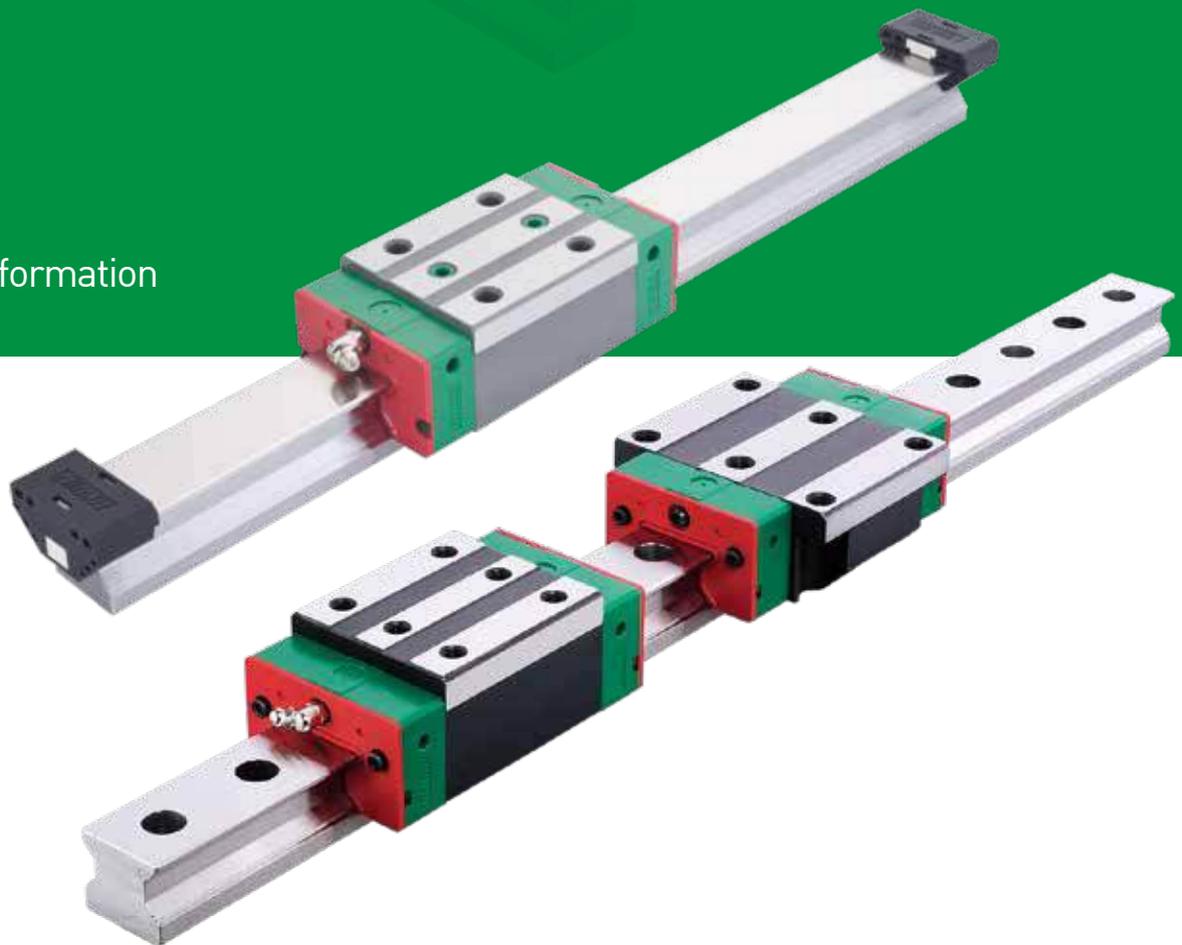


# Linear Guideway

Technical Information





### Multi-Axis Robot

- Pick-and-Place / Assembly / Array and Packaging / Semiconductor / Electro-Optical Industry / Automotive Industry / Food Industry
- Articulated Robot
  - Delta Robot
  - SCARA Robot
  - Wafer Robot
  - Electric Gripper
  - Integrated Electric Gripper
  - Rotary Joint



### Single-Axis Robot

- Precision / Semiconductor / Medical / FPD
- KK, SK
  - KS, KA
  - KU, KE, KC



### Torque Motor

### Rotary Table

- Medical / Automotive Industry / Machine Tools / Machinery Industry
- RAB Series
  - RAS Series
  - RCV Series
  - RCH Series



### Ballscrew

- Precision Ground / Rolled
- Super S Series
  - Super T Series
  - Mini Roller
  - Ecological & Economical Lubrication Module E2
  - Rotating Nut (R1)
  - Energy-Saving & Thermal-Controlling (Cool Type)
  - Heavy Load Series (RD)
  - Ball Spline



### Linear Guideway

- Automation / Semiconductor / Medical
- Ball Type--HG, EG, WE, MG, CG
  - Quiet Type--QH, QE, QW, QR
  - Other--RG, E2, PG, SE, RC



### Bearing

- Machine Tools / Robot
- Crossed Roller Bearing
  - Ballscrew Bearing
  - Linear Bearing
  - Support Unit



### DATORKER®

### Strain Wave Gear

- Robot / Automation Equipment / Semiconductor Equipment / Machine Tools
- DSC-P0 Type
  - DSC-C0 Type
  - DSH-PH Type
  - DSH-AH Type



### AC Servo Motor & Drive

- Semiconductor / Packaging Machine / SMT / Food Industry / LCD
- Drives--D1, D2T/D2T-LM, E1
  - Motors--50W-2000W



### Medical Equipment

- Hospital / Rehabilitation Centers / Nursing Homes
- Robotic Gait Training System
  - Robotic Endoscope Holder



### Linear Motor Stage

- Automated Transport / AOI Application / Precision / Semiconductor
- Iron-core Linear Motor
  - Coreless Linear Motor
  - Linear Turbo Motor LMT
  - Planar Servo Motor
  - Air Bearing Platform
  - X-Y Stage • Gantry Systems
  - Single-Axis Linear Motor Stage



### Torque Motor & Direct Drive Motor

- Machine Tools
- Torque Motor--TM-2/IM-2, TMRW Series
- Inspection / Testing Equipment / Robot
- Direct Drive Motor--DMS, DMY, DMN, DMT Series

**HIWIN®**

# Linear Guideways

## Technical Information Index

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[The specifications in this catalogue are subject to change without notification.]

## Preface

A linear guideway allows a type of linear motion that utilizes rolling elements such as balls or rollers. By using recirculating rolling elements between the rail and the block, a linear guideway can achieve high precision linear motion. Compared to a traditional slide, the coefficient of friction for a linear guideway is only 1/50. Because of the restraint effect between the rails and the blocks, linear guideways can take up loads in both the up/down and the left/right directions. With these features, linear guideways can greatly enhance moving accuracy, especially, when accompanied with precise ball screws.

## 1. General Information

### 1-1 Advantages and Features of Linear Guideways

#### (1) High positional accuracy

When a load is driven by a linear motion guideway, the frictional contact between the load and the bed desk is rolling contact. The coefficient of friction is only 1/50 of traditional contact, and the difference between the dynamic and the static coefficient of friction is small. Therefore, there would be no slippage while the load is moving.

#### (2) Long life with high motion accuracy

With a traditional slide, errors in accuracy are caused by the counter flow of the oil film. Insufficient lubrication causes wear between the contact surfaces, which become increasingly inaccurate. In contrast, rolling contact has little wear; therefore, machines can achieve a long life with highly accurate motion.

#### (3) High speed motion is possible with a low driving force

Because linear guideways have little friction resistance, only a small driving force is needed to move a load. This results in greater power savings, especially in the moving parts of a system. This is especially true for the reciprocating parts.

#### (4) Equal loading capacity in all directions

With this special design, these linear guideways can take loads in either the vertical or horizontal directions. Conventional linear slides can only take small loads in the direction parallel to the contact surface. They are also more likely to become inaccurate when they are subjected to these loads.

#### (5) Easy installation

Installing a linear guideway is fairly easy. Grinding or milling the machine surface, following the recommended installation procedure, and tightening the bolts to their specified torque can achieve highly accurate linear motion.

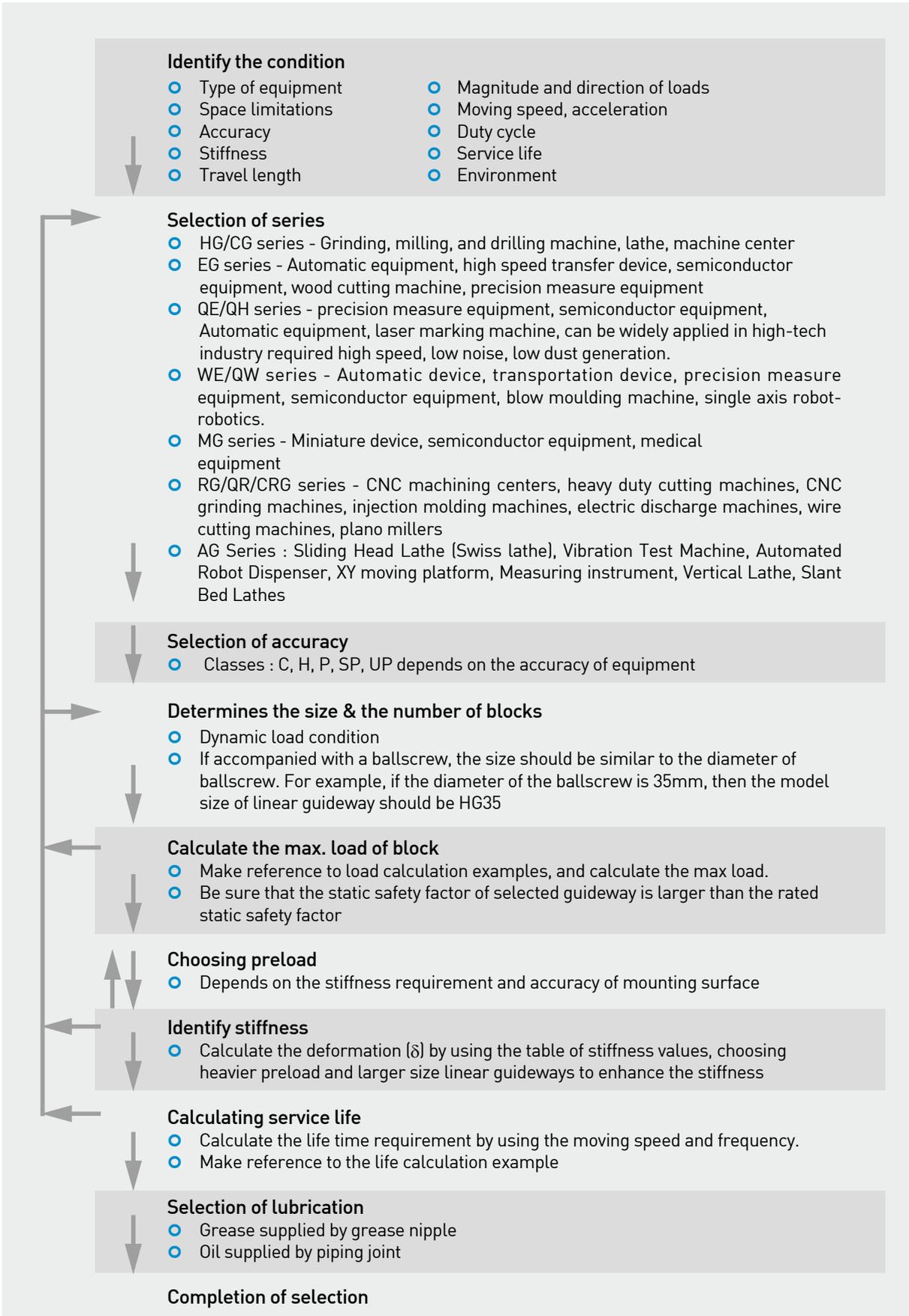
#### (6) Easy lubrication

With a traditional sliding system, insufficient lubrication causes wear on the contact surfaces. Also, it can be quite difficult to supply sufficient lubrication to the contact surfaces because finding an appropriate lubrication point is not very easy. With a linear motion guideway, grease can be easily supplied through the grease nipple on the linear guideway block. It is also possible to utilize a centralized oil lubrication system by piping the lubrication oil to the piping joint.

#### (7) Interchangeability

Compared with traditional boxways or v-groove slides, linear guideways can be easily replaced should any damage occur. For high precision grades consider ordering a matched, non-interchangeable, assembly of a block and rail.

## 1-2 The Principles of Selecting Linear Guideways



## 1-3 Basic Load Ratings of Linear Guideways

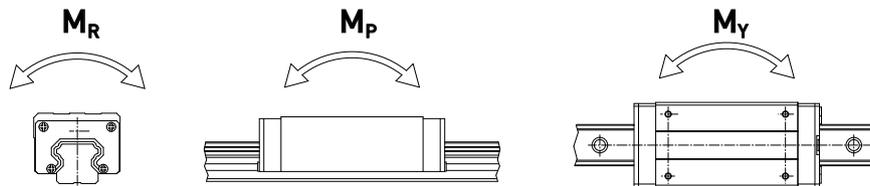
### 1-3-1 Basic Static Load

#### (1) Static load rating ( $C_0$ )

Localized permanent deformation will be caused between the raceway surface and the rolling elements when a linear guideway is subjected to an excessively large load or an impact load while either at rest or in motion. If the amount of this permanent deformation exceeds a certain limit, it becomes an obstacle to the smooth operation of the linear guideway. Generally, the definition of the basic static load rating is a static load of constant magnitude and direction resulting in a total permanent deformation of 0.0001 times the diameter of the rolling element and the raceway at the contact point subjected to the largest stress. The value is described in the dimension tables for each linear guideway. A designer can select a suitable linear guideway by referring to these tables. The maximum static load applied to a linear guideway must not exceed the basic static load rating.

#### (2) Static permissible moment ( $M_0$ )

The static permissible moment refers to a moment in a given direction and magnitude when the largest stress of the rolling elements in an applied system equals the stress induced by the Static Load Rating. The static permissible moment in linear motion systems is defined for three directions:  $M_R$ ,  $M_P$  and  $M_Y$ .



#### (3) Static safety factor

This condition applies when the guideway system is static or under low speed motion. The static safety factor, which depends on environmental and operating conditions, must be taken into consideration. A larger safety factor is especially important for guideways subject to impact loads (See Table 1-1). The static load can be obtained by using Eq. 1.1

Table 1-1 Static Safety Factor

| Load Condition          | $f_{SL}, f_{SM}$ (Min.) |
|-------------------------|-------------------------|
| Normal Load             | 1.0~3.0                 |
| With impacts/vibrations | 3.0~5.0                 |

$$f_{SL} = \frac{C_0}{P} \text{ or } f_{SM} = \frac{M_0}{M} \quad \dots\dots\dots \text{Eq.1.1}$$

- $f_{SL}$  : Static safety factor for simple load
- $f_{SM}$  : Static safety factor for moment
- $C_0$  : Static load rating (kN)
- $M_0$  : Static permissible moment (kN•mm)
- $P$  : Calculated working load (kN)
- $M$  : Calculated applying moment (kN•mm)

### 1-3-2 Basic Dynamic Load

#### (1) Dynamic load rating (C)

The basic dynamic load rating is an important factor used for calculation of service life of linear guideway. It is defined as the maximum load when the load that does not change in direction or magnitude and results in a nominal life of 50km of operation for a ball type linear guideway and 100km for a roller type linear guideway. The values for the basic dynamic load rating of each guideway are shown in dimension tables. They can be used to predict the service life for a selected linear guideway.

## 1-4 The Service Life of Linear Guideways

### 1-4-1 Service Life

When the raceway and the rolling elements of a linear guideway are continuously subjected to repeated stresses, the raceway surface shows fatigue. Flaking will eventually occur. This is called fatigue flaking. The life of a linear guideway is defined as the total distance traveled until fatigue flaking appears on the surface of the raceway or rolling elements.

### 1-4-2 Nominal Life (L)

The service life varies greatly even when the linear motion guideways are manufactured in the same way or operated under the same motion conditions. For this reason, nominal life is used as the criteria for predicting the service life of a linear motion guideway. The nominal life is the total distance that 90% of a group of identical linear motion guideways, operated under identical conditions, can travel without flaking. When the basic dynamic rated load is applied to a linear motion guideway, the nominal life is 50km.

### 1-4-3 Calculation of Nominal Life

The acting 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 of ball type and roller type linear guideway can be calculated by Eq.1.2 and Eq. 1.3 respectively.

$$\text{Ball type: } L = \left(\frac{C}{P}\right)^3 \cdot 50\text{km} = \left(\frac{C}{P}\right)^3 \cdot 31\text{mile} \quad \dots\dots\dots \text{Eq.1.2}$$

$$\text{Roller type: } L = \left(\frac{C}{P}\right)^{\frac{10}{3}} \cdot 100\text{km} = \left(\frac{C}{P}\right)^{\frac{10}{3}} \cdot 62\text{mile} \quad \dots\dots\dots \text{Eq.1.3}$$

- L : Nominal life
- C : Basic dynamic load rating
- P : Actual load

If the environmental factors are taken into consideration, the nominal life is 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.1.4 and Eq. 1.5.

$$\text{Ball type: } L = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c}\right)^3 \cdot 50\text{km} = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c}\right)^3 \cdot 31\text{mile} \quad \dots\dots\dots \text{Eq.1.4}$$

$$\text{Roller type: } L = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c}\right)^{\frac{10}{3}} \cdot 100\text{km} = \left(\frac{f_h \cdot f_t \cdot C}{f_w \cdot P_c}\right)^{\frac{10}{3}} \cdot 62\text{mile} \quad \dots\dots\dots \text{Eq.1.5}$$

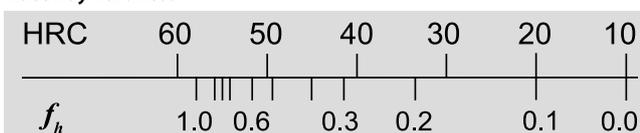
- L : Nominal life
- $f_h$  : Hardness factor
- C : Basic dynamic load rating
- $f_t$  : Temperature factor
- $P_c$  : Calculated load
- $f_w$  : Load factor

### 1-4-4 Factors of Normal Life

#### (1) Hardness factor ( $f_h$ )

In general, the raceway surface in contact with the rolling elements must have the hardness of HRC 58~62 to an appropriate depth. When the specified hardness is not obtained, the permissible load is reduced and the nominal life is decreased. In this situation, the basic dynamic load rating and the basic static load rating must be multiplied by the hardness factor for calculation.

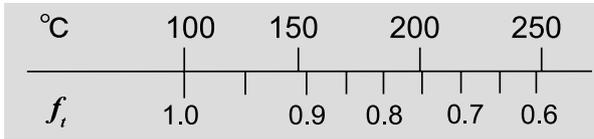
Raceway hardness



**(2) Temperature factor ( f<sub>t</sub> )**

Due to the temperature will affect the material of linear guide, therefore the permissible load will be reduced and the nominal service life will be decreased when over 100°C. Therefore, the basic dynamic and static load rating must be multiplied by the temperature factor. As some accessories are plastic which can't resist high temperature, the working environment is recommended to be lower than 100°C.

Temperature



**(3) Load factor ( f<sub>w</sub> )**

The loads acting on a linear guideway include the weight of slide, the inertia load at the times of start and stop, and the moment loads caused by overhanging. These load factors are especially difficult to estimate because of mechanical vibrations and impacts. Therefore, the load on a linear guideway should be divided by the empirical factor.

Table 1-2 Load factor

| Loading Condition        | Service Speed           | f <sub>w</sub> |
|--------------------------|-------------------------|----------------|
| No impacts & vibration   | V ≤ 15 m/min            | 1 ~ 1.2        |
| Small impacts            | 15 m/min < V ≤ 60 m/min | 1.2 ~ 1.5      |
| Normal load              | 60m/min < V ≤ 120 m/min | 1.5 ~ 2.0      |
| With impacts & vibration | V > 120 m/min           | 2.0 ~ 3.5      |

**1-4-5 Calculation of Service Life (L<sub>h</sub>)**

Transform the nominal life into the service life time by using speed and frequency.

$$\text{Ball type: } L_h = \frac{L \cdot 10^3}{V_e \cdot 60} = \frac{\left(\frac{C}{P}\right)^3 \cdot 50 \cdot 10^3}{V_e \cdot 60} \text{ hr} \dots\dots\dots \text{Eq.1.6}$$

$$\text{Roller type: } L_h = \frac{L \cdot 10^3}{V_e \cdot 60} = \frac{\left(\frac{C}{P}\right)^{\frac{10}{3}} \cdot 100 \cdot 10^3}{V_e \cdot 60} \text{ hr} \dots\dots\dots \text{Eq.1.7}$$

- L<sub>h</sub> : Service life (hr)
- L : Nominal life (km)
- V<sub>e</sub> : Speed (m/min)
- C/P : Load factor

**1-5 Applied Loads**

**1-5-1 Calculation of Load**

Several factors affect the calculation of loads acting on a linear guideway (such as the position of the object's center of gravity, the thrust position, and the inertial forces at the time of start and stop). To obtain the correct load value, each load condition should be carefully considered.

(1) Load on one block

Table 1-3 Calculation example of loads on block

| Patterns | Loads layout | Load on one block   |
|----------|--------------|---|
|          |              | $P_1 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_2 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} - \frac{F \cdot b}{2d}$ $P_3 = \frac{W}{4} + \frac{F}{4} - \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_4 = \frac{W}{4} + \frac{F}{4} - \frac{F \cdot a}{2c} - \frac{F \cdot b}{2d}$ |
|          |              | $P_1 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_2 = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot a}{2c} - \frac{F \cdot b}{2d}$ $P_3 = \frac{W}{4} + \frac{F}{4} - \frac{F \cdot a}{2c} + \frac{F \cdot b}{2d}$ $P_4 = \frac{W}{4} + \frac{F}{4} - \frac{F \cdot a}{2c} - \frac{F \cdot b}{2d}$ |
|          |              | $P_1 = P_3 = \frac{W}{4} - \frac{F \cdot l}{2d}$ $P_2 = P_4 = \frac{W}{4} + \frac{F \cdot l}{2d}$   |
|          |              | $P_1 \sim P_4 = -\frac{W \cdot h}{2d} + \frac{F \cdot L}{2d}$   |
|          |              | $P_1 \sim P_4 = -\frac{W \cdot h}{2c} - \frac{F \cdot L}{2c}$ $P_{t1} = P_{t3} = \frac{W}{4} + \frac{F}{4} + \frac{F \cdot k}{2d}$ $P_{t2} = P_{t4} = \frac{W}{4} + \frac{F}{4} - \frac{F \cdot k}{2d}$   |

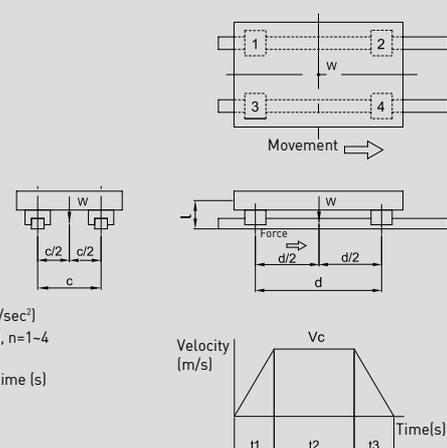
W: Applied weight  
l: Distance from external force to driver  
c: Rail spacing

$P_n$ : Load (radial, reverse radial), n=1-4  
F: External force  
d: Block spacing

a,b,k: Distance from external force to geometric center  
 $P_m$ : Load (lateral), n=1-4  
h: Distance from center of gravity to driver

(2) Loads with inertia forces

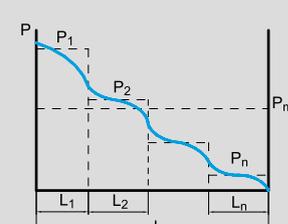
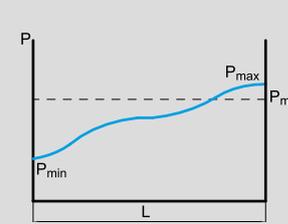
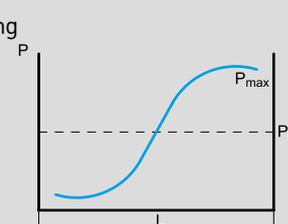
Table 1-4 Calculation Examples for Loads with Inertia Forces

| Considering the acceleration and deceleration   | Load on one block   |
|---|---|
|  <p>W: Weight of object (N)<br/>g: Gravitational acceleration (9.8m/sec<sup>2</sup>)<br/>P<sub>n</sub>: Load (radial, reverse radial) (N), n=1-4<br/>V<sub>c</sub>: Maximum speed (m/sec)<br/>t1(t3): Acceleration (deceleration) time (s)<br/>t2: Constant speed time (s)<br/>c: Rail spacing (m)<br/>d: Block spacing (m)<br/>l: Distance from center of gravity to driver (m)</p> | <ul style="list-style-type: none"> <li>Constant velocity<br/><math>P_1 \sim P_4 = \frac{W}{4}</math></li> <li>Acceleration<br/><math>P_1 = P_3 = \frac{W}{4} + \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_1} \cdot \frac{l}{d}</math><br/><math>P_2 = P_4 = \frac{W}{4} - \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_1} \cdot \frac{l}{d}</math></li> <li>Deceleration<br/><math>P_1 = P_3 = \frac{W}{4} - \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_3} \cdot \frac{l}{d}</math><br/><math>P_2 = P_4 = \frac{W}{4} + \frac{1}{2} \cdot \frac{W}{g} \cdot \frac{V_c}{t_3} \cdot \frac{l}{d}</math></li> </ul> |

1-5-2 Calculation of The Mean Load for Variable Loading

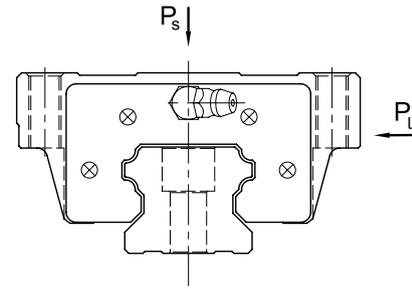
When the load on a linear guideway fluctuates greatly, the variable load condition must be considered in the life calculation. The definition of the mean load is the load equal to the bearing fatigue load under the variable loading conditions. It can be calculated by using table 1-5.

Table 1-5 Calculation Examples for Mean Load (P<sub>m</sub>)

| Operation Condition   | Mean load  |
|---|--|
| <p>Step load</p>           | $P_m = \sqrt[3]{1/L(P_1^3 \cdot L_1 + P_2^3 \cdot L_2 + \dots + P_n^3 \cdot L_n)}$ <p>P<sub>m</sub>: Mean load<br/>P<sub>n</sub>: Stepping<br/>L : Total running distance<br/>L<sub>n</sub>: Running distance under load P<sub>n</sub></p> |
| <p>Linear variation</p>    | $P_m = 1/3 (P_{min} + 2 \cdot P_{max})$ <p>P<sub>m</sub>: Mean load<br/>P<sub>min</sub>: Min. Load<br/>P<sub>max</sub>: Max. Load</p>  |
| <p>Sinusoidal loading</p>  | $P_m = 0.65 \cdot P_{max}$ <p>P<sub>m</sub>: Mean load<br/>P<sub>max</sub>: Max. Load</p>  |

### 1-5-3 Calculation for Bidirectional Equivalent Loads

HIWIN linear guideways can accept loads in several directions simultaneously. To calculate the service life of the guideway when the loads appear in multiple directions, calculate the equivalent load ( $P_e$ ) by using the equations below.



HG/EG/WE/QH/QE/QW/RG/QR/CG/CRG/AG Series

$$P_e = P_s + P_l \quad \text{Eq.1.8}$$

MG Series

$$\text{when } P_s > P_l \quad P_e = P_s + 0.5 \cdot P_l \quad \text{Eq.1.9}$$

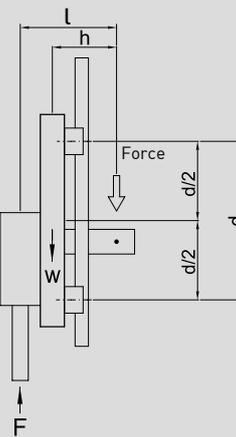
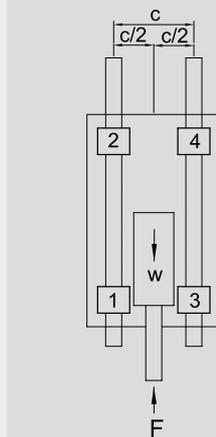
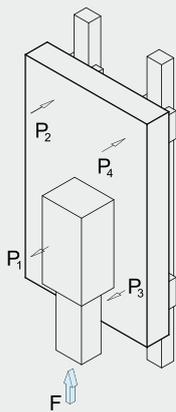
$$\text{when } P_l > P_s \quad P_e = P_l + 0.5 \cdot P_s \quad \text{Eq.1.10}$$

### 1-5-4 Calculation Example for Service Life

A suitable linear guideway should be selected based on the acting load. The service life is calculated from the ratio of the working load and the basic dynamic load rating.

Table 1-6 Calculation Example for Service Life

| Type of Linear Guideway   | Dimension of device | Operating condition             |
|---------------------------|---------------------|---------------------------------|
| Type: HGH 30 CA           | d : 600 mm          | Weight (W) : 15 kN              |
| C : 38.74 kN              | c : 400 mm          | Acting force (F) : 1 kN         |
| C <sub>0</sub> : 52.19 kN | h : 200 mm          | Temperature: normal temperature |
| Preload: Z0               | l : 250 mm          | Load status: normal load        |



- Calculation of acting loads

$$P_1 \sim P_4 = + \frac{W \times h}{2d} - \frac{F \times l}{2d} = + \frac{15 \times 200}{2 \times 600} - \frac{1 \times 250}{2 \times 600} = 2.29 \text{ (kN)}$$

$$P_{\max} = |P_1 \sim P_4| = 2.29 \text{ (kN)}$$

- Because preload is Z0,  $P_c = P_{\max} = 2.29 \text{ (kN)}$

Note: The larger preload (ZA, AB) will increase the rigidity, but decrease the nominal life of guideway.

- Calculation for life L

$$L = \left( \frac{f_h \times f_t \times C}{f_w \times P_c} \right)^3 \times 50 = \left( \frac{1 \times 1 \times 38.74}{2 \times 2.29} \right)^3 \times 50 = 30,258 \text{ (km)}$$



## 1-8 Lubrication

Supplying insufficient lubrication to the guideway will greatly reduce the service life due to an increase in rolling friction. The lubricant provides the following functions;

- Reduces the rolling friction between the contact surfaces to avoid abrasion and surface burning of the guideway.
- Generates a lubricant film between the rolling surfaces and decreases fatigue.
- Anti-corrosion.

### 1-8-1 Grease

Linear guideway must be lubricated with the lithium soap based grease before installation. After the linear guideway is installed, we recommend that the guideway be re-lubricated every 100 km. It is possible to carry out the lubrication through the grease nipple. Generally, grease is applied for speeds that do not exceed 60 m/min faster speeds will require high-viscosity oil as a lubricant.

$$T = \frac{100 \cdot 1000}{V_e \cdot 60} \text{ hr} \quad \dots\dots\dots \text{Eq.1.12}$$

T : Feeding frequency of oil (hour)  
V<sub>e</sub> : speed (m/min)

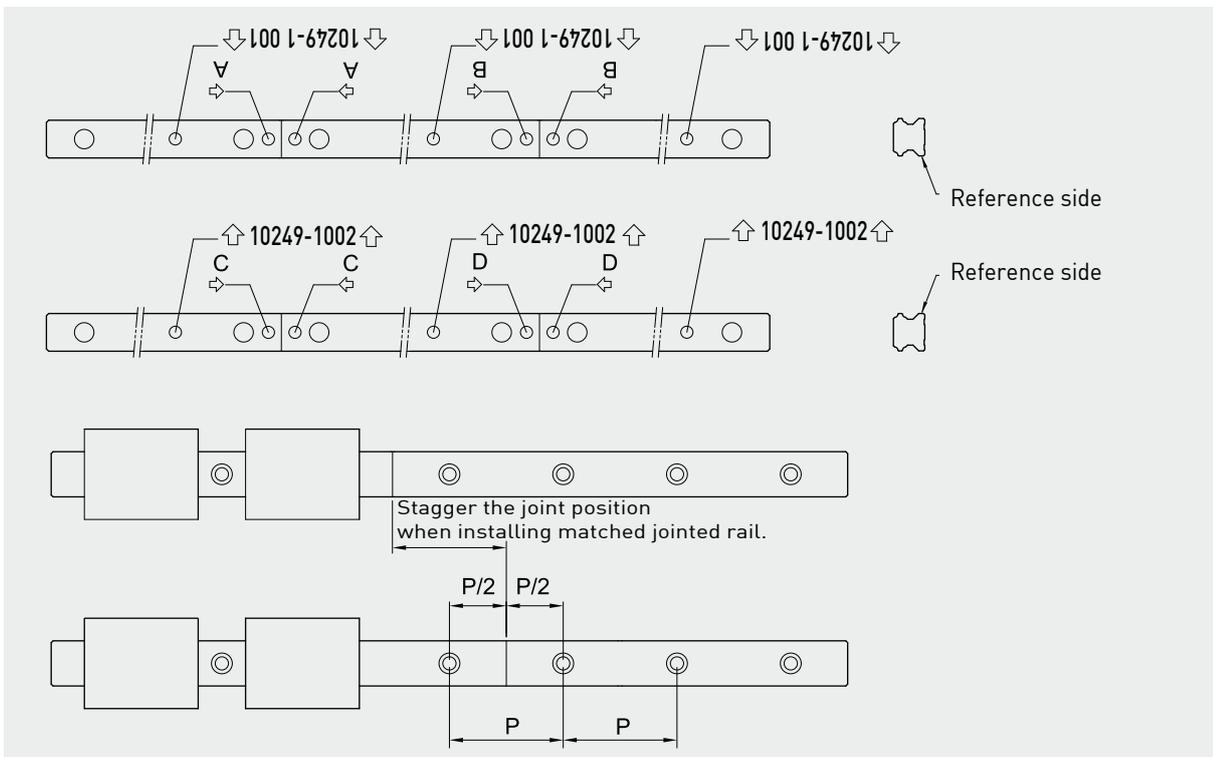
### 1-8-2 Oil

The recommended viscosity of oil is about 30~150cSt. The standard grease nipple may be replaced by an oil piping joint for oil lubrication. Since oil evaporates quicker than grease, the recommended oil feed rate is approximate 0.3cm<sup>3</sup>/hr.

## 1-9 The Butt-joint Rail

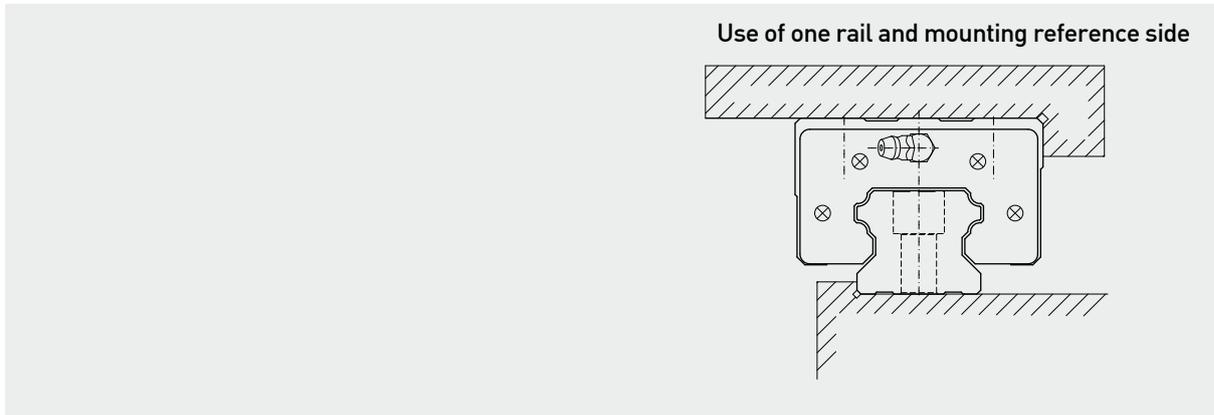
Jointed rail should be installed by following the arrow sign and ordinal number which is marked on the surface of each rail.

For matched pair, jointed rails, the jointed positions should be staggered. This will avoid accuracy problems due to discrepancies between the 2 rails (see figure).

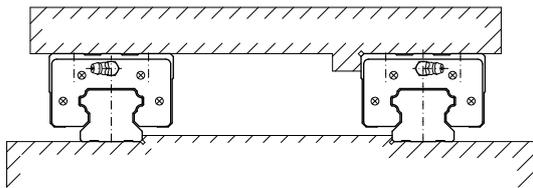


## 1-10 Mounting Configurations

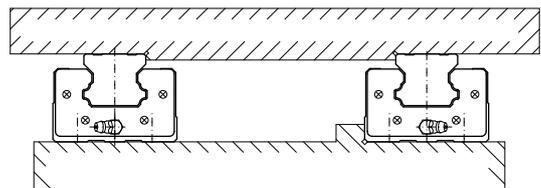
Linear guideways have equal load ratings in the radial, reverse radial and lateral directions. The application depends on the machine requirements and load directions. Typical layouts for linear guideways are shown below:



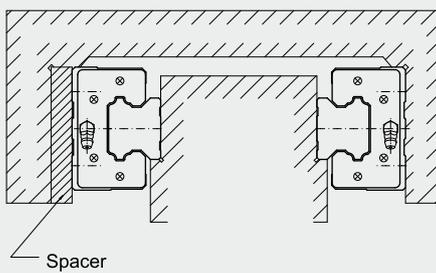
**use of two rails(block movement)**



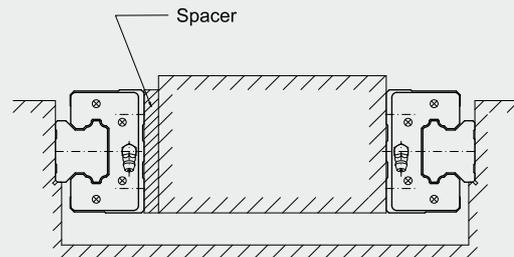
**use of two rails(block fixed)**



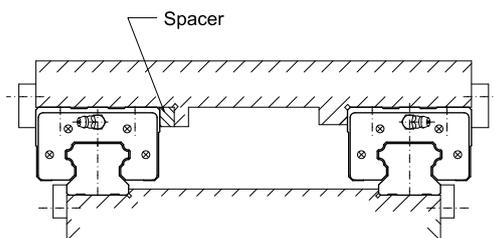
**use of two external rails**



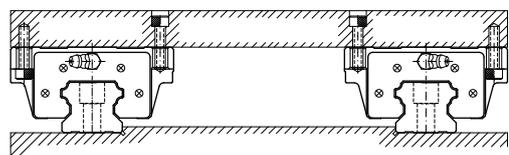
**use of two internal rails**



**total surface fixed installation**



**HGW type block with mounting holes in different directions.**

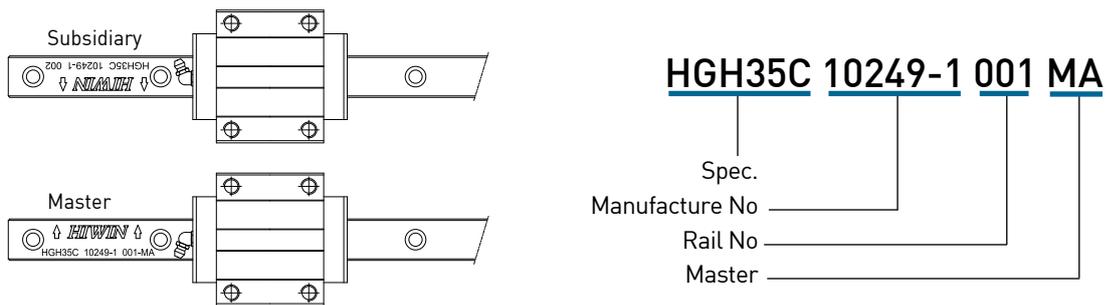


## 1-11 Mounting Procedures

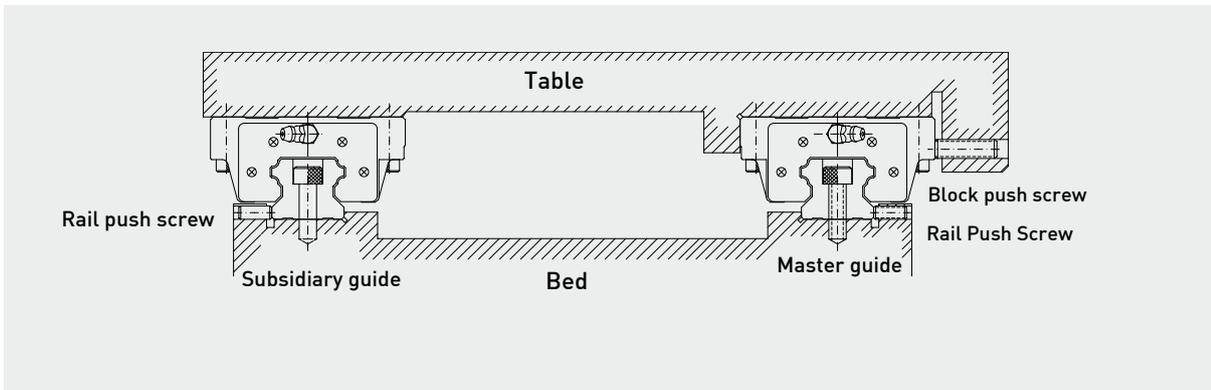
Three installation methods are recommended based on the required running accuracy and the degree of impacts and vibrations.

### 1-11-1 Master and Subsidiary Guide

For non-interchangeable type Linear Guideways, there are some differences between the master guide and subsidiary guide. The accuracy of the master guide's datum plane is better than the subsidiary's and it can be a reference side for installation. There is a mark "MA" printed on the rail, as shown in the figure below.

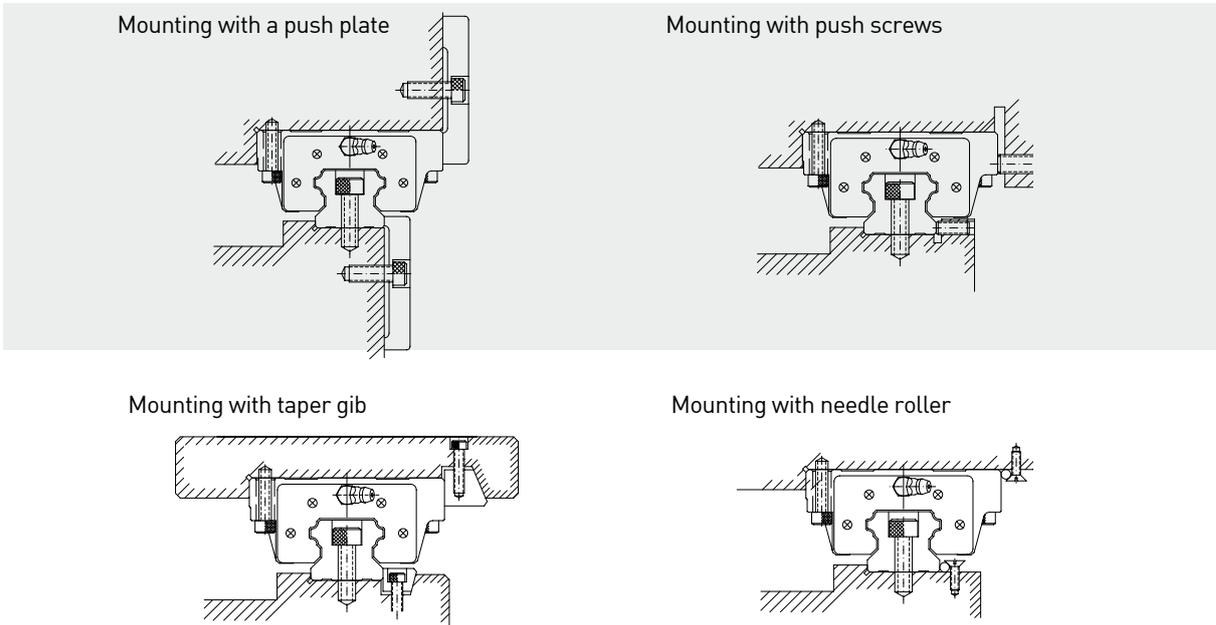


### 1-11-2 Installation to Achieve High Accuracy and Rigidity



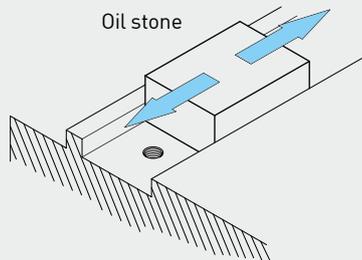
### (1) Mounting methods

It is possible that the rails and the blocks will be displaced when the machine is subjected to vibrations and impacts. To eliminate these difficulties and achieve high running accuracy, the following four methods are recommended for fixing.

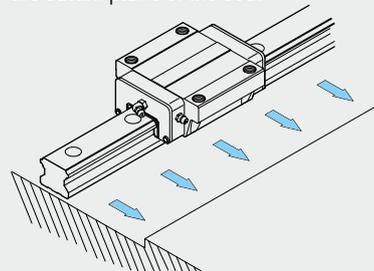


### (2) Procedure of rail installation

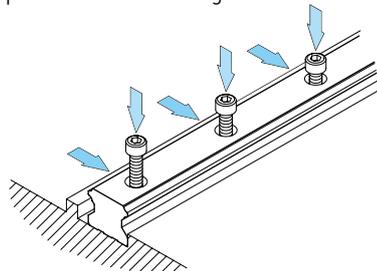
- 1 Before starting, remove all dirt from the mounting surface of the machine.



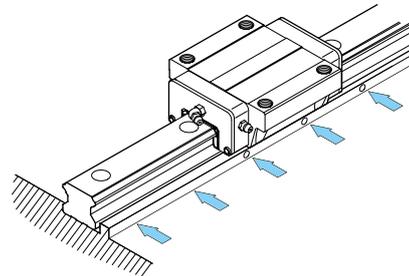
- 2 Place the linear guideway gently on the bed. Bring the guideway into close contact with the datum plane of the bed.



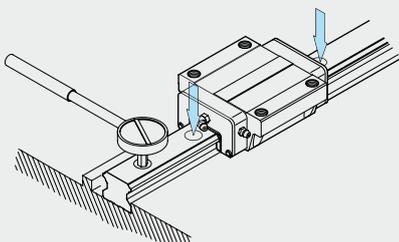
- 3 Check for correct thread engagement when inserting a bolt into the mounting hole while the rail is being placed on the mounting surface of the bed.



- 4 Tighten the push screws sequentially to ensure close contact between the rail and the side datum plane.



- 5 Tighten the mounting bolts with a torque wrench to the specified torque.



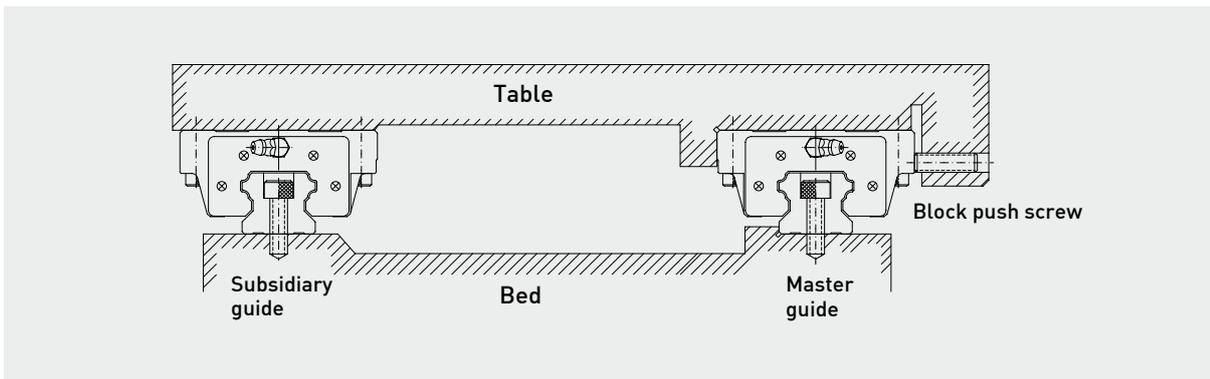
- 6 Install the remaining linear guideway in the same way.

**(3) Procedure of block installation**

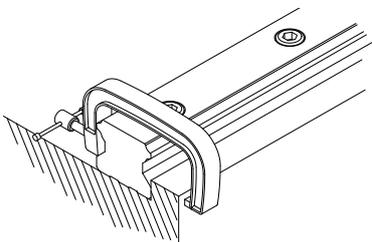
- Place the table gently on the blocks. Next, hand-tighten the block mounting bolts temporarily.
- Push the blocks against the datum plane of the table and position the table by tightening the push screws.
- The table can be fixed uniformly by tightening the mounting bolts on master guide side and subsidiary side in 1 to 4 sequences.

**1-11-3 Installation of the Master Guide without Push Screws**

To ensure parallelism between the subsidiary guide and the master guide without push screws, the following rail installation methods are recommended. The block installation is the same as mentioned previously.

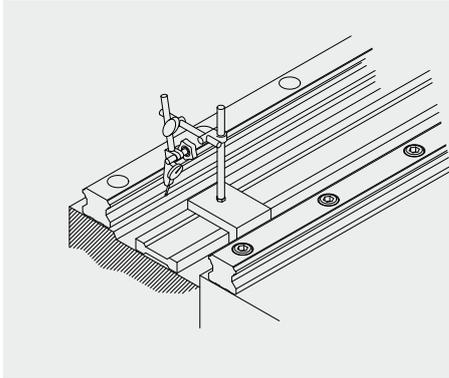


**(1) Installation of the rail on the subsidiary guide side**

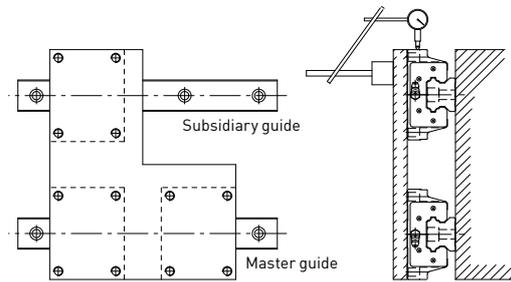


- **Using a vice**  
Place the rail into the mounting plane of the bed. Tighten the mounting bolts temporarily; then use a vice to push the rail against the side datum plane of the bed. Tighten the mounting bolts in sequence to the specified torque.

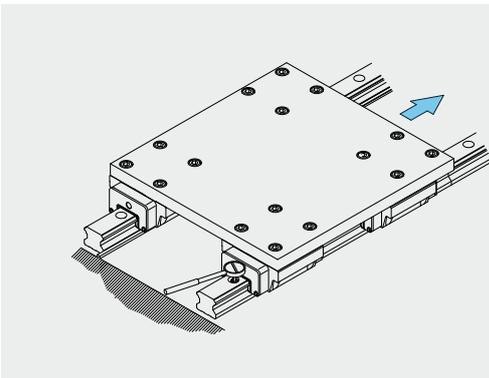
(2) Installation of the rail on the subsidiary guide side



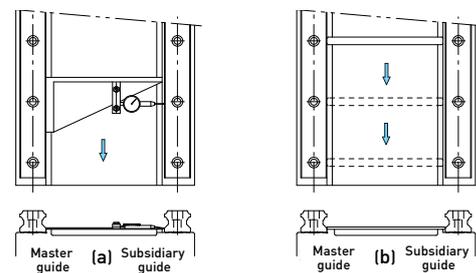
- **Method with use of a straight edge**  
Set a straight edge between the rails parallel to the side datum plane of the rail on the master guide side by using a dial gauge. Use the dial gauge to obtain the straight alignment of the rail on the subsidiary guide side. When the rail on the subsidiary guide side is parallel to the master side, tighten the mounting bolts in sequence from one end of the rail to the other.



- **Method with use of a table**  
Fix two blocks on the master guide side to the table. Temporarily fix the rail and one block on the subsidiary guide side to the bed and the table. Fix a dial gauge stand on the table surface and bring it into contact with the side of the block on the subsidiary guide side. Move the table from one end of the rail to the other. While aligning the rail on the subsidiary side parallel to the rail on the master guide side, tighten the bolts in sequence.



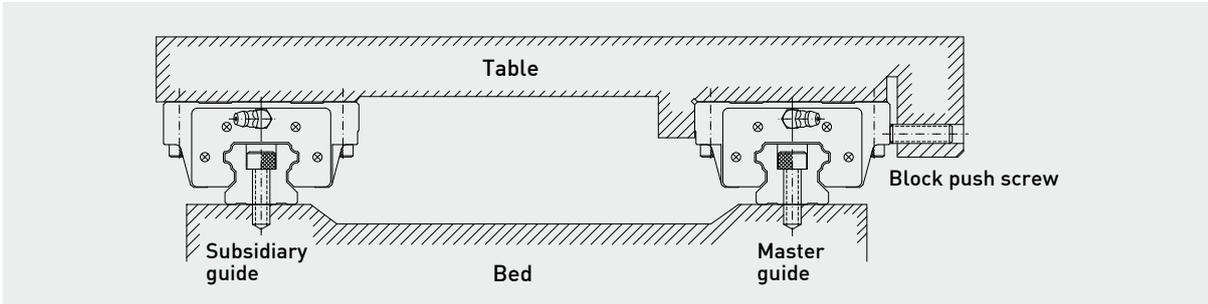
- **Method following the master guide side**  
When a rail on the master guide side is correctly tightened, fix both blocks on the master guide side and one of the two blocks on the subsidiary guide side completely to the table. When moving the table from one end of the rail, tighten the mounting bolts on the subsidiary guide side completely.



- **Method with use of a jig**  
Use a special jig to ensure the rail position on the subsidiary guide side. Tighten the mounting bolts to the specified torque in sequence.

### 1-11-4 Installation Without Side Surface

To ensure parallelism between the subsidiary guide and the master guide when there is no side surface, the following rail installation method is recommended. The installation of the blocks is the same as mentioned previously.



#### (1) Installation of the rail on the master guide side

- Using a provisional datum plane**  
 Two blocks are fixed in close contact by the measuring plate. A datum plane provided on the bed is used for straight alignment of the rail from one end to the other. Move the blocks and tighten the mounting bolts to the specified torque in sequence.

- Method with use of a straight edge**  
 Use a dial gauge and a straight edge to confirm the straightness of the side datum plane of the rail from one end to the other. Make sure the mounting bolts are tightened securely in sequence.

#### (2) Installation of the rail on the subsidiary guide side

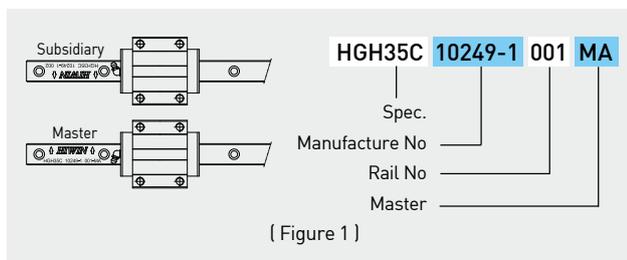
The method of installation for the rail on the subsidiary guide side is the same as the case without push screws.

### 1-11-5 Linear Guideway Mounting Notifications

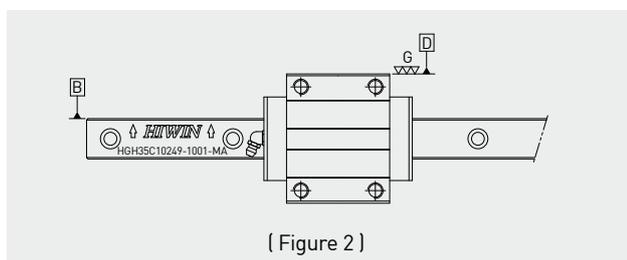
1. HIWIN guideways are applied with rust-proof oil before shipping. Please clean the oil before moving or running the blocks.

2. Recognition of master and subsidiary rails: For non-interchangeable type linear guideways, there are some differences between the master rail and subsidiary rail. The accuracy of the master rail's datum plane is better than the subsidiary's and it can be a reference side for installation. There is a mark "MA" printed on the rail. Check for the correct order before starting the installation. The rail number of master is an odd number and the rail number of subsidiary is an even number. Please install the rails according to the indication and carry on the installation according to the order for multi-rails installment (e.g.: 001 pairs 002 ; 003 pairs 004 etc.)

3. Recognition of datum plane: The datum plane (B) of rail is the side indicated by the arrow, which is marked on the top surface of the rail. The datum plane of block is smooth ground surface which shows as D in Figure 2.

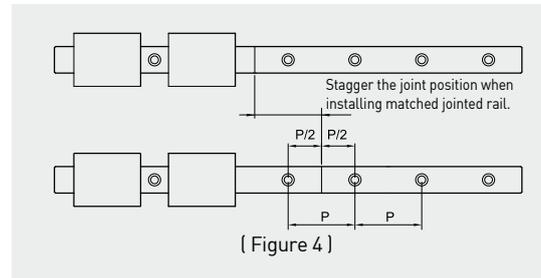
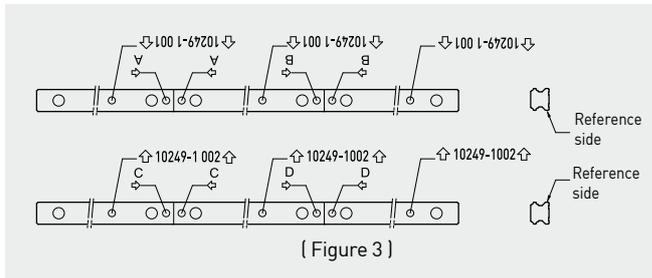


( Figure 1 )

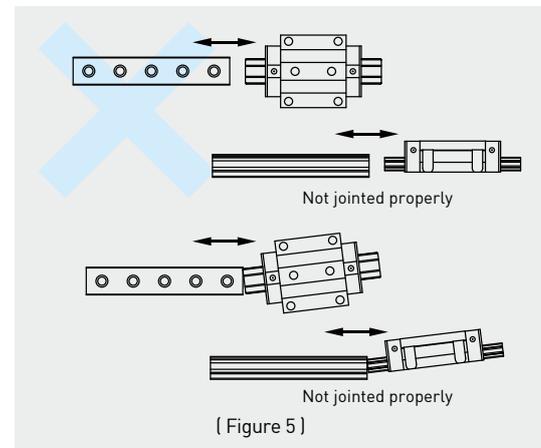
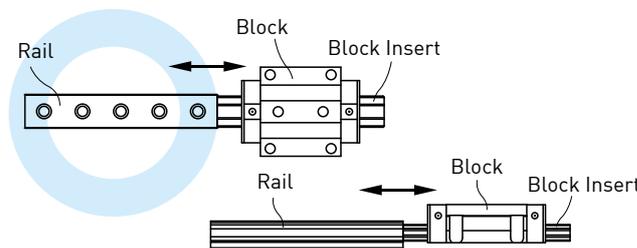


( Figure 2 )

4. Butt-joint rail: Butt-joint rail should be installed by following the arrow sign and ordinal number which is marked on the surface of each rail as shown in the figure 3. To avoid accuracy problems due to discrepancies between the 2 rails such as for matched pair, butt-joint rails, the jointed positions should be staggered as shown in figure 4.



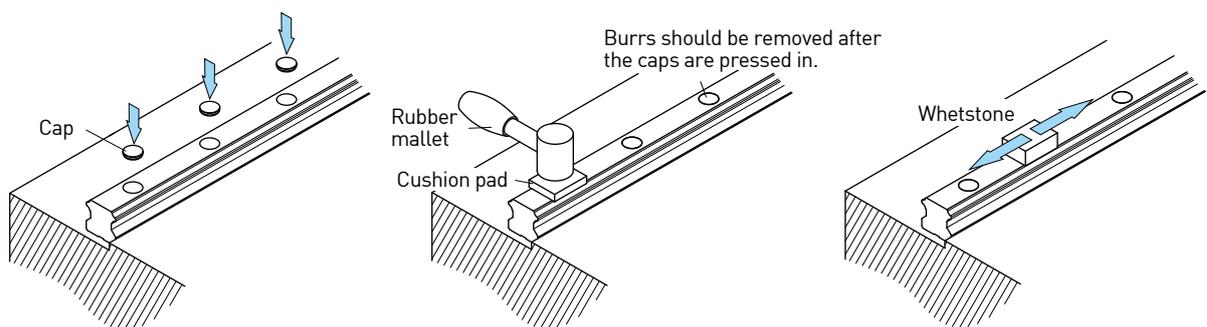
5. Do not remove blocks from rails when assembling the guideways. HIWIN recommends using block inserts (please see Figure 5) if it is necessary to remove/ mount block from/ onto rail.



6. HIWIN recommends not randomly mixing block units and rails for non interchangeable type to avoid any installation problem.
7. To ensure the straightness of rail, please tighten the mounting bolts sequentially with a torque wrench to the specified torque. (Refer to HIWIN Technical Information).

## 1-11-6 Linear Guideway Usage Instructions

To ensure a long lifetime and running accuracy of the linear guideways after assembly, it is recommended to cover the rail roles with caps.



1. Put the caps into the bolt hole.
2. Use the cushion pad and rubber mallet to flush the caps and make it even with the bolt holes.  
Burr should be removed after the caps are pressed in.
3. When the caps are fitted into the bolt holes, please smoothen the top surface of the caps and make sure no burrs remained and not higher than the rail.

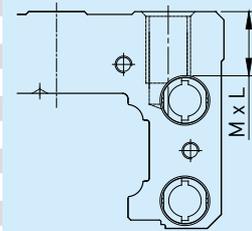
### 1-11-7 Linear Guideway Usage Instructions

1. Lubricate the blocks after assembling the guideways in machines. Use a lithium soap-base grease or oil.
2. The guideways are packaged with anti-corrosion oil before delivery. If the rails were cleaned before installation, remember to lubricate the rails after assembling the guideways in machine. (Please confirm the compatibility between lubricant & anti rust rail)
3. The blocks are composed of various plastic parts, please avoid prolonged exposure of these parts with any organic solvent when cleaning the blocks to prevent possible damage.
4. Try to avoid any foreign objects from getting into the block as this could result in damage to the product.
5. Please do not disassemble the parts, the incautious actions of disassembly may bring foreign objects into the block and diminish the precision of the guideways or cause possible damage.
6. When handling the guideways please hold them horizontally. Improper handling can cause the blocks to fall off the rail.
7. Please avoid the inappropriate falling or clash on the blocks, which will damage the function of guideways.
8. For special application conditions, please apply the appropriate surface treatment or refer to the Linear Guideway Technical Information catalog for more detailed instructions.
9. The operating temperature range of the E2 type (Self lubricant kit) is  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$ . For Q1 types (Quiet linear guideway), the range is  $-10^{\circ}\text{C} \sim 80^{\circ}\text{C}$ . The maximum service temperature of the SE type (Metallic end cap) is  $150^{\circ}\text{C}$  and for other standard types it is  $100^{\circ}\text{C}$ .
10. Please refer to the Linear Guideway Technical Information catalog for more detailed instructions. Please do not hesitate to contact HIWIN if there are further questions related to the application.

Note: For Q1 type guideways (QH & QE), please pay attention to the following instructions:

1. When assembling and disassembling the Q1 blocks, please use the block insert that is provided. (one block insert is equipped per block).
2. Special accessories are used in the Q1 type guideways, any adjustment on the preload is prohibited.
3. For some of our Q1 type Linear Guideways, the boreholes for fixing the slider on the block are connected with recirculation channels. Therefore please pay attention to the length of screws, to avoid the screw with longer length might interfere the recirculation parts and influence the operating performance.

| Specification | Max. length of screws<br>M x L (mm) |
|---------------|-------------------------------------|
| QHH20         | M5 x 6                              |
| QHH25         | M6 x 8                              |
| QHH30         | M8 x 10                             |
| QHH35         | M8 x 12                             |
| QEH20         | M5 x 7                              |
| QEH25         | M6 x 9                              |
| QEH30         | M8 x 10                             |
| QWH27         | M6 x 6                              |
| QWH35         | M8 x 8                              |



## 2. HIWIN Linear Guideway Product Series

In an effort to meet customer's requirement and service needs HIWIN offers several different types of guides. We supply the HG series which is suitable for CNC machineries, the EG series for automation industries, the WE series for single axis equipment, the RG series for high rigidity applications, and the miniature series, MGN/MGW, for medical devices and semiconductor equipment. Also for high technology industries, HIWIN has developed the QH and QE series with high speed and quiet characteristics.

### (1) Types & series

Table 2-1 Types & Series

| Series | Assembly Height | Load             | Square Tap hole | Flange   |              |                                 |
|--------|-----------------|------------------|-----------------|----------|--------------|---------------------------------|
|        |                 |                  |                 | Tap hole | Drilled hole | Combination                     |
| HG     | High            | Heavy Load       | HGH-CA          | -        | -            | -                               |
|        |                 | Super Heavy Load | HGH-HA          | -        | -            | -                               |
|        | Low             | Heavy Load       | HGL-CA          | HGW-CA   | HGW-CB       | HGW-CC                          |
|        |                 | Super Heavy Load | HGL-HA          | HGW-HA   | HGW-HB       | HGW-HC                          |
| EG     | Low             | Medium Load      | EGH-SA          | EGW-SA   | EGW-SB       | -                               |
|        |                 | Heavy Load       | EGH-CA          | EGW-CA   | EGW-CB       | -                               |
| WE     | Low             | Heavy Load       | WEH-CA          | -        | -            | WEW-CC                          |
| MGN    | -               | Standard         | MGN-C           | -        | -            | -                               |
|        |                 | Long             | MGN-H           | -        | -            | -                               |
| MGW    | -               | Standard         | MGW-C           | -        | -            | -                               |
|        |                 | Long             | MGW-H           | -        | -            | -                               |
| MGN-0  | -               | Standard         | MGN-C-0         | -        | -            | -                               |
|        |                 | Long             | MGN-H-0         | -        | -            | -                               |
| MGW-0  | -               | Standard         | MGW-C-0         | -        | -            | -                               |
|        |                 | Long             | MGW-H-0         | -        | -            | -                               |
| QH     | High            | Heavy Load       | QHH-CA          | -        | -            | -                               |
|        |                 | Super Heavy Load | QHH-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       | -                               |
| QW     | Low             | Heavy Load       | QWH-CA          | -        | -            | QWW-CC                          |
| CG     | High            | Heavy Load       | CGH-CA          | -        | -            | -                               |
|        |                 | Super Heavy Load | CGH-HA          | -        | -            | -                               |
|        | Low             | Heavy Load       | CGL-CA          | -        | -            | CGW-CC<br>CGW-CA <sup>(1)</sup> |
|        |                 | Super Heavy Load | CGL-HA          | -        | -            | CGW-HC<br>CGW-HA <sup>(1)</sup> |
| RG     | High            | Heavy Load       | RGH-CA          | -        | -            | -                               |
|        |                 | Super Heavy Load | RGH-HA          | -        | -            | -                               |
|        | Low             | Heavy Load       | RGL-CA          | -        | -            | RGW-CC                          |
|        |                 | Super Heavy Load | RGL-HA          | -        | -            | RGW-HC                          |
|        | Ultra low       | Heavy Load       | RGS-CA          | -        | -            | RGF-CC                          |
|        |                 | Super Heavy Load | RGS-HA          | -        | -            | RGF-HC                          |
| QR     | High            | Heavy Load       | QRH-CA          | -        | -            | -                               |
|        |                 | Super Heavy Load | QRH-HA          | -        | -            | -                               |
|        | Low             | Heavy Load       | QRL-CA          | -        | -            | QRW-CC                          |
|        |                 | Super Heavy Load | QRL-HA          | -        | -            | QRW-HC                          |
| CRG    | High            | Heavy Load       | CRGH-CA         | -        | -            | -                               |
|        |                 | Super Heavy Load | CRGH-HA         | -        | -            | -                               |
|        | Low             | Heavy Load       | CRGL-CA         | -        | -            | CRGW-CC                         |
|        |                 | Super Heavy Load | CRGL-HA         | -        | -            | CRGW-HC                         |
| AG     | -               | Heavy Load       | AG-C            | -        | -            | -                               |
|        |                 | Super Heavy Load | AG-H            | -        | -            | -                               |

Note : (1) For CGW-CA/HA ,The amount of block mounting holes is four.  
For CGW-CC/HC ,The amount of block mounting holes is six.  
Both types can be mounting from top or bottom.

**(2) Accuracy classes**

Table 2-2 Accuracy Classes

| Series | Assembly Type |      |           |                 |                 | Interchangeable Type |      |           |
|--------|---------------|------|-----------|-----------------|-----------------|----------------------|------|-----------|
|        | Normal        | High | Precision | Super Precision | Ultra Precision | Normal               | High | Precision |
|        | (C)           | (H)  | (P)       | (SP)            | (UP)            | (C)                  | (H)  | (P)       |
| HG     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| EG     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| WE     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| MGN    | ●             | ●    | ●         | -               | -               | ●                    | ●    | ●         |
| MGW    | ●             | ●    | ●         | -               | -               | ●                    | ●    | ●         |
| MGN-0  | ●             | ●    | ●         | -               | -               | ●                    | ●    | ●         |
| MGW-0  | ●             | ●    | ●         | -               | -               | ●                    | ●    | ●         |
| QH     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| QE     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| QW     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| CG     | ●             | ●    | ●         | ●               | ●               | ●                    | ●    | ●         |
| RG     | -             | ●    | ●         | ●               | ●               | -                    | ●    | ●         |
| QR     | -             | ●    | ●         | ●               | ●               | -                    | ●    | ●         |
| CRG    | -             | ●    | ●         | ●               | ●               | -                    | ●    | ●         |
| AG     | -             | -    | ●         | -               | -               | -                    | -    | -         |

**(3) Classification of preload**

Table 2-3 Preload

| Series | Non-interchangeable Type |                     |                    | Interchangeable Type |                     |
|--------|--------------------------|---------------------|--------------------|----------------------|---------------------|
|        | Light preload (Z0)       | Medium Preload (ZA) | Heavy Preload (ZB) | Light Preload (Z0)   | Medium Preload (ZA) |
| HG     | ●                        | ●                   | ●                  | ●                    | ●                   |
| EG     | ●                        | ●                   | ●                  | ●                    | ●                   |
| WE     | ●                        | ●                   | ●                  | ●                    | ●                   |
| QH     | ●                        | ●                   | ●                  | ●                    | ●                   |
| QE     | ●                        | ●                   | ●                  | ●                    | ●                   |
| QW     | ●                        | ●                   | ●                  | ●                    | ●                   |
| CG     | ●                        | ●                   | ●                  | ●                    | ●                   |
| AG     | ●                        | ●                   | ●                  | -                    | -                   |

| Series | Non-interchangeable Type |                     |                    | Interchangeable Type    |                    |
|--------|--------------------------|---------------------|--------------------|-------------------------|--------------------|
|        | Very Light Preload (Z0)  | Medium Preload (ZA) | Heavy Preload (ZB) | Very Light Preload (Z0) | Light Preload (ZA) |
| RG     | ●                        | ●                   | ●                  | ●                       | ●                  |
| QR     | ●                        | ●                   | ●                  | ●                       | ●                  |
| CRG    | ●                        | ●                   | ●                  | ●                       | ●                  |

| Series | Non-interchangeable Type |                         |                    | Interchangeable Type |                         |                    |
|--------|--------------------------|-------------------------|--------------------|----------------------|-------------------------|--------------------|
|        | Light Clearance (ZF)     | Very Light Preload (Z0) | Light Preload (Z1) | Light Clearance (ZF) | Very Light Preload (Z0) | Light Preload (Z1) |
| MGN    | ●                        | ●                       | ●                  | ●                    | ●                       | ●                  |
| MGW    | ●                        | ●                       | ●                  | ●                    | ●                       | ●                  |
| MGN-0  | ●                        | ●                       | ●                  | ●                    | ●                       | ●                  |
| MGW-0  | ●                        | ●                       | ●                  | ●                    | ●                       | ●                  |

(4) Recommended accuracy grade for machine applications

| Application Grade     |  | AXIS | Accuracy Grade |   |   |    |    |
|-----------------------|--|------|----------------|---|---|----|----|
|                       |  |      | C              | H | P | SP | UP |
| CNC Machinery Tools   | Lathes                                 | X    |                |   | ● | ●  | ●  |
|                       |  | Z    |                |   | ● | ●  |    |
|                       | Milling Machines<br>Boring Machines    | X    |                |   |   | ●  | ●  |
|                       |  | Y    |                |   | ● | ●  |    |
|                       |  | Z    |                |   | ● | ●  |    |
|                       | Machine Center                         | X    |                |   | ● | ●  | ●  |
|                       |  | Y    |                |   | ● | ●  | ●  |
|                       |  | Z    |                |   | ● | ●  |    |
|                       | Jig Borers                             | X    |                |   |   |    | ●  |
|                       |  | Y    |                |   |   |    | ●  |
|                       |  | Z    |                |   |   |    | ●  |
|                       | Drilling Machines                      | X    |                |   | ● |    |    |
|                       |  | Y    |                |   | ● |    |    |
|                       |  | Z    |                | ● | ● |    |    |
|                       | Grinders                               | X    |                |   |   | ●  | ●  |
|                       |  | Y    |                |   | ● | ●  |    |
|                       | EDM                                    | X    |                |   | ● | ●  |    |
|                       |  | Y    |                |   | ● | ●  |    |
|                       |  | Z    |                |   | ● |    |    |
|                       | Wire Cut EDM                           | X    |                |   |   | ●  |    |
| Y                     |  |      |                |   | ● |    |    |
| U                     |  |      |                | ● | ● |    |    |
| V                     |  |      |                | ● | ● |    |    |
| Laser Cutting Machine | X                                      |      |                | ● |   |    |    |
|                       | Y                                      |      |                | ● |   |    |    |
|                       | Z                                      |      |                | ● |   |    |    |
| General Machinery     | Punching Press                         | X    |                | ● | ● |    |    |
|                       |  | Y    |                | ● | ● |    |    |
|                       | Single Purpose Machines                |      |                | ● | ● | ●  |    |
|                       | Wood Working Machines                  |      | ●              | ● |   |    |    |
|                       | Industrial Robot ( Precision )         |      |                |   | ● | ●  |    |
|                       | Industrial Robot ( General )           |      | ●              | ● | ● |    |    |
|                       | Coordinate Measuring Machine           |      |                |   |   | ●  | ●  |
|                       | Non-CNC Machine                        |      |                |   | ● |    |    |
|                       | Transport Equipment                    |      | ●              | ● | ● |    |    |
|                       | X-Y Table                              |      |                |   | ● | ●  | ●  |
|                       | Linear Actuator                        |      | ●              | ● | ● |    |    |
|                       | Aircraft Landing Gear                  |      |                | ● | ● |    |    |
|                       | Airfoil Control                        |      |                | ● | ● |    |    |
|                       | Gate Valve                             |      | ●              | ● |   |    |    |
|                       | Power Steering                         |      |                | ● |   |    |    |
|                       | Glass Grinder                          |      |                |   | ● | ●  |    |
|                       | Surface Grinder                        |      |                |   | ● |    |    |
|                       | Induction Hardening Machine            |      | ●              | ● |   |    |    |
|                       | Electromachine                         |      |                |   | ● | ●  | ●  |
|                       | All-electric Injection Molding Machine |      | ●              | ● | ● |    |    |

## HG Series

### Heavy Load Ball Type

## 2-1 HG Series - Heavy Load Ball Type Linear Guideway

HG 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, HIWIN HG series linear guideways can achieve a long life with high speed, high accuracy and smooth linear motion.

### 2-1-1 Features of HG Series

#### (1) Self-aligning capability

By design, the circular-arc groove has contact points at 45 degrees. HG 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.

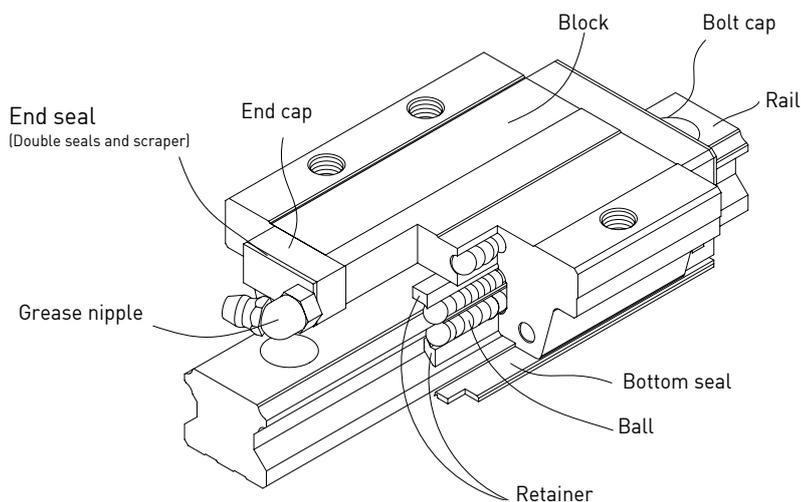
#### (2) Interchangeability

Because of precision dimensional control, the dimensional tolerance of HG 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 HG 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 HG Series

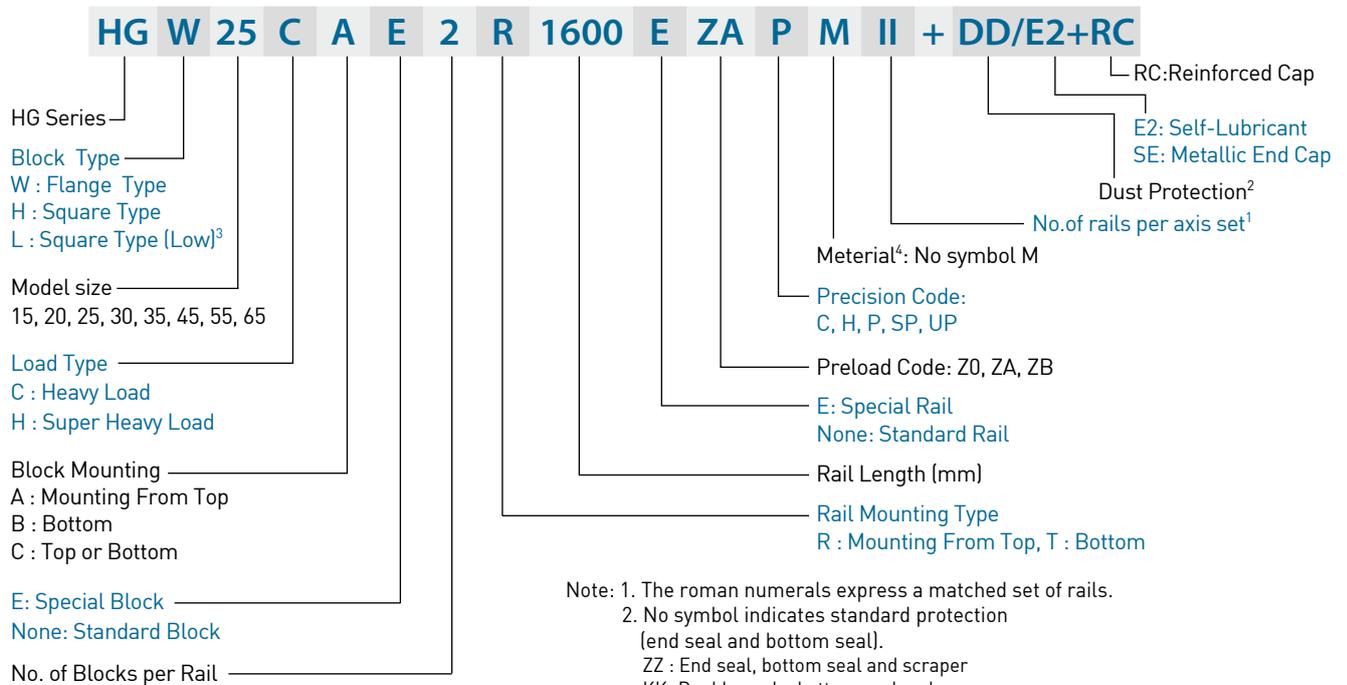


- Rolling circulation system: Block, Rail, End Cap and Retainer
- Lubrication system: Grease Nipple and Piping Joint
- Dust protection system: End seal, Bottom Seal, Bolt Cap, Double Seals and Scraper

### 2-1-3 Model Number of HG Series

HG 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 HG series contains the size, type, accuracy class, preload class, etc..

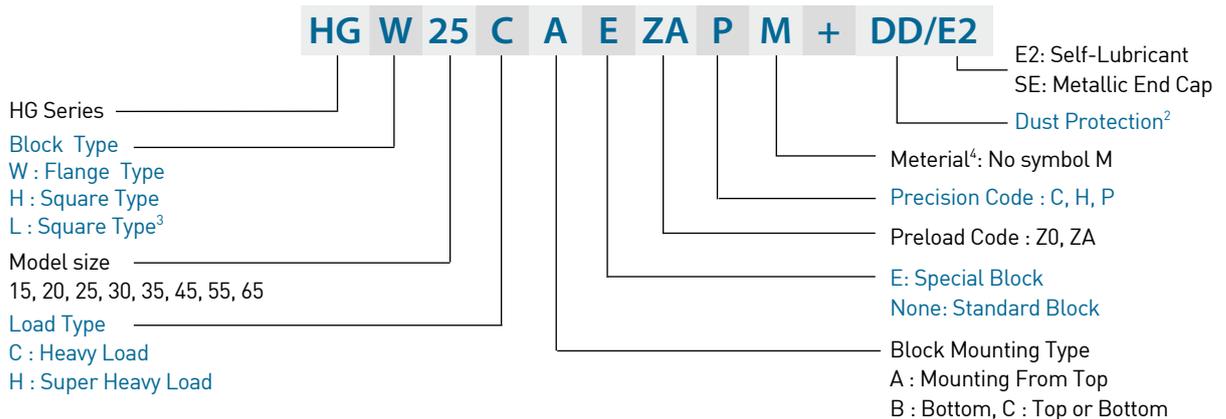
(1) Non-interchangeable type



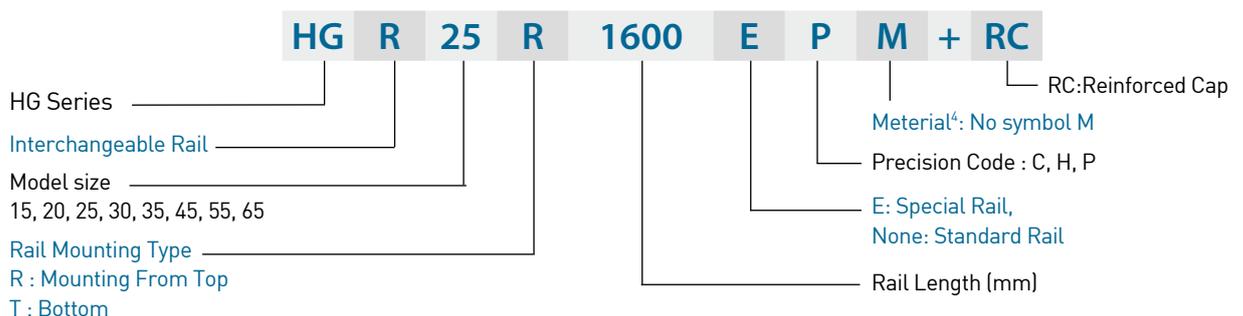
- Note: 1. The roman numerals express a matched set of rails.  
 2. No symbol indicates standard protection (end seal and bottom seal).  
 ZZ : End seal, bottom seal and scraper  
 KK: Double seals, bottom seal and scraper.  
 DD: Double seals and bottom seal  
 3. Block type HGL is the low profile design of HGH (square type), the assembled height is same as HGW (flange type) in same size.  
 4. No symbol: Carbon Steel / M: Stainless Steel  
 5. The stainless steel is available for HG15C · HG20C · HG25C.

(2) Interchangeable type

○ Model Number of HG Block



○ Model Number of HG Rail



# HG Series

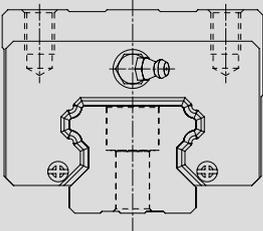
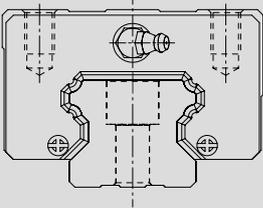
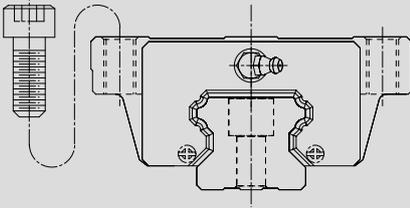
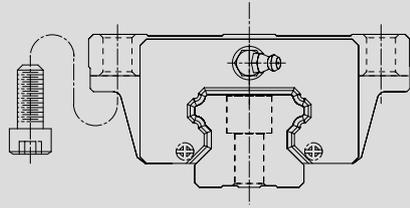
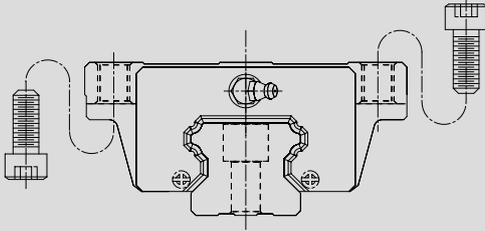
## Heavy Load Ball Type

### 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 | HGH-CA<br>HGH-HA |    | 28<br>↓<br>90 | 100<br>↓<br>4000 | <ul style="list-style-type: none"> <li>○ Machine Centers</li> <li>○ NC Lathes</li> <li>○ Grinding Machines</li> <li>○ Precision Machining Machines</li> <li>○ Heavy Cutting Machines</li> <li>○ Automation Devices</li> <li>○ Transportation Equipment</li> <li>○ Measuring Equipment</li> <li>○ Devices Requiring High Positional Accuracy</li> </ul> |
|        | HGL-CA<br>HGL-HA |  | 24<br>↓<br>70 | 100<br>↓<br>4000 |  |
| Flange | HGW-CA<br>HGW-HA |  | 24<br>↓<br>90 | 100<br>↓<br>4000 |  |
|        | HGW-CB<br>HGW-HB |  | 24<br>↓<br>90 | 100<br>↓<br>4000 |  |
|        | HGW-CC<br>HGW-HC |  | 24<br>↓<br>90 | 100<br>↓<br>4000 |  |

**(2) Rail types**

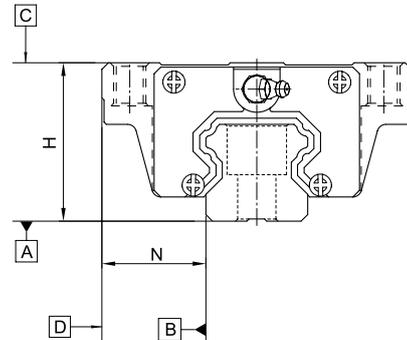
Besides the standard top mounting type, the bottom mounting type is also available.

Table 2-1-2 Rail Types



**2-1-5 Accuracy Classes**

The accuracy of HG 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

Unit: mm

| Item  | HG - 15, 20      |             |                  |                         |                         |
|---|------------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015            | 0<br>- 0.008            |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015            | 0<br>- 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 2-1-11 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |             |                  |                         |                         |

Table 2-1-4 Accuracy Standards

Unit: mm

| Item  | HG - 25, 30, 35  |             |                  |                         |                         |
|---|------------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 0.01             |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 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 2-1-11 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |             |                  |                         |                         |

## HG Series

### Heavy Load Ball Type

Table 2-1-5 Accuracy Standards

Unit: mm

| Item  | HG - 45, 55      |             |                  |                            |                            |
|---|------------------|-------------|------------------|----------------------------|----------------------------|
| Accuracy Classes                                    | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.05      | 0<br>- 0.05      | 0<br>- 0.03                | 0<br>- 0.02                |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.05      | 0<br>- 0.05      | 0<br>- 0.03                | 0<br>- 0.02                |
| Variation of height H                               | 0.03             | 0.015       | 0.007            | 0.005                      | 0.003                      |
| Variation of width N                                | 0.03             | 0.02        | 0.01             | 0.007                      | 0.005                      |
| Running parallelism of block surface C to surface A | See Table 2-1-11 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |             |                  |                            |                            |

Table 2-1-6 Accuracy Standards

Unit: mm

| Item  | HG - 65          |             |                  |                            |                            |
|---|------------------|-------------|------------------|----------------------------|----------------------------|
| Accuracy Classes                                    | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.07      | 0<br>- 0.07      | 0<br>- 0.05                | 0<br>- 0.03                |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.07      | 0<br>- 0.07      | 0<br>- 0.05                | 0<br>- 0.03                |
| Variation of height H                               | 0.03             | 0.02        | 0.01             | 0.007                      | 0.005                      |
| Variation of width N                                | 0.03             | 0.025       | 0.015            | 0.01                       | 0.007                      |
| Running parallelism of block surface C to surface A | See Table 2-1-11 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |             |                  |                            |                            |

### (2) Accuracy of interchangeable guideways

Table 2-1-7 Accuracy Standards

Unit: mm

| Item  | HG - 15, 20      |             |                  |
|---|------------------|-------------|------------------|
| Accuracy Classes                                    | Normal<br>(C)    | High<br>(H) | Precision<br>(P) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.03      | ± 0.015          |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.03      | ± 0.015          |
| Variation of height H                               | 0.02             | 0.01        | 0.006            |
| Variation of width N                                | 0.02             | 0.01        | 0.006            |
| Running parallelism of block surface C to surface A | See Table 2-1-11 |             |                  |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |             |                  |

Table 2-1-8 Accuracy Standards

Unit: mm

| Item  | HG - 25, 30, 35  |             |                  |
|---|------------------|-------------|------------------|
| Accuracy Classes                                    | Normal<br>(C)    | High<br>(H) | Precision<br>(P) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.04      | ± 0.02           |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.04      | ± 0.02           |
| Variation of height H                               | 0.02             | 0.015       | 0.007            |
| Variation of width N                                | 0.03             | 0.015       | 0.007            |
| Running parallelism of block surface C to surface A | See Table 2-1-11 |             |                  |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |             |                  |

Table 2-1-9 Accuracy Standards

Unit: mm

| Item  | HG - 45, 55      |          |               |
|---|------------------|----------|---------------|
| Accuracy Classes                                    | 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 2-1-11 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |          |               |

Table 2-1-10 Accuracy Standards

Unit: mm

| Item  | HG - 65          |          |               |
|---|------------------|----------|---------------|
| Accuracy Classes                                    | 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 2-1-11 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-1-11 |          |               |

### (3) Accuracy of running parallelism

Table 2-1-11 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  |

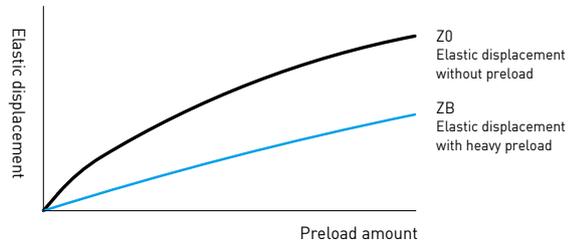
# HG Series

## Heavy Load Ball Type

### 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 HG20 to avoid an over-preload affecting the guideway's life.



#### (2) Preload classes

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

Table 2-1-12 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.

