

## RG Series

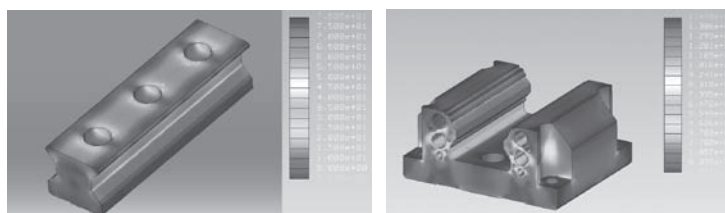
### 2-7 RG Series – High Rigidity Roller Type Linear Guideway

#### 2-7-1 Advantages and features

The new RG series from Hiwin features a roller as the rolling element instead of steel balls. The roller series offers super high rigidity and very high load capacities. The RG series is designed with a 45-degree angle of contact. Elastic deformation of the linear contact surface, during load, is greatly reduced thereby offering greater rigidity and higher load capacities in all 4 load directions. The RG series linear guideway offers high performance for high-precision manufacturing and achieving longer service life.

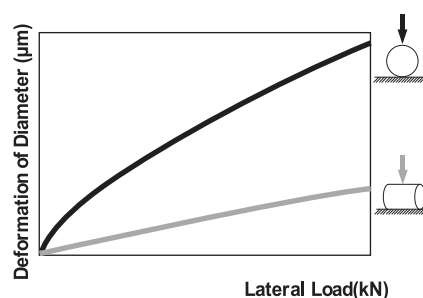
##### (1) Optimal design

FEM analysis was performed to determine the optimal structure of the block and the rail. The unique design of the circulation path allows the RG series linear guideway to offer smoother linear motion.



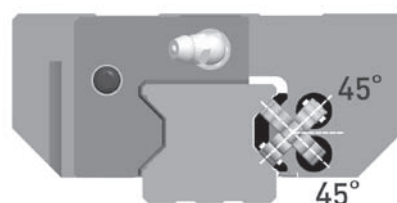
##### (2) Super high rigidity

The RG series is a type of linear guideway that uses rollers as the rolling elements. Rollers have a greater contact area than balls so that the roller guideway features higher load capacity and greater rigidity. The figure shows the rigidity of a roller and a ball with equal volume.



##### (3) Super high load capacity

With the four rows of rollers arranged at a contact angle of 45-degrees, the RG series linear guideway has equal load ratings in the radial, reverse radial and lateral directions. The RG series has a higher load capacity in a smaller size than conventional, ball-type linear guideways.



##### (4) Operating life increased

The basic dynamic load rating (100km rating) complies with ISO standard (ISO14728-1). The actual load will affect the nominal life of a linear guideway. Based on the selected basic dynamic rated load and the actual load, the nominal life can be calculated by using Eq.2.4. This life formula is different from that for conventional linear ball-type guideways.

$$L = \left( \frac{C}{P} \right)^{\frac{10}{3}} \cdot 100\text{km} = \left( \frac{C}{P} \right)^{\frac{10}{3}} \cdot 62\text{mile} \quad \text{Eq. 2.4}$$

If the environmental factors are taken into consideration, the nominal life will be influenced greatly by the motion conditions, the hardness of the raceway, and the temperature of the linear guideway. The relationship between these factors is expressed in Eq.2.5.

$$L = \left( \frac{f_h \cdot f_t \cdot C}{f_w \cdot P} \right)^{\frac{10}{3}} \cdot 100\text{km} = \left( \frac{f_h \cdot f_t \cdot C}{f_w \cdot P} \right)^{\frac{10}{3}} \cdot 62\text{mile} \quad \text{Eq. 2.5}$$

L : Nominal life	$f_h$ : Hardness factor
P : Calculated load	$f_t$ : Temperature factor
C : Basic dynamic load rating	$f_w$ : Load factor

Where, the hardness factor, the temperature factor and the load factor are the same as a ball-type guideway. Compared with conventional linear ball-type guideways, the RG series linear guideway has a higher load capacity that allows it to achieve a longer service life.

(5) Durability test

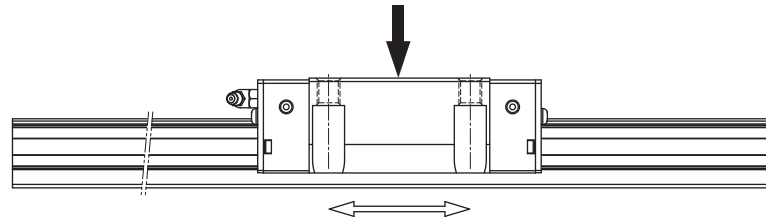


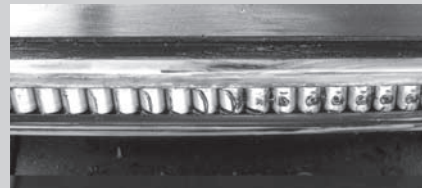
Table 2-7-1

**Tested model 1: RGH35CA**

Preload: ZA class  
 Max. Speed: 60m/min  
 Acceleration: 1G  
 Stroke: 0.55m  
 Lubrication: grease held every 100km  
 External: 15kN  
 Traveling distance: 1135km

**Test results:**

The nominal life of the model is 1000km.  
 After the traveling distance, fatigue flaking did not appear on the surface of the raceway or rollers.

