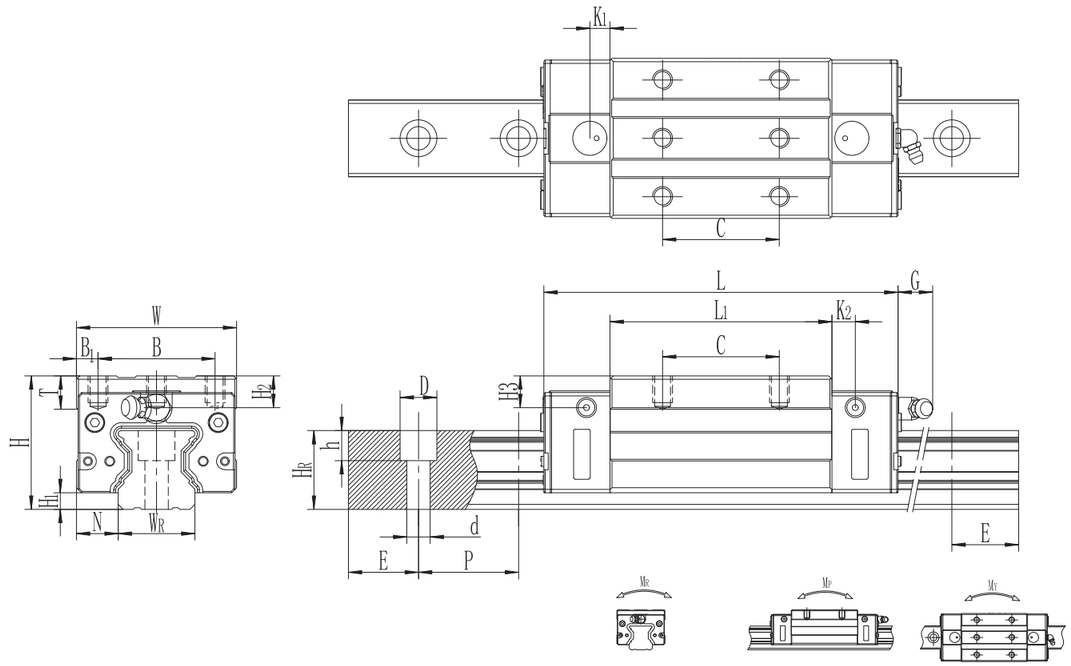
The maximum value of resistance per end seal are as shown in the table.

Table 2-5-21 Seal Resistance

Size	Resistance N (kgf)	Size	Resistance N (kgf)
R15	1.96 (0.2)	R35	3.53 (0.36)
R20	2.45 (0.25)	R45	4.21 (0.43)
R25	2.74 (0.28)	R55	5.09 (0.52)
R30	3.31 (0.31)	R65	6.66 (0.68)