#### (3) Stiffness performance

Stiffness depends on preload. The following table shows stiffness value of each size.

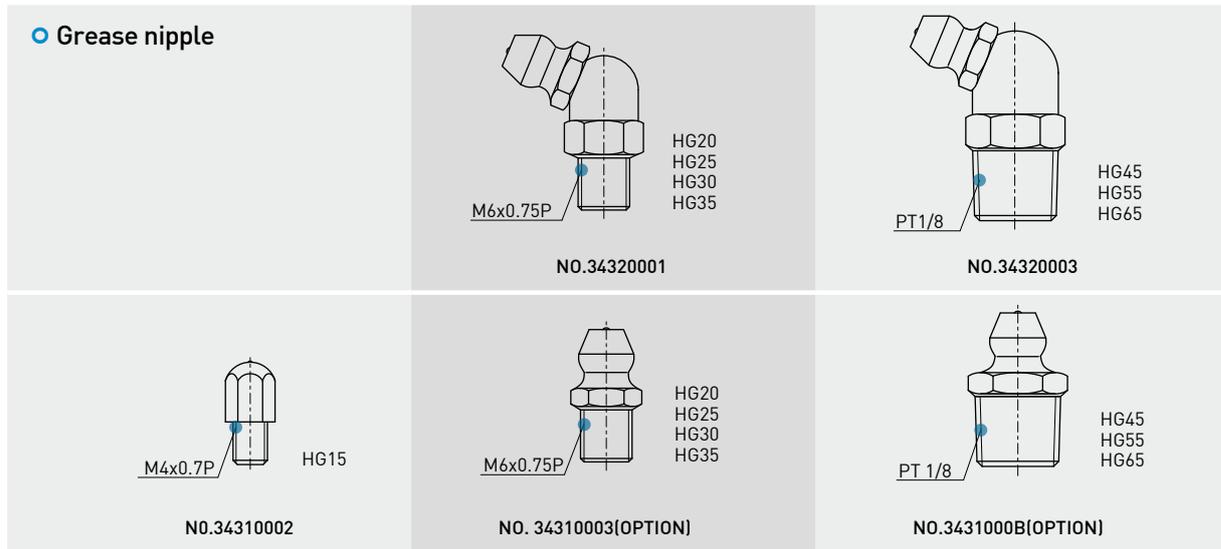
Table 2-1-13 Radial stiffness for HG Series

| Load type        | Series / Size | Stiffness (N/μm) |      |      |
|------------------|---------------|------------------|------|------|
|                  |               | Z0               | ZA   | ZB   |
| Heavy load       | HG 15C        | 196              | 365  | 483  |
|                  | HG 20C        | 232              | 460  | 678  |
|                  | HG 25C        | 292              | 539  | 705  |
|                  | HG 30C        | 354              | 618  | 823  |
|                  | HG 35C        | 395              | 642  | 865  |
|                  | HG 45C        | 505              | 738  | 980  |
|                  | HG 55C        | 609              | 828  | 1092 |
|                  | HG 65C        | 716              | 918  | 1201 |
| Super heavy load | HG 20H        | 300              | 611  | 824  |
|                  | HG 25H        | 378              | 715  | 935  |
|                  | HG 30H        | 453              | 820  | 1093 |
|                  | HG 35H        | 509              | 855  | 1150 |
|                  | HG 45H        | 649              | 970  | 1298 |
|                  | HG 55H        | 789              | 1085 | 1445 |
|                  | HG 65H        | 946              | 1221 | 1599 |

## 2-1-7 Lubrication

### (1) Grease

#### ○ Grease nipple



#### ○ Mounting location

The standard location of the grease fitting is at either end of the block, but the nipple can be mounted at either side of the block instead. For side installation, contact HIWIN to pre-drill the block at the desired location.

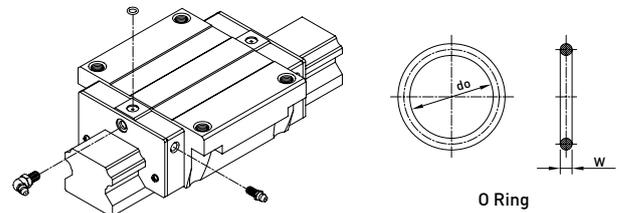


Table 2-1-14 O-Ring size and max. permissible depth for piercing

| Size | O-Ring   |          | Lube hole at top: max. permissible depth for piercing |
|------|----------|----------|---|
|      | do (mm)  | W (mm)   | T <sub>max</sub> (mm)                                 |
| HG15 | 2.5±0.15 | 1.5±0.15 | 3.75  |
| HG20 | 4.5±0.15 | 1.5±0.15 | 5.7   |
| HG25 | 4.5±0.15 | 1.5±0.15 | 5.8   |
| HG30 | 4.5±0.15 | 1.5±0.15 | 6.3   |
| HG35 | 4.5±0.15 | 1.5±0.15 | 8.8   |
| HG45 | 4.5±0.15 | 1.5±0.15 | 8.2   |
| HG55 | 4.5±0.15 | 1.5±0.15 | 11.8  |
| HG65 | 4.5±0.15 | 1.5±0.15 | 10.8  |

#### ○ The lubricant amount for a block filled with grease

Table 2-1-15 The lubricant Amount for a Block Filled with Grease

| Size | Heavy load (cm <sup>3</sup> ) | Super heavy load (cm <sup>3</sup> ) | Size | Heavy load (cm <sup>3</sup> ) | Super heavy load (cm <sup>3</sup> ) |
|------|-------------------------------|-------------------------------------|------|-------------------------------|-------------------------------------|
| HG15 | 1                             | -                                   | HG35 | 10                            | 12                                  |
| HG20 | 2                             | 3                                   | HG45 | 17                            | 21                                  |
| HG25 | 5                             | 6                                   | HG55 | 26                            | 33                                  |
| HG30 | 7                             | 8                                   | HG65 | 50                            | 61                                  |

#### ○ Frequency of replenishment

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

# HG Series

## Heavy Load Ball Type

### (2) Oil

The recommended viscosity of oil is about 30~150cSt. If customers need to use oil-type lubrication, please inform us.

### Types of oil piping joint

|  |  |   |
|--|--|---|
| <p>LF-64</p> <p>HG15</p> <p>NO.97000EA1</p>                            | <p>LF-76</p> <p>HG20<br/>HG25<br/>HG30<br/>HG35</p> <p>NO.970002A1</p> | <p>LF-78</p> <p>HG45<br/>HG55<br/>HG65</p> <p>NO.970006A1</p> |
| <p>SF-64</p> <p>HG15</p> <p>NO.97001TA1</p>                            | <p>LF-86</p> <p>HG20<br/>HG25<br/>HG30<br/>HG35</p> <p>NO.970004A1</p> | <p>LF-88</p> <p>HG45<br/>HG55<br/>HG65</p> <p>NO.970008A1</p> |
| <p>SF-76</p> <p>HG20<br/>HG25<br/>HG30<br/>HG35</p> <p>NO.970001A1</p> | <p>SF-78</p> <p>HG45<br/>HG55<br/>HG65</p> <p>NO.970005A1</p>          |   |
| <p>SF-86</p> <p>HG20<br/>HG25<br/>HG30<br/>HG35</p> <p>NO.970003A1</p> | <p>SF-88</p> <p>HG45<br/>HG55<br/>HG65</p> <p>NO.970007A1</p>          |   |

Oil refilling rate

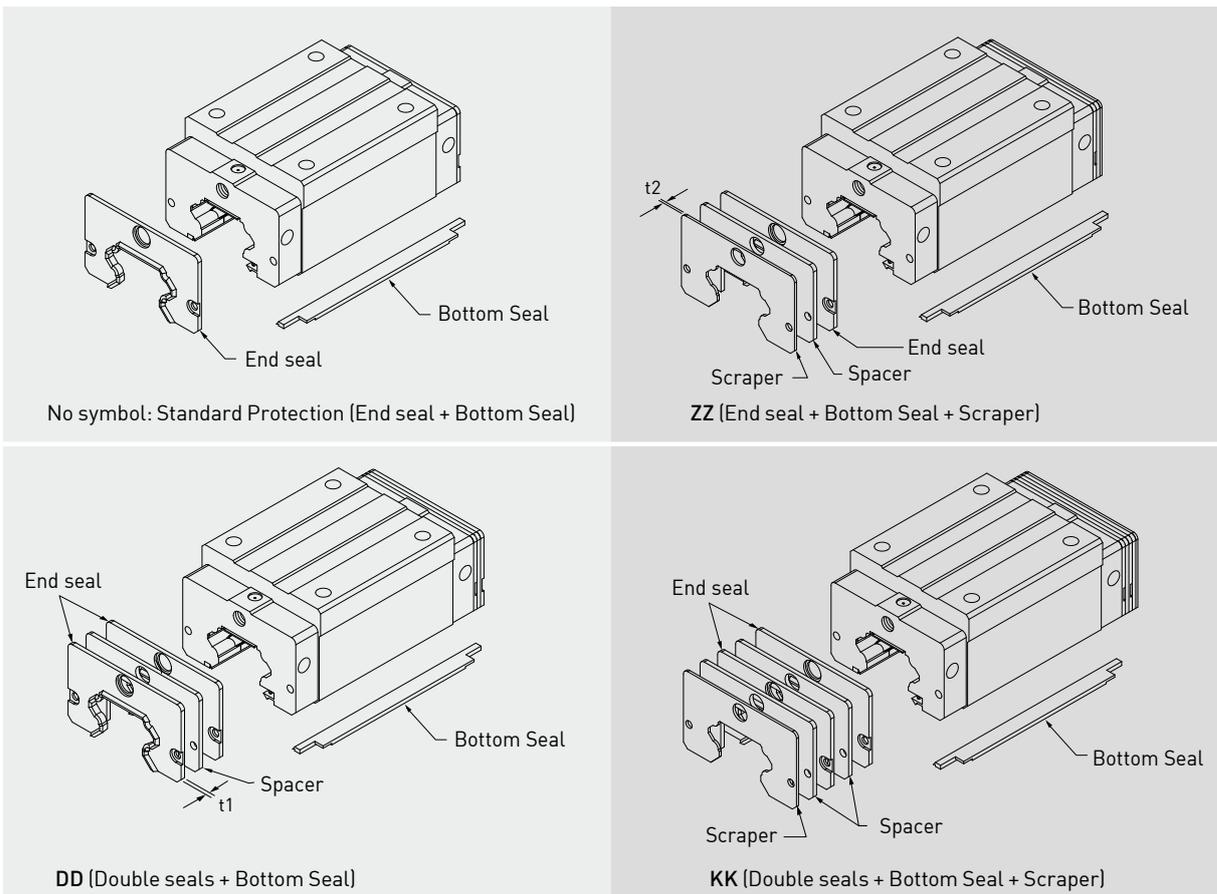
Table 2-1-16

| Size | Refilling rate (cm <sup>3</sup> /hr) | Size | Refilling rate (cm <sup>3</sup> /hr) |
|------|--------------------------------------|------|--------------------------------------|
| HG15 | 0.2                                  | HG35 | 0.3                                  |
| HG20 | 0.2                                  | HG45 | 0.4                                  |
| HG25 | 0.3                                  | HG55 | 0.5                                  |
| HG30 | 0.3                                  | HG65 | 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.



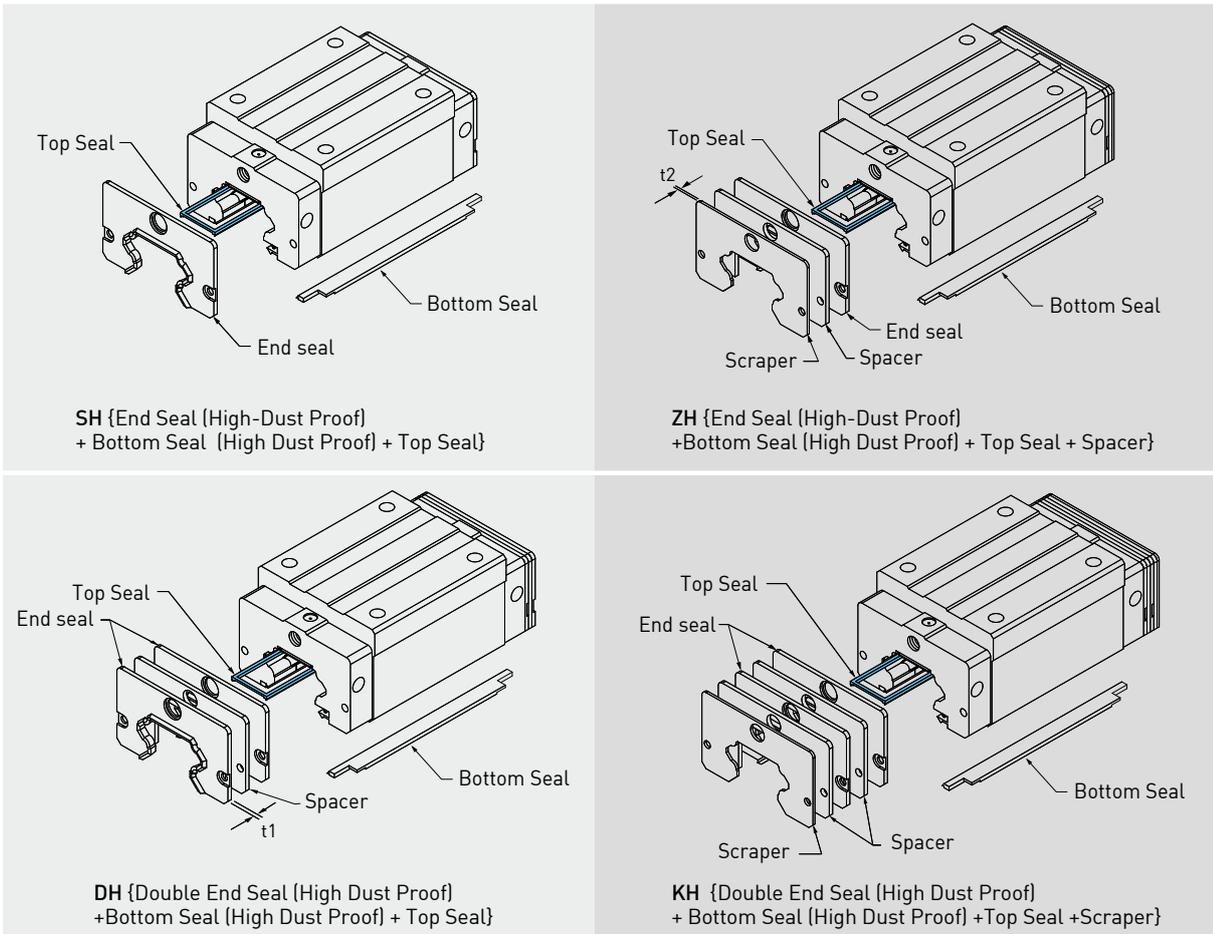
Note: HG20/25/65 are without spacer.

## HG Series

### Heavy Load Ball Type

#### [2] Codes of high-dust proof accessories

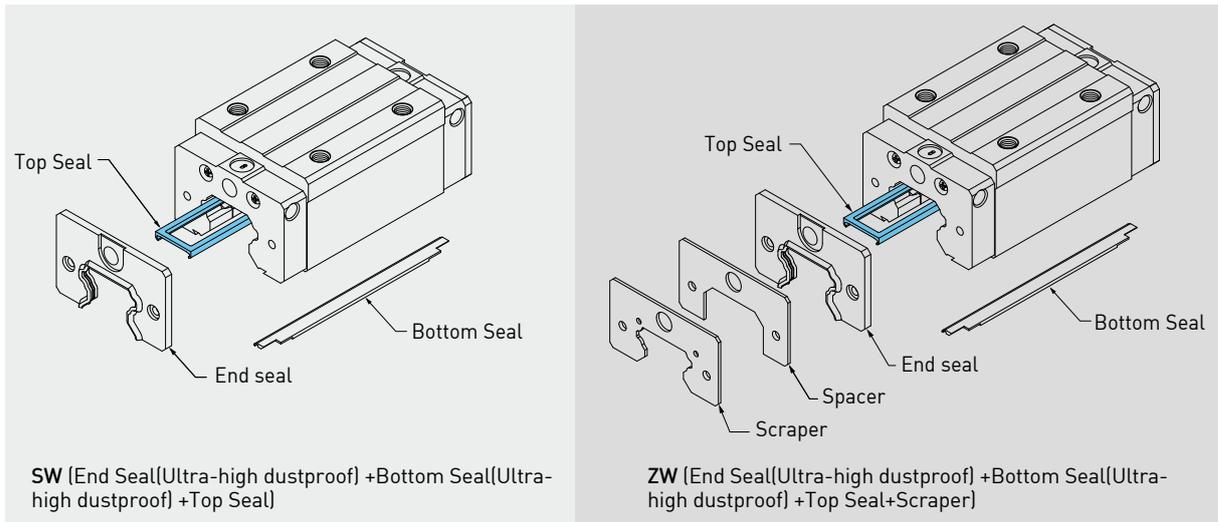
HIWIN develops many kinds of dust proof accessories for different application and working environment to avoid dust or debris. If the following accessories are needed, please add the code followed by the model number.



- Note:
1. The available size for high dust proof accessories are HG20(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.
  3. HG20/25 are without spacer.
  4. If higher dust proof accessories is needed, please contact HIWIN.

### (3) Codes of ultra-high dust proof accessories

Hiwin has developed high dust proof accessories which is used for environment that is full of dust and particle, such as wood working machinery and glass/stone machining equipment. These accessories show high performance of dust proof. If accessories are needed, please add the code followed by the model number.



- Note :
1. The available size for high dust proof accessories are HG15C, HG20(C/H), HG25(C/H), HG30(C/H), HG35(C/H), HG45(C/H).
  2. The value of friction force will increase 1.5~4.0 kgf.
  3. MGN5 is only supplied with End Seal (Ultra-high dustproof)

### (4) Fuction 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 2-1-17 Dimensions of end seal

| Size    | Thickness (t1)<br>(mm) | Size    | Thickness (t1)<br>(mm) |
|---------|------------------------|---------|------------------------|
| HG15 ES | 3                      | HG35 ES | 3.2                    |
| HG20 ES | 3.5                    | HG45 ES | 4.5                    |
| HG25 ES | 3.5                    | HG55 ES | 4.5                    |
| HG30 ES | 3.2                    | HG65 ES | 6                      |

#### ○ Scraper

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

Table 2-1-18 Dimensions of scraper

| Size    | Thickness (t2)<br>(mm) | Size    | Thickness (t2)<br>(mm) |
|---------|------------------------|---------|------------------------|
| HG15 SC | 1.5                    | HG35 SC | 1.5                    |
| HG20 SC | 1.5                    | HG45 SC | 1.5                    |
| HG25 SC | 1.5                    | HG55 SC | 1.5                    |
| HG30 SC | 1.5                    | HG65 SC | 1.5                    |

#### ○ Top Seal

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

## HG Series

### Heavy Load Ball Type

#### ○ 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.

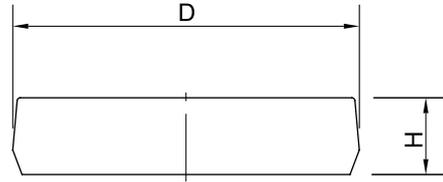


Table 2-1-19 Dimensions of Bolt Caps for Rail Mounting Holes

| Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) | Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) |
|-----------|-----------|---------------------|----------------------|-----------|-----------|---------------------|----------------------|
| HGR15     | M4        | 7.65                | 1.1                  | HGR35     | M8        | 14.20               | 3.5                  |
| HGR20     | M5        | 9.65                | 2.5                  | HGR45     | M12       | 20.25               | 4.5                  |
| HGR25     | M6        | 11.15               | 2.5                  | HGR55     | M14       | 23.25               | 5.0                  |
| HGR30     | M8        | 14.20               | 3.5                  | HGR65     | M16       | 26.35               | 5.0                  |

(5) Dimensions of block equipped with the parts

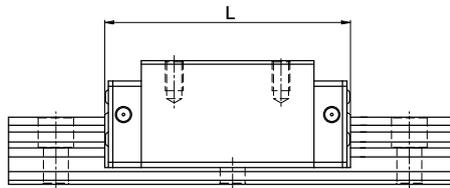


Table 2-1-20 Overall block length

unit: mm

| Size   | Overall block length (L) |               |               |               |               |               |
|--------|--------------------------|---------------|---------------|---------------|---------------|---------------|
|        | SS/SH                    | ZZ/ZH         | DD/DH         | KK/KH         | SW            | ZW            |
| HG15C  | 61.4 (61.8)              | 69.0 (69.0)   | 68.0 (68.4)   | 75.6 (75.6)   | 63.2 (63.2)   | 71.0 (71.0)   |
| *HG20C | 77.5 (79.3)              | 82.5 (84.5)   | 82.5 (84.3)   | 87.5 (89.5)   | 78.5 (78.5)   | 86.3 (87.7)   |
| *HG20H | 92.2 (94.0)              | 97.2 (99.2)   | 97.5 (99.0)   | 102.2 (104.2) | 93.2 (93.2)   | 101.0 (102.4) |
| *HG25C | 84.0 (85.0)              | 89.0 (91.0)   | 89.0 (90.0)   | 94.0 (96.0)   | 85.0 (85.0)   | 92.8 (94.8)   |
| *HG25H | 104.6 (105.6)            | 109.6 (111.6) | 109.6 (110.6) | 114.6 (116.6) | 105.6 (105.6) | 113.4 (115.4) |
| *HG30C | 97.4 (99.4)              | 105.4 (107.4) | 104.8 (106.8) | 112.8 (114.8) | 99.0 (100.4)  | 107.2 (109.2) |
| *HG30H | 120.4 (122.4)            | 128.4 (130.4) | 127.8 (129.8) | 135.8 (137.8) | 122.0 (123.4) | 130.2 (132.2) |
| *HG35C | 112.4 (114.4)            | 120.4 (122.4) | 119.8 (121.8) | 127.8 (129.8) | 115.2 (116.0) | 123.4 (125.4) |
| *HG35H | 138.2 (140.2)            | 146.2 (148.2) | 145.6 (147.6) | 153.6 (155.6) | 141.0 (141.8) | 149.2 (151.2) |
| *HG45C | 139.4 (139.4)            | 150.0 (150.0) | 149.4 (149.4) | 160.0 (160.0) | 140.0 (140.0) | 148.8 (150.2) |
| HG45H  | 171.2 (171.2)            | 181.8 (181.8) | 181.2 (181.2) | 191.8 (191.8) | 171.8 (171.8) | 180.6 (182.0) |
| HG55C  | 166.7 (166.7)            | 177.1 (177.1) | 177.1 (177.1) | 187.5 (187.5) | -             | -             |
| HG55H  | 204.8 (204.8)            | 215.2 (215.2) | 215.2 (215.2) | 225.6 (225.6) | -             | -             |
| HG65C  | 200.2 (200.2)            | 208.2 (208.2) | 209.2 (209.2) | 217.2 (217.2) | -             | -             |
| HG65H  | 259.6 (259.6)            | 267.6 (267.6) | 268.6 (268.6) | 276.6 (276.6) | -             | -             |

Note : 1. For the marking of "\*", it means this specification is available for SH/ZH/DH/KH dust proof accessories.

2. The marking of "[ ]" denotes the maximum block length with screws, lips of end seals, etc.

## 2-1-9 Friction

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

Table 2-1-21 Seal Resistance

| Size | Resistance N (kgf) | Size | Resistance N (kgf) |
|------|--------------------|------|--------------------|
| HG15 | 2.35 [0.24]        | HG35 | 4.91 [0.5]         |
| HG20 | 2.75 [0.28]        | HG45 | 3.83 [0.39]        |
| HG25 | 3.14 [0.32]        | HG55 | 4.61 [0.47]        |
| HG30 | 3.53 [0.36]        | HG65 | 5.79 [0.59]        |

Note: 1. 1kgf=9.81N

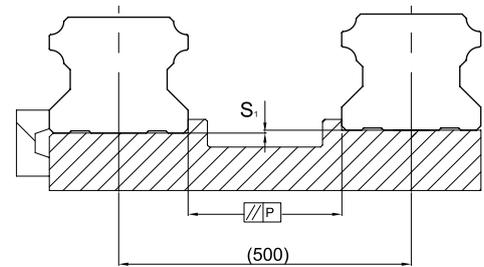
2. Please inform HIWIN if low friction request is required.

## 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 HG 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. For fast installation and smooth movement ability of the deviation in mounting surface accuracy.



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

Table 2-1-22 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    |
|------|-----------------|----|----|
|      | Z0              | ZA | ZB |
| HG15 | 25              | 18 | 13 |
| HG20 | 25              | 20 | 18 |
| HG25 | 30              | 22 | 20 |
| HG30 | 40              | 30 | 27 |
| HG35 | 50              | 35 | 30 |
| HG45 | 60              | 40 | 35 |
| HG55 | 70              | 50 | 45 |
| HG65 | 80              | 60 | 55 |

### (3) The accuracy tolerance of reference surface height

Table 2-1-23 Max. Tolerance of Reference Surface Height ( $S_1$ )

unit:  $\mu\text{m}$

| Size | Preload classes |     |     |
|------|-----------------|-----|-----|
|      | Z0              | ZA  | ZB  |
| HG15 | 130             | 85  | 35  |
| HG20 | 130             | 85  | 50  |
| HG25 | 130             | 85  | 70  |
| HG30 | 170             | 110 | 90  |
| HG35 | 210             | 150 | 120 |
| HG45 | 250             | 170 | 140 |
| HG55 | 300             | 210 | 170 |
| HG65 | 350             | 250 | 200 |

Note : Permissible value is proportional to the axial distance

## HG Series

### Heavy Load Ball Type

#### 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

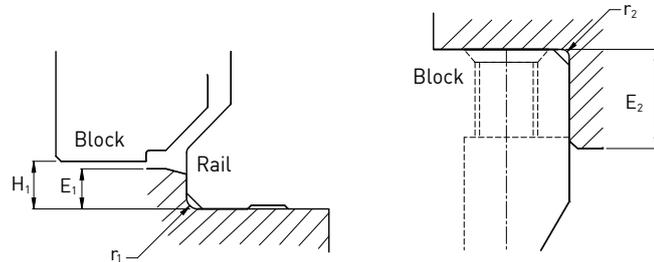


Table 2-1-24 Shoulder Heights and Fillets

| Size | Max. radius of fillets<br>$r_1$ (mm) | Max. radius of fillets<br>$r_2$ (mm) | Shoulder height beside the rail<br>$E_1$ (mm) | Shoulder height beside the block<br>$E_2$ (mm) | Clearance under block<br>$H_1$ (mm) |
|------|--------------------------------------|--------------------------------------|---|--|-------------------------------------|
| HG15 | 0.5                                  | 0.5                                  | 3   | 4  | 4.3                                 |
| HG20 | 0.5                                  | 0.5                                  | 3.5   | 5  | 4.6                                 |
| HG25 | 1.0                                  | 1                                    | 5   | 5  | 5.5                                 |
| HG30 | 1.0                                  | 1                                    | 5   | 5  | 6                                   |
| HG35 | 1.0                                  | 1                                    | 6   | 6  | 7.5                                 |
| HG45 | 1.0                                  | 1                                    | 8   | 8  | 9.5                                 |
| HG55 | 1.5                                  | 1.5                                  | 10  | 10   | 13                                  |
| HG65 | 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.

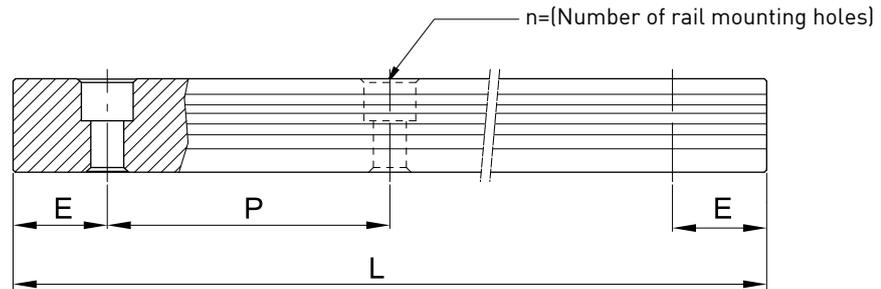
Table 2-1-25 Mounting Torque

| Size | Bolt size     | Torque N-cm (kgf-cm) |              |             |
|------|---------------|----------------------|--------------|-------------|
|      |               | Iron                 | Casting      | Aluminum    |
| HG15 | M4×0.7P×16L   | 392 (40)             | 274 (28)     | 206 (21)    |
| HG20 | M5×0.8P×16L   | 883 (90)             | 588 (60)     | 441 (45)    |
| HG25 | M6×1P×20L     | 1373 (140)           | 921 (94)     | 686 (70)    |
| HG30 | M8×1.25P×25L  | 3041 (310)           | 2010 (205)   | 1470 (150)  |
| HG35 | M8×1.25P×25L  | 3041 (310)           | 2010 (205)   | 1470 (150)  |
| HG45 | M12×1.75P×35L | 11772 (1200)         | 7840 (800)   | 5880 (600)  |
| HG55 | M14×2P×45L    | 15696 (1600)         | 10500 (1100) | 7840 (800)  |
| HG65 | M16×2P×50L    | 19620 (2000)         | 13100 (1350) | 9800 (1000) |

Note: 1 kgf=9.81 N

## 2-1-12 Standard and Maximum Lengths of Rail

HIWIN offers standard rail lengths for customer needs. For non-standard E-values, the recommended dimension should no greater than 1/2 of the pitch (P) dimension. This will prevent an unstable rail end.



$$L = (n - 1) \times P + 2 \times E \quad \text{Eq.2.1}$$

L : Total length of rail (mm)

n : Number of mounting holes

P : Distance between any two holes (mm)

E : Distance from the center of the last hole to the edge (mm)

Table 2-1-26 Rail Standard Length and Max. Length

unit: mm

| Item                              | HG15      | HG20       | HG25       | HG30       | HG35       | HG45       | HG55       | HG65       |
|-----------------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|
| Standard Length L(n)              | 160 (3)   | 220 (4)    | 220 (4)    | 280 (4)    | 280 (4)    | 570 (6)    | 780 (7)    | 1,270 (9)  |
|                                   | 220 (4)   | 280 (5)    | 280 (5)    | 440 (6)    | 440 (6)    | 885 (9)    | 1,020 (9)  | 1,570 (11) |
|                                   | 280 (5)   | 340 (6)    | 340 (6)    | 600 (8)    | 600 (8)    | 1,200 (12) | 1,260 (11) | 2,020 (14) |
|                                   | 340 (6)   | 460 (8)    | 460 (8)    | 760 (10)   | 760 (10)   | 1,620 (16) | 1,500 (13) | 2,620 (18) |
|                                   | 460 (8)   | 640 (11)   | 640 (11)   | 1,000 (13) | 1,000 (13) | 2,040 (20) | 1,980 (17) |            |
|                                   | 640 (11)  | 820 (14)   | 820 (14)   | 1,640 (21) | 1,640 (21) | 2,460 (24) | 2,580 (22) |            |
|                                   | 820 (14)  | 1,000 (17) | 1,000 (17) | 2,040 (26) | 2,040 (26) | 2,985 (29) | 2,940 (25) |            |
|                                   |           | 1,240 (21) | 1,240 (21) | 2,520 (32) | 2,520 (32) |            |            |            |
| Pitch (P)                         | 60        | 60         | 60         | 80         | 80         | 105        | 120        | 150        |
| Distance to End (E <sub>s</sub> ) | 20        | 20         | 20         | 20         | 20         | 22.5       | 30         | 35         |
| Max. Standard Length              | 4,000(67) | 4,000 (67) | 4,000 (67) | 3,960 (50) | 3,960 (50) | 3,930 (38) | 3,900 (33) | 3,970 (27) |
| 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.

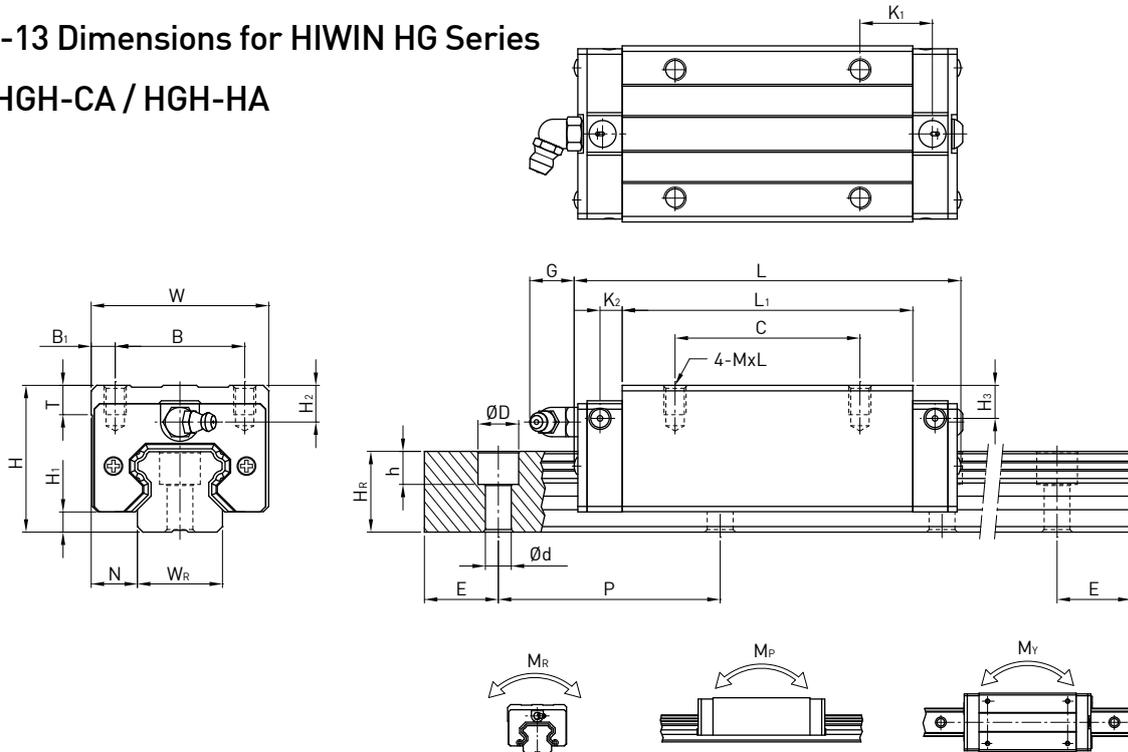
4. HGR15/HGR20/HGR25 of stainless steel is supplied with the maximum length of 2000mm.

# HG Series

## Heavy Load Ball Type

### 2-1-13 Dimensions for HIWIN HG Series

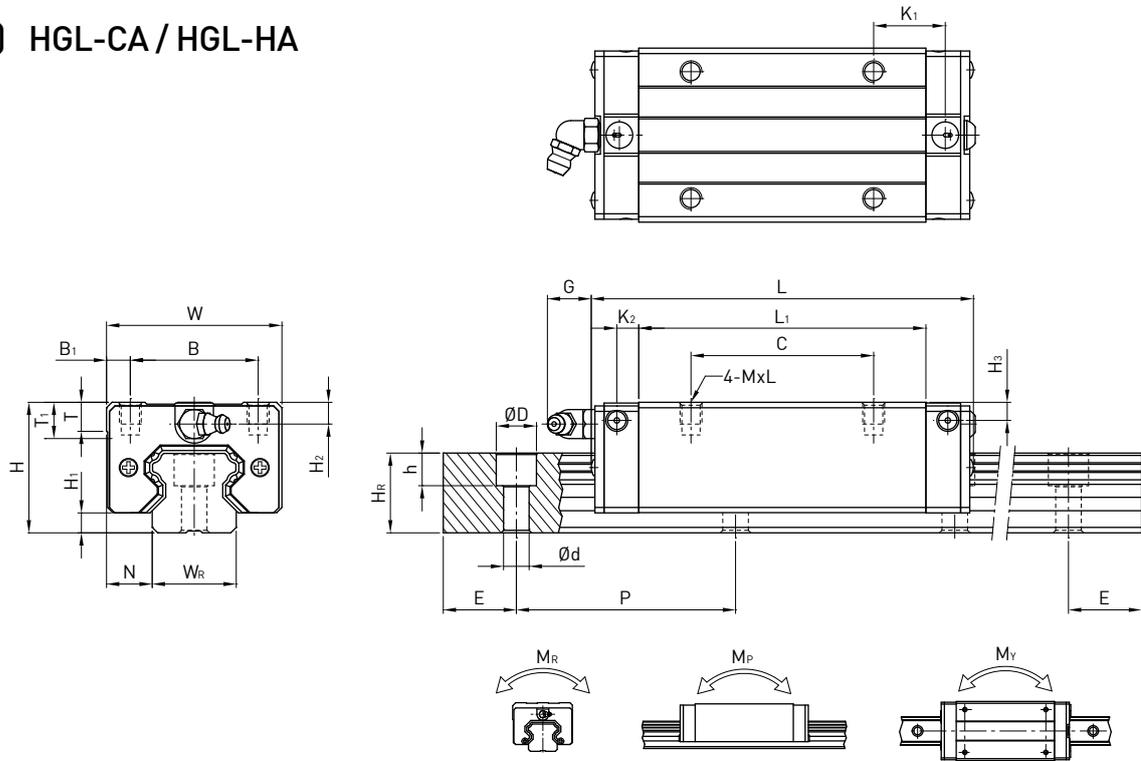
#### (1) HGH-CA / HGH-HA



| 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 C <sub>0</sub> (kN) | Static Rated Moment |      |        | Weight |        |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|--------------------------|-----|----|----------------|-----|----------------|-------|----------------|----------------|------|-------------------------|------|----------------|----------------|----------------|----------------|-----------------------------|----------------------------------|--|---------------------|------|--------|--------|--------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | MxL                     | T    | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> |                             |                                  |  | D                   | h    | d      | P      | E      | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
|           | HGH15CA                     | 28             | 4.3                      | 9.5 | 34 | 26             | 4   | 26             | 39.4  | 61.4           | 10             | 4.85 | 5.3                     | M4x5 | 6              | 7.95           | 7.7            | 15             | 15                          | 7.5                              | 5.3  | 4.5                 | 60   | 20     | M4x16  | 14.7   | 23.47                 | 0.12                  | 0.10                  | 0.10       | 0.18        |
| HGH20CA   | 30                          | 4.6            | 12                       | 44  | 32 | 6              | 36  | 50.5           | 77.5  | 12.25          | 6              | 12   | M5x6                    | 8    | 6              | 6              | 20             | 17.5           | 9.5                         | 8.5                              | 6  | 60                  | 20   | M5x16  | 27.1   | 36.68  | 0.27                  | 0.20                  | 0.20                  | 0.30       | 2.21        |
| HGH20HA   |                             |                |                          |     |    |                | 50  | 65.2           | 92.2  | 12.6           |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 32.7   | 47.96  | 0.35                  | 0.35                  | 0.35                  | 0.39       |             |
| HGH25CA   | 40                          | 5.5            | 12.5                     | 48  | 35 | 6.5            | 35  | 58             | 84    | 15.7           | 6              | 12   | M6x8                    | 8    | 10             | 9              | 23             | 22             | 11                          | 9                                | 7  | 60                  | 20   | M6x20  | 34.9   | 52.82  | 0.42                  | 0.33                  | 0.33                  | 0.51       | 3.21        |
| HGH25HA   |                             |                |                          |     |    |                | 50  | 78.6           | 104.6 | 18.5           |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 42.2   | 69.07  | 0.56                  | 0.57                  | 0.57                  | 0.69       |             |
| HGH30CA   | 45                          | 6              | 16                       | 60  | 40 | 10             | 40  | 70             | 97.4  | 20.25          | 6              | 12   | M8x10                   | 8.5  | 9.5            | 13.8           | 28             | 26             | 14                          | 12                               | 9  | 80                  | 20   | M8x25  | 48.5   | 71.87  | 0.66                  | 0.53                  | 0.53                  | 0.88       | 4.47        |
| HGH30HA   |                             |                |                          |     |    |                | 60  | 93             | 120.4 | 21.75          |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 58.6   | 93.99  | 0.88                  | 0.92                  | 0.92                  | 1.16       |             |
| HGH35CA   | 55                          | 7.5            | 18                       | 70  | 50 | 10             | 50  | 80             | 112.4 | 20.6           | 7              | 12   | M8x12                   | 10.2 | 16             | 19.6           | 34             | 29             | 14                          | 12                               | 9  | 80                  | 20   | M8x25  | 64.6   | 93.88  | 1.16                  | 0.81                  | 0.81                  | 1.45       | 6.30        |
| HGH35HA   |                             |                |                          |     |    |                | 72  | 105.8          | 138.2 | 22.5           |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 77.9   | 122.77 | 1.54                  | 1.40                  | 1.40                  | 1.92       |             |
| HGH45CA   | 70                          | 9.5            | 20.5                     | 86  | 60 | 13             | 60  | 97             | 139.4 | 23             | 10             | 12.9 | M10x17                  | 16   | 18.5           | 30.5           | 45             | 38             | 20                          | 17                               | 14   | 105                 | 22.5 | M12x35 | 103.8  | 146.71 | 1.98                  | 1.55                  | 1.55                  | 2.73       | 10.41       |
| HGH45HA   |                             |                |                          |     |    |                | 80  | 128.8          | 171.2 | 28.9           |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 125.3  | 191.85 | 2.63                  | 2.68                  | 2.68                  | 3.61       |             |
| HGH55CA   | 80                          | 13             | 23.5                     | 100 | 75 | 12.5           | 75  | 117.7          | 166.7 | 27.35          | 11             | 12.9 | M12x18                  | 17.5 | 22             | 29             | 53             | 44             | 23                          | 20                               | 16   | 120                 | 30   | M14x45 | 153.2  | 211.23 | 3.69                  | 2.64                  | 2.64                  | 4.17       | 15.08       |
| HGH55HA   |                             |                |                          |     |    |                | 95  | 155.8          | 204.8 | 36.4           |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 184.9  | 276.23 | 4.88                  | 4.57                  | 4.57                  | 5.49       |             |
| HGH65CA   | 90                          | 15             | 31.5                     | 126 | 76 | 25             | 70  | 144.2          | 200.2 | 43.1           | 14             | 12.9 | M16x20                  | 25   | 15             | 15             | 63             | 53             | 26                          | 22                               | 18   | 150                 | 35   | M16x50 | 213.2  | 287.48 | 6.65                  | 4.27                  | 4.27                  | 7.00       | 21.18       |
| HGH65HA   |                             |                |                          |     |    |                | 120 | 203.6          | 259.6 | 47.8           |                |      |                         |      |                |                |                |                |                             |                                  |  |                     |      |        | 277.8  | 420.17 | 9.38                  | 7.38                  | 7.38                  | 9.82       |             |

Note : 1 kgf = 9.81 N

(2) HGL-CA / HGL-HA



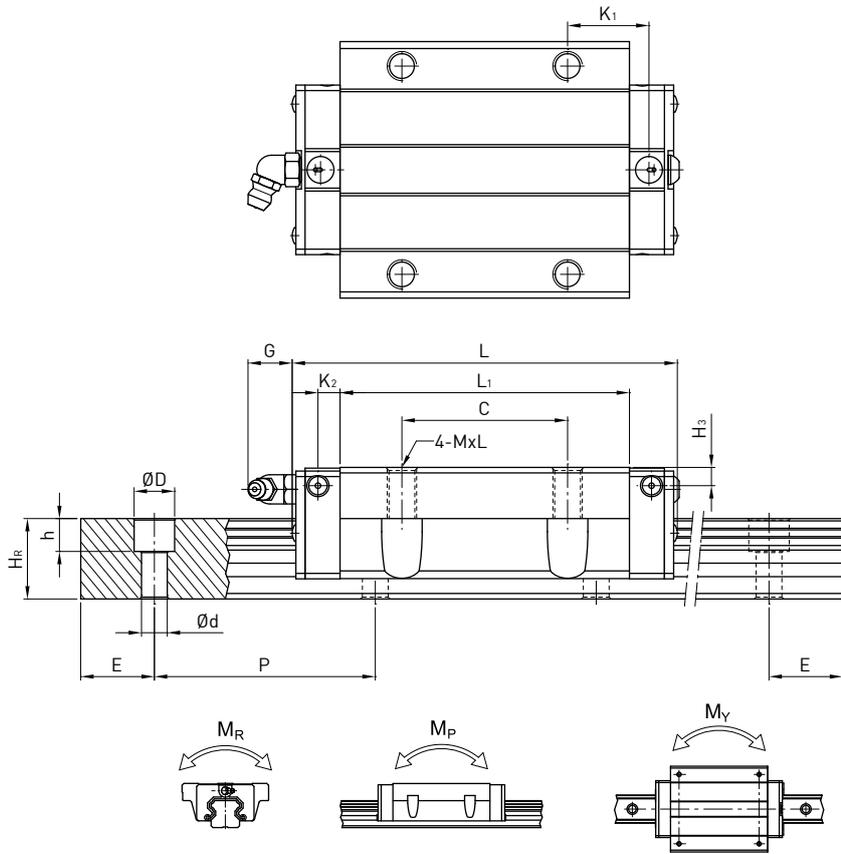
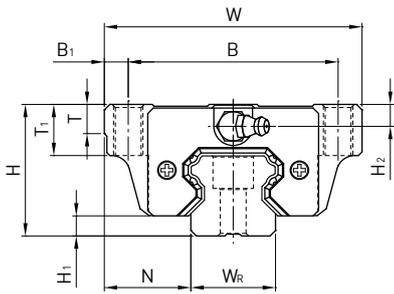
| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |     |    |                |    |                |       |                |                |      | Dimensions of Rail (mm) |      |                |                |                | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C(kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |     |      | Weight |       |        |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|--------------------------|-----|----|----------------|----|----------------|-------|----------------|----------------|------|-------------------------|------|----------------|----------------|----------------|-----------------------------|---------------------------------|--|---------------------|-----|------|--------|-------|--------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | MxL                     | T    | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> |                             |                                 |  | H <sub>R</sub>      | D   | h    | d      | P     | E      | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
|           | HGL15CA                     | 24             | 4.3                      | 9.5 | 34 | 26             | 4  | 26             | 39.4  | 61.4           | 10             | 4.85 | 5.3                     | M4x4 | 6              | 3.95           | 3.7            |                             |                                 |  | 15                  | 15  | 7.5  | 5.3    | 4.5   | 60     | 20                    | M4x16                 | 14.7                  | 23.47      | 0.12        |
| HGL25CA   | 36                          | 5.5            | 12.5                     | 48  | 35 | 6.5            | 35 | 58             | 84    | 15.7           | 6              | 12   | M6x6                    | 8    | 6              | 5              | 23             | 22                          | 11                              | 9  | 7                   | 60  | 20   | M6x20  | 34.9  | 52.82  | 0.42                  | 0.33                  | 0.33                  | 0.42       | 3.21        |
| HGL25HA   |                             |                |                          |     |    |                | 50 | 78.6           | 104.6 | 18.5           |                |      |                         |      |                |                |                |                             |                                 |  |                     |     |      |        | 42.2  | 69.07  | 0.56                  | 0.57                  | 0.57                  | 0.57       |             |
| HGL30CA   | 42                          | 6              | 16                       | 60  | 40 | 10             | 40 | 70             | 97.4  | 20.25          | 6              | 12   | M8x10                   | 8.5  | 6.5            | 10.8           | 28             | 26                          | 14                              | 12   | 9                   | 80  | 20   | M8x25  | 48.5  | 71.87  | 0.66                  | 0.53                  | 0.53                  | 0.78       | 4.47        |
| HGL30HA   |                             |                |                          |     |    |                | 60 | 93             | 120.4 | 21.75          |                |      |                         |      |                |                |                |                             |                                 |  |                     |     |      |        | 58.6  | 93.99  | 0.88                  | 0.92                  | 0.92                  | 1.03       |             |
| HGL35CA   | 48                          | 7.5            | 18                       | 70  | 50 | 10             | 50 | 80             | 112.4 | 20.6           | 7              | 12   | M8x12                   | 10.2 | 9              | 12.6           | 34             | 29                          | 14                              | 12   | 9                   | 80  | 20   | M8x25  | 64.6  | 93.88  | 1.16                  | 0.81                  | 0.81                  | 1.14       | 6.30        |
| HGL35HA   |                             |                |                          |     |    |                | 72 | 105.8          | 138.2 | 22.5           |                |      |                         |      |                |                |                |                             |                                 |  |                     |     |      |        | 77.9  | 122.77 | 1.54                  | 1.40                  | 1.40                  | 1.52       |             |
| HGL45CA   | 60                          | 9.5            | 20.5                     | 86  | 60 | 13             | 60 | 97             | 139.4 | 23             | 10             | 12.9 | M10x17                  | 16   | 8.5            | 20.5           | 45             | 38                          | 20                              | 17   | 14                  | 105 | 22.5 | M12x35 | 103.8 | 146.71 | 1.98                  | 1.55                  | 1.55                  | 2.08       | 10.41       |
| HGL45HA   |                             |                |                          |     |    |                | 80 | 128.8          | 171.2 | 28.9           |                |      |                         |      |                |                |                |                             |                                 |  |                     |     |      |        | 125.3 | 191.85 | 2.63                  | 2.68                  | 2.68                  | 2.75       |             |
| HGL55CA   | 70                          | 13             | 23.5                     | 100 | 75 | 12.5           | 75 | 117.7          | 166.7 | 27.35          | 11             | 12.9 | M12x18                  | 17.5 | 12             | 19             | 53             | 44                          | 23                              | 20   | 16                  | 120 | 30   | M14x45 | 153.2 | 211.23 | 3.69                  | 2.64                  | 2.64                  | 3.25       | 15.08       |
| HGL55HA   |                             |                |                          |     |    |                | 95 | 155.8          | 204.8 | 36.4           |                |      |                         |      |                |                |                |                             |                                 |  |                     |     |      |        | 184.9 | 276.23 | 4.88                  | 4.57                  | 4.57                  | 4.27       |             |

Note : 1 kgf = 9.81 N

# HG Series

## Heavy Load Ball Type

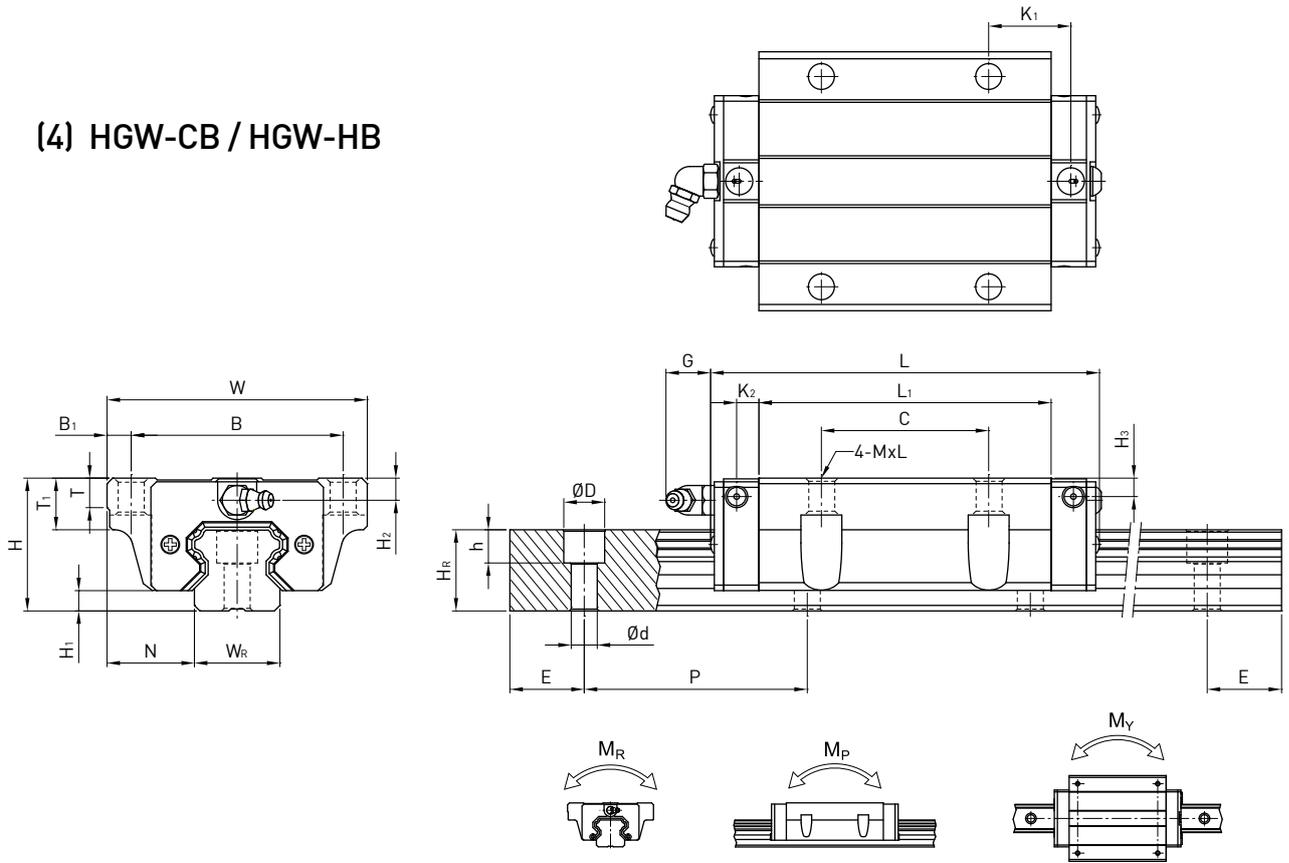
### (3) HGW-CA / HGW-HA



| 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                           | H1  | N                        | W   | B   | B1  | C   | L1    | L     | K1    | K2   | G    | M   | T    | T1   | H2   | H3                      | WR | HR   | D   |                             |                                 |                                 | h                   | d      | P     | E      | MR   | MP   | MY   | Block kg | Rail kg/m |
|           |                             |     |                          |     |     |     |     |       |       |       |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        |       |        |      |      |      |          |           |
| HGW15CA   | 24                          | 4.3 | 16                       | 47  | 38  | 4.5 | 30  | 39.4  | 61.4  | 8     | 4.85 | 5.3  | M5  | 6    | 8.9  | 3.95 | 3.7                     | 15 | 15   | 7.5 | 5.3                         | 4.5                             | 60                              | 20                  | M4x16  | 14.7  | 23.47  | 0.12 | 0.10 | 0.10 | 0.17     | 1.45      |
| HGW20CA   | 30                          | 4.6 | 21.5                     | 63  | 53  | 5   | 40  | 50.5  | 77.5  | 10.25 | 6    | 12   | M6  | 8    | 10   | 6    | 6                       | 20 | 17.5 | 9.5 | 8.5                         | 6                               | 60                              | 20                  | M5x16  | 27.1  | 36.68  | 0.27 | 0.20 | 0.20 | 0.40     | 2.21      |
| HGW20HA   |                             |     |                          |     |     |     |     | 65.2  | 92.2  | 17.6  |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 32.7  | 47.96  | 0.35 | 0.35 | 0.35 | 0.52     |           |
| HGW25CA   | 36                          | 5.5 | 23.5                     | 70  | 57  | 6.5 | 45  | 58    | 84    | 10.7  | 6    | 12   | M8  | 8    | 14   | 6    | 5                       | 23 | 22   | 11  | 9                           | 7                               | 60                              | 20                  | M6x20  | 34.9  | 52.82  | 0.42 | 0.33 | 0.33 | 0.59     | 3.21      |
| HGW25HA   |                             |     |                          |     |     |     |     | 78.6  | 104.6 | 21    |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 42.2  | 69.07  | 0.56 | 0.57 | 0.57 | 0.80     |           |
| HGW30CA   | 42                          | 6   | 31                       | 90  | 72  | 9   | 52  | 70    | 97.4  | 14.25 | 6    | 12   | M10 | 8.5  | 16   | 6.5  | 10.8                    | 28 | 26   | 14  | 12                          | 9                               | 80                              | 20                  | M8x25  | 48.5  | 71.87  | 0.66 | 0.53 | 0.53 | 1.09     | 4.47      |
| HGW30HA   |                             |     |                          |     |     |     |     | 93    | 120.4 | 25.75 |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 58.6  | 93.99  | 0.88 | 0.92 | 0.92 | 1.44     |           |
| HGW35CA   | 48                          | 7.5 | 33                       | 100 | 82  | 9   | 62  | 80    | 112.4 | 14.6  | 7    | 12   | M10 | 10.1 | 18   | 9    | 12.6                    | 34 | 29   | 14  | 12                          | 9                               | 80                              | 20                  | M8x25  | 64.6  | 93.88  | 1.16 | 0.81 | 0.81 | 1.56     | 6.30      |
| HGW35HA   |                             |     |                          |     |     |     |     | 105.8 | 138.2 | 27.5  |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 77.9  | 122.77 | 1.54 | 1.40 | 1.40 | 2.06     |           |
| HGW45CA   | 60                          | 9.5 | 37.5                     | 120 | 100 | 10  | 80  | 97    | 139.4 | 13    | 10   | 12.9 | M12 | 15.1 | 22   | 8.5  | 20.5                    | 45 | 38   | 20  | 17                          | 14                              | 105                             | 22.5                | M12x35 | 103.8 | 146.71 | 1.98 | 1.55 | 1.55 | 2.79     | 10.41     |
| HGW45HA   |                             |     |                          |     |     |     |     | 128.8 | 171.2 | 28.9  |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 125.3 | 191.85 | 2.63 | 2.68 | 2.68 | 3.69     |           |
| HGW55CA   | 70                          | 13  | 43.5                     | 140 | 116 | 12  | 95  | 117.7 | 166.7 | 17.35 | 11   | 12.9 | M14 | 17.5 | 26.5 | 12   | 19                      | 53 | 44   | 23  | 20                          | 16                              | 120                             | 30                  | M14x45 | 153.2 | 211.23 | 3.69 | 2.64 | 2.64 | 4.52     | 15.08     |
| HGW55HA   |                             |     |                          |     |     |     |     | 155.8 | 204.8 | 36.4  |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 184.9 | 276.23 | 4.88 | 4.57 | 4.57 | 5.96     |           |
| HGW65CA   | 90                          | 15  | 53.5                     | 170 | 142 | 14  | 110 | 144.2 | 200.2 | 23.1  | 14   | 12.9 | M16 | 25   | 37.5 | 15   | 15                      | 63 | 53   | 26  | 22                          | 18                              | 150                             | 35                  | M16x50 | 213.2 | 287.48 | 6.65 | 4.27 | 4.27 | 9.17     | 21.18     |
| HGW65HA   |                             |     |                          |     |     |     |     | 203.6 | 259.6 | 52.8  |      |      |     |      |      |      |                         |    |      |     |                             |                                 |                                 |                     |        | 277.8 | 420.17 | 9.38 | 7.38 | 7.38 | 12.89    |           |

Note : 1 kgf = 9.81 N

(4) HGW-CB / HGW-HB



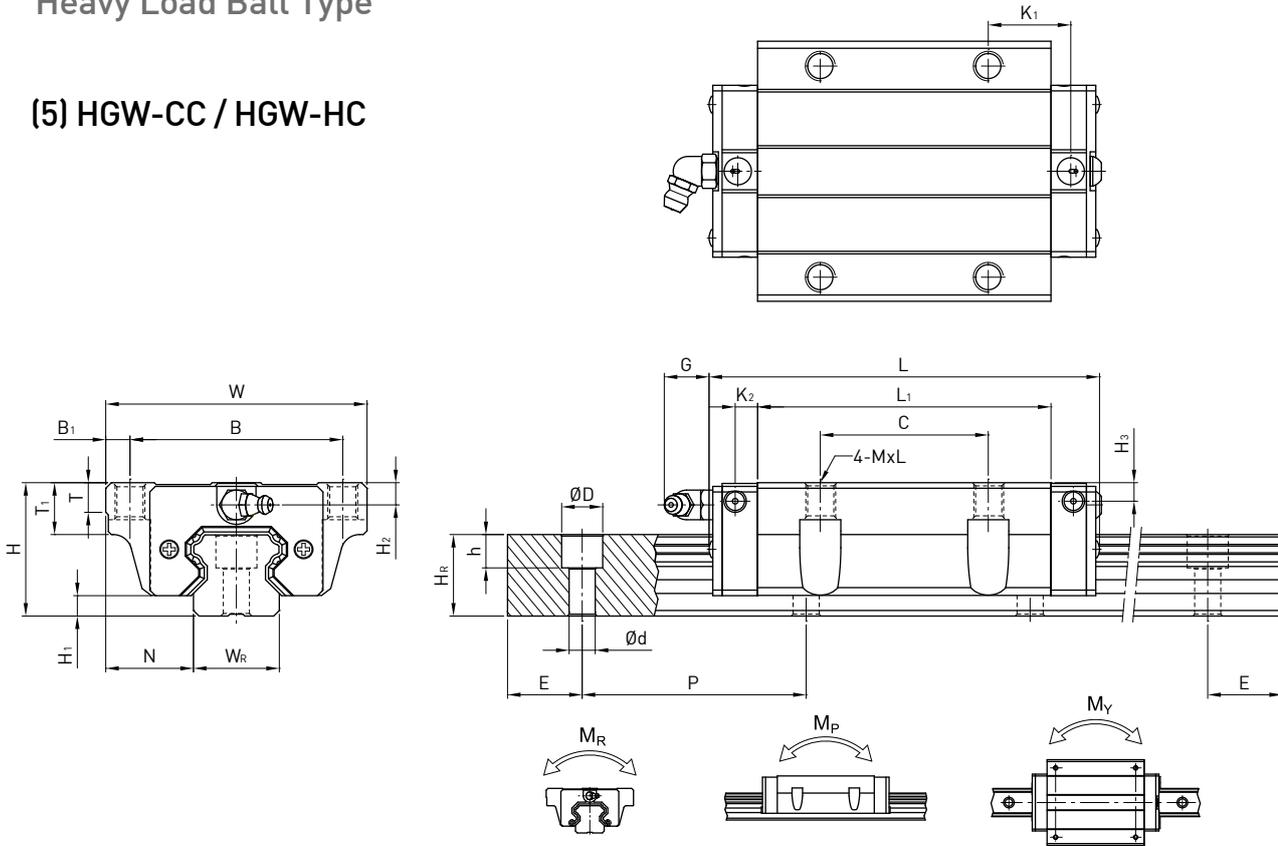
| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |     |                |     |                |       |                |                |      |     |      |                |                | Dimensions of Rail (mm) |                |                |                |     |     | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C(kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |       |        | Weight                |                       |                       |            |             |
|-----------|-----------------------------|----------------|------|--------------------------|-----|----------------|-----|----------------|-------|----------------|----------------|------|-----|------|----------------|----------------|-------------------------|----------------|----------------|----------------|-----|-----|-----------------------------|---------------------------------|--|---------------------|-------|--------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | M   | T    | T <sub>1</sub> | T <sub>2</sub> | H <sub>2</sub>          | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> | D   | h   |                             |                                 |  | d                   | P     | E      | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
|           | HGW15CB                     | 24             | 4.3  | 16                       | 47  | 38             | 4.5 | 30             | 39.4  | 61.4           | 8              | 4.85 | 5.3 | Ø4.5 | 6              | 8.9            | 6.95                    | 3.95           | 3.7            | 15             | 15  | 7.5 |                             |                                 |  | 5.3                 | 4.5   | 60     | 20                    | M4x16                 | 14.7                  | 23.47      | 0.12        |
| HGW20CB   | 30                          | 4.6            | 21.5 | 63                       | 53  | 5              | 40  | 50.5           | 77.5  | 10.25          | 6              | 12   | Ø6  | 8    | 10             | 9.5            | 6                       | 6              | 20             | 17.5           | 9.5 | 8.5 | 6                           | 60                              | 20   | M5x16               | 27.1  | 36.68  | 0.27                  | 0.20                  | 0.20                  | 0.40       | 2.21        |
| HGW20HB   |                             |                |      |                          |     |                |     | 65.2           | 92.2  | 17.6           |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     | 58    | 84     | 10.7                  | 6                     | 12                    | Ø7         |             |
| HGW25CB   | 36                          | 5.5            | 23.5 | 70                       | 57  | 6.5            | 45  | 78.6           | 104.6 | 21             | 6              | 12   | Ø7  | 8    | 14             | 10             | 6                       | 5              | 23             | 22             | 11  | 9   | 7                           | 60                              | 20   | M6x20               | 42.2  | 69.07  | 0.56                  | 0.57                  | 0.57                  | 0.80       | 3.21        |
| HGW25HB   |                             |                |      |                          |     |                |     | 70             | 97.4  | 14.25          |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     | 6     | 12     | Ø9                    | 8.5                   | 16                    | 10         |             |
| HGW30CB   | 42                          | 6              | 31   | 90                       | 72  | 9              | 52  | 93             | 120.4 | 25.75          | 6              | 12   | Ø9  | 8.5  | 16             | 10             | 6.5                     | 10.8           | 28             | 26             | 14  | 12  | 9                           | 80                              | 20   | M8x25               | 58.6  | 93.99  | 0.88                  | 0.92                  | 0.92                  | 1.44       | 4.47        |
| HGW30HB   |                             |                |      |                          |     |                |     | 80             | 112.4 | 14.6           |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     | 7     | 12     | Ø9                    | 10.1                  | 18                    | 13         |             |
| HGW35CB   | 48                          | 7.5            | 33   | 100                      | 82  | 9              | 62  | 105.8          | 138.2 | 27.5           | 7              | 12   | Ø9  | 10.1 | 18             | 13             | 9                       | 12.6           | 34             | 29             | 14  | 12  | 9                           | 80                              | 20   | M8x25               | 77.9  | 122.77 | 1.54                  | 1.40                  | 1.40                  | 2.06       | 6.30        |
| HGW35HB   |                             |                |      |                          |     |                |     | 80             | 112.4 | 14.6           |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     | 10    | 12.9   | Ø11                   | 15.1                  | 22                    | 15         |             |
| HGW45CB   | 60                          | 9.5            | 37.5 | 120                      | 100 | 10             | 80  | 128.8          | 171.2 | 28.9           | 10             | 12.9 | Ø11 | 15.1 | 22             | 15             | 8.5                     | 20.5           | 45             | 38             | 20  | 17  | 14                          | 105                             | 22.5   | M12x35              | 125.3 | 191.85 | 2.63                  | 2.68                  | 2.68                  | 3.69       | 10.41       |
| HGW45HB   |                             |                |      |                          |     |                |     | 117.7          | 166.7 | 17.35          |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     | 11    | 12.9   | Ø14                   | 17.5                  | 26.5                  | 17         |             |
| HGW55CB   | 70                          | 13             | 43.5 | 140                      | 116 | 12             | 95  | 155.8          | 204.8 | 36.4           | 11             | 12.9 | Ø14 | 17.5 | 26.5           | 17             | 12                      | 19             | 53             | 44             | 23  | 20  | 16                          | 120                             | 30   | M14x45              | 184.9 | 276.23 | 4.88                  | 4.57                  | 4.57                  | 5.96       | 15.08       |
| HGW55HB   |                             |                |      |                          |     |                |     | 144.2          | 200.2 | 23.1           |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     | 14    | 12.9   | Ø16                   | 25                    | 37.5                  | 23         |             |
| HGW65CB   | 90                          | 15             | 53.5 | 170                      | 142 | 14             | 110 | 203.6          | 259.6 | 52.8           | 14             | 12.9 | Ø16 | 25   | 37.5           | 23             | 15                      | 15             | 63             | 53             | 26  | 22  | 18                          | 150                             | 35   | M16x50              | 277.8 | 420.17 | 9.38                  | 7.38                  | 7.38                  | 12.89      | 21.18       |
| HGW65HB   |                             |                |      |                          |     |                |     |                |       |                |                |      |     |      |                |                |                         |                |                |                |     |     |                             |                                 |  |                     |       |        |                       |                       |                       |            |             |

Note : 1 kgf = 9.81 N

# HG Series

## Heavy Load Ball Type

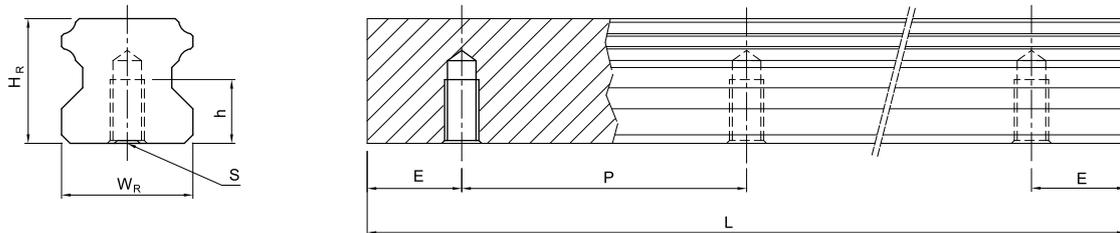
### (5) HGW-CC / HGW-HC



| 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 C <sub>0</sub> (kN) | Static Rated Moment |       |        | Weight         |                |                |          |           |    |
|-----------|-----------------------------|----------------|--------------------------|-----|-----|----------------|-----|----------------|-------|----------------|----------------|------|-----|------|----------------|----------------|----------------|-------------------------|----------------|----------------|-----|-----|-----------------------------|---------------------------------|--|---------------------|-------|--------|----------------|----------------|----------------|----------|-----------|----|
|           | 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    | M   | T    | T <sub>1</sub> | T <sub>2</sub> | H <sub>2</sub> | H <sub>3</sub>          | W <sub>R</sub> | H <sub>R</sub> | D   | h   |                             |                                 |  | d                   | P     | E      | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block kg | Rail kg/m |    |
|           |                             |                |                          |     |     |                |     |                |       |                |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                | kN-m           | kN-m     | kN-m      | kg |
| HGW15CC   | 24                          | 4.3            | 16                       | 47  | 38  | 4.5            | 30  | 39.4           | 61.4  | 8              | 4.85           | 5.3  | M5  | 6    | 8.9            | 6.95           | 3.95           | 3.7                     | 15             | 15             | 7.5 | 5.3 | 4.5                         | 60                              | 20   | M4x16               | 14.7  | 23.47  | 0.12           | 0.10           | 0.10           | 0.17     | 1.45      |    |
| HGW20CC   | 30                          | 4.6            | 21.5                     | 63  | 53  | 5              | 40  | 50.5           | 77.5  | 10.25          | 6              | 12   | M6  | 8    | 10             | 9.5            | 6              | 6                       | 20             | 17.5           | 9.5 | 8.5 | 6                           | 60                              | 20   | M5x16               | 27.1  | 36.68  | 0.27           | 0.20           | 0.20           | 0.40     | 2.21      |    |
| HGW20HC   |                             |                |                          |     |     |                |     | 65.2           | 92.2  | 17.6           |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |
| HGW25CC   | 36                          | 5.5            | 23.5                     | 70  | 57  | 6.5            | 45  | 58             | 84    | 10.7           | 6              | 12   | M8  | 8    | 14             | 10             | 6              | 5                       | 23             | 22             | 11  | 9   | 7                           | 60                              | 20   | M6x20               | 34.9  | 52.82  | 0.42           | 0.33           | 0.33           | 0.59     | 3.21      |    |
| HGW25HC   |                             |                |                          |     |     |                |     | 78.6           | 104.6 | 21             |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |
| HGW30CC   | 42                          | 6              | 31                       | 90  | 72  | 9              | 52  | 70             | 97.4  | 14.25          | 6              | 12   | M10 | 8.5  | 16             | 10             | 6.5            | 10.8                    | 28             | 26             | 14  | 12  | 9                           | 80                              | 20   | M8x25               | 48.5  | 71.87  | 0.66           | 0.53           | 0.53           | 1.09     | 4.47      |    |
| HGW30HC   |                             |                |                          |     |     |                |     | 93             | 120.4 | 25.75          |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |
| HGW35CC   | 48                          | 7.5            | 33                       | 100 | 82  | 9              | 62  | 80             | 112.4 | 14.6           | 7              | 12   | M10 | 10.1 | 18             | 13             | 9              | 12.6                    | 34             | 29             | 14  | 12  | 9                           | 80                              | 20   | M8x25               | 64.6  | 93.88  | 1.16           | 0.81           | 0.81           | 1.56     | 6.30      |    |
| HGW35HC   |                             |                |                          |     |     |                |     | 105.8          | 138.2 | 27.5           |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |
| HGW45CC   | 60                          | 9.5            | 37.5                     | 120 | 100 | 10             | 80  | 97             | 139.4 | 13             | 10             | 12.9 | M12 | 15.1 | 22             | 15             | 8.5            | 20.5                    | 45             | 38             | 20  | 17  | 14                          | 105                             | 22.5   | M12x35              | 103.8 | 146.71 | 1.98           | 1.55           | 1.55           | 2.79     | 10.41     |    |
| HGW45HC   |                             |                |                          |     |     |                |     | 128.8          | 171.2 | 28.9           |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |
| HGW55CC   | 70                          | 13             | 43.5                     | 140 | 116 | 12             | 95  | 117.7          | 166.7 | 17.35          | 11             | 12.9 | M14 | 17.5 | 26.5           | 17             | 12             | 19                      | 53             | 44             | 23  | 20  | 16                          | 120                             | 30   | M14x45              | 153.2 | 211.23 | 3.69           | 2.64           | 2.64           | 4.52     | 15.08     |    |
| HGW55HC   |                             |                |                          |     |     |                |     | 155.8          | 204.8 | 36.4           |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |
| HGW65CC   | 90                          | 15             | 53.5                     | 170 | 142 | 14             | 110 | 144.2          | 200.2 | 23.1           | 14             | 12.9 | M16 | 25   | 37.5           | 23             | 15             | 15                      | 63             | 53             | 26  | 22  | 18                          | 150                             | 35   | M16x50              | 213.2 | 287.48 | 6.65           | 4.27           | 4.27           | 9.17     | 21.18     |    |
| HGW65HC   |                             |                |                          |     |     |                |     | 203.6          | 259.6 | 52.8           |                |      |     |      |                |                |                |                         |                |                |     |     |                             |                                 |  |                     |       |        |                |                |                |          |           |    |

Note : 1 kgf = 9.81 N

**(6) Dimensions for HGR-T (Rail Mounting from Bottom)**



| Model No. | Dimensions of Rail (mm) |       |             |    |     |      | Weight |
|-----------|-------------------------|-------|-------------|----|-----|------|--------|
|           | $W_R$                   | $H_R$ | S           | h  | P   | E    | (kg/m) |
| HGR15T    | 15                      | 15    | M5 x 0.8P   | 8  | 60  | 20   | 1.48   |
| HGR20T    | 20                      | 17.5  | M6 x 1P     | 10 | 60  | 20   | 2.29   |
| HGR25T    | 23                      | 22    | M6 x 1P     | 12 | 60  | 20   | 3.35   |
| HGR30T    | 28                      | 26    | M8 x 1.25P  | 15 | 80  | 20   | 4.67   |
| HGR35T    | 34                      | 29    | M8x1.25P    | 17 | 80  | 20   | 6.51   |
| HGR45T    | 45                      | 38    | M12 x 1.75P | 24 | 105 | 22.5 | 10.87  |
| HGR55T    | 53                      | 44    | M14 x 2P    | 24 | 120 | 30   | 15.67  |
| HGR65T    | 63                      | 53    | M20 x 2.5P  | 30 | 150 | 35   | 21.73  |

## EG Series

### Low Profile Ball Type

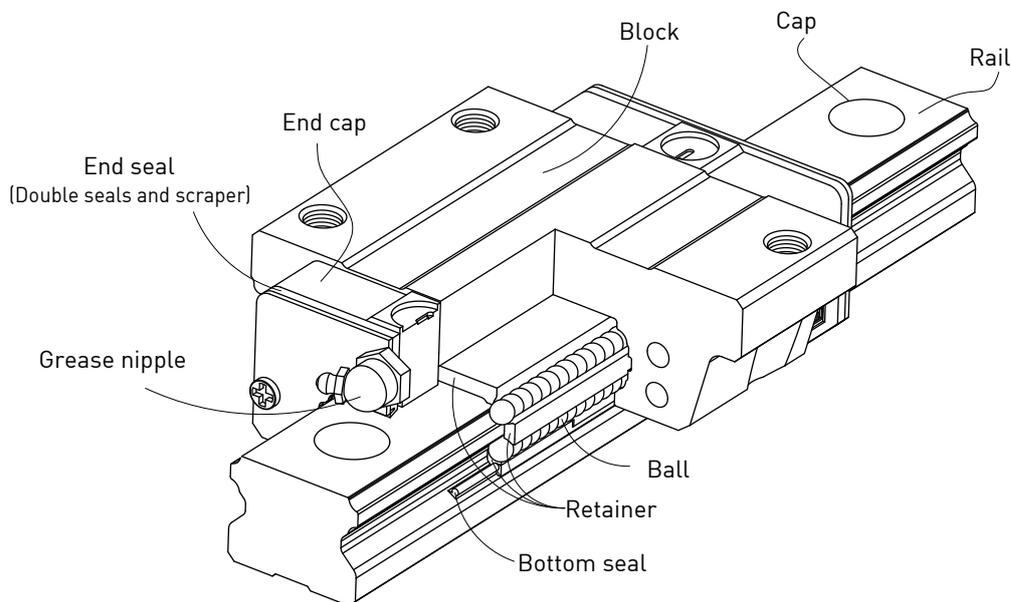
## 2-2 EG Series - Low Profile Ball Type Linear Guideway

### 2-2-1 Features of the EG Series Linear Guideway

The design of the EG 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 EG 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 EG Series

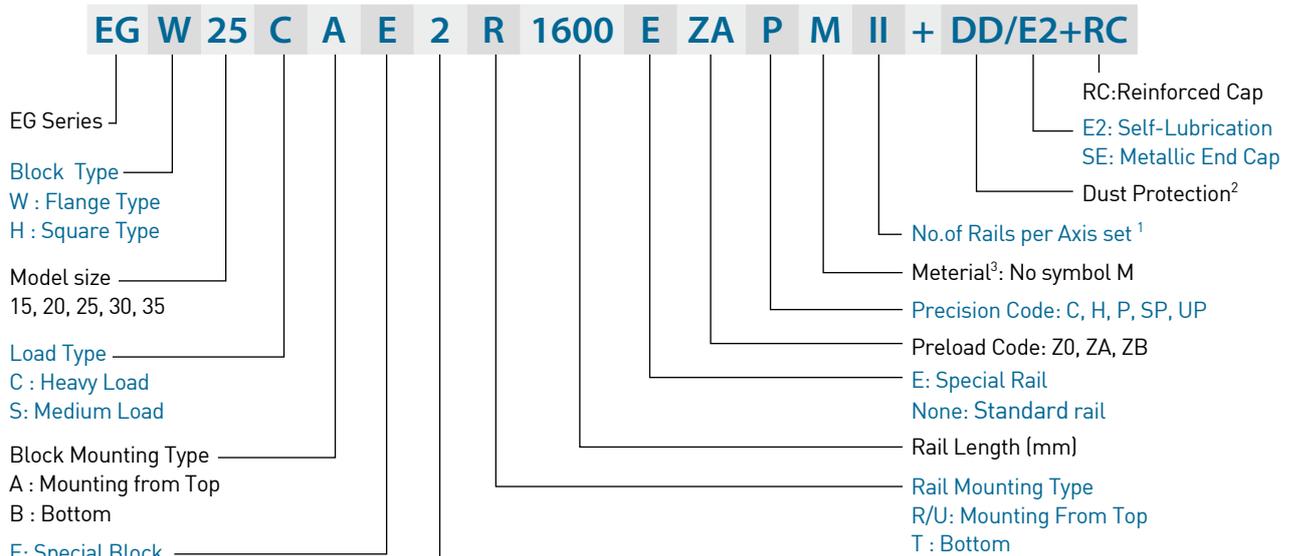


- Rolling circulation system: Block, rail, end cap and retainer
- Lubrication system: Grease nipple and piping Joint
- Dust protection system: End seal, bottom seal, cap and scraper

### 2-2-3 Model Number of EG Series

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

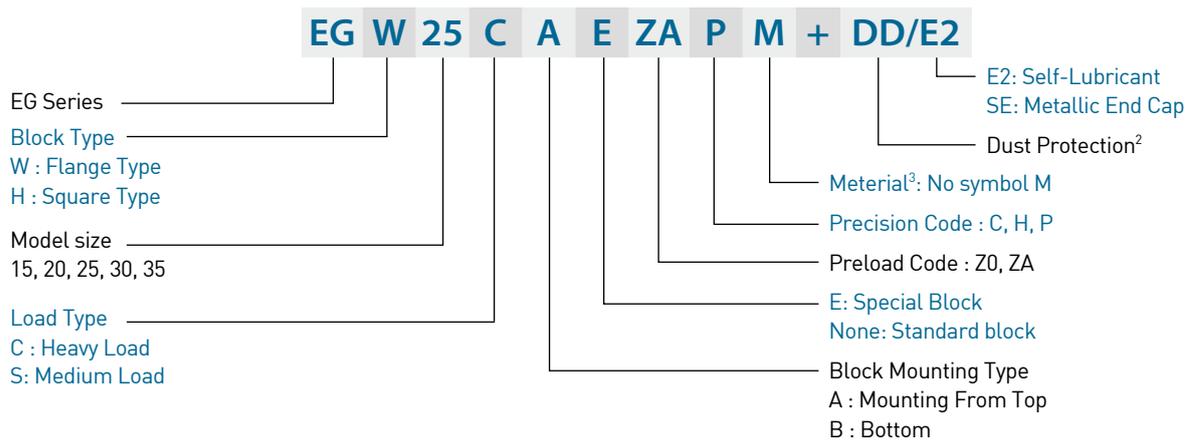
(1) Non-interchangeable type



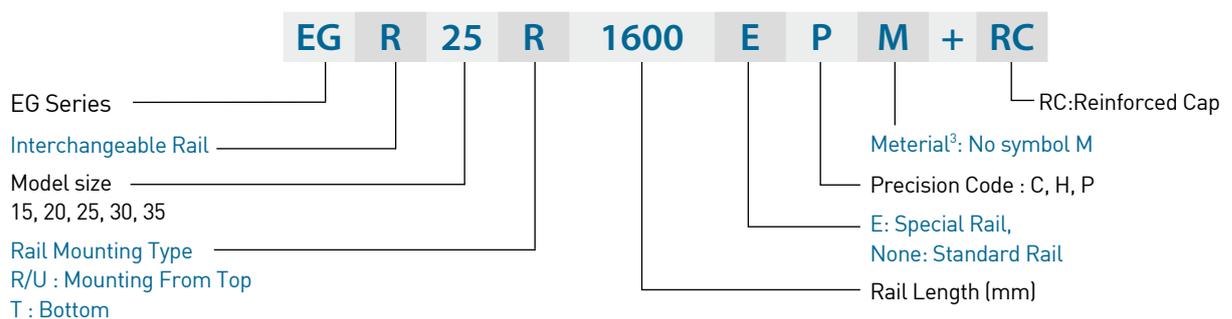
- Note: 1. The roman numerals are used to express the number of matched rails used in one axis. When a single rail is used in an axis, no symbol is indicated.  
 2. No symbol indicates standard protection (end seal and bottom seal).  
 ZZ : End seal, bottom seal and scraper  
 KK: Double seals, bottom seal and scraper.  
 DD: Double seals and bottom seal  
 3. No symbol: Carbon Steel, M: Stainless Steel  
 4. The stainless steel is available for EG15C.

(2) Interchangeable type

○ Model Number of EG Block



○ Model Number of EG Rail



## EG Series

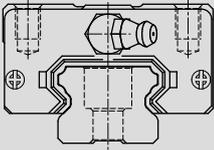
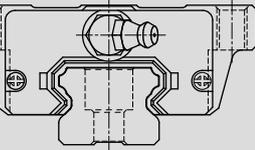
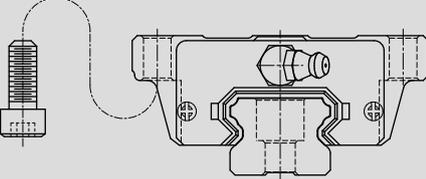
### Low Profile Ball Type

#### 2-2-4 Types

##### (1) Block types

HIWIN offers two types of linear guideways, flange and square types.

Table 2-2-1 **Block Types**

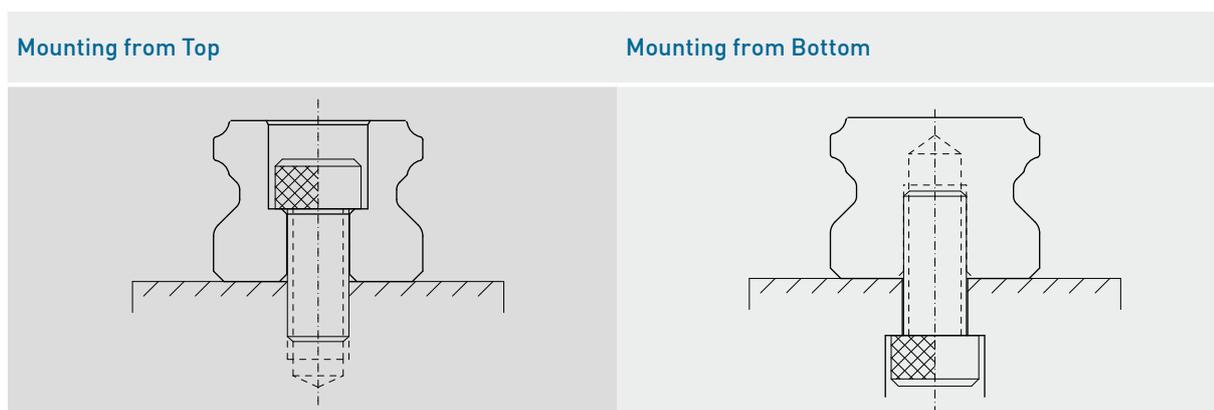
| Type   | Model            | Shape   | Height (mm) | Rail Length (mm) | Main Applications   |
|--------|------------------|---|-------------|------------------|---|
| Square | EGH-SA<br>EGH-CA |    | 24          | 100              | <ul style="list-style-type: none"> <li>○ Automation devices</li> <li>○ High-speed transportation equipment</li> <li>○ Precision measuring equipment</li> <li>○ Semiconductor manufacturing equipment</li> </ul> |
|        |                  |   | ↓           | ↓                |   |
| Flange | EGW-SA<br>EGW-CA |   | 48          | 4000             |   |
|        |                  |   | ↓           | ↓                |   |
|        |                  |   | 24          | 100              |   |
|        |                  |   | ↓           | ↓                |   |
| Flange | EGW-SB<br>EGW-CB |  | 48          | 4000             |   |
|        |                  |   | ↓           | ↓                |   |

\*Please refer to the chapter 2-2-13 for the dimensional detail.

##### (2) Rail types

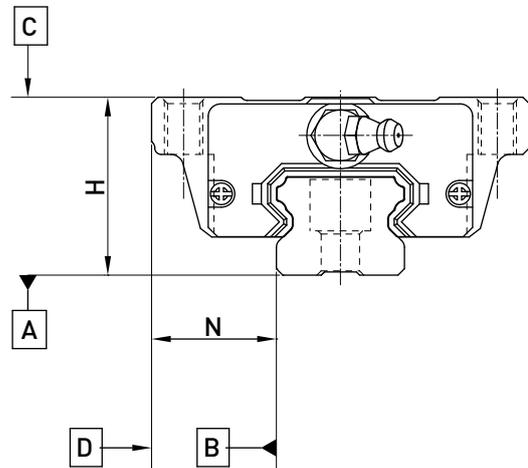
Besides the standard top mounting type, HIWIN also offers bottom mounting type rails.

Table 2-2-2 **Rail Types**



## 2-2-5 Accuracy

The accuracy of the EG series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



### (1) Accuracy of non-interchangeable guideways

Table 2-2-3 Accuracy Standards

Unit: mm

| Item  | EG - 15, 20     |             |                  |                            |                            |
|---|-----------------|-------------|------------------|----------------------------|----------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015               | 0<br>- 0.008               |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015               | 0<br>- 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 2-2-7 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-2-7 |             |                  |                            |                            |

Table 2-2-4 Accuracy Standards

Unit: mm

| Item  | EG - 25, 30, 35 |             |                  |                            |                            |
|---|-----------------|-------------|------------------|----------------------------|----------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02                | 0<br>- 0.01                |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02                | 0<br>- 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 2-2-7 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-2-7 |             |                  |                            |                            |

## EG Series

### Low Profile Ball Type

#### (2) Accuracy of interchangeable guideways

Table 2-2-5 Accuracy Standards

Unit: mm

| Item  | EG - 15, 20     |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03   | ± 0.015       |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03   | ± 0.015       |
| Variation of height H                               | 0.02            | 0.01     | 0.006         |
| Variation of width N                                | 0.02            | 0.01     | 0.006         |
| Running parallelism of block surface C to surface A | See Table 2-2-7 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-2-7 |          |               |

Table 2-2-6 Accuracy Standards

Unit: mm

| Item  | EG - 25, 30, 35 |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.04   | ± 0.02        |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.04   | ± 0.02        |
| Variation of height H                               | 0.02            | 0.015    | 0.007         |
| Variation of width N                                | 0.03            | 0.015    | 0.007         |
| Running parallelism of block surface C to surface A | See Table 2-2-7 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-2-7 |          |               |

#### (3) Accuracy of running parallelism

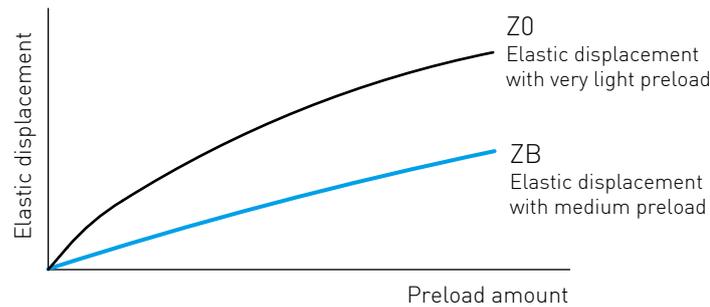
Table 2-2-7 Accuracy of Running Parallelism

| 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  |

## 2-2-6 Preload

### (1) Definition

A preload can be applied to each guideway. Generally, a linear motion guideway has a negative clearance between the groove and balls in order to improve stiffness and maintain high precision. The figure shows that adding a preload can improve stiffness of the linear guideway. A preload no greater than ZA would be recommended for model sizes smaller than EG20. This will avoid an over-loaded condition that would affect guideway life.



### (2) Preload classes

HIWIN offers three standard preloads for various applications and conditions.

Table 2-2-8 Preload Classes

| Class              | Code | Preload      | Condition  |
|--------------------|------|--------------|--|
| Very Light Preload | Z0   | 0~ 0.02C     | Certain load direction, low impact, low precision required |
| Light Preload      | ZA   | 0.03C~0.05C  | low load and high precision required                       |
| Medium Preload     | ZB   | 0.06C~ 0.08C | High rigidity required, with vibration and impact          |

| 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.

### (3) Stiffness performance

Stiffness depends on preload. The following table shows stiffness value of each size.