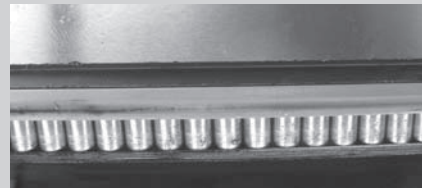


**Tested model 2: RGW35CC**

Preload: ZA class  
 Max. Speed: 120m/min  
 Acceleration: 1G  
 Stroke: 2m  
 Lubrication: oil feed rate: 0.3cm<sup>3</sup>/hr  
 External load: 0kN  
 Traveling distance: 15000km

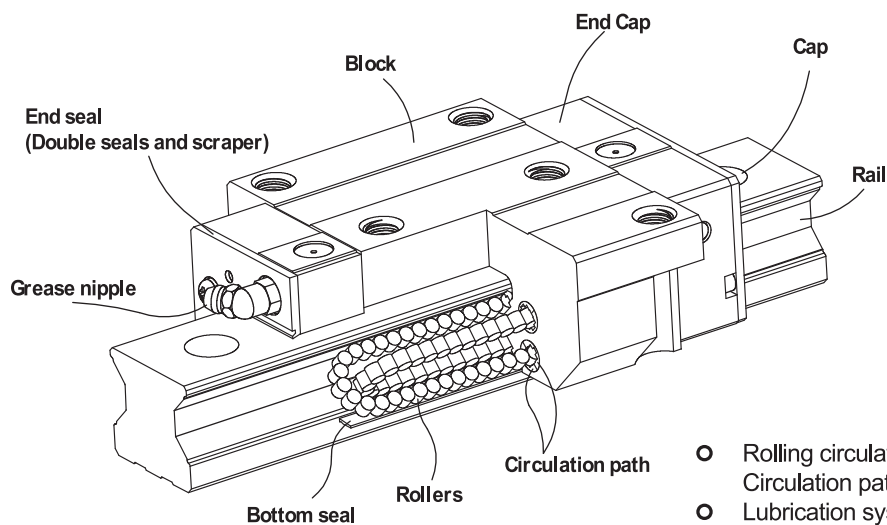
**Test results:**

Fatigue flaking did not appear on the surface of the raceway or rollers after a distance of (15000km).



**Note:** The data listed are from these samples.

2-7-2 Construction of RG Series



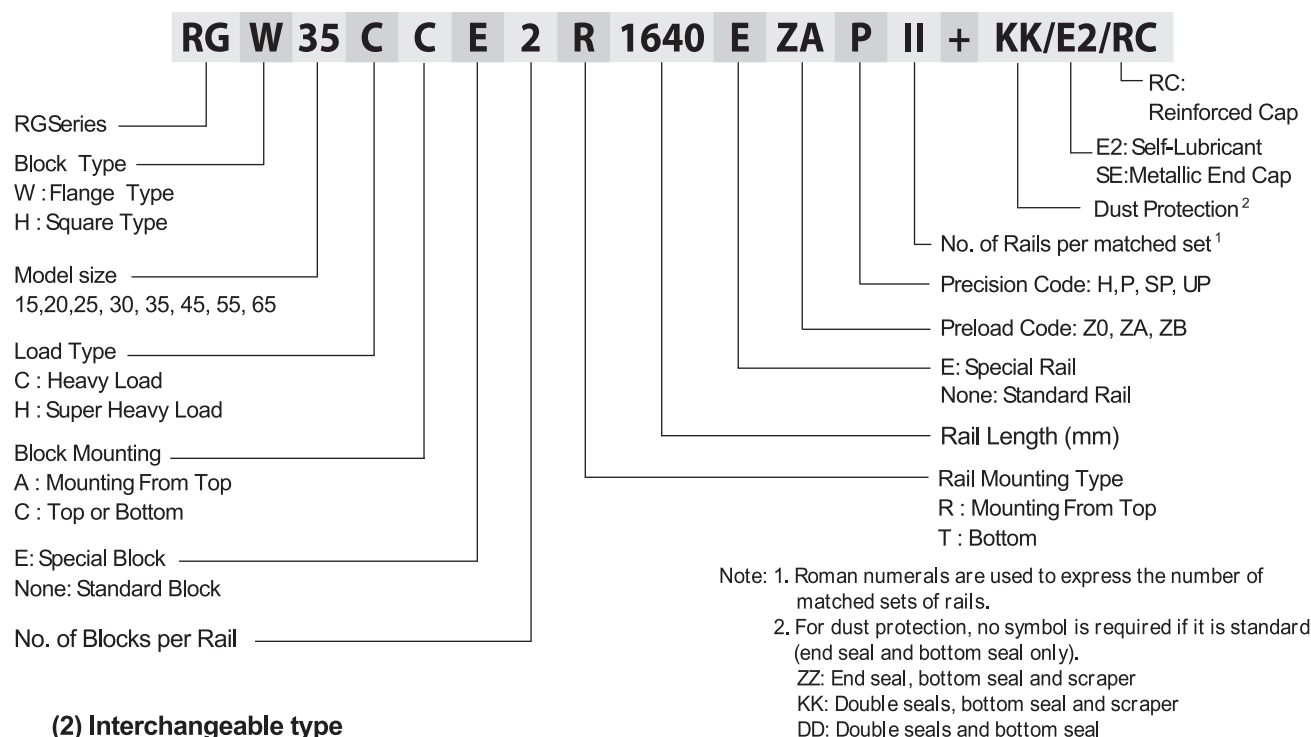
- Rolling circulation system: Block, Rail, End cap, Circulation path, rollers
- Lubrication system: Grease nipple and piping joint
- Dust protection system: End seal, Bottom seal, Cap, Double seals and Scraper