2-5-10 Dimensions for R series

(1) RH-SA/RH-CA/RH-HA

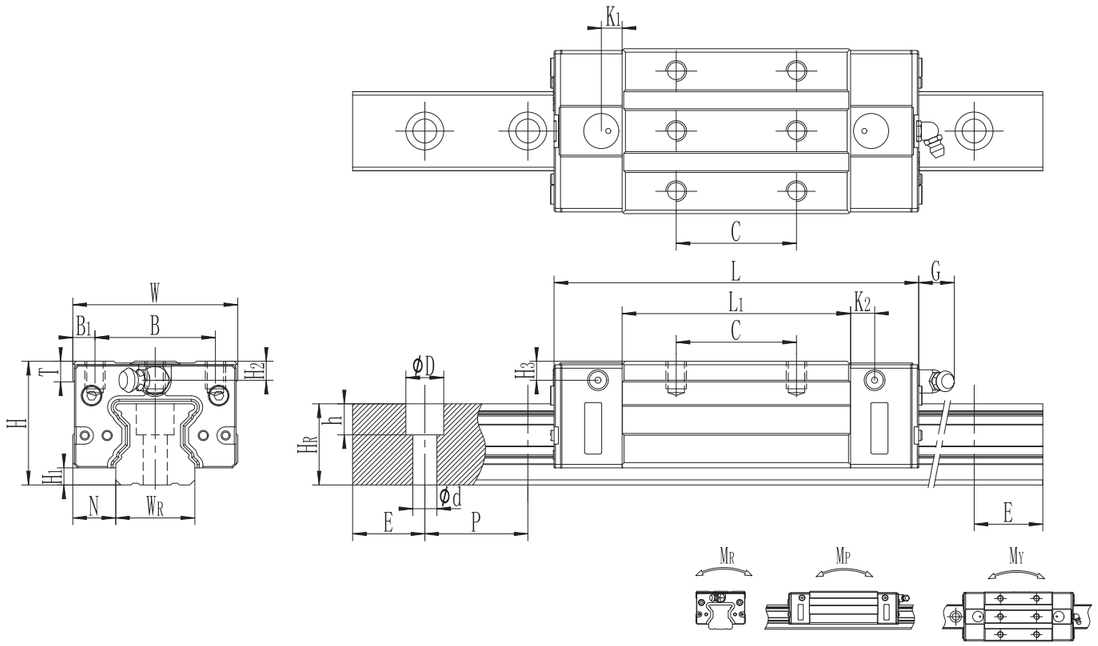


Model No.	Dimensions of Assembly (mm)			Dimensions of Block(mm)												Dimensions of Rail (mm)						Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M*L	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(KN)	C0(KN)	M_R KN-m	M_P KN-m	M_Y KN-m	Block kg	Rail kg/m
RH25SA	40	5	12.5	48	35	6.5	35	55.1	96.3	6	7	12	M6X10	10	9.5	9.5	23	23.6	11	9	7	30	20	M6X25	28.54	50.21	0.78	0.65	0.65	0.53	3.12
RH25CA								66.5	107.7																33.35	61.37	0.89	0.80	0.80	0.64	
RH25HA							50	83	124.2																39,13	75.31	1.12	1.15	1.15	0.78	
RH30CA	45	6	16	60	40	10	40	71	114	8	8	12	M8X10	9,5	9,5	10,3	28	28	14	12	9	40	20	M8X30	48.62	81.29	1.8	1.55	1.55	0.92	4.47
RH30HA							60	93	136																61.45	109.98	2.05	1.92	1.92	1.21	
RH35CA	55	6,5	18	70	50	10	50	82	131	8	12	12	M8X14	12	16	16	34	30,2	14	12	9	40	20	M8X30	55.14	95.64	2.01	1.22	1.22	1.6	6.13
RH35HA							72	110	159																69.62	129.11	2.66	2.3	2.3	2.1	
RH45CA	70	8	20,5	86	60	13	60	106	158	8	10	13	M10X20	16	20	20	45	38	20	17	14	52,5	22,5	M12X35	95.63	178.72	4.75	3.55	3.55	3.2	9.99
RH45HA							80	142	194																120.6	240.89	6.55	5.8	5.8	4.19	
RH55CA	80	10	23.5	100	75	12.5	75	125.5	182.5	8	12.5	13	M12X20	19	22	22	53	44	23	20	16	60	30	M14X45	147.64	255.03	8,2	5.6	5.6	4.92	14.14
RH55HA							95	176.5	233.5																196.95	369.8	11.25	10.4	10.4	6.72	
RH65CA	90	12	31.5	126	76	25	70	160	232	16	16	13	M16X20	25	15	15	63	53	26	22	18	75.0	35.0	M16X50	213	411.6	16.2	11.59	11.59	8.89	20.3
RH65HA							120	223	295																275,3	572,7	22,55	22,17	22,17	12,13	

Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C_{100R}, if necessary C_{50R} conversion formula is as follows : $C_{50R} = 1.23 \times C_{100R}$

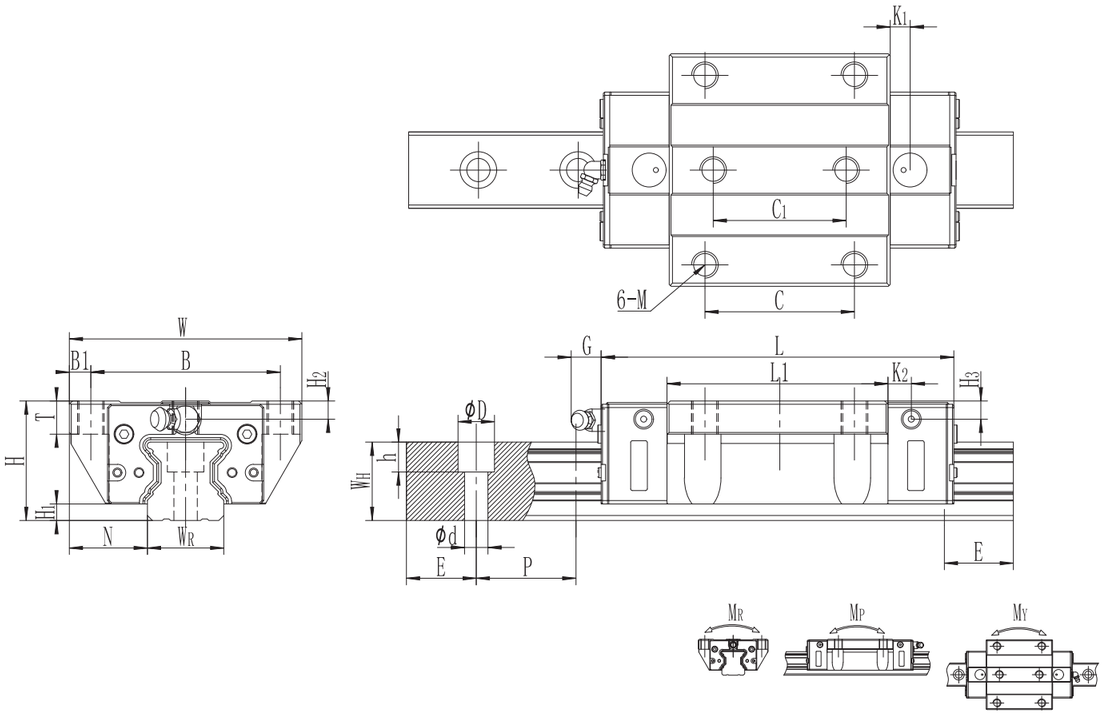
(2) RL-SA/RL-CA/RL-HA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block(mm)												Dimensions of Rail (mm)							Mounting Bolt for Rail	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*L	T	H_2	H_3	W_R	H_R	D	h	d	P	E	(mm)	C(KN)	C0(KN)	M_R KN-m	M_P KN-m	M_Y KN-m	Block kg	Rail kg/m
RL25SA	36	5	12.5	48	35	6.5	35	55.1	96.3	6	7	12	M6X10	10	5.5	5.5	23	23.6	11	9	7	30	20	M6X25	28.54	50.21	0.78	0.65	0.65	0.53	3.12
RL25CA								66.5	107.7																33.35	61.37	0.89	0.80	0.80	0.64	
RL25HA								83	124.2																39.13	75.31	1.12	1.15	1.15	0.78	
RL30CA	42	6	16	60	40	10	40	71	114	8	8	12	M8X10	9.5	6.5	7.3	28	28	14	12	9	40	20	M8X30	48.62	81.29	1.8	1.55	1.55	0.92	4.47
RL30HA							60	93	136																61.45	109.98	2.05	1.92	1.92	1.21	
RL35CA	48	6.5	18	70	50	10	50	82	131	8	12	12	M8X14	12	9	9	34	30.2	14	12	9	40	20	M8X30	55.14	95.64	2.01	1.22	1.22	1.6	6.13
RL35HA							72	110	159																69.62	129.11	2.66	2.3	2.3	2.1	
RL45CA	60	8	20.5	86	60	13	60	106	158	8	10	13	M10X17	16	10	10	45	38	20	17	14	52.5	22.5	M12X35	95.63	178.72	4.75	3.55	3.55	3.2	9.99
RL45HA							80	142	194																120.6	240.89	6.55	5.8	5.8	4.19	
RL55CA	70	10	23.5	100	75	12.5	75	125.5	182.5	8	12.5	13	M12X20	19	12	12	53	44	23	20	16	60	30	M14X45	147.64	255.03	8.2	5.6	5.6	4.92	14.14
RL55HA							95	176.5	233.5																196.95	369.8	11.25	10.4	10.4	6.72	