Table 2-2-9 Radial stiffness for EG Series

| Load type   | Series / Size | Stiffness (N/μm) |     |     |
|-------------|---------------|------------------|-----|-----|
|             |               | Z0               | ZA  | ZB  |
| Medium load | EG 15S        | 87               | 186 | 246 |
|             | EG 20S        | 114              | 267 | 369 |
|             | EG 25S        | 138              | 307 | 415 |
|             | EG 30S        | 166              | 335 | 447 |
|             | EG 35S        | 189              | 369 | 492 |
| Heavy load  | EG 15C        | 141              | 323 | 429 |
|             | EG 20C        | 181              | 444 | 615 |
|             | EG 25C        | 219              | 510 | 668 |
|             | EG 30C        | 265              | 555 | 745 |
|             | EG 35C        | 307              | 615 | 816 |

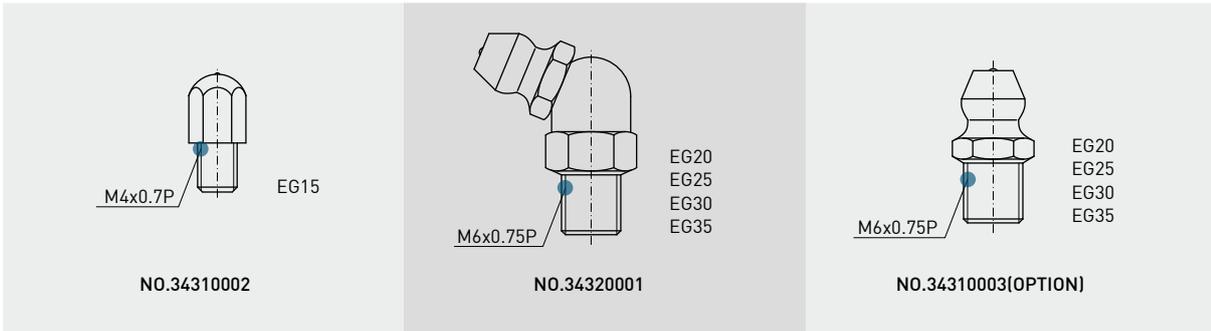
# EG Series

## Low Profile Ball Type

### 2-2-7 Lubrication

#### (1) Grease

##### ○ Grease nipple



##### ○ Mounting location

The standard location of the grease fitting is at both ends of the block, the nipple may be mounted in the side or top of the block. For lateral installation, we recommend that the nipple be mounted to the non-reference side, otherwise please contact us. When lubricating from above, in the recess for the O-ring, a smaller, preformed recess can be found. Preheat the 0.8 mm diameter metal tip. Carefully open the small recess with the metal tip and pierce through it. Insert a round sealing ring into the recess. (The round sealing ring is not supplied with the block) Do not open the small recess with a drill bit this may introduce the danger of contamination. It is possible to carry out the lubrication by using the oil-piping joint.

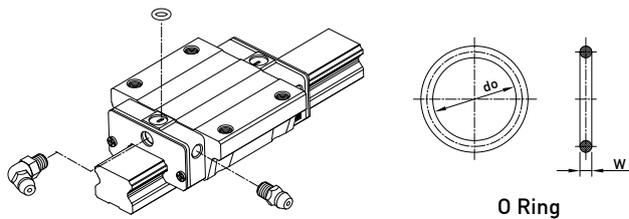
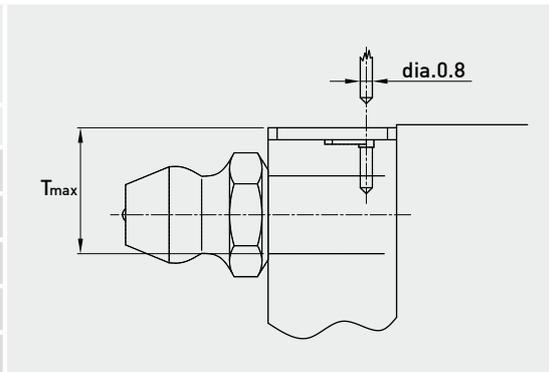


Table 2-2-10 O-Ring size and max. permissible depth for piercing

| Size | O-Ring     |            | Lube hole at top:<br>max. permissible depth<br>for piercing |
|------|------------|------------|---|
|      | do(mm)     | W (mm)     | T <sub>max</sub> (mm)                                       |
| EG15 | 2.5 ± 0.15 | 1.5 ± 0.15 | 6.9   |
| EG20 | 4.5 ± 0.15 | 1.5 ± 0.15 | 8.4   |
| EG25 | 4.5 ± 0.15 | 1.5 ± 0.15 | 10.4  |
| EG30 | 4.5 ± 0.15 | 1.5 ± 0.15 | 10.4  |
| EG35 | 4.5 ± 0.15 | 1.5 ± 0.15 | 10.8  |



○ The oil amount for a block filled with grease

Table 2-2-11 The oil amount for a block filled with grease

| Size | Medium Load<br>(cm <sup>3</sup> ) | Heavy Load<br>(cm <sup>3</sup> ) |
|------|-----------------------------------|----------------------------------|
| EG15 | 0.8                               | 1.4                              |
| EG20 | 1.5                               | 2.4                              |
| EG25 | 2.8                               | 4.6                              |
| EG30 | 3.7                               | 6.3                              |
| EG35 | 5.6                               | 6.6                              |

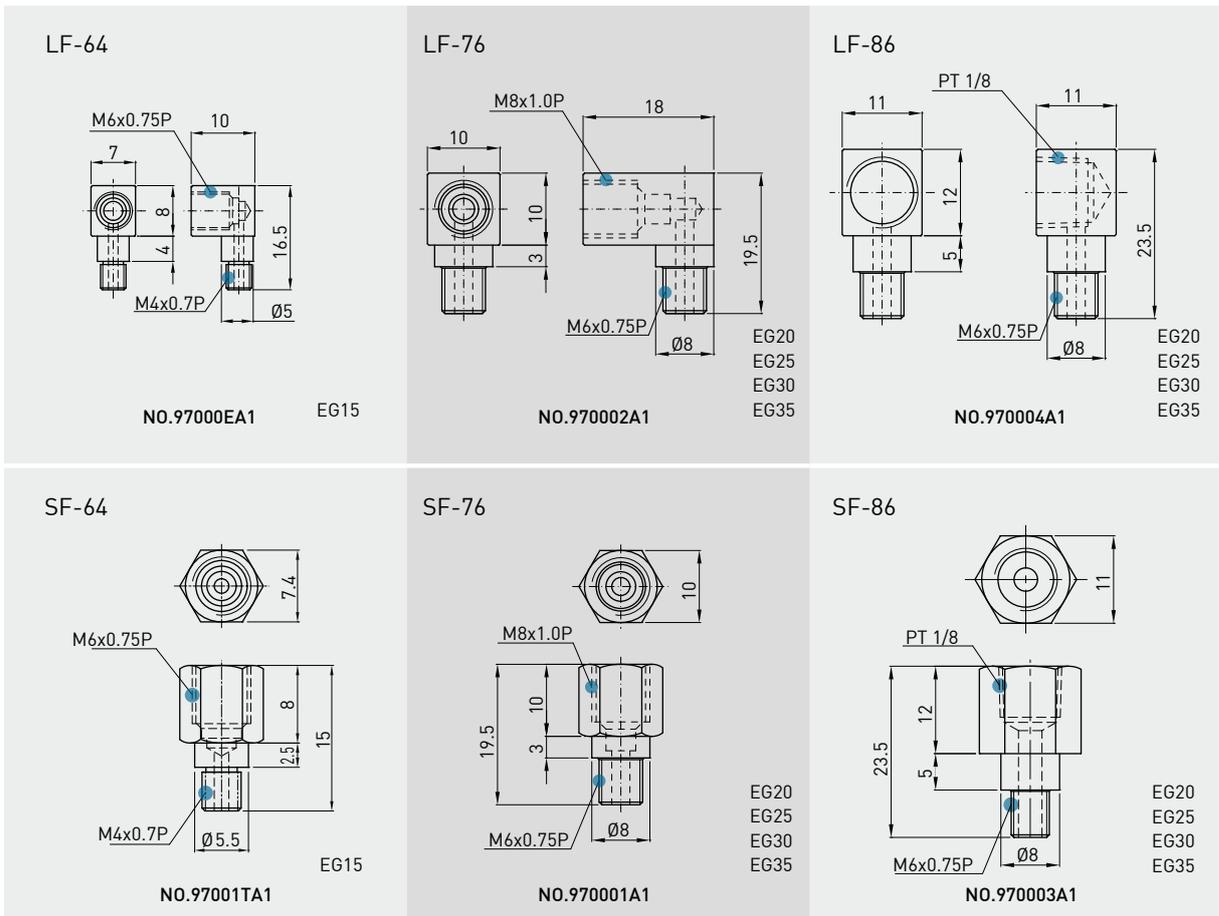
○ Frequency of replenishment

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.

○ Types of oil piping joint



○ Oil feeding rate

Table 2-2-12 oil feed rate

| Size | feed rate<br>(cm <sup>3</sup> /hr) | Size | feed rate<br>(cm <sup>3</sup> /hr) |
|------|------------------------------------|------|------------------------------------|
| EG15 | 0.1                                | EG30 | 0.2                                |
| EG20 | 0.133                              | EG35 | 0.233                              |
| EG25 | 0.167                              |      |                                    |

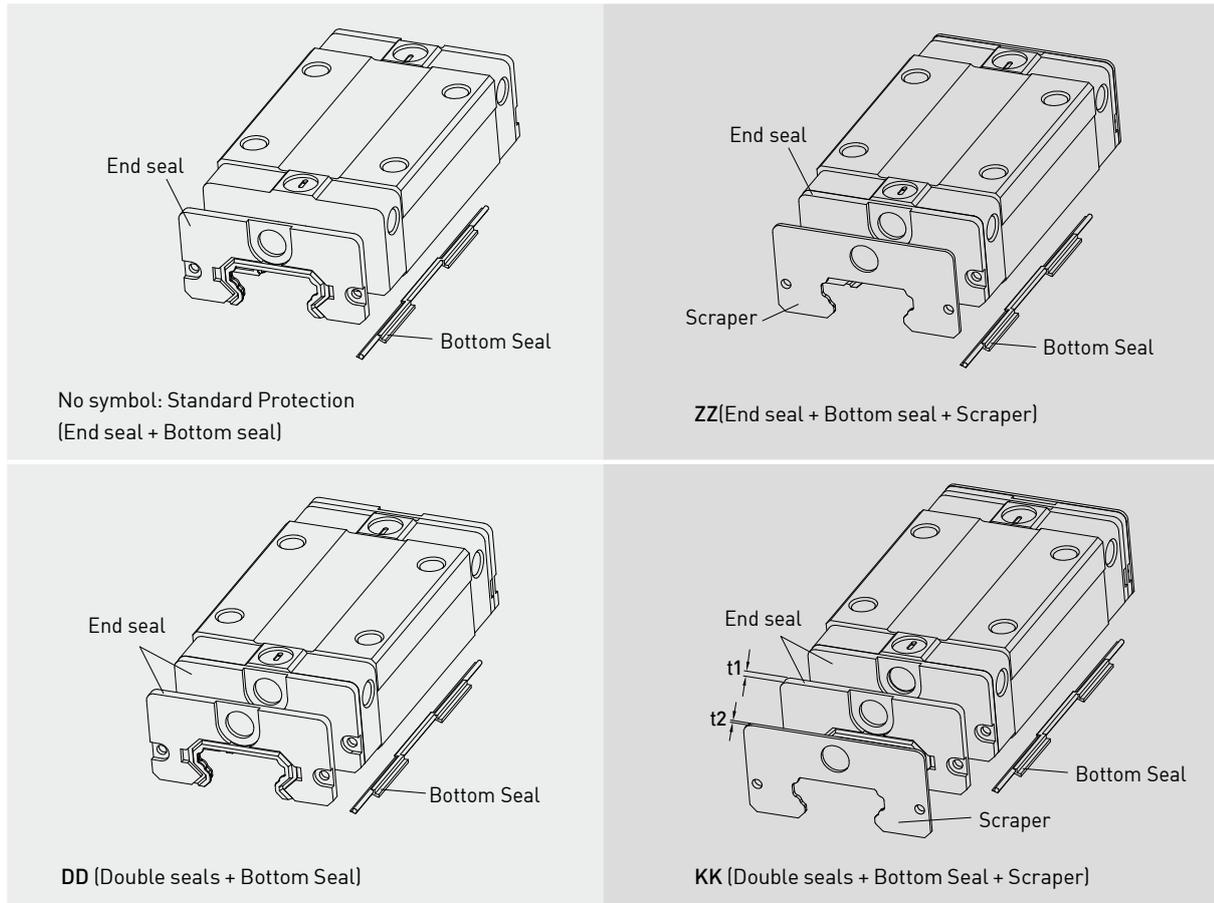
## EG Series

### Low Profile Ball Type

#### 2-2-8 Dust Protection Equipment

##### (1) Codes of equipment

If the following equipment is needed, please indicate the code followed by the model number.



##### (2) End seal and bottom seal

Protects against contaminants entering the block. Reduces potential for groove damage resulting in a reduction of life ratings.

##### (3) Double seals

Removing foreign matters from the rail to prevent contaminants from entering the block.

Table 2-2-13 Dimensions of end seal

| Size    | Thickness (t1)<br>(mm) | Size    | Thickness (t1)<br>(mm) |
|---------|------------------------|---------|------------------------|
| EG15 ES | 2                      | EG30 ES | 2                      |
| EG20 ES | 2                      | EG35 ES | 2                      |
| EG25 ES | 2                      |         |                        |

**(4) Scraper**

Clears larger contaminants, such as weld spatter and metal cuttings, from the rail. Metal scraper protects end seals from excessive damage.

Table 2-2-14 Dimensions of Scraper

| Size    | Thickness (t2)<br>(mm) | Size    | Thickness (t2)<br>(mm) |
|---------|------------------------|---------|------------------------|
| EG15 SC | 0.8                    | EG30 SC | 1                      |
| EG20 SC | 0.8                    | EG35 SC | 1.5                    |
| EG25 SC | 1                      |         |                        |

**(5) Bolt caps for rail mounting holes**

Rail mounting hole caps prevent foreign matter from accumulating in the mounting holes. Caps are included with the rail package.



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

| Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) |
|-----------|-----------|---------------------|----------------------|
| EGR15R    | M3        | 6.15                | 1.2                  |
| EGR20R    | M5        | 9.65                | 2.5                  |
| EGR25R    | M6        | 11.15               | 2.5                  |
| EGR30R    | M6        | 11.15               | 2.5                  |
| EGR35R    | M8        | 14.20               | 3.5                  |
| EGR15U    | M4        | 7.65                | 1.1                  |
| EGR30U    | M8        | 14.20               | 3.5                  |

**(6) Dimensions of block equipped with the dustproof parts**

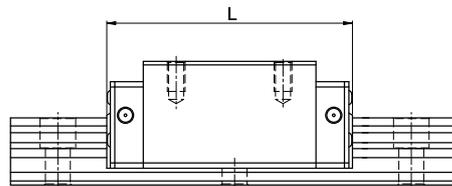


Table 2-2-16 Overall block length

unit: mm

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| EG15S | 40.1 (42.5)              | 41.7 (46.1)   | 44.1 (46.5)   | 45.7 (50.1)   |
| EG15C | 56.8 (59.2)              | 58.4 (62.8)   | 60.8 (63.2)   | 62.4 (66.8)   |
| EG20S | 50.0 (54.0)              | 51.6 (57.6)   | 54.0 (58.0)   | 55.6 (61.6)   |
| EG20C | 69.1 (73.1)              | 70.7 (76.7)   | 73.1 (77.1)   | 74.7 (80.7)   |
| EG25S | 59.1 (63.1)              | 61.1 (67.1)   | 63.1 (67.1)   | 65.1 (71.1)   |
| EG25C | 82.6 (86.6)              | 84.6 (90.6)   | 86.6 (90.6)   | 88.6 (94.6)   |
| EG30S | 69.5 (73.5)              | 71.5 (77.5)   | 73.5 (77.5)   | 75.5 (81.5)   |
| EG30C | 98.1 (102.1)             | 100.1 (106.1) | 102.1 (106.1) | 104.1 (110.1) |
| EG35S | 75.0 (79.0)              | 78.0 (84.0)   | 79.0 (83.0)   | 82.0 (88.0)   |
| EG35C | 108.0 (112.0)            | 111.0 (117.0) | 112.0 (116.0) | 115.0 (121.0) |

Note : The marking of “[ ]” denotes the maximum block length with screws, lips of end seals, etc.

## EG Series

### Low Profile Ball Type

#### 2-2-9 Friction

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

Table 2-2-17 Seal Resistance

| Size | Resistance N (kgf) |
|------|--------------------|
| EG15 | 1.47 (0.15)        |
| EG20 | 1.96 (0.2)         |
| EG25 | 1.96 (0.2)         |
| EG30 | 2.45 (0.25)        |
| EG35 | 1.96 (0.2)         |

Note: 1. 1kgf=9.81N  
2. Please inform HIWIN if low friction request is required.

#### 2-2-10 Mounting Surface Accuracy Tolerance

Because of the circular-arc contact design, the EG linear guideway can withstand surface-error installation and deliver smooth linear motion. When the mounting surface meets the accuracy requirements of the installation, the high accuracy and rigidity of the guideway will be obtained without any difficulty. For faster installation and smoother movement, HIWIN offers a preload with normal clearance because of its ability to absorb higher deviations in mounting surface inaccuracies.

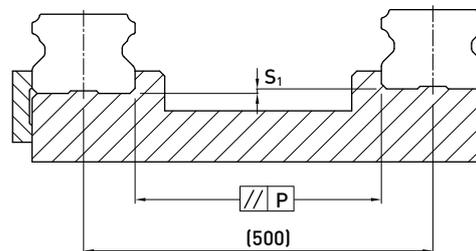


Table 2-2-18 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    |
|------|-----------------|----|----|
|      | Z0              | ZA | ZB |
| EG15 | 25              | 18 | -  |
| EG20 | 25              | 20 | 18 |
| EG25 | 30              | 22 | 20 |
| EG30 | 40              | 30 | 27 |
| EG35 | 50              | 35 | 30 |

Table 2-2-19 Max. Tolerance of Reference Surface Height ( $S_1$ )

unit:  $\mu\text{m}$

| Size | Preload classes |     |     |
|------|-----------------|-----|-----|
|      | Z0              | ZA  | ZB  |
| EG15 | 130             | 85  | -   |
| EG20 | 130             | 85  | 50  |
| EG25 | 130             | 85  | 70  |
| EG30 | 170             | 110 | 90  |
| EG35 | 210             | 150 | 120 |

Note : Permissible value is proportional to the axial distance

## 2-2-11 Cautions for Installation

### (1) Shoulder heights and chamfers

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

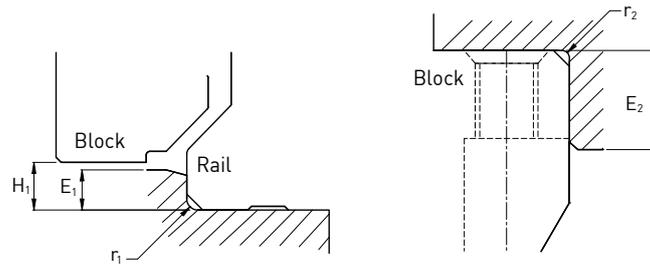


Table 2-2-20 Shoulder Heights and Chamfers

unit: mm

| Size | Max. radius of fillets<br>$r_1$ (mm) | Max. radius of fillets<br>$r_2$ (mm) | Shoulder height beside the rail<br>$E_1$ (mm) | Shoulder height beside the block<br>$E_2$ (mm) | Clearance under block<br>$H_1$ (mm) |
|------|--------------------------------------|--------------------------------------|---|--|-------------------------------------|
| EG15 | 0.5                                  | 0.5                                  | 2.7   | 5.0  | 4.5                                 |
| EG20 | 0.5                                  | 0.5                                  | 5.0   | 7.0  | 6.0                                 |
| EG25 | 1.0                                  | 1.0                                  | 5.0   | 7.5  | 7.0                                 |
| EG30 | 1.0                                  | 1.0                                  | 7.0   | 7.0  | 10.0                                |
| EG35 | 1.0                                  | 1.0                                  | 7.5   | 9.5  | 11.0                                |

### (2) Tightening Torque of Bolts for Installation

Improperly tightened mounting bolts will seriously affect the accuracy of linear guide installations. The following tightening torques for different sizes of bolts are recommended.

Table 2-2-21 Tightening Torque

| Size  | Bolt size    | Torque N-cm(kgf-cm) |            |            |
|-------|--------------|---------------------|------------|------------|
|       |              | Iron                | Casting    | Aluminum   |
| EG 15 | M3×0.5P×16L  | 186 (19)            | 127 (13)   | 98 (10)    |
| EG 20 | M5×0.8P×16L  | 883 (90)            | 588 (60)   | 441 (45)   |
| EG 25 | M6×1P×20L    | 1373 (140)          | 921 (94)   | 686 (70)   |
| EG 30 | M6×1P×25L    | 1373 (140)          | 921 (94)   | 686 (70)   |
| EG 35 | M8×1.25P×25L | 3041 (310)          | 2010 (205) | 1470 (150) |

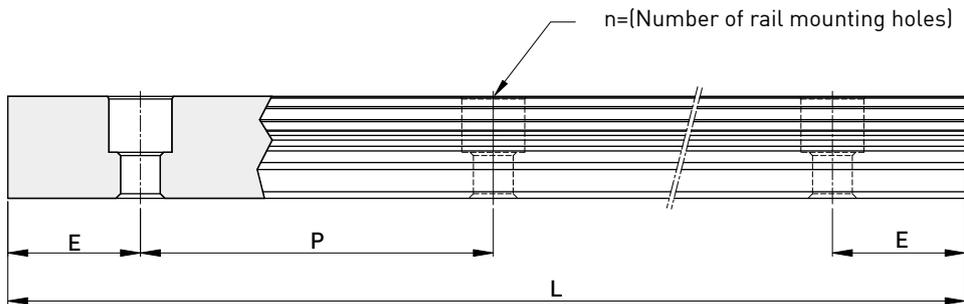
Note: 1 kgf = 9.81 N

## EG Series

### Low Profile Ball Type

#### 2-2-12 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.



$$L = (n - 1) \times P + 2 \times E \quad \dots \dots \dots \text{Eq.2.2}$$

- L : Total length of rail (mm)
- n : Number of mounting holes
- P : Distance between any two holes (mm)
- E : Distance from the center of the last hole to the edge (mm)

Table 2-2-22 Rail Standard Length and Max. Length

unit: mm

| Item                              | EGR15      | EGR20      | EGR25      | EGR30      | EGR35      |
|-----------------------------------|------------|------------|------------|------------|------------|
| Standard Length L(n)              | 160 (3)    | 220 (4)    | 220 (4)    | 280 (4)    | 280 (4)    |
|                                   | 220 (4)    | 280 (5)    | 280 (5)    | 440 (6)    | 440 (6)    |
|                                   | 280 (5)    | 340 (6)    | 340 (6)    | 600 (8)    | 600 (8)    |
|                                   | 340 (6)    | 460 (8)    | 460 (8)    | 760 (10)   | 760 (10)   |
|                                   | 460 (8)    | 640 (11)   | 640 (11)   | 1,000 (13) | 1,000 (13) |
|                                   | 640 (11)   | 820 (14)   | 820 (14)   | 1,640 (21) | 1,640 (21) |
|                                   | 820 (14)   | 1,000 (17) | 1,000 (17) | 2,040 (26) | 2,040 (26) |
|                                   |            | 1,240 (21) | 1,240 (21) | 2,520 (32) | 2,520 (32) |
|                                   | 1,600 (27) | 1,600 (27) | 3,000 (38) | 3,000 (38) |            |
| Pitch (P)                         | 60         | 60         | 60         | 80         | 80         |
| Distance to End (E <sub>s</sub> ) | 20         | 20         | 20         | 20         | 20         |
| Max. Standard Length              | 4,000(67)  | 4,000 (67) | 4,000 (67) | 3,960 (50) | 3,960 (50) |
| Max. Length                       | 4,000      | 4,000      | 4,000      | 4,000      | 4,000      |

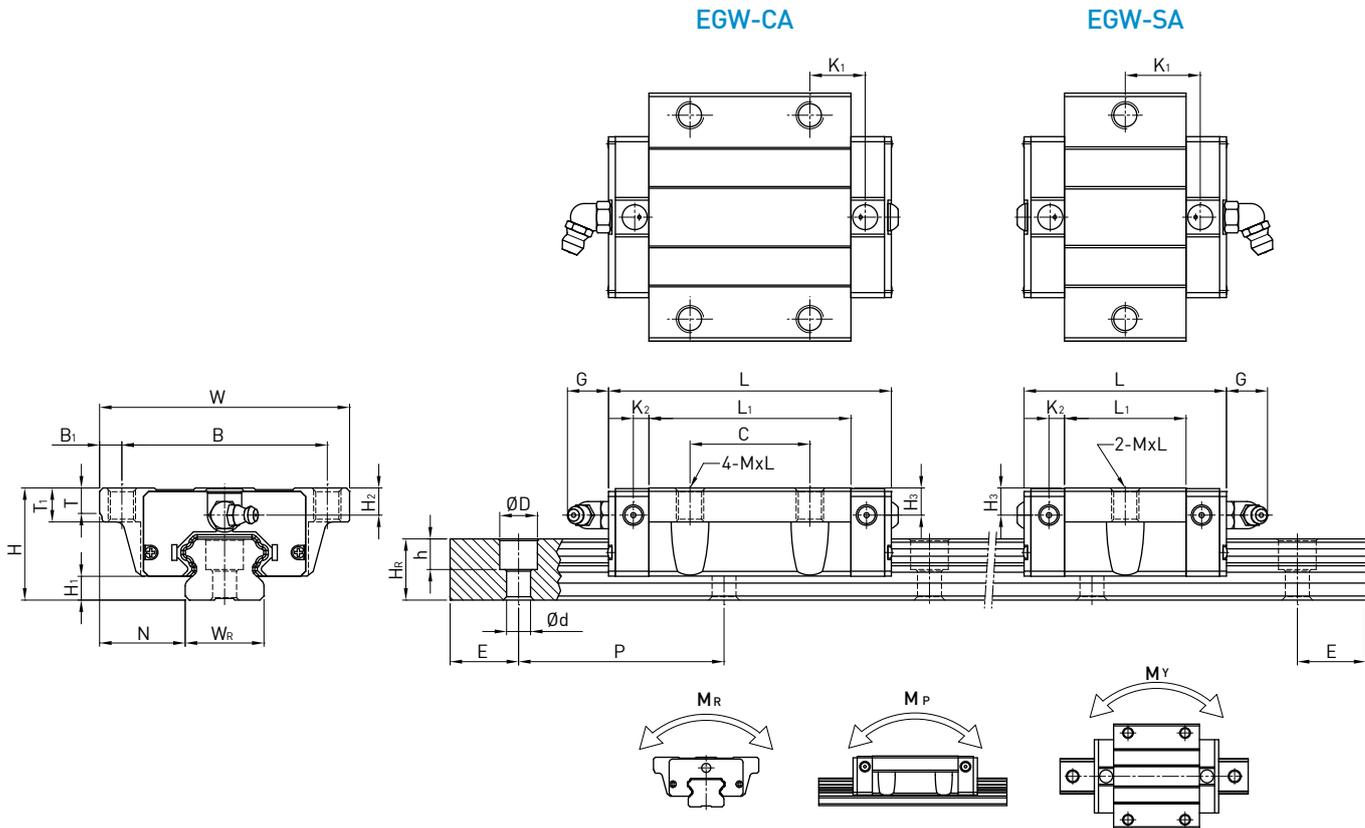
- Note :
1. Tolerance of E value for standard rail is 0.5~-0.5 mm. Tolerance of E value for jointed rail is 0~-0.3 mm.
  2. Maximum standard length means the max. rail length with standard E value on both sides.
  3. If different E value is needed, please contact HIWIN.
  4. EGR15 of stainless steel is supplied with the maximum length of 2000mm.



# EG Series

## Low Profile Ball Type

### (2) EGW-SA / EGW-CA



| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |     |    |                |    |                |      |                |                |     |     |     |                | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |                |                | Weight         |    |    |       |       |       |                |                |                |          |           |
|-----------|-----------------------------|----------------|--------------------------|-----|----|----------------|----|----------------|------|----------------|----------------|-----|-----|-----|----------------|-----------------------------|----------------------------------|--|---------------------|----------------|----------------|----------------|----|----|-------|-------|-------|----------------|----------------|----------------|----------|-----------|
|           | 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   | 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     | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block kg | Rail kg/m |
|           |                             |                |                          |     |    |                |    |                |      |                |                |     |     |     |                |                             |                                  |  |                     |                |                |                |    |    |       |       |       |                |                |                |          |           |
| EGW15SA   | 24                          | 4.5            | 18.5                     | 52  | 41 | 5.5            | -  | 23.1           | 40.1 | 14.8           | 3.5            | 5.7 | M5  | 5   | 7              | 5.5                         | 6                                | 15   | 12.5                | 6              | 4.5            | 3.5            | 60 | 20 | M3x16 | 5.35  | 9.40  | 0.08           | 0.04           | 0.04           | 0.12     | 1.25      |
| EGW15CA   |                             |                |                          |     |    |                | 26 | 39.8           | 56.8 | 10.15          |                |     |     |     |                |                             |                                  |  |                     |                |                |                |    |    |       |       |       |                |                |                |          |           |
| EGW20SA   | 28                          | 6              | 19.5                     | 59  | 49 | 5              | -  | 29             | 50   | 18.75          | 4.15           | 12  | M6  | 7   | 9              | 6                           | 6                                | 20   | 15.5                | 9.5            | 8.5            | 6              | 60 | 20 | M5x16 | 7.23  | 12.74 | 0.13           | 0.06           | 0.06           | 0.19     | 2.08      |
| EGW20CA   |                             |                |                          |     |    |                | 32 | 48.1           | 69.1 | 12.3           |                |     |     |     |                |                             |                                  |  |                     |                |                |                |    |    |       |       |       |                |                |                |          |           |
| EGW25SA   | 33                          | 7              | 25                       | 73  | 60 | 6.5            | -  | 35.5           | 59.1 | 21.9           | 4.55           | 12  | M8  | 7.5 | 10             | 8                           | 8                                | 23   | 18                  | 11             | 9              | 7              | 60 | 20 | M6x20 | 11.40 | 19.50 | 0.23           | 0.12           | 0.12           | 0.35     | 2.67      |
| EGW25CA   |                             |                |                          |     |    |                | 35 | 59             | 82.6 | 16.15          |                |     |     |     |                |                             |                                  |  |                     |                |                |                |    |    |       |       |       |                |                |                |          |           |
| EGW30SA   | 42                          | 10             | 31                       | 90  | 72 | 9              | -  | 41.5           | 69.5 | 26.75          | 6              | 12  | M10 | 7   | 10             | 8                           | 9                                | 28   | 23                  | 11             | 9              | 7              | 80 | 20 | M6x25 | 16.42 | 28.10 | 0.40           | 0.21           | 0.21           | 0.62     | 4.35      |
| EGW30CA   |                             |                |                          |     |    |                | 40 | 70.1           | 98.1 | 21.05          |                |     |     |     |                |                             |                                  |  |                     |                |                |                |    |    |       |       |       |                |                |                |          |           |
| EGW35SA   | 48                          | 11             | 33                       | 100 | 82 | 9              | -  | 45             | 75   | 28.5           | 7              | 12  | M10 | 10  | 13             | 8.5                         | 8.5                              | 34   | 27.5                | 14             | 12             | 9              | 80 | 20 | M8x25 | 22.66 | 37.38 | 0.56           | 0.31           | 0.31           | 0.84     | 6.14      |
| EGW35CA   |                             |                |                          |     |    |                | 50 | 78             | 108  | 20             |                |     |     |     |                |                             |                                  |  |                     |                |                |                |    |    |       |       |       |                |                |                |          |           |

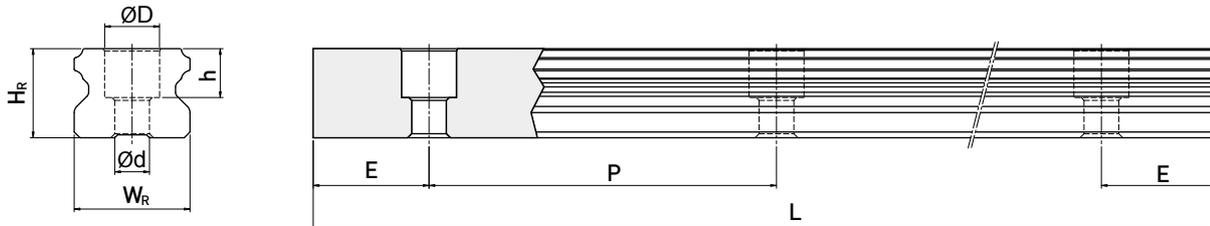
Note : 1 kgf = 9.81 N



## EG Series

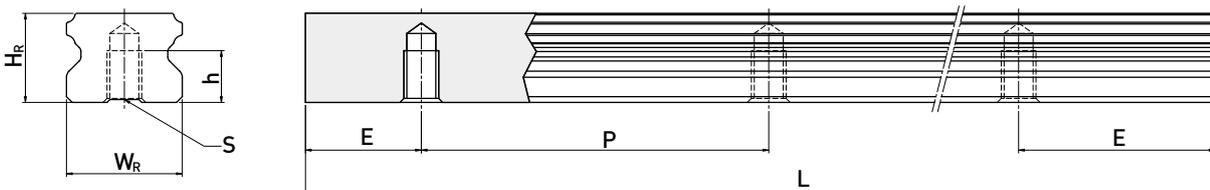
### Low Profile Ball Type

#### (4) Dimensions for EGR-U (large mounting hole, rail mounting from top)



| Model No. | Mounting Bolt<br>for Rail(mm) | Dimensions of Rail (mm) |                |     |     |     |    |    | Weight<br>(kg/m) |
|-----------|-------------------------------|-------------------------|----------------|-----|-----|-----|----|----|------------------|
|           |                               | W <sub>R</sub>          | H <sub>R</sub> | D   | h   | d   | P  | E  |                  |
| EGR15U    | M4x16                         | 15                      | 12.5           | 7.5 | 5.3 | 4.5 | 60 | 20 | 1.23             |
| EGR30U    | M8x25                         | 28                      | 23             | 14  | 12  | 9   | 80 | 20 | 4.23             |

#### (5) Dimensions for EGR-T (rail mounting from bottom)



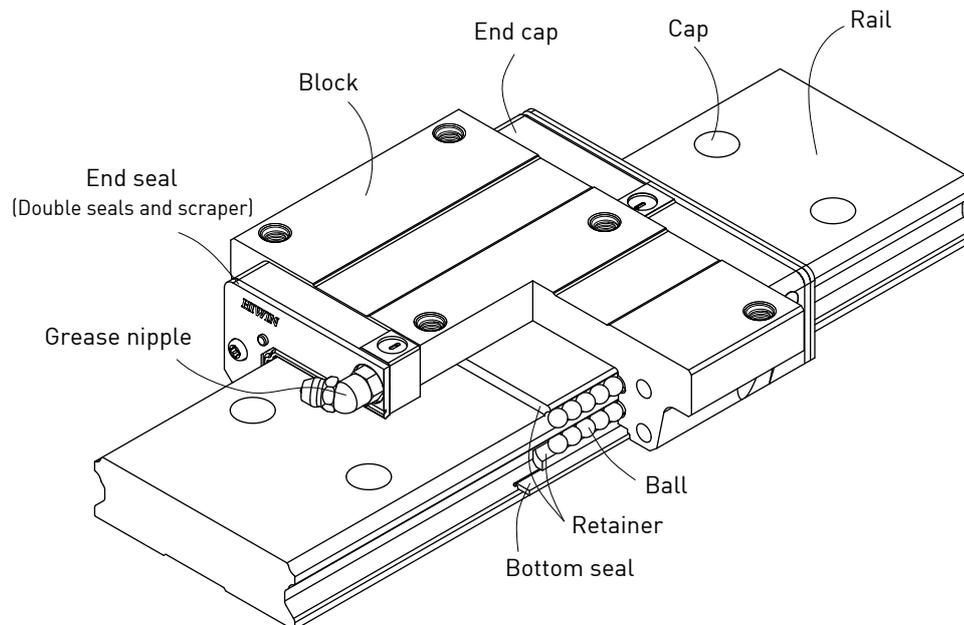
| Model No. | Dimensions of Rail (mm) |                |            |    |    |    | Weight<br>(kg/m) |
|-----------|-------------------------|----------------|------------|----|----|----|------------------|
|           | W <sub>R</sub>          | H <sub>R</sub> | S          | h  | P  | E  |                  |
| EGR15T    | 15                      | 12.5           | M5 x 0.8P  | 7  | 60 | 20 | 1.26             |
| EGR20T    | 20                      | 15.5           | M6 x 1P    | 9  | 60 | 20 | 2.15             |
| EGR25T    | 23                      | 18             | M6 x 1P    | 10 | 60 | 20 | 2.79             |
| EGR30T    | 28                      | 23             | M8 x 1.25P | 14 | 80 | 20 | 4.42             |
| EGR35T    | 34                      | 27.5           | M8 x 1.25P | 17 | 80 | 20 | 6.34             |

## 2-3 WE Type – Four-Row Wide Rail Linear Guideway

### 2-3-1 Construction

The WE series features equal load ratings in the radial, reverse radial and the lateral direction with contact points at 45 degrees. This along with the wide rail, allows the guide way to be rated for high loads, moments and rigidity. By design, it has a self-aligning capacity that can absorb most installation errors and can meet high accuracy standards. The ability to use a single rail and to have the low profile with a low center of gravity is ideal where space is limited and/or high moments are required.

### 2-3-2 Construction of WE 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

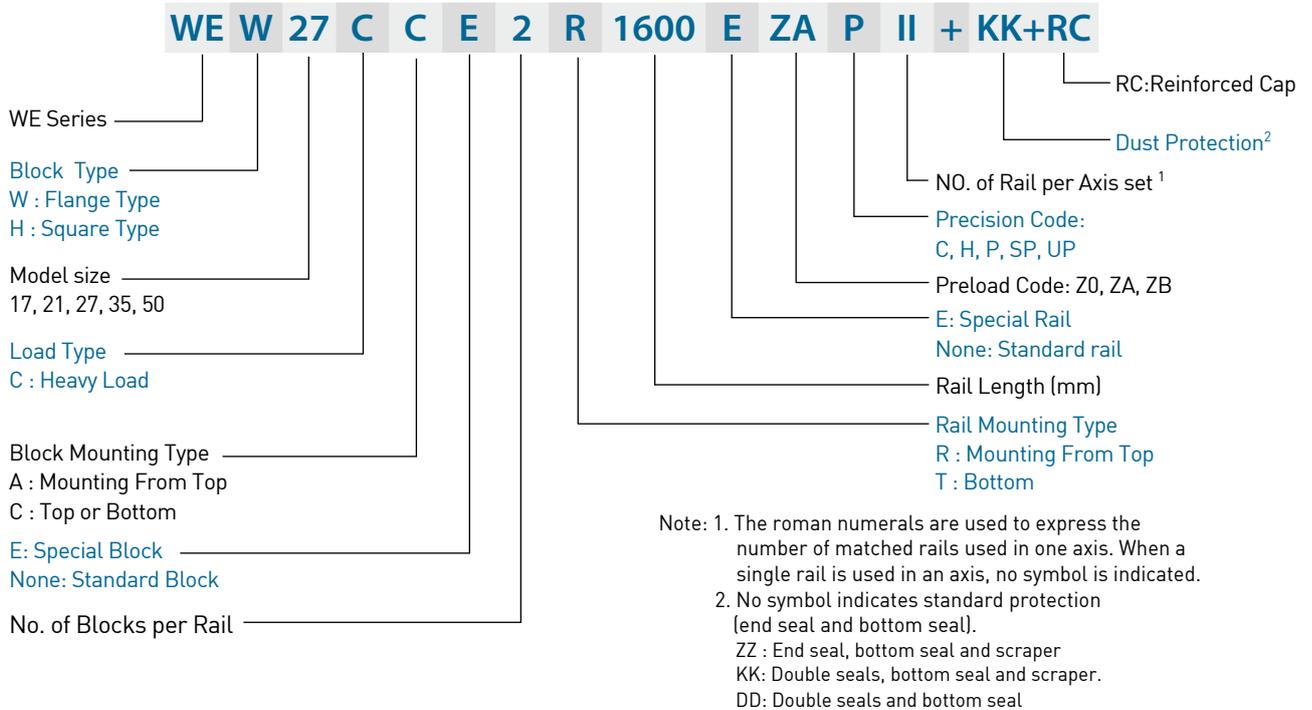
### 2-3-3 Model Number of WE Series

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

# WE Series

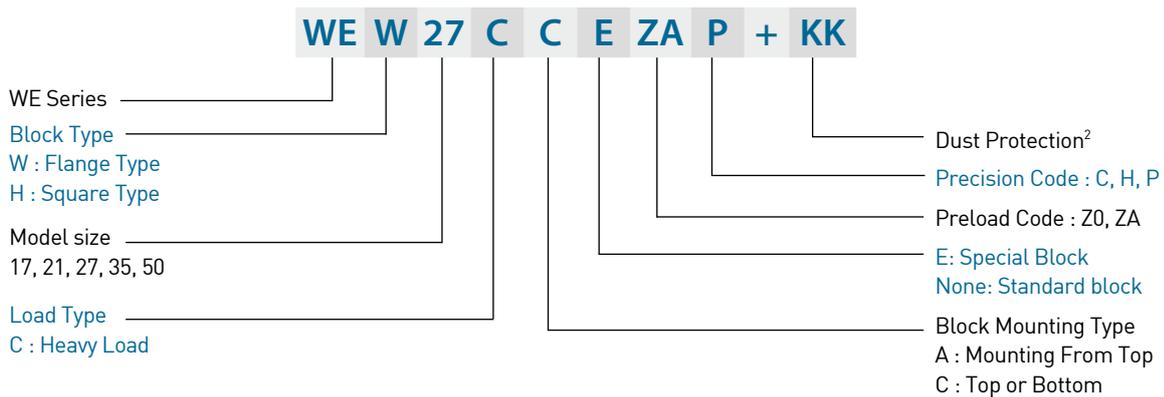
## Four-Row Wide Rail

### (1) Non-interchangeable type

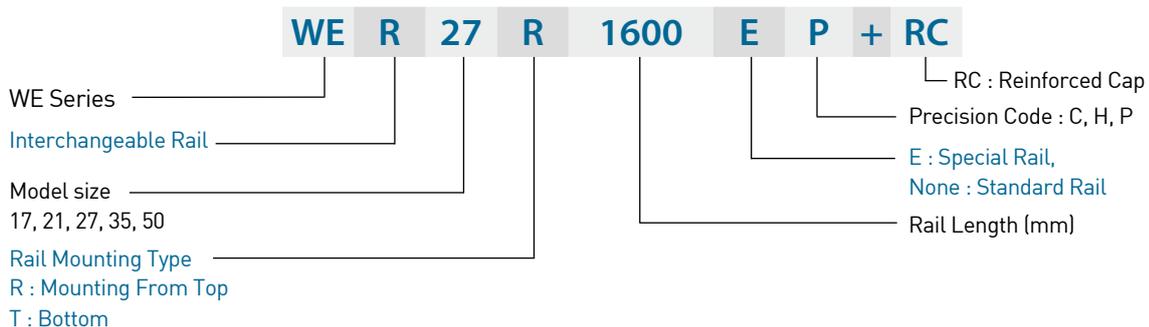


### (2) Interchangeable type

#### Model Number of WE Block



#### Model Number of WE Rail

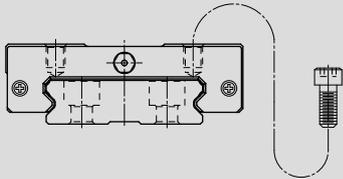
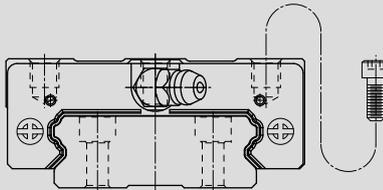
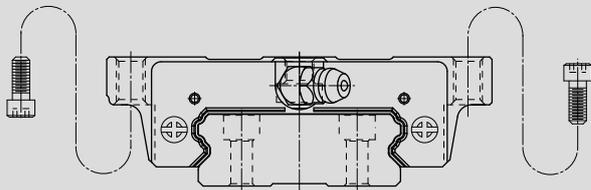


## 2-3-4 Types

### (1) Block types

HIWIN offers two types of linear guideways, flange and square types.

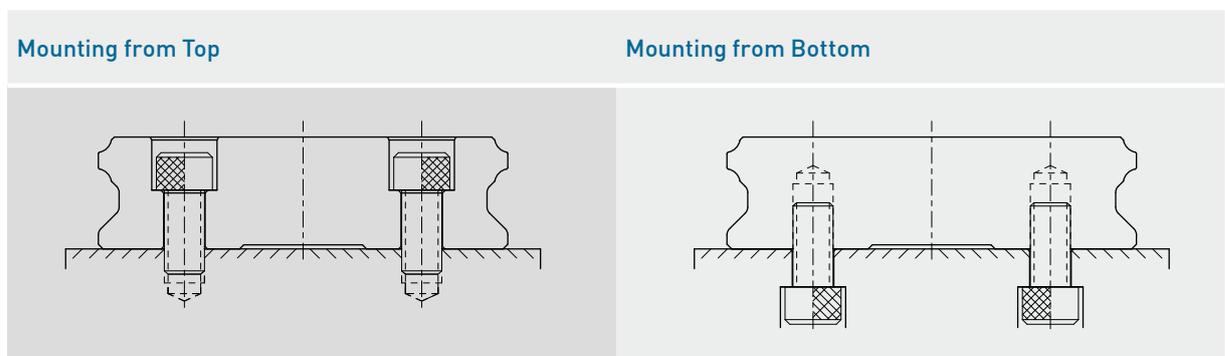
Table 2-3-1 Block Types

| Type   | Model                | Shape  | Height (mm) | Rail Length (mm) | Main Applications   |
|--------|----------------------|--|-------------|------------------|---|
| Square | WEH-CA<br>17, 21     |     | 17          | 100              | <ul style="list-style-type: none"> <li>○ Automation</li> <li>○ High-speed transportation equipment</li> <li>○ Precision measuring equipment</li> </ul>  |
|        |                      |  | ↓           | ↓                |   |
| Square | WEH-CA<br>27, 35, 50 |    | 27          | 100              | <ul style="list-style-type: none"> <li>○ Semiconductor manufacturing equipment</li> <li>○ Blow Moulding machines</li> <li>○ Single Axis Robot-Robotics</li> <li>○ Single Axis Equipment with High Anti-rolling Requirement</li> </ul> |
|        |                      |  | ↓           | ↓                |   |
| Flange | WEW-CC               |  | 17          | 100              |   |
|        |                      |  | ↓           | ↓                |   |
|        |                      |  | 50          | 4000             |   |

### (2) Rail types

Besides the standard top mounting type, HIWIN also offers bottom mounting type rails.

Table 2-3-2 Rail Types



## 2-3-5 Accuracy

The accuracy of the WE series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.

### (1) Accuracy of non-interchangeable guideways

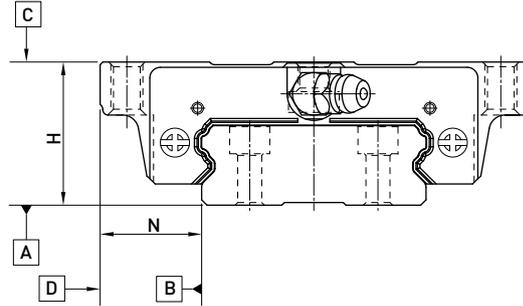


Table 2-3-3 Accuracy Standards

Unit: mm

| Type  | WE - 17, 21     |             |                  |                            |                            | WE - 27, 35   |             |                  |                            |                            |
|---|-----------------|-------------|------------------|----------------------------|----------------------------|---------------|-------------|------------------|----------------------------|----------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) | Normal<br>(C) | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ±0.1            | ±0.03       | 0<br>-0.03       | 0<br>-0.015                | 0<br>-0.008                | ±0.1          | ±0.04       | 0<br>-0.04       | 0<br>-0.02                 | 0<br>-0.01                 |
| Dimensional tolerance of width N                    | ±0.1            | ±0.03       | 0<br>-0.03       | 0<br>-0.015                | 0<br>-0.008                | ±0.1          | ±0.04       | 0<br>-0.04       | 0<br>-0.02                 | 0<br>-0.01                 |
| Variation of height H                               | 0.02            | 0.01        | 0.006            | 0.004                      | 0.003                      | 0.02          | 0.015       | 0.007            | 0.005                      | 0.003                      |
| Variation of width N                                | 0.02            | 0.01        | 0.006            | 0.004                      | 0.003                      | 0.03          | 0.015       | 0.007            | 0.005                      | 0.003                      |
| Running parallelism of block surface C to surface A | See Table 2-3-5 |             |                  |                            |                            |               |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-3-5 |             |                  |                            |                            |               |             |                  |                            |                            |

| Type  | WE - 50         |             |                  |                            |                            |
|---|-----------------|-------------|------------------|----------------------------|----------------------------|
| Accuracy Classes                                    | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ±0.1            | ±0.05       | 0<br>-0.05       | 0<br>-0.03                 | 0<br>-0.02                 |
| Dimensional tolerance of width N                    | ±0.1            | ±0.05       | 0<br>-0.05       | 0<br>-0.03                 | 0<br>-0.02                 |
| Variation of height H                               | 0.03            | 0.015       | 0.007            | 0.005                      | 0.003                      |
| Variation of width N                                | 0.03            | 0.02        | 0.01             | 0.007                      | 0.005                      |
| Running parallelism of block surface C to surface A | See Table 2-3-5 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-3-5 |             |                  |                            |                            |

### (2) Accuracy of interchangeable guideways

Table 2-3-4 Accuracy Standards

Unit: mm

| Item  | WE - 17, 21     |             |                  | WE - 27, 35   |             |                  | WE - 50       |             |                  |
|---|-----------------|-------------|------------------|---------------|-------------|------------------|---------------|-------------|------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Normal<br>(C) | High<br>(H) | Precision<br>(P) | Normal<br>(C) | High<br>(H) | Precision<br>(P) |
| Dimensional tolerance of height H                   | ±0.1            | ±0.03       | ±0.015           | ±0.1          | ±0.04       | ±0.02            | ±0.1          | ±0.05       | ±0.025           |
| Dimensional tolerance of width N                    | ±0.1            | ±0.03       | ±0.015           | ±0.1          | ±0.04       | ±0.02            | ±0.1          | ±0.05       | ±0.025           |
| Variation of height H                               | 0.02            | 0.01        | 0.006            | 0.02          | 0.015       | 0.007            | 0.03          | 0.015       | 0.007            |
| Variation of width N                                | 0.02            | 0.01        | 0.006            | 0.03          | 0.015       | 0.007            | 0.03          | 0.02        | 0.01             |
| Running parallelism of block surface C to surface A | See Table 2-3-5 |             |                  |               |             |                  |               |             |                  |
| Running parallelism of block surface D to surface B | See Table 2-3-5 |             |                  |               |             |                  |               |             |                  |

### (3) Accuracy of running parallelism

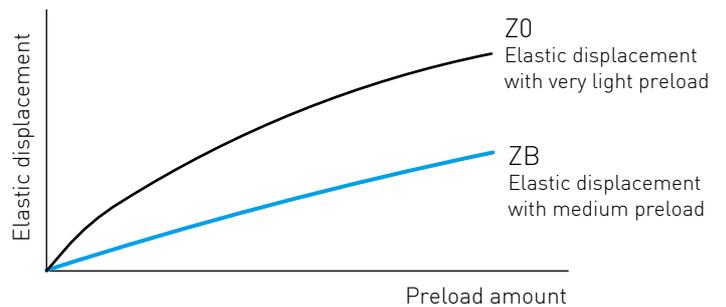
Table 2-3-5 Accuracy of Running Parallelism

| 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  |

### 2-3-6 Preload

#### (1) Definition

A preload can be applied to each guideway. Generally, a linear motion guideway has a negative clearance between the groove and balls in order to improve stiffness and maintain high precision. The figure shows that adding a preload can improve stiffness of the linear guideway.



#### (2) Preload classes

HIWIN offers three standard preloads for various applications and conditions.

Table 2-3-6 Preload Classes

| Class              | Code | Preload      | Condition   |
|--------------------|------|--------------|---|
| Very Light Preload | Z0   | 0~ 0.02C     | Certain load direction, low impact, low precision requirement |
| Light Preload      | ZA   | 0.03C~0.05C  | low load and high precision requirement                       |
| Medium Preload     | ZB   | 0.06C~ 0.08C | High rigidity requirement, with vibration and impact          |

| 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.

#### (3) Stiffness performance

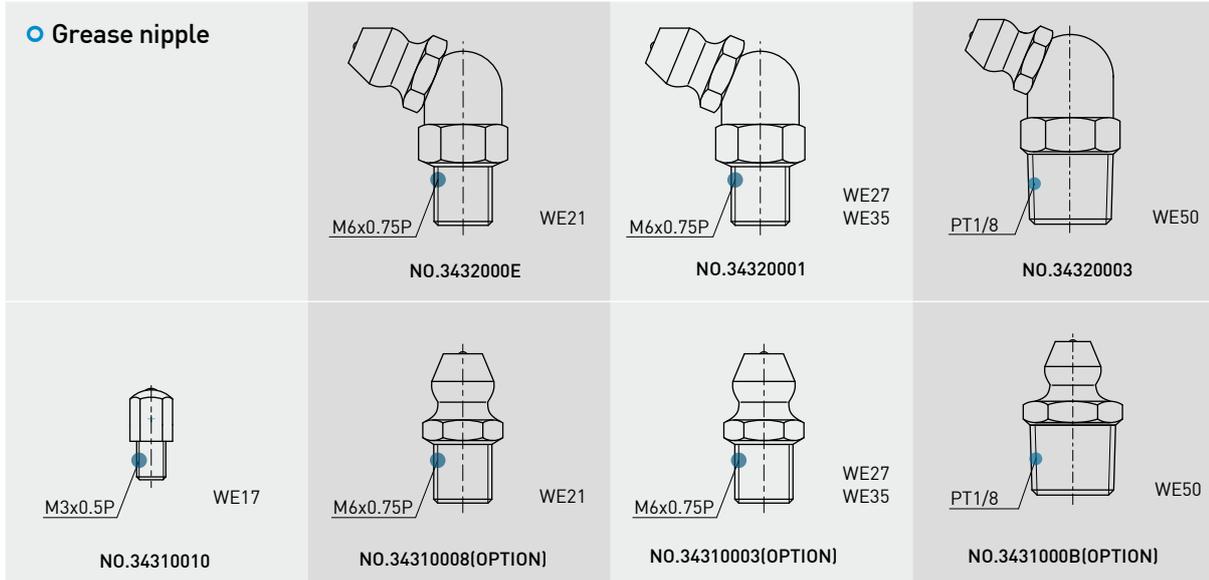
Stiffness depends on preload. The following table shows stiffness value of each size.

Table 2-3-7 Radial stiffness for WE Series

| Load type  | Series / Size | Stiffness (N/μm) |     |      |
|------------|---------------|------------------|-----|------|
|            |               | Z0               | ZA  | ZB   |
| Heavy load | WE 17C        | 130              | 342 | 469  |
|            | WE 21C        | 153              | 368 | 497  |
|            | WE 27C        | 188              | 476 | 651  |
|            | WE 35C        | 285              | 607 | 804  |
|            | WE 50C        | 429              | 758 | 1042 |

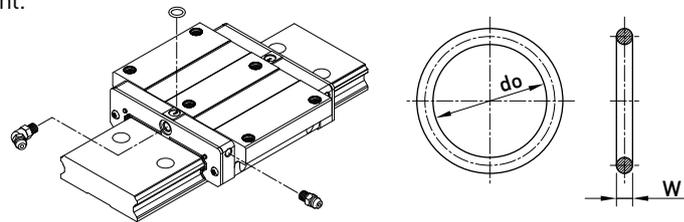
## 2-3-7 Lubrication

### (1) Grease



### ○ Mounting location

The standard location of the grease fitting is at both ends of the block, the nipple may be mounted in the side or top of the block. For lateral installation, we recommend that the nipple be mounted to the non-reference side, otherwise please contact us. When lubricating from above, in the recess for the O-ring, a smaller, preformed recess can be found. Preheat the 0.8 mm diameter metal tip. Carefully open the small recess with the metal tip and pierce through it. Insert a round sealing ring into the recess. (The round sealing ring is not supplied with the block) Do not open the small recess with a drill bit this may introduce the danger of contamination. It is possible to carry out the lubrication by using the oil-piping joint.



O Ring

Table 2-3-8 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 <sub>max</sub> (mm)                                 |
| WE 21 | 2.5 ± 0.15 | 1.5 ± 0.15 | 4.2   |
| WE 27 | 4.5 ± 0.15 | 1.5 ± 0.15 | 5.8   |
| WE 35 | 4.5 ± 0.15 | 1.5 ± 0.15 | 7.6   |
| WE 50 | 4.5 ± 0.15 | 1.5 ± 0.15 | 11.8  |

### ○ The oil amount for a block filled with grease

Table 2-3-9 The oil amount for a block filled with grease

| Size  | Heavy Load (cm <sup>3</sup> ) | Size  | Heavy Load (cm <sup>3</sup> ) |
|-------|-------------------------------|-------|-------------------------------|
| WE 17 | 1.4                           | WE 35 | 9.5                           |
| WE 21 | 2.4                           | WE 50 | 20                            |
| WE 27 | 3.6                           |       |                               |

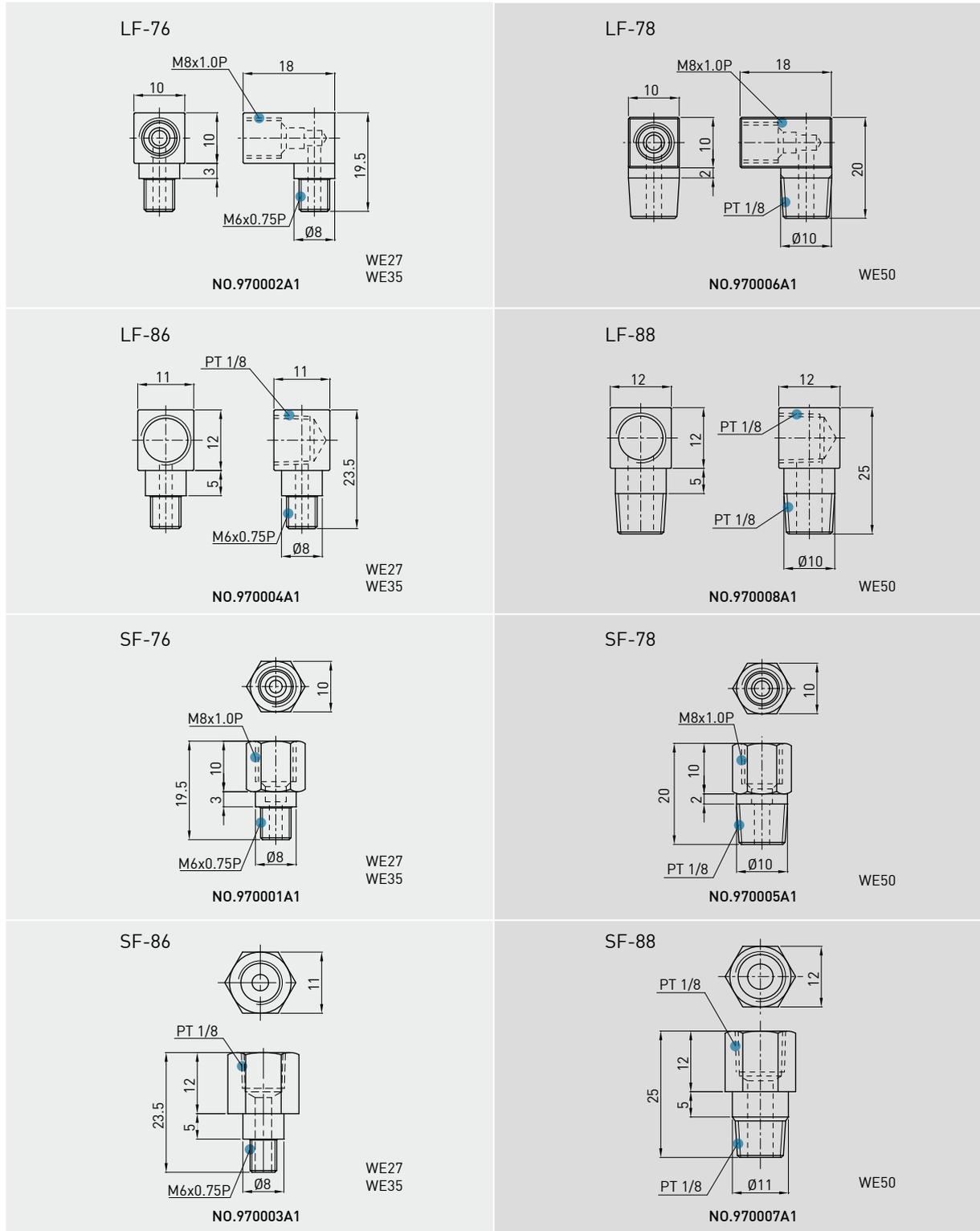
### ○ Frequency of replenishment

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

**(2) Oil**

The recommended viscosity of oil is about 30~150cSt. If you need to use oil-type lubrication, please inform us.

**○ Types of oil piping joint**



## WE Series

### Four-Row Wide Rail

#### Oil feeding rate

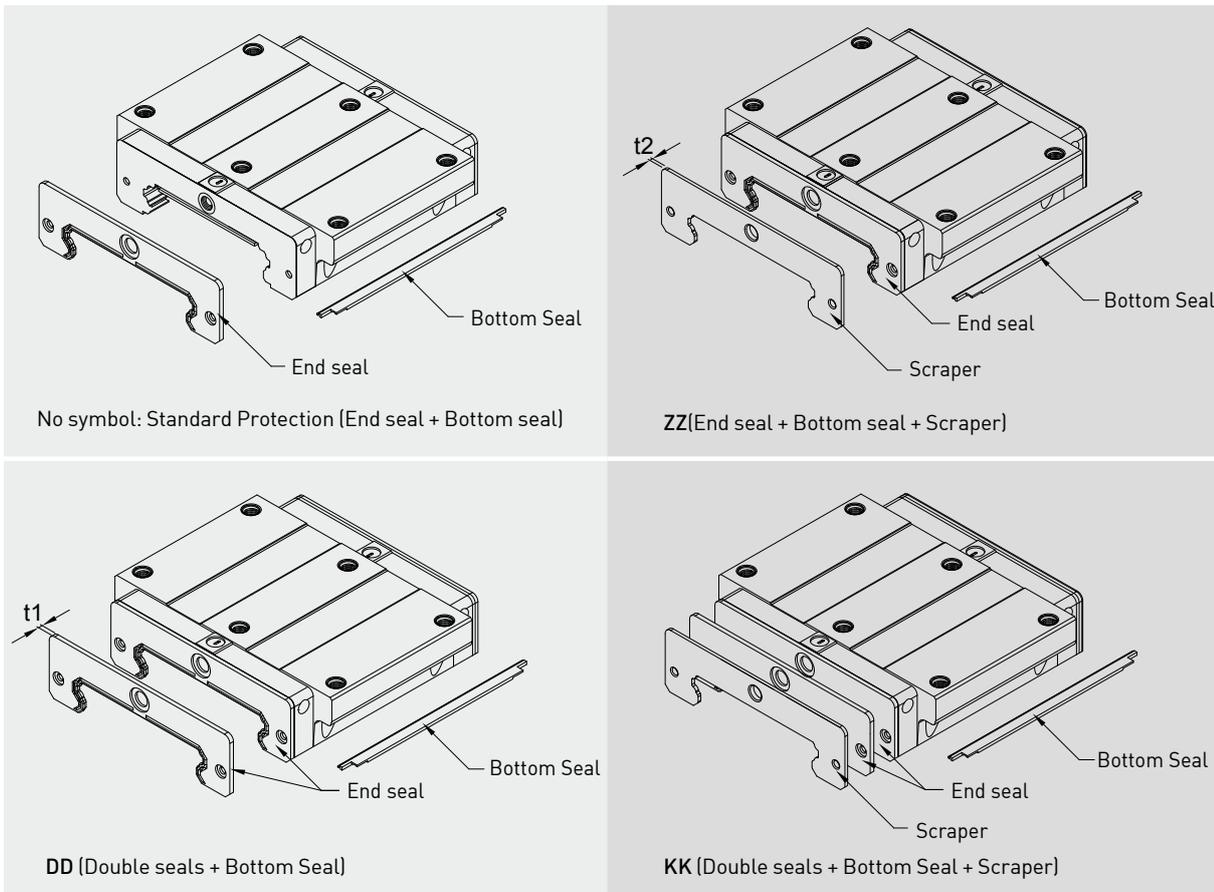
Table 2-3-10 oil feed rate

| Size  | feed rate<br>(cm <sup>3</sup> /hr) |
|-------|------------------------------------|
| WE 17 | 0.15                               |
| WE 21 | 0.2                                |
| WE 27 | 0.2                                |
| WE 35 | 0.3                                |
| WE 50 | 0.4                                |

### 2-3-8 Dust Protection Equipment

#### (1) Codes of equipment

If the following equipment is needed, please indicate the code followed by the model number.



**(2) End seal and bottom seal**

Protects against contaminants entering the block. Reduces potential for groove damage resulting in a reduction of life ratings.

**(3) Double seals**

Removes foreign matter from the rail preventing contaminants from entering the block.

Table 2-3-11 Dimensions of end seal

| Size     | Thickness (t1)<br>(mm) | Size     | Thickness (t1)<br>(mm) |
|----------|------------------------|----------|------------------------|
| WE 17 ES | 1.6                    | WE 35 ES | 2                      |
| WE 21 ES | 2                      | WE 50 ES | 2.5                    |
| WE 27 ES | 2                      |          |                        |

**(4) Scraper**

Clears larger contaminants, such as weld spatter and metal cuttings, from the rail. Metal scraper protects end seals from excessive damage.

Table 2-3-12 Dimensions of Scraper

| Size     | Thickness (t2)<br>(mm) | Size     | Thickness (t2)<br>(mm) |
|----------|------------------------|----------|------------------------|
| WE 17 SC | 1                      | WE 35 SC | 1.5                    |
| WE 21 SC | 1                      | WE 50 SC | 1                      |
| WE 27 SC | 1                      |          |                        |

**(5) Bolt caps for rail mounting holes**

Rail mounting hole caps prevent foreign matter from accumulating in the mounting holes. Caps are included with the rail package.



Table 2-3-13 Dimensions of Bolt Caps for Rail Mounting Holes

| Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) |
|-----------|-----------|---------------------|----------------------|
| WER17R    | M4        | 7.65                | 1.1                  |
| WER21R    | M4        | 7.65                | 1.1                  |
| WER27R    | M4        | 7.65                | 1.1                  |
| WER35R    | M6        | 11.15               | 2.5                  |
| WER50R    | M8        | 14.20               | 3.5                  |

## WE Series

### Four-Row Wide Rail

#### (6) Dimensions of block equipped with the dustproof parts

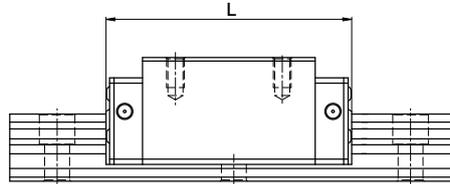


Table 2-3-14 Overall block length

unit: mm

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| WE17C | 50.6 (51.5)              | 52.6 (55.6)   | 53.8 (55.0)   | 55.8 (58.8)   |
| WE21C | 59.0 (63.0)              | 61.0 (67.0)   | 63.0 (67.0)   | 65.0 (71.0)   |
| WE27C | 72.8 (77.2)              | 74.8 (80.8)   | 76.8 (81.2)   | 78.8 (84.8)   |
| WE35C | 102.6 (106.6)            | 105.6 (111.6) | 106.6 (110.6) | 109.6 (115.6) |
| WE50C | 140.0 (141.6)            | 142.0 (146.2) | 145.0 (146.6) | 147.0 (151.2) |

Note : The marking of “{ }” denotes the maximum block length with screws, lips of end seals, etc.

### 2-3-9 Friction

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

Table 2-3-15 Seal Resistance

| Size  | Resistance N (kgf) | Size  | Resistance N (kgf) |
|-------|--------------------|-------|--------------------|
| WE 17 | 1.18 (0.12)        | WE 35 | 3.92 (0.4)         |
| WE 21 | 1.96 (0.2)         | WE 50 | 3.92 (0.4)         |
| WE 27 | 2.94 (0.3)         |       |                    |

Note:1kgf=9.81N

### 2-3-10 Mounting Surface Accuracy Tolerance

Because of the circular-arc contact design, the WE linear guideway can withstand surface-error installation and deliver smooth linear motion. When the mounting surface meets the accuracy requirements of the installation, the high accuracy and rigidity of the guideway will be obtained without any difficulty. For faster installation and smoother movement, HIWIN offers a preload with normal clearance because of its ability to absorb higher deviations in mounting surface inaccuracies.

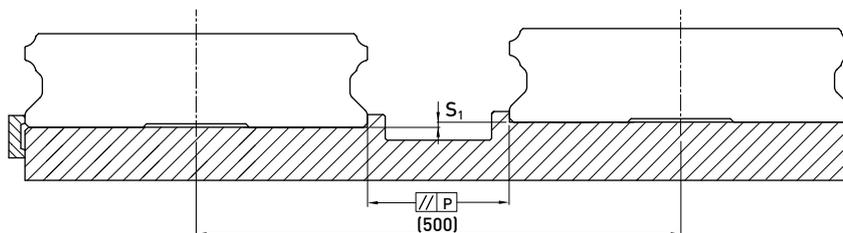


Table 2-3-16 Max. Parallelism Tolerance (P)

unit: µm

| Size  | Preload classes |    |    | Size  | Preload classes |    |    |
|-------|-----------------|----|----|-------|-----------------|----|----|
|       | Z0              | ZA | ZB |       | Z0              | ZA | ZB |
| WE 17 | 20              | 15 | 9  | WE 35 | 30              | 22 | 20 |
| WE 21 | 25              | 18 | 9  | WE 50 | 40              | 30 | 27 |
| WE 27 | 25              | 20 | 13 |       |                 |    |    |

Table 2-3-17 Max. Tolerance of Reference Surface Height (S<sub>1</sub>)

unit: μm

| Size  | Preload classes |    |    | Size  | Preload classes |     |    |
|-------|-----------------|----|----|-------|-----------------|-----|----|
|       | Z0              | ZA | ZB |       | Z0              | ZA  | ZB |
| WE 17 | 65              | 20 | -  | WE 35 | 130             | 85  | 70 |
| WE 21 | 130             | 85 | 45 | WE 50 | 170             | 110 | 90 |
| WE 27 | 130             | 85 | 45 |       |                 |     |    |

Note : Permissible value is proportional to the axial distance.

## 2-3-11 Cautions for Installation

### (1) Shoulder heights and chamfers

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

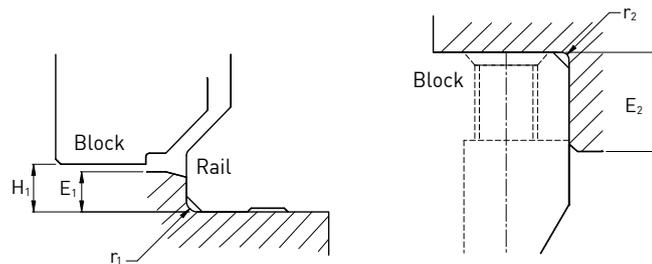


Table 2-3-18 Shoulder Heights and Chamfers

unit: mm

| Size  | Max. radius of fillets<br>r <sub>1</sub> (mm) | Max. radius of fillets<br>r <sub>2</sub> (mm) | Shoulder height beside the rail<br>E <sub>1</sub> (mm) | Shoulder height beside the block<br>E <sub>2</sub> (mm) | Clearance under block<br>H <sub>1</sub> (mm) |
|-------|---|---|--|---|--|
| WE 17 | 0.4   | 0.4   | 2.0  | 4.0   | 2.5  |
| WE 21 | 0.4   | 0.4   | 2.5  | 5.0   | 3.0  |
| WE 27 | 0.5   | 0.4   | 3.0  | 7.0   | 4.0  |
| WE 35 | 0.5   | 0.5   | 3.5  | 10.0  | 4.0  |
| WE 50 | 0.8   | 0.8   | 6.0  | 10.0  | 7.5  |

### (2) Tightening Torque of Bolts for Installation

Improperly tightened mounting bolts will seriously affect the accuracy of linear guide installations. The following tightening torques for different sizes of bolts are recommended.

Table 2-3-19 Tightening Torque

| Size  | Bolt size    | Torque N-cm(kgf-cm) |           |           |
|-------|--------------|---------------------|-----------|-----------|
|       |              | Iron                | Casting   | Aluminum  |
| WE 17 | M4×0.7P×12L  | 392(40)             | 274(28)   | 206(21)   |
| WE 21 | M4×0.7P×12L  | 392(40)             | 274(28)   | 206(21)   |
| WE 27 | M4×0.7P×16L  | 392(40)             | 274(28)   | 206(21)   |
| WE 35 | M6×1P×20L    | 1373(140)           | 921(94)   | 686(70)   |
| WE 50 | M8×1.25P×25L | 3041(310)           | 2010(205) | 1470(150) |

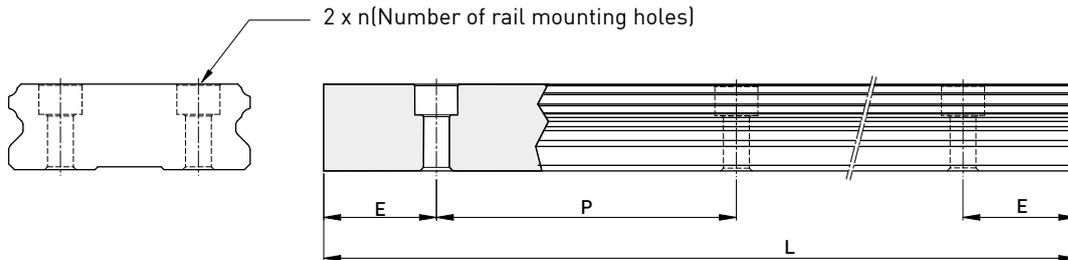
Note: 1 kgf = 9.81 N

## WE Series

### Four-Row Wide Rail

#### 2-3-12 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.



$$L = (n - 1) \times P + 2 \times E \quad \text{Eq.2.3}$$

L : Total length of rail (mm)

n : Number of mounting holes

P : Distance between any two holes (mm)

E : Distance from the center of the last hole to the edge (mm)

Table 2-3-20 Rail Standard Length and Max. Length

unit: mm

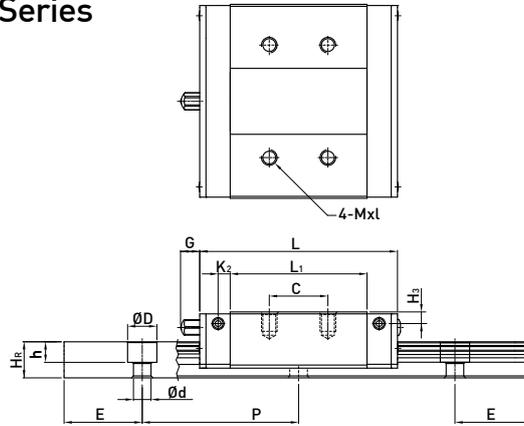
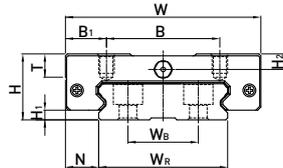
| Item                              | WER17       | WER21      | WER27      | WER35      | WER50      |
|-----------------------------------|-------------|------------|------------|------------|------------|
| Standard Length L(n)              | 110 (3)     | 130 (3)    | 220 (4)    | 280 (4)    | 280 (4)    |
|                                   | 190 (5)     | 230 (5)    | 280 (5)    | 440 (6)    | 440 (6)    |
|                                   | 310 (8)     | 380 (8)    | 340 (6)    | 600 (8)    | 600 (8)    |
|                                   | 390 (10)    | 480 (10)   | 460 (8)    | 760 (10)   | 760 (10)   |
|                                   | 470 (12)    | 580 (12)   | 640 (11)   | 1000 (13)  | 1,000 (13) |
|                                   | 550 (14)    | 780 (16)   | 820 (14)   | 1,640 (21) | 1,640 (21) |
|                                   | -           | -          | 1,000 (17) | 2,040 (26) | 2,040 (26) |
|                                   | -           | -          | 1,240 (21) | 2,520 (32) | 2,520 (32) |
| Pitch (P)                         | 40          | 50         | 60         | 80         | 80         |
| Distance to End (E <sub>s</sub> ) | 15          | 15         | 20         | 20         | 20         |
| Max. Standard Length              | 3,990 (100) | 3,980 (80) | 4,000 (67) | 3,960 (50) | 3,960 (50) |
| Max. Length                       | 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.

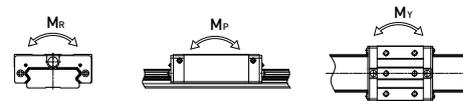
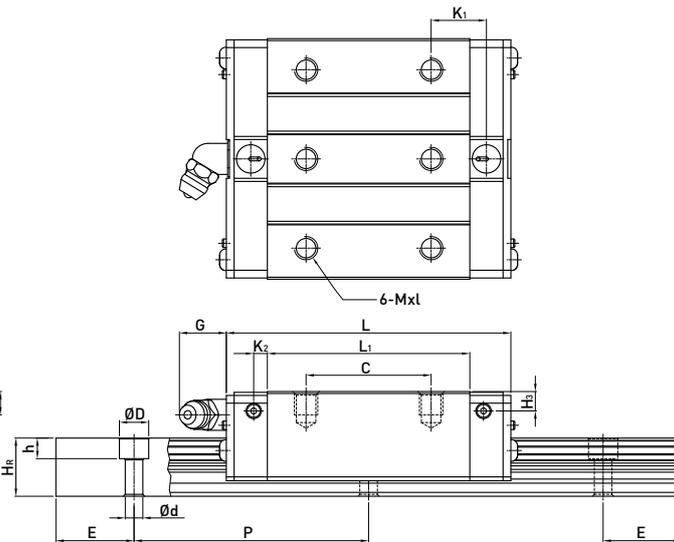
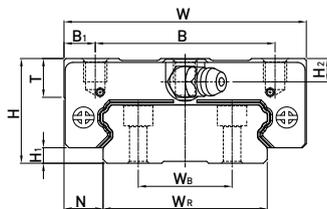
## 2-3-13 Dimensions for HIWIN WE Series

### (1) WEH-CA

WEH17CA  
WEH21CA



WEH27CA  
WEH35CA  
WEH50CA



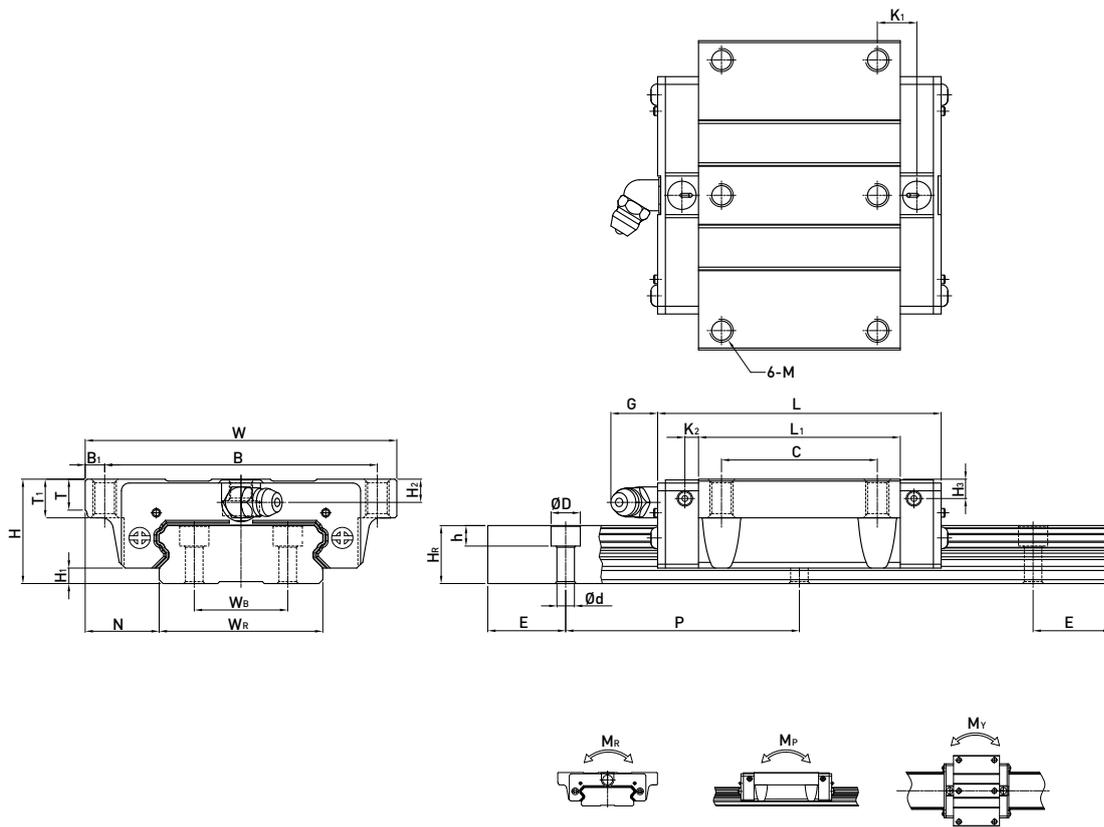
| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |     |     |                |    |                |       |                |                |      |        |      |                | Dimensions of Rail (mm) |                |                |                |     |     |     |    |    |                | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |                |       | Weight |      |
|-----------|-----------------------------|----------------|--------------------------|-----|-----|----------------|----|----------------|-------|----------------|----------------|------|--------|------|----------------|-------------------------|----------------|----------------|----------------|-----|-----|-----|----|----|----------------|-----------------------------|----------------------------------|--|---------------------|----------------|-------|--------|------|
|           | 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    | MxL    | T    | H <sub>2</sub> | H <sub>3</sub>          | W <sub>R</sub> | W <sub>B</sub> | H <sub>R</sub> | D   | h   | d   | P  | E  | M <sub>R</sub> |                             |                                  |  | M <sub>P</sub>      | M <sub>Y</sub> | Block | Rail   |      |
|           | mm                          | mm             | mm                       | mm  | mm  | mm             | mm | mm             | mm    | mm             | mm             | mm   | mm     | mm   | mm             | mm                      | mm             | mm             | mm             | mm  | mm  | mm  | mm | mm | mm             |                             |                                  |  | kN-m                | kN-m           | kN-m  | kg     | kg/m |
| WEH17CA   | 17                          | 2.5            | 8.5                      | 50  | 29  | 10.5           | 15 | 35             | 50.6  | -              | 3.1            | 4.9  | M4x5   | 6    | 4              | 3                       | 33             | 18             | 9.3            | 7.5 | 5.3 | 4.5 | 40 | 15 | M4x12          | 5.23                        | 9.64                             | 0.15   | 0.062               | 0.062          | 0.12  | 2.2    |      |
| WEH21CA   | 21                          | 3              | 8.5                      | 54  | 31  | 11.5           | 19 | 41.7           | 59    | 14.68          | 3.65           | 12   | M5x6   | 8    | 4.5            | 4.2                     | 37             | 22             | 11             | 7.5 | 5.3 | 4.5 | 50 | 15 | M4x12          | 7.21                        | 13.7                             | 0.23   | 0.10                | 0.10           | 0.20  | 3.0    |      |
| WEH27CA   | 27                          | 4              | 10                       | 62  | 46  | 8              | 32 | 51.8           | 72.8  | 14.15          | 3.5            | 12   | M6x6   | 10   | 6              | 5                       | 42             | 24             | 15             | 7.5 | 5.3 | 4.5 | 60 | 20 | M4x16          | 12.4                        | 21.6                             | 0.42   | 0.17                | 0.17           | 0.35  | 4.7    |      |
| WEH35CA   | 35                          | 4              | 15.5                     | 100 | 76  | 12             | 50 | 77.6           | 102.6 | 18.35          | 5.25           | 12   | M8x8   | 13   | 8              | 6.5                     | 69             | 40             | 19             | 11  | 9   | 7   | 80 | 20 | M6x20          | 29.8                        | 49.4                             | 1.48   | 0.67                | 0.67           | 1.1   | 9.7    |      |
| WEH50CA   | 50                          | 7.5            | 20                       | 130 | 100 | 15             | 65 | 112            | 140   | 28.05          | 6              | 12.9 | M10x15 | 19.5 | 12             | 10.5                    | 90             | 60             | 24             | 14  | 12  | 9   | 80 | 20 | M8x25          | 61.52                       | 97.1                             | 4.03   | 1.96                | 1.96           | 3.16  | 15.5   |      |

Note : 1 kgf = 9.81 N

# WE Series

## Four-Row Wide Rail

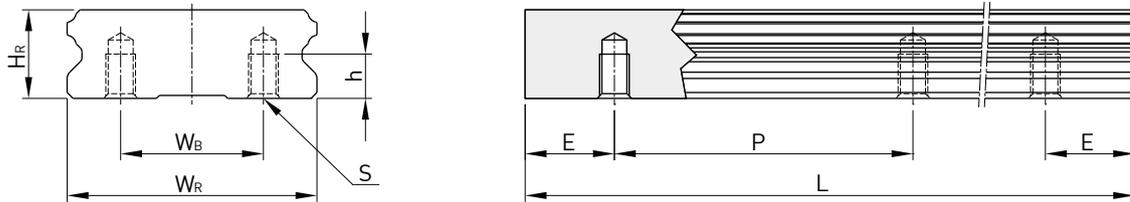
### (2) WEW-CC



| 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 C <sub>0</sub> (kN) | Static Rated Moment |    |       | Weight |      |                |                |                |       |      |
|-----------|-----------------------------|----------------|--------------------------|-----|-----|----------------|----|----------------|-------|----------------|----------------|------|-----|------|----------------|-------------------------|----------------|----------------|----------------|----------------|-----------------------------|----------------------------------|--|---------------------|----|-------|--------|------|----------------|----------------|----------------|-------|------|
|           | 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    | M   | T    | T <sub>1</sub> | H <sub>2</sub>          | H <sub>3</sub> | W <sub>R</sub> | W <sub>B</sub> | H <sub>R</sub> |                             |                                  |  | D                   | h  | d     | P      | E    | M <sub>R</sub> | M <sub>P</sub> | M <sub>V</sub> | Block | Rail |
|           | kgf                         | mm             | mm                       | mm  | mm  | mm             | mm | mm             | mm    | mm             | mm             | mm   | mm  | mm   | mm             | mm                      | mm             | mm             | mm             | mm             |                             |                                  |  | mm                  | mm | mm    | mm     | mm   | mm             | kgf-m          | kgf-m          | kgf-m | kg   |
| WEW17CC   | 17                          | 2.5            | 13.5                     | 60  | 53  | 3.5            | 26 | 35             | 50.6  | -              | 3.1            | 4.9  | M4  | 5.3  | 6              | 4                       | 3              | 33             | 18             | 9.3            | 7.5                         | 5.3                              | 4.5  | 40                  | 15 | M4x12 | 5.23   | 9.64 | 0.15           | 0.062          | 0.062          | 0.13  | 2.2  |
| WEW21CC   | 21                          | 3              | 15.5                     | 68  | 60  | 4              | 29 | 41.7           | 59    | 9.68           | 3.65           | 12   | M5  | 7.3  | 8              | 4.5                     | 4.2            | 37             | 22             | 11             | 7.5                         | 5.3                              | 4.5  | 50                  | 15 | M4x12 | 7.21   | 13.7 | 0.23           | 0.10           | 0.10           | 0.23  | 3.0  |
| WEW27CC   | 27                          | 4              | 19                       | 80  | 70  | 5              | 40 | 51.8           | 72.8  | 10.15          | 3.5            | 12   | M6  | 8    | 10             | 6                       | 5              | 42             | 24             | 15             | 7.5                         | 5.3                              | 4.5  | 60                  | 20 | M4x16 | 12.4   | 21.6 | 0.42           | 0.17           | 0.17           | 0.43  | 4.7  |
| WEW35CC   | 35                          | 4              | 25.5                     | 120 | 107 | 6.5            | 60 | 77.6           | 102.6 | 13.35          | 5.25           | 12   | M8  | 11.2 | 14             | 8                       | 6.5            | 69             | 40             | 19             | 11                          | 9                                | 7  | 80                  | 20 | M6x20 | 29.8   | 49.4 | 1.48           | 0.67           | 0.67           | 1.26  | 9.7  |
| WEW50CC   | 50                          | 7.5            | 36                       | 162 | 144 | 9              | 80 | 112            | 140   | 20.55          | 6              | 12.9 | M10 | 14   | 18             | 12                      | 10.5           | 90             | 60             | 24             | 14                          | 12                               | 9  | 80                  | 20 | M8x25 | 61.52  | 97.1 | 4.03           | 1.96           | 1.96           | 3.71  | 15.5 |

Note : 1 kgf = 9.81 N

(3) Dimensions for WER-T (rail mounting from bottom)



| Model No. | Dimensions of Rail (mm) |       |       |            |     |     |     | Weight<br>(kg/m) |
|-----------|-------------------------|-------|-------|------------|-----|-----|-----|------------------|
|           | $W_R$                   | $W_B$ | $H_R$ | $S$        | $h$ | $P$ | $E$ |                  |
| WER17T    | 33                      | 18    | 9.3   | M4 x 0.7P  | 6   | 40  | 15  | 2.3              |
| WER21T    | 37                      | 22    | 11    | M4 x 0.7P  | 7   | 50  | 15  | 3.1              |
| WER27T    | 42                      | 24    | 15    | M5 x 0.8P  | 7.5 | 60  | 20  | 4.8              |
| WER35T    | 69                      | 40    | 19    | M6 x 1P    | 12  | 80  | 20  | 9.9              |
| WER50T    | 90                      | 60    | 24    | M8 x 1.25P | 15  | 80  | 20  | 15.9             |

## MG Series

### Miniature Type

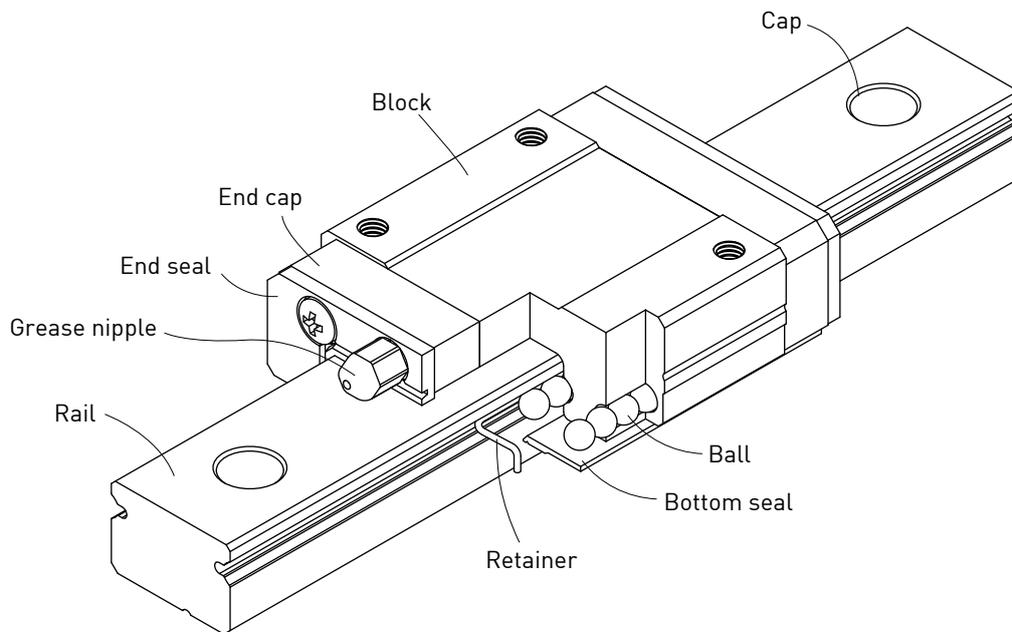
## 2-4 MG Series - Miniature Linear Guideway

### 2-4-1 Features of MGN Series

Design features of narrow type miniature guideways- MGN:

1. Tiny and light weight, suitable for miniature equipment.
2. Gothic arch contact design can sustain loads from all directions and offer high rigidity and high accuracy.
3. Specification with ball retainers would avoid ball falling when the blocks are removed from rails.
4. Interchangeable types are available in certain sizes and precision grades.