## RG Series

### 2-7-3 Model Number of RG series

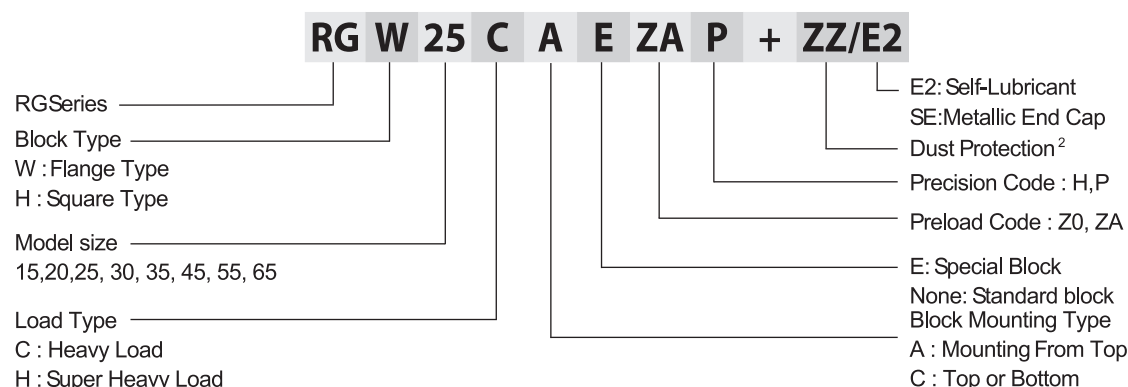
RG series linear guideways are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of strict 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 RG series identifies the size, type, accuracy class, preload class, etc.

#### (1) Non-interchangeable type

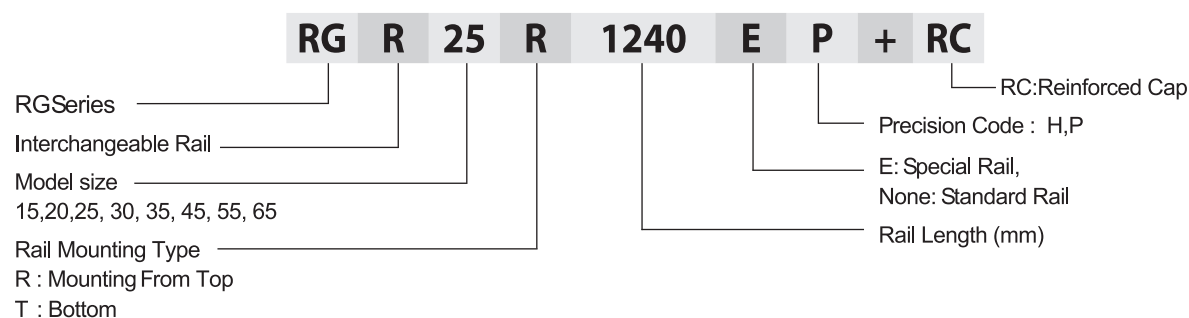


#### (2) Interchangeable type

##### ○ Model Number of RG Block



##### ○ Model Number of RG Rail

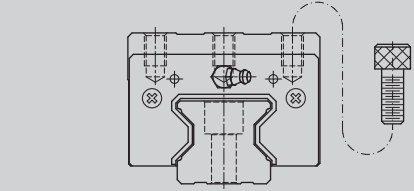
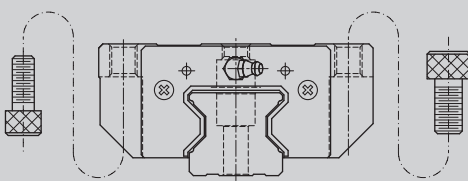


## 2-7-4 Types

### (1) Block types

HIWIN 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.