Note : 1. 1 kgf = 9.81 N
2. The theoretical dynamic rated load is C_{100R}, if necessary C_{50R}conversion formula is as follows : C_{50R}= 1.23 x C_{100R}

(3) RW-SC/RW-CC/RW-HC



Model No.	Dimensions of Assembly (mm)			Dimensions of Block(mm)														Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H_1	N	W	B	B_1	C	C1	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	(mm)	C(KN)	C0(KN)	M_R KN-m	M_P KN-m	M_Y KN-m	Block kg	Rail kg/m
RW25SC	36	5	23.5	70	57	6.5	45	40	55.1	96.3	6	7	12	M8	10	12.5	5.5	5.5	23	23.6	11	9	7	30	20	M6X25	28.54	50.21	0.78	0.65	0.65	0.53	3.12
RW25CC									66.5	107.7																	33.35	61.37	0.89	0.80	0.80	0.64	
RW25HC									83	124.2																	39.13	75.31	1.12	1.15	1.15	0.78	
RW30CC	42	6	31	90	72	9	52	44	71	114	8	8	12	M10	9.5	14	6.5	7.3	28	28	14	12	9	40	20	M8X30	48.62	81.29	1.8	1.55	1.55	0.92	4.47
RW30HC									93	136																	61.45	109.98	2.05	1.92	1.92	1.21	
RW35CC	48	6.5	33	100	82	9	62	52	82	131	8	12	12	M10	12	13	9	9	34	30.2	14	12	9	40	20	M8X30	55.14	95.64	2.01	1.22	1.22	1.6	6.13
RW35HC									110	159																	69.62	129.11	2.66	2.3	2.3	2.1	
RW45CC	60	8	37.5	120	100	10	80	60	106	158	8	10	13	M12	16	18	10	10	45	38	20	17	14	52.5	22.5	M12X35	95.63	178.72	4.75	3.55	3.55	3.2	9.99
RW45HC									142	194																	120.6	240.89	6.55	5.8	5.8	4.19	
RW55CC	70	10	43.5	140	116	12	95	70	125.5	182.5	8	13	13	M14	18	18	12	12	53	44	23	20	16	60	30	M14X45	147.64	255.03	8.2	5.6	5.6	4.92	14.14
RW55HC									176.5	233.5																	196.95	369.8	11.25	10.4	10.4	6.72	
RW65CC	90	12	53.5	170	142	14	110	82	160	232	16	16	13	M16	22	23	15	15	63	53	26	22	18	75	35	M16X50	213	411.6	16.2	11.59	11.59	8.89	20.3
RW65HC									223	295																	275.3	572.7	22.55	22.17	22.17	12.13	

Note : 1. 1 kgf = 9.81 N
2. The theoretical dynamic rated load is C_{100R}, if necessary C_{50R} conversion formula is as follows : C_{50R}= 1.23 x C_{100R}