### 2-4-2 Construction of MGN Series



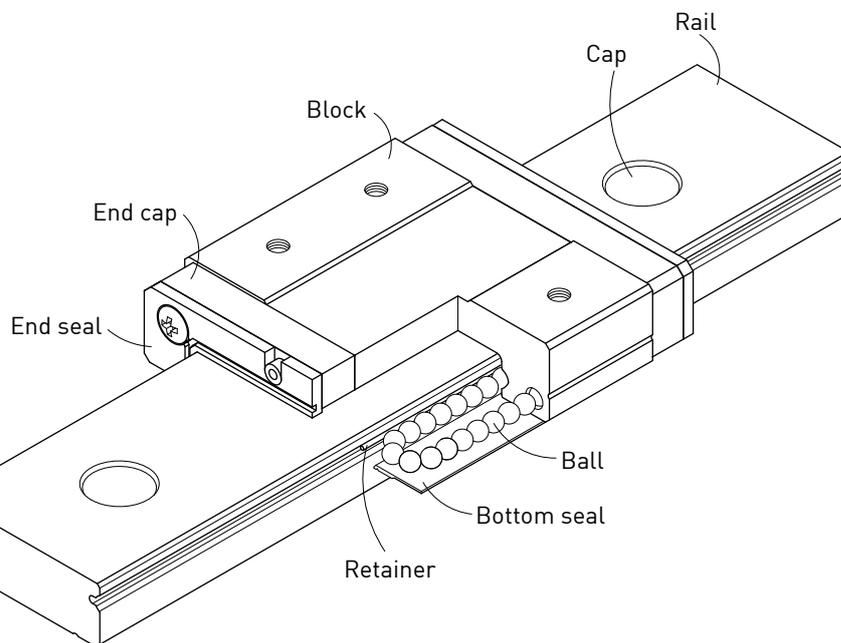
- Rolling circulation system: Block, rail, ball, end cap and retainer (except size 2, 3)
- Lubrication system: Grease nipple is available for MGN15, lubricated by grease gun. MGN7, 9, 12 are lubricated by the hole at the side of the end cap.
- Dust protection system: End seal (except size 2), bottom seal (optional size 9,12,15), cap (size12,15)

### 2-4-3 Features of MGW Series

Design features of wide type miniature guideways- MGW:

1. The enlarged width design increases the capacity of moment loading.
2. Gothic arch contact design has high rigidity characteristic in all directions.
3. Specification with ball retainers would avoid ball falling when the blocks are removed from rails.
4. Interchangeable types are available in certain sizes and precision grades.

### 2-4-4 Construction of MGW Series



- Rolling circulation system: Block, rail, ball, end cap and retainer (except size 2)
- Lubrication system: Grease nipple is available for MGW14, 15, lubricated by grease gun. MGW3, 7, 9, 12 are lubricated by the hole at the side of the end cap.
- Dust protection system: End seal (except size 2), bottom seal (optional size 9,12,14,15), cap (size12,14,15)

## MG Series

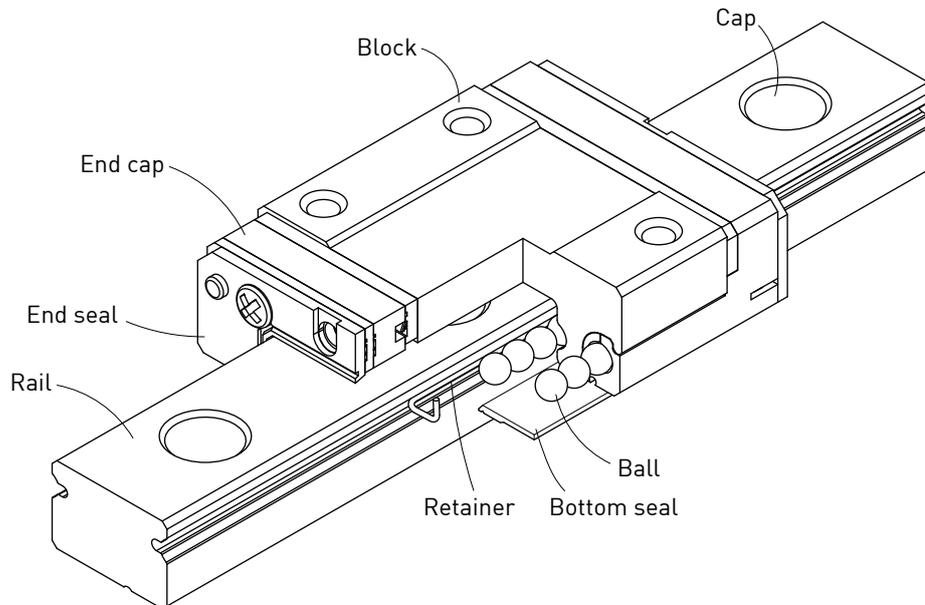
### Miniature Type

#### 2-4-5 Features of MGN-0 Series

Design features of narrow type miniature guideways- MGN-0:

1. Reduce 20% weight of block by using resin in the recirculation unit. The compact size and light weight is suitable for miniaturized machinery.
2. Gothic arch contact design can sustain loads from all directions and offer high rigidity and high accuracy.
3. Interchangeable types are available in certain precision grades.
4. The design of resin recirculation unit is able to eliminate the collision with the metal block.
5. Integrated design for recirculation system.

#### 2-4-6 Construction of MGN-0 Series



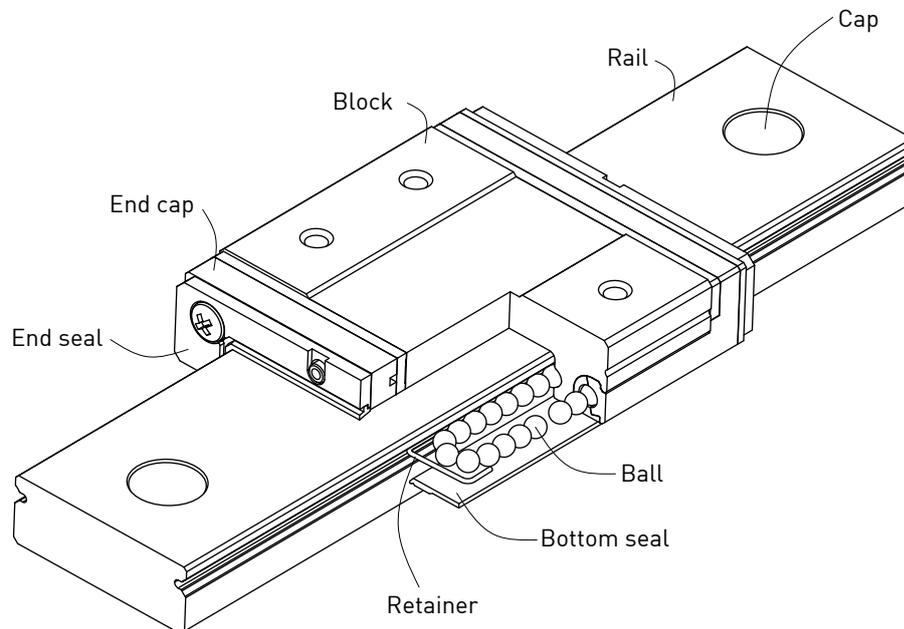
- Rolling circulation system: Block, rail, ball, end cap and retainer
- Lubrication system: Grease nipple is available for MGN15-0, lubricated by grease gun. MGN5-0, MGN7-0, MGN9-0, MGN12-0 are lubricated by the hole at the side of the end cap.
- Dust protection system: End seal, bottom seal (optional size 9,12,15), cap (size12,15)

### 2-4-7 Features of MGW-0 Series

Design features of wide type miniature guideways- MGW-0:

1. The enlarged width design increases the capacity of moment loading.
2. Gothic arch contact design has high rigidity characteristic in all directions.
3. Steel balls are held by a miniature retainer to keep balls from falling out, even when the blocks are removed from the rail.
4. Integrated design for recirculation system, which reduce 20% weight of block by using resin in the recirculation unit.

### 2-4-8 Construction of MGW-0 Series



- Rolling circulation system: Block, rail, ball, end cap and retainer
- Lubrication system: Grease nipple is available for MGW15-0, lubricated by grease gun. MGW5-0, MGW7-0, MGW9-0, MGW12-0 are lubricated by the hole at the side of the end cap.
- Dust protection system: End seal, bottom seal (optional size 9, 12, 15), cap (size12, 15)

### 2-4-9 Application

MGN/MGW series can be used in various applications, such as semiconductor equipment, PCB /IC equipment, medical, robotics, measuring equipment, automation equipment, and other miniature sliding machinery.

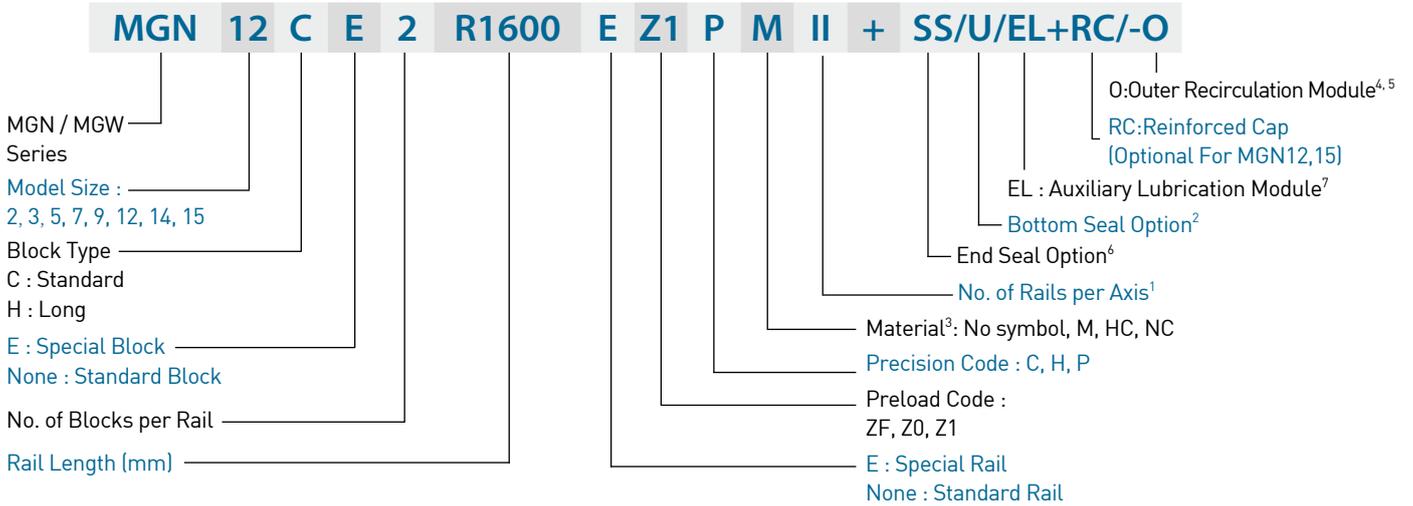
### 2-4-10 Model Number of MG Series

MG Series linear guideway can be classified into non-interchangeable and interchangeable types, which are the same size. The interchangeable type is more convenient due to replaceable rails; however, the precision is less than non-interchangeable type. With strict dimension and quality control, the interchangeable type linear guideways are a suitable choice for customers when rails don't need to be paired. The model number contains information for the size, type, accuracy, preload, and so on.

# MG Series

## Miniature Type

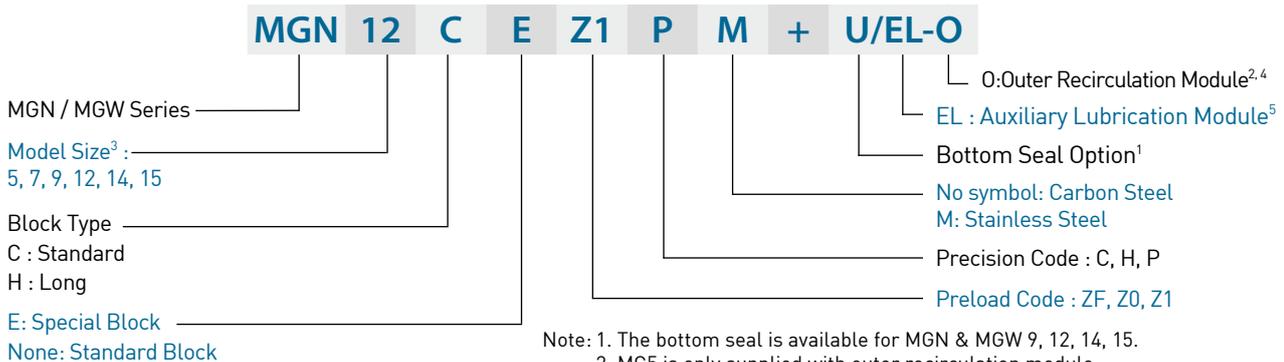
### (1) Non-interchangeable type



- Note: 1. Symbol for No. of rails used on the same plane.  
 No symbol indicates single rail in a axis.  
 2. The bottom seal is available for MGN & MGW 9, 12, 14, 15.  
 3. No symbol: Carbon Steel  
 M: Stainless Steel  
 HC: Carbon Steel+Hard Chrome Treatment  
 NC: Carbon Steel+hicoating Treatment  
 4. MG5 is only supplied with outer recirculation module.  
 5. MG2, MG3 and MGW14 are only supplied without outer recirculation module.  
 6. The end seal is optional for MGN3, and it's available for SS symbol.  
 7. The available size for EL auxiliary lubrication module are , MGN7,9,12 & MGW9,12.

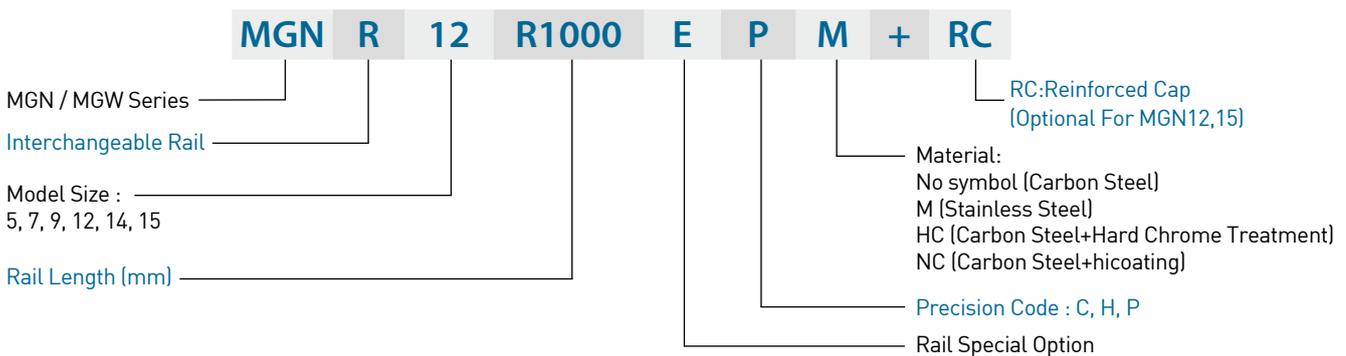
### (2) Interchangeable type

#### ○ Interchangeable Block



- Note: 1. The bottom seal is available for MGN & MGW 9, 12, 14, 15.  
 2. MG5 is only supplied with outer recirculation module.  
 3. No interchangeable offer of MG2 and MG3.  
 4. MGW14 is only supplied without outer recirculation module.  
 5. The available size for EL auxiliary lubrication module are , MGN7,9,12 & MGW9,12.

#### ○ Interchangeable Rail

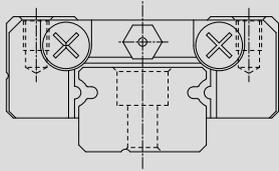
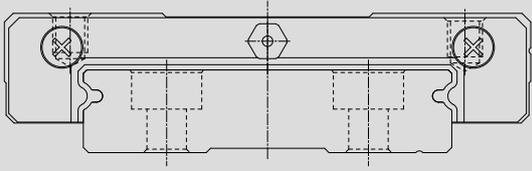


## 2-4-11 Types

### (1) Block types

HIWIN offers two types of linear guideways, flange and square types.

Table 2-4-1 Block Types

| Type   | Model          | Shape  | Height<br>(mm) | Rail<br>Length<br>(mm) | Main Applications   |
|--------|----------------|--|----------------|------------------------|---|
| Square | MGN-C<br>MGN-H |   | 3.2            | 30                     | <ul style="list-style-type: none"> <li>○ Printer</li> <li>○ Robotics</li> <li>○ Precision measure equipment</li> <li>○ Semiconductor equipment</li> </ul> |
|        |                |  | ↓              | ↓                      |   |
| 16     | 2000           |  |                |                        |   |
| ↓      | ↓              |  |                |                        |   |
| Flange | MGW-C<br>MGW-H |  | 4              | 40                     |   |
|        |                |  | ↓              | ↓                      |   |
| 16     | 2000           |  |                |                        |   |
| ↓      | ↓              |  |                |                        |   |

\*Please refer to the chapter 2-4-14 for the dimensional detail.

### (2) Rail types

HIWIN offers standard top mounting and bottom mounting type.

Table 2-4-2 Rail Types

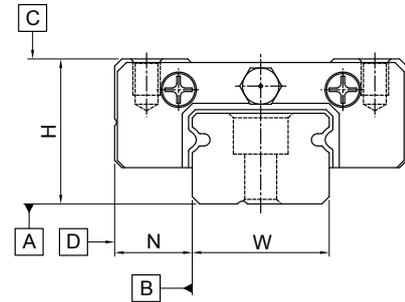


## MG Series

### Miniature Type

#### 2-4-12 Accuracy Classes

The accuracy of MGN/MGW series can be classified into three classes: normal (C), high (H), precision (P). Choices for different accuracy classes are available according to various requirements.



#### (1) Accuracy of non-interchangeable guideways

Table 2-4-3 Accuracy Standard of Non-interchangeable Type

Unit: mm

| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
|---|-----------------|----------|---------------|
| Dimensional tolerance of height H                   | ± 0.04          | ± 0.02   | ± 0.01        |
| Dimensional tolerance of width N                    | ± 0.04          | ± 0.025  | ± 0.015       |
| Pair Variation of height H                          | 0.03            | 0.015    | 0.007         |
| Pair Variation of width N (Master Rail)             | 0.03            | 0.02     | 0.01          |
| Running parallelism of block surface C to surface A | See Table 2-4-5 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-4-5 |          |               |

#### (2) Accuracy of interchangeable guideways

Table 2-4-4 Accuracy Standard of Interchangeable Type

Unit: mm

| Accuracy Classes                                    | Normal (C)                 | High (H) | Precision (P) |
|---|----------------------------|----------|---------------|
| Dimensional tolerance of height H                   | ± 0.04                     | ± 0.02   | ± 0.01        |
| Dimensional tolerance of width N                    | ± 0.04                     | ± 0.025  | ± 0.015       |
| One Set   | Pair Variation of height H | 0.03     | 0.015         |
|   | Pair Variation of width N  | 0.03     | 0.02          |
| Pair Variation of width N (Master Rail)             | 0.07                       | 0.04     | 0.02          |
| Running parallelism of block surface C to surface A | See Table 2-4-5            |          |               |
| Running parallelism of block surface D to surface B | See Table 2-4-5            |          |               |

#### (3) Accuracy of running parallelism

The running parallelism C to A and D to B are related to the rail length.

Table 2-4-5 Accuracy of Running Parallelism

| Rail Length (mm) | Accuracy (μm) |     |     | Rail Length (mm) | Accuracy (μm) |     |     |
|------------------|---------------|-----|-----|------------------|---------------|-----|-----|
|                  | (C)           | (H) | (P) |                  | (C)           | (H) | (P) |
| ~ 50             | 12            | 6   | 2   | 1,000 ~ 1,200    | 25            | 18  | 11  |
| 50 ~ 80          | 13            | 7   | 3   | 1,200 ~ 1,300    | 25            | 18  | 11  |
| 80 ~ 125         | 14            | 8   | 3.5 | 1,300 ~ 1,400    | 26            | 19  | 12  |
| 125 ~ 200        | 15            | 9   | 4   | 1,400 ~ 1,500    | 27            | 19  | 12  |
| 200 ~ 250        | 16            | 10  | 5   | 1,500 ~ 1,600    | 28            | 20  | 13  |
| 250 ~ 315        | 17            | 11  | 5   | 1,600 ~ 1,700    | 29            | 20  | 14  |
| 315 ~ 400        | 18            | 11  | 6   | 1,700 ~ 1,800    | 30            | 21  | 14  |
| 400 ~ 500        | 19            | 12  | 6   | 1,800 ~ 1,900    | 30            | 21  | 15  |
| 500 ~ 630        | 20            | 13  | 7   | 1,900 ~ 2,000    | 31            | 22  | 15  |
| 630 ~ 800        | 22            | 14  | 8   | 2,000 ~          | 31            | 22  | 16  |
| 800 ~ 1,000      | 23            | 16  | 9   |                  |               |     |     |

## 2-4-13 Preload

MGN/MGW series provides three different preload levels for various applications.

Table 2-4-6 Preload Classes

| Class              | Code | Preload          | Accuracy |
|--------------------|------|------------------|----------|
| Light Clearance    | ZF   | Clearance 4~10µm | C        |
| Very Light Preload | Z0   | Clearance 0~3µm  | C~P      |
| Light Preload      | Z1   | 0.02C            | C~P      |

Note: "C" in column preload means basic dynamic load rating.

### ○ Stiffness performance

Stiffness depends on preload. The following table shows stiffness value of each size.

Table 2-4-7 Radial stiffness for MG Series

| Load type | Series / Size | Stiffness (N/µm) |     | Series / Size | Stiffness (N/µm) |     |
|-----------|---------------|------------------|-----|---------------|------------------|-----|
|           |               | Z0               | Z1  |               | Z0               | Z1  |
| Standard  | MGN5C-0       | 20               | 61  | MGW5C-0       | 32               | 85  |
|           | MGN7C         | 26               | 73  | MGW7C         | 44               | 112 |
|           | MGN9C         | 38               | 102 | MGW9C         | 62               | 140 |
|           | MGN12C        | 44               | 105 | MGW12C        | 72               | 148 |
|           | MGN15C        | 58               | 126 | MGW15C        | 85               | 154 |
| Long      | MGN5H-0       | 26               | 79  | -             | -                | -   |
|           | MGN7H         | 42               | 122 | MGW7H         | 64               | 168 |
|           | MGN9H         | 56               | 153 | MGW9H         | 81               | 190 |
|           | MGN12H        | 70               | 175 | MGW12H        | 102              | 217 |
|           | MGN15H        | 89               | 202 | MGW15H        | 122              | 235 |

## 2-4-14 Dust Proof Accessories

End seals on both sides of the block can prevent dust from entering the block and maintain the accuracy and service life of a linear guideway. End seals for MGN3 are optional, customers can order it by adding the mark "+SS" followed by the model number. For other size of MG series, end seals are standard accessories. Bottom seals are fixed under the skirt portion of the block to prevent dust from entering. Customers can order bottom seals by adding the mark "+U" followed by the model number. Sizes 9, 12, 14 and 15 provide bottom seals as an option, but size 2, 3, 5, 7 do not offer the option due to the space limit of  $H_1$ . Note that " $H_1$ " would be reduced if bottom seals are attached, be aware of possible interference between block and mounting surface.

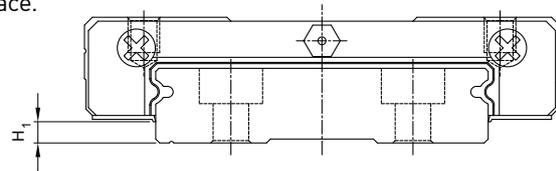


Table 2-4-8

| Size    | Bottom seal | $H_1$ , mm | Size    | Bottom seal | $H_1$ , mm |
|---------|-------------|------------|---------|-------------|------------|
| MGN2    | -           | -          | MGW2    | -           | -          |
| MGN3    | -           | -          | MGW3    | -           | -          |
| MGN7    | -           | -          | MGW7    | -           | -          |
| MGN9    | ●           | 1          | MGW9    | ●           | 1.9        |
| MGN12   | ●           | 2          | MGW12   | ●           | 2.4        |
| -       | -           | -          | MGW14   | ●           | 2.4        |
| MGN15   | ●           | 3          | MGW15   | ●           | 2.4        |
| MGN5-0  | -           | -          | MGW5-0  | -           | -          |
| MGN7-0  | -           | -          | MGW7-0  | -           | -          |
| MGN9-0  | ●           | 1.2        | MGW9-0  | ●           | 1.95       |
| MGN12-0 | ●           | 2          | MGW12-0 | ●           | 2.45       |
| MGN15-0 | ●           | 3          | MGW15-0 | ●           | 2.45       |

## MG Series

### Miniature Type

● **Bolt caps for rail mounting holes**

Rail mounting hole caps prevent foreign matter from accumulating in the mounting holes. Caps are included with the rail package.



Table 2-4-9 Dimensions of Bolt Caps for Rail Mounting Holes

| Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) |
|-----------|-----------|---------------------|----------------------|
| MGN12     | M3        | 6.15                | 1.2                  |
| MGN15     | M3        | 6.15                | 1.2                  |
| MGW12     | M4        | 8.15                | 2.2                  |
| MGW14     | M4        | 8.15                | 2.2                  |
| MGW15     | M4        | 8.15                | 2.2                  |

### 2-4-15 Mounting Surface Accuracy Tolerance

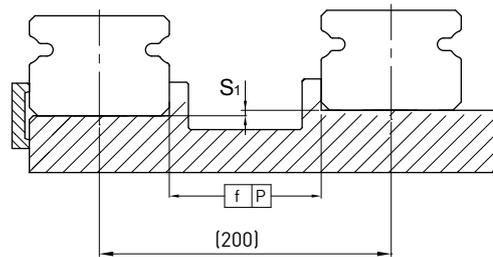


Table 2-4-10 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    | Size | Preload classes |    |    |
|------|-----------------|----|----|------|-----------------|----|----|
|      | ZF              | Z0 | Z1 |      | ZF              | Z0 | Z1 |
| MG2  | 2               | 2  | 2  | MG9  | 4               | 4  | 3  |
| MG3  | 2               | 2  | 2  | MG12 | 9               | 9  | 5  |
| MG5  | 2               | 2  | 2  | MG14 | 10              | 10 | 6  |
| MG7  | 3               | 3  | 3  | MG15 | 10              | 10 | 6  |

Table 2-4-11 Max. Tolerance of Reference Surface Height (S<sub>1</sub>)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    | Size | Preload classes |    |    |
|------|-----------------|----|----|------|-----------------|----|----|
|      | ZF              | Z0 | Z1 |      | ZF              | Z0 | Z1 |
| MG2  | 15              | 15 | 2  | MG9  | 35              | 35 | 6  |
| MG3  | 15              | 15 | 2  | MG12 | 50              | 50 | 12 |
| MG5  | 20              | 20 | 2  | MG14 | 60              | 60 | 20 |
| MG7  | 25              | 25 | 3  | MG15 | 60              | 60 | 20 |

Table 2-4-12 Permissible Error of Mounting Surface

unit: mm

| Size | Flatness of the Mounting Surface | Size | Flatness of the Mounting Surface |
|------|----------------------------------|------|----------------------------------|
| MG2  | 0.012/200                        | MG9  | 0.035/200                        |
| MG3  | 0.012/200                        | MG12 | 0.050/200                        |
| MG5  | 0.015/200                        | MG14 | 0.060/200                        |
| MG7  | 0.025/200                        | MG15 | 0.060/200                        |

Note: The values above are suitable for preload of ZF/Z0. For preload of Z1 or using two(or more) rails on the same plane, 50% or less of the values above are recommended.

## 2-4-16 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

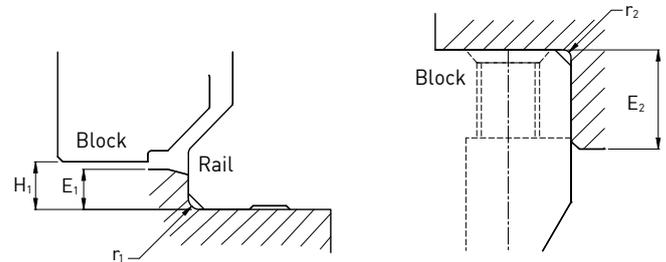


Table 2-4-13 Shoulder Heights and Fillets

| Size  | Max. radius of fillets $r_1$ (mm) | Max. radius of fillets $r_2$ (mm) | Shoulder height beside the rail $E_1$ (mm) | Shoulder height beside the block $E_2$ (mm) | Clearance under block $H_1$ (mm) |
|-------|-----------------------------------|-----------------------------------|--|---|----------------------------------|
| MGN2  | 0.1                               | 0.2                               | 0.5  | 1.5   | 0.7                              |
| MGN3  | 0.1                               | 0.2                               | 0.6  | 1.5   | 1                                |
| MGN5  | 0.1                               | 0.2                               | 1.2  | 2   | 1.5                              |
| MGN7  | 0.2                               | 0.2                               | 1.2  | 3   | 1.5                              |
| MGN9  | 0.2                               | 0.3                               | 1.7  | 3   | 2                                |
| MGN12 | 0.3                               | 0.4                               | 1.7  | 4   | 3                                |
| MGN15 | 0.5                               | 0.5                               | 2.5  | 5   | 4                                |
| MGW2  | 0.1                               | 0.2                               | 0.6  | 1.5   | 1                                |
| MGW3  | 0.1                               | 0.2                               | 0.6  | 2   | 1                                |
| MGW5  | 0.1                               | 0.2                               | 1.2  | 2   | 1.5                              |
| MGW7  | 0.2                               | 0.2                               | 1.7  | 3   | 1.9                              |
| MGW9  | 0.3                               | 0.3                               | 2.5  | 3   | 2.9                              |
| MGW12 | 0.4                               | 0.4                               | 3  | 4   | 3.4                              |
| MGW14 | 0.4                               | 0.4                               | 3  | 5   | 3.5                              |
| MGW15 | 0.4                               | 0.8                               | 3  | 5   | 3.4                              |

### (2) Tightening torque of bolts for installation

Improper tightening of rail mounting bolts will seriously affect the accuracy of the linear guideway. The following table lists the recommended tightening torque for the specific bolt sizes.

Table 2-4-14 Tightening Torque

| Size  | Bolt size       | Torque, N-cm (kgf-cm) |          |            |
|-------|-----------------|-----------------------|----------|------------|
|       |                 | Iron                  | Casting  | Aluminum   |
| MGN5  | M2×0.4P×6L      | 57(5.9)               | 39.2(4)  | 29.4(3)    |
| MGN7  | M2×0.4P×6L      | 57(5.9)               | 39.2(4)  | 29.4(3)    |
| MGN9  | M3×0.5P×8L      | 186(19)               | 127(13)  | 98(10)     |
| MGN12 | M3×0.5P×8L      | 186(19)               | 127(13)  | 98(10)     |
| MGN15 | M3×0.5P×10L     | 186(19)               | 127(13)  | 98(10)     |
| MGW2  | M1.6×0.35P×4.4L | 27.6(2.8)             | 19(1.94) | 14.2(1.45) |
| MGW3  | M2×0.4P×6L      | 57(5.9)               | 39.2(4)  | 29.4(3)    |
| MGW5  | M2.5×0.45P×7L   | 118(12)               | 78.4(8)  | 58.8(6)    |
| MGW7  | M3×0.5P×6L      | 186(19)               | 127(13)  | 98(10)     |
| MGW9  | M3×0.5P×8L      | 186(19)               | 127(13)  | 98(10)     |
| MGW12 | M4×0.7P×8L      | 392(40)               | 274(28)  | 206(21)    |
| MGW14 | M4×0.7P×10L     | 392(40)               | 274(28)  | 206(21)    |
| MGW15 | M4×0.7P×10L     | 392(40)               | 274(28)  | 206(21)    |

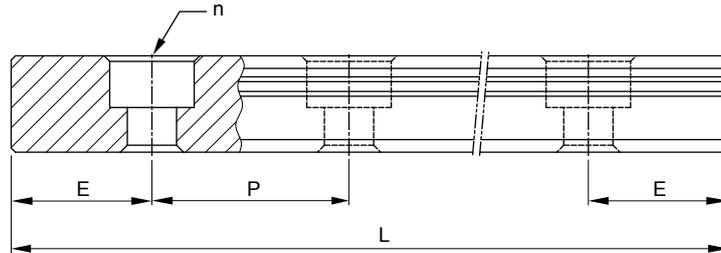
Note : 1 kgf = 9.81 N

## MG Series

### Miniature Type

#### 2-4-17 Standard and Maximum Lengths of Rail

HIWIN offers standard lengths of rail for fast shipping. For non-standard rail lengths, it's recommended that the E value is no greater than 1/2 of the pitch(P) to prevent instability at the end of the rail, and the E value should be no less than E-min to avoid a broken mounting hole.



$$L = (n - 1) \times P + 2 \times E \quad \text{Eq.2.4}$$

L : Total length of rail (mm)

n : Number of mounting holes

P : Distance between any two holes (mm)

E : Distance from the center of the last hole to the edge (mm)

Table 2-4-15

unit: mm

| Item                              | MGNR2            | MGNR3            | MGNR5            | MGNR7   | MGNR9             | MGNR12   | MGNR15   | MGWR2            | MGWR3            | MGWR5            | MGWR7            | MGWR9    | MGWR12   | MGWR14            | MGWR15   |
|-----------------------------------|------------------|------------------|------------------|---------|-------------------|----------|----------|------------------|------------------|------------------|------------------|----------|----------|-------------------|----------|
| Standard Length L (n)             | 32(4)            | 30(3)            | 40(3)            | 40(3)   | 55(3)             | 70(3)    | 70(2)    | 40(4)            | 40(3)            | 50(3)            | 50(2)            | 80(3)    | 110(3)   | 110(3)            | 110(3)   |
|                                   | 40(5)            | 40(4)            | 55(4)            | 55(4)   | 75(4)             | 95(4)    | 110(3)   | 60(6)            | 55(4)            | 70(4)            | 80(3)            | 110(4)   | 150(4)   | 150(4)            | 150(4)   |
|                                   | 56(7)            | 50(5)            | 70(5)            | 70(5)   | 95(5)             | 120(5)   | 150(4)   | 70(7)            | 70(5)            | 90(5)            | 110(4)           | 140(5)   | 190(5)   | 190(5)            | 190(5)   |
|                                   | 80(10)           | 60(6)            | 100(7)           | 85(6)   | 115(6)            | 145(6)   | 190(5)   | 80(8)            | 100(7)           | 110(6)           | 140(5)           | 170(6)   | 230(6)   | 230(6)            | 230(6)   |
|                                   | 104(13)          | 80(8)            | 130(9)           | 100(7)  | 135(7)            | 170(7)   | 230(6)   | 100(10)          | 130(9)           | 130(7)           | 170(6)           | 200(7)   | 270(7)   | 270(7)            | 270(7)   |
|                                   |                  | 100(10)          | 160(11)          | 130(9)  | 155(8)            | 195(8)   | 270(7)   |                  | 160(11)          | 150(8)           | 200(7)           | 230(8)   | 310(8)   | 310(8)            | 310(8)   |
|                                   |                  |                  |                  |         | 175(9)            | 220(9)   | 310(8)   |                  | 170(9)           | 260(9)           | 260(9)           | 350(9)   | 350(9)   | 350(9)            | 350(9)   |
|                                   |                  |                  |                  |         | 195(10)           | 245(10)  | 350(9)   |                  |                  | 290(10)          | 290(10)          | 390(10)  | 390(10)  | 390(10)           | 390(10)  |
|                                   |                  |                  |                  |         | 275(14)           | 270(11)  | 390(10)  |                  |                  |                  | 350(14)          | 430(11)  | 430(11)  | 430(11)           | 430(11)  |
|                                   |                  |                  |                  |         | 375(19)           | 320(13)  | 430(11)  |                  |                  |                  | 500(19)          | 510(13)  | 510(13)  | 510(13)           | 510(13)  |
|                                   |                  |                  |                  |         | 370(15)           | 470(12)  |          |                  |                  | 710(24)          | 590(15)          | 590(15)  | 590(15)  | 590(15)           |          |
|                                   |                  |                  |                  |         | 470(19)           | 550(14)  |          |                  |                  | 860(29)          | 750(19)          | 750(19)  | 750(19)  | 750(19)           |          |
|                                   |                  |                  |                  |         | 570(23)           | 670(17)  |          |                  |                  |                  | 910(23)          | 910(23)  | 910(23)  | 910(23)           |          |
|                                   |                  |                  |                  |         | 695(28)           | 870(22)  |          |                  |                  |                  | 1070(27)         | 1070(27) | 1070(27) | 1070(27)          |          |
| Pitch (P)                         | 8                | 10               | 15               | 15      | 20                | 25       | 40       | 10               | 15               | 20               | 30               | 30       | 40       | 40                | 40       |
| Distance to End (E <sub>s</sub> ) | 4                | 5                | 5                | 5       | 7.5               | 10       | 15       | 5                | 5                | 5                | 10               | 10       | 15       | 15                | 15       |
| Max. Standard Length              | 248(31)          | 250(25)          | 250(17)          | 595(40) | 1195(60)          | 1995(80) | 1990(50) | 250(25)          | 250(17)          | 250(13)          | 590(20)          | 1970(66) | 1990(50) | 1790(45)          | 1990(50) |
| Max. Length                       | 250 <sup>6</sup> | 250 <sup>6</sup> | 250 <sup>6</sup> | 600     | 1200 <sup>7</sup> | 2000     | 2000     | 250 <sup>6</sup> | 250 <sup>6</sup> | 250 <sup>6</sup> | 600 <sup>8</sup> | 2000     | 2000     | 1800 <sup>5</sup> | 2000     |

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 indicates the max. rail length with standard E value on both sides.

3. Fixing screws for MGN5's mounting holes are appended.

4. If smaller E value is needed, please contact HIWIN.

5. MGWR14 is only supplied with carbon steel.

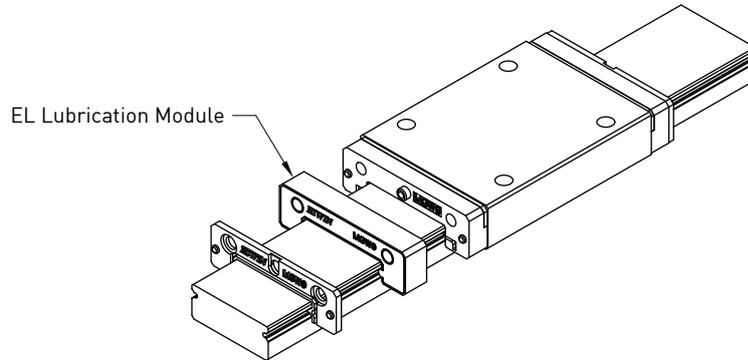
6. MGNR2, MGWR2, MGNR3, MGWR3, MGNR5, MGWR5 are only supplied with stainless steel.

7. MGNR9 of stainless steel is supplied with the maximum length of 1200mm; MGNR9 of carbon steel is supplied with the maximum length of 1000mm.

8. MGWR7 of stainless steel is supplied with the maximum length of 600mm; MGWR7 of carbon steel is supplied with the maximum length of 2000mm.

## 2-4-18 EL Auxiliary Lubrication Module

The EL Auxiliary Lubrication Module is an environment friendly lubrication system that can extend the maintenance life of HIWIN and guideways up to 10,000 km. The module is installed on either end of a guideway block and provides extended lubrication through a no-drip encapsulated material for a cleaner environmental solution.



### (1) Feature

1. Extend maintenance period up to 10,000km
2. Contained lubrication fluid prevents spills
3. Direct lubrication in ball rolling raceway.
4. Compatible with most HIWIN guideways.
5. Conform to cleanroom class 1000 regulation.

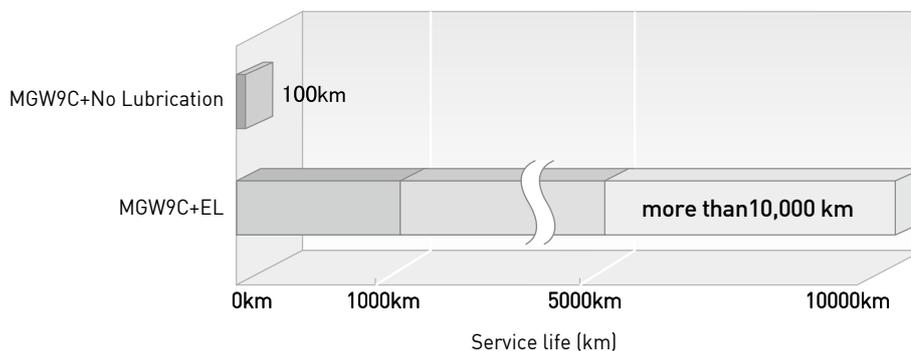
Notes : 1. Service life will vary from application environment, lubrication conditions, and assembly accuracy.  
 2. Not for use in high heat conditions greater than 50°C, and if lower than 25° C please contact HIWIN.  
 3. Standard parts must be pregreased with HIWIN G05. If there is no pregreasing, the maintenance mileage will be shortened.

### (2) Applications

Broadly applicable in automation, conveying equipment, Industrial machine, Semi-conductor, and inspection machine.

### (3) Lubrication Capability

- High speed life testing with light load

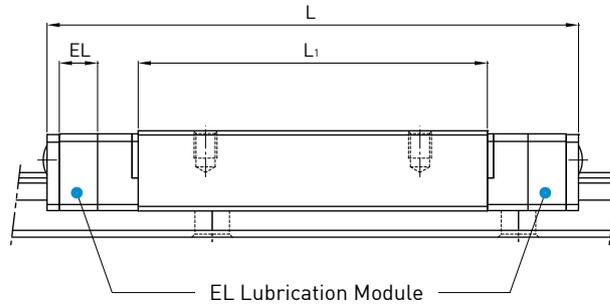


|                           |                        |
|---------------------------|------------------------|
| <b>Test Specification</b> | MGW9C1R1000Z0CM+EL     |
| <b>Velocity</b>           | 5 m/s                  |
| <b>Acceleration</b>       | 50 m/s <sup>2</sup>    |
| <b>Applied Load</b>       | 0.2 kgf                |
| <b>Stroke</b>             | 850 mm                 |
| <b>Lubrication</b>        | Lithium Soap Grease+EL |
| <b>Distance travel</b>    | 10,000 km              |

## MG Series

### Miniature Type

#### (4) Dimension Table for EL Type



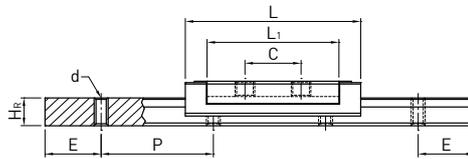
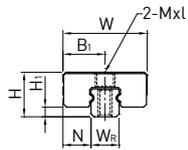
unit : mm

| Model No. | Lubrication device (R <sub>1</sub> ) | Block length (L <sub>1</sub> ) | Total length (L) |
|-----------|--------------------------------------|--------------------------------|------------------|
| MGN7C     | 3.5                                  | 13.5                           | 29.5             |
| MGN7H     |                                      | 21.8                           | 37.8             |
| MGN9C     | 5                                    | 18.9                           | 38.9             |
| MGN9H     |                                      | 29.9                           | 49.9             |
| MGN12C    | 5                                    | 21.7                           | 44.7             |
| MGN12H    |                                      | 32.4                           | 55.4             |
| MGW9C     | 5                                    | 27.5                           | 49.3             |
| MGW9H     |                                      | 38.5                           | 60.7             |
| MGW12C    | 5                                    | 31.3                           | 56.1             |
| MGW12H    |                                      | 45.6                           | 70.4             |

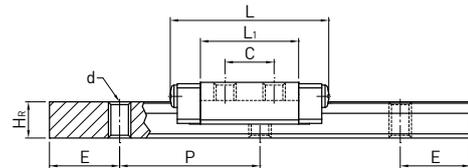
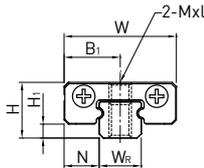
## 2-4-19 Dimensions for MGN/MGW Series

### (1) MGN-C / MGN-H

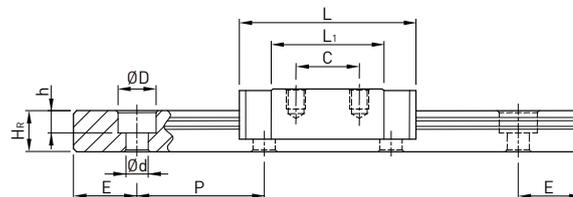
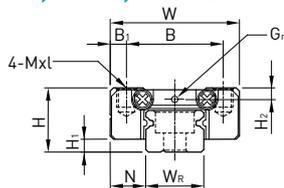
MGN2



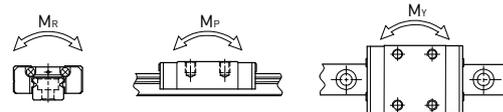
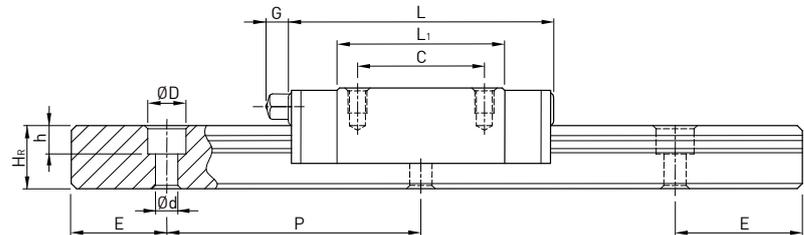
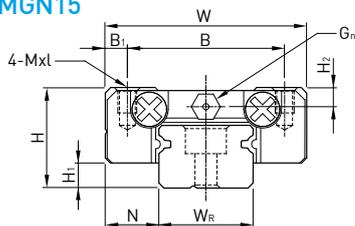
MGN3



MGN7, MGN9, MGN12



MGN15



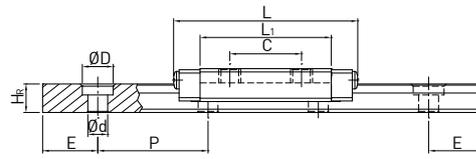
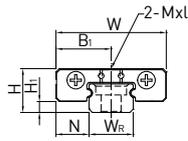
| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |    |    |                |     |                |      |     |                |           | Dimensions of Rail (mm) |                |                |           |     | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C(kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |      |      | Weight         |                |                |          |           |
|-----------|-----------------------------|----------------|--------------------------|----|----|----------------|-----|----------------|------|-----|----------------|-----------|-------------------------|----------------|----------------|-----------|-----|-----------------------------|---------------------------------|--|---------------------|------|------|----------------|----------------|----------------|----------|-----------|
|           | H                           | H <sub>1</sub> | N                        | W  | B  | B <sub>1</sub> | C   | L <sub>1</sub> | L    | G   | G <sub>n</sub> | Mxl       | H <sub>2</sub>          | W <sub>R</sub> | H <sub>R</sub> | D         | h   |                             |                                 |  | d                   | P    | E    | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block kg | Rail kg/m |
| MGN 2C    | 3.2                         | 0.7            | 2                        | 6  | -  | 3              | 4   | 9.5            | 12.5 | -   | -              | M1.4 THRU | -                       | 2              | 2              | M1 THRU   | 8   | 4                           | M1                              | 0.22   | 0.4                 | 0.42 | 0.63 | 0.63           | 0.001          | 0.03           |          |           |
| MGN 3C    | 4                           | 1              | 2.5                      | 8  | -  | 4              | 3.5 | 7              | 11.3 | -   | -              | M1.6x1.3  | -                       | 3              | 2.6            | M1.6 THRU | 10  | 5                           | M1.6                            | 0.29   | 0.44                | 0.7  | 0.5  | 0.5            | 0.001          | 0.05           |          |           |
| MGN 3H    |                             |                |                          |    |    |                | 5.5 | 11             | 15.3 |     |                | M2x1.3    |                         |                |                |           |     |                             |                                 | 0.39   | 0.68                | 1.0  | 1.3  | 1.3            |                |                | 0.002    |           |
| MGN 7C    | 8                           | 1.5            | 5                        | 17 | 12 | 2.5            | 8   | 13.5           | 22.5 | -   | Ø1.2           | M2x2.5    | 1.5                     | 7              | 4.8            | 4.2       | 2.3 | 2.4                         | 15                              | 5  | M2x6                | 0.98 | 1.24 | 4.70           | 2.84           | 2.84           | 0.010    | 0.22      |
| MGN 7H    |                             |                |                          |    |    |                | 13  | 21.8           | 30.8 |     |                |           |                         |                |                |           |     |                             |                                 |  |                     | 1.37 | 1.96 | 7.64           | 4.80           | 4.80           |          |           |
| MGN 9C    | 10                          | 2              | 5.5                      | 20 | 15 | 2.5            | 10  | 18.9           | 28.9 | -   | Ø1.4           | M3x3      | 1.8                     | 9              | 6.5            | 6         | 3.5 | 3.5                         | 20                              | 7.5  | M3x8                | 1.86 | 2.55 | 11.76          | 7.35           | 7.35           | 0.016    | 0.38      |
| MGN 9H    |                             |                |                          |    |    |                | 16  | 29.9           | 39.9 |     |                |           |                         |                |                |           |     |                             |                                 |  |                     | 2.55 | 4.02 | 19.60          | 18.62          | 18.62          |          |           |
| MGN 12C   | 13                          | 3              | 7.5                      | 27 | 20 | 3.5            | 15  | 21.7           | 34.7 | -   | Ø2             | M3x3.5    | 2.5                     | 12             | 8              | 6         | 4.5 | 3.5                         | 25                              | 10   | M3x8                | 2.84 | 3.92 | 25.48          | 13.72          | 13.72          | 0.034    | 0.65      |
| MGN 12H   |                             |                |                          |    |    |                | 20  | 32.4           | 45.4 |     |                |           |                         |                |                |           |     |                             |                                 |  |                     | 3.72 | 5.88 | 38.22          | 36.26          | 36.26          |          |           |
| MGN 15C   | 16                          | 4              | 8.5                      | 32 | 25 | 3.5            | 20  | 26.7           | 42.1 | 4.5 | M3             | M3x4      | 3                       | 15             | 10             | 6         | 4.5 | 3.5                         | 40                              | 15   | M3x10               | 4.61 | 5.59 | 45.08          | 21.56          | 21.56          | 0.059    | 1.06      |
| MGN 15H   |                             |                |                          |    |    |                | 25  | 43.4           | 58.8 |     |                |           |                         |                |                |           |     |                             |                                 |  |                     | 6.37 | 9.11 | 73.50          | 57.82          | 57.82          |          |           |

Note : 1. 1 kgf = 9.81N

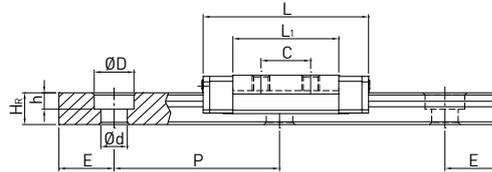
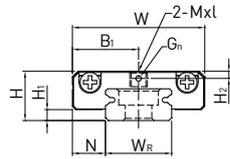
2. MG2, MG3 blocks should not be removed from the rail. If removing the blocks is necessary, the blocks should be kept on the block inserts.

(2) MGW-C / MGW-H

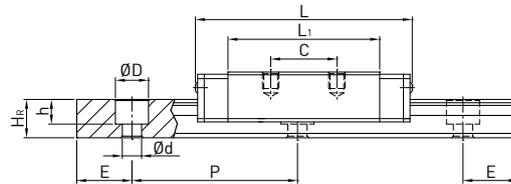
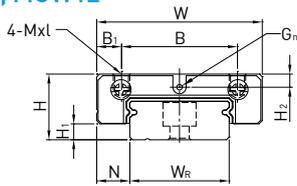
MGW2



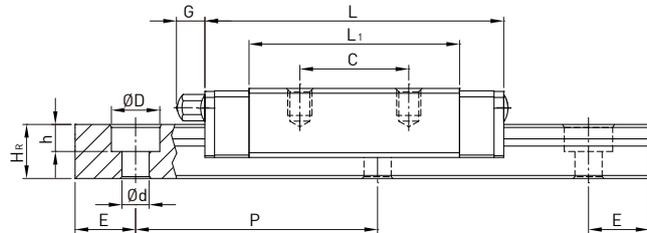
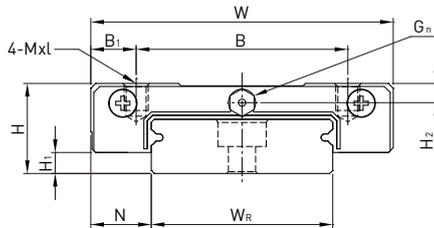
MGW3



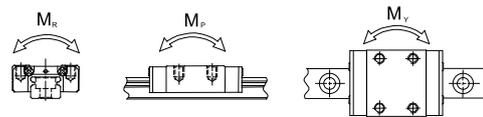
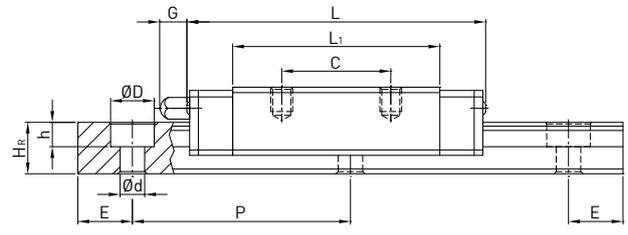
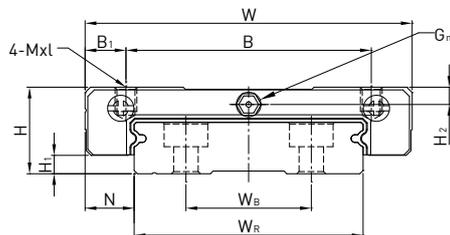
MGW7, MGW9, MGW12



MGW14



MGW15



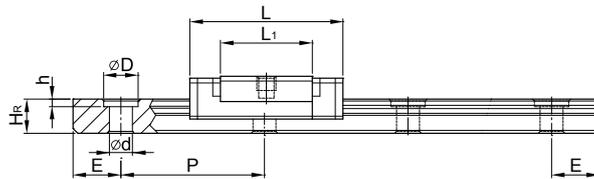
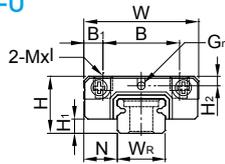
| Model No. | Dimensions of Assembly (mm) |                |     | Dimensions of Block (mm) |    |                |     |                |      |     |                |         |                | Dimensions of Rail (mm) |                |                |     |     |     |    | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |                      |                      | Weight               |            |             |
|-----------|-----------------------------|----------------|-----|--------------------------|----|----------------|-----|----------------|------|-----|----------------|---------|----------------|-------------------------|----------------|----------------|-----|-----|-----|----|-----------------------------|----------------------------------|--|---------------------|----------------------|----------------------|----------------------|------------|-------------|
|           | H                           | H <sub>1</sub> | N   | W                        | B  | B <sub>1</sub> | C   | L <sub>1</sub> | L    | G   | G <sub>n</sub> | Mxl     | H <sub>2</sub> | W <sub>R</sub>          | W <sub>B</sub> | H <sub>R</sub> | D   | h   | d   | P  |                             |                                  |  | E                   | M <sub>R</sub> (N-m) | M <sub>P</sub> (N-m) | M <sub>V</sub> (N-m) | Block (kg) | Rail (kg/m) |
| MGW 2C    | 4                           | 1              | 3   | 10                       | -  | 5              | 6.5 | 11.9           | 16.7 | -   | -              | M2x1.3  | -              | 4                       | -              | 2.6            | 2.8 | 1   | 1.8 | 10 | 5                           | M1.6                             | 0.41   | 0.73                | 1.1                  | 2.2                  | 2.2                  | 0.002      | 0.07        |
| MGW 3C    | 4.5                         | 1              | 3   | 12                       | -  | 6              | 4.5 | 9.6            | 15   | -   | Ø0.5           | M2-THRU | 0.65           | 6                       | -              | 2.9            | 3.6 | 1.5 | 2.4 | 15 | 5                           | M2                               | 0.54   | 0.84                | 2.3                  | 1.3                  | 1.3                  | 0.003      | 0.13        |
| MGW 3H    |                             |                |     |                          |    |                | 8   | 14.2           | 19.6 |     |                |         |                |                         |                |                |     |     |     |    |                             |                                  | 0.68   | 1.18                | 3.3                  | 2.7                  | 2.7                  |            |             |
| MGW 7C    | 9                           | 1.9            | 5.5 | 25                       | 19 | 3              | 10  | 21             | 31.2 | -   | Ø1.2           | M3x3    | 1.85           | 14                      | -              | 5.2            | 6   | 3.2 | 3.5 | 30 | 10                          | M3x6                             | 1.37   | 2.06                | 15.70                | 7.14                 | 7.14                 | 0.020      | 0.51        |
| MGW 7H    |                             |                |     |                          |    |                | 19  | 30.8           | 41   |     |                |         |                |                         |                |                |     |     |     |    |                             |                                  | 1.77   | 3.14                | 23.45                | 15.53                | 15.53                |            |             |
| MGW 9C    | 12                          | 2.9            | 6   | 30                       | 21 | 4.5            | 12  | 27.5           | 39.3 | -   | Ø1.2           | M3x3    | 2.4            | 18                      | -              | 7              | 6   | 4.5 | 3.5 | 30 | 10                          | M3x8                             | 2.75   | 4.12                | 40.12                | 18.96                | 18.96                | 0.040      | 0.91        |
| MGW 9H    |                             |                |     |                          |    |                | 23  | 3.5            | 24   |     |                |         |                |                         |                |                |     |     |     |    |                             |                                  | 38.5   | 50.7                | 3.43                 | 5.89                 | 54.54                |            |             |
| MGW 12C   | 14                          | 3.4            | 8   | 40                       | 28 | 6              | 15  | 31.3           | 46.1 | -   | Ø1.2           | M3x3.6  | 2.8            | 24                      | -              | 8.5            | 8   | 4.5 | 4.5 | 40 | 15                          | M4x8                             | 3.92   | 5.59                | 70.34                | 27.80                | 27.80                | 0.071      | 1.49        |
| MGW 12H   |                             |                |     |                          |    |                | 28  | 45.6           | 60.4 |     |                |         |                |                         |                |                |     |     |     |    |                             |                                  | 5.10   | 8.24                | 102.70               | 57.37                | 57.37                |            |             |
| MGW 14C   | 15                          | 3.5            | 10  | 50                       | 35 | 7.5            | 18  | 34.8           | 49.4 | 4.7 | M3             | M4x4.5  | 3.2            | 30                      | -              | 9              | 8   | 4.5 | 4.5 | 40 | 15                          | M4                               | 5.90   | 8.44                | 116.96               | 48.91                | 48.91                | 0.110      | 1.98        |
| MGW 14H   |                             |                |     |                          |    |                | 35  | 53             | 67.6 |     |                |         |                |                         |                |                |     |     |     |    |                             |                                  | 7.70   | 12.33               | 170.94               | 102.12               | 102.12               |            |             |
| MGW 15C   | 16                          | 3.4            | 9   | 60                       | 45 | 7.5            | 20  | 38             | 54.8 | 5.2 | M3             | M4x4.2  | 3.2            | 42                      | 23             | 9.5            | 8   | 4.5 | 4.5 | 40 | 15                          | M4x10                            | 6.77   | 9.22                | 199.34               | 56.66                | 56.66                | 0.143      | 2.86        |
| MGW 15H   |                             |                |     |                          |    |                | 35  | 57             | 73.8 |     |                |         |                |                         |                |                |     |     |     |    |                             |                                  | 8.93   | 13.38               | 299.01               | 122.60               | 122.60               |            |             |

Note : 1. 1 kgf = 9.81N

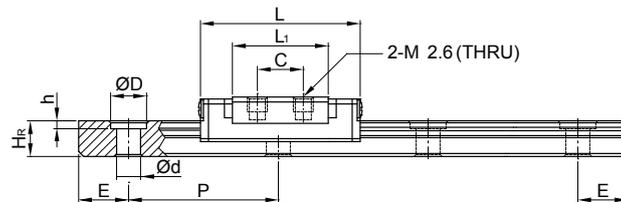
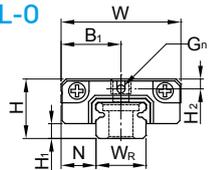
2. MG2 and MG3 blocks should not be removed from the rail. If removing the blocks is necessary, the blocks should be kept on the block inserts.

### (3) MGN-C-O / MGN-H-O

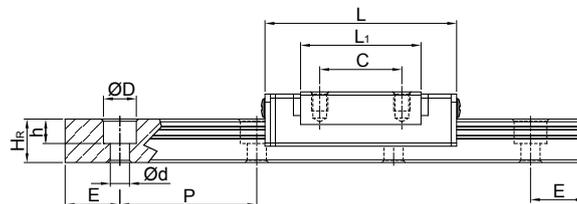
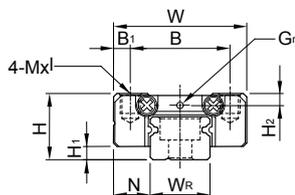
#### MGN5-O



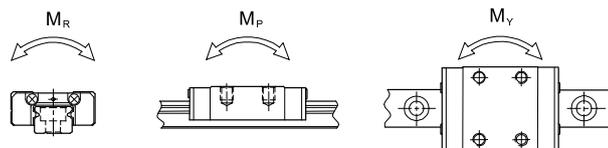
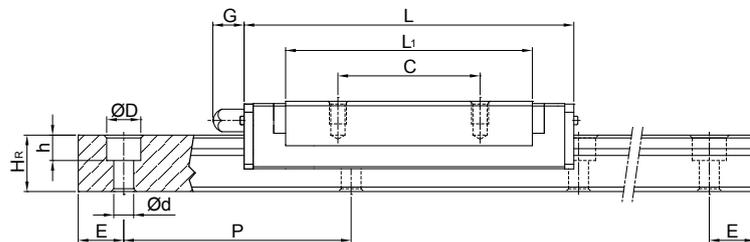
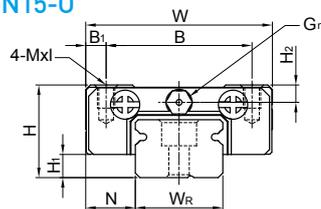
#### MGN5HL-O



#### MGN7-O, MGN9-O, MGN12-O



#### MGN15-O

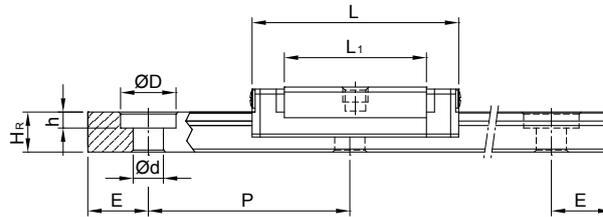
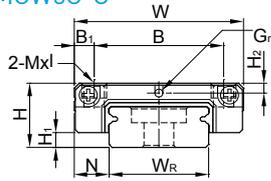


| Model No. | Dimensions of Assembly (mm) |                |     | Dimensions of Block (mm) |    |                |    |                |      |      |                |           |                | Dimensions of Rail (mm) |                |     |     |     | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |      |                    | Weight             |                    |          |           |
|-----------|-----------------------------|----------------|-----|--------------------------|----|----------------|----|----------------|------|------|----------------|-----------|----------------|-------------------------|----------------|-----|-----|-----|-----------------------------|----------------------------------|--|---------------------|------|--------------------|--------------------|--------------------|----------|-----------|
|           | H                           | H <sub>1</sub> | N   | W                        | B  | B <sub>1</sub> | C  | L <sub>1</sub> | L    | G    | G <sub>n</sub> | Mxl       | H <sub>2</sub> | W <sub>R</sub>          | H <sub>R</sub> | D   | h   | d   |                             |                                  |  | P                   | E    | M <sub>R</sub> N-m | M <sub>P</sub> N-m | M <sub>Y</sub> N-m | Block kg | Rail kg/m |
| MGN 5C-O  |                             |                |     |                          | 8  | 2              | -  | 9.6            | 16   |      |                | M2x1.5    |                |                         |                |     |     |     |                             |                                  |  | 0.54                | 0.84 | 2                  | 1.3                | 1.3                | 0.003    |           |
| MGN 5H-O  | 6                           | 1.5            | 3.5 | 12                       | 8  | 2              | -  | 12.6           | 19   |      | 0.8            | M2x1.5    | 1              | 5                       | 3.6            | 3.6 | 0.8 | 2.4 | 15                          | 5                                | M2x6   | 0.67                | 1.08 | 2.6                | 2.3                | 2.3                | 0.004    | 0.15      |
| MGN 5HL-O |                             |                |     |                          |    | 6              | 7  | 12.6           | 19   |      |                | M2.6-THRU |                |                         |                |     |     |     |                             |                                  |  | 0.67                | 1.08 | 2.6                | 2.3                | 2.3                | 0.004    |           |
| MGN7C-O   |                             |                |     |                          | 12 | 2.5            | 8  | 13.5           | 22.5 |      | Ø1.2           | M2×2.5    |                |                         |                |     |     |     |                             |                                  |  | 0.98                | 1.24 | 4.70               | 2.84               | 2.84               | 0.008    |           |
| MGN7H-O   | 8                           | 1.5            | 5   | 17                       | 12 | 2.5            | 13 | 21.8           | 30.8 |      |                | M2×2.5    | 1.5            | 7                       | 4.8            | 4.2 | 2.3 | 2.4 | 15                          | 5                                | M2x6   | 1.37                | 1.96 | 7.64               | 4.80               | 4.80               | 0.012    | 0.22      |
| MGN 9C-O  |                             |                |     |                          | 15 | 2.5            | 10 | 19.4           | 30   |      | Ø1.4           | M3x3      |                |                         |                |     |     |     |                             |                                  |  | 2.01                | 2.84 | 13.05              | 8.97               | 8.97               | 0.012    |           |
| MGN9H-O   | 10                          | 2.2            | 5.5 | 20                       | 15 | 2.5            | 16 | 29.3           | 39.9 |      |                | M3x3      | 1.8            | 9                       | 6.5            | 6   | 3.5 | 3.5 | 20                          | 7.5                              | M3x8   | 2.5                 | 3.93 | 19.71              | 21.47              | 21.47              | 0.02     | 0.38      |
| MGN 12C-O |                             |                |     |                          | 20 | 3.5            | 15 | 22             | 35   |      | Ø2             | M3x3.5    |                |                         |                |     |     |     |                             |                                  |  | 2.84                | 3.92 | 25.48              | 13.72              | 13.72              | 0.025    |           |
| MGN12H-O  | 13                          | 3              | 7.5 | 27                       | 20 | 3.5            | 20 | 34.6           | 47.6 |      |                | M3x3.5    | 2.5            | 12                      | 8              | 6   | 4.5 | 3.5 | 25                          | 10                               | M3x8   | 4.27                | 5.9  | 38.4               | 37.49              | 37.49              | 0.047    | 0.65      |
| MGN 15C-O |                             |                |     |                          | 25 | 3.5            | 20 | 26.7           | 41.3 |      |                | M3x4      |                |                         |                |     |     |     |                             |                                  |  | 4.61                | 5.59 | 45.08              | 21.56              | 21.56              | 0.057    |           |
| MGN 15H-O | 16                          | 4              | 8.5 | 32                       | 25 | 3.5            | 25 | 43.4           | 58   | 4.50 | M3             | M3x4      | 3              | 15                      | 10             | 6   | 4.5 | 3.5 | 40                          | 15                               | M3x10  | 6.37                | 9.11 | 73.5               | 57.82              | 57.82              | 0.088    | 1.06      |

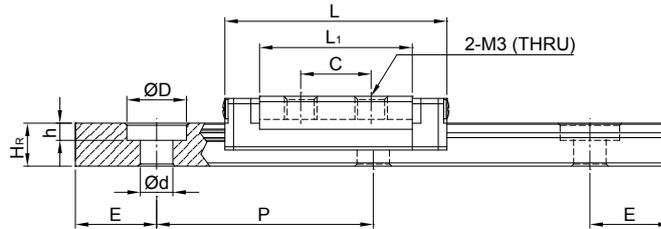
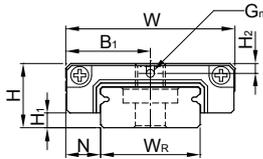
Note : 1 kgf = 9.81 N

**(4) MGW-C-0 / MGW-H-0**

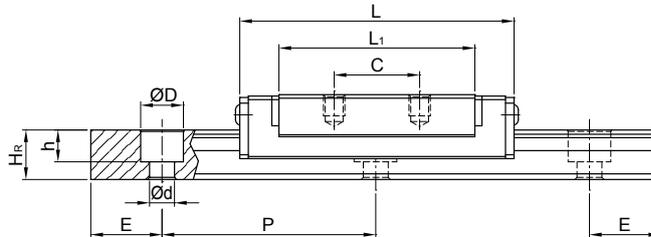
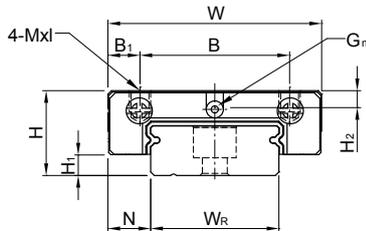
**MGW5C-0**



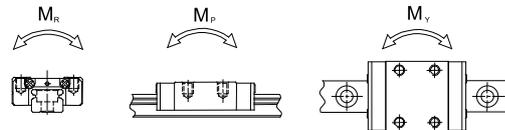
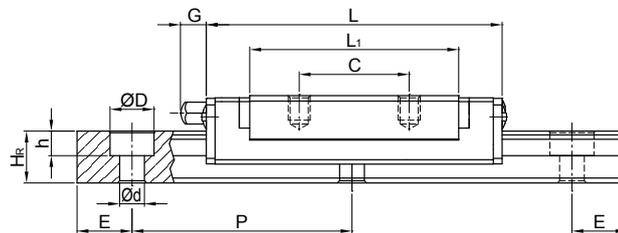
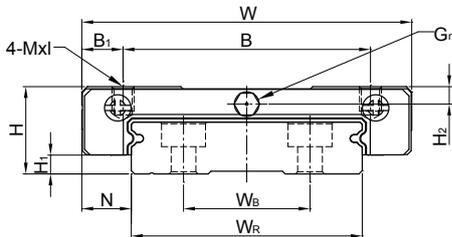
**MGW5CL-0**



**MGW7-0, MGW9-0, MGW12-0**



**MGW15-0**



| 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 C <sub>0</sub> (kN) | Static Rated Moment |      |      | Weight             |                    |                    |          |           |
|-----------|-----------------------------|----------------|-----|--------------------------|----|----------------|-----|----------------|------|-----|----------------|----------|----------------|-------------------------|----------------|----------------|-----|-----|-----------------------------|----------------------------------|--|---------------------|------|------|--------------------|--------------------|--------------------|----------|-----------|
|           | H                           | H <sub>1</sub> | N   | W                        | B  | B <sub>1</sub> | C   | L <sub>1</sub> | L    | G   | G <sub>n</sub> | Mxl      | H <sub>2</sub> | W <sub>R</sub>          | W <sub>B</sub> | H <sub>R</sub> | D   | h   |                             |                                  |  | d                   | P    | E    | M <sub>r</sub> N-m | M <sub>p</sub> N-m | M <sub>v</sub> N-m | Block kg | Rail kg/m |
|           |                             |                |     |                          |    |                |     |                |      |     |                |          |                |                         |                |                |     |     |                             |                                  |  |                     |      |      |                    |                    |                    |          |           |
| MGW 5C-0  | 6.5                         | 1.5            | 3.5 | 17                       | 13 | 2              | -   | 14.1           | 20.5 | -   | Ø0.8           | M2.5x1.5 | 1              | 10                      | -              | 4              | 5.5 | 1.6 | 3                           | 20                               | 5  | M2.5X7              | 0.68 | 1.18 | 5.5                | 2.7                | 2.7                | 0.006    | 0.34      |
| MGW 5CL-0 |                             |                |     |                          | -  | 8.5            | 6.5 | 14.1           | 20.5 |     |                | M3-THRU  |                |                         |                |                |     |     |                             |                                  |  |                     |      |      |                    |                    |                    |          |           |
| MGW 7C-0  | 9                           | 1.9            | 5.5 | 25                       | 19 | 3              | 10  | 21             | 31.2 | -   | Ø1.2           | M3x3     | 1.85           | 14                      | -              | 5.2            | 6   | 3.2 | 3.5                         | 30                               | 10   | M3x6                | 1.37 | 2.06 | 15.70              | 7.14               | 7.14               | 0.018    | 0.51      |
| MGW 7H-0  |                             |                |     |                          | 19 | 3              | 19  | 30.8           | 41   |     |                | M3x3     |                |                         |                |                |     |     |                             |                                  |  |                     |      |      |                    |                    |                    |          |           |
| MGW 9C-0  | 12                          | 2.95           | 6   | 30                       | 21 | 4.5            | 12  | 27.5           | 39.7 | -   | Ø1.2           | M3x3     | 2.65           | 18                      | -              | 7              | 6   | 4.5 | 3.5                         | 30                               | 10   | M3x8                | 2.75 | 4.12 | 40.12              | 18.96              | 18.96              | 0.038    | 0.91      |
| MGW 9H-0  |                             |                |     |                          | 23 | 3.5            | 24  | 38.5           | 50.7 |     |                | M3x3     |                |                         |                |                |     |     |                             |                                  |  |                     |      |      |                    |                    |                    |          |           |
| MGW 12C-0 | 14                          | 3.45           | 8   | 40                       | 28 | 6              | 15  | 31.3           | 45.1 | -   | Ø1.2           | M3x3.6   | 2.8            | 24                      | -              | 8.5            | 8   | 4.5 | 4.5                         | 40                               | 15   | M4x8                | 3.92 | 5.59 | 70.34              | 27.8               | 27.8               | 0.066    | 1.49      |
| MGW 12H-0 |                             |                |     |                          | 28 | 6              | 28  | 45.6           | 59.4 |     |                | M3x3.6   |                |                         |                |                |     |     |                             |                                  |  |                     |      |      |                    |                    |                    |          |           |
| MGW 15C-0 | 16                          | 3.45           | 9   | 60                       | 45 | 7.5            | 20  | 38             | 53.8 | 5.2 | M3             | M4x4.2   | 3.2            | 42                      | 23             | 9.5            | 8   | 4.5 | 4.5                         | 40                               | 15   | M4x10               | 6.77 | 9.22 | 199.34             | 56.66              | 56.66              | 0.138    | 2.86      |
| MGW 15H-0 |                             |                |     |                          | 45 | 7.5            | 35  | 57             | 72.8 |     |                | M4x4.2   |                |                         |                |                |     |     |                             |                                  |  |                     |      |      |                    |                    |                    |          |           |

Note : 1 kgf = 9.81 N

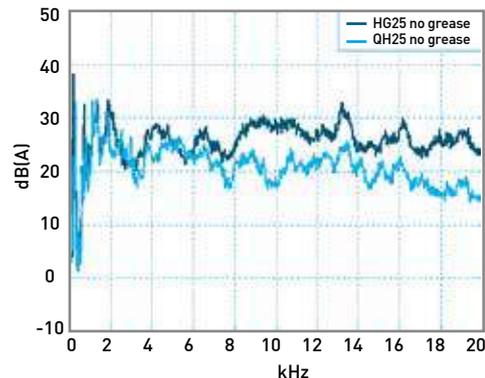
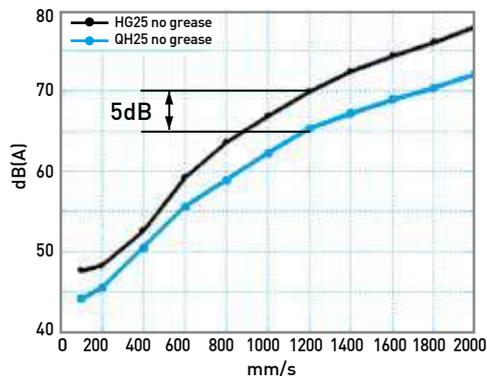
## 2-5 QH Series – Heavy Load Type Linear Guideway, with SynchMotion® Technology

The development of QH linear guideway is based on a four-row circular-arc contact. The QH series linear guideway with SynchMotion® Technology offers smooth movement, superior lubrication, quieter operation and longer running life. Therefore the QH linear guideway has broad industrial applicability. In the high-tech industry where high speed, low noise, and reduced dust generation is required, the HIWIN-QH series is interchangeable with the HG series.

### 2-5-1 Features

#### (1) Low Noise Design

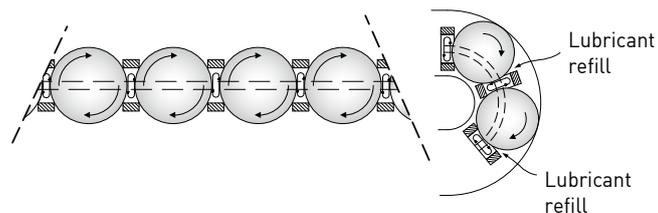
With SynchMotion® technology, rolling elements are interposed between the partitions of SynchMotion® to provide improved circulation. Due to the elimination of contact between the rolling elements, noise levels due to collision are drastically reduced.



#### (2) Self-Lubricant Design

The partition is a grouping of hollow ring-like structures formed with a through-hole to facilitate circulation of the lubricant. Because of the special lubrication path design, the lubricant of the partition storage space can be refilled. Therefore, the frequency of lubricant refilling can be decreased.

The QH-series linear guideway is pre-lubricated. Performance testing at a 0.2C (basic dynamic load) shows that after running 4,000km no damage was apparent to either the rolling elements or the raceway.



## QH Series

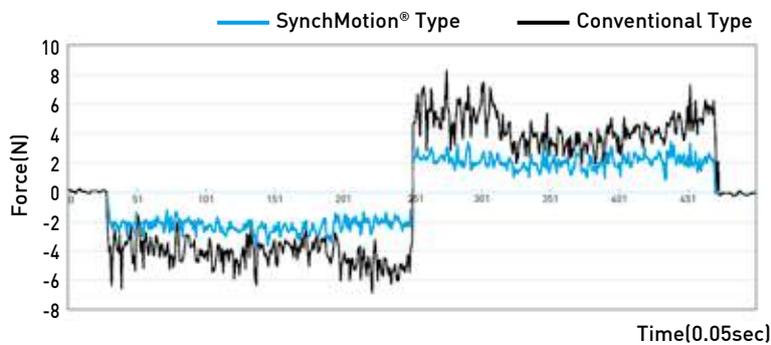
### Heavy Load Type

Table 2-5-1 Load Test

| Test Sample     | QHH25CAZAH  | Load Test  |
|-----------------|---|--|
| Speed           | 24m/min   |  <p>Load=5kN After 4,000km</p> |
| Lubricant       | lithium soap base grease (initial lubrication only) |  |
| Load            | 5kN   |  |
| Distance travel | 4,000km   |  |

### (3) Smooth Movement

In standard linear guideways, rolling elements on the load side of the guide block begin rolling and push their way through the raceway. When they contact other rolling elements they create counter-rotational friction. This results in a great variation of rolling resistance. The QH linear guideway, with SynchMotion® technology prevents this condition. As the block starts to move, the rolling elements begin rolling consecutively and remain separated to prevent contact with one another thus keeping the element's kinetic energy extremely stable in order to effectively reduce fluctuations in rolling resistance.



### (4) High Speed Performance

The QH series offers excellent high-speed performance due to the partitions of the SynchMotion® structure. They are employed to separate the adjacent balls thereby resulting in low rolling traction and the metallic friction between adjacent balls is eliminated.

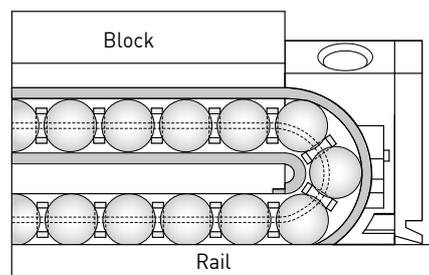
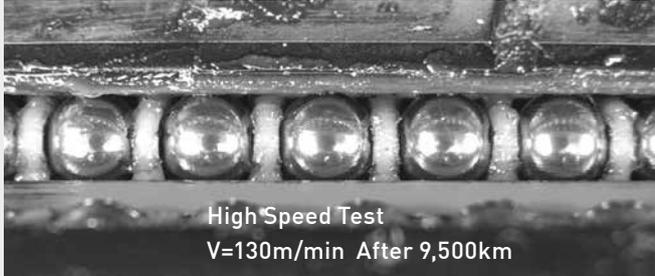
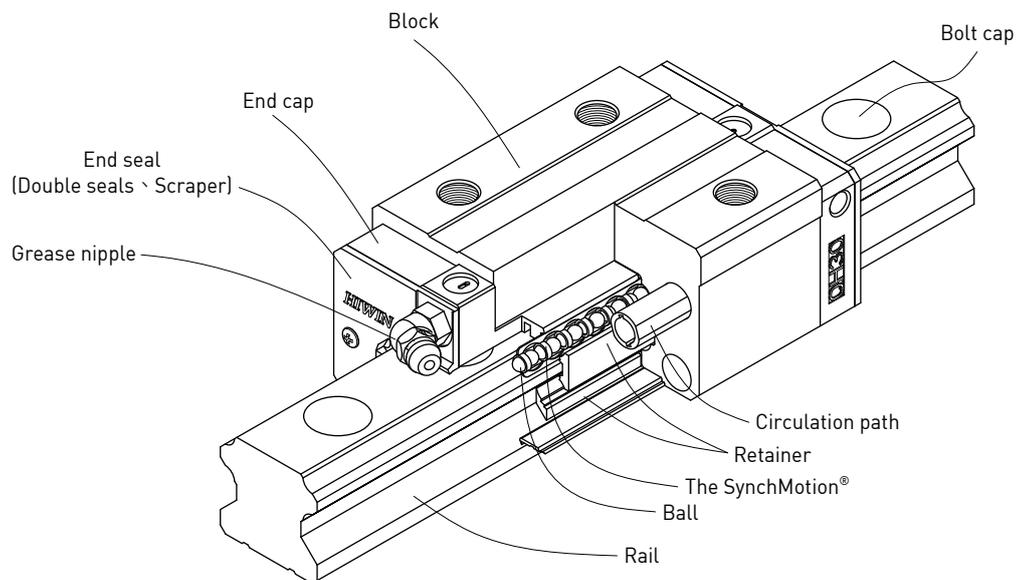


Table 2-5-2

| Test Sample QHW25CAZAH |   | High Speed Test  |
|------------------------|---|--|
| Speed                  | 130m/min  |  |
| Lubricant              | lithium soap base grease (initial lubrication only) |  |
| Distance travel        | 9,500km   |  |

## 2-5-2 Construction



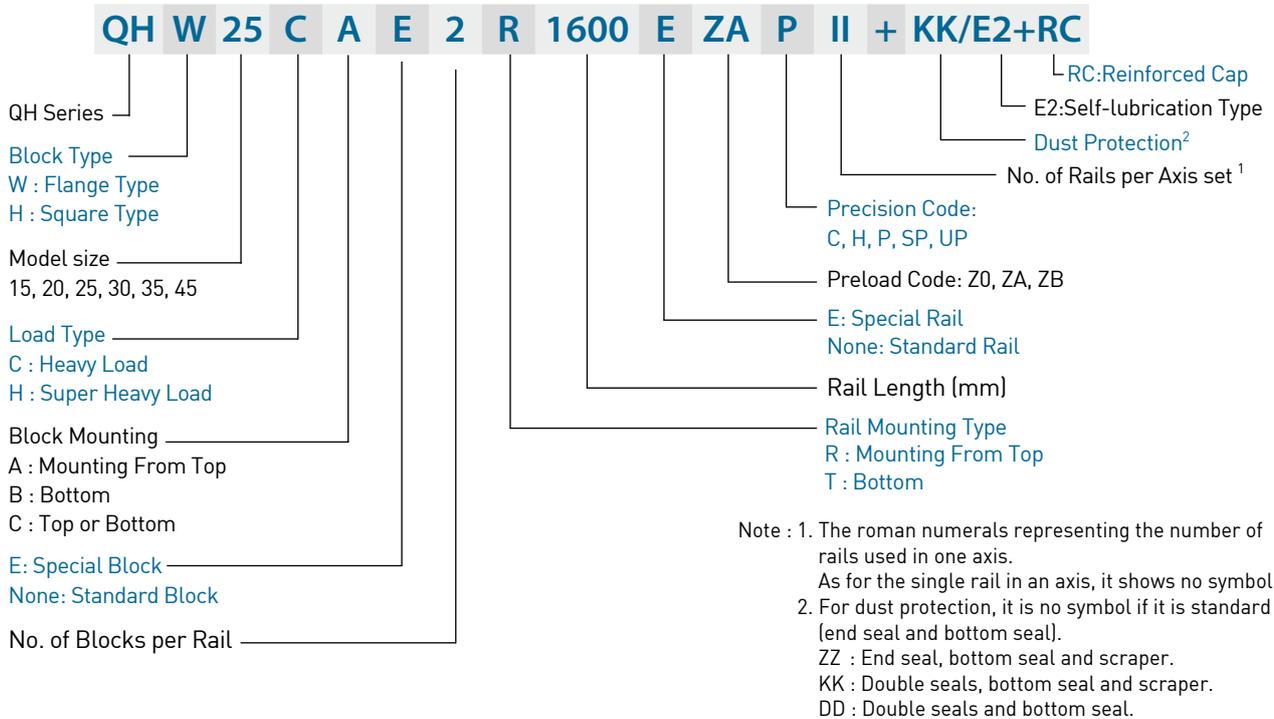
## 2-5-3 Model Number of QH Series

QH series guideway can be classified into non-interchangeable and interchangeable types. The sizes are identical. The main difference is that the interchangeable blocks and rails can be freely exchanged. Because of dimensional control, the interchangeable type linear guideway is a perfect choice for the client when rails do not need to be paired for an axis. And since the QH and HG share the identical rails, the customer does not need to redesign when choosing the QH series. Therefore the QH linear guideway has increased applicability.

# QH Series

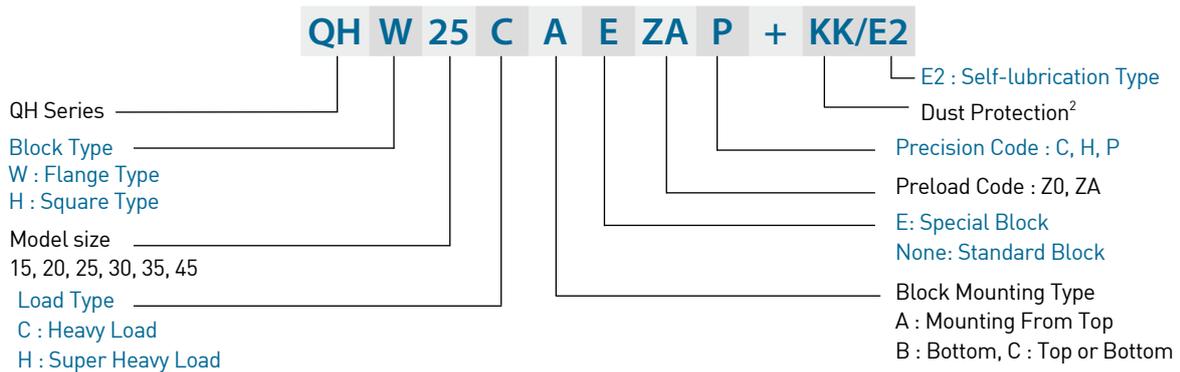
## Heavy Load Type

### (1) Non-interchangeable type

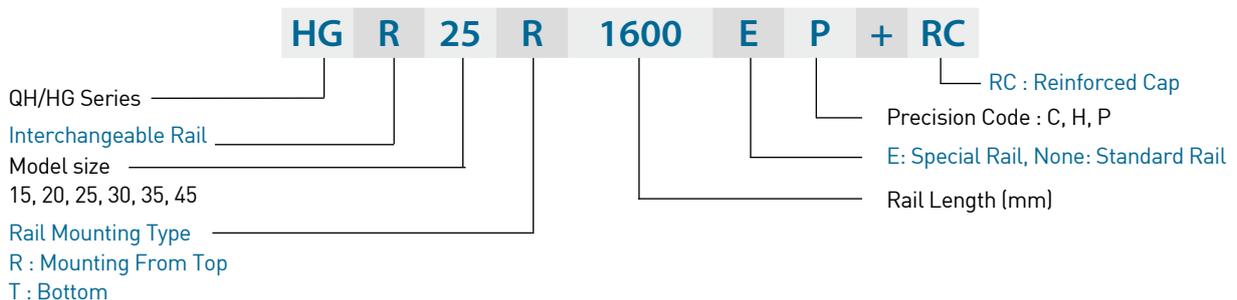


### (2) Interchangeable type

#### ○ Model Number of QH Block



#### ○ Model Number of QH Rail (QH and HG share the identical rails)

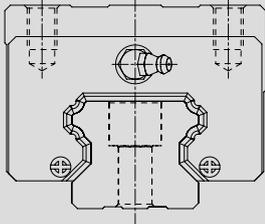
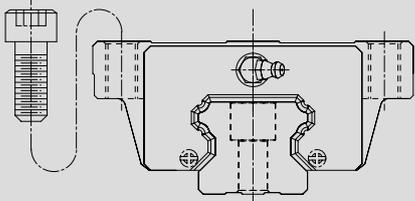
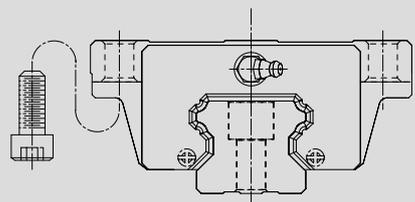
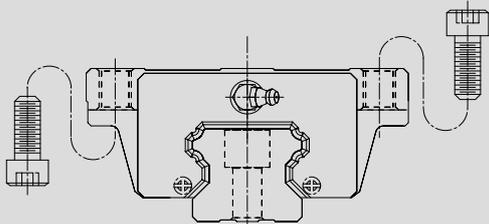


## 2-5-4 Types

### (1) Block types

HIWIN offers two types of linear guideways, flange and square types.