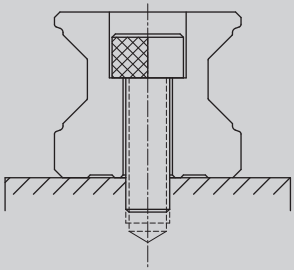
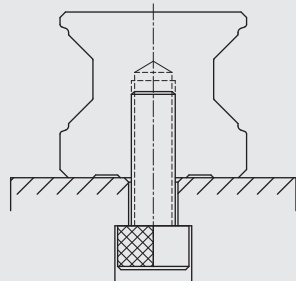
Table 2-7-2 Block Types

Type	Model	Shape	Height (mm)	Rail Length (mm)	Main Applications
Square	RGH-CA RGH-HA		28	100	<ul style="list-style-type: none"> <li>Automation Systems</li> <li>Transportation equipment</li> <li>CNC machining centers</li> <li>Heavy duty cutting machines</li> <li>CNC grinding machines</li> <li>Injection molding machines</li> <li>Plano millers</li> <li>Devices requiring high rigidity</li> <li>Devices requiring high load capacity</li> <li>Electric discharge machines</li> </ul>
			↓	↓	
			90	4000	
Flange	RGW-CC RGW-HC		24	100	
			↓	↓	
			90	4000	

### (2) Rail types

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

Table 2-7-3 Rail Types

Mounting from Top	Mounting from Bottom
	

## Oil feeding rate

Table 2-7-16 oil feed rate

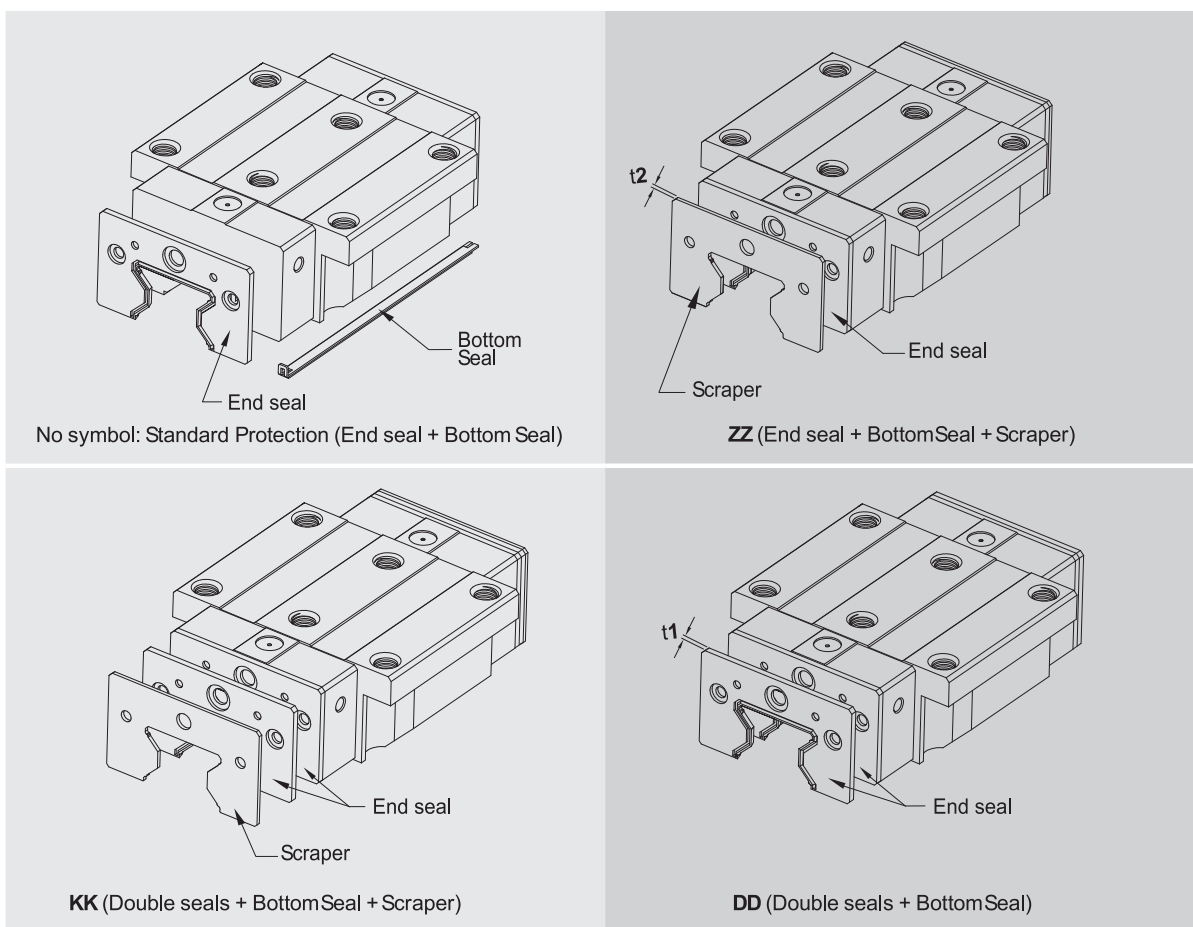
Size	feed rate (cm <sup>3</sup> /hr)
RG 15	0.14
RG 20	0.14
RG 25	0.167
RG 30	0.2
RG 35	0.23
RG 45	0.3
RG 55	0.367
RG 65	0.433