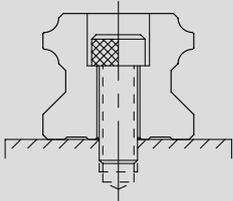
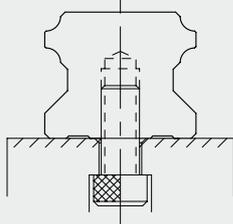
Table 2-5-3 Block Types

| Type   | Model            | Shape   | Height<br>(mm) | Rail<br>Length<br>(mm) | Main Applications   |
|--------|------------------|---|----------------|------------------------|---|
| Square | QHH-CA<br>QHH-HA |    | 28             | 100                    | <ul style="list-style-type: none"> <li>○ Automation devices</li> <li>○ High-speed transportation equipment</li> <li>○ Precision measuring equipment</li> <li>○ Semiconductor manufacturing equipment</li> </ul> |
|        |                  |   | ↓              | ↓                      |   |
| Flange | QHW-CA<br>QHW-HA |   | 24             | 100                    |   |
|        |                  |   | ↓              | ↓                      |   |
|        | QHW-CB<br>QHW-HB |  | 60             | 4000                   |   |
|        |                  |   | ↓              | ↓                      |   |
|        | QHW-CC<br>QHW-HC |  | 24             | 100                    |   |
|        |                  |   | ↓              | ↓                      |   |
| 60     | 4000             |   |                |                        |   |

### (2) Rail types

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

Table 2-5-4 Rail Types

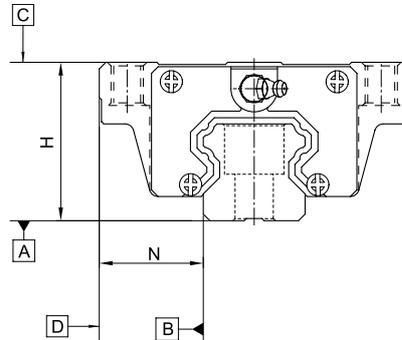
| Mounting from Top   | Mounting from bottom  |
|---|---|
|  |  |

# QH Series

## Heavy Load Type

### 2-5-5 Accuracy Classes

The accuracy of QH 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

Table 2-5-5 Accuracy Standards

Unit: mm

| Item  | QH - 15, 20      |             |                  |                         |                         |
|---|------------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015            | 0<br>- 0.008            |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015            | 0<br>- 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 2-5-11 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-5-11 |             |                  |                         |                         |

Table 2-5-6 Accuracy Standards

Unit: mm

| Item  | QH - 25, 30, 35  |             |                  |                         |                         |
|---|------------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 0.01             |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 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 2-5-11 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-5-11 |             |                  |                         |                         |

Table 2-5-7 Accuracy Standards

Unit: mm

| Item  | QH - 45          |             |                  |                         |                         |
|---|------------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.05      | 0<br>- 0.05      | 0<br>- 0.03             | 0<br>- 0.02             |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.05      | 0<br>- 0.05      | 0<br>- 0.03             | 0<br>- 0.02             |
| Variation of height H                               | 0.03             | 0.015       | 0.007            | 0.005                   | 0.003                   |
| Variation of width N                                | 0.03             | 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 |             |                  |                         |                         |

(2) Accuracy of interchangeable

Table 2-5-8 Accuracy Standards

Unit: mm

| Item  | QH - 15, 20      |          |               |
|---|------------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)       | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.03   | ± 0.015       |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.03   | ± 0.015       |
| Variation of height H                               | 0.02             | 0.01     | 0.006         |
| Variation of width N                                | 0.02             | 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 2-5-9 Accuracy Standards

Unit: mm

| Item  | QH - 25, 30, 35  |          |               |
|---|------------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)       | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.04   | ± 0.02        |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.04   | ± 0.02        |
| Variation of height H                               | 0.02             | 0.015    | 0.007         |
| Variation of width N                                | 0.03             | 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 2-5-10 Accuracy Standards

Unit: mm

| Item  | QH - 45          |          |               |
|---|------------------|----------|---------------|
| Accuracy Classes                                    | 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 2-5-11 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-5-11 |          |               |

## QH Series

### Heavy Load Type

#### (3) Accuracy of running parallelism

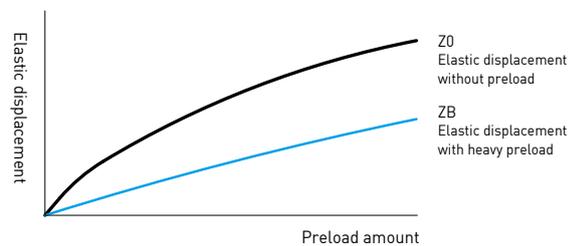
Table 2-5-11 Accuracy of Running Parallelism

| 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  |

## 2-5-6 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 QH20 to avoid an over-preload affecting the guideway's life.



### (2) Preload classes

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

Table 2-5-12 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 |
| <b>Class</b>    | <b>Interchangeable Guideway</b> |              | <b>Non-Interchangeable Guideway</b>                        |  |
| Preload classes | Z0, ZA                          |              | Z0, ZA, ZB   |  |

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

## 2-5-7 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.

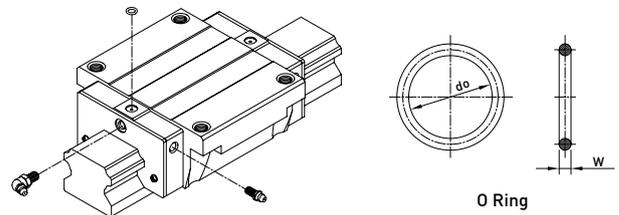
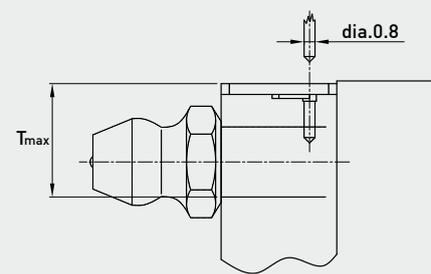


Table 2-5-13 O-Ring size and max. permissible depth for piercing

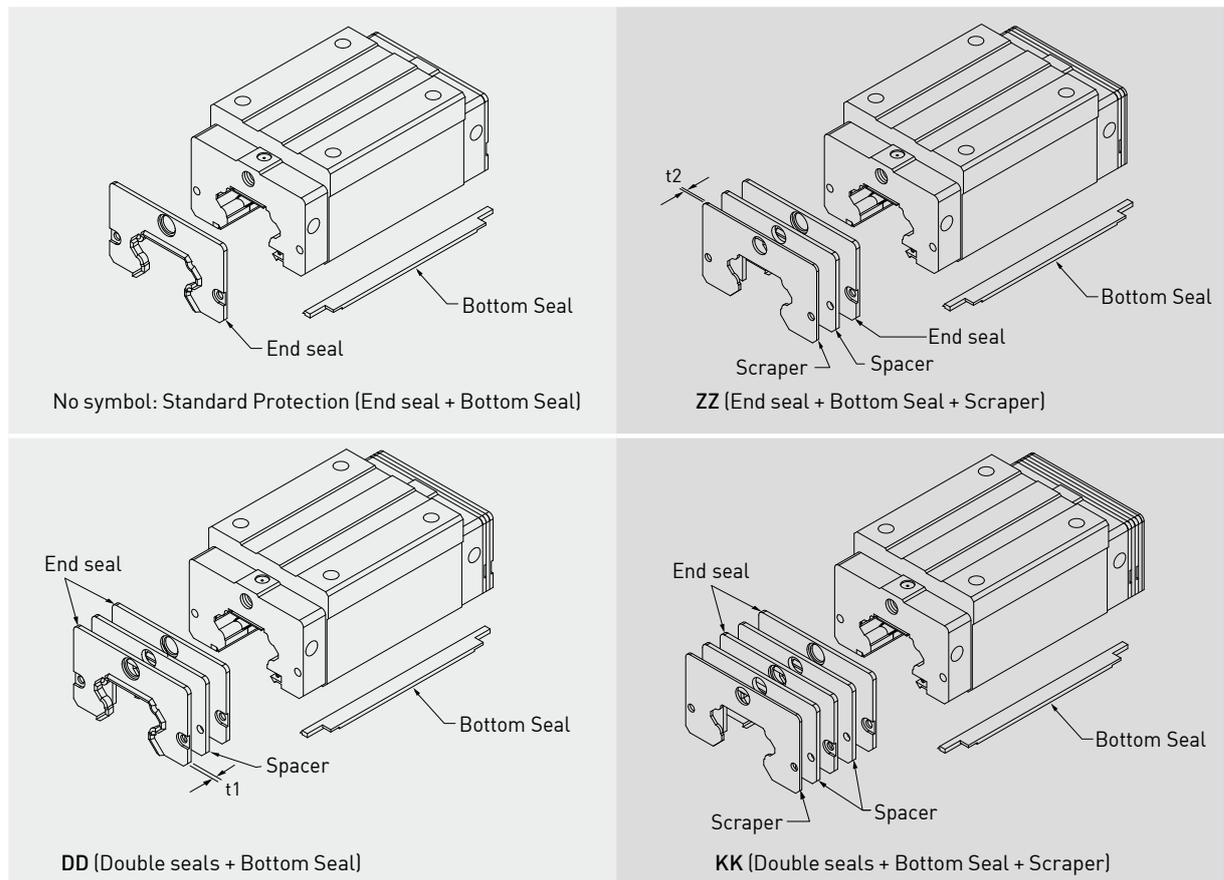
| Size  | O-Ring   |          | Lube hole at top: max. permissible depth for piercing |
|-------|----------|----------|---|
|       | do (mm)  | W (mm)   | T <sub>max</sub> (mm)                                 |
| QH 15 | 3±0.15   | 1±0.15   | 3.75  |
| QH 20 | 4.5±0.15 | 1.5±0.15 | 5.7   |
| QH 25 | 4.5±0.15 | 1.5±0.15 | 5.8   |
| QH 30 | 4.5±0.15 | 1.5±0.15 | 6.3   |
| QH 35 | 4.5±0.15 | 1.5±0.15 | 8   |
| QH 45 | 4.5±0.15 | 1.5±0.15 | 8.2   |



## 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.



## QH Series

### Heavy Load Type

#### (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 2-5-14 Dimensions of end seal

| Size    | Thickness (t1) (mm) | Size    | Thickness (t1) (mm) |
|---------|---------------------|---------|---------------------|
| QH15 ES | 3                   | QH30 ES | 3.2                 |
| QH20 ES | 2.5                 | QH35 ES | 2.5                 |
| QH25 ES | 2.5                 | QH45 ES | 3.6                 |

#### (4) Scraper

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

Table 2-5-15 Dimensions of scraper

| Size    | Thickness (t2) (mm) | Size    | Thickness (t2) (mm) |
|---------|---------------------|---------|---------------------|
| QH15 SC | 1.5                 | QH30 SC | 1.5                 |
| QH20 SC | 1.5                 | QH35 SC | 1.5                 |
| QH25 SC | 1.5                 | QH45 SC | 1.5                 |

#### (5) Dimensions of block equipped with the dustproof parts

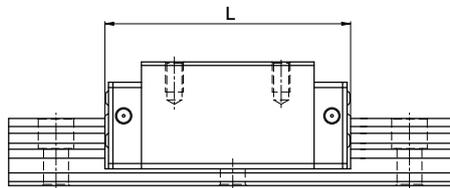


Table 2-5-16 Overall block length

unit: mm

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| QH15C | 61.4 (61.8)              | 68.4 (69.4)   | 68.0 (68.4)   | 75.0 (76.0)   |
| QH20C | 76.7 (78.9)              | 81.9 (84.5)   | 81.7 (83.9)   | 86.9 (89.5)   |
| QH20H | 91.4 (93.6)              | 96.6 (99.2)   | 96.4 (98.6)   | 101.6 (104.2) |
| QH25C | 83.4 (86.0)              | 89.4 (92.0)   | 88.4 (91.0)   | 94.4 (97.0)   |
| QH25H | 104.0 (106.6)            | 110.0 (112.6) | 109.0 (111.6) | 115.0 (117.6) |
| QH30C | 97.4 (99.4)              | 104.8 (107.4) | 104.8 (106.8) | 112.2 (114.8) |
| QH30H | 120.4 (122.4)            | 127.8 (130.4) | 127.8 (129.8) | 135.2 (137.8) |
| QH35C | 113.6 (114.4)            | 119.0 (120.0) | 118.6 (119.4) | 124.0 (125.0) |
| QH35H | 139.4 (140.2)            | 144.8 (145.8) | 144.4 (145.2) | 149.8 (150.8) |
| QH45C | 139.4 (139.4)            | 147.2 (147.2) | 146.6 (146.6) | 154.4 (154.4) |
| QH45H | 171.2 (171.2)            | 179.0 (179.0) | 178.4 (178.4) | 186.2 (186.2) |

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

## 2-5-9 Friction

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

Table 2-5-17 Seal Resistance

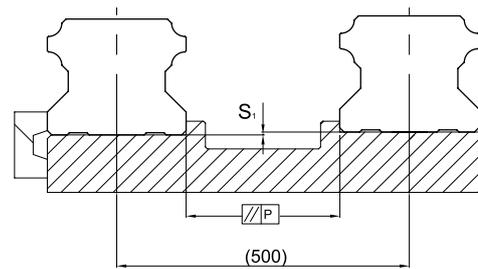
| Size | Resistance N (kgf) |
|------|--------------------|
| QH15 | 1.2 (0.12)         |
| QH20 | 1.6 (0.16)         |
| QH25 | 2.0 (0.2)          |
| QH30 | 2.7 (0.27)         |
| QH35 | 3.1 (0.31)         |
| QH45 | 5.3 (0.53)         |

## 2-5-10 The Accuracy Tolerance of Mounting Surface

### (1) The accuracy tolerance of rail-mounting surface

Because of the Circular-arc contact design, the QH 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, HIWIN 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

Table 2-5-18 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    |
|------|-----------------|----|----|
|      | Z0              | ZA | ZB |
| QH15 | 25              | 18 | -  |
| QH20 | 25              | 20 | 18 |
| QH25 | 30              | 22 | 20 |
| QH30 | 40              | 30 | 27 |
| QH35 | 50              | 35 | 30 |
| QH45 | 60              | 40 | 35 |

### (3) The accuracy tolerance of reference surface height

Table 2-5-19 Max. Tolerance of Reference Surface Height ( $S_1$ )

unit:  $\mu\text{m}$

| Size | Preload classes |     |     |
|------|-----------------|-----|-----|
|      | Z0              | ZA  | ZB  |
| QH15 | 130             | 85  | -   |
| QH20 | 130             | 85  | 50  |
| QH25 | 130             | 85  | 70  |
| QH30 | 170             | 110 | 90  |
| QH35 | 210             | 150 | 120 |
| QH45 | 250             | 170 | 140 |

Note : Tolerance is proportional to distance of two rails.

## QH Series

### Heavy Load Type

#### 2-5-11 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

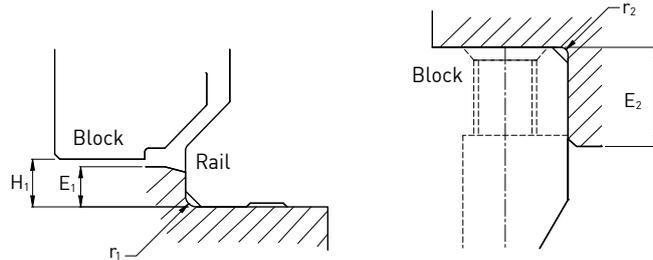


Table 2-5-20 Shoulder Heights and Fillets

| Size | Max. radius of fillets<br>$r_1$ (mm) | Max. radius of fillets<br>$r_2$ (mm) | Shoulder height beside the rail<br>$E_1$ (mm) | Shoulder height beside the block<br>$E_2$ (mm) | Clearance under block<br>$H_1$ (mm) |
|------|--------------------------------------|--------------------------------------|---|--|-------------------------------------|
| QH15 | 0.5                                  | 0.5                                  | 3.0   | 4.0  | 4.0                                 |
| QH20 | 0.5                                  | 0.5                                  | 3.5   | 5.0  | 4.6                                 |
| QH25 | 1.0                                  | 1.0                                  | 5.0   | 5.0  | 5.5                                 |
| QH30 | 1.0                                  | 1.0                                  | 5.0   | 5.0  | 6.0                                 |
| QH35 | 1.0                                  | 1.0                                  | 6.0   | 6.0  | 7.5                                 |
| QH45 | 1.0                                  | 1.0                                  | 8.0   | 8.0  | 9.2                                 |

##### (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.

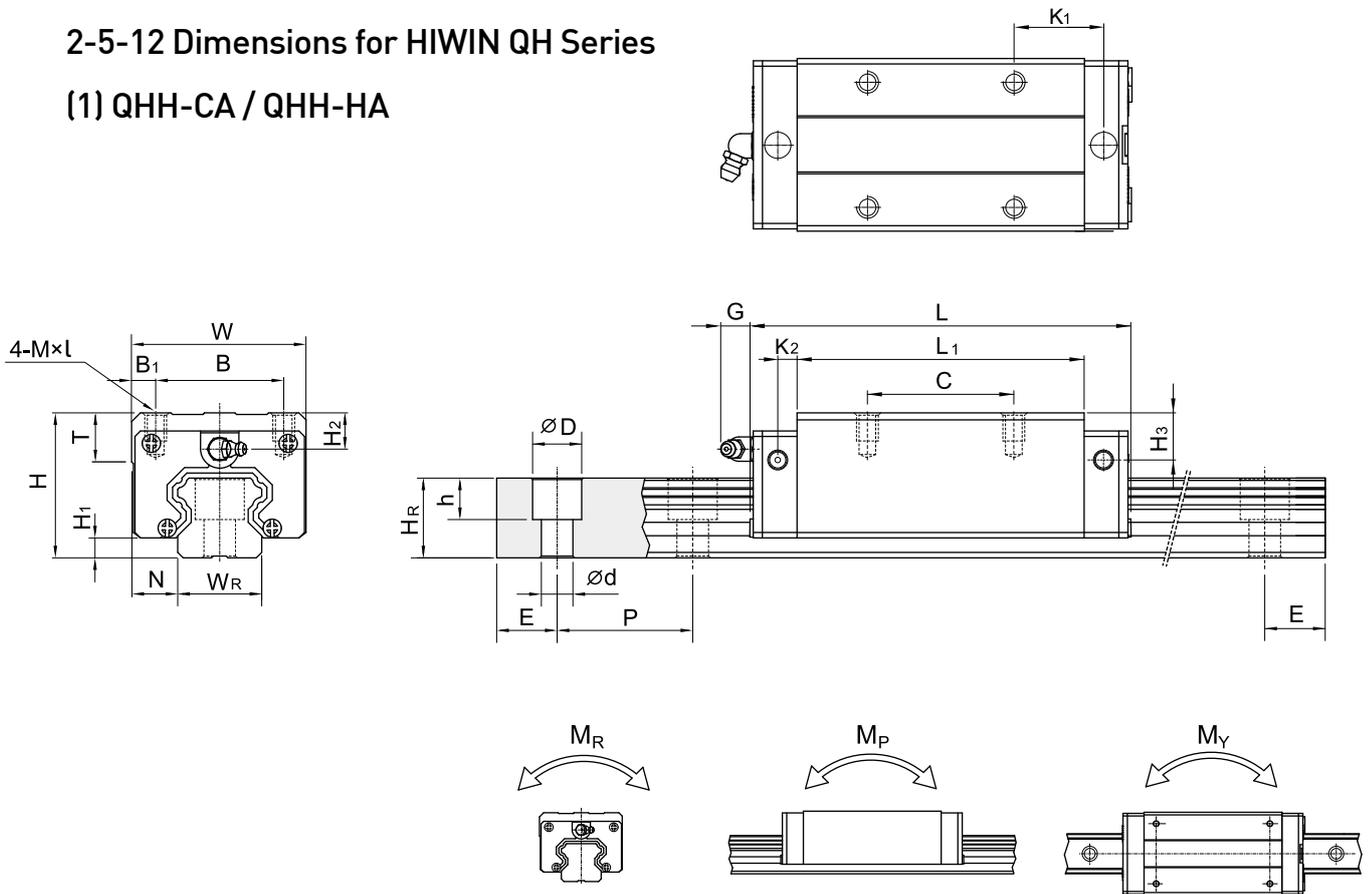
Table 2-5-21 Mounting Torque

| Size | Bolt size     | Torque N-cm(kgf-cm) |            |            |
|------|---------------|---------------------|------------|------------|
|      |               | Iron                | Casting    | Aluminum   |
| QH15 | M4×0.7P×16L   | 392 (40)            | 274 (28)   | 206 (21)   |
| QH20 | M5×0.8P×16L   | 883 (90)            | 588 (60)   | 441 (50)   |
| QH25 | M6×1P×20L     | 1373 (140)          | 921 (94)   | 686 (70)   |
| QH30 | M8×1.25P×25L  | 3041 (310)          | 2010 (205) | 1470 (150) |
| QH35 | M8×1.25P×25L  | 3041 (310)          | 2010 (205) | 1470 (150) |
| QH45 | M12×1.75P×35L | 11772 (1200)        | 7840 (800) | 5880 (600) |

Note : 1 kgf = 9.81 N

2-5-12 Dimensions for HIWIN QH Series

(1) QHH-CA / QHH-HA



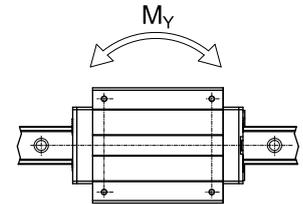
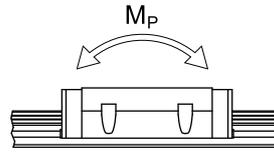
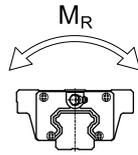
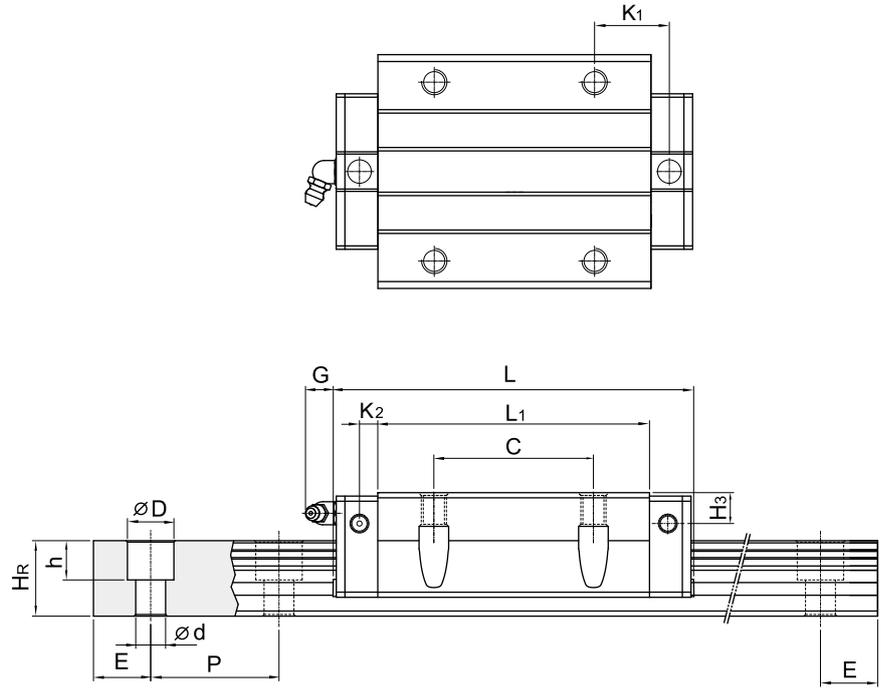
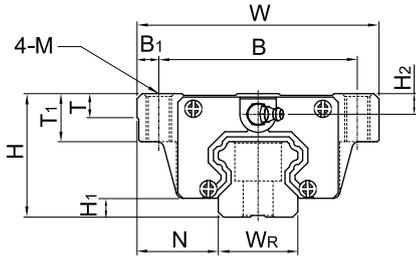
| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |    |                |    |                |       |                |                |      |        |      | Dimensions of Rail (mm) |                |                |                | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C(kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |      |        | Weight |        |                |                |                |       |       |
|-----------|-----------------------------|----------------|------|--------------------------|----|----------------|----|----------------|-------|----------------|----------------|------|--------|------|-------------------------|----------------|----------------|----------------|-----------------------------|---------------------------------|--|---------------------|------|--------|--------|--------|----------------|----------------|----------------|-------|-------|
|           | 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    | MxL    | T    | H <sub>2</sub>          | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> |                             |                                 |  | D                   | h    | d      | P      | E      | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail  |
|           | kgf                         | mm             | mm   | mm                       | mm | mm             | mm | mm             | mm    | mm             | mm             | mm   | mm     | mm   | mm                      | mm             | mm             | mm             |                             |                                 |  | mm                  | mm   | mm     | mm     | mm     | mm             | kgf            | kgf            | kgf   | kgf   |
| QHH15CA   | 28                          | 4              | 9.5  | 34                       | 26 | 4              | 26 | 39.4           | 61.4  | 10             | 5              | 5.3  | M4 x 5 | 6    | 7.95                    | 8.2            | 15             | 15             | 7.5                         | 5.3                             | 4.5  | 60                  | 20   | M4x16  | 17.94  | 19.86  | 0.10           | 0.08           | 0.08           | 0.18  | 1.45  |
| QHH20CA   | 30                          | 4.6            | 12   | 44                       | 32 | 6              | 36 | 50.5           | 76.7  | 11.75          | 6              | 12   | M5 x 6 | 8    | 6                       | 6              | 20             | 17.5           | 9.5                         | 8.5                             | 6  | 60                  | 20   | M5x16  | 30.0   | 33.86  | 0.26           | 0.19           | 0.19           | 0.29  | 2.21  |
| QHH20HA   |                             |                |      |                          |    |                | 50 | 65.2           | 91.4  | 12.1           |                |      |        |      |                         |                |                |                |                             |                                 |  |                     |      |        | 35.7   | 42.31  | 0.31           | 0.27           | 0.27           | 0.38  |       |
| QHH25CA   | 40                          | 5.5            | 12.5 | 48                       | 35 | 6.5            | 35 | 58             | 83.4  | 15.7           | 6              | 12   | M6 x 8 | 8    | 10                      | 9              | 23             | 22             | 11                          | 9                               | 7  | 60                  | 20   | M6x20  | 41.9   | 48.75  | 0.39           | 0.31           | 0.31           | 0.50  | 3.21  |
| QHH25HA   |                             |                |      |                          |    |                | 50 | 78.6           | 104   | 18.5           |                |      |        |      |                         |                |                |                |                             |                                 |  |                     |      |        | 50.61  | 60.94  | 0.50           | 0.45           | 0.45           | 0.68  |       |
| QHH30CA   | 45                          | 6              | 16   | 60                       | 40 | 10             | 40 | 70             | 97.4  | 19.5           | 6.25           | 12   | M8x10  | 8.5  | 9.5                     | 9              | 28             | 26             | 14                          | 12                              | 9  | 80                  | 20   | M8x25  | 58.26  | 66.34  | 0.60           | 0.5            | 0.50           | 0.87  | 4.47  |
| QHH30HA   |                             |                |      |                          |    |                | 60 | 93             | 120.4 | 21.75          |                |      |        |      |                         |                |                |                |                             |                                 |  |                     |      |        | 70.32  | 88.45  | 0.83           | 0.89           | 0.89           | 1.15  |       |
| QHH35CA   | 55                          | 7.5            | 18   | 70                       | 50 | 10             | 50 | 80             | 113.6 | 19             | 7.5            | 12   | M8x12  | 10.2 | 15.5                    | 13.5           | 34             | 29             | 14                          | 12                              | 9  | 80                  | 20   | M8x25  | 78.89  | 86.66  | 1.07           | 0.76           | 0.76           | 1.44  | 6.30  |
| QHH35HA   |                             |                |      |                          |    |                | 72 | 105.8          | 139.4 | 20.9           |                |      |        |      |                         |                |                |                |                             |                                 |  |                     |      |        | 95.23  | 115.55 | 1.45           | 1.33           | 1.33           | 1.90  |       |
| QHH45CA   | 70                          | 9.2            | 20.5 | 86                       | 60 | 13             | 60 | 97             | 139.4 | 23             | 10             | 12.9 | M10x17 | 16   | 18.5                    | 20             | 45             | 38             | 20                          | 17                              | 14   | 105                 | 22.5 | M12x35 | 119.4  | 135.42 | 1.83           | 1.38           | 1.38           | 2.72  | 10.41 |
| QHH45HA   |                             |                |      |                          |    |                | 80 | 128.8          | 171.2 | 29.09          |                |      |        |      |                         |                |                |                |                             |                                 |  |                     |      |        | 144.13 | 180.56 | 2.47           | 2.41           | 2.41           | 3.59  |       |

Note : 1 kgf = 9.81 N

# QH Series

## Heavy Load Type

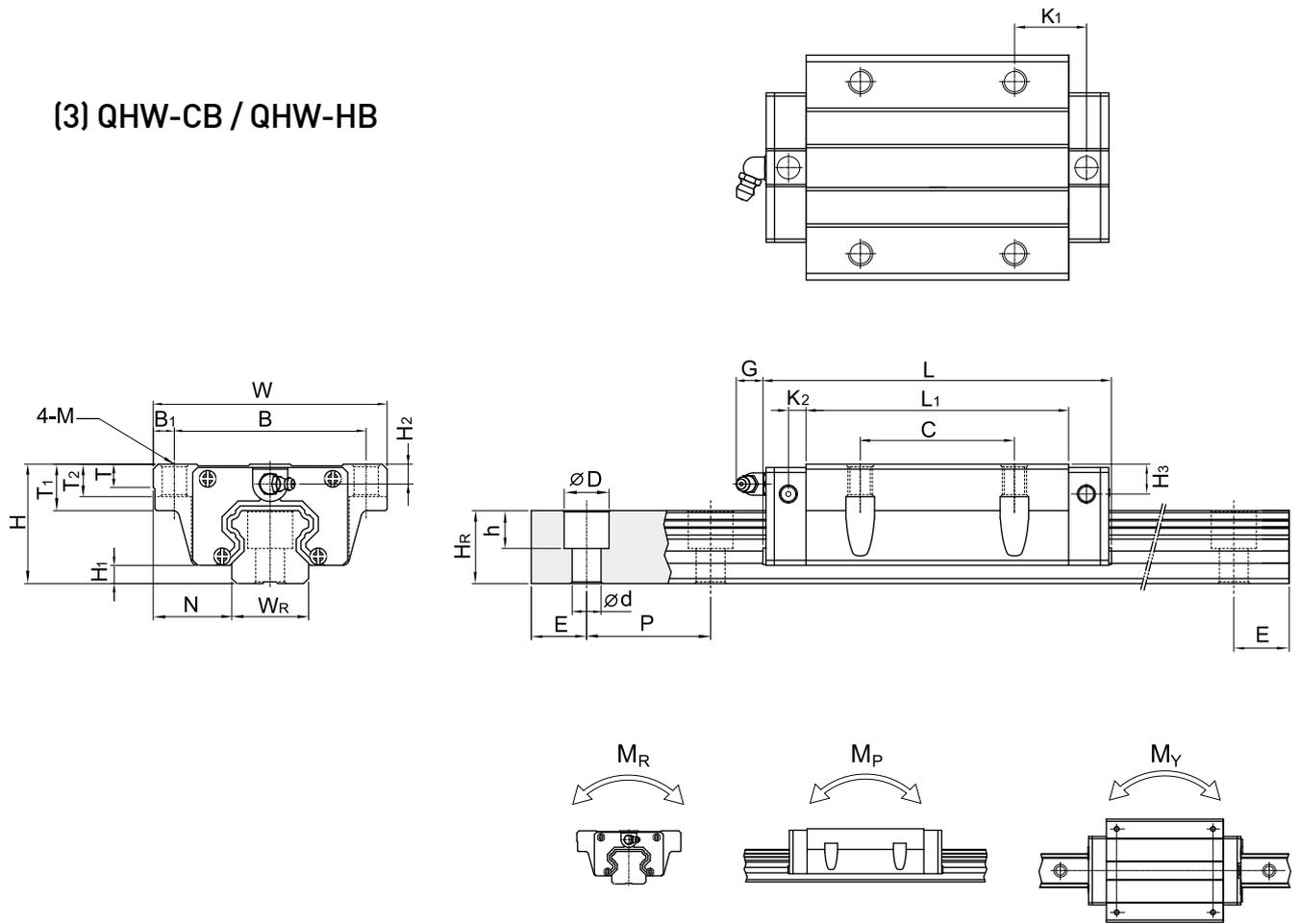
(2) QHW-CA / QHW-HA



| 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 C <sub>0</sub> (kN) | Static Rated Moment |        |                | Weight         |                |       |       |      |  |
|-----------|-----------------------------|----------------|--------------------------|-----|-----|----------------|----|----------------|-------|----------------|----------------|------|-----|------|----------------|----------------|-------------------------|----------------|----------------|-----|-----|-----|-----------------------------|----------------------------------|--|---------------------|--------|----------------|----------------|----------------|-------|-------|------|--|
|           | 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    | 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      | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail  |      |  |
|           | kgf                         | mm             | mm                       | mm  | mm  | mm             | mm | mm             | mm    | mm             | mm             | mm   | mm  | mm   | mm             | mm             | mm                      | mm             | mm             | mm  | mm  | mm  |                             |                                  |  | mm                  | mm     | mm             | kN-m           | kN-m           | kN-m  | kg    | kg/m |  |
| QHW15CA   | 24                          | 4              | 16                       | 47  | 38  | 4.5            | 30 | 39.4           | 61.4  | 8              | 5              | 5.3  | M5  | 6    | 8.9            | 3.95           | 4.2                     | 15             | 15             | 7.5 | 5.3 | 4.5 | 60                          | 20                               | M4x16  | 17.94               | 19.86  | 0.1            | 0.08           | 0.08           | 0.17  | 1.45  |      |  |
| QHW20CA   | 30                          | 4.6            | 21.5                     | 63  | 53  | 5              | 40 | 50.5           | 76.7  | 9.75           | 6              | 12   | M6  | 8    | 10             | 6              | 6                       | 20             | 17.5           | 9.5 | 8.5 | 6   | 60                          | 20                               | M5x16  | 30.0                | 33.86  | 0.26           | 0.19           | 0.19           | 0.40  | 2.21  |      |  |
| QHW20HA   |                             |                |                          |     |     |                |    | 65.2           | 91.4  | 17.1           |                |      |     |      |                |                |                         |                |                |     |     |     |                             |                                  |  |                     |        |                |                |                |       |       |      |  |
| QHW25CA   | 36                          | 5.5            | 23.5                     | 70  | 57  | 6.5            | 45 | 58             | 83.4  | 10.7           | 6              | 12   | M8  | 8    | 14             | 6              | 5                       | 23             | 22             | 11  | 9   | 7   | 60                          | 20                               | M6x20  | 41.9                | 48.75  | 0.39           | 0.31           | 0.31           | 0.59  | 3.21  |      |  |
| QHW25HA   |                             |                |                          |     |     |                |    | 78.6           | 104   | 21             |                |      |     |      |                |                |                         |                |                |     |     |     |                             |                                  |  |                     |        |                |                |                |       |       |      |  |
| QHW30CA   | 42                          | 6              | 31                       | 90  | 72  | 9              | 52 | 70             | 97.4  | 13.5           | 6.25           | 12   | M10 | 8.5  | 16             | 6.5            | 6                       | 28             | 26             | 14  | 12  | 9   | 80                          | 20                               | M8x25  | 58.26               | 66.34  | 0.6            | 0.5            | 0.5            | 1.09  | 4.47  |      |  |
| QHW30HA   |                             |                |                          |     |     |                |    | 93             | 120.4 | 25.75          |                |      |     |      |                |                |                         |                |                |     |     |     |                             |                                  |  |                     |        |                |                |                |       |       |      |  |
| QHW35CA   | 48                          | 7.5            | 33                       | 100 | 82  | 9              | 62 | 80             | 113.6 | 13             | 7.5            | 12   | M10 | 10.1 | 18             | 8.5            | 6.5                     | 34             | 29             | 14  | 12  | 9   | 80                          | 20                               | M8x25  | 78.89               | 86.66  | 1.07           | 0.76           | 0.76           | 1.56  | 6.30  |      |  |
| QHW35HA   |                             |                |                          |     |     |                |    | 105.8          | 139.4 | 25.9           |                |      |     |      |                |                |                         |                |                |     |     |     |                             |                                  |  |                     |        |                |                |                |       |       |      |  |
| QHW45CA   | 60                          | 9.2            | 37.5                     | 120 | 100 | 10             | 80 | 97             | 139.4 | 13             | 10             | 12.9 | M12 | 15.1 | 22             | 8.5            | 10                      | 45             | 38             | 20  | 17  | 14  | 105                         | 22.5                             | M12x35                                       | 119.4               | 135.42 | 1.83           | 1.38           | 1.38           | 2.79  | 10.41 |      |  |
| QHW45HA   |                             |                |                          |     |     |                |    | 128.8          | 171.2 | 28.9           |                |      |     |      |                |                |                         |                |                |     |     |     |                             |                                  |  |                     |        |                |                |                |       |       |      |  |

Note : 1 kgf = 9.81 N

(3) QHW-CB / QHW-HB



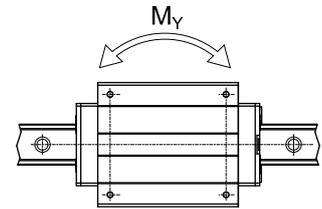
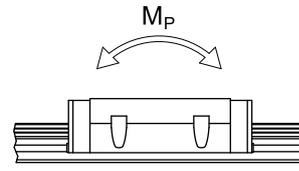
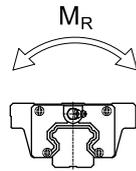
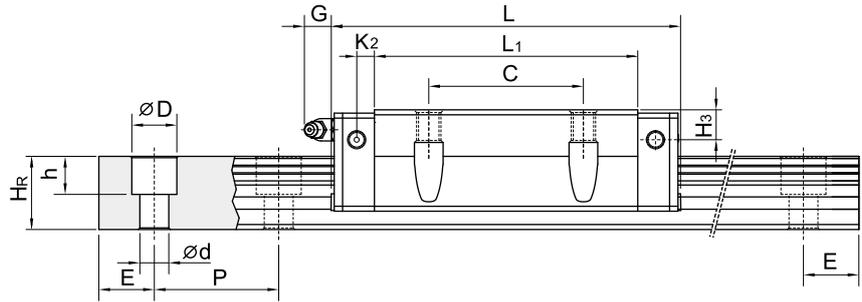
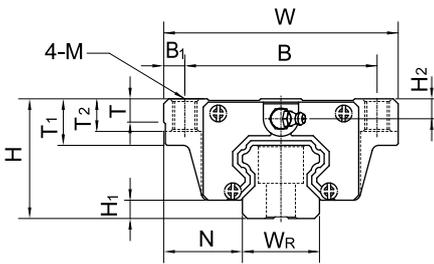
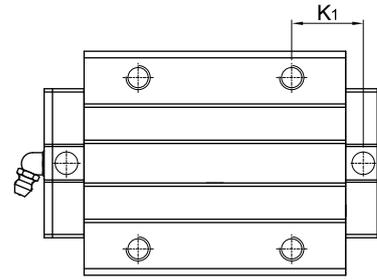
| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |     |     |                |    |                |       |                |                |      |      |      |                |                | Dimensions of Rail (mm) |                |                |                |     | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |        |       | Weight |                |                |                |       |       |
|-----------|-----------------------------|----------------|--------------------------|-----|-----|----------------|----|----------------|-------|----------------|----------------|------|------|------|----------------|----------------|-------------------------|----------------|----------------|----------------|-----|-----------------------------|----------------------------------|--|---------------------|--------|-------|--------|----------------|----------------|----------------|-------|-------|
|           | 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    | M    | T    | T <sub>1</sub> | T <sub>2</sub> | H <sub>2</sub>          | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> | D   |                             |                                  |  | h                   | d      | P     | E      | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail  |
|           | kg                          | kg             | kg                       | kg  | kg  | kg             | kg | kg             | kg    | kg             | kg             | kg   | kg   | kg   | kg             | kg             | kg                      | kg             | kg             | kg             | kg  |                             |                                  |  | kg                  | kg     | kg    | kg     | kg             | kg             | kg             | kg    | kg    |
| QHW15CB   | 24                          | 4              | 16                       | 47  | 38  | 4.5            | 30 | 39.4           | 61.4  | 8              | 5              | 5.3  | 04.5 | 6    | 8.9            | 6.95           | 3.95                    | 4.2            | 15             | 15             | 7.5 | 5.3                         | 4.5                              | 60   | 20                  | M4x16  | 17.94 | 19.86  | 0.1            | 0.08           | 0.08           | 0.17  | 1.45  |
| QHW20CB   | 30                          | 4.6            | 21.5                     | 63  | 53  | 5              | 40 | 50.5           | 76.7  | 9.75           | 6              | 12   | 06   | 8    | 10             | 9.5            | 6                       | 6              | 20             | 17.5           | 9.5 | 8.5                         | 6                                | 60   | 20                  | M5x16  | 30.0  | 33.86  | 0.26           | 0.19           | 0.19           | 0.40  | 2.21  |
| QHW20HB   |                             |                |                          |     |     |                |    | 65.2           | 91.4  | 17.1           |                |      |      |      |                |                |                         |                |                |                |     |                             |                                  |  |                     |        |       |        |                |                |                |       |       |
| QHW25CB   | 36                          | 5.5            | 23.5                     | 70  | 57  | 6.5            | 45 | 58             | 83.4  | 10.7           | 6              | 12   | 07   | 8    | 14             | 10             | 6                       | 5              | 23             | 22             | 11  | 9                           | 7                                | 60   | 20                  | M6x20  | 41.9  | 48.75  | 0.39           | 0.31           | 0.31           | 0.59  | 3.21  |
| QHW25HB   |                             |                |                          |     |     |                |    | 78.6           | 104   | 21             |                |      |      |      |                |                |                         |                |                |                |     |                             |                                  |  |                     |        |       |        |                |                |                |       |       |
| QHW30CB   | 42                          | 6              | 31                       | 90  | 72  | 9              | 52 | 70             | 97.4  | 13.5           | 6.25           | 12   | 09   | 8.5  | 16             | 10             | 6.5                     | 6              | 28             | 26             | 14  | 12                          | 9                                | 80   | 20                  | M8x25  | 58.26 | 66.34  | 0.6            | 0.5            | 0.5            | 1.09  | 4.47  |
| QHW30HB   |                             |                |                          |     |     |                |    | 93             | 120.4 | 25.75          |                |      |      |      |                |                |                         |                |                |                |     |                             |                                  |  |                     |        |       |        |                |                |                |       |       |
| QHW35CB   | 48                          | 7.5            | 33                       | 100 | 82  | 9              | 62 | 80             | 113.6 | 13             | 7.5            | 12   | 09   | 10.1 | 18             | 13             | 8.5                     | 6.5            | 34             | 29             | 14  | 12                          | 9                                | 80   | 20                  | M8x25  | 78.89 | 86.66  | 1.07           | 0.76           | 0.76           | 1.56  | 6.30  |
| QHW35HB   |                             |                |                          |     |     |                |    | 105.8          | 139.4 | 25.9           |                |      |      |      |                |                |                         |                |                |                |     |                             |                                  |  |                     |        |       |        |                |                |                |       |       |
| QHW45CB   | 60                          | 9.2            | 37.5                     | 120 | 100 | 10             | 80 | 97             | 139.4 | 13             | 10             | 12.9 | 011  | 15.1 | 22             | 15             | 8.5                     | 10             | 45             | 38             | 20  | 17                          | 14                               | 105  | 22.5                | M12x35 | 119.4 | 135.42 | 1.83           | 1.38           | 1.38           | 2.79  | 10.41 |
| QHW45HB   |                             |                |                          |     |     |                |    | 128.8          | 171.2 | 28.9           |                |      |      |      |                |                |                         |                |                |                |     |                             |                                  |  |                     |        |       |        |                |                |                |       |       |

Note : 1 kgf = 9.81 N

# QH Series

## Heavy Load Type

### (4) QHW-CC / QHW-HC



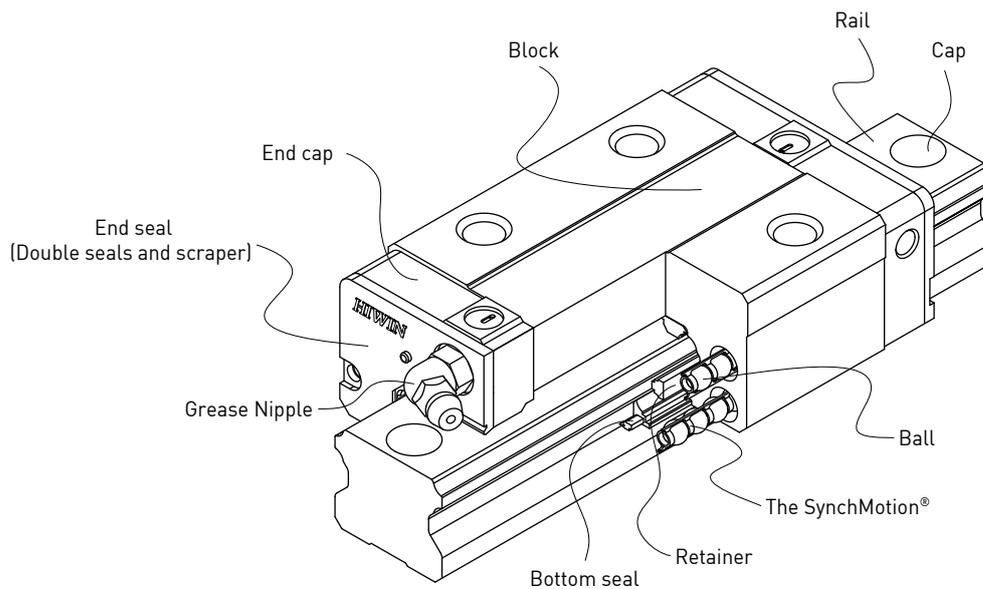
| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |     |     |                |    |                |       |                |                |      |     |      |                | Dimensions of Rail (mm) |                |                |                |                | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |      |        | Weight |        |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|--------------------------|-----|-----|----------------|----|----------------|-------|----------------|----------------|------|-----|------|----------------|-------------------------|----------------|----------------|----------------|----------------|-----------------------------|----------------------------------|--|---------------------|------|--------|--------|--------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | M   | T    | T <sub>1</sub> | T <sub>2</sub>          | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> |                             |                                  |  | D                   | h    | d      | P      | E      | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
| QHW15CC   | 24                          | 4              | 16                       | 47  | 38  | 4.5            | 30 | 39.4           | 61.4  | 8              | 5              | 5.3  | M5  | 6    | 8.9            | 6.95                    | 3.95           | 4.2            | 15             | 15             | 7.5                         | 5.3                              | 4.5  | 60                  | 20   | M4x16  | 17.94  | 19.86  | 0.1                   | 0.08                  | 0.08                  | 0.17       | 1.45        |
| QHW20CC   | 30                          | 4.6            | 21.5                     | 63  | 53  | 5              | 40 | 50.5           | 76.7  | 9.75           | 6              | 12   | M6  | 8    | 10             | 9.5                     | 6              | 6              | 20             | 17.5           | 9.5                         | 8.5                              | 6  | 60                  | 20   | M5x16  | 30.0   | 33.86  | 0.26                  | 0.19                  | 0.19                  | 0.40       | 2.21        |
| QHW20HC   |                             |                |                          |     |     |                |    | 65.2           | 91.4  | 17.1           |                |      |     |      |                |                         |                |                |                |                |                             |                                  |  |                     |      |        |        |        |                       |                       |                       |            |             |
| QHW25CC   | 36                          | 5.5            | 23.5                     | 70  | 57  | 6.5            | 45 | 58             | 83.4  | 10.7           | 6              | 12   | M8  | 8    | 14             | 10                      | 6              | 5              | 23             | 22             | 11                          | 9                                | 7  | 60                  | 20   | M6x20  | 41.9   | 48.75  | 0.39                  | 0.31                  | 0.31                  | 0.59       | 3.21        |
| QHW25HC   |                             |                |                          |     |     |                |    | 78.6           | 104   | 21             |                |      |     |      |                |                         |                |                |                |                |                             |                                  |  |                     |      |        |        |        |                       |                       |                       |            |             |
| QHW30CC   | 42                          | 6              | 31                       | 90  | 72  | 9              | 52 | 70             | 97.4  | 13.5           | 6.25           | 12   | M10 | 8.5  | 16             | 10                      | 6.5            | 6              | 28             | 26             | 14                          | 12                               | 9  | 80                  | 20   | M8x25  | 58.26  | 66.34  | 0.6                   | 0.5                   | 0.5                   | 1.09       | 4.47        |
| QHW30HC   |                             |                |                          |     |     |                |    | 93             | 120.4 | 25.75          |                |      |     |      |                |                         |                |                |                |                |                             |                                  |  |                     |      |        |        |        |                       |                       |                       |            |             |
| QHW35CC   | 48                          | 7.5            | 33                       | 100 | 82  | 9              | 62 | 80             | 113.6 | 13             | 7.5            | 12   | M10 | 10.1 | 18             | 13                      | 8.5            | 6.5            | 34             | 29             | 14                          | 12                               | 9  | 80                  | 20   | M8x25  | 78.89  | 86.66  | 1.07                  | 0.76                  | 0.76                  | 1.56       | 6.30        |
| QHW35HC   |                             |                |                          |     |     |                |    | 105.8          | 139.4 | 25.9           |                |      |     |      |                |                         |                |                |                |                |                             |                                  |  |                     |      |        |        |        |                       |                       |                       |            |             |
| QHW45CC   | 60                          | 9.2            | 37.5                     | 120 | 100 | 10             | 80 | 97             | 139.4 | 13             | 10             | 12.9 | M12 | 15.1 | 22             | 15                      | 8.5            | 10             | 45             | 38             | 20                          | 17                               | 14   | 105                 | 22.5 | M12x35 | 119.4  | 135.42 | 1.83                  | 1.38                  | 1.38                  | 2.79       | 10.41       |
| QHW45HC   |                             |                |                          |     |     |                |    | 128.8          | 171.2 | 28.9           |                |      |     |      |                |                         |                |                |                |                |                             |                                  |  |                     |      |        |        |        |                       |                       |                       |            |             |

Note : 1 kgf = 9.81 N

## 2-6 QE Series – Low Profile Linear Guideway, with SynchMotion® Technology

The development of QE linear guideway is based on a four-row circular-arc contact. The QE series linear guideway with SynchMotion® Technology offers smooth movement, superior lubrication, quieter operation and longer running life. Therefore the QE linear guideway has broad industrial applicability. In the high-tech industry where high speed, low noise, and reduced dust generation is required, the QE series is interchangeable with the EG series.

### 2-6-1 Construction



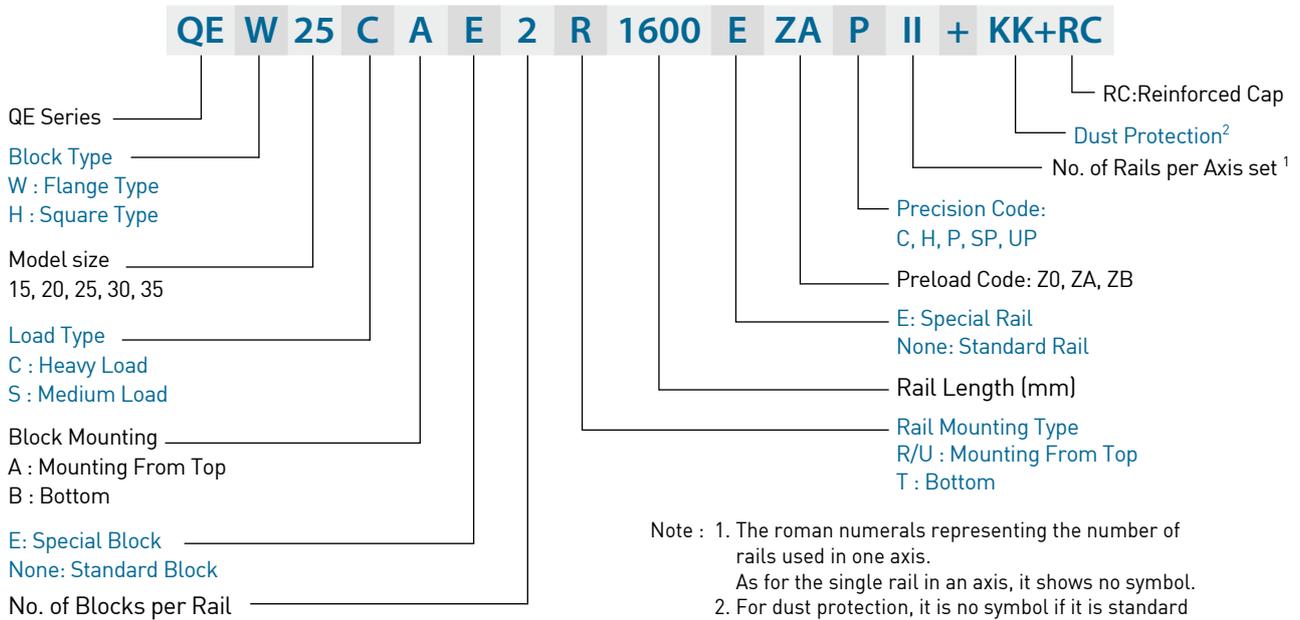
### 2-6-2 Model Number of QE Series

QE series guideway can be classified into non-interchangeable and interchangeable types. The sizes are identical. The main difference is that the interchangeable blocks and rails can be freely exchanged. Because of dimensional control, the interchangeable type linear guideway is a perfect choice for the client when rails do not need to be paired for an axis. And since the QE and EG share the identical rails, the customer does not need to redesign when choosing the QE series. Therefore the QE linear guideway has increased applicability.

# QE Series

## Low Profile

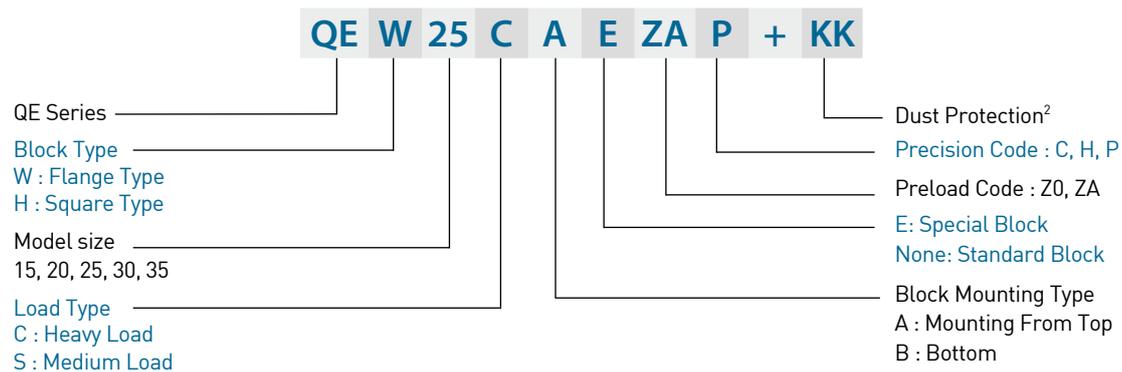
### (1) Non-interchangeable type



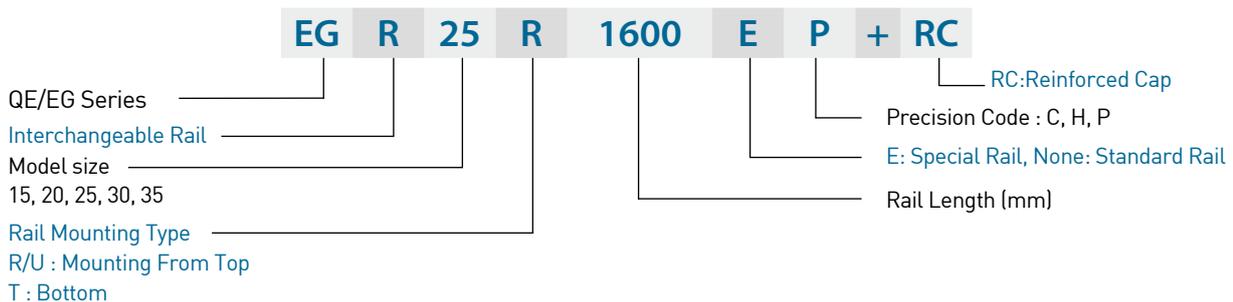
Note : 1. The roman numerals representing the number of rails used in one axis.  
As for the single rail in an axis, it shows no symbol.  
2. For dust protection, it is no symbol if it is standard (end seal and bottom seal).  
ZZ : End seal, bottom seal and scraper.  
KK : Double seals, bottom seal and scraper.  
DD : Double seals and bottom seal.

### (2) Interchangeable type

○ Model Number of QE Block



○ Model Number of QE Rail (QE and EG share the identical rails)

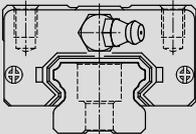
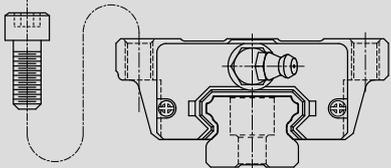
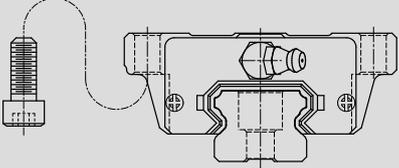


## 2-6-3 Types

### (1) Block types

HIWIN offers two types of linear guideways, flange and square types.

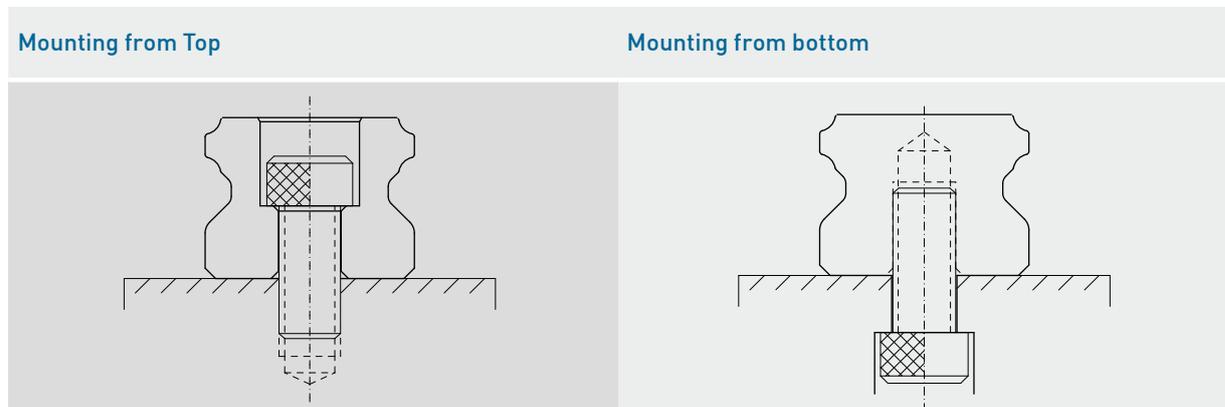
Table 2-6-1 Block Type

| Type   | Model            | Shape   | Height<br>(mm) | Rail<br>Length<br>(mm) | Main Applications   |
|--------|------------------|---|----------------|------------------------|---|
| Square | QEH-SA<br>QEH-CA |    | 24             | 100                    | <ul style="list-style-type: none"> <li>○ Automation devices</li> <li>○ High-speed transportation equipment</li> <li>○ Precision measuring equipment</li> <li>○ Semiconductor manufacturing equipment</li> </ul> |
|        |                  |   | ↓              | ↓                      |   |
| 48     | 4000             |   |                |                        |   |
| Flange | QEW-SA<br>QEW-CA |   | 24             | 100                    |   |
|        |                  |   | ↓              | ↓                      |   |
|        | 48               | 4000  |                |                        |   |
|        | QEW-SB<br>QEW-CB |  | 24             | 100                    |   |
| ↓      |                  |   | ↓              |                        |   |
| 48     | 4000             |   |                |                        |   |

### (2) Rail types

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

Table 2-6-2 Rail Types

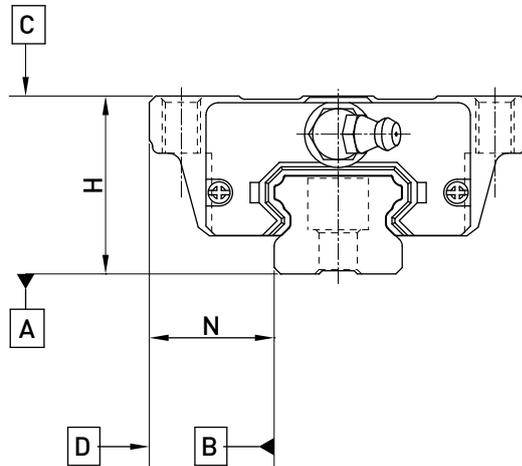


## QE Series

### Low Profile

#### 2-6-4 Accuracy

The accuracy of the QE series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



#### (1) Accuracy of non-interchangeable guideways

Table 2-6-3 Accuracy Standards

Unit: mm

| Item  | QE - 15, 20     |             |                  |                            |                            |
|---|-----------------|-------------|------------------|----------------------------|----------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015               | 0<br>- 0.008               |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015               | 0<br>- 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 2-6-7 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-6-7 |             |                  |                            |                            |

Table 2-6-4 Accuracy Standards

Unit: mm

| Item  | QE - 25, 30, 35 |             |                  |                            |                            |
|---|-----------------|-------------|------------------|----------------------------|----------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super<br>Precision<br>(SP) | Ultra<br>Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02                | 0<br>- 0.01                |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02                | 0<br>- 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 2-6-7 |             |                  |                            |                            |
| Running parallelism of block surface D to surface B | See Table 2-6-7 |             |                  |                            |                            |

## (2) Accuracy of interchangeable guideways

Table 2-6-5 Accuracy Standards

Unit: mm

| Item  | QE - 15, 20     |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03   | ± 0.015       |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03   | ± 0.015       |
| Variation of height H                               | 0.02            | 0.01     | 0.006         |
| Variation of width N                                | 0.02            | 0.01     | 0.006         |
| Running parallelism of block surface C to surface A | See Table 2-6-7 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-6-7 |          |               |

Table 2-6-6 Accuracy Standards

Unit: mm

| Item  | QE - 25, 30, 35 |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.04   | ± 0.02        |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.04   | ± 0.02        |
| Variation of height H                               | 0.02            | 0.015    | 0.007         |
| Variation of width N                                | 0.03            | 0.015    | 0.007         |
| Running parallelism of block surface C to surface A | See Table 2-6-7 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-6-7 |          |               |

## (3) Accuracy of running parallelism

Table 2-6-7 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  |

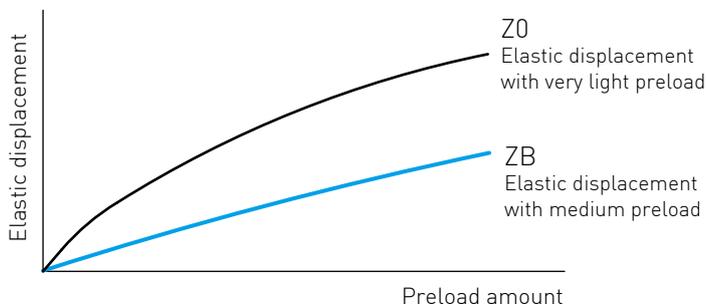
## QE Series

### Low Profile

#### 2-6-5 Preload

##### (1) Definition

A preload can be applied to each guideway. Generally, a linear motion guideway has a negative clearance between the groove and balls in order to improve stiffness and maintain high precision. The figure shows that adding a preload can improve stiffness of the linear guideway. A preload no greater than ZA would be recommended for model sizes smaller than QE20. This will avoid an over-loaded condition that would affect guideway life.



##### (2) Preload classes

HIWIN offers three standard preloads for various applications and conditions.

Table 2-6-8 Preload Classes

| Class              | Code | Preload      | Condition  |
|--------------------|------|--------------|--|
| Very Light Preload | Z0   | 0~ 0.02C     | Certain load direction, low impact, low precision required |
| Light Preload      | ZA   | 0.03C~0.05C  | low load and high precision required                       |
| Medium Preload     | ZB   | 0.06C~ 0.08C | High rigidity required, with vibration and impact          |

| 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.

#### 2-6-6 Mounting location

The standard location of the grease fitting is at both ends of the block, the nipple may be mounted in the side or top of the block. For lateral installation, we recommend that the nipple be mounted to the non-reference side, otherwise please contact us. When lubricating from above, in the recess for the O-ring, a smaller, preformed recess can be found. Preheat the 0.8 mm diameter metal tip. Carefully open the small recess with the metal tip and pierce through it. Insert a round sealing ring into the recess. (The round sealing ring is not supplied with the block) Do not open the small recess with a drill bit this may introduce the danger of contamination. It is possible to carry out the lubrication by using the oil-piping joint.

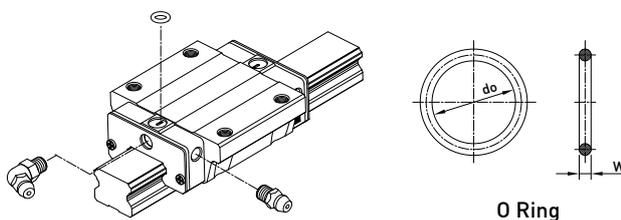


Table 2-6-9 O-Ring size and max. permissible depth for piercing

| Size  | O-Ring   |          | Lube hole at top:<br>max. permissible depth<br>for piercing |
|-------|----------|----------|---|
|       | do(mm)   | W (mm)   | T <sub>max</sub> (mm)                                       |
| QE 15 | 2.5±0.15 | 1.5±0.15 | 5.3   |
| QE 20 | 4.5±0.15 | 1.5±0.15 | 5.8   |
| QE 25 | 3±0.15   | 2.5±0.15 | 7   |
| QE 30 | 4.5±0.15 | 1.5±0.15 | 7.8   |
| QE 35 | 4.5±0.15 | 1.5±0.15 | 8.3   |

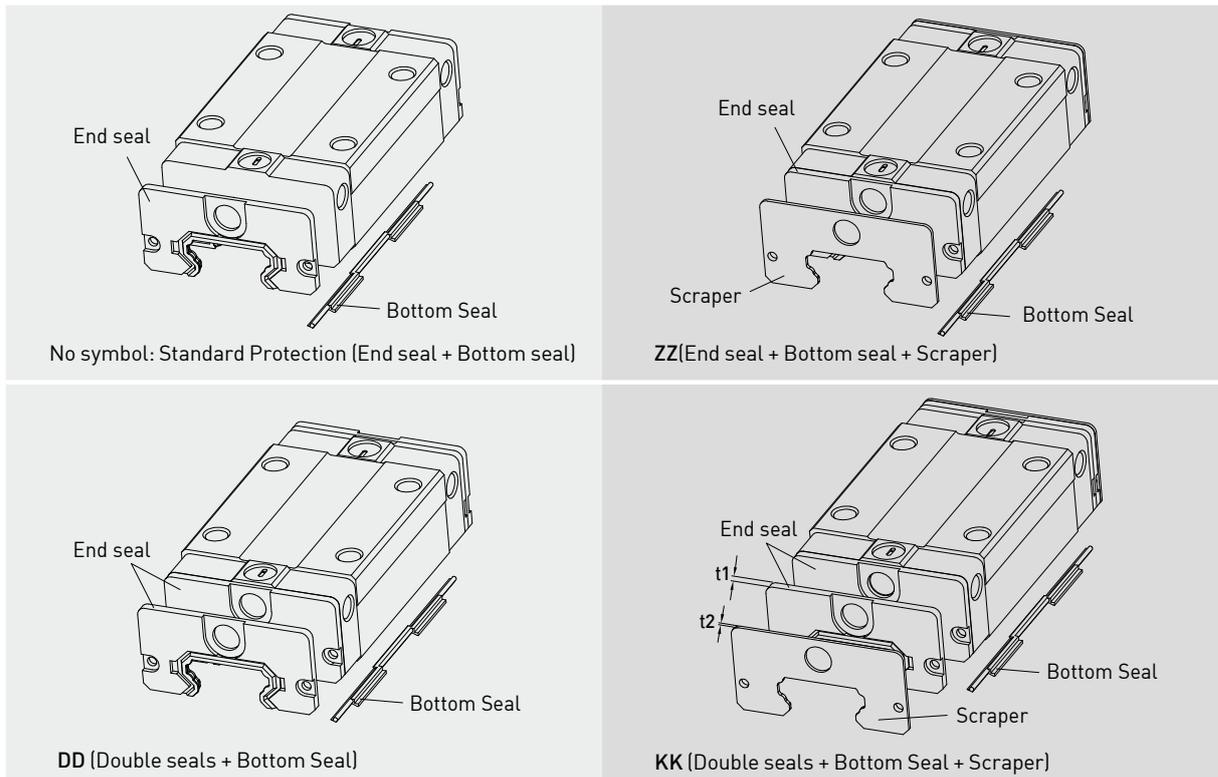
  

The diagram shows a cross-section of the linear guideway block with a lube hole at the top. A vertical arrow indicates the diameter of the hole is 'dia.0.8'. A horizontal arrow indicates the maximum permissible depth for piercing is 'T<sub>max</sub>'.

## 2-6-7 Dust Protection Equipment

### (1) Codes of equipment

If the following equipment is needed, please indicate the code followed by the model number.



### (2) End seal and bottom seal

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

### (3) Double seals

Removes foreign matter from the rail preventing contaminants from entering the block.

Table 2-6-10 Dimensions of end seal

| Size    | Thickness (t1) (mm) | Size    | Thickness (t1) (mm) |
|---------|---------------------|---------|---------------------|
| QE15 ES | 2                   | QE30 ES | 2.5                 |
| QE20 ES | 2                   | QE35 ES | 2                   |
| QE25 ES | 2.5                 |         |                     |

### (4) Scraper

Clears larger contaminants, such as weld spatter and metal cuttings, from the rail. Metal scraper protects end seals from excessive damage.

Table 2-6-11 Dimensions of Scraper

| Size    | Thickness (t2) (mm) | Size    | Thickness (t2) (mm) |
|---------|---------------------|---------|---------------------|
| QE15 SC | 1                   | QE30 SC | 1                   |
| QE20 SC | 1                   | QE35 SC | 1.5                 |
| QE25 SC | 1                   |         |                     |

## QE Series

### Low Profile

#### (5) Dimensions of block equipped with the dustproof parts

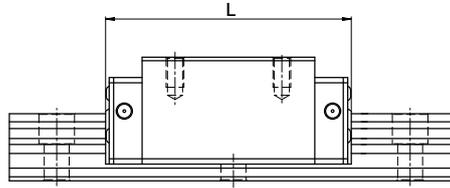


Table 2-6-12 Overall block length

unit: mm

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| QE15S | 40.1 (42.9)              | 42.1 (46.5)   | 44.1 (46.9)   | 46.1 (50.5)   |
| QE15C | 56.8 (59.6)              | 58.8 (63.2)   | 60.8 (63.6)   | 62.8 (67.2)   |
| QE20S | 50.0 (54.0)              | 52.0 (58.0)   | 54.0 (58.0)   | 56.0 (62.0)   |
| QE20C | 69.1 (73.1)              | 71.1 (77.1)   | 73.1 (77.1)   | 75.1 (81.1)   |
| QE25S | 60.1 (63.5)              | 62.1 (68.1)   | 65.1 (68.5)   | 67.1 (73.1)   |
| QE25C | 83.6 (87.0)              | 85.6 (91.6)   | 88.6 (92.0)   | 90.6 (96.6)   |
| QE30S | 67.5 (71.3)              | 69.5 (75.5)   | 72.5 (76.3)   | 74.5 (80.5)   |
| QE30C | 96.1 (99.9)              | 98.1 (104.1)  | 101.1 (104.9) | 103.1 (109.1) |
| QE35S | 76.0 (80.0)              | 79.0 (85.0)   | 80.0 (84.0)   | 83.0 (89.0)   |
| QE35C | 108.0 (112)              | 111.0 (117.0) | 112.0 (116.0) | 115.0 (121.0) |

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

### 2-6-8 Friction

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

Table 2-6-13 Seal Resistance

| Size | Resistance N (kgf) | Size | Resistance N (kgf) |
|------|--------------------|------|--------------------|
| QE15 | 1.08 (0.11)        | QE30 | 2.06 (0.21)        |
| QE20 | 1.37 (0.14)        | QE35 | 2.26 (0.23)        |
| QE25 | 1.67 (0.17)        |      |                    |

Note: 1kgf=9.81N

### 2-6-9 Mounting Surface Accuracy Tolerance

Because of the circular-arc contact design, the QE linear guideway can withstand surface-error installation and deliver smooth linear motion. When the mounting surface meets the accuracy requirements of the installation, the high accuracy and rigidity of the guideway will be obtained without any difficulty. For faster installation and smoother movement, HIWIN offers a preload with normal clearance because of its ability to absorb higher deviations in mounting surface inaccuracies.

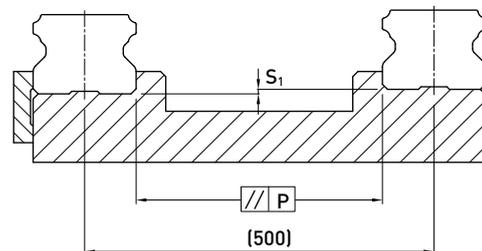


Table 2-6-14 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    | Size | Preload classes |    |    |
|------|-----------------|----|----|------|-----------------|----|----|
|      | Z0              | ZA | ZB |      | Z0              | ZA | ZB |
| QE15 | 25              | 18 | -  | QE30 | 40              | 30 | 27 |
| QE20 | 25              | 20 | 18 | QE35 | 50              | 35 | 30 |
| QE25 | 30              | 22 | 20 |      |                 |    |    |

Table 2-6-15 Max. Tolerance of Reference Surface Height ( $S_1$ )

unit:  $\mu\text{m}$

| Size | Preload classes |    |    | Size | Preload classes |     |     |
|------|-----------------|----|----|------|-----------------|-----|-----|
|      | Z0              | ZA | ZB |      | Z0              | ZA  | ZB  |
| QE15 | 130             | 85 | -  | QE30 | 170             | 110 | 90  |
| QE20 | 130             | 85 | 50 | QE35 | 210             | 150 | 120 |
| QE25 | 130             | 85 | 70 |      |                 |     |     |

Note: The allowable value is proportional to the distance between the axes.

## 2-6-10 Cautions for Installation

### (1) Shoulder heights and chamfers

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

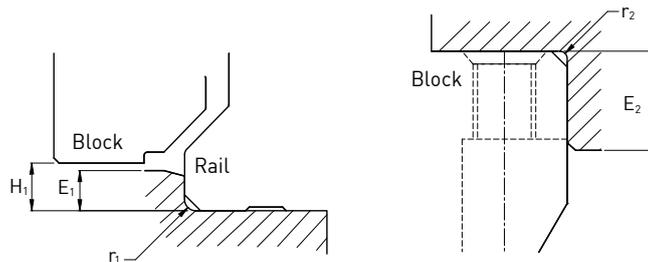


Table 2-6-16 Shoulder Heights and Chamfers

unit: mm

| Size | Max. radius of fillets $r_1$ (mm) | Max. radius of fillets $r_2$ (mm) | Shoulder height beside the rail $E_1$ (mm) | Shoulder height beside the block $E_2$ (mm) | Clearance under block $H_1$ (mm) |
|------|-----------------------------------|-----------------------------------|--|---|----------------------------------|
| QE15 | 0.5                               | 0.5                               | 2.7  | 5.0   | 4.0                              |
| QE20 | 0.5                               | 0.5                               | 5.0  | 7.0   | 6.0                              |
| QE25 | 1.0                               | 1.0                               | 5.0  | 7.5   | 6.2                              |
| QE30 | 1.0                               | 1.0                               | 7.0  | 7.0   | 10.0                             |
| QE35 | 1.0                               | 1.5                               | 7.5  | 9.5   | 11.0                             |

### (2) Tightening Torque of Bolts for Installation

Improperly tightened mounting bolts will seriously affect the accuracy of linear guide installations. The following tightening torques for different sizes of bolts are recommended.

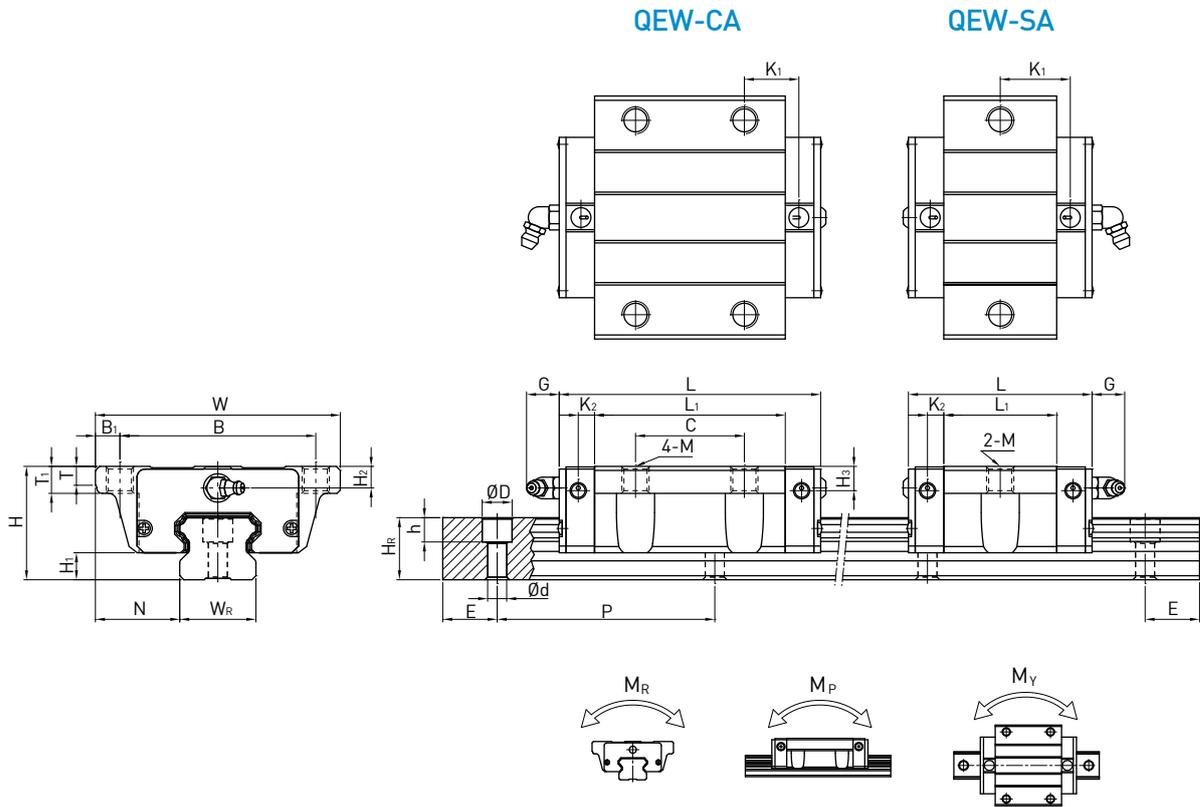
Table 2-6-17 Tightening Torque

| Size | Bolt size    | Torque N-cm(kgf-cm) |            |            |
|------|--------------|---------------------|------------|------------|
|      |              | Iron                | Casting    | Aluminum   |
| QE15 | M3×0.5P×16L  | 186 (19)            | 127 (13)   | 98(10)     |
| QE20 | M5×0.8P×16L  | 883 (90)            | 588 (60)   | 441 (45)   |
| QE25 | M6×1P×20L    | 1373 (140)          | 921 (94)   | 686 (70)   |
| QE30 | M6×1P×25L    | 1373 (140)          | 921 (94)   | 686 (70)   |
| QE35 | M8×1.25P×25L | 3041 (310)          | 2010 (205) | 1470 (150) |

Note: 1 kgf = 9.81 N



(2) QEW-CA / QEW-SA



| 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 C <sub>0</sub> (kN) | Static Rated Moment |    |       | Weight |       |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|--------------------------|-----|----|----------------|----|----------------|------|----------------|----------------|-----|-------------------------|-----|----------------|----------------|----------------|----------------|----------------|-----------------------------|----------------------------------|--|---------------------|----|-------|--------|-------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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   | 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     | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
| QEW15SA   | 24                          | 4              | 18.5                     | 52  | 41 | 5.5            | -  | 23.1           | 40.1 | 14.8           | 3.5            | 5.7 | M5                      | 5   | 7              | 5.5            | 6              | 15             | 12.5           | 6                           | 4.5                              | 3.5  | 60                  | 20 | M3×16 | 8.56   | 8.79  | 0.07                  | 0.03                  | 0.03                  | 0.12       | 1.25        |
| QEW15CA   |                             |                |                          |     |    |                | 26 | 39.8           | 56.8 | 10.15          |                |     |                         |     |                |                |                |                |                |                             |                                  |  |                     |    |       | 12.53  | 15.28 | 0.12                  | 0.09                  | 0.09                  | 0.21       |             |
| QEW20SA   | 28                          | 6              | 19.5                     | 59  | 49 | 5              | -  | 29             | 50   | 18.75          | 4.15           | 12  | M6                      | 7   | 9              | 6              | 6.5            | 20             | 15.5           | 9.5                         | 8.5                              | 6  | 60                  | 20 | M5×16 | 11.57  | 12.18 | 0.13                  | 0.05                  | 0.05                  | 0.19       | 2.08        |
| QEW20CA   |                             |                |                          |     |    |                | 32 | 48.1           | 69.1 | 12.3           |                |     |                         |     |                |                |                |                |                |                             |                                  |  |                     |    |       | 16.50  | 20.21 | 0.21                  | 0.15                  | 0.15                  | 0.31       |             |
| QEW25SA   | 33                          | 6.2            | 25                       | 73  | 60 | 6.5            | -  | 35.5           | 60.1 | 21.9           | 5              | 12  | M8                      | 7.5 | 10             | 8              | 8              | 23             | 18             | 11                          | 9                                | 7  | 60                  | 20 | M6×20 | 18.24  | 18.90 | 0.22                  | 0.10                  | 0.10                  | 0.34       | 2.67        |
| QEW25CA   |                             |                |                          |     |    |                | 35 | 59             | 83.6 | 16.15          |                |     |                         |     |                |                |                |                |                |                             |                                  |  |                     |    |       | 26.03  | 31.49 | 0.37                  | 0.29                  | 0.29                  | 0.58       |             |
| QEW30SA   | 42                          | 10             | 31                       | 90  | 72 | 9              | -  | 41.5           | 67.5 | 25.75          | 6              | 12  | M10                     | 7   | 10             | 8              | 9              | 28             | 23             | 11                          | 9                                | 7  | 80                  | 20 | M6×25 | 26.27  | 27.82 | 0.40                  | 0.18                  | 0.18                  | 0.61       | 4.35        |
| QEW30CA   |                             |                |                          |     |    |                | 40 | 70.1           | 96.1 | 20.05          |                |     |                         |     |                |                |                |                |                |                             |                                  |  |                     |    |       | 37.92  | 46.63 | 0.67                  | 0.51                  | 0.51                  | 1.03       |             |
| QEW35SA   | 48                          | 11             | 33                       | 100 | 82 | 9              | -  | 51             | 76   | 30.3           | 6.25           | 12  | M10                     | 10  | 13             | 8.5            | 8.5            | 34             | 27.5           | 14                          | 12                               | 9  | 80                  | 20 | M8×25 | 36.39  | 36.43 | 0.61                  | 0.33                  | 0.33                  | 0.77       | 6.14        |
| QEW35CA   |                             |                |                          |     |    |                | 50 | 83             | 108  | 21.3           |                |     |                         |     |                |                |                |                |                |                             |                                  |  |                     |    |       | 51.18  | 59.28 | 1.00                  | 0.75                  | 0.75                  | 1.19       |             |

Note : 1 kgf = 9.81 N

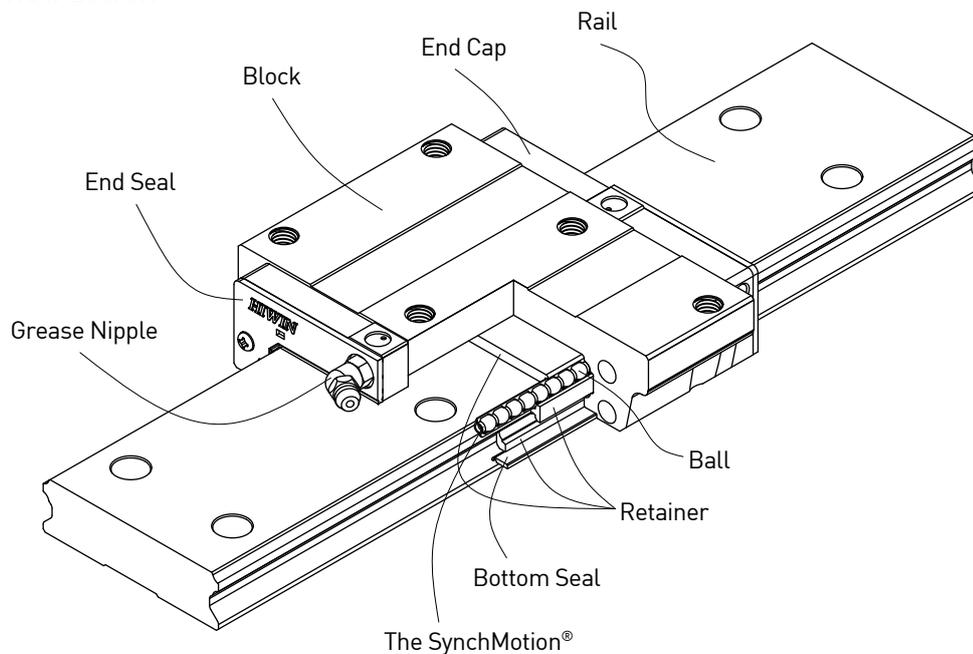


## 2-7 QW Series - Wide Rail Linear Guideway, with SynchMotion® Technology

### 2-7-1 Features

The QW series linear guideway with SynchMotion® Technology possesses all the advantages of the WE series, which features high moment rigidity and is suitable for single rail or space saving applications. With the SynchMotion® technology it also provides quieter and smoother movement, superior lubrication, and longer service life.

### 2-7-2 Construction



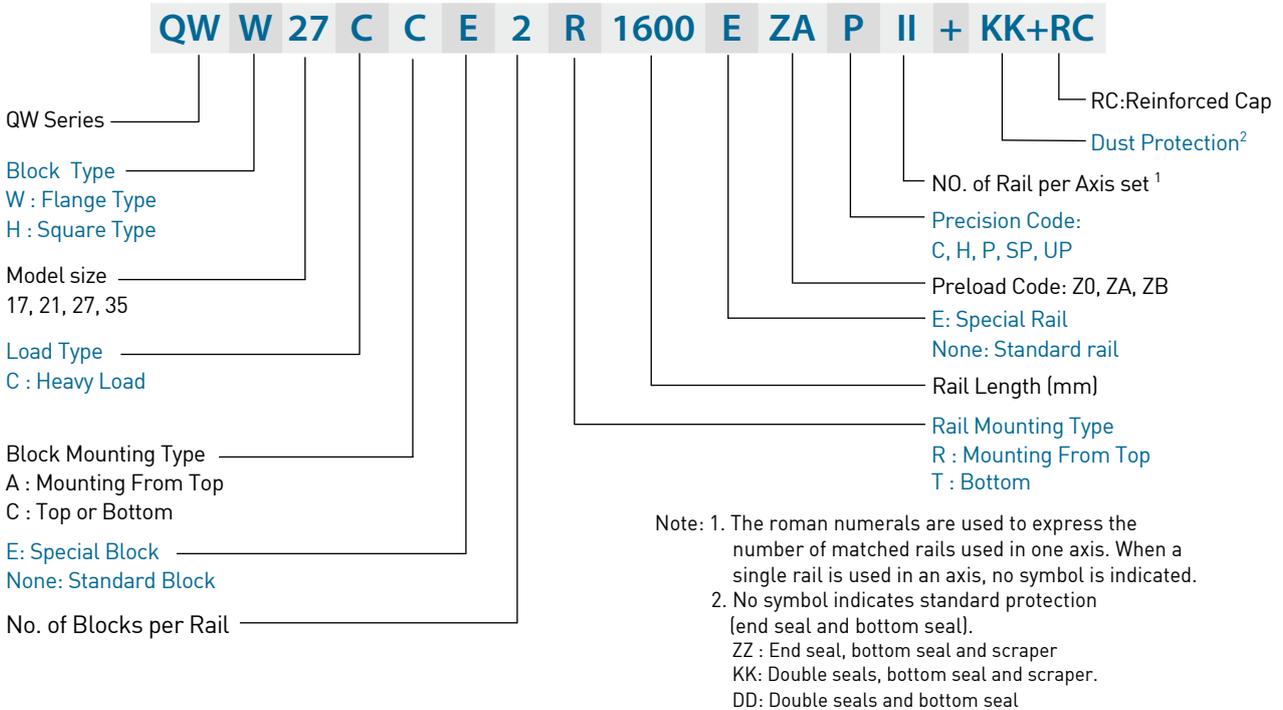
### 2-7-3 Model Number of QW Series

QW series guideway can be classified into non-interchangeable and interchangeable types. The sizes are identical. The main difference is that the interchangeable blocks and rails can be freely exchanged. Because of dimensional control, the interchangeable type linear guideway is a perfect choice for the client when rails do not need to be paired for an axis. And since the QW and WE share the identical rails, the customer does not need to redesign when choosing the QW series. Therefore the QW linear guideway has increased applicability.