## 2-7-8 Dust Proof Accessories

### (1) Codes of accessories

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

Table 2-7-17



## RG Series

### 2-7-12 Standard and Maximum Lengths of Rail

HIWIN offers a number of standard rail lengths. Standard rail lengths feature end mounting hole placements set to predetermined values (E). For non-standard rail lengths, be sure to specify the E-value to be no greater than 1/2 the pitch (P) dimension. An E-value greater than this will result in unstable rail ends.

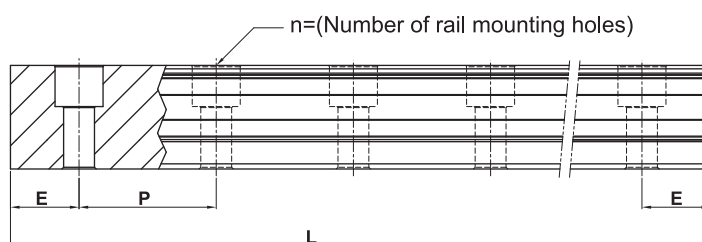


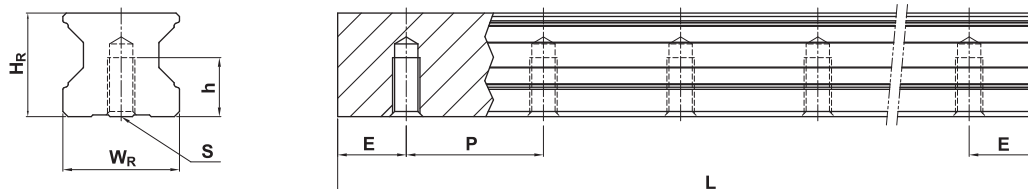
Table 2-7-26

unit: mm

Item	RGR15	RGR20	RGR25	RGR30	RGR35	RGR45	RGR55	RGR65
Standard Length L(n)	160(5)	220(7)	220(7)	280(7)	280(7)	570(11)	780(13)	1,270(17)
	220(7)	280(9)	280(9)	440(11)	440(11)	885(17)	1020(17)	1,570(21)
	340(11)	340(11)	340(11)	600(15)	600(15)	1,200(23)	1,260(21)	2,020(27)
	460(15)	460(15)	460(15)	760(19)	760(19)	1,620(31)	1,500(25)	2,620(35)
	580(19)	640(21)	640(21)	1,000(25)	1,000(25)	2,040(39)	1,980(33)	-
	700(23)	820(27)	820(27)	1,640(41)	1,640(41)	2,460(47)	2,580(43)	-
	940(31)	1000(33)	1,000(33)	2,040(51)	2,040(51)	2,985(57)	2,940(49)	-
	1120(37)	1180(39)	1,240(41)	2,520(63)	2,520(63)	3,090(59)	3,060(51)	-
	1360(45)	1360(45)	1,600(53)	3,000(75)	3,000(75)	-	-	-
Pitch (P)	30	30	30	40	40	52.5	60	75
Distance to End (E <sub>s</sub> )	20	20	20	20	20	22.5	30	35
Max. Standard Length	4,000(133)	4,000(133)	4,000(133)	3,960(99)	3,960(99)	3,930(75)	3,900(65)	3,970(53)
Max. Length	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000

Note : 1. Tolerance of E value for standard rail is 0.5~0.5 mm. Tolerance of E value for jointed rail is 0~0.3 mm.  
2. Maximum standard length means the max. rail length with standard E value on both sides.  
3. If different E value is needed, please contact HIWIN.