# QW Series

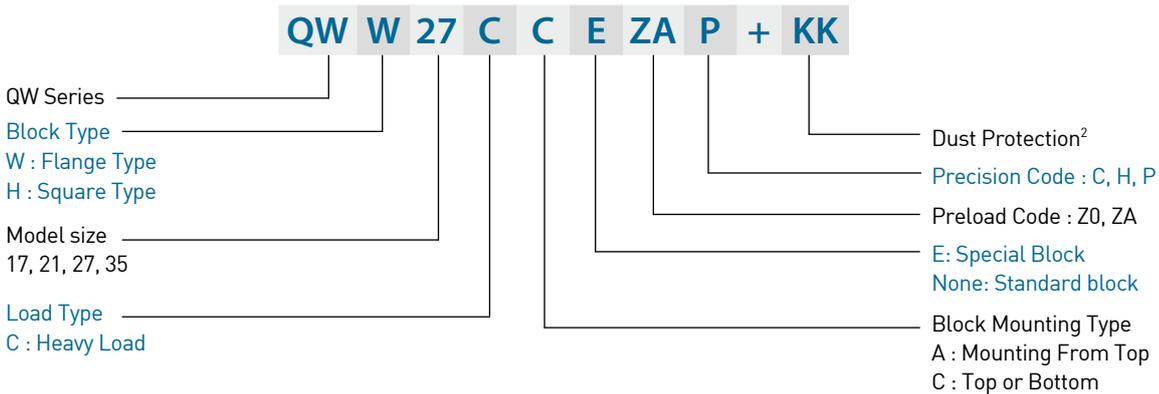
## Wide Rail

### (1) Non-interchangeable type

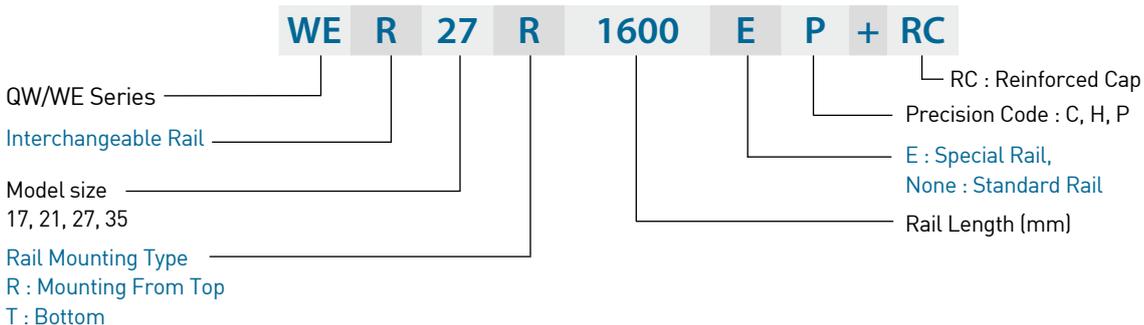


### (2) Interchangeable type

#### Model Number of QW Block



#### Model Number of QW Rail (QW and WE share the identical rails)

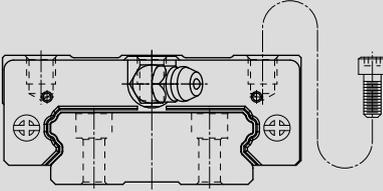
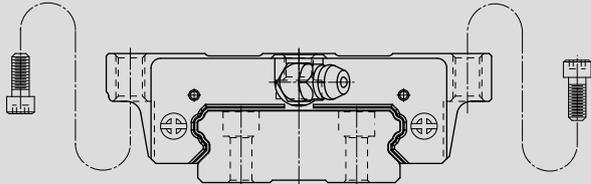


## 2-7-4 Types

### (1) Block types

HIWIN offers two types of linear guideways, flange and square types.

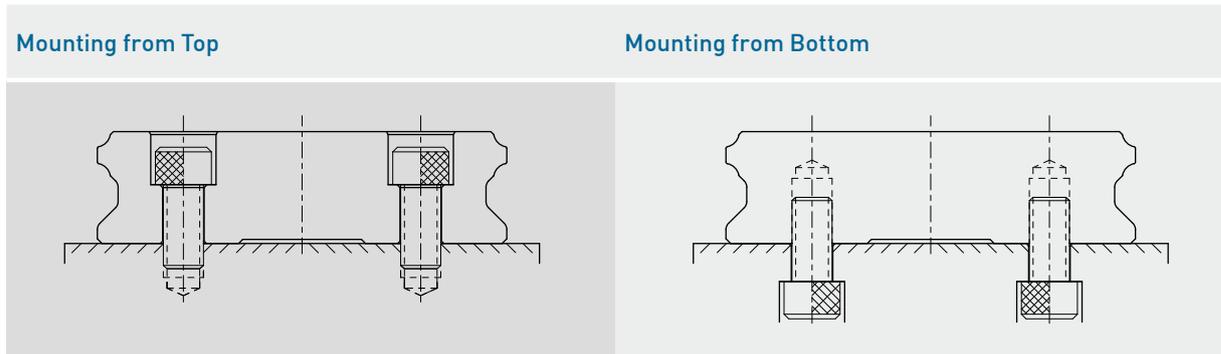
Table 2-7-1 Block Types

| Type   | Model  | Shape   | Height<br>(mm) | Rail<br>Length<br>(mm) | Main Applications   |
|--------|--------|---|----------------|------------------------|---|
| Square | QWH-CA |    | 17             | 100                    | <ul style="list-style-type: none"> <li>○ Automation devices</li> <li>○ High-speed transportation equipment</li> <li>○ Precision measuring equipment</li> <li>○ Semiconductor manufacturing equipment</li> </ul> |
|        |        |   | ↓              | ↓                      |   |
| 35     | 4000   |   |                |                        |   |
| ↓      | ↓      |   |                |                        |   |
| Flange | QWW-CC |  | 17             | 100                    |   |
|        |        |   | ↓              | ↓                      |   |
| 35     | 4000   |   |                |                        |   |
| ↓      | ↓      |   |                |                        |   |

### (2) Rail types

Besides the standard top mounting type, HIWIN also offers bottom mounting type rails.

Table 2-7-2 Rail Types

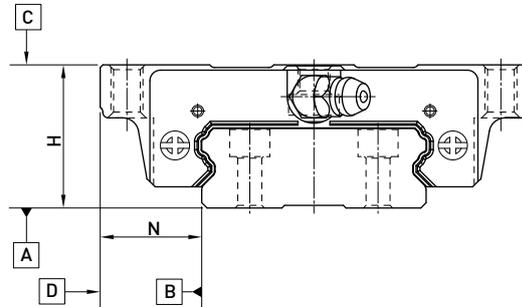


# QW Series

## Wide Rail

### 2-7-5 Accuracy

The accuracy of the QW series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



#### (1) Accuracy of non-interchangeable guideways

Table 2-7-3 Accuracy Standards

Unit: mm

| Type  | QW - 17, 21     |          |               |                      |                      | QW - 27, 35 |          |               |                      |                      |
|---|-----------------|----------|---------------|----------------------|----------------------|-------------|----------|---------------|----------------------|----------------------|
|   | Normal (C)      | High (H) | Precision (P) | Super Precision (SP) | Ultra Precision (UP) | Normal (C)  | High (H) | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03   | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 0.008         | ± 0.1       | ± 0.04   | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 0.01          |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03   | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 0.008         | ± 0.1       | ± 0.04   | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 0.01          |
| Variation of height H                               | 0.02            | 0.01     | 0.006         | 0.004                | 0.003                | 0.02        | 0.015    | 0.007         | 0.005                | 0.003                |
| Variation of width N                                | 0.02            | 0.01     | 0.006         | 0.004                | 0.003                | 0.03        | 0.015    | 0.007         | 0.005                | 0.003                |
| Running parallelism of block surface C to surface A | See Table 2-7-5 |          |               |                      |                      |             |          |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-7-5 |          |               |                      |                      |             |          |               |                      |                      |

#### (2) Accuracy of interchangeable guideways

Table 2-7-4 Accuracy Standards

Unit: mm

| Item  | QW - 17, 21     |          |               | QW - 27, 35 |          |               |
|---|-----------------|----------|---------------|-------------|----------|---------------|
|   | Normal (C)      | High (H) | Precision (P) | Normal (C)  | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03   | ± 0.015       | ± 0.1       | ± 0.04   | ± 0.02        |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03   | ± 0.015       | ± 0.1       | ± 0.04   | ± 0.02        |
| Variation of height H                               | 0.02            | 0.01     | 0.006         | 0.02        | 0.015    | 0.007         |
| Variation of width N                                | 0.02            | 0.01     | 0.006         | 0.03        | 0.015    | 0.007         |
| Running parallelism of block surface C to surface A | See Table 2-7-5 |          |               |             |          |               |
| Running parallelism of block surface D to surface B | See Table 2-7-5 |          |               |             |          |               |

### (3) Accuracy of running parallelism

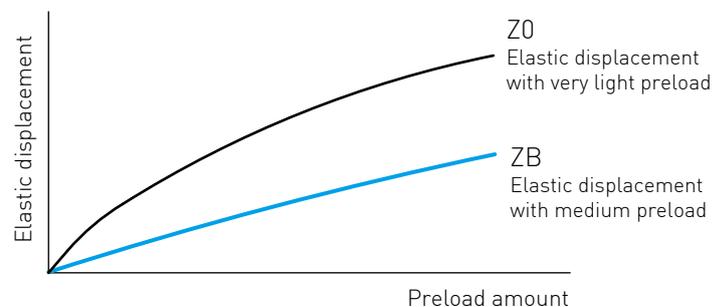
Table 2-7-5 Accuracy of Running Parallelism

| 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  |

## 2-7-6 Preload

### (1) Definition

A preload can be applied to each guideway. Generally, a linear motion guideway has a negative clearance between the groove and balls in order to improve stiffness and maintain high precision. The figure shows that adding a preload can improve stiffness of the linear guideway.



### (2) Preload classes

HIWIN offers three standard preloads for various applications and conditions.

Table 2-7-6 Preload Classes

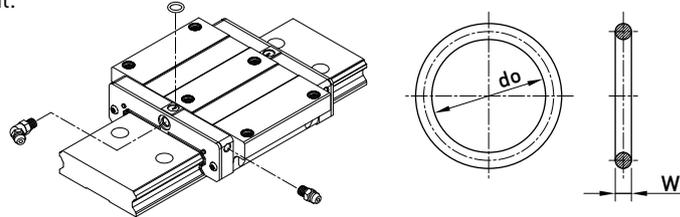
| Class              | Code | Preload      | Condition   |
|--------------------|------|--------------|---|
| Very Light Preload | Z0   | 0~ 0.02C     | Certain load direction, low impact, low precision requirement |
| Light Preload      | ZA   | 0.03C~0.05C  | low load and high precision requirement                       |
| Medium Preload     | ZB   | 0.06C~ 0.08C | High rigidity requirement, with vibration and impact          |

| 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.

## 2-7-7 Mounting location

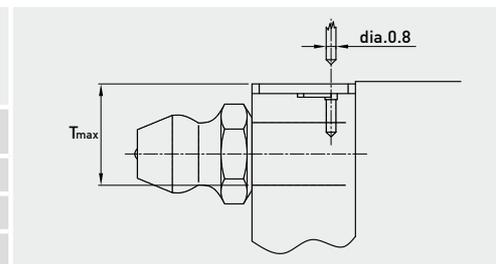
The standard location of the grease fitting is at both ends of the block, the nipple may be mounted in the side or top of the block. For lateral installation, we recommend that the nipple be mounted to the non-reference side, otherwise please contact us. When lubricating from above, in the recess for the O-ring, a smaller, preformed recess can be found. Preheat the 0.8 mm diameter metal tip. Carefully open the small recess with the metal tip and pierce through it. Insert a round sealing ring into the recess. (The round sealing ring is not supplied with the block) Do not open the small recess with a drill bit this may introduce the danger of contamination. It is possible to carry out the lubrication by using the oil-piping joint.



O Ring

Table 2-7-7 O-Ring size and max. permissible depth for piercing

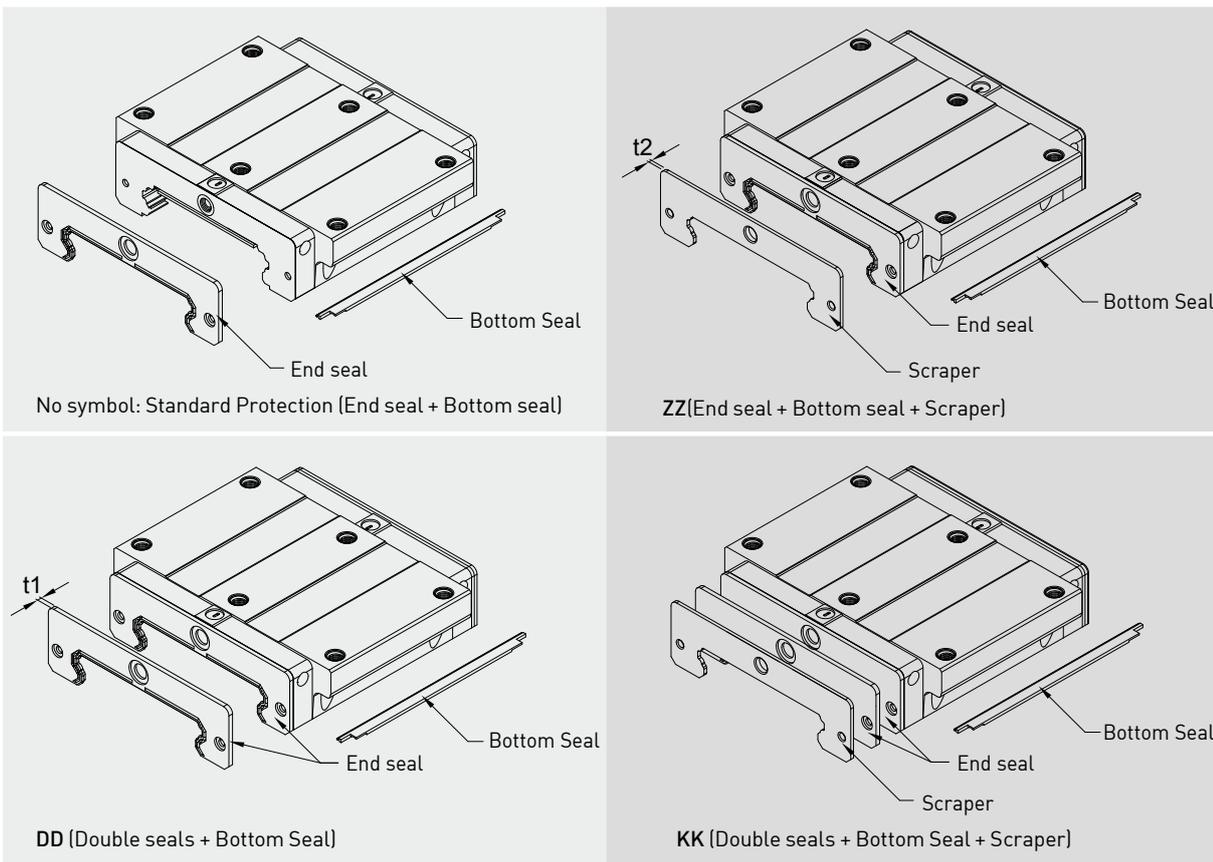
| Size  | O-Ring   |          | Lube hole at top: max. permissible depth for piercing |
|-------|----------|----------|---|
|       | do(mm)   | W (mm)   | T <sub>max</sub> (mm)                                 |
| QW 21 | 2.5±0.15 | 1.5±0.15 | 4.2   |
| QW 27 | 2.5±0.15 | 1.5±0.15 | 5.7   |
| QW 35 | 4.5±0.15 | 1.5±0.15 | 7.6   |



## 2-7-8 Dust Protection Equipment

### (1) Codes of equipment

If the following equipment is needed, please indicate the code followed by the model number.



**(2) End seal and bottom seal**

Protects against contaminants entering the block. Reduces potential for groove damage resulting in a reduction of life ratings.

**(3) Double seals**

Removes foreign matter from the rail preventing contaminants from entering the block.

Table 2-7-8 Dimensions of end seal

| Size | Thickness (t1)<br>(mm) | Size | Thickness (t1)<br>(mm) |
|------|------------------------|------|------------------------|
| QW17 | 1.6                    | QW27 | 2                      |
| QW21 | 2                      | QW35 | 2                      |

**(4) Scraper**

Clears larger contaminants, such as weld spatter and metal cuttings, from the rail. Metal scraper protects end seals from excessive damage.

Table 2-7-9 Dimensions of Scraper

| Size | Thickness (t2)<br>(mm) | Size | Thickness (t2)<br>(mm) |
|------|------------------------|------|------------------------|
| QW17 | 1                      | QW27 | 1                      |
| QW21 | 1                      | QW35 | 1.5                    |

**(5) Dimensions of block equipped with the dustproof parts**

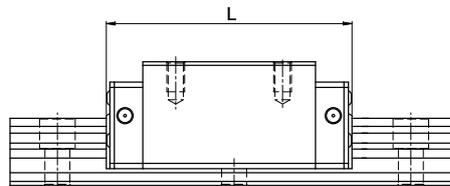


Table 2-7-10 Overall block length

unit: mm

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| QW17C | 51.0 (53.0)              | 53.0 (56.0)   | 54.2 (56.2)   | 56.2 (59.2)   |
| QW21C | 59.0 (63.0)              | 61.0 (67.0)   | 63.0 (67.0)   | 65.0 (71.0)   |
| QW27C | 73.2 (77.2)              | 75.2 (81.2)   | 77.2 (81.2)   | 79.2 (85.2)   |
| QW35C | 107.0 (111.0)            | 110.0 (116.0) | 111.0 (115.0) | 114.0 (120.0) |

Note : The marking of “[ ]” denotes the maximum block length with screws, lips of end seals, etc.

**2-7-9 Friction**

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

Table 2-7-11 Seal Resistance

| Size | Resistance N (kgf) | Size | Resistance N (kgf) |
|------|--------------------|------|--------------------|
| QW17 | 1.18 (0.12)        | QW27 | 2.94 (0.3)         |
| QW21 | 1.96 (0.2)         | QW35 | 3.92 (0.4)         |

Note:1kgf=9.81N

## QW Series

### Wide Rail

#### 2-7-10 Mounting Surface Accuracy Tolerance

Because of the circular-arc contact design, the QW linear guideway can withstand surface-error installation and deliver smooth linear motion. When the mounting surface meets the accuracy requirements of the installation, the high accuracy and rigidity of the guideway will be obtained without any difficulty. For faster installation and smoother movement, HIWIN offers a preload with normal clearance because of its ability to absorb higher deviations in mounting surface inaccuracies.

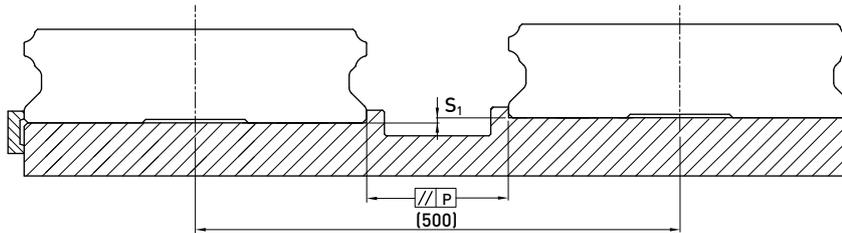


Table 2-7-12 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    | Size | Preload classes |    |    |
|------|-----------------|----|----|------|-----------------|----|----|
|      | Z0              | ZA | ZB |      | Z0              | ZA | ZB |
| QW17 | 20              | 15 | -  | QW27 | 25              | 20 | -  |
| QW21 | 25              | 18 | -  | QW35 | 30              | 22 | 20 |

Table 2-7-13 Max. Tolerance of Reference Surface Height (S<sub>1</sub>)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    | Size | Preload classes |    |    |
|------|-----------------|----|----|------|-----------------|----|----|
|      | Z0              | ZA | ZB |      | Z0              | ZA | ZB |
| QW17 | 65              | 20 | -  | QW27 | 130             | 85 | -  |
| QW21 | 130             | 85 | -  | QW35 | 130             | 85 | 70 |

#### 2-7-11 Cautions for Installation

##### (1) Shoulder heights and chamfers

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

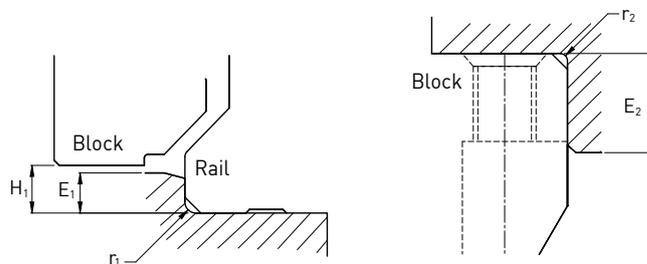


Table 2-7-14 Shoulder Heights and Chamfers

unit: mm

| Size | Max. radius of fillets $r_1$ (mm) | Max. radius of fillets $r_2$ (mm) | Shoulder height beside the rail $E_1$ (mm) | Shoulder height beside the block $E_2$ (mm) | Clearance under block $H_1$ (mm) |
|------|-----------------------------------|-----------------------------------|--|---|----------------------------------|
| QW17 | 0.4                               | 0.4                               | 2.0  | 4.0   | 2.5                              |
| QW21 | 0.4                               | 0.4                               | 2.5  | 5.0   | 3.0                              |
| QW27 | 0.5                               | 0.4                               | 2.5  | 7.0   | 4.0                              |
| QW35 | 0.5                               | 0.5                               | 2.5  | 10.0  | 4.0                              |

## (2) Tightening Torque of Bolts for Installation

Improperly tightened mounting bolts will seriously affect the accuracy of linear guide installations. The following tightening torques for different sizes of bolts are recommended.

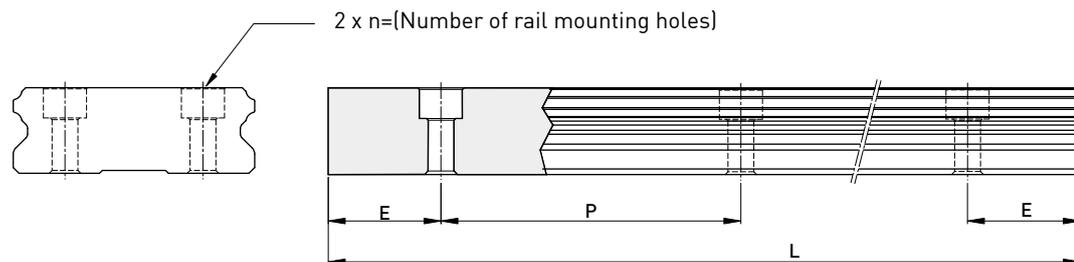
Table 2-7-15 Tightening Torque

| Size | Bolt size   | Torque N-cm(kgf-cm) |          |          |
|------|-------------|---------------------|----------|----------|
|      |             | Iron                | Casting  | Aluminum |
| QW17 | M4×0.7P×12L | 392 (40)            | 274 (28) | 206 (21) |
| QW21 | M4×0.7P×12L | 392 (40)            | 274 (28) | 206 (21) |
| QW27 | M4×0.7P×16L | 392 (40)            | 274 (28) | 206 (21) |
| QW35 | M6×1P×20L   | 1373 (140)          | 921 (94) | 686 (70) |

Note: 1 kgf = 9.81 N

## 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.



$$L = (n - 1) \times P + 2 \times E \quad \dots \dots \dots \text{Eq.2.3}$$

- L : Total length of rail (mm)
- n : Number of mounting holes
- P : Distance between any two holes (mm)
- E : Distance from the center of the last hole to the edge (mm)

Table 2-7-16 Rail Standard Length and Max. Length

unit: mm

| Item                              | QWR17       | QWR21      | QWR27      | QWR35      |
|-----------------------------------|-------------|------------|------------|------------|
| Standard Length L(n)              | 110 (3)     | 130 (3)    | 220 (4)    | 280 (4)    |
|                                   | 190 (5)     | 230 (5)    | 280 (5)    | 440 (6)    |
|                                   | 310 (8)     | 380 (8)    | 340 (6)    | 600 (8)    |
|                                   | 390 (10)    | 480 (10)   | 460 (8)    | 760 (10)   |
|                                   | 470 (12)    | 580 (12)   | 640 (11)   | 1000 (13)  |
|                                   | 550 (14)    | 780 (16)   | 820 (14)   | 1,640 (21) |
|                                   | -           | -          | 1,000 (17) | 2,040 (26) |
|                                   | -           | -          | 1,240 (21) | 2,520 (32) |
|                                   | -           | -          | 1,600 (27) | 3,000 (38) |
| Pitch (P)                         | 40          | 50         | 60         | 80         |
| Distance to End (E <sub>s</sub> ) | 15          | 15         | 20         | 20         |
| Max. Standard Length              | 3,990 (100) | 3,980 (80) | 4,000 (67) | 3,960 (50) |
| Max. Length                       | 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.

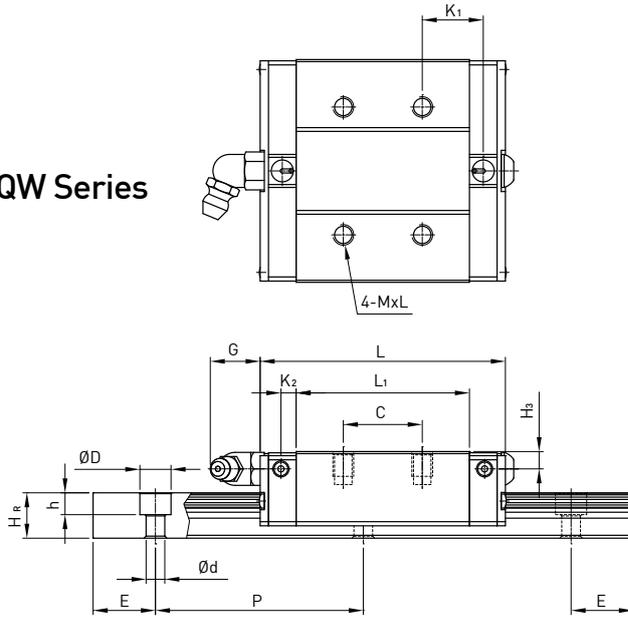
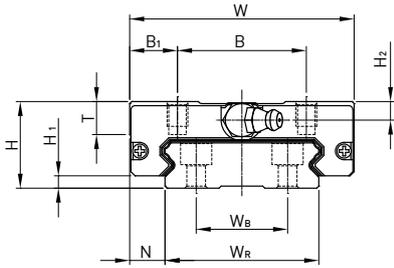
# QW Series

Wide Rail

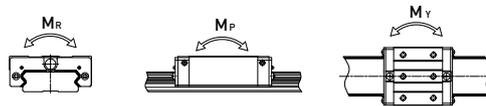
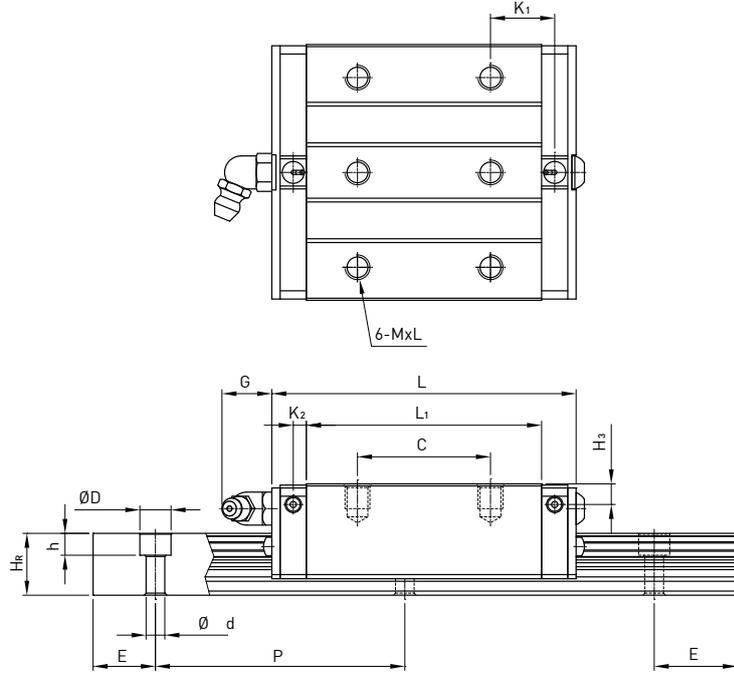
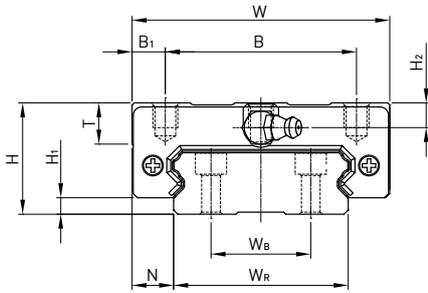
## 2-7-13 Dimensions for HIWIN QW Series

### (1) QWH-CA

#### QWH-17,21CA



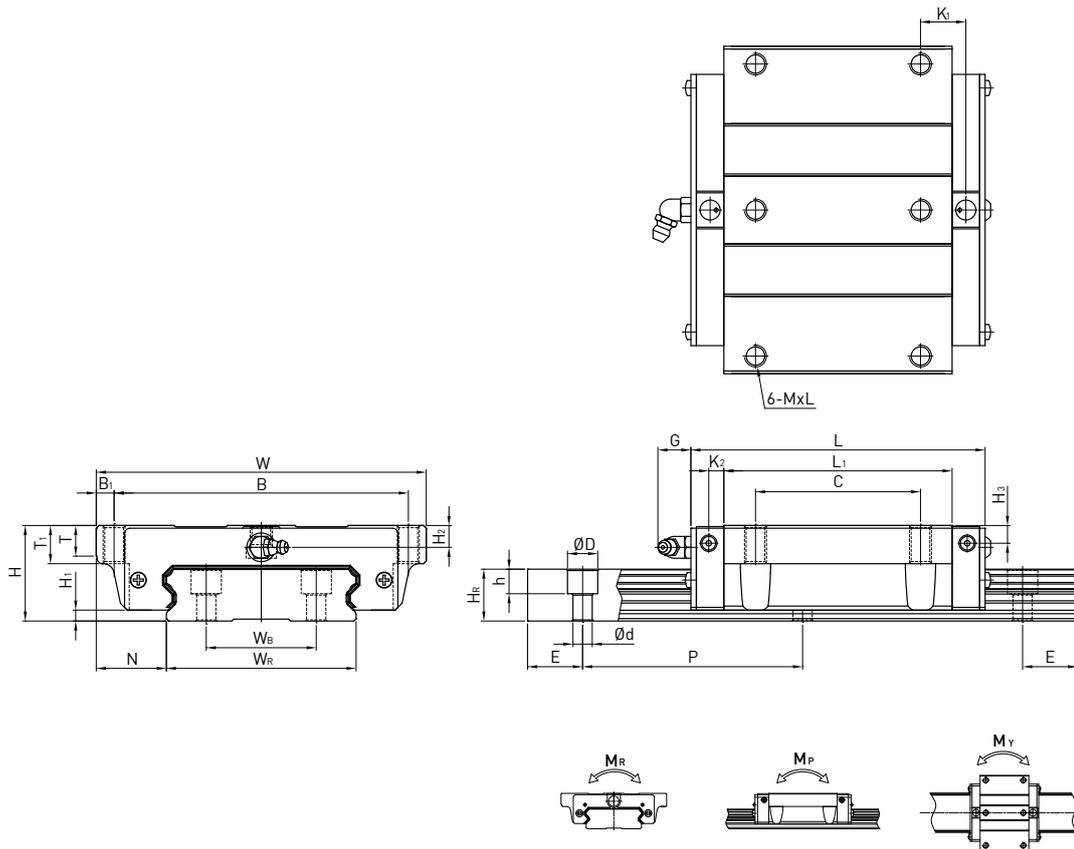
#### QWH-27,35CA



| 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 C <sub>0</sub> (kN) | Static Rated Moment |                |                | Weight         |       |      |
|-----------|-----------------------------|----------------|------|--------------------------|----|----------------|----|----------------|------|----------------|----------------|-----|------|-------------------------|----------------|----------------|----------------|----------------|----------------|-----|-----|-----|----|-----------------------------|----------------------------------|--|---------------------|----------------|----------------|----------------|-------|------|
|           | 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   | MxL  | T                       | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | W <sub>B</sub> | H <sub>R</sub> | D   | h   | d   | P  |                             |                                  |  | E                   | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail |
|           | kgf                         | mm             | mm   | mm                       | mm | mm             | mm | mm             | mm   | mm             | mm             | mm  | mm   | mm                      | mm             | mm             | mm             | mm             | mm             | mm  | mm  | mm  | mm |                             |                                  |  | mm                  | mm             | kN-m           | kN-m           | kN-m  | kg   |
| QWH17CA   | 17                          | 2.5            | 8.5  | 50                       | 29 | 10.5           | 15 | 38             | 51   | 13.95          | 2.45           | 4.9 | M4x5 | 6                       | 4              | 2.5            | 33             | 18             | 9.3            | 7.5 | 5.3 | 4.5 | 40 | 15                          | M4x12                            | 7.32   | 9.1                 | 0.14           | 0.055          | 0.055          | 0.12  | 2.2  |
| QWH21CA   | 21                          | 3              | 8.5  | 54                       | 31 | 11.5           | 19 | 41.7           | 59   | 14.68          | 3.3            | 12  | M5x6 | 8                       | 4.5            | 4.2            | 37             | 22             | 11             | 7.5 | 5.3 | 4.5 | 50 | 15                          | M4x12                            | 8.1  | 12.1                | 0.21           | 0.08           | 0.08           | 0.2   | 3    |
| QWH27CA   | 27                          | 4              | 10   | 62                       | 46 | 8              | 32 | 56.6           | 73.2 | 15.45          | 3.15           | 12  | M6x6 | 10                      | 6              | 5              | 42             | 24             | 15             | 7.5 | 5.3 | 4.5 | 60 | 20                          | M4x16                            | 16   | 22.2                | 0.42           | 0.2            | 0.2            | 0.35  | 4.7  |
| QWH35CA   | 35                          | 4              | 15.5 | 100                      | 76 | 12             | 50 | 83             | 107  | 21.5           | 5              | 12  | M8x8 | 13                      | 8              | 6.5            | 69             | 40             | 19             | 11  | 9   | 7   | 80 | 20                          | M6x20                            | 36.8   | 49.2                | 1.51           | 0.65           | 0.65           | 1.1   | 9.7  |

Note : 1 kgf = 9.81 N

(2) QWW-CC



| 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 C <sub>0</sub> (kN) | Static Rated Moment |      |      | Weight         |                |                |       |      |
|-----------|-----------------------------|----------------|------|--------------------------|-----|----------------|----|----------------|------|----------------|----------------|-----|----|------|----------------|----------------|----------------|-------------------------|----------------|----------------|-----|-----|-----------------------------|----------------------------------|--|---------------------|------|------|----------------|----------------|----------------|-------|------|
|           | 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   | M  | T    | T <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub>          | W <sub>B</sub> | H <sub>R</sub> | D   | h   |                             |                                  |  | d                   | P    | E    | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail |
|           | mm                          | mm             | mm   | mm                       | mm  | mm             | mm | mm             | mm   | mm             | mm             | mm  | mm | mm   | mm             | mm             | mm             | mm                      | mm             | mm             | mm  | mm  |                             |                                  |  | mm                  | mm   | mm   | mm             | kN-m           | kN-m           | kN-m  | kg   |
| QWW17CC   | 17                          | 2.5            | 13.5 | 60                       | 53  | 3.5            | 26 | 38             | 51   | 8.45           | 2.45           | 4.9 | M4 | 6    | 5.1            | 4              | 2.5            | 33                      | 18             | 9.3            | 7.5 | 5.3 | 4.5                         | 40                               | 15   | M4x12               | 7.32 | 9.1  | 0.14           | 0.055          | 0.055          | 0.13  | 2.2  |
| QWW21CC   | 21                          | 3              | 15.5 | 68                       | 60  | 4              | 29 | 41.7           | 59   | 9.68           | 3.3            | 12  | M5 | 7.3  | 8              | 4.5            | 4.2            | 37                      | 22             | 11             | 7.5 | 5.3 | 4.5                         | 50                               | 15   | M4x12               | 8.1  | 12.1 | 0.21           | 0.08           | 0.08           | 0.23  | 3    |
| QWW27CC   | 27                          | 4              | 19   | 80                       | 70  | 5              | 40 | 56.6           | 73.2 | 11.45          | 3.15           | 12  | M6 | 8    | 10             | 6              | 5              | 42                      | 24             | 15             | 7.5 | 5.3 | 4.5                         | 60                               | 20   | M4x16               | 16   | 22.2 | 0.42           | 0.2            | 0.2            | 0.43  | 4.7  |
| QWW35CC   | 35                          | 4              | 25.5 | 120                      | 107 | 6.5            | 60 | 83             | 107  | 16.50          | 5              | 12  | M8 | 11.2 | 14             | 8              | 6.5            | 69                      | 40             | 19             | 11  | 9   | 7                           | 80                               | 20   | M6x20               | 36.8 | 49.2 | 1.51           | 0.65           | 0.65           | 1.26  | 9.7  |

Note : 1 kgf = 9.81 N

## CG Series

Superior Rolling Moment with Cover Strip

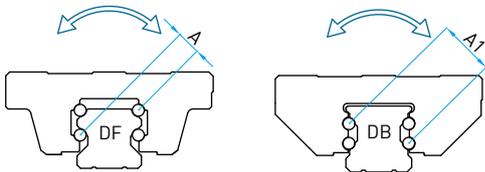
### 2-8 CG Series - Superior Rolling Moment with Cover Strip Linear Guideway

CG series linear guideways are a four-row arc-tooth contact type, featuring high rigidity, high load, and high torsional resistance. It also has four-way load characteristics. This specification can be matched with the latest slide dustproof accessories.

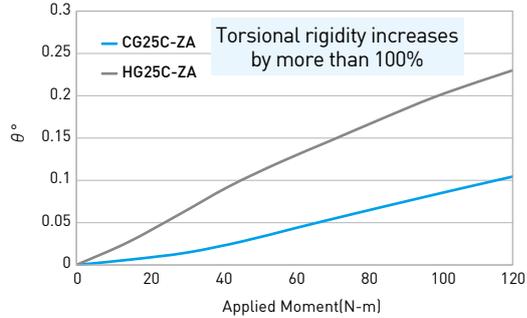
#### 2-8-1 Features of CG Series

##### (1) High rolling moment resistance

CG rail designed with DB type (also known as o arrangement) has longer range of moment compared to DF type (also known as x arrangement). It is suitable for applications that have larger rolling moment.



Rigidity Test



##### (2) Optimal recirculation path

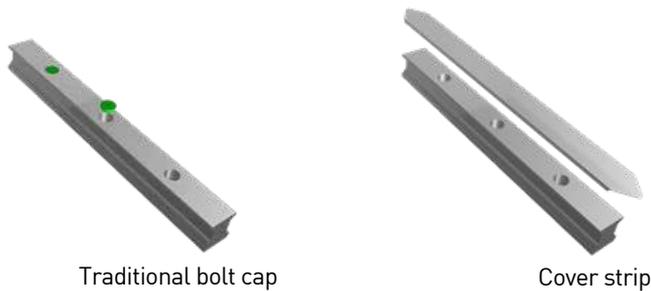
Better smoothness due to integrated component.

##### (3) Better protection

The CG series uses a metal scraper as a standard accessory for protection against high temperature chips and particles.

##### (4) Latest dustproof accessory for rail

The CG series offers a special stainless cover strip for better dust protection than standard bolt caps.

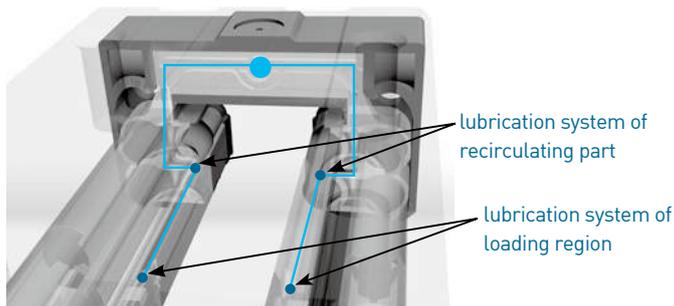


Traditional bolt cap

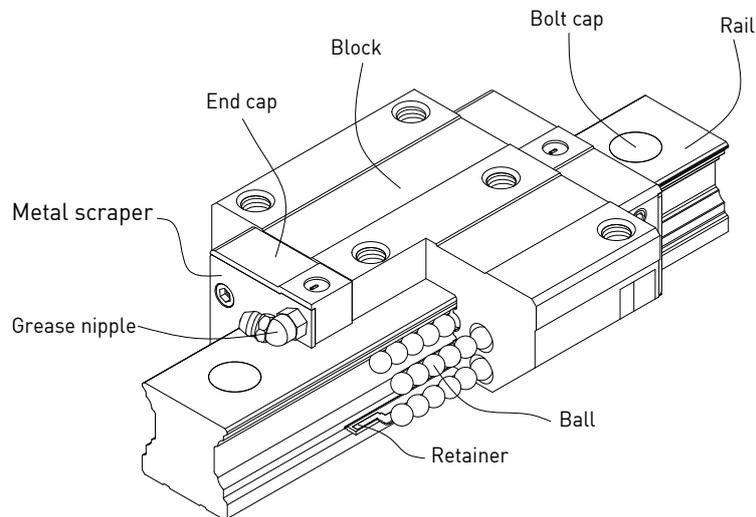
Cover strip

##### (5) Full lubrication

Specially designed for short stroke motion.



## 2-8-2 Construction of CG 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, Metal scraper

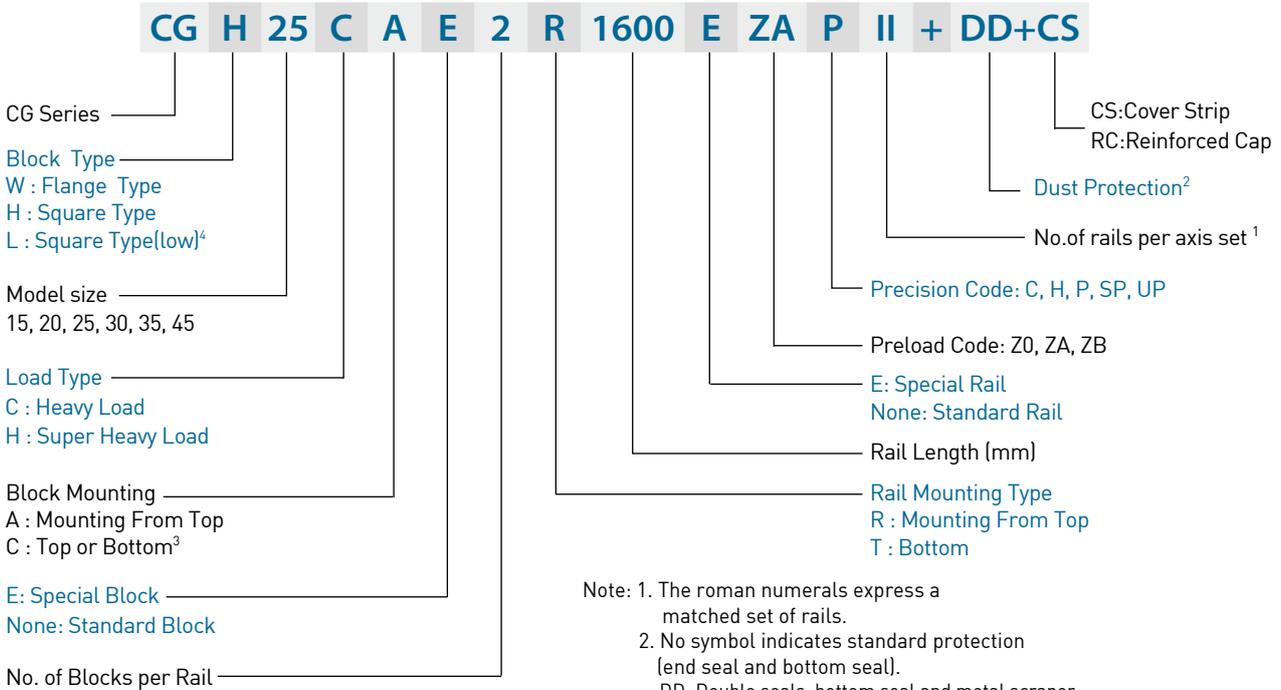
## 2-8-3 Model Number of CG Series

CG 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 CG series contains the size, type, accuracy class, preload class, etc..

# CG Series

## Superior Rolling Moment with Cover Strip

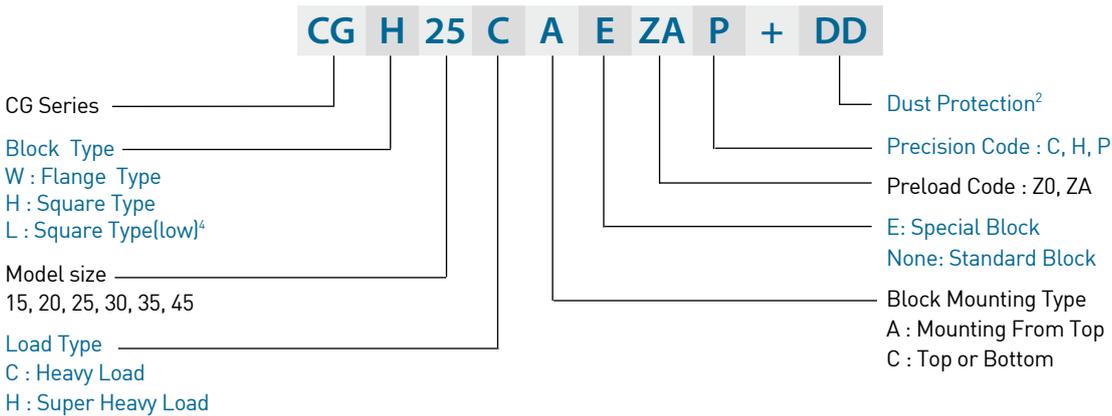
### (1) Non-interchangeable type



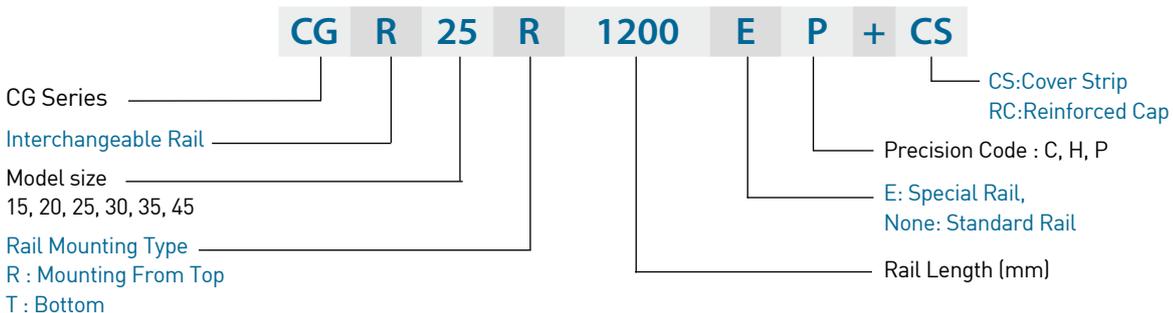
- Note: 1. The roman numerals express a matched set of rails.  
 2. No symbol indicates standard protection (end seal and bottom seal).  
 DD: Double seals, bottom seal and metal scraper  
 3. For mounting type A, The amount of block mounting holes is four. For mounting type C, The amount of block mounting holes is six. Both types can be mounting from top or bottom.  
 4. Block type CGL is the low profile design of CGH (square type), the assembled height is same as CGW (flange type) in same size.

### (2) Interchangeable type

#### Model Number of CG Block



#### Model Number of CG Rail

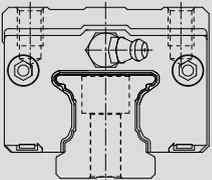
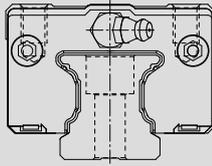
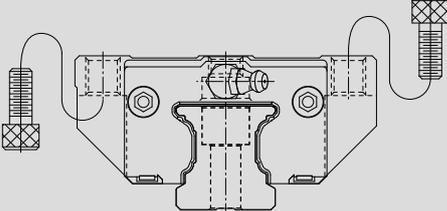
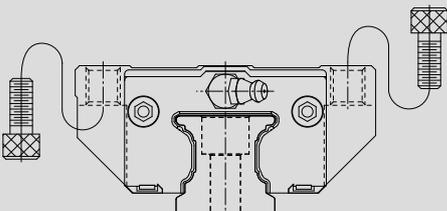


## 2-8-4 Types

### (1) Block types

There are two types of blocks: flange and square.

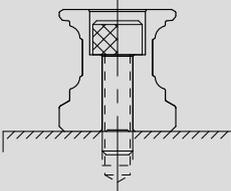
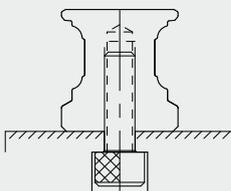
Table 2-8-1 Block Types

| Type   | Model            | Shape   | Height (mm) | Rail Length (mm) | Main Application   |
|--------|------------------|---|-------------|------------------|--|
| Square | CGH-CA<br>CGH-HA |    | 28          | 100              | <ul style="list-style-type: none"> <li>○ Machine Centers</li> <li>○ NC Lathes</li> <li>○ Grinding Machines</li> <li>○ Precision Machining Machines</li> <li>○ Heavy Cutting Machines</li> <li>○ Automation Devices</li> <li>○ Transportation Equipment</li> <li>○ Measuring Equipment</li> <li>○ Devices Requiring High Positional Accuracy</li> </ul> |
|        |                  |   | ↓           | ↓                |  |
| Square | CGL-CA<br>CGL-HA |   | 24          | 100              |  |
|        |                  |   | ↓           | ↓                |  |
| Flange | CGW-CC<br>CGW-HC |  | 24          | 100              |  |
|        |                  |   | ↓           | ↓                |  |
| Flange | CGW-CA<br>CGW-HA |  | 60          | 4000             |  |
|        |                  |   | ↓           | ↓                |  |

### (2) Rail types

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

Table 2-8-2 Rail Types

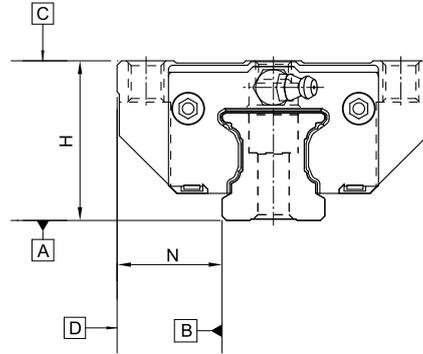
| Mounting from Top   | Mounting from bottom  |
|---|---|
|  |  |

## CG Series

### Superior Rolling Moment with Cover Strip

#### 2-8-5 Accuracy Classes

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



#### (1) Accuracy of non-interchangeable guideways

Table 2-8-3 Accuracy Standards

Unit: mm

| Item  | CG - 15, 20     |             |                  |                         |                         |
|---|-----------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015            | 0<br>- 0.008            |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03      | 0<br>- 0.03      | 0<br>- 0.015            | 0<br>- 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 2-8-9 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-8-9 |             |                  |                         |                         |

Table 2-8-4 Accuracy Standards

Unit: mm

| Item  | CG - 25, 30, 35 |             |                  |                         |                         |
|---|-----------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 0.01             |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 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 2-8-9 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-8-9 |             |                  |                         |                         |

Table 2-8-5 Accuracy Standards

Unit: mm

| Item  | CG - 45         |             |                  |                         |                         |
|---|-----------------|-------------|------------------|-------------------------|-------------------------|
|   | Normal<br>(C)   | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.05      | 0<br>- 0.05      | 0<br>- 0.03             | 0<br>- 0.02             |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.05      | 0<br>- 0.05      | 0<br>- 0.03             | 0<br>- 0.02             |
| Variation of height H                               | 0.03            | 0.015       | 0.007            | 0.005                   | 0.003                   |
| Variation of width N                                | 0.03            | 0.02        | 0.01             | 0.007                   | 0.005                   |
| Running parallelism of block surface C to surface A | See Table 2-8-9 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See Table 2-8-9 |             |                  |                         |                         |

(2) Accuracy of interchangeable guideways

Table 2-8-6 Accuracy Standards

Unit: mm

| Item  | CG - 15, 20     |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.03   | ± 0.015       |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.03   | ± 0.015       |
| Variation of height H                               | 0.02            | 0.01     | 0.006         |
| Variation of width N                                | 0.02            | 0.01     | 0.006         |
| Running parallelism of block surface C to surface A | See Table 2-8-9 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-8-9 |          |               |

Table 2-8-7 Accuracy Standards

Unit: mm

| Item  | CG - 25, 30, 35 |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | Normal (C)      | High (H) | Precision (P) |
| Dimensional tolerance of height H                   | ± 0.1           | ± 0.04   | ± 0.02        |
| Dimensional tolerance of width N                    | ± 0.1           | ± 0.04   | ± 0.02        |
| Variation of height H                               | 0.02            | 0.015    | 0.007         |
| Variation of width N                                | 0.03            | 0.015    | 0.007         |
| Running parallelism of block surface C to surface A | See Table 2-8-9 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-8-9 |          |               |

Table 2-8-8 Accuracy Standards

Unit: mm

| Item  | CG - 45         |          |               |
|---|-----------------|----------|---------------|
| Accuracy Classes                                    | 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 2-8-9 |          |               |
| Running parallelism of block surface D to surface B | See Table 2-8-9 |          |               |

## CG Series

### Superior Rolling Moment with Cover Strip

#### (3) Accuracy of running parallelism

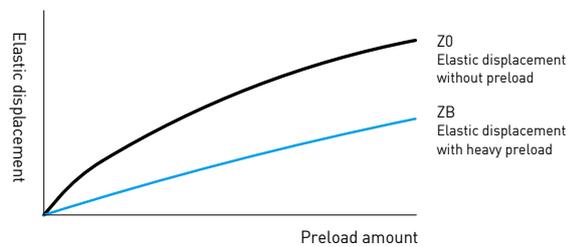
Table 2-8-9 Accuracy of Running Parallelism

| Rail Length (mm) | Accuracy (μm) |    |    |    |   |    |
|------------------|---------------|----|----|----|---|----|
|                  | C             | H  | P  | SP | H | 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  |

## 2-8-6 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 HG20 to avoid an over-preload affecting the guideway's life.



### (2) Preload classes

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

Table 2-8-10 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.

### (3) Stiffness performance

Stiffness depends on preload. The following table shows stiffness value of each size.

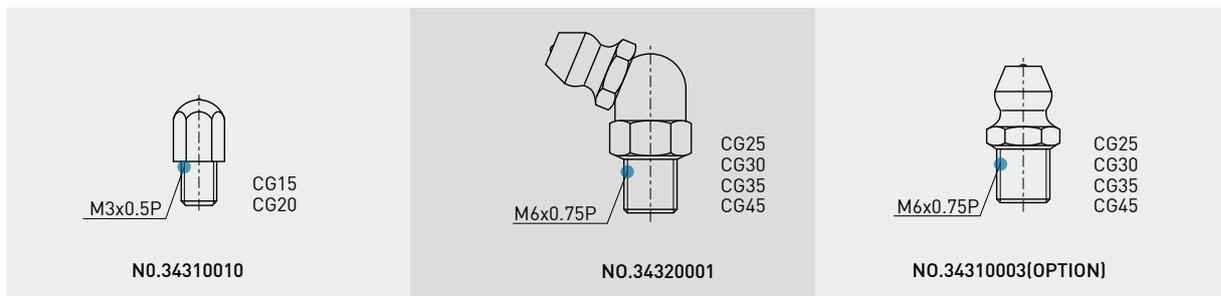
Table 2-8-11 Radial stiffness for CG Series

| Load type        | Series / Size | Stiffness (N/μm) |     |      |
|------------------|---------------|------------------|-----|------|
|                  |               | Z0               | ZA  | ZB   |
| Heavy load       | CG 15C        | 180              | 341 | 482  |
|                  | CG 20C        | 258              | 540 | 701  |
|                  | CG 25C        | 290              | 581 | 786  |
|                  | CG 30C        | 342              | 595 | 907  |
|                  | CG 35C        | 378              | 606 | 950  |
|                  | CG 45C        | 443              | 634 | 999  |
| Super heavy load | CG 20H        | 331              | 716 | 918  |
|                  | CG 25H        | 351              | 720 | 969  |
|                  | CG 30H        | 449              | 802 | 1208 |
|                  | CG 35H        | 497              | 813 | 1269 |
|                  | CG 45H        | 587              | 842 | 1291 |

## 2-8-7 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 can be mounted at the non-reference side, otherwise please contact us. It is possible to perform lubrication by using the oil-piping joint.

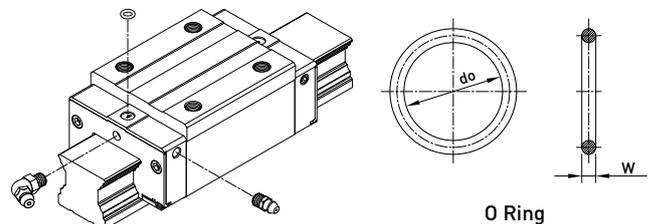
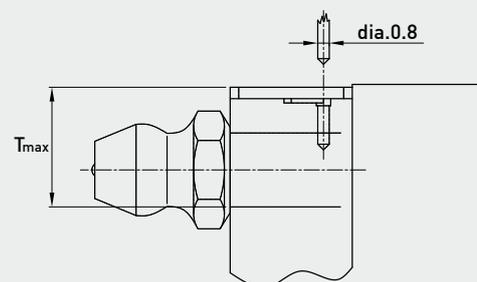


Table 2-8-12 O-Ring size and max. permissible depth for piercing

| Size | O-Ring   |          | Lube hole at top: max. permissible depth for piercing |
|------|----------|----------|---|
|      | do (mm)  | W (mm)   | T <sub>max</sub> (mm)                                 |
| CG15 | 2.5±0.15 | 1.5±0.15 | 3.75  |
| CG20 | 4.5±0.15 | 1.5±0.15 | 5.7   |
| CG25 | 4.5±0.15 | 1.5±0.15 | 5.8   |
| CG30 | 4.5±0.15 | 1.5±0.15 | 6.3   |
| CG35 | 4.5±0.15 | 1.5±0.15 | 8.8   |
| CG45 | 4.5±0.15 | 1.5±0.15 | 8.2   |



## CG Series

### Superior Rolling Moment with Cover Strip

○ The lubricant amount for a block filled with grease

Table 2-8-13 The lubricant Amount for a Block Filled with Grease

| Size | Heavy load (cm <sup>3</sup> ) | Super Heavy load (cm <sup>3</sup> ) | Size | Heavy load (cm <sup>3</sup> ) | Super Heavy load (cm <sup>3</sup> ) |
|------|-------------------------------|-------------------------------------|------|-------------------------------|-------------------------------------|
| CG15 | 1                             | -                                   | CG30 | 3.5                           | 5                                   |
| CG20 | 2                             | 3                                   | CG35 | 7                             | 9                                   |
| CG25 | 2.5                           | 4                                   | CG45 | 8.5                           | -                                   |

Note : If other size is needed, please contact HIWIN.

○ Frequency of replenishment

Table 2-8-14 Frequency of replenishment for one block

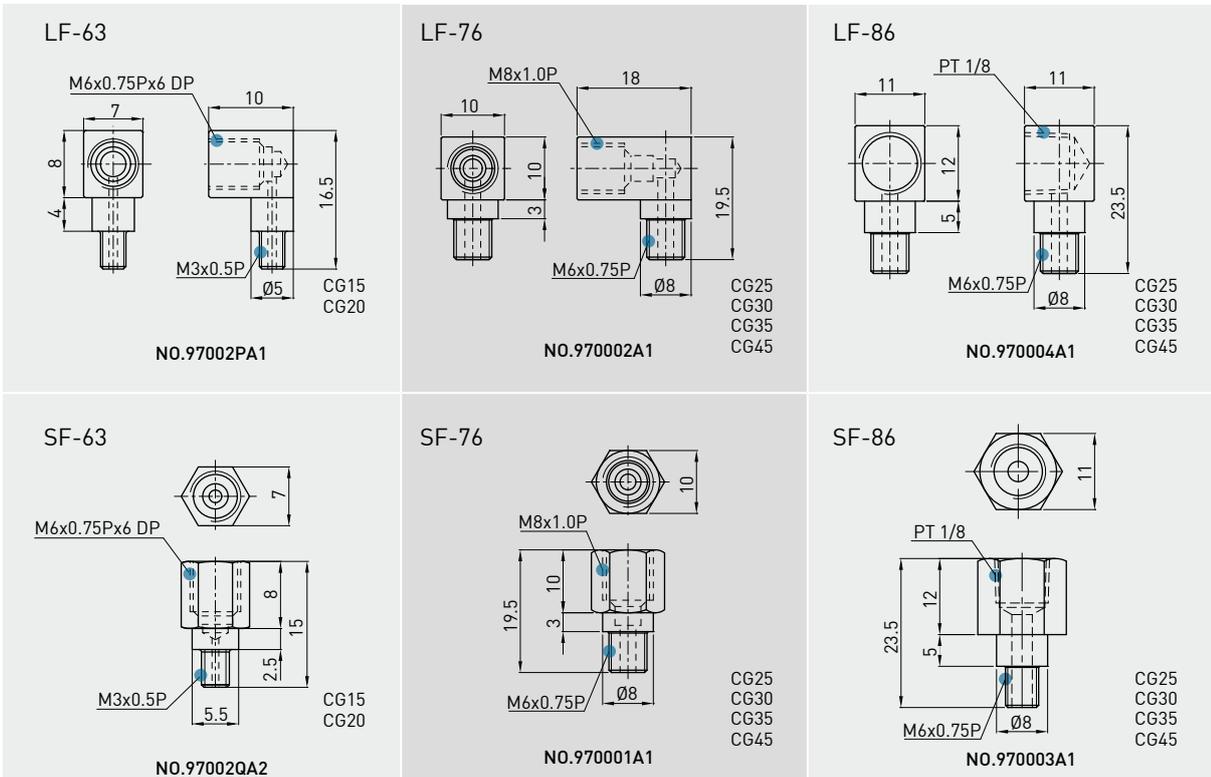
| Recommended lubrication interval [km] |           |                 |      |           |                 |
|---------------------------------------|-----------|-----------------|------|-----------|-----------------|
| Size                                  | P/C < 0,1 | 0,1 < P/C < 0,3 | Size | P/C < 0,1 | 0,1 < P/C < 0,3 |
| CG15                                  | 3000      | (C/P)*100       | CG30 | 3000      | (C/P)*100       |
| CG20                                  | 3000      | (C/P)*100       | CG35 | 3000      | (C/P)*100       |
| CG25                                  | 3000      | (C/P)*100       | CG45 | 3000      | (C/P)*100       |

C : Dynamic rating P : Loading

(2) Oil

The recommended viscosity of oil is about 30~150cSt. If customers need to use oil-type lubrication, please inform us.

○ Types of oil piping joint



○ Oil refilling rate

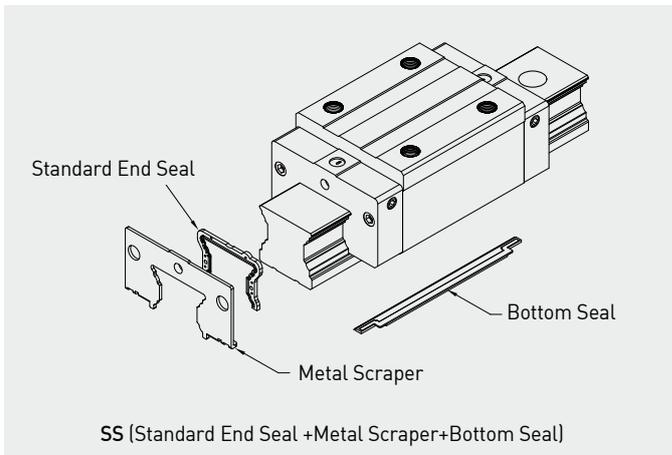
Table 2-8-15

| Size  | Refilling rate (cm <sup>3</sup> /hr) | Size  | Refilling rate (cm <sup>3</sup> /hr) |
|-------|--------------------------------------|-------|--------------------------------------|
| CG 15 | 0.2                                  | CG 30 | 0.3                                  |
| CG 20 | 0.2                                  | CG 35 | 0.3                                  |
| CG 25 | 0.3                                  | CG 45 | 0.4                                  |

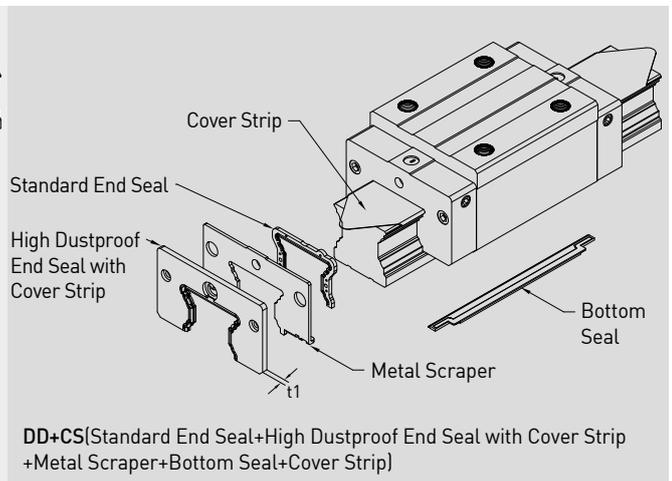
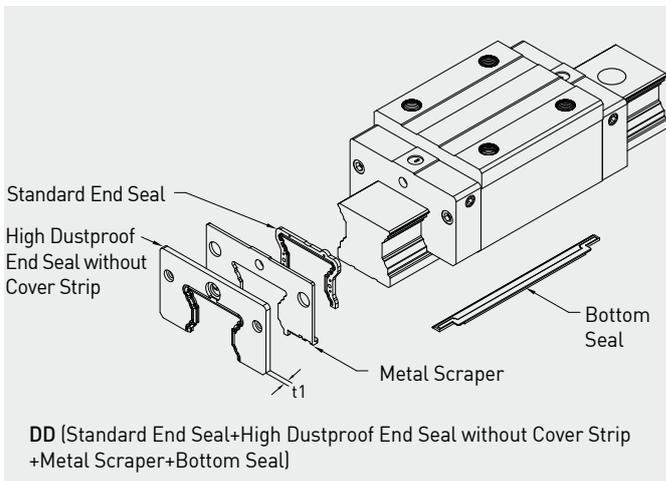
## 2-8-8 Dust Proof Accessories

### (1) Codes of standard dust proof accessories

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



### (2) Codes of high-dust proof accessories



### (3) 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 2-8-16 Dimensions of end seal

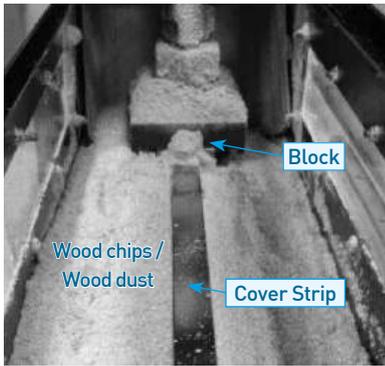
| Size | Thickness (t1) (mm) | Size | Thickness (t1) (mm) |
|------|---------------------|------|---------------------|
| CG15 | 2.8                 | CG30 | 2.8                 |
| CG20 | 2.8                 | CG35 | 2.8                 |
| CG25 | 2.5                 | CG45 | 2.7                 |

## CG Series

### Superior Rolling Moment with Cover Strip

#### ○ Cover Strip

The cover strip offers better dust proof protection than rail bolt caps and is easier to install. The strip is held in place by a plastic retainer at each end. For high temperature environments a metal retainer is available.



|                                  |                        |   |
|----------------------------------|------------------------|---|
| <b>Spec.</b>                     | CGH25CA1R700Z0C+DD/CS  | <b>Test result</b><br><br>No dust get into ball tracks |
| <b>Max.velocity/acceleration</b> | 1m/s,1G                |   |
| <b>Loading</b>                   | Fixture weight         |   |
| <b>Distance</b>                  | 1500km                 |   |
| <b>Dust type</b>                 | Wood chips / Wood dust |   |
| <b>Diameter</b>                  | 100~500µm              |   |

#### ○ 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.

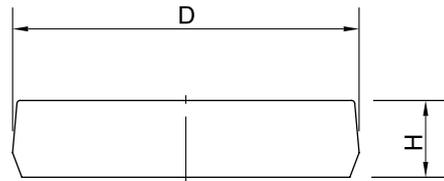


Table 2-8-17 Dimensions of Bolt Caps for Rail Mounting Holes

| Rail size | Bolt size | Diameter(D) (mm) | Thickness(H) (mm) | Rail size | Bolt size | Diameter(D) (mm) | Thickness(H) (mm) |
|-----------|-----------|------------------|-------------------|-----------|-----------|------------------|-------------------|
| CGR15     | M4        | 7.65             | 1.1               | CGR30     | M8        | 14.20            | 3.5               |
| CGR20     | M5        | 9.65             | 2.5               | CGR35     | M8        | 14.20            | 3.5               |
| CGR25     | M6        | 11.15            | 2.5               | CGR45     | M12       | 20.25            | 4.5               |

(4) Dimensions of block equipped with the parts

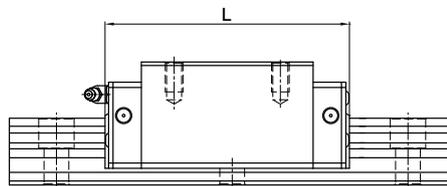


Table 2-8-18 Overall block length

unit: mm

| Size  | Overall block length (L) |       |       | Size  | Overall block length (L) |       |       |
|-------|--------------------------|-------|-------|-------|--------------------------|-------|-------|
|       | SS                       | DD    | DD+CS |       | SS                       | DD    | DD+CS |
| CG15C | 58.2                     | 63.8  | 63.8  | -     | -                        | -     | -     |
| CG20C | 74.9                     | 80.5  | 80.5  | CG20H | 90.9                     | 96.5  | 96.5  |
| CG25C | 84                       | 89    | 89    | CG25H | 101.4                    | 106.4 | 106.4 |
| CG30C | 97.4                     | 103.8 | 103   | CG30H | 119.9                    | 126.3 | 125.5 |
| CG35C | 111.4                    | 117.8 | 117   | CG35H | 135.8                    | 142.2 | 141.4 |
| CG45C | 137.6                    | 145.6 | 145.6 | CG45H | 174                      | 182   | 182   |

## 2-8-9 Friction

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

Table 2-8-19 Seal Resistance

| Size | Resistance N (kgf) | Size | Resistance N (kgf) |
|------|--------------------|------|--------------------|
| CG15 | 0.98 [0.1]         | CG30 | 3.43 [0.35]        |
| CG20 | 1.96 [0.2]         | CG35 | 3.92 [0.4]         |
| CG25 | 3.43 [0.35]        | CG45 | 4.9 [0.5]          |

Note : 1 kgf = 9.81N

Other specifications please contact HIWIN

## 2-8-10 The Accuracy Tolerance of Mounting Surface

CG rail designed with DB type (also known as o arrangement) which has better moment load capacity. Moreover, The CG series can compensate for some surface-error on installation and still maintain smooth linear motion due to circular-arc contact design.

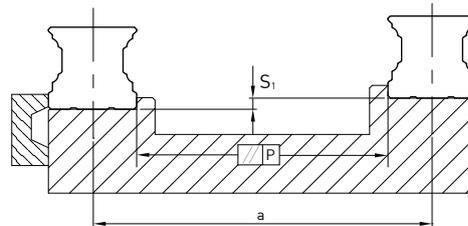


Table 2-8-20 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    |
|------|-----------------|----|----|
|      | Z0              | ZA | ZB |
| CG15 | 9               | 5  | 4  |
| CG20 | 11              | 7  | 5  |
| CG25 | 12              | 8  | 6  |
| CG30 | 14              | 9  | 7  |
| CG35 | 15              | 11 | 8  |
| CG45 | 19              | 14 | 10 |

- The accuracy tolerance of reference surface height ( $S_1$ )

$$S_1 = K \cdot 10^{(-4)} \cdot a - T_H$$

$S_1$  : Max. tolerance of height

$a$  : Distance between paired rails

$K$  : Coefficient of tolerance of height

$T_H$  : dimensional tolerance of height, please refer to accuracy class

Table 2-8-21 Coefficient of tolerance of height

| Size                          | Preload classes    |                     |                    |
|-------------------------------|--------------------|---------------------|--------------------|
|                               | Light Preload (Z0) | Medium Preload (ZA) | Heavy Preload (ZB) |
| K [ $\mu\text{m}/\text{mm}$ ] | 2.8                | 1.7                 | 1.2                |

## CG Series

### Superior Rolling Moment with Cover Strip

#### 2-8-11 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

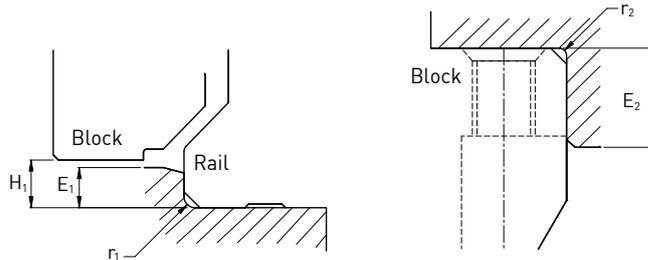


Table 2-8-22 Shoulder Heights and Fillets

| Size  | Max. radius of fillets<br>r <sub>1</sub> (mm) | Max. radius of fillets<br>r <sub>2</sub> (mm) | Shoulder height beside the rail<br>E <sub>1</sub> (mm) | Shoulder height beside the block<br>E <sub>2</sub> (mm) | Clearance under block<br>H <sub>1</sub> (mm) |
|-------|---|---|--|---|--|
| CG 15 | 0.5   | 0.5   | 3.0  | 4.0   | 4.3  |
| CG 20 | 0.5   | 0.5   | 3.5  | 5.0   | 4.6  |
| CG 25 | 1.0   | 1.0   | 5.0  | 5.0   | 5.5  |
| CG 30 | 1.0   | 1.0   | 5.0  | 5.0   | 6.0  |
| CG 35 | 1.0   | 1.0   | 6.0  | 6.0   | 7.5  |
| CG 45 | 1.0   | 1.0   | 8.0  | 8.0   | 9.5  |

##### (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.

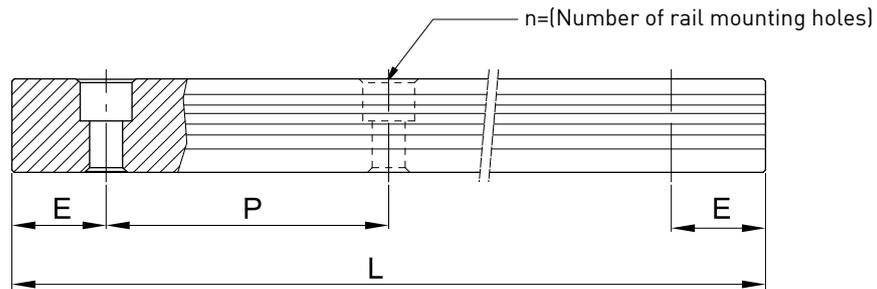
Table 2-8-23 Mounting Torque

| Size  | Bolt size     | Torque N-cm (kgf-cm) |           |           |
|-------|---------------|----------------------|-----------|-----------|
|       |               | Iron                 | Casting   | Aluminum  |
| CG 15 | M4×0.7P×16L   | 392(40)              | 274(28)   | 206(21)   |
| CG 20 | M5×0.8P×16L   | 883(90)              | 588(60)   | 441(45)   |
| CG 25 | M6×1P×20L     | 1373(140)            | 921(94)   | 686(70)   |
| CG 30 | M8×1.25P×25L  | 3041(310)            | 2010(205) | 1470(150) |
| CG 35 | M8×1.25P×25L  | 3041(310)            | 2010(205) | 1470(150) |
| CG 45 | M12×1.75P×35L | 11772(1200)          | 7840(800) | 5880(600) |

Note : 1 kgf = 9.81N

## 2-8-12 Standard and Maximum Lengths of Rail

HIWIN offers standard rail lengths for customer needs. For non-standard E-values, the recommended dimension should not be greater than 1/2 of the pitch (P) dimension. This will prevent an unstable rail end.



$$L = (n - 1) \times P + 2 \times E \quad \text{Eq.2.1}$$

L : Total length of rail (mm)

n : Number of mounting holes

P : Distance between any two holes (mm)

E : Distance from the center of the last hole to the edge (mm)

Table 2-8-24 Rail Standard Length and Max. Length

unit: mm

| Item                              | CG15      | CG20      | CG25      | CG30      | CG35      | CG45      |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Standard Length L(n)              | 160(3)    | 220(4)    | 220(4)    | 280(4)    | 280(4)    | 570(6)    |
|                                   | 220(4)    | 280(5)    | 280(5)    | 440(6)    | 440(6)    | 885(9)    |
|                                   | 280(5)    | 340(6)    | 340(6)    | 600(8)    | 600(8)    | 1,200(12) |
|                                   | 340(6)    | 460(8)    | 460(8)    | 760(10)   | 760(10)   | 1,620(16) |
|                                   | 460(8)    | 640(11)   | 640(11)   | 1,000(13) | 1,000(13) | 2,040(20) |
|                                   | 640(11)   | 820(14)   | 820(14)   | 1,640(21) | 1,640(21) | 2,460(24) |
|                                   | 820(14)   | 1,000(17) | 1,000(17) | 2,040(26) | 2,040(26) | 2,985(29) |
|                                   |           | 1,240(21) | 1,240(21) | 2,520(32) | 2,520(32) |           |
|                                   |           | 1,600(27) | 3,000(38) | 3,000(38) |           |           |
| Pitch (P)                         | 60        | 60        | 60        | 80        | 80        | 105       |
| Distance to End (E <sub>s</sub> ) | 20        | 20        | 20        | 20        | 20        | 22.5      |
| Max. Standard Length              | 4,000(67) | 4,000(67) | 4,000(67) | 3,960(50) | 3,960(50) | 3,930(38) |
| Max. Length                       | 4,000     | 4,000     | 4,000     | 4,000     | 4,000     | 4,000     |

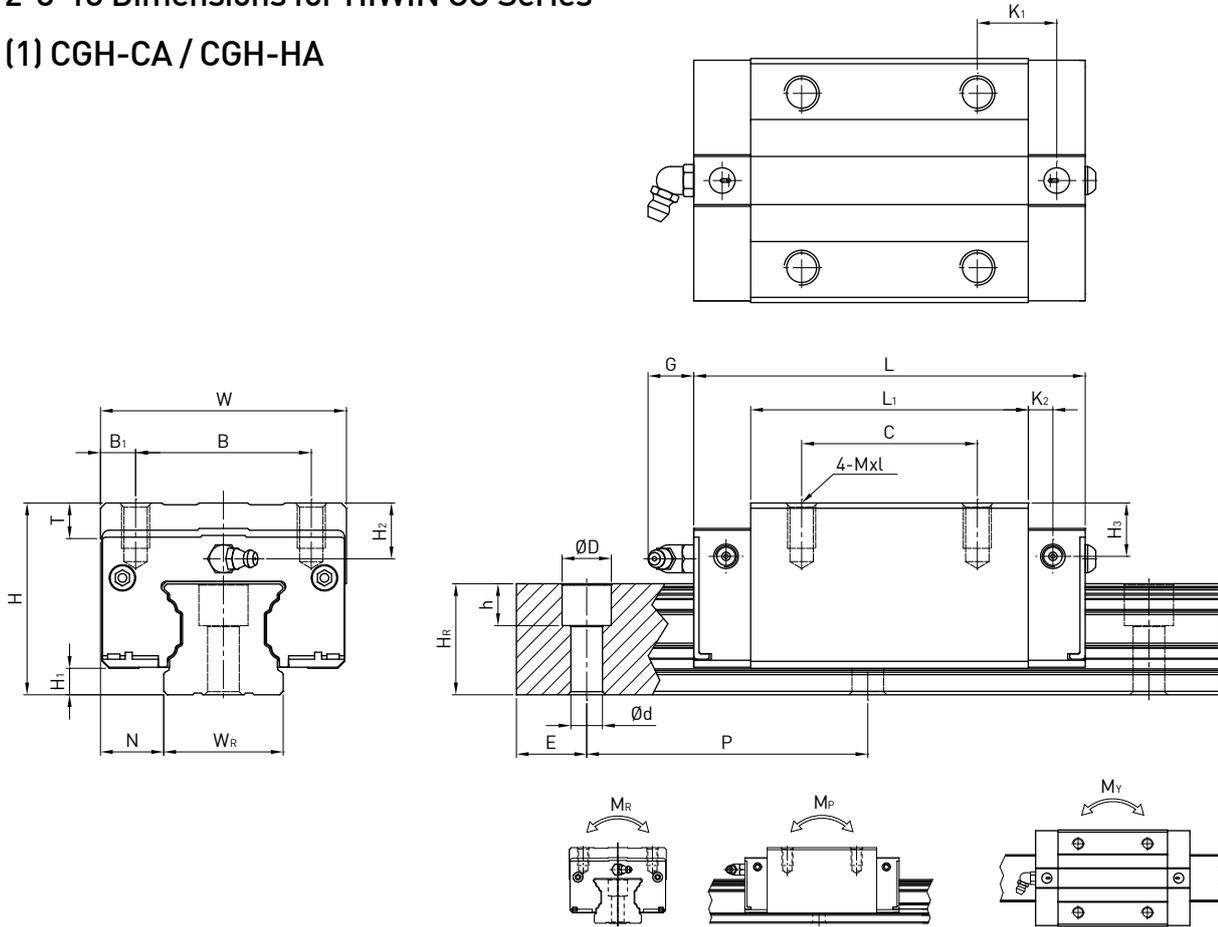
- Note :
1. Tolerance of E value for standard rail is 0.5~-0.5 mm. Tolerance of E value for jointed rail is 0~-0.3 mm.
  2. Maximum standard length means the max. rail length with standard E value on both sides.
  3. If different E value is needed, please contact HIWIN.