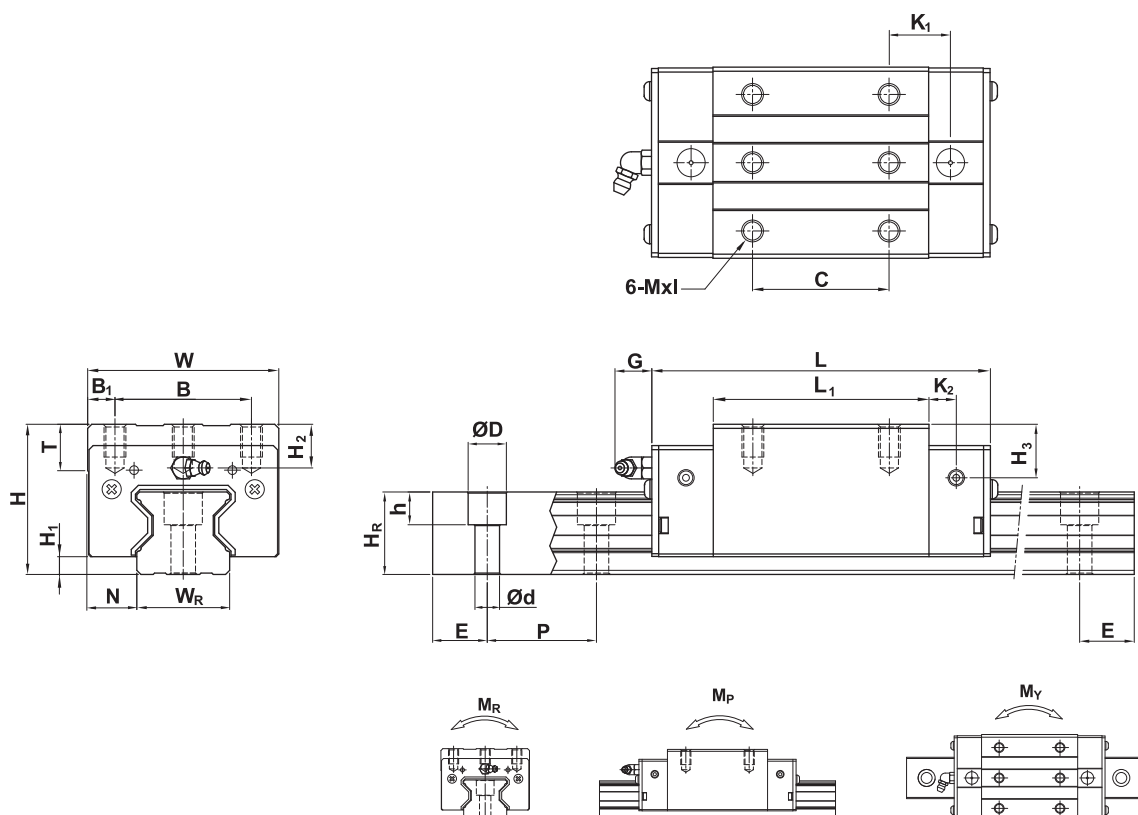
(3) Dimensions for RGR-T (Rail Mounting from Bottom)



Model No.	Dimensions of Rail (mm)						Weight
	$W_R$	$H_R$	S	h	P	E	(kg/m)
RGR15T	15	16.5	M5×0.8P	8	30	20	1.86
RGR20T	20	21	M6×1P	10	30	20	2.76
RGR25T	23	23.6	M6×1P	12	30	20	3.36
RGR30T	28	28	M8×1.25P	15	40	20	4.82
RGR35T	34	30.2	M8×1.25P	17	40	20	6.48
RGR45T	45	38	M12×1.75P	24	52.5	22.5	10.83
RGR55T	53	44	M14×2P	24	60	30	15.15
RGR65T	63	53	M20×2.5P	30	75	35	21.24

# 2-7-13 Dimensions for RG series

## (1) RGH-CA / RGH-HA

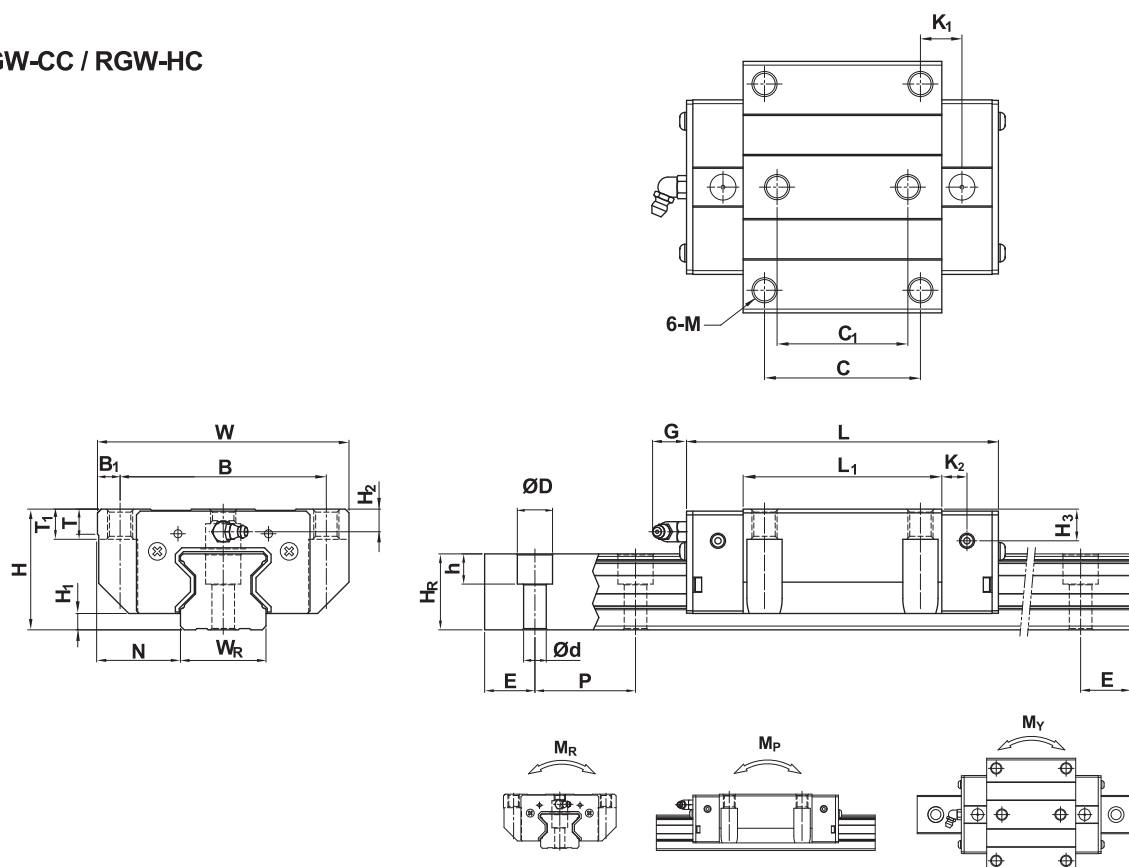


Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)													Dimensions of Rail (mm)										Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
																														M <sub>R</sub>	M <sub>p</sub>	M <sub>y</sub>	Block	Rail
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	MxI	T	H <sub>2</sub>	H <sub>3</sub>	W <sub>R</sub>	H <sub>R</sub>	D	h	d	P	E	(mm)	C(kN)	C <sub>0</sub> (kN)				kN-m	kN-m	kN-m	kg	kg/m
RGH15CA	28	4	9.5	34	26	4	26	45	68	13.4	4.7	5.3	M4 x 8	6	7.6	10.1	15	16.5	7.5	5.7	4.5	30	20	M4 x16	11.3	24	0.311	0.173	0.173	0.22	1.8			
RGH20CA	34	5	12	44	32	6	36	57.5	86	15.8	6	5.3	M5 x 8	8	8.3	8.3	20	21	9.5	8.5	6	30	20	M5 x20	21.3	46.7	0.647	0.46	0.46	0.37	2.76			
RGH20HA							50	77.5	106	18.8															26.9	63	0.872	0.837	0.837	0.49				
RGH25CA	40	5.5	12.5	48	35	6.5	35	64.5	97.9	20.75	7.25	12	M6 x 8	9.5	10.2	10	23	23.6	11	9	7	30	20	M6 x20	27.7	57.1	0.758	0.605	0.605	0.55	3.08			
RGH25HA							50	81	114.4	21.5															33.9	73.4	0.975	0.991	0.991	0.7				
RGH 30CA	45	6	16	60	40	10	40	71	109.8	23.5	8	12	M8 x10	9.5	9.5	10.3	28	28	14	12	9	40	20	M8 x25	39.1	82.1	1.445	1.06	1.06	0.82	4.41			
RGH 30HA							60	93	131.8	24.5															48.1	105	1.846	1.712	1.712	1.07				
RGH35CA	55	6.5	18	70	50	10	50	79	124	22.5	10	12	M8 x12	12	16	19.6	34	30.2	14	12	9	40	20	M8 x25	57.9	105.2	2.17	1.44	1.44	1.43	6.06			
RGH35HA							72	106.5	151.5	25.25															73.1	142	2.93	2.6	2.6	1.86				
RGH45CA	70	8	20.5	86	60	13	60	106	153.2	31	10	12.9	M10x17	16	20	24	45	38	20	17	14	52.5	22.5	M12 x35	92.6	178.8	4.52	3.05	3.05	2.97	9.97			
RGH45HA							80	139.8	187	37.9															116	230.9	6.33	5.47	5.47	3.97				
RGH55CA	80	10	23.5	100	75	12.5	75	125.5	183.7	37.75	12.5	12.9	M12x18	17.5	22	27.5	53	44	23	20	16	60	30	M14 x45	130.5	252	8.01	5.4	5.4	4.62	13.98			
RGH55HA							95	173.8	232	51.9															167.8	348	11.15	10.25	10.25	6.4				
RGH 65CA	90	12	31.5	126	76	25	70	160	232	60.8	15.8	12.9	M16 x20	25	15	15	63	53	26	22	18	75	35	M16x50	213	411.6	16.20	11.59	11.59	8.33	20.22			
RGH 65HA							120	223	295	67.3															275.3	572.7	22.55	22.17	22.17	11.62				