# CG Series

Superior Rolling Moment with Cover Strip

## 2-8-13 Dimensions for HIWIN CG Series

### (1) CGH-CA / CGH-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     | G  | K1    | K2   | T    | H2   | H3   | M x l    | WR                      | Hr    | D   | h   | d   |                             |                                  |                                  | P                   | E      | MR   | MP     | MY   | Block kg | Rail kg/m |
| CGH15CA   | 28                          | 4.1  | 9.5  | 34                       | 26 | 4   | 26 | 39.6  | 58.2  | 6  | 10.8  | 4.25 | 6    | 7.8  | 7.8  | M4 x 6   | 15                      | 16.2  | 7.5 | 5.9 | 4.5 | 60                          | 20                               | M4x17                            | 14.7                | 19.52  | 0.19 | 0.14   | 0.14 | 0.15     | 1.58      |
| CGH20CA   | 30                          | 4.65 | 12   | 44                       | 32 | 6   | 36 | 52.5  | 74.9  | 6  | 12.45 | 5.5  | 8    | 3.7  | 4    | M5 x 6   | 20                      | 20.55 | 9.5 | 8.5 | 6   | 60                          | 20                               | M5x19                            | 23.7                | 30.51  | 0.37 | 0.28   | 0.28 | 0.25     | 2.48      |
| CGH20HA   | 30                          | 4.65 | 12   | 44                       | 32 | 6   | 50 | 68.5  | 90.9  | 6  | 13.45 | 5.5  | 8    | 3.7  | 4    | M5 x 6   | 20                      | 20.55 | 9.5 | 8.5 | 6   | 60                          | 20                               |                                  | 28.6                | 39.9   | 0.48 | 0.48   | 0.48 | 0.33     | 2.48      |
| CGH25CA   | 40                          | 6.1  | 12.5 | 48                       | 35 | 6.5 | 35 | 61    | 84    | 13 | 17.4  | 5    | 8    | 10   | 9.1  | M6 x 8   | 23                      | 24.25 | 11  | 9   | 7   | 60                          | 20                               | M6x22                            | 34.96               | 43.94  | 0.6  | 0.49   | 0.49 | 0.46     | 3.38      |
| CGH25HA   | 40                          | 6.1  | 12.5 | 48                       | 35 | 6.5 | 50 | 78.4  | 101.4 | 13 | 18.6  | 5    | 8    | 10   | 9.1  | M6 x 8   | 23                      | 24.25 | 11  | 9   | 7   | 60                          | 20                               |                                  | 40.5                | 54.08  | 0.74 | 0.73   | 0.73 | 0.59     | 3.38      |
| CGH30CA   | 45                          | 7    | 16   | 60                       | 40 | 10  | 40 | 69    | 97.4  | 13 | 19.75 | 8.7  | 9.5  | 9.7  | 9.7  | M8 x 10  | 28                      | 28.35 | 14  | 12  | 9   | 80                          | 20                               | M8x25                            | 46                  | 55.19  | 0.95 | 0.7    | 0.7  | 0.71     | 5.1       |
| CGH30HA   | 45                          | 7    | 16   | 60                       | 40 | 10  | 60 | 91.5  | 119.9 | 13 | 21    | 8.7  | 9.5  | 9.7  | 9.7  | M8 x 10  | 28                      | 28.35 | 14  | 12  | 9   | 80                          | 20                               |                                  | 58.59               | 78.18  | 1.35 | 1.23   | 1.23 | 0.94     | 5.1       |
| CGH35CA   | 55                          | 7.6  | 18   | 70                       | 50 | 10  | 50 | 79    | 111.4 | 13 | 22.6  | 7    | 10.2 | 16   | 15.3 | M8 x 13  | 34                      | 31.85 | 14  | 12  | 9   | 80                          | 20                               | M8x28                            | 61.17               | 79.3   | 1.73 | 1.09   | 1.09 | 1.24     | 7.14      |
| CGH35HA   | 55                          | 7.6  | 18   | 70                       | 50 | 10  | 72 | 103.4 | 135.8 | 13 | 23.8  | 7    | 10.2 | 16   | 15.3 | M8 x 13  | 34                      | 31.85 | 14  | 12  | 9   | 80                          | 20                               |                                  | 77.9                | 112.34 | 2.46 | 2.02   | 2.02 | 1.62     | 7.14      |
| CGH45CA   | 70                          | 9.7  | 20.5 | 86                       | 60 | 13  | 60 | 97.2  | 137.6 | 13 | 23    | 8.7  | 16   | 18.5 | 18.5 | M10 x 17 | 45                      | 39.85 | 20  | 17  | 14  | 105                         | 22.5                             | M12x37                           | 98.43               | 112.66 | 3.56 | 2.35   | 2.35 | 2.38     | 11.51     |
| CGH45HA   | 70                          | 9.7  | 20.5 | 86                       | 60 | 13  | 80 | 133.6 | 174   | 13 | 31.2  | 8.7  | 16   | 18.5 | 18.5 | M10 x 17 | 45                      | 39.85 | 20  | 17  | 14  | 105                         | 22.5                             |                                  | 125.58              | 159.6  | 5.05 | 4.45   | 4.45 | 3.01     | 11.51     |

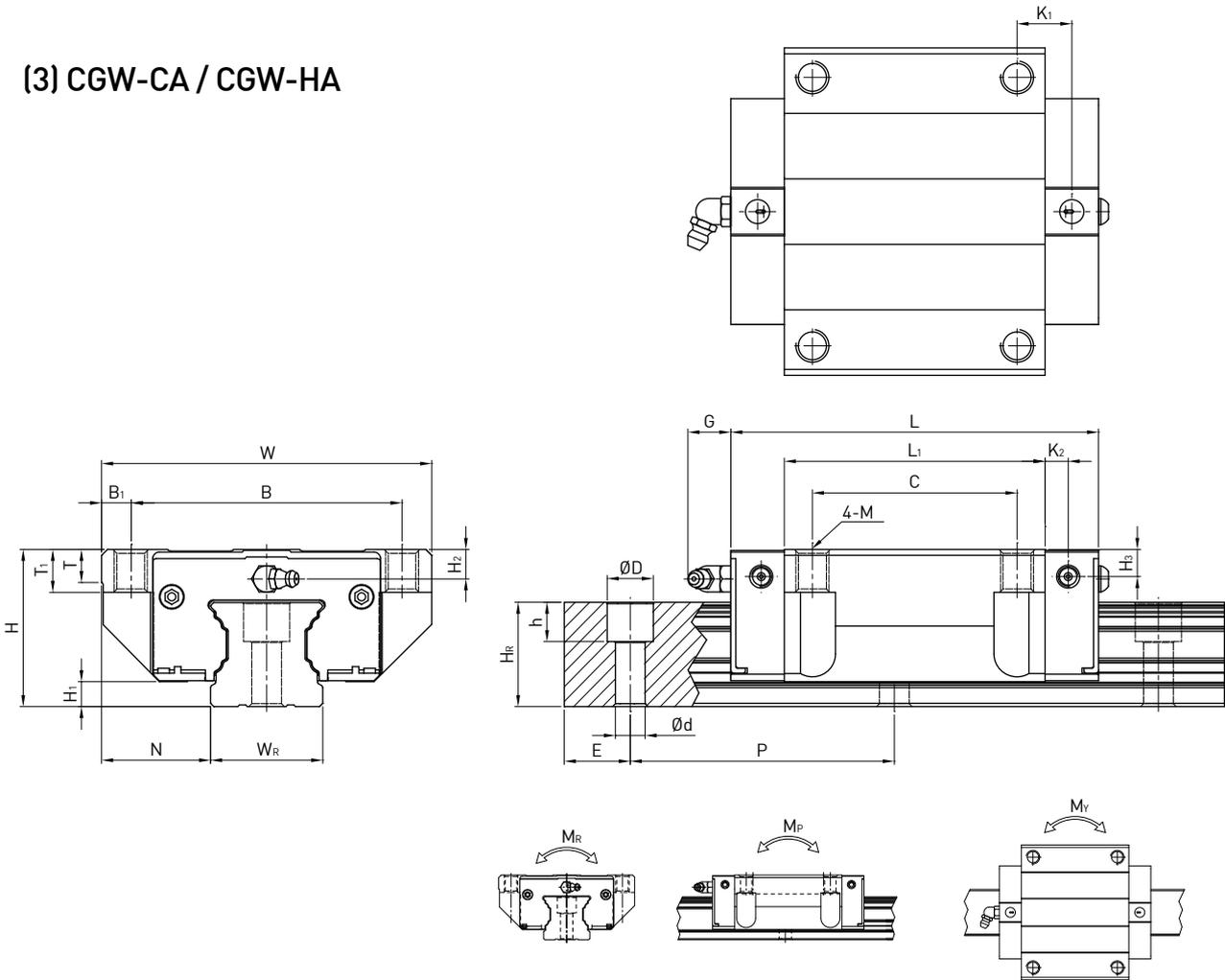
Note : 1 kgf = 9.81 N



# CG Series

Superior Rolling Moment with Cover Strip

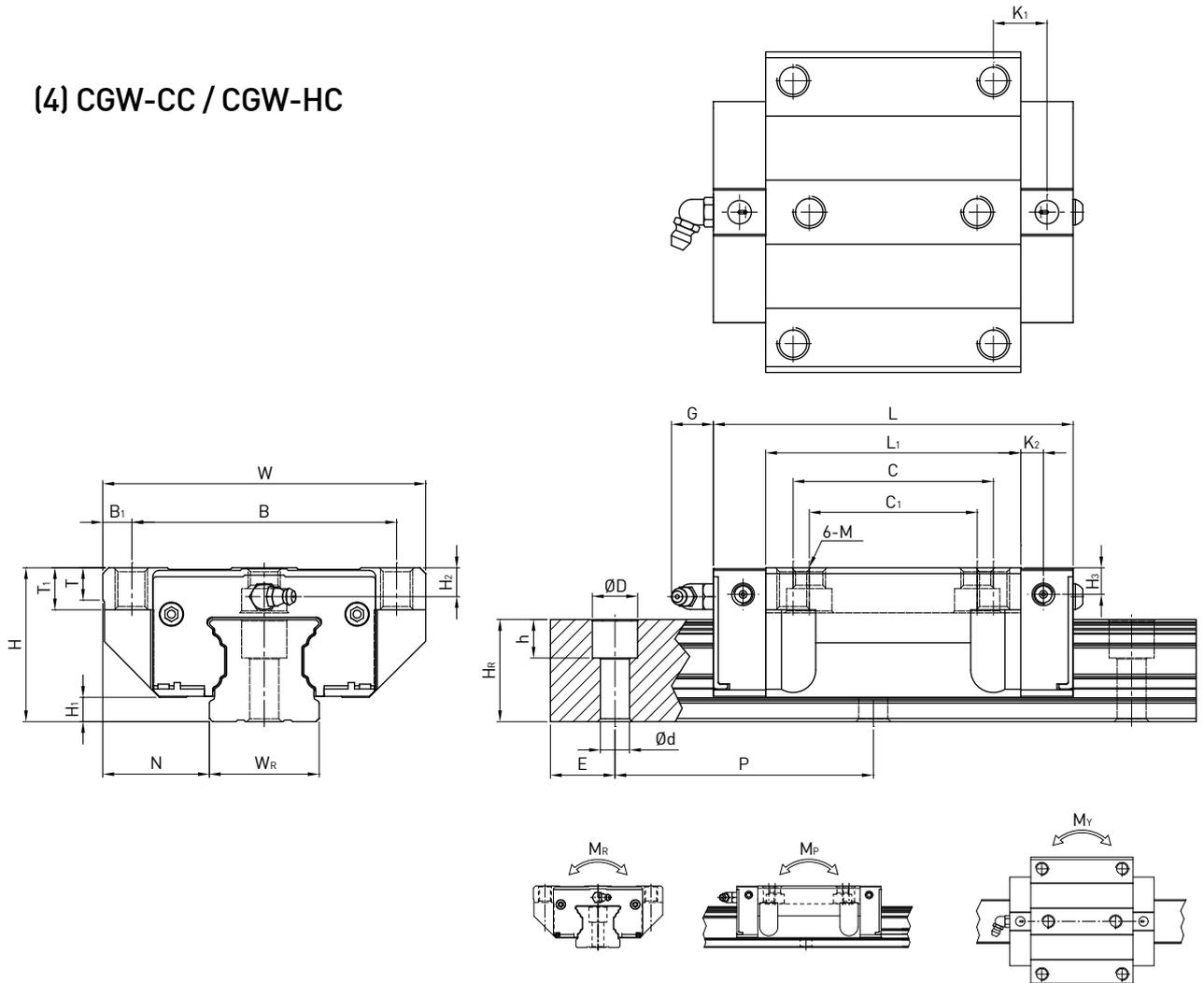
## (3) CGW-CA / CGW-HA



| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |     |                |     |                |       |      |                |                |      |                |                |                | Dimensions of Rail (mm) |                |                |      |     |     |     |      |                |                | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C <sub>0</sub> (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |          |           | Weight |      |
|-----------|-----------------------------|----------------|------|--------------------------|-----|----------------|-----|----------------|-------|------|----------------|----------------|------|----------------|----------------|----------------|-------------------------|----------------|----------------|------|-----|-----|-----|------|----------------|----------------|-----------------------------|---|--|---------------------|----------|-----------|--------|------|
|           | H                           | H <sub>1</sub> | N    | W                        | B   | B <sub>1</sub> | C   | L <sub>1</sub> | L     | G    | K <sub>1</sub> | K <sub>2</sub> | T    | T <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> | M                       | W <sub>R</sub> | H <sub>R</sub> | D    | h   | d   | P   | E    | M <sub>R</sub> | M <sub>P</sub> |                             |   |  | M <sub>Y</sub>      | Block kg | Rail kg/m |        |      |
|           | CGW15CA                     | 24             | 4.1  | 16                       | 47  | 38             | 4.5 | 30             | 39.6  | 58.2 | 6              | 8.8            | 4.25 | 6              | 6.5            | 3.8            | 3.8                     | M5             | 15             | 16.2 | 7.5 | 5.9 | 4.5 | 60   | 20             | M4x17          |                             |   |  | 14.7                | 19.52    | 0.19      | 0.14   | 0.14 |
| CGW20CA   | 30                          | 4.65           | 21.5 | 63                       | 53  | 5              | 40  | 52.5           | 74.9  | 6    | 10.45          | 5.5            | 6.5  | 7.7            | 3.7            | 4              | M6                      | 20             | 20.55          | 9.5  | 8.5 | 6   | 60  | 20   | M5x19          | 23.7           | 30.51                       | 0.37  | 0.28   | 0.28                | 0.36     | 2.48      |        |      |
| CGW20HA   | 30                          | 4.65           | 21.5 | 63                       | 53  | 5              | 40  | 68.5           | 90.9  | 6    | 18.45          | 5.5            | 6.5  | 7.7            | 3.7            | 4              | M6                      | 20             | 20.55          | 9.5  | 8.5 | 6   | 60  | 20   |                | 28.6           | 39.9                        | 0.48  | 0.48   | 0.48                | 0.47     | 2.48      |        |      |
| CGW25CA   | 36                          | 6.1            | 23.5 | 70                       | 57  | 6.5            | 45  | 61             | 84    | 13   | 12.4           | 5              | 7    | 9.3            | 6              | 5.1            | M8                      | 23             | 24.25          | 11   | 9   | 7   | 60  | 20   | M6x22          | 34.96          | 43.94                       | 0.6   | 0.49   | 0.49                | 0.53     | 3.38      |        |      |
| CGW25HA   | 36                          | 6.1            | 23.5 | 70                       | 57  | 6.5            | 45  | 78.4           | 101.4 | 13   | 21.1           | 5              | 7    | 9.3            | 6              | 5.1            | M8                      | 23             | 24.25          | 11   | 9   | 7   | 60  | 20   |                | 40.5           | 54.08                       | 0.74  | 0.73   | 0.73                | 0.68     | 3.38      |        |      |
| CGW30CA   | 42                          | 7              | 31   | 90                       | 72  | 9              | 52  | 69             | 97.4  | 13   | 13.75          | 8.7            | 10.5 | 12             | 6.7            | 6.7            | M10                     | 28             | 28.35          | 14   | 12  | 9   | 80  | 20   | M8x25          | 46             | 55.19                       | 0.95  | 0.7  | 0.7                 | 0.9      | 5.1       |        |      |
| CGW30HA   | 42                          | 7              | 31   | 90                       | 72  | 9              | 52  | 91.5           | 119.9 | 13   | 25             | 8.7            | 10.5 | 12             | 6.7            | 6.7            | M10                     | 28             | 28.35          | 14   | 12  | 9   | 80  | 20   |                | 58.59          | 78.18                       | 1.35  | 1.23   | 1.23                | 1.19     | 5.1       |        |      |
| CGW35CA   | 48                          | 7.6            | 33   | 100                      | 82  | 9              | 62  | 79             | 111.4 | 13   | 16.6           | 7              | 10.1 | 13.1           | 9              | 8.3            | M10                     | 34             | 31.85          | 14   | 12  | 9   | 80  | 20   | M8x28          | 61.17          | 79.3                        | 1.73  | 1.09   | 1.09                | 1.37     | 7.14      |        |      |
| CGW35HA   | 48                          | 7.6            | 33   | 100                      | 82  | 9              | 62  | 103.4          | 135.8 | 13   | 28.8           | 7              | 10.1 | 13.1           | 9              | 8.3            | M10                     | 34             | 31.85          | 14   | 12  | 9   | 80  | 20   |                | 77.9           | 112.34                      | 2.46  | 2.02   | 2.02                | 1.79     | 7.14      |        |      |
| CGW45CA   | 60                          | 9.7            | 37.5 | 120                      | 100 | 10             | 80  | 97.2           | 137.6 | 13   | 13             | 8.7            | 13.5 | 15             | 8.5            | 8.5            | M12                     | 45             | 39.85          | 20   | 17  | 14  | 105 | 22.5 | M12x37         | 98.43          | 112.66                      | 3.56  | 2.35   | 2.35                | 2.45     | 11.51     |        |      |
| CGW45HA   | 60                          | 9.7            | 37.5 | 120                      | 100 | 10             | 80  | 133.6          | 174   | 13   | 31.2           | 8.7            | 13.5 | 15             | 8.5            | 8.5            | M12                     | 45             | 39.85          | 20   | 17  | 14  | 105 | 22.5 |                | 125.58         | 159.6                       | 5.05  | 4.45   | 4.45                | 3        | 11.51     |        |      |

Note : 1 kgf = 9.81 N

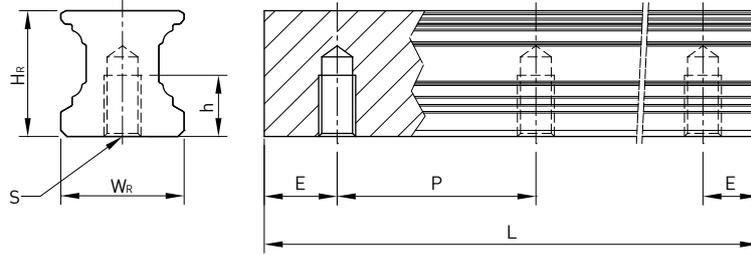
(4) CGW-CC / CGW-HC



| 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 C <sub>0</sub> (kN) | 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     | G  | K <sub>1</sub> | K <sub>2</sub> | T    | T <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub>          | M   | W <sub>R</sub> | H <sub>R</sub> | D   |                             |                                  |  | h                   | d      | P      | E      | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block kg | Rail kg/m |
|           |                             |                |      |                          |     |                |    |                |                |       |    |                |                |      |                |                |                         |     |                |                |     |                             |                                  |  |                     |        |        |        |                |                |                |          |           |
| CGW15CC   | 24                          | 4.1            | 16   | 47                       | 38  | 4.5            | 30 | 26             | 39.6           | 58.2  | 6  | 8.8            | 4.25           | 6    | 6.5            | 3.8            | 3.8                     | M5  | 15             | 16.2           | 7.5 | 5.9                         | 4.5                              | 60   | 20                  | M4x17  | 14.7   | 19.52  | 0.19           | 0.14           | 0.14           | 0.14     | 1.58      |
| CGW20CC   | 30                          | 4.65           | 21.5 | 63                       | 53  | 5              | 40 | 35             | 52.5           | 74.9  | 6  | 10.45          | 5.5            | 6.5  | 7.7            | 3.7            | 4                       | M6  | 20             | 20.55          | 9.5 | 8.5                         | 6                                | 60   | 20                  | M5x19  | 23.7   | 30.51  | 0.37           | 0.28           | 0.28           | 0.36     | 2.48      |
| CGW20HC   | 30                          | 4.65           | 21.5 | 63                       | 53  | 5              | 40 | 35             | 68.5           | 90.9  | 6  | 18.45          | 5.5            | 6.5  | 7.7            | 3.7            | 4                       | M6  | 20             | 20.55          | 9.5 | 8.5                         | 6                                | 60   | 20                  | M5x19  | 28.6   | 39.9   | 0.48           | 0.48           | 0.48           | 0.47     | 2.48      |
| CGW25CC   | 36                          | 6.1            | 23.5 | 70                       | 57  | 6.5            | 45 | 40             | 61             | 84    | 13 | 12.4           | 5              | 7    | 9.3            | 6              | 5.1                     | M8  | 23             | 24.25          | 11  | 9                           | 7                                | 60   | 20                  | M6x22  | 34.96  | 43.94  | 0.6            | 0.49           | 0.49           | 0.53     | 3.38      |
| CGW25HC   | 36                          | 6.1            | 23.5 | 70                       | 57  | 6.5            | 45 | 40             | 78.4           | 101.4 | 13 | 21.1           | 5              | 7    | 9.3            | 6              | 5.1                     | M8  | 23             | 24.25          | 11  | 9                           | 7                                | 60   | 20                  | M6x22  | 40.5   | 54.08  | 0.74           | 0.73           | 0.73           | 0.68     | 3.38      |
| CGW30CC   | 42                          | 7              | 31   | 90                       | 72  | 9              | 52 | 44             | 69             | 97.4  | 13 | 13.75          | 8.7            | 10.5 | 12             | 6.7            | 6.7                     | M10 | 28             | 28.35          | 14  | 12                          | 9                                | 80   | 20                  | M8x25  | 46     | 55.19  | 0.95           | 0.7            | 0.7            | 0.9      | 5.1       |
| CGW30HC   | 42                          | 7              | 31   | 90                       | 72  | 9              | 52 | 44             | 91.5           | 119.9 | 13 | 25             | 8.7            | 10.5 | 12             | 6.7            | 6.7                     | M10 | 28             | 28.35          | 14  | 12                          | 9                                | 80   | 20                  | M8x25  | 58.59  | 78.18  | 1.35           | 1.23           | 1.23           | 1.19     | 5.1       |
| CGW35CC   | 48                          | 7.6            | 33   | 100                      | 82  | 9              | 62 | 52             | 79             | 111.4 | 13 | 16.6           | 7              | 10.1 | 13.1           | 9              | 8.3                     | M10 | 34             | 31.85          | 14  | 12                          | 9                                | 80   | 20                  | M8x28  | 61.17  | 79.3   | 1.73           | 1.09           | 1.09           | 1.37     | 7.14      |
| CGW35HC   | 48                          | 7.6            | 33   | 100                      | 82  | 9              | 62 | 52             | 103.4          | 135.8 | 13 | 28.8           | 7              | 10.1 | 13.1           | 9              | 8.3                     | M10 | 34             | 31.85          | 14  | 12                          | 9                                | 80   | 20                  | M8x28  | 77.9   | 112.34 | 2.46           | 2.02           | 2.02           | 1.79     | 7.14      |
| CGW45CC   | 60                          | 9.7            | 37.5 | 120                      | 100 | 10             | 80 | 60             | 97.2           | 137.6 | 13 | 13             | 8.7            | 13.5 | 15             | 8.5            | 8.5                     | M12 | 45             | 39.85          | 20  | 17                          | 14                               | 105  | 22.5                | M12x37 | 98.43  | 112.66 | 3.56           | 2.35           | 2.35           | 2.45     | 11.51     |
| CGW45HC   | 60                          | 9.7            | 37.5 | 120                      | 100 | 10             | 80 | 60             | 133.6          | 174   | 13 | 31.2           | 8.7            | 13.5 | 15             | 8.5            | 8.5                     | M12 | 45             | 39.85          | 20  | 17                          | 14                               | 105  | 22.5                | M12x37 | 125.58 | 159.6  | 5.05           | 4.45           | 4.45           | 3        | 11.51     |

Note : 1 kgf = 9.81 N

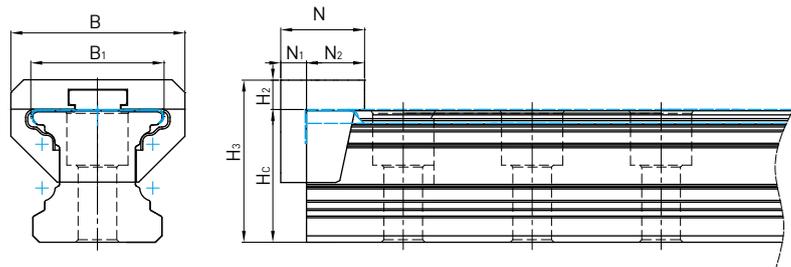
**(5) Dimensions for CGR-T (Rail Mounting from Bottom)**



| Size   | Dimensions of Rail (mm) |       |           |    |     |      |
|--------|-------------------------|-------|-----------|----|-----|------|
|        | $W_R$                   | $H_R$ | S         | h  | P   | E    |
| CGR15T | 15                      | 16.2  | M5X0.8P   | 8  | 60  | 20   |
| CGR20T | 20                      | 20.55 | M6X1P     | 10 | 60  | 20   |
| CGR25T | 23                      | 24.25 | M6X1P     | 12 | 60  | 20   |
| CGR30T | 28                      | 28.35 | M8X1.25P  | 15 | 80  | 20   |
| CGR35T | 34                      | 31.85 | M8X1.25P  | 17 | 80  | 20   |
| CGR45T | 45                      | 39.85 | M12X1.75P | 24 | 105 | 22.5 |

**(6) Dimension of cover strip and plastic end jig**

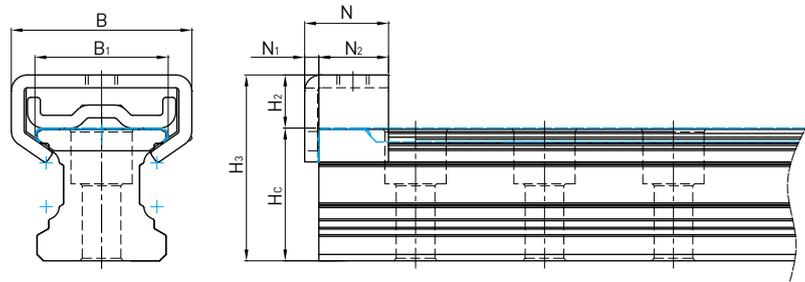
- plastic end jig (standard)



| Size  | $H_3$ | $H_c^1$ | $H_2$ | N    | $N_1$ | $N_2$ | B    | $B_1$ |
|-------|-------|---------|-------|------|-------|-------|------|-------|
| CG 15 | 20.8  | 16.4    | 4.4   | 13.0 | 3.7   | 9.3   | 20.0 | 15.8  |
| CG 20 | 25.65 | 20.75   | 4.9   | 13.0 | 4.0   | 9.0   | 27.0 | 20.7  |
| CG 25 | 29.55 | 24.45   | 5.1   | 15.0 | 4.2   | 10.8  | 31.5 | 23.9  |
| CG 30 | 35.45 | 28.55   | 6.9   | 21.0 | 6.0   | 15.0  | 40.0 | 28.9  |
| CG 35 | 40.75 | 32.05   | 8.7   | 21.5 | 6.2   | 15.3  | 46.0 | 34.8  |
| CG 45 | 48.3  | 40.05   | 8.25  | 22.0 | 6.2   | 15.8  | 51.6 | 45.6  |

Note : 1. Dimension  $H_c$  with cover strip

- Metal end jig (optional)



| Size  | $H_3$ | $H_c^1$ | $H_2$ | N    | $N_1$ | $N_2$ | B    | $B_1$ |
|-------|-------|---------|-------|------|-------|-------|------|-------|
| CG 15 | 20.09 | 16.4    | 3.69  | 15.0 | 2.2   | 12.8  | 21.0 | 15.8  |
| CG 20 | 29.05 | 20.75   | 8.3   | 13.0 | 2.2   | 10.8  | 28.0 | 20.7  |
| CG 25 | 34.42 | 24.45   | 9.97  | 15.0 | 2.2   | 12.8  | 30.6 | 23.9  |
| CG 30 | 37.80 | 28.55   | 9.25  | 12.0 | 2.2   | 9.8   | 34.0 | 28.9  |
| CG 35 | 43.2  | 32.05   | 11.15 | 18.0 | 2.2   | 15.8  | 35.4 | 34.8  |
| CG 45 | 52.66 | 40.05   | 12.61 | 18.0 | 2.2   | 15.8  | 53.6 | 45.6  |

Note : 1. Dimension  $H_c$  with cover strip

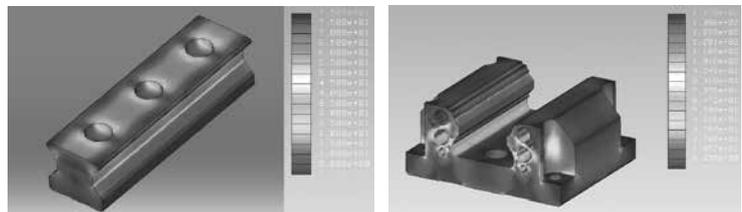
## 2-9 RG Series – High Rigidity Roller Type Linear Guideway

### 2-9-1 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.

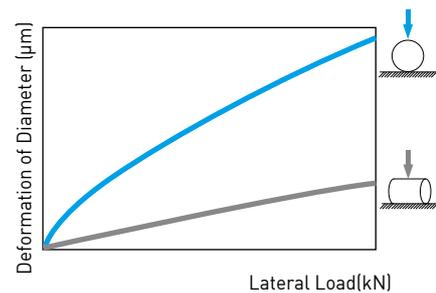
#### (1) Optimal design

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.



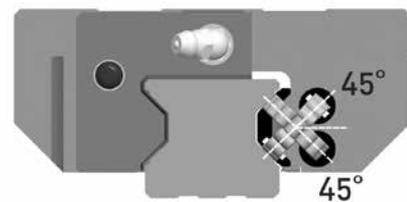
#### (2) Super high rigidity

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

Compare with the ball element, the contact pressure of rolling element is distributed on the line region. Therefore, stress concentration was reduced significantly and the RG series offers longer running life. The nominal life of RG series can be calculated by using Eq.

The acting 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 of ball type and roller type linear guideway can be calculated by Eq.2.5 respectively.

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

If the environmental factors are taken into consideration, the nominal life is 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.2.6.

$$L = \left( \frac{f_h \cdot f_t \cdot C}{f_w \cdot P} \right)^{\frac{10}{3}} \cdot 100\text{km} = \left( \frac{f_h \cdot f_t \cdot C}{f_w \cdot P} \right)^{\frac{10}{3}} \cdot 62\text{mile} \dots\dots\dots \text{Eq. 2.6}$$

L : Nominal life  
 C : Basic dynamic load rating  
 P : Actual load  
 f<sub>h</sub> : Hardness factor  
 f<sub>t</sub> : Temperature factor  
 f<sub>w</sub> : Load factor

## RG Series

### High Rigidity Roller Type

(5) Test Data  
1. Nominal life test

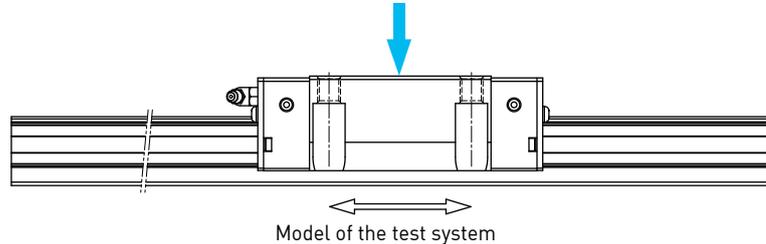
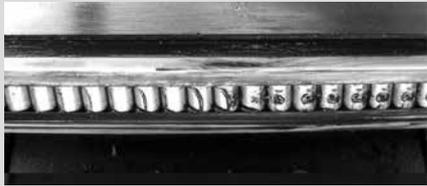


Table 2-9-1

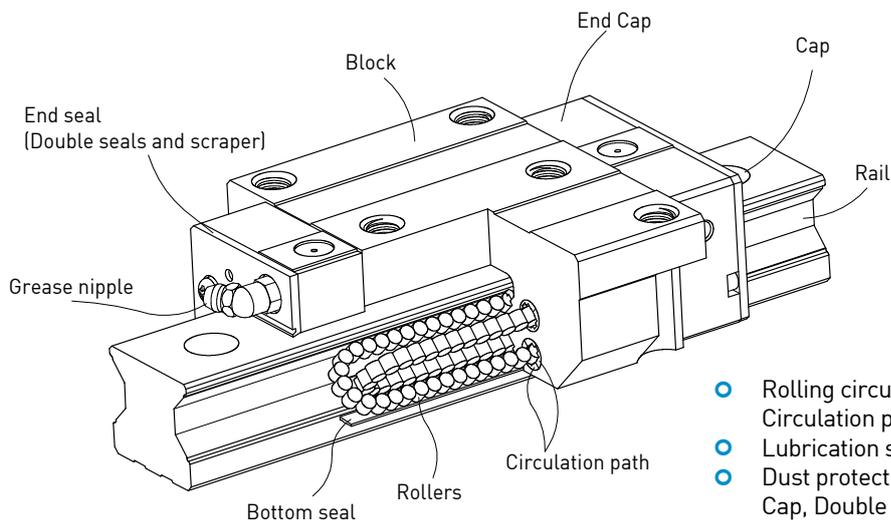
|   |   |
|---|---|
| <p><b>Tested model 1: RGH35CA</b><br/>                 Preload: ZA class<br/>                 Max. Speed: 60m/min<br/>                 Acceleration: 1G<br/>                 Stroke: 0.55m<br/>                 Lubrication: grease held every 100km<br/>                 External load: 15kN<br/>                 Traveling distance: 1135km</p> | <p><b>Test results:</b><br/>                 The nominal life of RGH35CA is 1000km.<br/>                 After traveling 1135km, fatigue flaking did not appear on the surface of the raceway or rollers.</p>  |
|---|---|

2. Durability Test

|   |  |
|---|--|
| <p><b>Tested model 2: RGW35CC</b><br/>                 Preload: ZA class<br/>                 Max. Speed: 120m/min<br/>                 Acceleration: 1G<br/>                 Stroke: 2m<br/>                 Lubrication: oil feed rate: 0.3cm<sup>3</sup>/hr<br/>                 External load: 0kN<br/>                 Traveling distance: 15000km</p> | <p><b>Test results:</b><br/>                 Fatigue flaking did not appear on the surface of the raceway or rollers after traveling 15000km.</p>  |
|---|--|

Note: The data listed are from samples.

### 2-9-2 Construction of RG Series

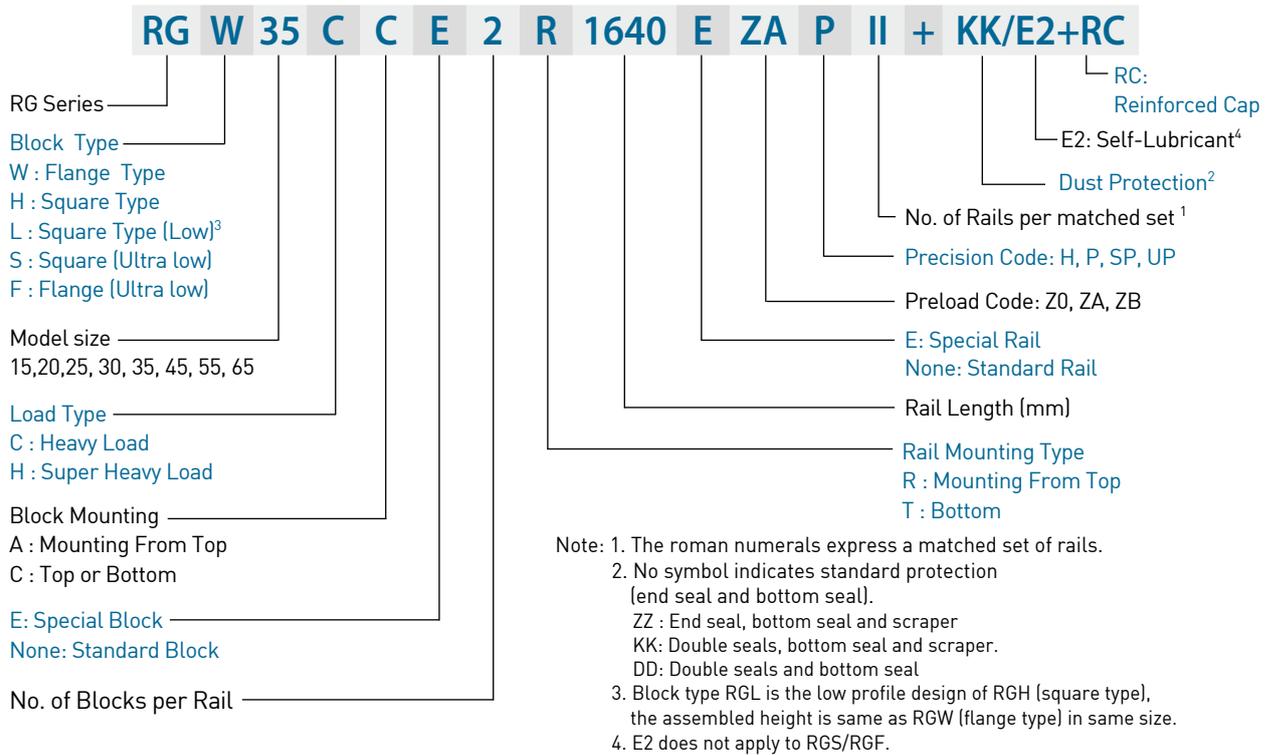


- Rolling circulation system: Block, Rail, End cap, Circulation path, rollers
- Lubrication system: Grease nipple and piping joint
- Dust protection system: End seal, Bottom seal, Cap, Double seals and Scraper

## 2-9-3 Model Number of RG series

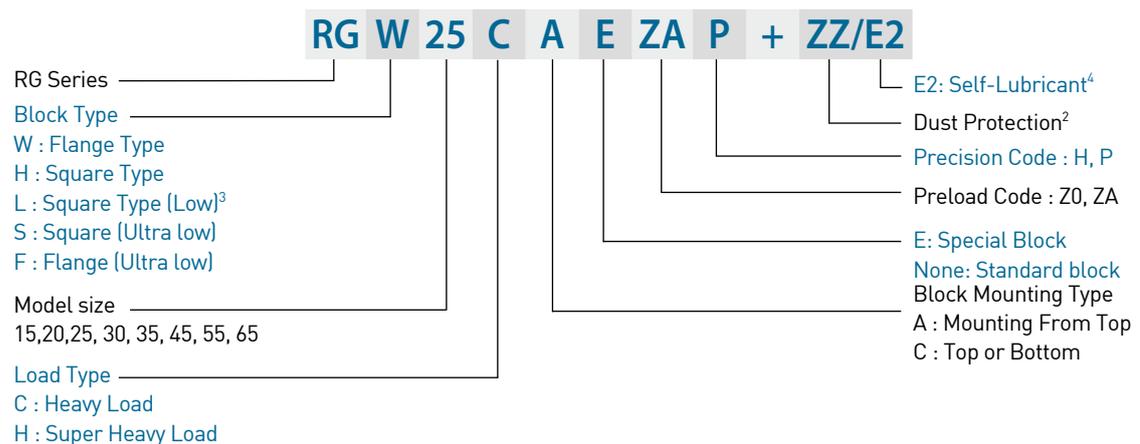
RG series linear guideways are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of strict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

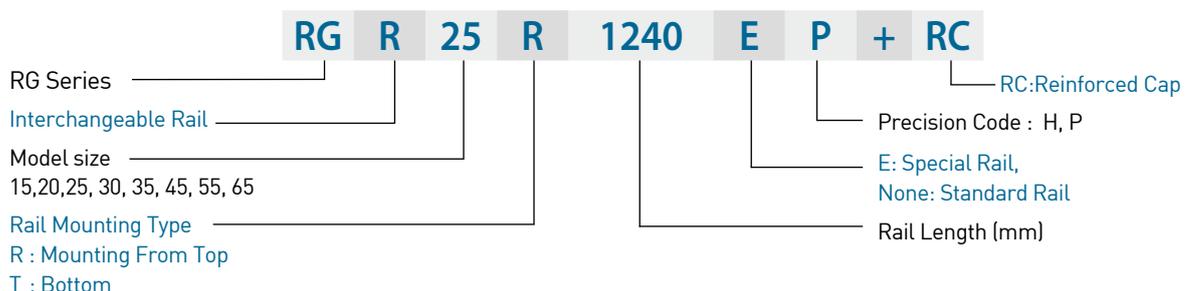


### (2) Interchangeable type

#### ○ Model Number of RG Block



#### ○ Model Number of RG Rail



## RG Series

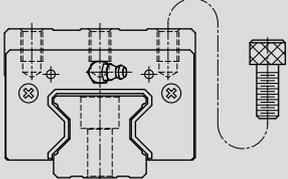
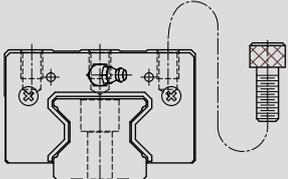
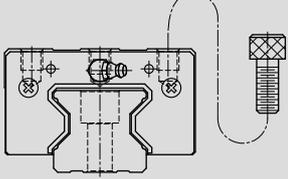
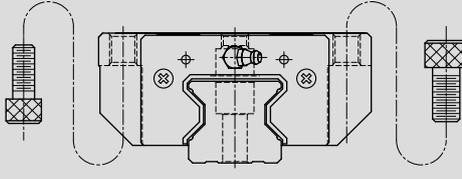
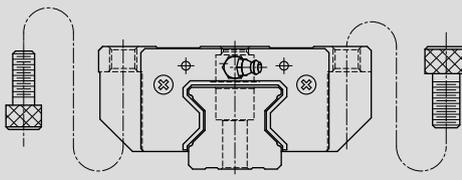
### High Rigidity Roller Type

#### 2-9-4 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.

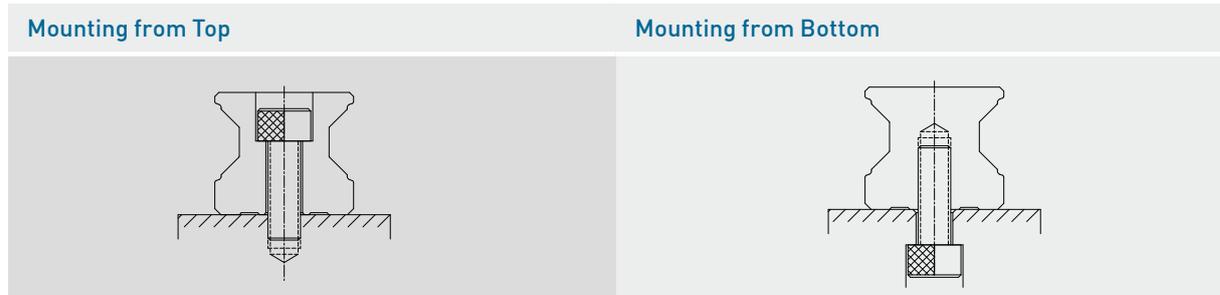
Table 2-9-2 Block Types

| Type               | Model            | Shape   | Height (mm) | Rail Length (mm) | Main Applications  |
|--------------------|------------------|---|-------------|------------------|--|
| Square             | RGH-CA<br>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             |  |
| Square (low)       | RGL-CA<br>RGL-HA |   | 24          | 100              |  |
|                    |                  |   | ↓           | ↓                |  |
|                    |                  |   | 70          | 4000             |  |
| Square (Ultra low) | RGS-CA<br>RGS-HA |  | 44          | 100              |  |
|                    |                  |   | ↓           | ↓                |  |
|                    |                  |   | 52          | 4000             |  |
| Flange             | RGW-CC<br>RGW-HC |  | 24          | 100              |  |
|                    |                  |   | ↓           | ↓                |  |
|                    |                  |   | 90          | 4000             |  |
| Flange (Ultra low) | RGF-CC<br>RGF-HC |  | 44          | 100              |  |
|                    |                  |   | ↓           | ↓                |  |
|                    |                  |   | 52          | 4000             |  |

## (2) Rail types

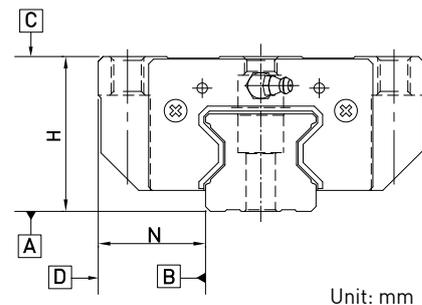
In addition to the standard top mounting type, HIWIN also offers the bottom mounting type of rails.

Table 2-9-3 Rail Types



## 2-9-5 Accuracy Classes

The accuracy of the RG 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 2-9-4 Accuracy Standards

| Item  | RG - 15, 20      |               |                      |                      |
|---|------------------|---------------|----------------------|----------------------|
|   | High (H)         | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.03           | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 0.008         |
| Dimensional tolerance of width N                    | ± 0.03           | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 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 2-9-12 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |                      |                      |

Table 2-9-5 Accuracy Standards

Unit: mm

| Item  | RG - 25, 30, 35  |               |                      |                      |
|---|------------------|---------------|----------------------|----------------------|
|   | High (H)         | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.04           | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 0.01          |
| Dimensional tolerance of width N                    | ± 0.04           | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 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 2-9-12 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |                      |                      |

## RG Series

### High Rigidity Roller Type

Table 2-9-6 Accuracy Standards

Unit: mm

| Item  | RG - 45, 55      |               |                      |                      |
|---|------------------|---------------|----------------------|----------------------|
|   | High (H)         | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.05           | 0<br>- 0.05   | 0<br>- 0.03          | 0<br>- 0.02          |
| Dimensional tolerance of width N                    | ± 0.05           | 0<br>- 0.05   | 0<br>- 0.03          | 0<br>- 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 2-9-12 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |                      |                      |

Table 2-9-7 Accuracy Standards

Unit: mm

| Item  | RG - 65          |               |                      |                      |
|---|------------------|---------------|----------------------|----------------------|
|   | High (H)         | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.07           | 0<br>- 0.07   | 0<br>- 0.05          | 0<br>- 0.03          |
| Dimensional tolerance of width N                    | ± 0.07           | 0<br>- 0.07   | 0<br>- 0.05          | 0<br>- 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 2-9-12 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |                      |                      |

### (2) Accuracy of interchangeable

Table 2-9-8 Accuracy Standards

Unit: mm

| Item  | RG - 15, 20      |               |
|---|------------------|---------------|
|   | 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 2-9-12 |               |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |

Table 2-9-9 Accuracy Standards

Unit: mm

| Item  | RG - 25, 30, 35  |               |
|---|------------------|---------------|
|   | 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 2-9-12 |               |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |

Table 2-9-10 Accuracy Standards

Unit: mm

| Item  | RG - 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 2-9-12 |               |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |

Table 2-9-11 Accuracy Standards

Unit: mm

| Item  | RG - 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 2-9-12 |               |
| Running parallelism of block surface D to surface B | See Table 2-9-12 |               |

### (3) Accuracy of running parallelism

Table 2-9-12 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  |

## RG Series

### High Rigidity Roller Type

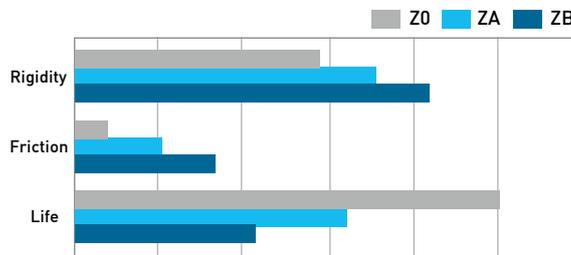
#### 2-9-6 Preload

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 RG series linear guideway offers three standard preloads for various applications and conditions.

Table 2-9-13

| 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.



#### ○ Stiffness performance

Stiffness depends on preload. The following table shows stiffness value of each size.

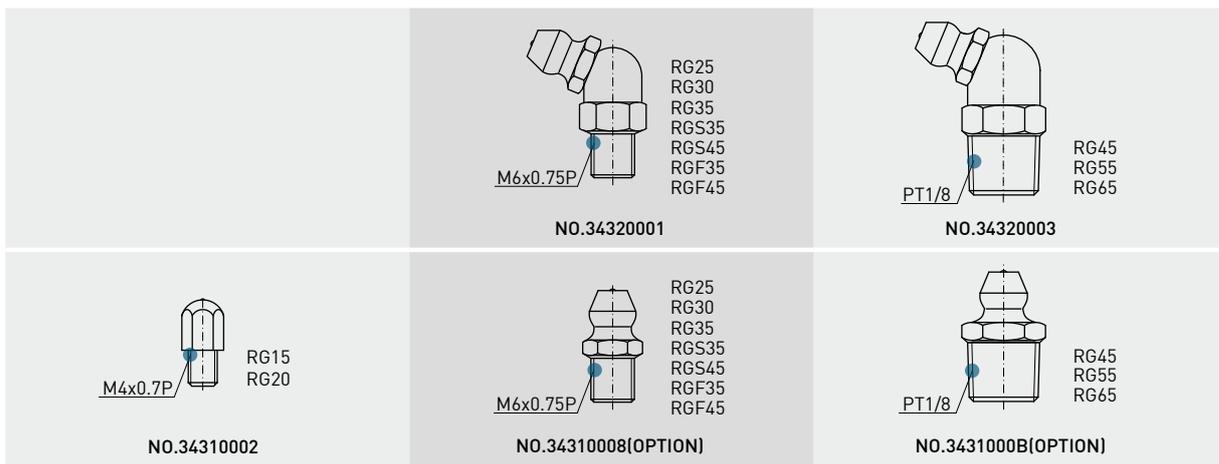
Table 2-9-14 Radial stiffness for RG Series

| Load type        | Series / Size | Stiffness (N/μm) |      |      |
|------------------|---------------|------------------|------|------|
|                  |               | Z0               | ZA   | ZB   |
| Heavy load       | RG 15C        | 508              | 727  | 788  |
|                  | RG 20C        | 625              | 853  | 950  |
|                  | RG 25C        | 692              | 954  | 1196 |
|                  | RG 30C        | 882              | 1082 | 1333 |
|                  | RG 35C        | 1059             | 1247 | 1547 |
|                  | RG 45C        | 1642             | 1851 | 2332 |
|                  | RG 55C        | 1784             | 2053 | 2506 |
|                  | RG 65C        | 2564             | 2900 | 3482 |
| Super heavy load | RG 20H        | 840              | 1160 | 1279 |
|                  | RG 25H        | 887              | 1242 | 1549 |
|                  | RG 30H        | 1125             | 1391 | 1711 |
|                  | RG 35H        | 1412             | 1757 | 2144 |
|                  | RG 45H        | 2207             | 2511 | 3172 |
|                  | RG 55H        | 2459             | 2858 | 3538 |
|                  | RG 65H        | 3560             | 4064 | 4937 |

## 2-9-7 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.

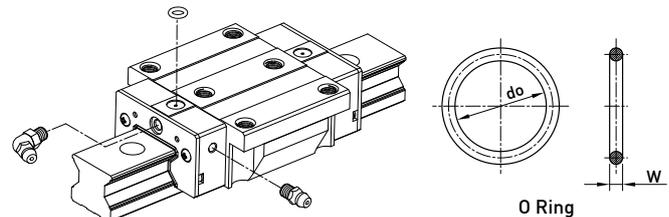
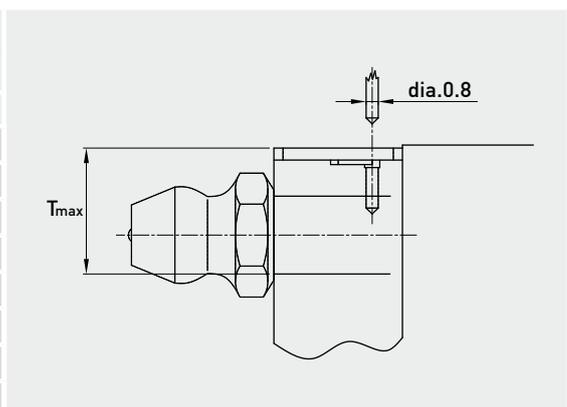


Table 2-9-15 O-Ring size and max. permissible depth for piercing

| Size | O-Ring   |          | Lube hole at top:<br>max. permissible depth<br>for piercing |
|------|----------|----------|---|
|      | do (mm)  | W (mm)   | T <sub>max</sub> (mm)                                       |
| RG15 | 2.5±0.15 | 1.5±0.15 | 3.45  |
| RG20 | 2.5±0.15 | 1.5±0.15 | 4   |
| RG25 | 7.5±0.15 | 1.5±0.15 | 5.8   |
| RG30 | 7.5±0.15 | 1.5±0.15 | 6.2   |
| RG35 | 7.5±0.15 | 1.5±0.15 | 8.65  |
| RG45 | 7.5±0.15 | 1.5±0.15 | 9.5   |
| RG55 | 7.5±0.15 | 1.5±0.15 | 11.6  |
| RG65 | 7.5±0.15 | 1.5±0.15 | 14.5  |



#### ○ The oil amount for a block filled with grease

Table 2-9-16 The oil amount for a block filled with grease

| Size | Heavy Load(cm <sup>3</sup> ) | Super Heavy Load(cm <sup>3</sup> ) | Size | Heavy Load(cm <sup>3</sup> ) | Super Heavy Load(cm <sup>3</sup> ) |
|------|------------------------------|------------------------------------|------|------------------------------|------------------------------------|
| RG15 | 3                            | -                                  | RG35 | 12                           | 14                                 |
| RG20 | 5                            | 6                                  | RG45 | 19                           | 23                                 |
| RG25 | 7                            | 8                                  | RG55 | 28                           | 35                                 |
| RG30 | 9                            | 10                                 | RG65 | 52                           | 63                                 |

#### ○ Frequency of replenishment

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

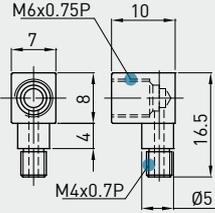
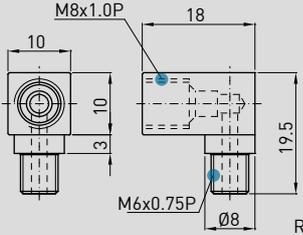
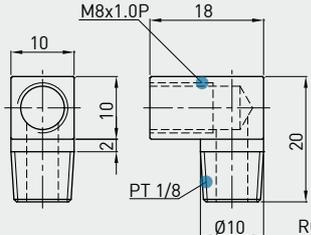
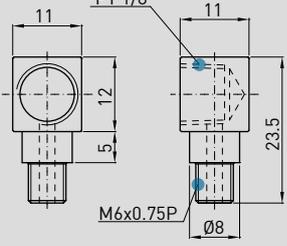
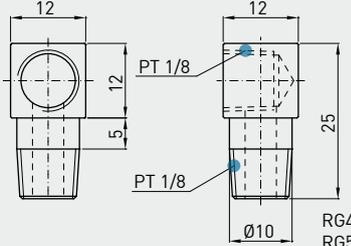
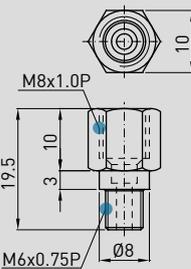
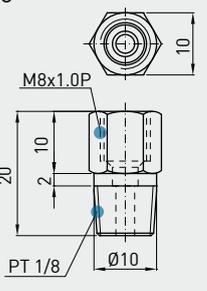
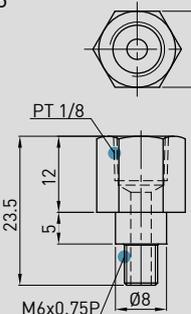
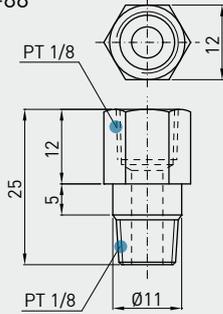
## RG Series

### High Rigidity Roller Type

#### (2) Oil

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

#### Types of oil piping joint

|   |   |   |
|---|---|---|
| <p>LF-64</p>  <p>RG15<br/>RG20</p> <p>NO.97000EA1</p>  | <p>LF-76</p>  <p>RG25<br/>RG30<br/>RG35</p> <p>NO.970002A1</p>     | <p>LF-78</p>  <p>RG45<br/>RG55<br/>RG65</p> <p>NO.970006A1</p> |
| <p>LF-86</p>  <p>RG25<br/>RG30<br/>RG35<br/>RGS35<br/>RGS45<br/>RGF35<br/>RGF45</p> <p>NO.970004A1</p>  | <p>LF-88</p>  <p>RG45<br/>RG55<br/>RG65</p> <p>NO.970008A1</p>   |   |
| <p>SF-76</p>  <p>RG25<br/>RG30<br/>RG35<br/>RGS35<br/>RGS45<br/>RGF35<br/>RGF45</p> <p>NO.970001A1</p> | <p>SF-78</p>  <p>RG45<br/>RG55<br/>RG65</p> <p>NO.970005A1</p> |   |
| <p>SF-86</p>  <p>RG25<br/>RG30<br/>RG35</p> <p>NO.970003A1</p>   | <p>SF-88</p>  <p>RG45<br/>RG55<br/>RG65</p> <p>NO.970007A1</p> |   |

○ Oil feeding rate

Table 2-9-17 oil feed rate

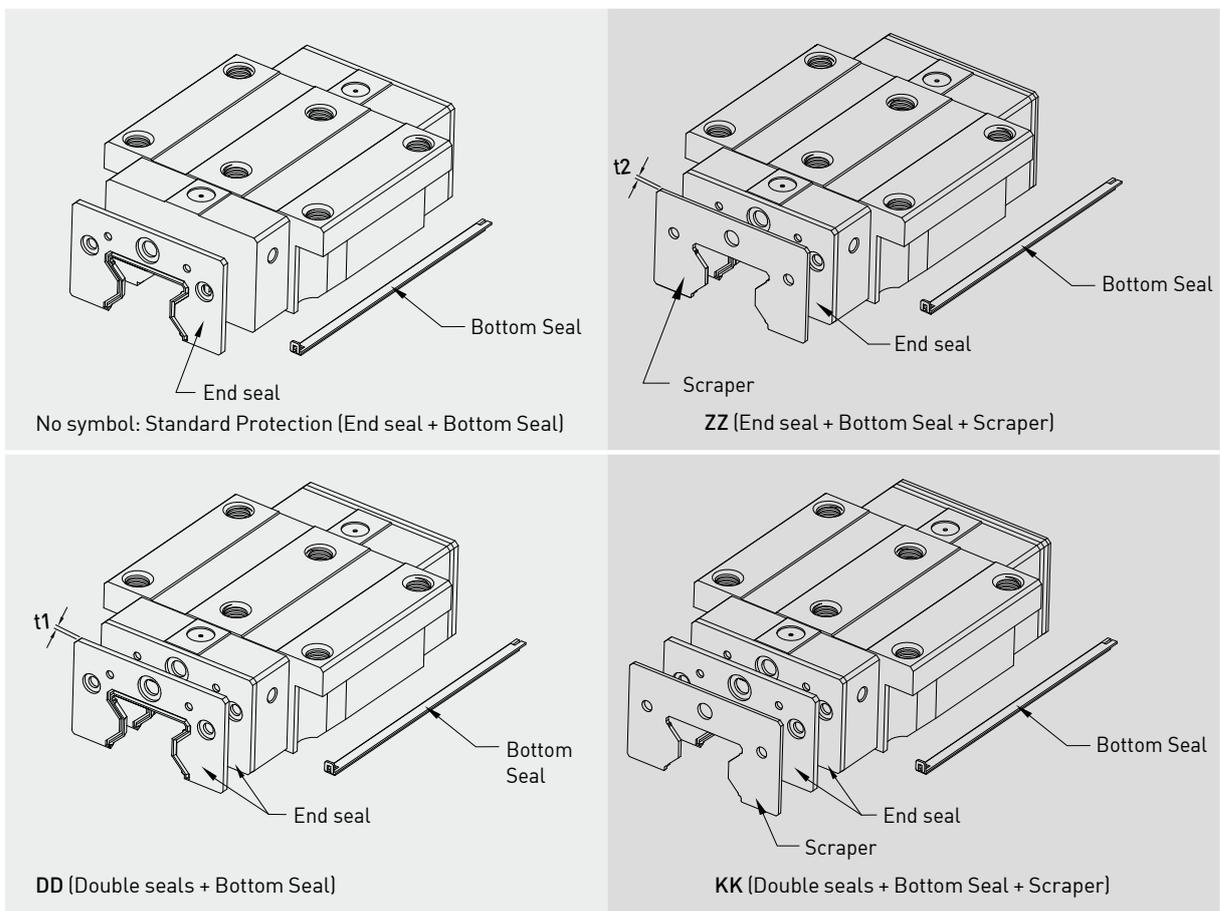
| Size | Feed rate (cm <sup>3</sup> /hr) | Size | Feed rate (cm <sup>3</sup> /hr) |
|------|---------------------------------|------|---------------------------------|
| RG15 | 0.14                            | RG35 | 0.23                            |
| RG20 | 0.14                            | RG45 | 0.3                             |
| RG25 | 0.167                           | RG55 | 0.367                           |
| RG30 | 0.2                             | RG65 | 0.433                           |

## 2-9-8 Dust Proof Accessories

### (1) Codes of accessories

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

Table 2-9-18



### (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 2-9-19 Dimensions of end seal

| Size    | Thickness (t1) (mm) | Size    | Thickness (t1) (mm) |
|---------|---------------------|---------|---------------------|
| RG15 ES | 2.2                 | RG35 ES | 2.5                 |
| RG20 ES | 2.2                 | RG45 ES | 3.6                 |
| RG25 ES | 2.2                 | RG55 ES | 3.6                 |
| RG30 ES | 2.4                 | RG65 ES | 4.4                 |

## RG Series

### High Rigidity Roller Type

#### (4) Scraper

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

Table 2-9-20 Dimensions of scraper

| Size    | Thickness (t2)<br>(mm) | Size    | Thickness (t2)<br>(mm) |
|---------|------------------------|---------|------------------------|
| RG15 SC | 1.0                    | RG35 SC | 1.5                    |
| RG20 SC | 1.0                    | RG45 SC | 1.5                    |
| RG25 SC | 1.0                    | RG55 SC | 1.5                    |
| RG30 SC | 1.5                    | RG65 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.

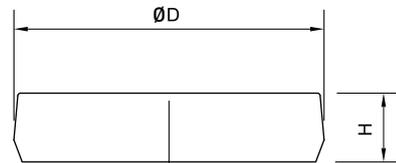


Table 2-9-21 Dimensions of Bolt Caps for Rail Mounting Holes

| Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) | Rail size | Bolt size | Diameter(D)<br>(mm) | Thickness(H)<br>(mm) |
|-----------|-----------|---------------------|----------------------|-----------|-----------|---------------------|----------------------|
| RGR15     | M4        | 7.65                | 1.1                  | RGR35     | M8        | 14.20               | 3.5                  |
| RGR20     | M5        | 9.65                | 2.5                  | RGR45     | M12       | 20.25               | 4.5                  |
| RGR25     | M6        | 11.15               | 2.5                  | RGR55     | M14       | 23.25               | 5                    |
| RGR30     | M8        | 14.2                | 3.5                  | RGR65     | M16       | 26.35               | 5                    |

#### (6) Dimensions of block equipped with the dustproof parts

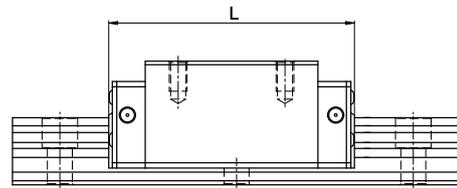


Table 2-9-22 Overall block length

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| RG15C | 68.0 (70.4)              | 70.0 (74.4)   | 72.4 (74.8)   | 74.4 (78.8)   |
| RG20C | 86.0 (88.4)              | 88.0 (92.4)   | 90.4 (92.8)   | 92.4 (96.8)   |
| RG20H | 106.0 (108.4)            | 108.0 (112.4) | 110.4 (112.8) | 112.4 (116.8) |
| RG25C | 97.9 (101.5)             | 99.9 (105.9)  | 102.3 (105.9) | 104.3 (110.3) |
| RG25H | 114.4 (118)              | 116.4 (122.4) | 118.8 (122.4) | 120.8 (126.8) |
| RG30C | 109.8 (113.4)            | 112.8 (118.8) | 114.6 (118.2) | 117.6 (123.6) |
| RG30H | 131.8 (135.4)            | 134.8 (140.8) | 136.6 (140.2) | 139.6 (145.6) |
| RG35C | 124.0 (129.4)            | 127.0 (135.0) | 129.0 (134.4) | 132.0 (140.0) |
| RG35H | 151.5 (156.9)            | 154.5 (162.5) | 156.5 (161.9) | 159.5 (167.5) |
| RG45C | 153.2 (156.4)            | 156.2 (164.2) | 160.4 (163.6) | 163.4 (171.4) |
| RG45H | 187.0 (190.2)            | 190.0 (198.0) | 194.2 (197.4) | 197.2 (205.2) |
| RG55C | 183.7 (186.9)            | 186.7 (194.7) | 190.9 (194.1) | 193.9 (201.9) |
| RG55H | 232.0 (235.2)            | 235.0 (243.0) | 239.2 (242.4) | 242.2 (250.2) |
| RG65C | 232.0 (236.0)            | 235.0 (245.0) | 240.8 (244.8) | 243.8 (253.8) |
| RG65H | 295.0 (299.0)            | 298.0 (308.0) | 303.8 (307.8) | 306.8 (316.8) |

unit: mm

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

## 2-9-9 Friction

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

Table 2-9-23 Seal Resistance

| Size | Resistance N (kgf) | Size | Resistance N (kgf) |
|------|--------------------|------|--------------------|
| RG15 | 2.45 [0.25]        | RG35 | 4.61 [0.47]        |
| RG20 | 2.9 [0.3]          | RG45 | 4.91 [0.5]         |
| RG25 | 3.43 [0.35]        | RG55 | 5.89 [0.6]         |
| RG30 | 4.22 [0.43]        | RG65 | 7.36 [0.75]        |

Note: 1. 1kgf=9.81N

2. Please inform HIWIN if low friction request is required.

## 2-9-10 The Accuracy Tolerance of Mounting Surface

### (1) The accuracy tolerance of rail-mounting surface

As long as the accuracy requirements of the mounting surfaces shown in the following tables are met, the high accuracy, high rigidity and long life of the RG series linear guideway will be maintained without any difficulty.

- The parallelism tolerance of reference surface (P)

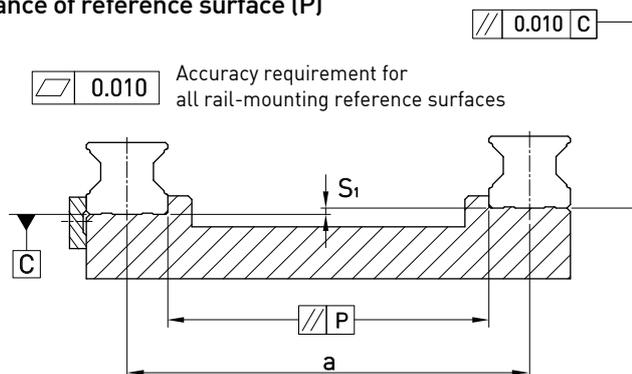


Table 2-9-24 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes    |                     |                    |
|------|--------------------|---------------------|--------------------|
|      | Light Preload (Z0) | Medium Preload (ZA) | Heavy Preload (ZB) |
| RG15 | 5                  | 3                   | 3                  |
| RG20 | 8                  | 6                   | 4                  |
| RG25 | 9                  | 7                   | 5                  |
| RG30 | 11                 | 8                   | 6                  |
| RG35 | 14                 | 10                  | 7                  |
| RG45 | 17                 | 13                  | 9                  |
| RG55 | 21                 | 14                  | 11                 |
| RG65 | 27                 | 18                  | 14                 |

- The accuracy tolerance of reference surface height ( $S_1$ )

$$S_1 = a \times K - T_H$$

$S_1$  : Max. tolerance of height

$a$  : Distance between paired rails

$K$  : Coefficient of tolerance of height

Table 2-9-25 Coefficient of tolerance of height

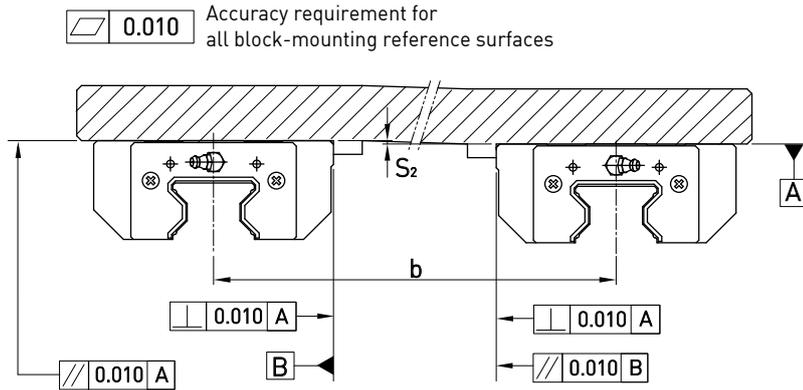
| Size | Preload classes      |                      |                      |
|------|----------------------|----------------------|----------------------|
|      | Light Preload (Z0)   | Medium Preload (ZA)  | Heavy Preload (ZB)   |
| K    | $2.2 \times 10^{-4}$ | $1.7 \times 10^{-4}$ | $1.2 \times 10^{-4}$ |

## RG Series

### High Rigidity Roller Type

#### (2) The accuracy tolerance of block-mounting surface

- The tolerance of the height of reference surface when two or more pieces are used in parallel ( $S_2$ )

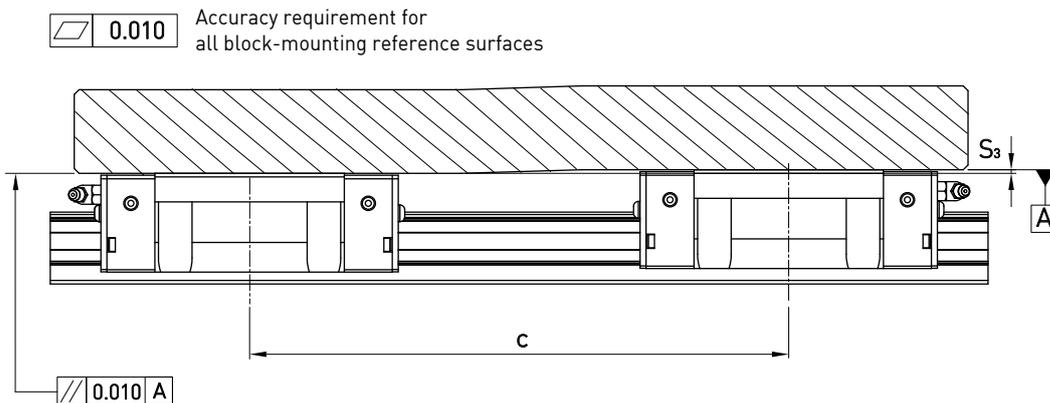


$$S_2 = b \times 4.2 \times 10^{-5}$$

$S_2$  : Max. tolerance of height

$b$  : Distance between paired blocks

- The tolerance of the height of reference surface when two or more pieces are used in parallel ( $S_3$ )



$$S_3 = c \times 4.2 \times 10^{-5}$$

$S_3$  : Max. tolerance of height

$c$  : Distance between paired blocks

## 2-9-11 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

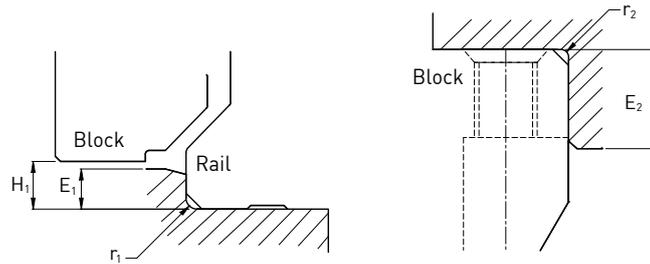


Table 2-9-26

| Size | Max. radius of fillets<br>$r_1$ (mm) | Max. radius of fillets<br>$r_2$ (mm) | Shoulder height beside the rail<br>$E_1$ (mm) | Shoulder height beside the block<br>$E_2$ (mm) | Clearance under block<br>$H_1$ (mm) |
|------|--------------------------------------|--------------------------------------|---|--|-------------------------------------|
| RG15 | 0.5                                  | 0.5                                  | 3   | 4  | 4                                   |
| RG20 | 0.5                                  | 0.5                                  | 3.5   | 5  | 5                                   |
| RG25 | 1.0                                  | 1.0                                  | 5   | 5  | 5.5                                 |
| RG30 | 1.0                                  | 1.0                                  | 5   | 5  | 6                                   |
| RG35 | 1.0                                  | 1.0                                  | 6   | 6  | 6.5                                 |
| RG45 | 1.0                                  | 1.0                                  | 7   | 8  | 8                                   |
| RG55 | 1.5                                  | 1.5                                  | 9   | 10   | 10                                  |
| RG65 | 1.5                                  | 1.5                                  | 10  | 10   | 12                                  |

### (2) Tightening Torque of Mounting Bolts

Improper tightening of mounting bolts will seriously influence the accuracy of a linear guideway. The following tightening torque for the different sizes of bolt is recommended.

Table 2-9-27

| Size | Bolt size     | Torque N-cm(kgf-cm) |              |             |
|------|---------------|---------------------|--------------|-------------|
|      |               | Iron                | Casting      | Aluminum    |
| RG15 | M4×0.7P×16L   | 392 (40)            | 274 (28)     | 206 (21)    |
| RG20 | M5×0.8P×20L   | 883 (90)            | 588 (60)     | 441 (45)    |
| RG25 | M6×1P×20L     | 1373 (140)          | 921 (94)     | 686 (70)    |
| RG30 | M8×1.25P×25L  | 3041 (310)          | 2010 (205)   | 1470 (150)  |
| RG35 | M8×1.25P×25L  | 3041 (310)          | 2010 (205)   | 1470 (150)  |
| RG45 | M12×1.75P×35L | 11772 (1200)        | 7840 (800)   | 5880 (600)  |
| RG55 | M14×2P×45L    | 15696 (1600)        | 10500 (1100) | 7840 (800)  |
| RG65 | M16×2P×50L    | 19620 (2000)        | 13100 (1350) | 9800 (1000) |

## RG Series

### High Rigidity Roller Type

#### 2-9-12 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.

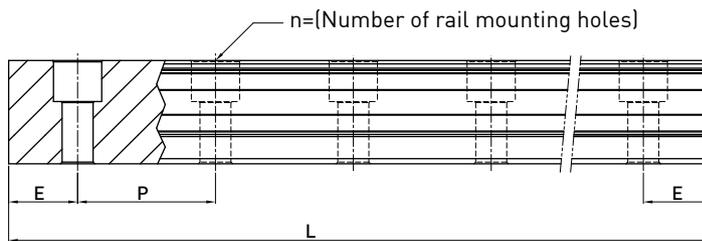


Table 2-9-28

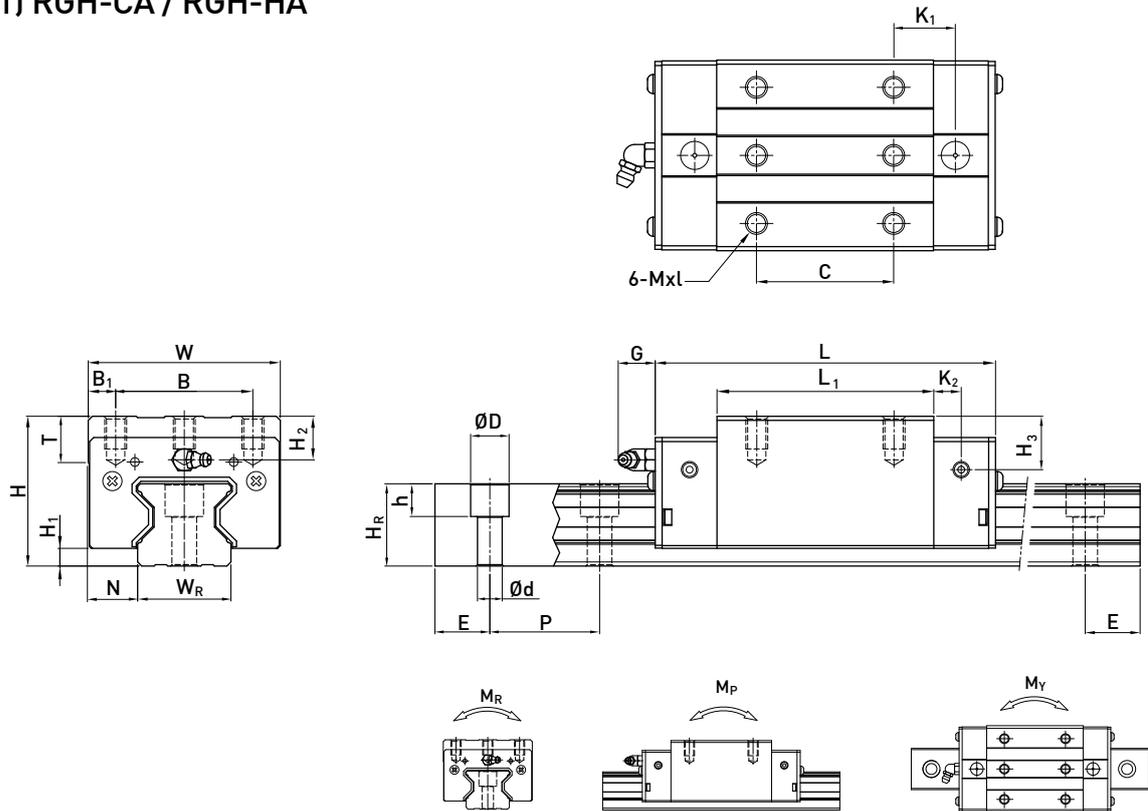
unit: mm

| 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) | 4,000 (100) | 4,000 (100) | 3,982.5 (76) | 3,960 (66) | 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.

## 2-9-13 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 (mm) | Basic Dynamic Load Rating C(kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |      |          | Weight |       |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|------|--------------------------|----|----------------|-----|----------------|-------|----------------|----------------|------|----------|-------------------------|----------------|----------------|----------------|----------------|-----------------------------|---------------------------------|--|---------------------|------|----------|--------|-------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | Mxl      | T                       | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> |                             |                                 |  | D                   | h    | d        | P      | E     | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (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 x 16  | 11.3   | 24    | 0.311                 | 0.173                 | 0.173                 | 0.20       | 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 x 20  | 21.3   | 46.7  | 0.647                 | 0.46                  | 0.46                  | 0.40       | 2.76        |
| RGH20HA   |                             |                |      |                          |    |                | 50  | 77.5           | 106   | 18.8           |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 26.9   | 63    | 0.872                 | 0.837                 | 0.837                 | 0.53       |             |
| 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 x 20  | 27.7   | 57.1  | 0.758                 | 0.605                 | 0.605                 | 0.61       | 3.08        |
| RGH25HA   |                             |                |      |                          |    |                | 50  | 81             | 114.4 | 21.5           |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 33.9   | 73.4  | 0.975                 | 0.991                 | 0.991                 | 0.75       |             |
| RGH30CA   | 45                          | 6              | 16   | 60                       | 40 | 10             | 40  | 71             | 109.8 | 23.5           | 8              | 12   | M8 x 10  | 9.5                     | 9.5            | 10.3           | 28             | 28             | 14                          | 12                              | 9  | 40                  | 20   | M8 x 25  | 39.1   | 82.1  | 1.445                 | 1.06                  | 1.06                  | 0.90       | 4.41        |
| RGH30HA   |                             |                |      |                          |    |                | 60  | 93             | 131.8 | 24.5           |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 48.1   | 105   | 1.846                 | 1.712                 | 1.712                 | 1.16       |             |
| RGH35CA   | 55                          | 6.5            | 18   | 70                       | 50 | 10             | 50  | 79             | 124   | 22.5           | 10             | 12   | M8 x 12  | 12                      | 16             | 19.6           | 34             | 30.2           | 14                          | 12                              | 9  | 40                  | 20   | M8 x 25  | 57.9   | 105.2 | 2.17                  | 1.44                  | 1.44                  | 1.57       | 6.06        |
| RGH35HA   |                             |                |      |                          |    |                | 72  | 106.5          | 151.5 | 25.25          |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 73.1   | 142   | 2.93                  | 2.6                   | 2.6                   | 2.06       |             |
| RGH45CA   | 70                          | 8              | 20.5 | 86                       | 60 | 13             | 60  | 106            | 153.2 | 31             | 10             | 12.9 | M10 x 17 | 16                      | 20             | 24             | 45             | 38             | 20                          | 17                              | 14   | 52.5                | 22.5 | M12 x 35 | 92.6   | 178.8 | 4.52                  | 3.05                  | 3.05                  | 3.18       | 9.97        |
| RGH45HA   |                             |                |      |                          |    |                | 80  | 139.8          | 187   | 37.9           |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 116    | 230.9 | 6.33                  | 5.47                  | 5.47                  | 4.13       |             |
| RGH55CA   | 80                          | 10             | 23.5 | 100                      | 75 | 12.5           | 75  | 125.5          | 183.7 | 37.75          | 12.5           | 12.9 | M12 x 18 | 17.5                    | 22             | 27.5           | 53             | 44             | 23                          | 20                              | 16   | 60                  | 30   | M14 x 45 | 130.5  | 252   | 8.01                  | 5.4                   | 5.4                   | 4.89       | 13.98       |
| RGH55HA   |                             |                |      |                          |    |                | 95  | 173.8          | 232   | 51.9           |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 167.8  | 348   | 11.15                 | 10.25                 | 10.25                 | 6.68       |             |
| RGH65CA   | 90                          | 12             | 31.5 | 126                      | 76 | 25             | 70  | 160            | 232   | 60.8           | 15.8           | 12.9 | M16 x 20 | 25                      | 15             | 15             | 63             | 53             | 26                          | 22                              | 18   | 75                  | 35   | M16 x 50 | 213    | 411.6 | 16.20                 | 11.59                 | 11.59                 | 8.89       | 20.22       |
| RGH65HA   |                             |                |      |                          |    |                | 120 | 223            | 295   | 67.3           |                |      |          |                         |                |                |                |                |                             |                                 |  |                     |      |          | 275.3  | 572.7 | 22.55                 | 22.17                 | 22.17                 | 12.13      |             |

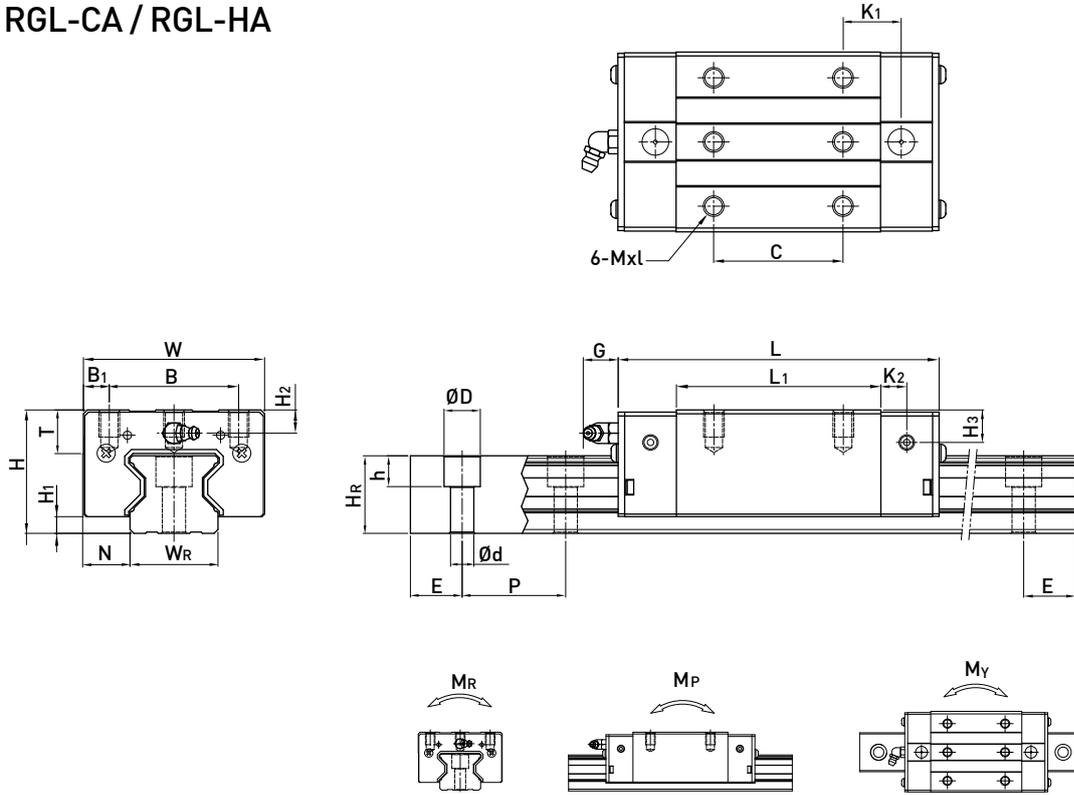
Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

# RG Series

## High Rigidity Roller Type

### (2) RGL-CA / RGL-HA

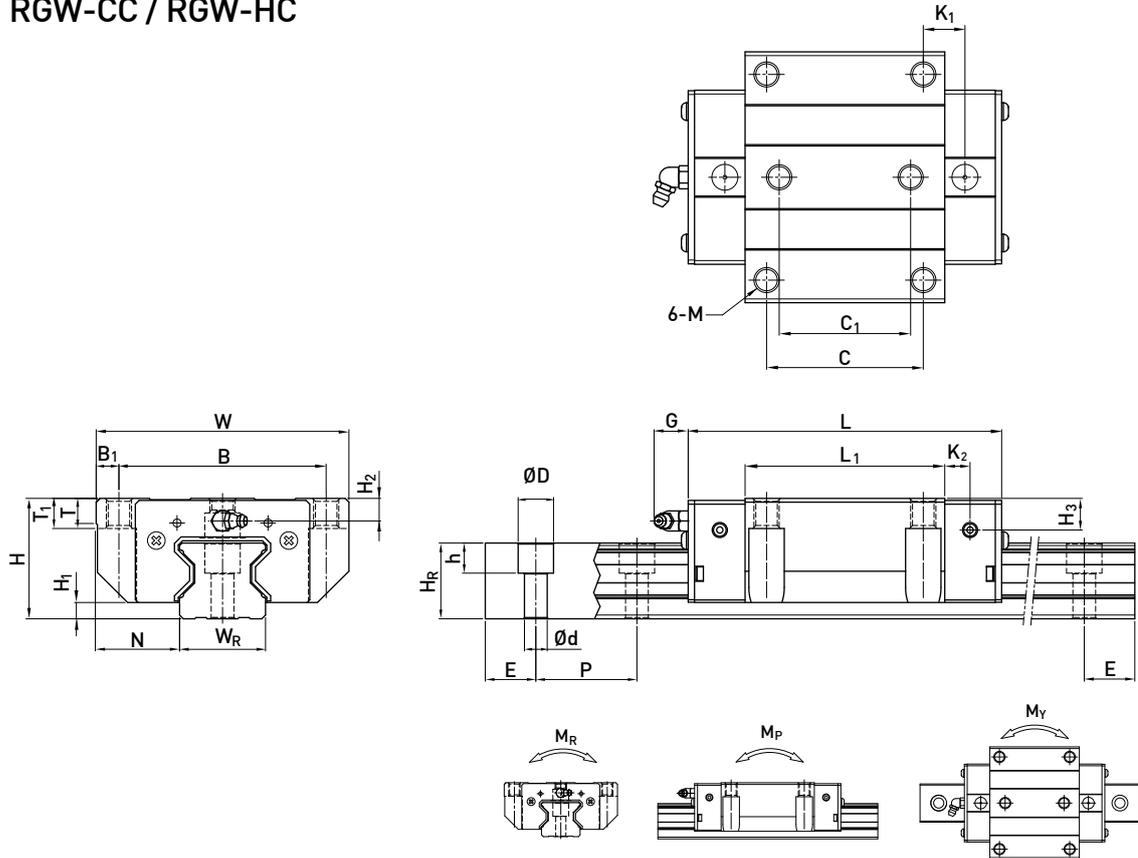


| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |     |    |                |    |                |       |                |                |      |        | Dimensions of Rail (mm) |                |                |                |                |      | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |        |       | Weight |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|--------------------------|-----|----|----------------|----|----------------|-------|----------------|----------------|------|--------|-------------------------|----------------|----------------|----------------|----------------|------|-----------------------------|----------------------------------|--|---------------------|--------|-------|--------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | Mxl    | T                       | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> | D    |                             |                                  |  | h                   | d      | P     | E      | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
|           | RGL15CA                     | 24             | 4                        | 9.5 | 34 | 26             | 4  | 26             | 45    | 68             | 13.4           | 4.7  | 5.3    | M4X5.5                  | 6              | 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      | 0.15        |
| RGL20CA   | 30                          | 5              | 12                       | 44  | 32 | 6              | 36 | 57.5           | 86    | 15.8           | 6              | 5.3  | M5X6   | 8                       | 4.3            | 4.3            | 20             | 21             | 9.5  | 8.5                         | 6                                | 30   | 20                  | M5x20  | 21.3  | 46.7   | 0.647                 | 0.46                  | 0.46                  | 0.32       | 2.76        |
| RGL20HA   |                             |                |                          |     |    |                | 50 | 77.5           | 106   | 18.8           |                |      |        |                         |                |                |                |                |      |                             |                                  |  |                     |        | 26.9  | 63     | 0.872                 | 0.837                 | 0.837                 | 0.42       |             |
| RGL25CA   | 36                          | 5.5            | 12.5                     | 48  | 35 | 6.5            | 35 | 64.5           | 97.9  | 20.75          | 7.25           | 12   | M6x8   | 9.5                     | 6.2            | 6              | 23             | 23.6           | 11   | 9                           | 7                                | 30   | 20                  | M6x20  | 27.7  | 57.1   | 0.758                 | 0.605                 | 0.605                 | 0.51       | 3.08        |
| RGL25HA   |                             |                |                          |     |    |                | 50 | 81             | 114.4 | 21.5           |                |      |        |                         |                |                |                |                |      |                             |                                  |  |                     |        | 33.9  | 73.4   | 0.975                 | 0.991                 | 0.991                 | 0.63       |             |
| RGL30CA   | 42                          | 6              | 16                       | 60  | 40 | 10             | 40 | 71             | 109.8 | 23.5           | 8              | 12   | M8x10  | 9.5                     | 6.5            | 7.3            | 28             | 28             | 14   | 12                          | 9                                | 40   | 20                  | M8x25  | 39.1  | 82.1   | 1.445                 | 1.06                  | 1.06                  | 0.80       | 4.41        |
| RGL30HA   |                             |                |                          |     |    |                | 60 | 93             | 131.8 | 24.5           |                |      |        |                         |                |                |                |                |      |                             |                                  |  |                     |        | 48.1  | 105    | 1.846                 | 1.712                 | 1.712                 | 1.03       |             |
| RGL35CA   | 48                          | 6.5            | 18                       | 70  | 50 | 10             | 50 | 79             | 124   | 22.5           | 10             | 12   | M8x12  | 12                      | 9              | 12.6           | 34             | 30.2           | 14   | 12                          | 9                                | 40   | 20                  | M8x25  | 57.9  | 105.2  | 2.17                  | 1.44                  | 1.44                  | 1.27       | 6.06        |
| RGL35HA   |                             |                |                          |     |    |                | 72 | 106.5          | 151.5 | 25.25          |                |      |        |                         |                |                |                |                |      |                             |                                  |  |                     |        | 73.1  | 142    | 2.93                  | 2.6                   | 2.6                   | 1.65       |             |
| RGL45CA   | 60                          | 8              | 20.5                     | 86  | 60 | 13             | 60 | 106            | 153.2 | 31             | 10             | 12.9 | M10x17 | 16                      | 10             | 14             | 45             | 38             | 20   | 17                          | 14                               | 52.5   | 22.5                | M12x35 | 92.6  | 178.8  | 4.52                  | 3.05                  | 3.05                  | 2.47       | 9.97        |
| RGL45HA   |                             |                |                          |     |    |                | 80 | 139.8          | 187   | 37.9           |                |      |        |                         |                |                |                |                |      |                             |                                  |  |                     |        | 116   | 230.9  | 6.33                  | 5.47                  | 5.47                  | 3.20       |             |
| RGL55CA   | 70                          | 10             | 23.5                     | 100 | 75 | 12.5           | 75 | 125.5          | 183.7 | 37.75          | 12.5           | 12.9 | M12x18 | 17.5                    | 12             | 17.5           | 53             | 44             | 23   | 20                          | 16                               | 60   | 30                  | M14x45 | 130.5 | 252    | 8.01                  | 5.4                   | 5.4                   | 3.91       | 13.98       |
| RGL55HA   |                             |                |                          |     |    |                | 95 | 173.8          | 232   | 51.9           |                |      |        |                         |                |                |                |                |      |                             |                                  |  |                     |        | 167.8 | 348    | 11.15                 | 10.25                 | 10.25                 | 5.32       |             |

Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

(3) RGW-CC / RGW-HC



| 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 C <sub>0</sub> (kN) | 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     | M <sub>R</sub> | M <sub>p</sub> | M <sub>y</sub> | 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          | 0.22     | 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           | 0.47     | 2.76      |
| RGW20HC   |                             |                |      |                          |     |                |     |                | 77.5           | 106   | 23.8           |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 26.9  | 63    | 0.872          | 0.837          | 0.837          | 0.63     |           |
| 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          | 0.72     | 3.08      |
| RGW25HC   |                             |                |      |                          |     |                |     |                | 81             | 114.4 | 24             |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 33.9  | 73.4  | 0.975          | 0.991          | 0.991          | 0.91     |           |
| 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           | 1.16     | 4.41      |
| RGW30HC   |                             |                |      |                          |     |                |     |                | 93             | 131.8 | 28.5           |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 48.1  | 105   | 1.846          | 1.712          | 1.712          | 1.52     |           |
| 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           | 1.75     | 6.06      |
| RGW35HC   |                             |                |      |                          |     |                |     |                | 106.5          | 151.5 | 30.25          |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 73.1  | 142   | 2.93           | 2.6            | 2.6            | 2.40     |           |
| 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           | 3.43     | 9.97      |
| RGW45HC   |                             |                |      |                          |     |                |     |                | 139.8          | 187   | 37.9           |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 116   | 230.9 | 6.33           | 5.47           | 5.47           | 4.57     |           |
| 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            | 5.43     | 13.98     |
| RGW55HC   |                             |                |      |                          |     |                |     |                | 173.8          | 232   | 51.9           |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 167.8 | 348   | 11.15          | 10.25          | 10.25          | 7.61     |           |
| RGW 65CC  | 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          | 11.63    | 20.22     |
| RGW 65HC  |                             |                |      |                          |     |                |     |                | 223            | 295   | 72.3           |                |      |     |                         |                |                |                |                |                             |                                 |  |                     |      |      |        | 275.3 | 572.7 | 22.55          | 22.17          | 22.17          | 16.58    |           |

Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

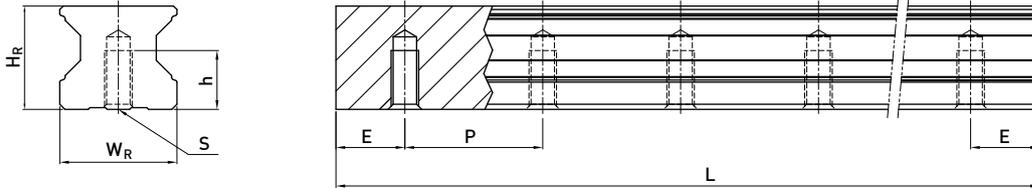




## RG Series

### High Rigidity Roller Type

#### (6) 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  |

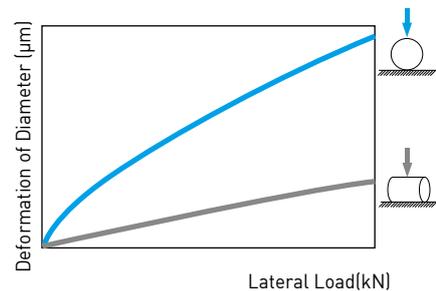
## 2-10 CRG Series - High Rigidity Roller Type Linear Guideway with Cover Strip

### 2-10-1 Advantages and features

CRG series linear guideways are a : cover-strip type, featuring high rigidity for high loads. It also has four-way load characteristics. This specification can be matched with the latest slide dustproof accessories.

#### (1) Super high rigidity

The CRG 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.



#### (2) Operating life increased

Compare with the ball element, the contact pressure of rolling element is distributed on the line region. Therefore, stress concentration was reduced significantly and the CRG series offers longer running life.

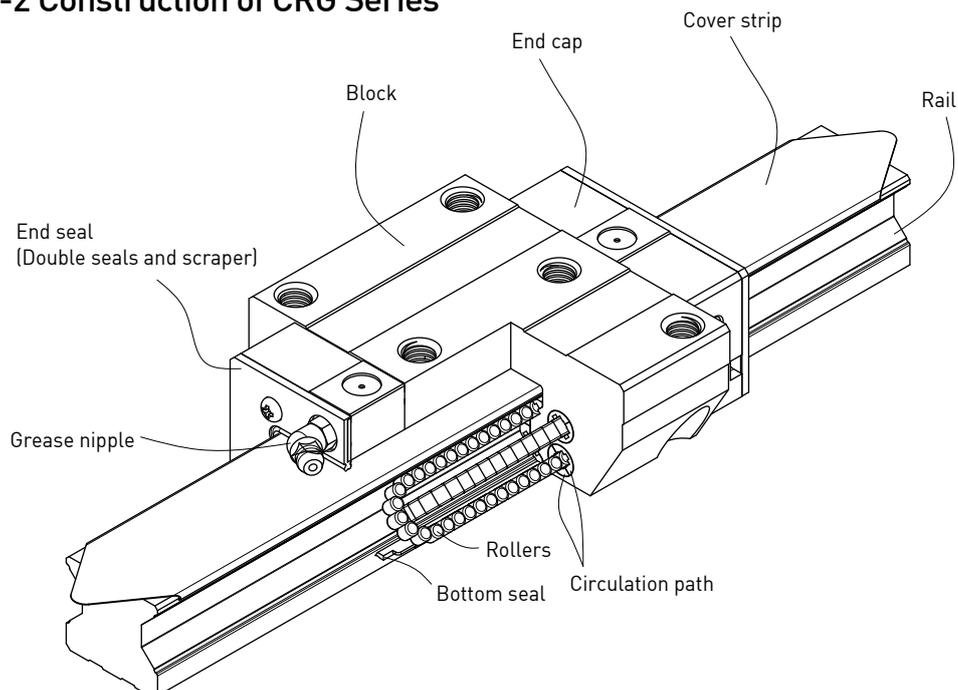
#### (3) Latest dustproof accessory for rail

The CRG series offers a special stainless cover strip.