Note : 1 kgf = 9.81 N

RG Series

(2) RGW-CC / RGW-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 <sub>1</sub>	N	W	B	B <sub>1</sub>	C	C <sub>1</sub>	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M	T	T <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	W <sub>R</sub>	H <sub>R</sub>	D	h	d	P	E	(mm)	C(kN)	C <sub>0</sub> (kN)	M <sub>R</sub> kN-m	M <sub>p</sub> kN-m	M <sub>Y</sub> kN-m	Block kg	Rail kg/m		
RGW15CC	24	4	16	47	38	4.5	30	26	45	68	11.4	4.7	5.3	M5	6	6.95	3.6	6.1	15	16.5	7.5	5.7	4.5	30	20	M4x16	11.3	24	0.311	0.173	0.173	0.23	1.8		
RGW20CC	30	5	21.5	63	53	5	40	35	57.5	86	13.8	6	5.3	M6	8	10	4.3	4.3	20	21	9.5	8.5	6	30	20	M5x20	21.3	46.7	0.647	0.46	0.46	0.44	2.76		
RGW20HC									77.5	106	23.8															7.25	12	M8	9.5	10	6.2	6		23	23.6
RGW25CC	36	5.5	23.5	70	57	6.5	45	40	64.5	97.9	15.75	7.25	12	M8	9.5	10	6.2	6	23	23.6	11	9	7	30	20	M6x20	27.7	57.1	0.758	0.605	0.605	0.67	3.08		
RGW25HC									81	114.4	24															8	12	M10	9.5	10	6.5	7.3		28	28
RGW30CC	42	6	31	90	72	9	52	44	71	109.8	17.5	8	12	M10	9.5	10	6.5	7.3	28	28	14	12	9	40	20	M8x25	39.1	82.1	1.445	1.06	1.06	1.06	4.41		
RGW30HC									93	131.8	28.5															93	131.8	28.5	93	131.8	28.5	93		131.8	28.5
RGW35CC	48	6.5	33	100	82	9	62	52	79	124	16.5	10	12	M10	12	13	9	12.6	34	30.2	14	12	9	40	20	M8x25	57.9	105.2	2.17	1.44	1.44	1.61	6.06		
RGW35HC									106.5	151.5	30.25															106.5	151.5	30.25	106.5	151.5	30.25	106.5		151.5	30.25
RGW45CC	60	8	37.5	120	100	10	80	60	106	153.2	21	10	12.9	M12	14	15	10	14	45	38	20	17	14	52.5	22.5	M12x35	92.6	178.8	4.52	3.05	3.05	3.22	9.97		
RGW45HC									139.8	187	37.9															139.8	187	37.9	139.8	187	37.9	139.8		187	37.9
RGW55CC	70	10	43.5	140	116	12	95	70	125.5	183.7	27.75	12.5	12.9	M14	16	17	12	17.5	53	44	23	20	16	60	30	M14x45	130.5	252	8.01	5.4	5.4	5.18	13.98		
RGW55HC									173.8	232	51.9															173.8	232	51.9	173.8	232	51.9	173.8		232	51.9
RGW65CC	90	12	53.5	170	142	14	110	82	160	232	40.8	15.8	12.9	M16	22	23	15	15	63	53	26	22	18	75	35	M16x50	213	411.6	16.20	11.59	11.59	11.04	20.22		
RGW65HC									223	295	72.3															223	295	72.3	223	295	72.3	223		295	72.3
Note : 1 kgf = 9.81 N																																			

Note : 1 kgf = 9.81 N