Cover strip

### 2-10-2 Construction of CRG 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, without CAP, Cover Strip, Double seals and Scraper

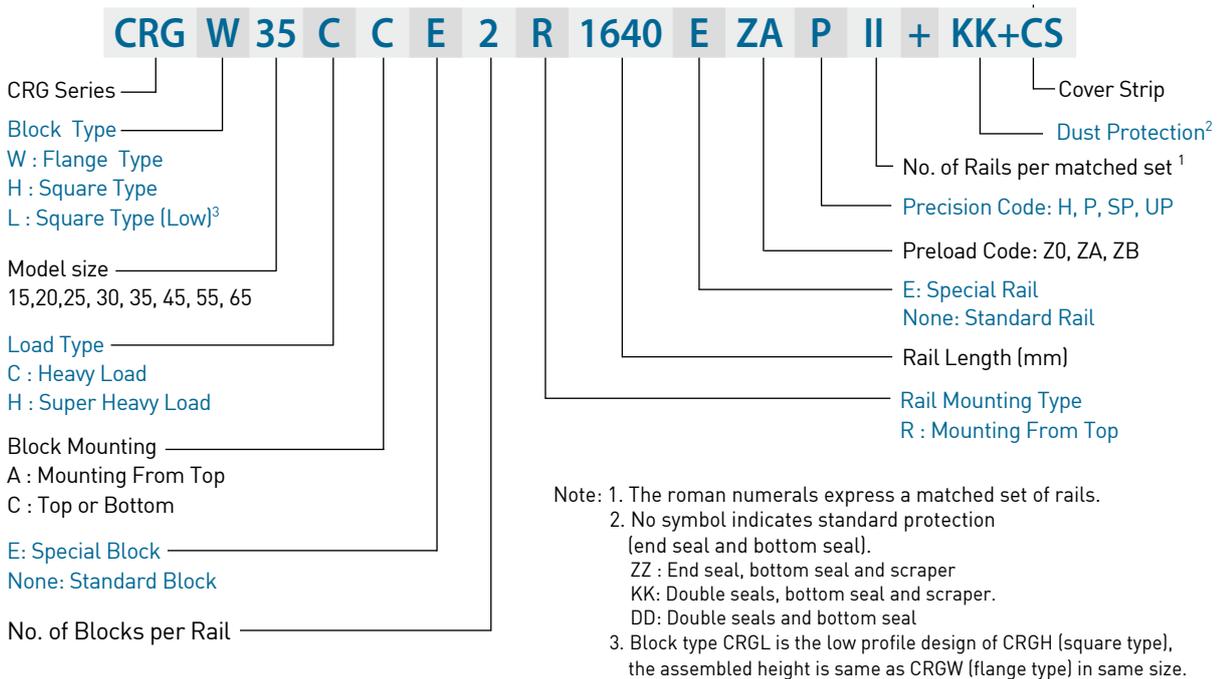
# CRG Series

## High Rigidity Roller Type with Cover Strip

### 2-10-3 Model Number of CRG series

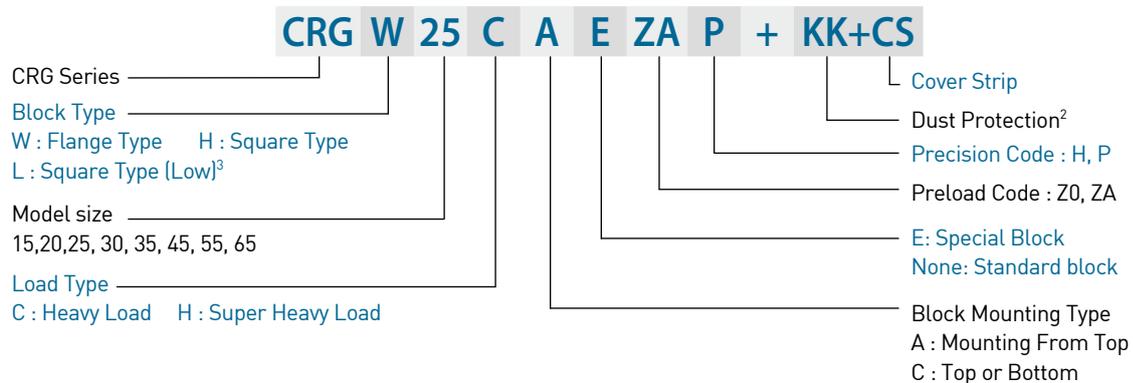
CRG series linear guideways are classified into non-interchangeable and interchangeable types. The sizes of these two types are the same as one another. The main difference is that the interchangeable type of blocks and rails can be freely exchanged and they can maintain P-class accuracy. Because of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

#### (1) Non-interchangeable type

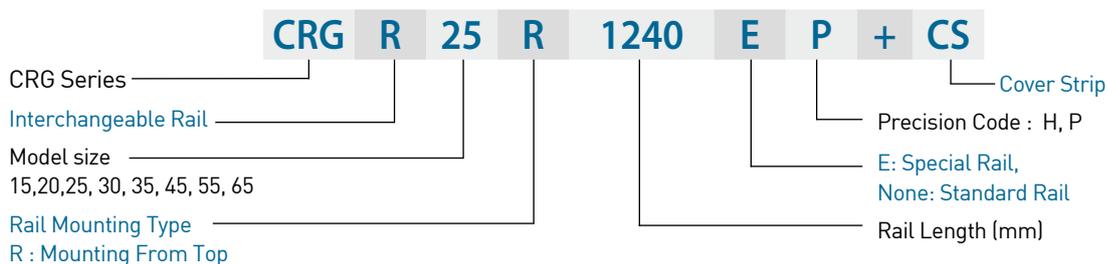


#### (2) Interchangeable type

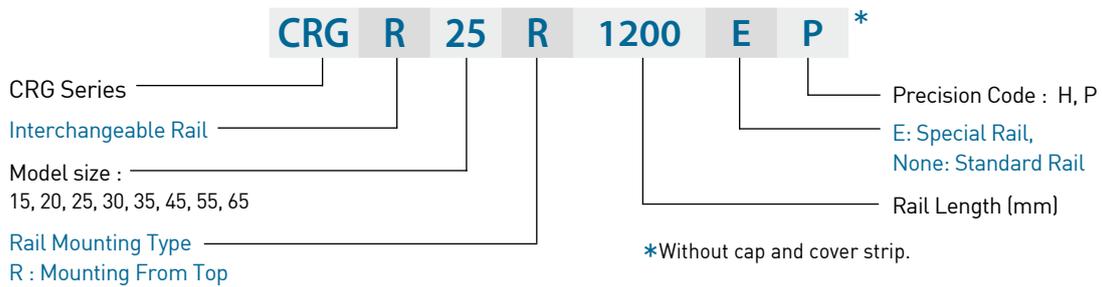
##### Model Number of CRG Block



##### Model Number of CRG Rail



○ Model Number of CRG Rail



## 2-10-4 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.

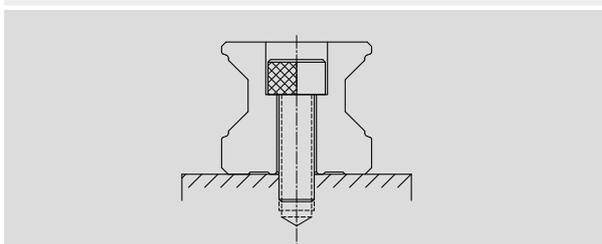
Table 2-10-1 Block Types

| Type         | Model              | Shape | Height (mm) | Rail Length (mm) | Main Applications   |
|--------------|--------------------|-------|-------------|------------------|---|
| Square       | CRGH-CA<br>CRGH-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> </ul>  |
|              |                    |       | ↓           | ↓                |   |
| Square (low) | CRGL-CA<br>CRGL-HA |       | 90          | 4000             | <ul style="list-style-type: none"> <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> </ul> |
|              |                    |       | ↓           | ↓                |   |
| Flange       | CRGW-CC<br>CRGW-HC |       | 24          | 100              | <ul style="list-style-type: none"> <li>Electric discharge machines</li> </ul>   |
|              |                    |       | ↓           | ↓                |   |
|              |                    |       | 90          | 4000             |   |

### (2) Rail types

Table 2-10-2 Rail Types

#### Mounting from Top



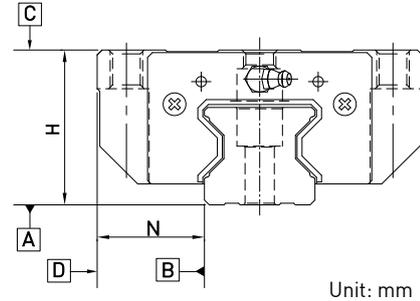
## CRG Series

### High Rigidity Roller Type with Cover Strip

#### 2-10-5 Accuracy Classes

The accuracy of the CRG 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



Unit: mm

Table 2-10-3 Accuracy Standards

| Item  | CRG - 15, 20      |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
|   | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.03            | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 0.008         |
| Dimensional tolerance of width N                    | ± 0.03            | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 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 2-10-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |                      |                      |

Table 2-10-4 Accuracy Standards

Unit: mm

| Item  | CRG - 25, 30, 35  |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
|   | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.04            | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 0.01          |
| Dimensional tolerance of width N                    | ± 0.04            | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 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 2-10-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |                      |                      |

Table 2-10-5 Accuracy Standards

Unit: mm

| Item  | CRG - 45, 55      |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
|   | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.05            | 0<br>- 0.05   | 0<br>- 0.03          | 0<br>- 0.02          |
| Dimensional tolerance of width N                    | ± 0.05            | 0<br>- 0.05   | 0<br>- 0.03          | 0<br>- 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 2-10-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |                      |                      |

Table 2-10-6 Accuracy Standards

Unit: mm

| Item  | CRG - 65          |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
| Accuracy Classes                                    | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.07            | 0<br>- 0.07   | 0<br>- 0.05          | 0<br>- 0.03          |
| Dimensional tolerance of width N                    | ± 0.07            | 0<br>- 0.07   | 0<br>- 0.05          | 0<br>- 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 2-10-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |                      |                      |

(2) Accuracy of interchangeable

Table 2-10-7 Accuracy Standards

Unit: mm

| Item  | CRG - 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 2-10-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |

Table 2-10-8 Accuracy Standards

Unit: mm

| Item  | CRG - 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 2-10-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |

Table 2-10-9 Accuracy Standards

Unit: mm

| Item  | CRG - 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 2-10-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |

## CRG Series

### High Rigidity Roller Type with Cover Strip

Table 2-10-10 Accuracy Standards

Unit: mm

| Item  | CRG - 65          |               |
|---|-------------------|---------------|
|   | 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 2-10-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-10-11 |               |

### (3) Accuracy of running parallelism

Table 2-10-11 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  |

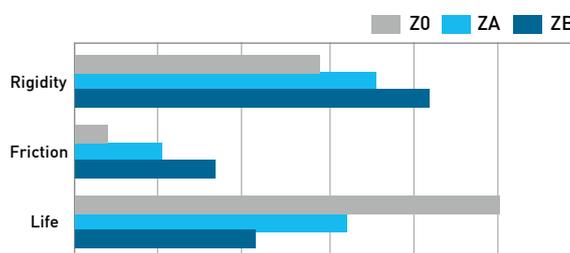
### 2-10-6 Preload

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 CRG series linear guideway offers three standard preloads for various applications and conditions.

Table 2-10-12

| 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    |

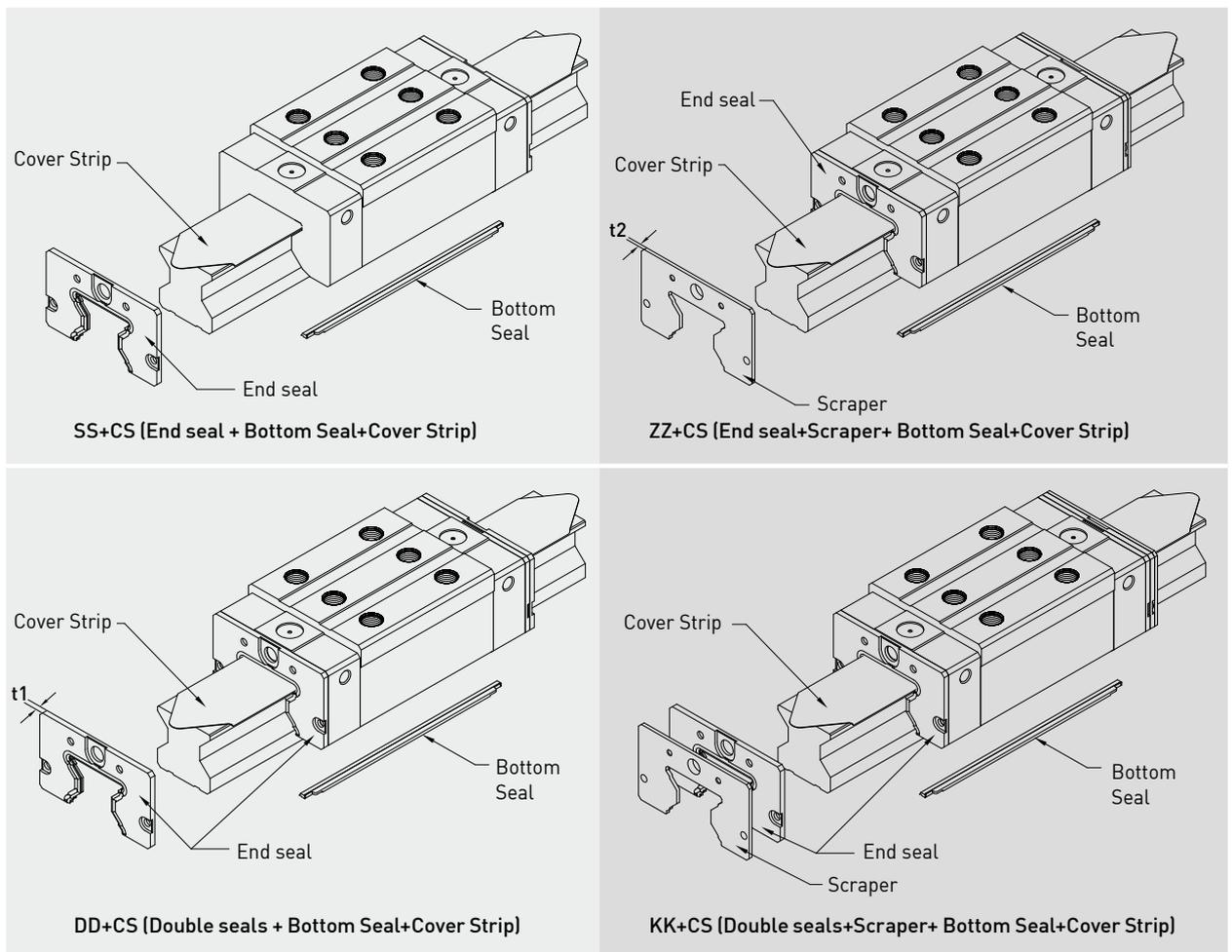
The figure shows the relationship between the rigidity, friction and nominal life. A preload no larger than ZA would be recommended for smaller model sizes to avoid over-preload affecting the life of the guideway.



## 2-10-7 Dust Proof Accessories

### (1) Codes of accessories

Table 2-10-13



### (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 2-10-14 Dimensions of end seal

| Size     | Thickness (t1)<br>(mm) | Size     | Thickness (t1)<br>(mm) |
|----------|------------------------|----------|------------------------|
| CRG15 ES | 2.2                    | CRG35 ES | 2.5                    |
| CRG20 ES | 2.2                    | CRG45 ES | 3.6                    |
| CRG25 ES | 2.2                    | CRG55 ES | 3.6                    |
| CRG30 ES | 2.4                    | CRG65 ES | 4.4                    |

## CRG Series

### High Rigidity Roller Type with Cover Strip

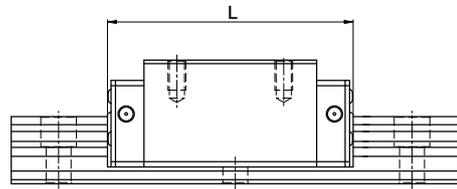
#### (4) Scraper

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

Table 2-10-15 Dimensions of scraper

| Size     | Thickness (t2)<br>(mm) | Size     | Thickness (t2)<br>(mm) |
|----------|------------------------|----------|------------------------|
| CRG15 SC | 1.0                    | CRG35 SC | 1.5                    |
| CRG20 SC | 1.0                    | CRG45 SC | 1.5                    |
| CRG25 SC | 1.0                    | CRG55 SC | 1.5                    |
| CRG30 SC | 1.5                    | CRG65 SC | 1.5                    |

#### (5) Dimensions of block equipped with the dustproof parts



unit: mm

Table 2-10-16 Overall block length

| Size   | Overall block length (L) |               |               |               |
|--------|--------------------------|---------------|---------------|---------------|
|        | SS                       | ZZ            | DD            | KK            |
| CRG15C | 68.0 (70.0)              | 70.0 (74.4)   | 72.4 (74.4)   | 74.4 (78.8)   |
| CRG20C | 86.0 (88.0)              | 88.0 (92.4)   | 90.4 (92.4)   | 92.4 (96.8)   |
| CRG20H | 106.0 (108.0)            | 108.0 (112.4) | 110.4 (112.4) | 112.4 (116.8) |
| CRG25C | 97.9 (101.5)             | 99.9 (105.9)  | 102.3 (105.9) | 104.3 (110.3) |
| CRG25H | 114.4 (118)              | 116.4 (122.4) | 118.8 (122.4) | 120.8 (126.8) |
| CRG30C | 109.8 (113.4)            | 112.8 (118.8) | 114.6 (118.2) | 117.6 (123.6) |
| CRG30H | 131.8 (135.4)            | 134.8 (140.8) | 136.6 (140.2) | 139.6 (145.6) |
| CRG35C | 124.0 (129.4)            | 127.0 (135.0) | 129.0 (134.4) | 132.0 (140.0) |
| CRG35H | 151.5 (156.9)            | 154.5 (162.5) | 156.5 (161.9) | 159.5 (167.5) |
| CRG45C | 153.2 (156.4)            | 156.2 (164.2) | 160.4 (163.6) | 163.4 (171.4) |
| CRG45H | 187.0 (190.2)            | 190.0 (198.0) | 194.2 (197.4) | 197.2 (205.2) |
| CRG55C | 183.7 (186.9)            | 186.7 (194.7) | 190.9 (194.1) | 193.9 (201.9) |
| CRG55H | 232.0 (235.2)            | 235.0 (243.0) | 239.2 (242.4) | 242.2 (250.2) |
| CRG65C | 232.0 (236.0)            | 235.0 (245.0) | 240.8 (244.8) | 243.8 (253.8) |
| CRG65H | 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.

## 2-10-8 Friction

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

Table 2-10-17 Seal Resistance

| Size  | Resistance N (kgf) | Size  | Resistance N (kgf) |
|-------|--------------------|-------|--------------------|
| CRG15 | 1.96 (0.2)         | CRG35 | 3.53 (0.36)        |
| CRG20 | 2.45 (0.25)        | CRG45 | 4.21 (0.43)        |
| CRG25 | 2.74 (0.28)        | CRG55 | 5.09 (0.52)        |
| CRG30 | 3.31 (0.31)        | CRG65 | 6.66 (0.68)        |

## 2-10-9 The Accuracy Tolerance of Mounting Surface

### (1) The accuracy tolerance of rail-mounting surface

As long as the accuracy requirements of the mounting surfaces shown in the following tables are met, the high accuracy, high rigidity and long life of the CRG series linear guideway will be maintained without any difficulty.

- The parallelism tolerance of reference surface (P)

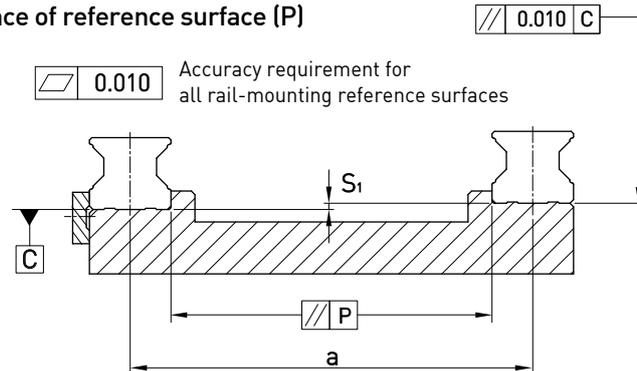


Table 2-10-18 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size  | Preload classes    |                     |                    |
|-------|--------------------|---------------------|--------------------|
|       | Light Preload (Z0) | Medium Preload (ZA) | Heavy Preload (ZB) |
| CRG15 | 5                  | 3                   | 3                  |
| CRG20 | 8                  | 6                   | 4                  |
| CRG25 | 9                  | 7                   | 5                  |
| CRG30 | 11                 | 8                   | 6                  |
| CRG35 | 14                 | 10                  | 7                  |
| CRG45 | 17                 | 13                  | 9                  |
| CRG55 | 21                 | 14                  | 11                 |
| CRG65 | 27                 | 18                  | 14                 |

- The accuracy tolerance of reference surface height ( $S_1$ )

$$S_1 = a \times K$$

$S_1$  : Max. tolerance of height

$a$  : Distance between paired rails

$K$  : Coefficient of tolerance of height

Table 2-10-19 Coefficient of tolerance of height

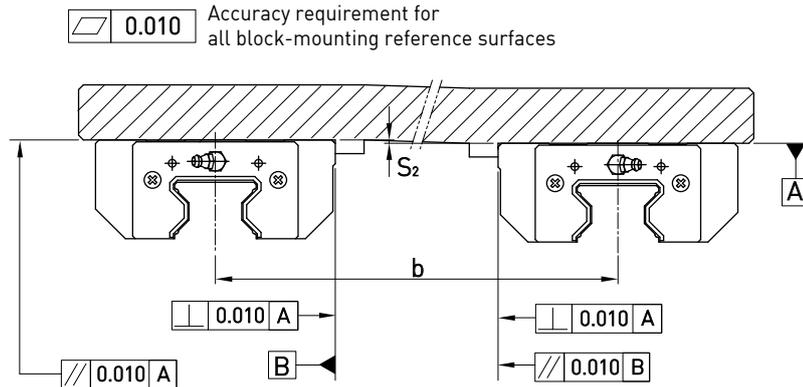
| Size | Preload classes      |                      |                      |
|------|----------------------|----------------------|----------------------|
|      | Light Preload (Z0)   | Medium Preload (ZA)  | Heavy Preload (ZB)   |
| K    | $2.2 \times 10^{-4}$ | $1.7 \times 10^{-4}$ | $1.2 \times 10^{-4}$ |

## CRG Series

### High Rigidity Roller Type with Cover Strip

#### (2) The accuracy tolerance of block-mounting surface

- The tolerance of the height of reference surface when two or more pieces are used in parallel ( $S_2$ )

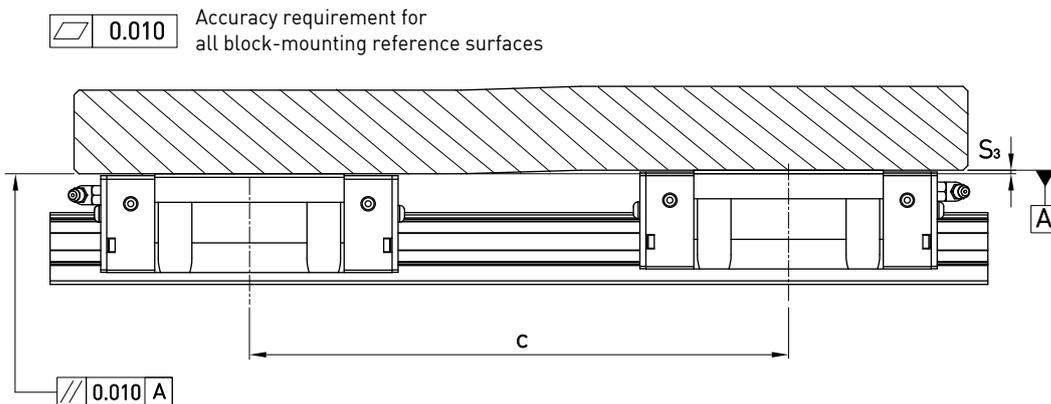


$$S_2 = b \times 4.2 \times 10^{-5}$$

$S_2$  : Max. tolerance of height

$b$  : Distance between paired blocks

- The tolerance of the height of reference surface when two or more pieces are used in parallel ( $S_3$ )



$$S_3 = c \times 4.2 \times 10^{-5}$$

$S_3$  : Max. tolerance of height

$c$  : Distance between paired blocks

## 2-10-10 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

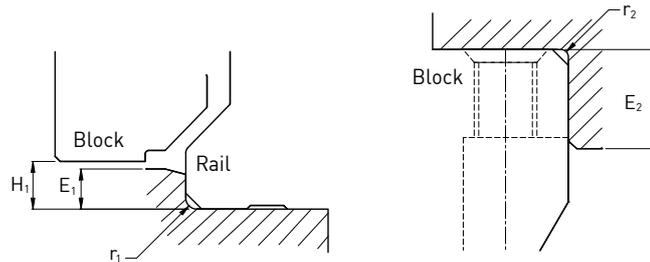


Table 2-10-20

| Size  | Max. radius of fillets<br>$r_1$ (mm) | Max. radius of fillets<br>$r_2$ (mm) | Shoulder height beside the rail<br>$E_1$ (mm) | Shoulder height beside the block<br>$E_2$ (mm) | Clearance under block<br>$H_1$ (mm) |
|-------|--------------------------------------|--------------------------------------|---|--|-------------------------------------|
| CRG15 | 0.5                                  | 0.5                                  | 3   | 4  | 4                                   |
| CRG20 | 0.5                                  | 0.5                                  | 3.5   | 5  | 5                                   |
| CRG25 | 1.0                                  | 1.0                                  | 5   | 5  | 5.5                                 |
| CRG30 | 1.0                                  | 1.0                                  | 5   | 5  | 6                                   |
| CRG35 | 1.0                                  | 1.0                                  | 6   | 6  | 6.5                                 |
| CRG45 | 1.0                                  | 1.0                                  | 7   | 8  | 8                                   |
| CRG55 | 1.5                                  | 1.5                                  | 9   | 10   | 10                                  |
| CRG65 | 1.5                                  | 1.5                                  | 10  | 10   | 12                                  |

### (2) Tightening Torque of Mounting Bolts

Improper tightening of mounting bolts will seriously influence the accuracy of a linear guideway. The following tightening torque for the different sizes of bolt is recommended.

Table 2-10-21

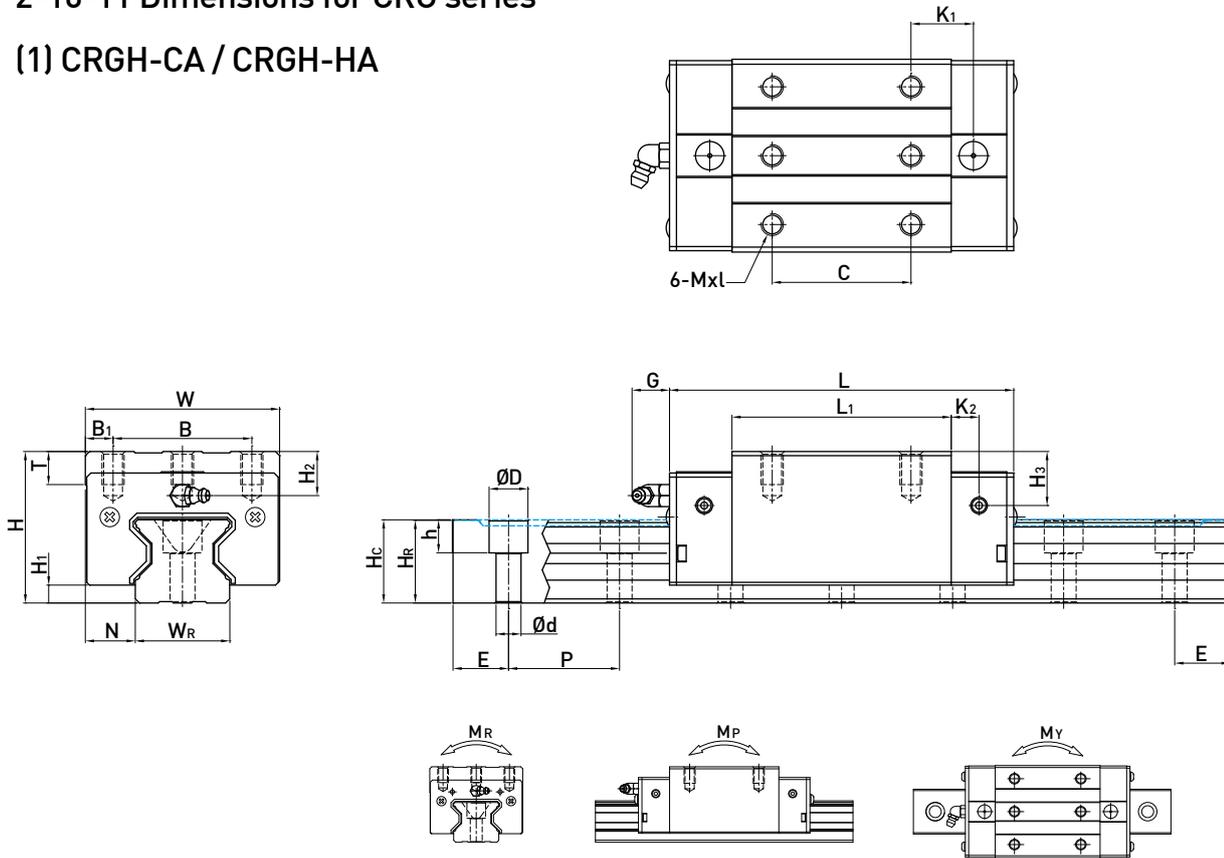
| Size  | Bolt size     | Torque N-cm(kgf-cm) |              |             |
|-------|---------------|---------------------|--------------|-------------|
|       |               | Iron                | Casting      | Aluminum    |
| CRG15 | M4×0.7P×16L   | 392 (40)            | 274 (28)     | 206 (21)    |
| CRG20 | M5×0.8P×20L   | 883 (90)            | 588 (60)     | 441 (45)    |
| CRG25 | M6×1P×20L     | 1373 (140)          | 921 (94)     | 686 (70)    |
| CRG30 | M8×1.25P×25L  | 3041 (310)          | 2010 (205)   | 1470 (150)  |
| CRG35 | M8×1.25P×25L  | 3041 (310)          | 2010 (205)   | 1470 (150)  |
| CRG45 | M12×1.75P×35L | 11772 (1200)        | 7840 (800)   | 5880 (600)  |
| CRG55 | M14×2P×45L    | 15696 (1600)        | 10500 (1100) | 7840 (800)  |
| CRG65 | M16×2P×50L    | 19620 (2000)        | 13100 (1350) | 9800 (1000) |

# CRG Series

## High Rigidity Roller Type with Cover Strip

### 2-10-11 Dimensions for CRG series

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



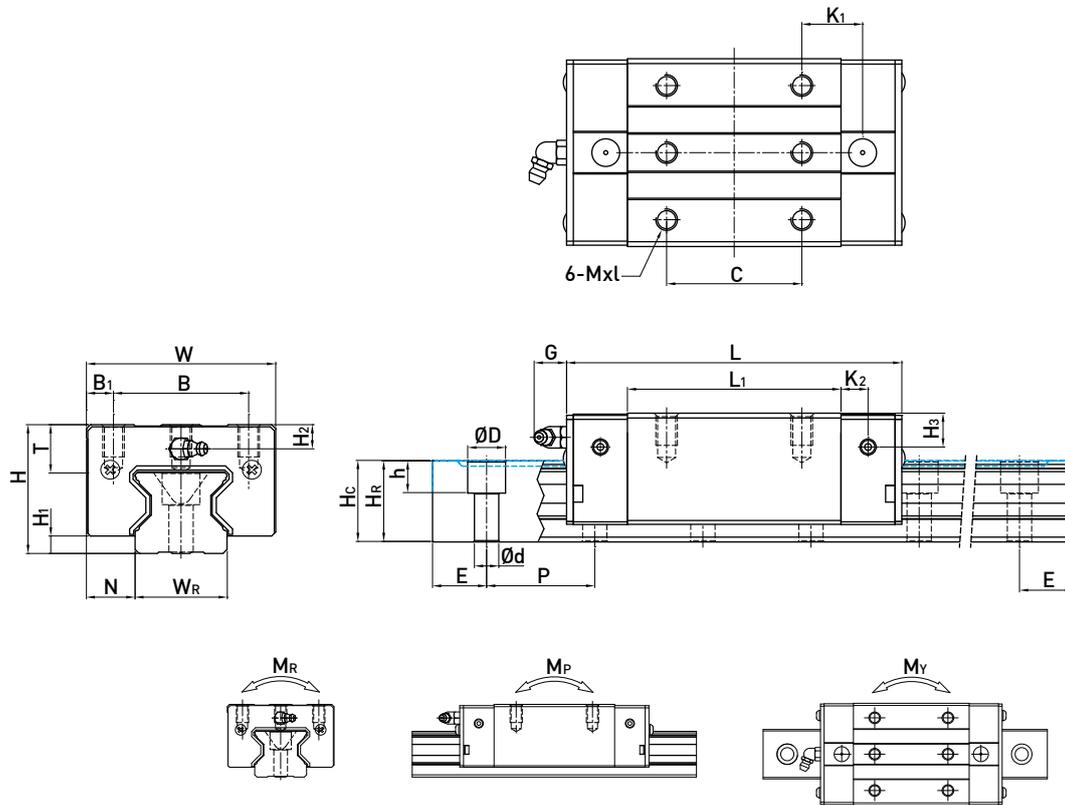
| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |    |                |     |                |       |                |                |      |          | Dimensions of Rail (mm) |                |                |                |                |                             | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |      |          | Weight |       |                       |                       |                       |            |             |
|-----------|-----------------------------|----------------|------|--------------------------|----|----------------|-----|----------------|-------|----------------|----------------|------|----------|-------------------------|----------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------------------------|--|---------------------|------|----------|--------|-------|-----------------------|-----------------------|-----------------------|------------|-------------|
|           | 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    | Mxl      | T                       | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> | H <sub>C</sub> <sup>3</sup> |                             |                                  |  | D                   | h    | d        | P      | E     | M <sub>R</sub> (kN-m) | M <sub>P</sub> (kN-m) | M <sub>Y</sub> (kN-m) | Block (kg) | Rail (kg/m) |
| CRGH15CA  | 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           | 16.7                        | 7.5                         | 5.7                              | 4.5  | 30                  | 20   | M4 x 16  | 11.3   | 24    | 0.311                 | 0.173                 | 0.173                 | 0.20       | 1.8         |
| CRGH20CA  | 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             | 21.2                        | 9.5                         | 8.5                              | 6  | 30                  | 20   | M5 x 20  | 21.3   | 46.7  | 0.647                 | 0.46                  | 0.46                  | 0.40       | 2.76        |
| CRGH20HA  |                             |                |      |                          |    |                | 50  | 77.5           | 106   | 18.8           |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 27.7   | 63    | 0.872                 | 0.837                 | 0.837                 | 0.53       |             |
| CRGH25CA  | 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           | 23.8                        | 11                          | 9                                | 7  | 30                  | 20   | M6 x 20  | 27.7   | 57.1  | 0.758                 | 0.605                 | 0.605                 | 0.61       | 3.08        |
| CRGH25HA  |                             |                |      |                          |    |                | 50  | 81             | 114.4 | 21.5           |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 33.9   | 73.4  | 0.975                 | 0.991                 | 0.991                 | 0.75       |             |
| CRGH30CA  | 45                          | 6              | 16   | 60                       | 40 | 10             | 40  | 71             | 109.8 | 23.5           | 8              | 12   | M8 x 10  | 9.5                     | 9.5            | 10.3           | 28             | 28             | 28.2                        | 14                          | 12                               | 9  | 40                  | 20   | M8 x 25  | 39.1   | 82.1  | 1.445                 | 1.06                  | 1.06                  | 0.90       | 4.41        |
| CRGH30HA  |                             |                |      |                          |    |                | 60  | 93             | 131.8 | 24.5           |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 48.1   | 105   | 1.846                 | 1.712                 | 1.712                 | 1.16       |             |
| CRGH35CA  | 55                          | 6.5            | 18   | 70                       | 50 | 10             | 50  | 79             | 124   | 22.5           | 10             | 12   | M8 x 12  | 12                      | 16             | 19.6           | 34             | 30.2           | 30.4                        | 14                          | 12                               | 9  | 40                  | 20   | M8 x 25  | 57.9   | 105.2 | 2.17                  | 1.44                  | 1.44                  | 1.57       | 6.06        |
| CRGH35HA  |                             |                |      |                          |    |                | 72  | 106.5          | 151.5 | 25.25          |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 73.1   | 142   | 2.93                  | 2.6                   | 2.6                   | 2.06       |             |
| CRGH45CA  | 70                          | 8              | 20.5 | 86                       | 60 | 13             | 60  | 106            | 153.2 | 31             | 10             | 12.9 | M10 x 17 | 16                      | 20             | 24             | 45             | 38             | 38.2                        | 20                          | 17                               | 14   | 52.5                | 22.5 | M12 x 35 | 92.6   | 178.8 | 4.52                  | 3.05                  | 3.05                  | 3.18       | 9.97        |
| CRGH45HA  |                             |                |      |                          |    |                | 80  | 139.8          | 187   | 37.9           |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 116    | 230.9 | 6.33                  | 5.47                  | 5.47                  | 4.13       |             |
| CRGH55CA  | 80                          | 10             | 23.5 | 100                      | 75 | 12.5           | 75  | 125.5          | 183.7 | 37.75          | 12.5           | 12.9 | M12 x 18 | 17.5                    | 22             | 27.5           | 53             | 44             | 44.2                        | 23                          | 20                               | 16   | 60                  | 30   | M14 x 45 | 130.5  | 252   | 8.01                  | 5.4                   | 5.4                   | 4.89       | 13.98       |
| CRGH55HA  |                             |                |      |                          |    |                | 95  | 173.8          | 232   | 51.9           |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 167.8  | 348   | 11.15                 | 10.25                 | 10.25                 | 6.68       |             |
| CRGH65CA  | 90                          | 12             | 31.5 | 126                      | 76 | 25             | 70  | 160            | 232   | 60.8           | 15.8           | 12.9 | M16 x 20 | 25                      | 15             | 15             | 63             | 53             | 53.2                        | 26                          | 22                               | 18   | 75                  | 35   | M16 x 50 | 213    | 411.6 | 16.20                 | 11.59                 | 11.59                 | 8.89       | 20.22       |
| CRGH65HA  |                             |                |      |                          |    |                | 120 | 223            | 295   | 67.3           |                |      |          |                         |                |                |                |                |                             |                             |                                  |  |                     |      |          | 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<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

3. Dimension H<sub>c</sub> with cover strip.

(2) CRGL-CA / CRGL-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 C <sub>0</sub> (kN) | Static Rated Moment |       |                | Weight         |                |       |       |
|-----------|-----------------------------|----------------|--------------------------|-----|----|----------------|----|----------------|-------|----------------|----------------|------|--------|------|----------------|----------------|-------------------------|----------------|-----------------------------|-----|-----|-----|-----------------------------|---------------------------------|--|---------------------|-------|----------------|----------------|----------------|-------|-------|
|           | 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    | M      | T    | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub>          | H <sub>R</sub> | H <sub>C</sub> <sup>3</sup> | D   | h   | d   |                             |                                 |  | P                   | E     | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail  |
|           | kgf                         | mm             | mm                       | mm  | mm | mm             | mm | mm             | mm    | mm             | mm             | mm   | mm     | mm   | mm             | mm             | mm                      | mm             | mm                          | mm  | mm  | mm  | mm                          | mm                              | mm   | mm                  | mm    | mm             | mm             | mm             | mm    |       |
| CRGL15CA  | 24                          | 4              | 9.5                      | 34  | 26 | 4              | 26 | 45             | 68    | 13.4           | 4.7            | 5.3  | M4x5.5 | 6    | 3.6            | 6.1            | 15                      | 16.5           | 16.7                        | 7.5 | 5.7 | 4.5 | 30                          | 20                              | M4x16  | 11.3                | 24    | 0.311          | 0.173          | 0.173          | 0.15  | 1.8   |
| CRGL20CA  | 30                          | 5              | 12                       | 44  | 32 | 6              | 36 | 57.5           | 86    | 15.8           | 6              | 5.3  | M5x6   | 8    | 4.3            | 4.3            | 20                      | 21             | 21.2                        | 9.5 | 8.5 | 6   | 30                          | 20                              | M5x20  | 21.3                | 46.7  | 0.647          | 0.46           | 0.46           | 0.32  | 2.76  |
| CRGL20HA  |                             |                |                          |     |    |                | 50 | 77.5           | 106   | 18.8           |                |      |        |      |                |                |                         |                |                             |     |     |     |                             |                                 |  | 26.9                | 63    | 0.872          | 0.837          | 0.837          | 0.42  |       |
| CRGL25CA  | 36                          | 5.5            | 12.5                     | 48  | 35 | 6.5            | 35 | 64.5           | 97.9  | 20.75          | 7.25           | 12   | M6x8   | 9.5  | 6.2            | 6              | 23                      | 23.6           | 23.8                        | 11  | 9   | 7   | 30                          | 20                              | M6x20  | 27.7                | 57.1  | 0.758          | 0.605          | 0.605          | 0.51  | 3.08  |
| CRGL25HA  |                             |                |                          |     |    |                | 50 | 81             | 114.4 | 21.5           |                |      |        |      |                |                |                         |                |                             |     |     |     |                             |                                 |  | 33.9                | 73.4  | 0.975          | 0.991          | 0.991          | 0.63  |       |
| CRGL30CA  | 42                          | 6              | 16                       | 60  | 40 | 10             | 40 | 71             | 109.8 | 23.5           | 8              | 12   | M8x10  | 9.5  | 6.5            | 7.3            | 28                      | 28             | 28.2                        | 14  | 12  | 9   | 40                          | 20                              | M8x25  | 39.1                | 82.1  | 1.445          | 1.06           | 1.06           | 0.80  | 4.41  |
| CRGL30HA  |                             |                |                          |     |    |                | 60 | 93             | 131.8 | 24.5           |                |      |        |      |                |                |                         |                |                             |     |     |     |                             |                                 |  | 48.1                | 105   | 1.846          | 1.712          | 1.712          | 1.03  |       |
| CRGL35CA  | 48                          | 6.5            | 18                       | 70  | 50 | 10             | 50 | 79             | 124   | 22.5           | 10             | 12   | M8x12  | 12   | 9              | 12.6           | 34                      | 30.2           | 30.4                        | 14  | 12  | 9   | 40                          | 20                              | M8x25  | 57.9                | 105.2 | 2.17           | 1.44           | 1.44           | 1.27  | 6.06  |
| CRGL35HA  |                             |                |                          |     |    |                | 72 | 106.5          | 151.5 | 25.25          |                |      |        |      |                |                |                         |                |                             |     |     |     |                             |                                 |  | 73.1                | 142   | 2.93           | 2.6            | 2.6            | 1.65  |       |
| CRGL45CA  | 60                          | 8              | 20.5                     | 86  | 60 | 13             | 60 | 106            | 153.2 | 31             | 10             | 12.9 | M10x17 | 16   | 10             | 14             | 45                      | 38             | 38.2                        | 20  | 17  | 14  | 52.5                        | 22.5                            | M12x35                                       | 92.6                | 178.8 | 4.52           | 3.05           | 3.05           | 2.47  | 9.97  |
| CRGL45HA  |                             |                |                          |     |    |                | 80 | 139.8          | 187   | 37.9           |                |      |        |      |                |                |                         |                |                             |     |     |     |                             |                                 |  | 116                 | 230.9 | 6.33           | 5.47           | 5.47           | 3.20  |       |
| CRGL55CA  | 70                          | 10             | 23.5                     | 100 | 75 | 12.5           | 75 | 125.5          | 183.7 | 37.75          | 12.5           | 12.9 | M12x18 | 17.5 | 12             | 17.5           | 53                      | 44             | 44.2                        | 23  | 20  | 16  | 60                          | 30                              | M14x45                                       | 130.5               | 252   | 8.01           | 5.4            | 5.4            | 3.91  | 13.98 |
| CRGL55HA  |                             |                |                          |     |    |                | 95 | 173.8          | 232   | 51.9           |                |      |        |      |                |                |                         |                |                             |     |     |     |                             |                                 |  | 167.8               | 348   | 11.15          | 10.25          | 10.25          | 5.32  |       |

Note : 1. 1 kgf = 9.81 N

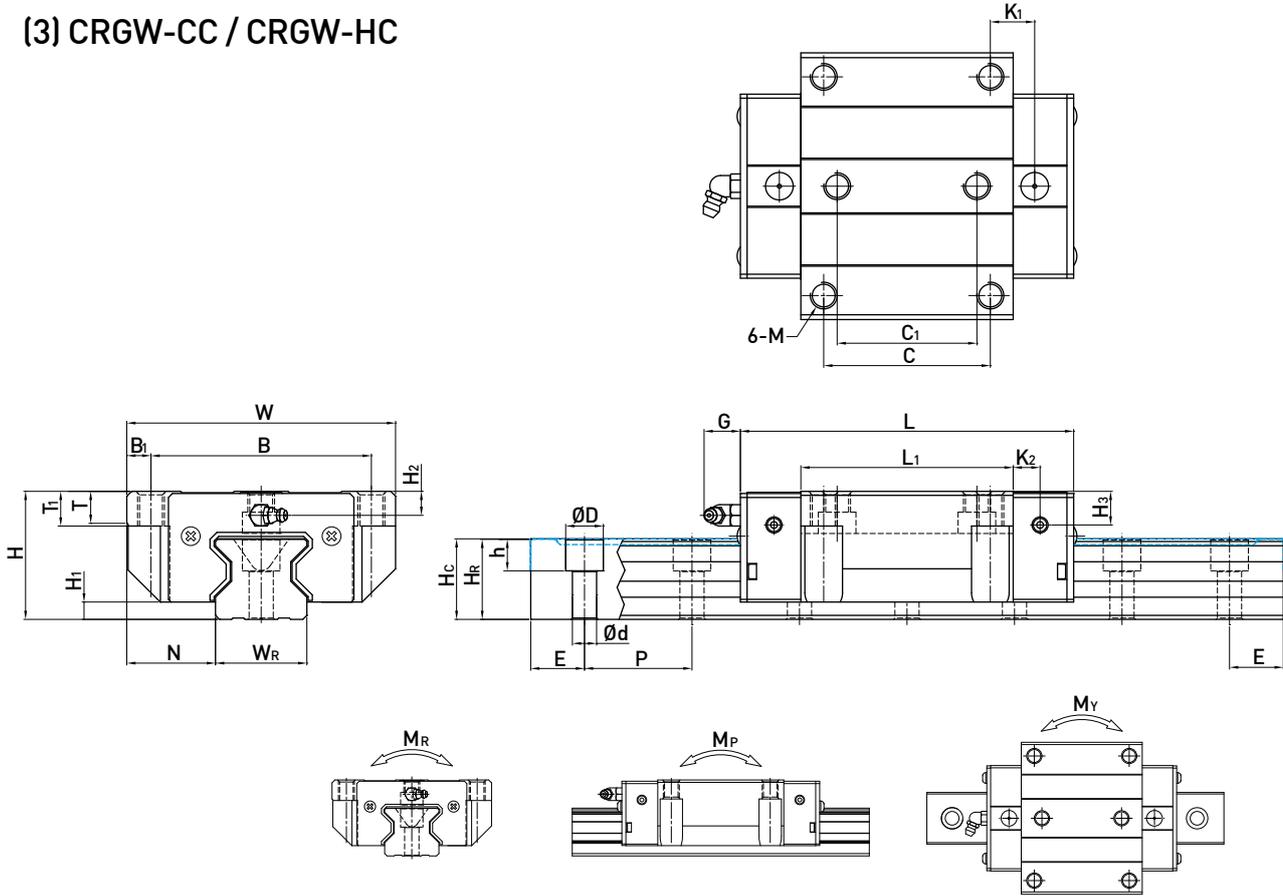
2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

3. Dimension H<sub>C</sub> with cover strip.

# CRG Series

## High Rigidity Roller Type with Cover Strip

### (3) CRGW-CC / CRGW-HC

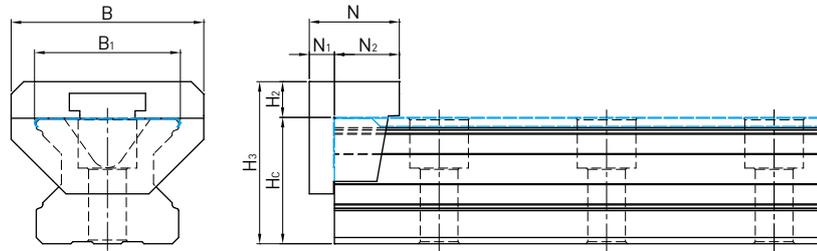


| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |     |                |     |                |                |       |                |                |      |     | Dimensions of Rail (mm) |                |                |                |                |                |                             |     |     |     | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating Co (kN) | Static Rated Moment |       |                     | Weight              |                     |          |           |
|-----------|-----------------------------|----------------|------|--------------------------|-----|----------------|-----|----------------|----------------|-------|----------------|----------------|------|-----|-------------------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|-----|-----|-----|-----------------------------|----------------------------------|----------------------------------|---------------------|-------|---------------------|---------------------|---------------------|----------|-----------|
|           | H                           | 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> | H <sub>C</sub> <sup>3</sup> | D   | h   | d   |                             |                                  |                                  | P                   | E     | M <sub>R</sub> kN-m | M <sub>P</sub> kN-m | M <sub>Y</sub> kN-m | Block kg | Rail kg/m |
| CRGW15CC  | 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           | 16.7                        | 7.5 | 5.7 | 4.5 | 30                          | 20                               | M4x16                            | 11.3                | 24    | 0.311               | 0.173               | 0.173               | 0.22     | 1.8       |
| CRGW20CC  | 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             | 21.2                        | 9.5 | 8.5 | 6   | 30                          | 20                               | M5x20                            | 21.3                | 46.7  | 0.647               | 0.46                | 0.46                | 0.47     | 2.76      |
| CRGW20HC  |                             |                |      |                          |     |                |     |                | 77.5           | 106   | 23.8           |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |
| CRGW25CC  | 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           | 23.8                        | 11  | 9   | 7   | 30                          | 20                               | M6x20                            | 27.7                | 57.1  | 0.758               | 0.605               | 0.605               | 0.72     | 3.08      |
| CRGW25HC  |                             |                |      |                          |     |                |     |                | 81             | 114.4 | 24             |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |
| CRGW30CC  | 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             | 28.2                        | 14  | 12  | 9   | 40                          | 20                               | M8x25                            | 39.1                | 82.1  | 1.445               | 1.06                | 1.06                | 1.16     | 4.41      |
| CRGW30HC  |                             |                |      |                          |     |                |     |                | 93             | 131.8 | 28.5           |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |
| CRGW35CC  | 48                          | 6.5            | 33   | 100                      | 82  | 9              | 62  | 52             | 79             | 124   | 16.5           | 10             | 12   | M10 | 12                      | 13             | 9              | 12.6           | 34             | 30.2           | 30.4                        | 14  | 12  | 9   | 40                          | 20                               | M8x25                            | 57.9                | 105.2 | 2.17                | 1.44                | 1.44                | 1.75     | 6.06      |
| CRGW35HC  |                             |                |      |                          |     |                |     |                | 106.5          | 151.5 | 30.25          |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |
| CRGW45CC  | 60                          | 8              | 37.5 | 120                      | 100 | 10             | 80  | 60             | 106            | 153.2 | 21             | 10             | 12.9 | M12 | 14                      | 15             | 10             | 14             | 45             | 38             | 38.2                        | 20  | 17  | 14  | 52.5                        | 22.5                             | M12x35                           | 92.6                | 178.8 | 4.52                | 3.05                | 3.05                | 3.43     | 9.97      |
| CRGW45HC  |                             |                |      |                          |     |                |     |                | 139.8          | 187   | 37.9           |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |
| CRGW55CC  | 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             | 44.2                        | 23  | 20  | 16  | 60                          | 30                               | M14x45                           | 130.5               | 252   | 8.01                | 5.4                 | 5.4                 | 5.43     | 13.98     |
| CRGW55HC  |                             |                |      |                          |     |                |     |                | 173.8          | 232   | 51.9           |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |
| CRGW65CC  | 90                          | 12             | 53.5 | 170                      | 142 | 14             | 110 | 82             | 160            | 232   | 40.8           | 15.8           | 12.9 | M16 | 22                      | 23             | 15             | 15             | 63             | 53             | 53.2                        | 26  | 22  | 18  | 75                          | 35                               | M16x50                           | 213                 | 411.6 | 16.20               | 11.59               | 11.59               | 11.63    | 20.22     |
| CRGW65HC  |                             |                |      |                          |     |                |     |                | 223            | 295   | 72.3           |                |      |     |                         |                |                |                |                |                |                             |     |     |     |                             |                                  |                                  |                     |       |                     |                     |                     |          |           |

Note : 1. 1 kgf = 9.81 N  
 2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>  
 3. Dimension H<sub>c</sub> with cover strip.

#### (4) Dimension of cover strip and plastic end jig

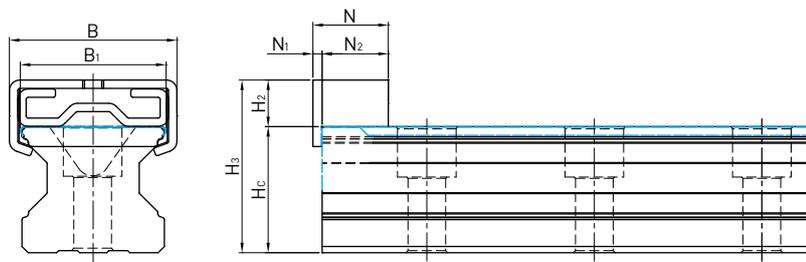
○ plastic end jig (standard)



| Model No. | H <sub>3</sub> | H <sub>c</sub> <sup>1</sup> | H <sub>2</sub> | N    | N <sub>1</sub> | N <sub>2</sub> | B    | B <sub>1</sub> |
|-----------|----------------|-----------------------------|----------------|------|----------------|----------------|------|----------------|
| CRG15     | 21.2           | 16.7                        | 4.5            | 13.0 | 3.7            | 9.3            | 20.0 | 16.0           |
| CRG20     | 26.1           | 21.2                        | 4.9            | 13.0 | 4              | 9.0            | 27.0 | 21.0           |
| CRG25     | 28.9           | 23.8                        | 5.1            | 15.0 | 4              | 11.0           | 31.5 | 24.0           |
| CRG30     | 35.1           | 28.2                        | 6.9            | 21.0 | 6              | 15.0           | 40.0 | 29.0           |
| CRG35     | 39.1           | 30.4                        | 8.7            | 21.5 | 6              | 15.5           | 46.0 | 35.0           |
| CRG45     | 46.6           | 38.2                        | 8.4            | 22.0 | 5.2            | 16.8           | 51.6 | 46.0           |
| CRG55     | 54.3           | 44.2                        | 10.1           | 22.5 | 7.7            | 14.8           | 62.0 | 54.0           |
| CRG65     | 64.4           | 53.2                        | 11.2           | 30.0 | 9.2            | 20.8           | 70.0 | 64.0           |

Note : 1. Dimension H<sub>c</sub> with cover strip

○ Metal end jig (optional)



| Model No. | H <sub>3</sub> | H <sub>c</sub> <sup>1</sup> | H <sub>2</sub> | N  | N <sub>1</sub> | N <sub>2</sub> | B     | B <sub>1</sub> |
|-----------|----------------|-----------------------------|----------------|----|----------------|----------------|-------|----------------|
| CRG15     | 20.5           | 16.7                        | 3.8            | 15 | 2.2            | 12.8           | 21    | 15.8           |
| CRG20     | 28.4           | 21.2                        | 7.2            | 13 | 2.2            | 10.8           | 28    | 20.7           |
| CRG25     | 33.8           | 23.8                        | 10             | 15 | 2.2            | 12.8           | 30.7  | 23.9           |
| CRG30     | 37.4           | 28.2                        | 9.2            | 12 | 2.2            | 9.8            | 34    | 28.9           |
| CRG35     | 41.6           | 30.4                        | 11.2           | 18 | 2.2            | 15.8           | 40    | 34.8           |
| CRG45     | 50.2           | 38.2                        | 12             | 18 | 2.2            | 15.8           | 53.58 | 45.6           |
| CRG55     | 55.4           | 44.2                        | 11.2           | 18 | 2.2            | 15.8           | 58.6  | 53.7           |
| CRG65     | 65.2           | 53.2                        | 12             | 18 | 2.2            | 15.8           | 71.8  | 63.6           |

Note : 1. Dimension H<sub>c</sub> with cover strip

# QR Series

## Roller Type

### 2-11 QR series - Roller Type Linear Guideway, with SynchMotion® Technology

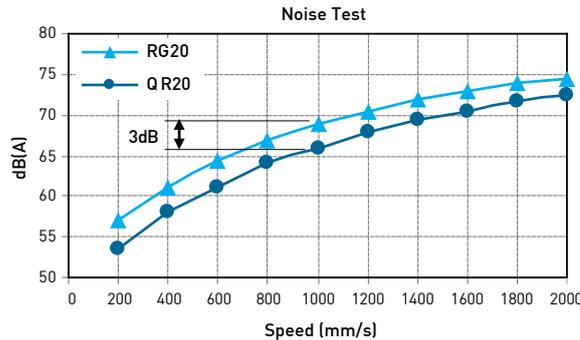
QR series offers super high rigidity and very high load capacities. The QR series with SynchMotion® Technology offers low friction, smooth movement, quieter operation and longer running life. In the industry where high accuracy, low noise and high rigidity is required, the QR series is interchangeable with the RG series.

#### 2-11-1 Advantages and features

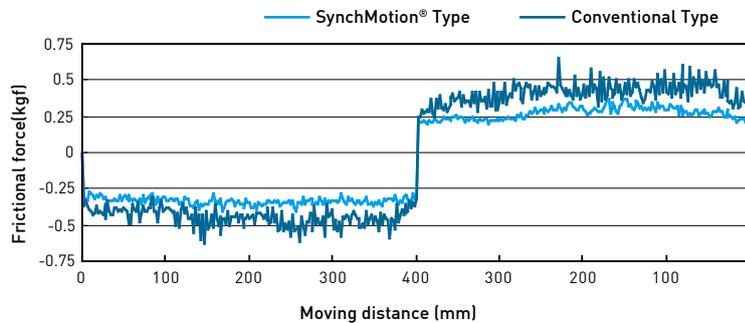
(1) Super high load capacity in linear guideway, with the four rows of rollers arranged at a contact angle of 45-degrees, the QR series linear guideway has equal load ratings in the radial, reverse radial and lateral directions. The QR series has a higher load capacity in a smaller size than conventional,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



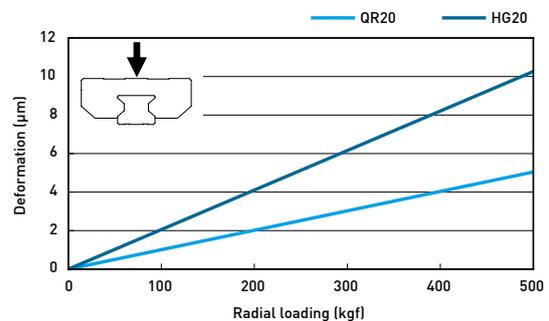
(2) Low Noise Design With SynchMotion® technology, rolling elements are interposed between the partitions of SynchMotion® to provide improved circulation. Due to the elimination of contact between the rolling elements, collision noise and sound levels are drastically reduced.



(3) Smooth Movement In standard linear guideways, rolling elements on the load side of the guide block begin rolling and push their way through the raceway. When they contact other rolling elements they create counter-rotational friction. This results in a great variation of rolling resistance. The QR linear guideway, with SynchMotion® technology prevents this condition.



(4) The QR series is a type of linear guideway that uses rollers as the rolling elements. 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.



(5) Sample test  
1. Nominal life test

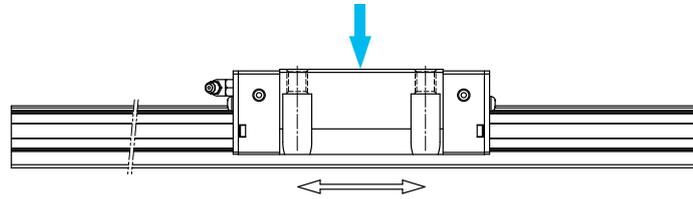


Table 2-11-1

Tested model 1: QRW20CC  
 Preload: ZA class  
 Max speed: 28m/min  
 Acceleration: 1G  
 Stroke: 0.2m  
 Lubrication: grease held every 100 km  
 External: 8.6 kN  
 Traveling distance: 1024km

**Test results:**

The nominal life of QRW20 is 1000km. After traveling 1024km, fatigue flaking did not appear on the surface of the raceway or rollers. And roller chain is not broken in this case.



2. Durability Test

Table 2-11-2

Tested model 2: QRH20CA  
 Preload: Z0 class  
 Max speed: 180m/min  
 Acceleration: 3G  
 Stroke: 0.23m  
 Oil feed rate: 0.14cm<sup>3</sup>/hr  
 External: 0km (No loading)  
 Traveling distance: 10586km

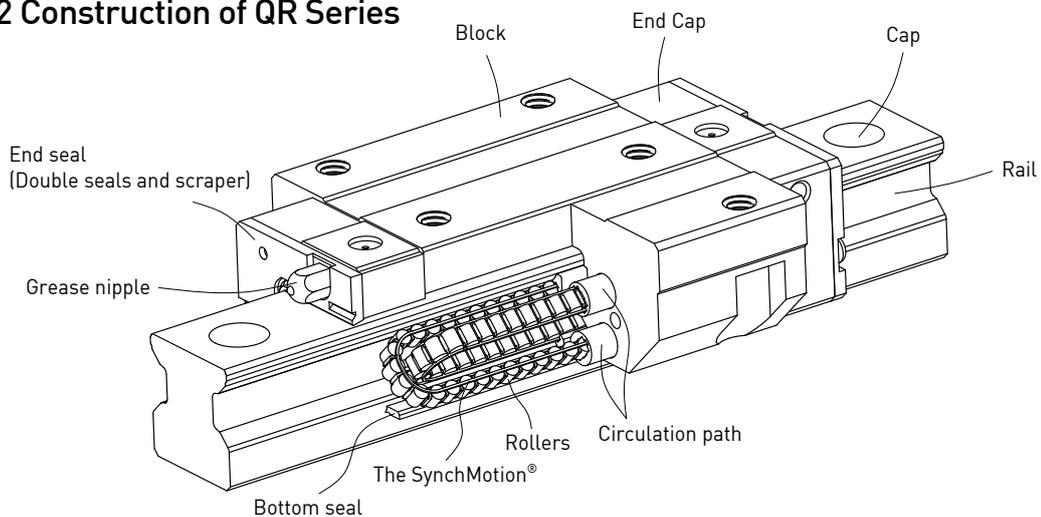
**Test results:**

After traveling 10586km, fatigue flaking did not appear on the surface of the raceway or rollers. And roller chain is not broken in this case.



Note: The data listed are from samples.

2-11-2 Construction of QR Series



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

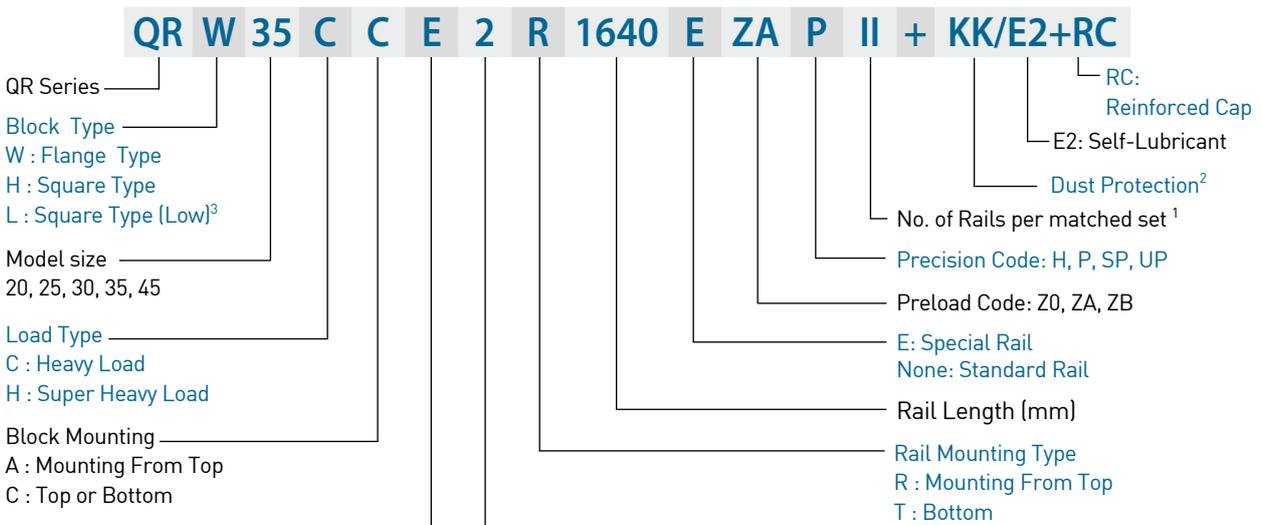
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### 2-11-3 Model Number of QR series

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

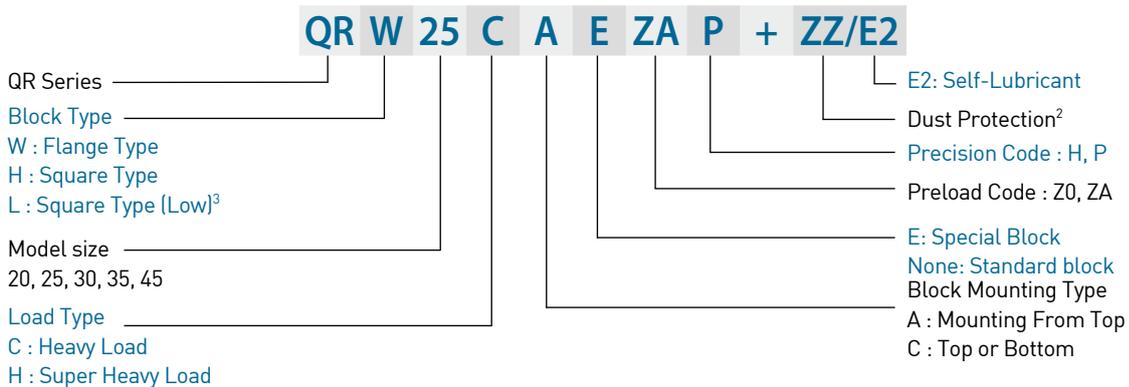
#### (1) Non-interchangeable type



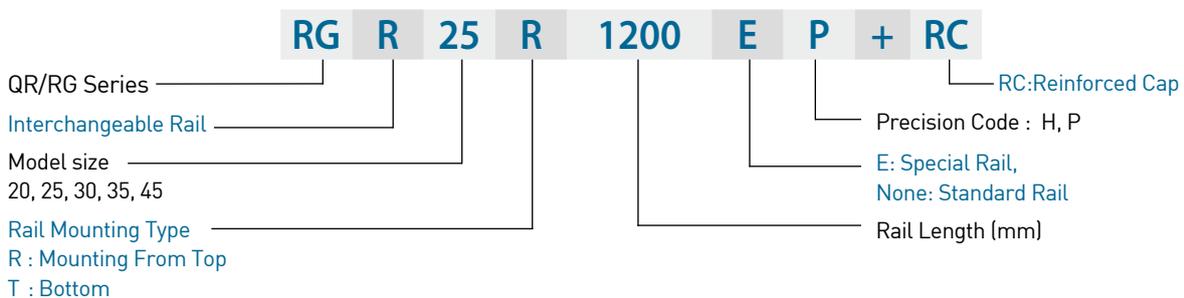
- Note: 1. The roman numerals express a matched set of rails.  
 2. No symbol indicates standard protection (end seal and bottom seal).  
 ZZ : End seal, bottom seal and scraper  
 KK: Double seals, bottom seal and scraper.  
 DD: Double seals and bottom seal  
 3. Block type QRL is the low profile design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

#### (2) Interchangeable type

##### ○ Model Number of RG Block



##### ○ Model Number of QR Rail (QR and RG share the identical rails)

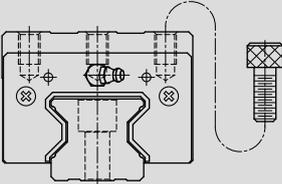
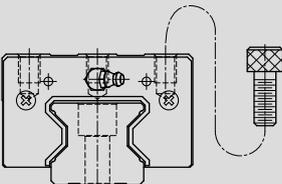
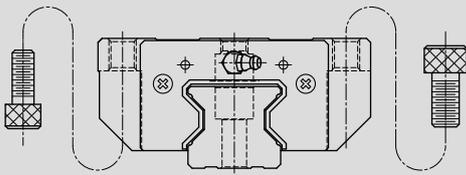


## 2-11-4 Types

### (1) Block types

QR series 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.

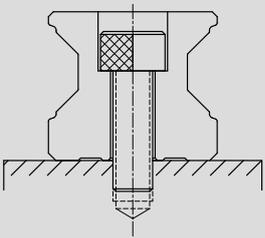
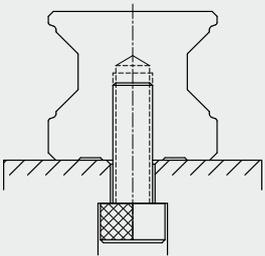
Table 2-11-3 Block Types

| Type         | Model            | Shape   | Height (mm) | Rail Length (mm) | Main Applications  |
|--------------|------------------|---|-------------|------------------|--|
| Square       | QRH-CA<br>QRH-HA |    | 34          | 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> |
|              |                  |   | ↓           | ↓                |  |
| Square (low) | QRL-CA<br>QRL-HA |  | 30          | 100              |  |
|              |                  |   | ↓           | ↓                |  |
| Flange       | QRW-CC<br>QRW-HC |  | 30          | 100              |  |
|              |                  |   | ↓           | ↓                |  |
|              |                  |   | 60          | 4000             |  |

### (2) Rail types

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

Table 2-11-4 Rail Types

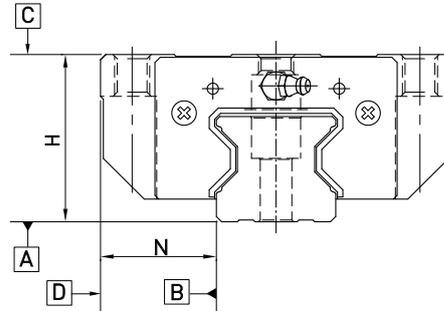
| Mounting from Top   | Mounting from Bottom  |
|---|---|
|  |  |

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### 2-11-5 Accuracy Classes

The accuracy of the QR 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 2-11-5 Accuracy Standards

Unit: mm

| Item  | QR - 20           |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
|   | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.03            | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 0.008         |
| Dimensional tolerance of width N                    | ± 0.03            | 0<br>- 0.03   | 0<br>- 0.015         | 0<br>- 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 2-11-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-11-11 |               |                      |                      |

Table 2-11-6 Accuracy Standards

Unit: mm

| Item  | QR- 25, 30, 35    |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
|   | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.04            | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 0.01          |
| Dimensional tolerance of width N                    | ± 0.04            | 0<br>- 0.04   | 0<br>- 0.02          | 0<br>- 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 2-11-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-11-11 |               |                      |                      |

Table 2-11-7 Accuracy Standards

Unit: mm

| Item  | QR - 45           |               |                      |                      |
|---|-------------------|---------------|----------------------|----------------------|
|   | High (H)          | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Dimensional tolerance of height H                   | ± 0.05            | 0<br>- 0.05   | 0<br>- 0.03          | 0<br>- 0.02          |
| Dimensional tolerance of width N                    | ± 0.05            | 0<br>- 0.05   | 0<br>- 0.03          | 0<br>- 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 2-11-11 |               |                      |                      |
| Running parallelism of block surface D to surface B | See Table 2-11-11 |               |                      |                      |

(2) Accuracy of interchangeable

Table 2-11-8 Accuracy Standards

Unit: mm

| Item  | QR - 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 2-11-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-11-11 |               |

Table 2-11-9 Accuracy Standards

Unit: mm

| Item  | QR- 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 2-11-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-11-11 |               |

Table 2-11-10 Accuracy Standards

Unit: mm

| Item  | QR - 45           |               |
|---|-------------------|---------------|
| 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 2-11-11 |               |
| Running parallelism of block surface D to surface B | See Table 2-11-11 |               |

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#### (3) Accuracy of running parallelism

Table 2-11-11 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  |

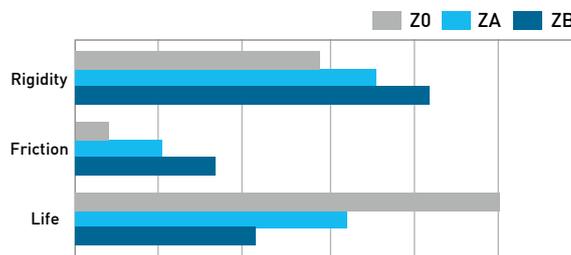
#### 2-11-6 Preload

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 QR series linear guideway offers three standard preloads for various applications and conditions.

Table 2-11-12

| 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.



## 2-11-7 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.

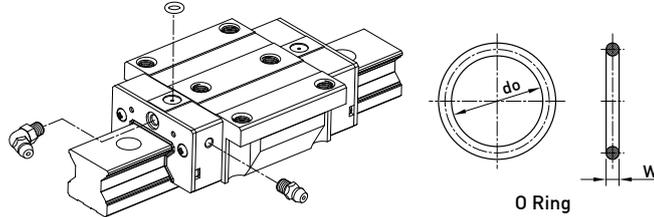
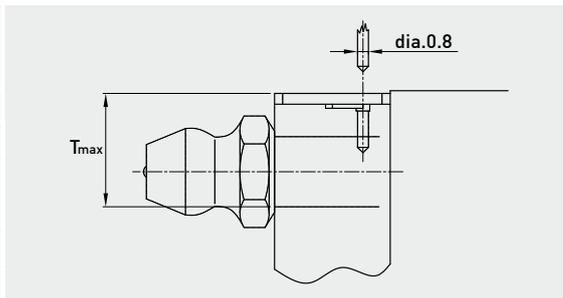


Table 2-11-13 O-Ring size and max. permissible depth for piercing

| Size  | O-Ring   |          | Lube hole at top:<br>max. permissible depth<br>for piercing |
|-------|----------|----------|---|
|       | do (mm)  | W (mm)   | T <sub>max</sub> (mm)                                       |
| QR 20 | 2.5±0.15 | 1.5±0.15 | 4   |
| QR 25 | 7.5±0.15 | 1.5±0.15 | 5.8   |
| QR 30 | 7.5±0.15 | 1.5±0.15 | 6.2   |
| QR 35 | 7.5±0.15 | 1.5±0.15 | 8.65  |
| QR 45 | 7.5±0.15 | 1.5±0.15 | 9.5   |

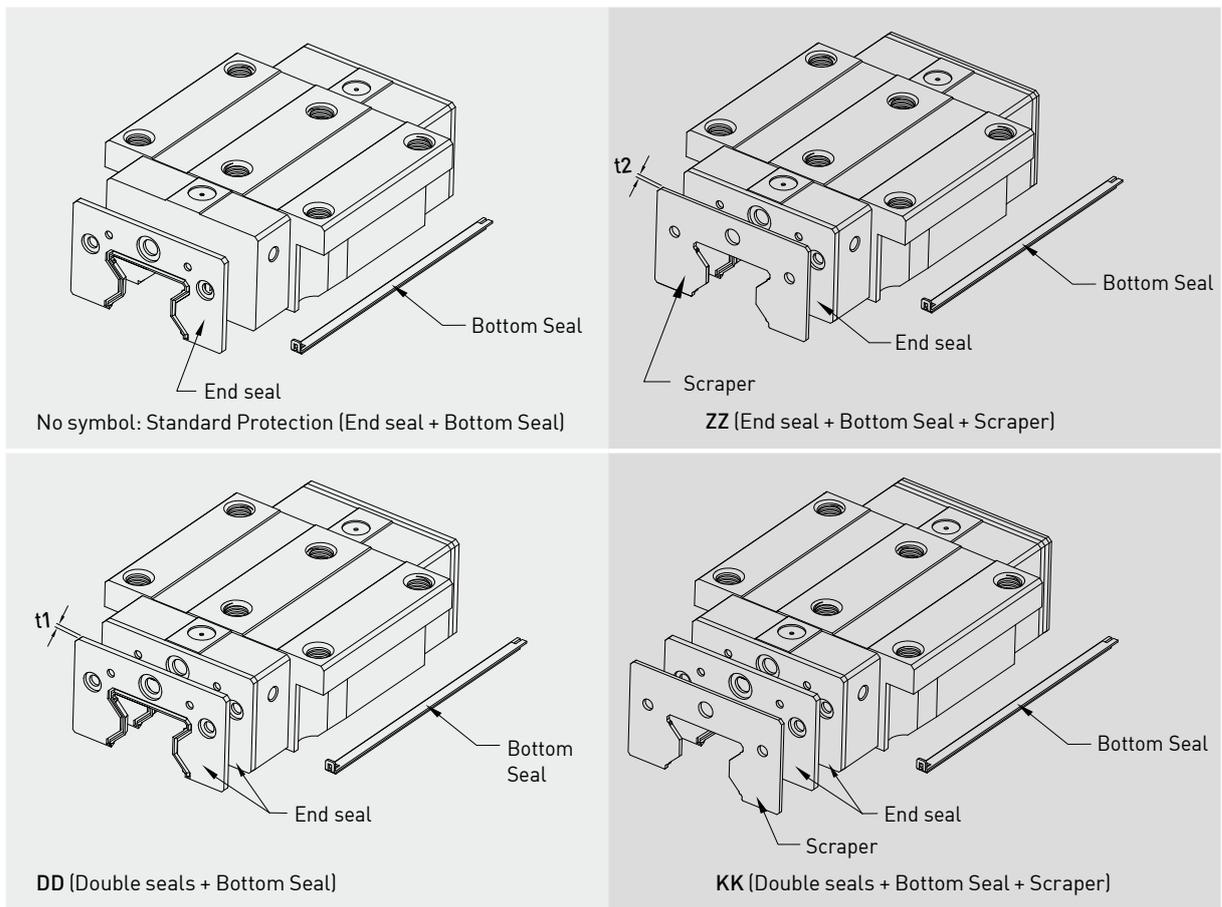


## 2-11-8 Dust Proof Accessories

### (1) Codes of accessories

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

Table 2-11-14



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#### (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 2-11-15 Dimensions of end seal

| Size    | Thickness (t1)<br>(mm) | Size    | Thickness (t1)<br>(mm) |
|---------|------------------------|---------|------------------------|
| QR20 ES | 2.2                    | QR35 ES | 2.5                    |
| QR25 ES | 2.2                    | QR45 ES | 3.6                    |
| QR30 ES | 2.4                    |         |                        |

#### (4) Scraper

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

Table 2-11-16 Dimensions of scraper

| Size    | Thickness (t2)<br>(mm) | Size    | Thickness (t2)<br>(mm) |
|---------|------------------------|---------|------------------------|
| QR20 SC | 1.0                    | QR35 SC | 1.5                    |
| QR25 SC | 1.0                    | QR45 SC | 1.5                    |
| QR30 SC | 1.5                    |         |                        |

#### (5) Dimensions of block equipped with the dustproof parts

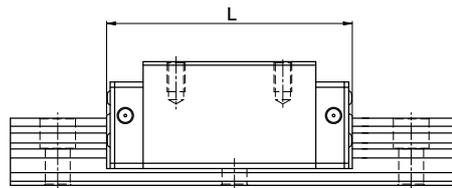


Table 2-11-17 Overall block length

unit: mm

| Size  | Overall block length (L) |               |               |               |
|-------|--------------------------|---------------|---------------|---------------|
|       | SS                       | ZZ            | DD            | KK            |
| QR20C | 86.0 (88.0)              | 88.0 (92.4)   | 90.4 (92.4)   | 92.4 (96.8)   |
| QR25C | 97.7 (101.5)             | 99.9 (105.9)  | 102.3 (105.9) | 104.3 (110.3) |
| QR25H | 112.9 (116.5)            | 114.9 (120.9) | 117.3 (120.9) | 119.3 (125.3) |
| QR30C | 109.8 (113.4)            | 112.8 (118.8) | 114.6 (118.2) | 117.6 (123.6) |
| QR30H | 131.8 (135.4)            | 134.8 (140.8) | 136.6 (140.2) | 139.6 (145.6) |
| QR35C | 124.0 (129.4)            | 127.0 (135.0) | 129.0 (134.4) | 132.0 (140.0) |
| QR35H | 151.5 (156.9)            | 154.5 (162.5) | 156.5 (161.9) | 159.5 (167.5) |
| QR45C | 153.2 (156.4)            | 156.2 (164.2) | 160.4 (163.6) | 163.4 (171.4) |
| QR45H | 187.0 (190.2)            | 190.0 (198.0) | 194.2 (197.4) | 197.2 (205.2) |

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

## 2-11-9 Friction

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

Table 2-11-18 Seal Resistance

| Size     | Resistance N (kgf) | Size     | Resistance N (kgf) |
|----------|--------------------|----------|--------------------|
| QR 20 ES | 2.45 [0.25]        | QR 35 ES | 3.53 [0.36]        |
| QR 25 ES | 2.74 [0.28]        | QR 45 ES | 4.21 [0.43]        |
| QR 30 ES | 3.31 [0.31]        |          |                    |

## 2-11-10 The Accuracy Tolerance of Mounting Surface

### (1) The accuracy tolerance of rail-mounting surface

As long as the accuracy requirements of the mounting surfaces shown in the following tables are met, the high accuracy, high rigidity and long life of the QR series linear guideway will be maintained without any difficulty.

- The parallelism tolerance of reference surface (P)

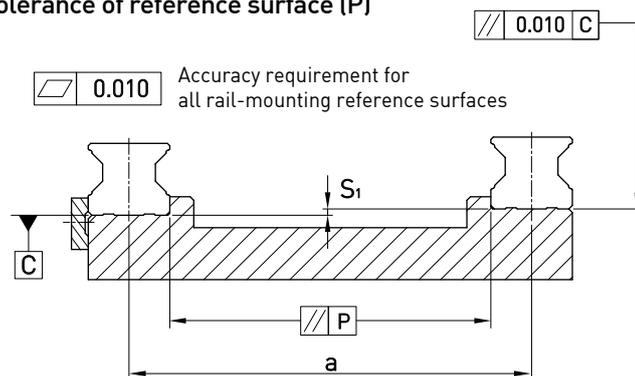


Table 2-11-19 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes    |                     |                    |
|------|--------------------|---------------------|--------------------|
|      | Light Preload (Z0) | Medium Preload (ZA) | Heavy Preload (ZB) |
| QR20 | 8                  | 6                   | 4                  |
| QR25 | 9                  | 7                   | 5                  |
| QR30 | 11                 | 8                   | 6                  |
| QR35 | 14                 | 10                  | 7                  |
| QR45 | 17                 | 13                  | 9                  |

- The accuracy tolerance of reference surface height ( $S_1$ )

$$S_1 = a \times K$$

$S_1$  : Max. tolerance of height

$a$  : Distance between paired rails

$K$  : Coefficient of tolerance of height

Table 2-11-20 Coefficient of tolerance of height

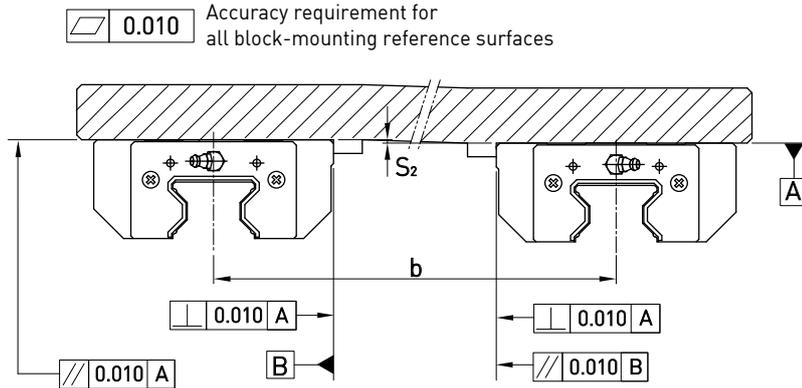
| Size | Preload classes      |                      |                      |
|------|----------------------|----------------------|----------------------|
|      | Light Preload (Z0)   | Medium Preload (ZA)  | Heavy Preload (ZB)   |
| K    | $2.2 \times 10^{-4}$ | $1.7 \times 10^{-4}$ | $1.2 \times 10^{-4}$ |

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#### (2) The accuracy tolerance of block-mounting surface

- The tolerance of the height of reference surface when two or more pieces are used in parallel ( $S_2$ )

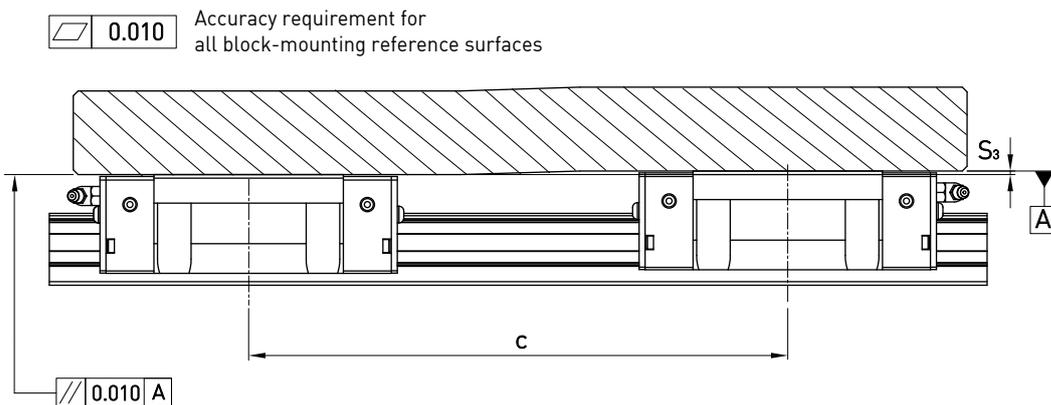


$$S_2 = b \times 4.2 \times 10^{-5}$$

$S_2$  : Max. tolerance of height

$b$  : Distance between paired blocks

- The tolerance of the height of reference surface when two or more pieces are used in parallel ( $S_3$ )



$$S_3 = c \times 4.2 \times 10^{-5}$$

$S_3$  : Max. tolerance of height

$c$  : Distance between paired blocks

## 2-11-11 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

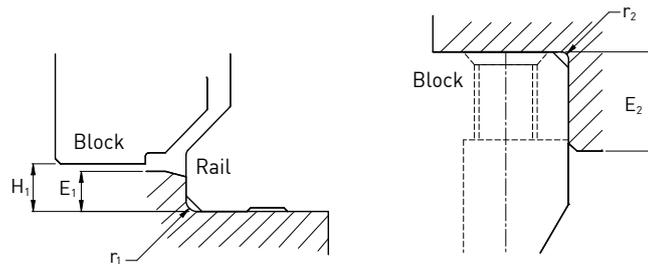


Table 2-11-21

| Size | Max. radius of fillets<br>$r_1$ (mm) | Max. radius of fillets<br>$r_2$ (mm) | Shoulder height beside the rail<br>$E_1$ (mm) | Shoulder height beside the block<br>$E_2$ (mm) | Clearance under block<br>$H_1$ (mm) |
|------|--------------------------------------|--------------------------------------|---|--|-------------------------------------|
| QR20 | 0.5                                  | 0.5                                  | 3.5   | 5  | 5                                   |
| QR25 | 1.0                                  | 1.0                                  | 5   | 5  | 5.5                                 |
| QR30 | 1.0                                  | 1.0                                  | 5   | 5  | 6                                   |
| QR35 | 1.0                                  | 1.0                                  | 6   | 6  | 6.5                                 |
| QR45 | 1.0                                  | 1.0                                  | 7   | 8  | 8                                   |

### (2) Tightening Torque of Mounting Bolts

Improper tightening of mounting bolts will seriously influence the accuracy of a linear guideway. The following tightening torque for the different sizes of bolt is recommended.

Table 2-11-22

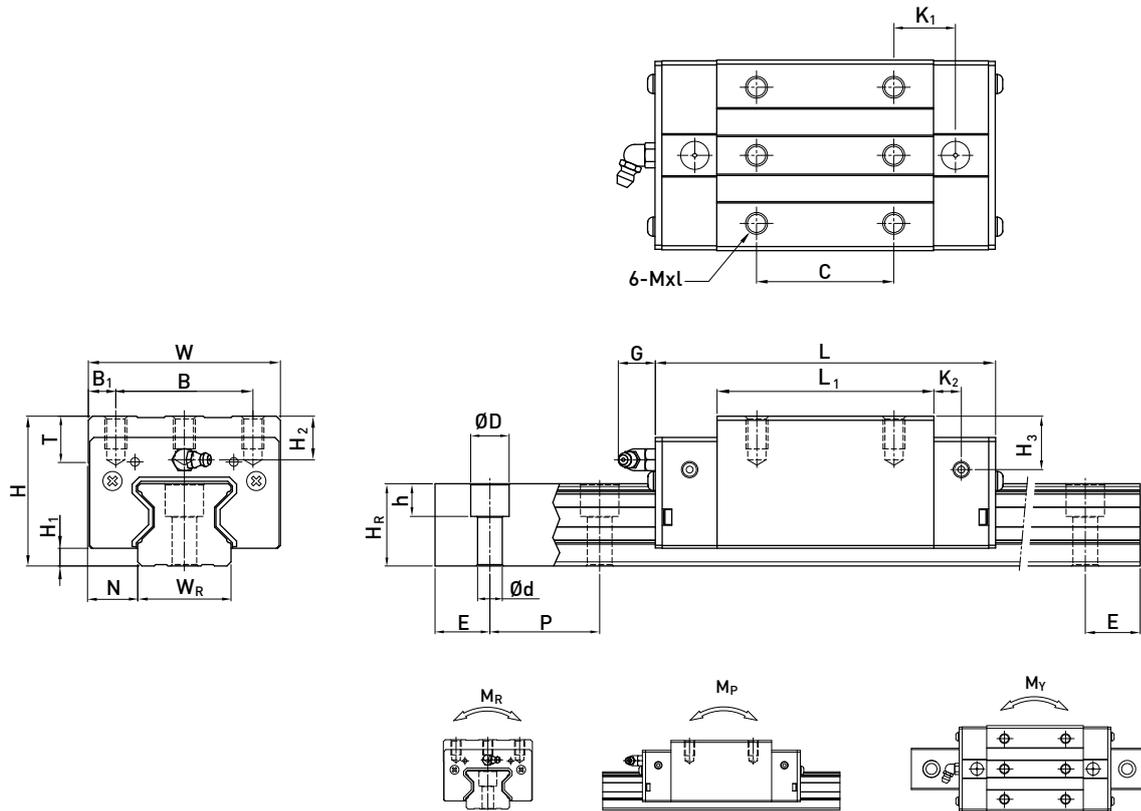
| Size | Bolt size     | Torque N-cm(kgf-cm) |            |            |
|------|---------------|---------------------|------------|------------|
|      |               | Iron                | Casting    | Aluminum   |
| QR20 | M5×0.8P×20L   | 883 (90)            | 588 (60)   | 441 (45)   |
| QR25 | M6×1P×20L     | 1373 (140)          | 921 (94)   | 686 (70)   |
| QR30 | M8×1.25P×25L  | 3041 (310)          | 2010 (205) | 1470 (150) |
| QR35 | M8×1.25P×25L  | 3041 (310)          | 2010 (205) | 1470 (150) |
| QR45 | M12×1.75P×35L | 11772 (1200)        | 7840 (800) | 5880 (600) |

# QR Series

## Roller Type

### 2-11-12 Dimensions for QR series

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

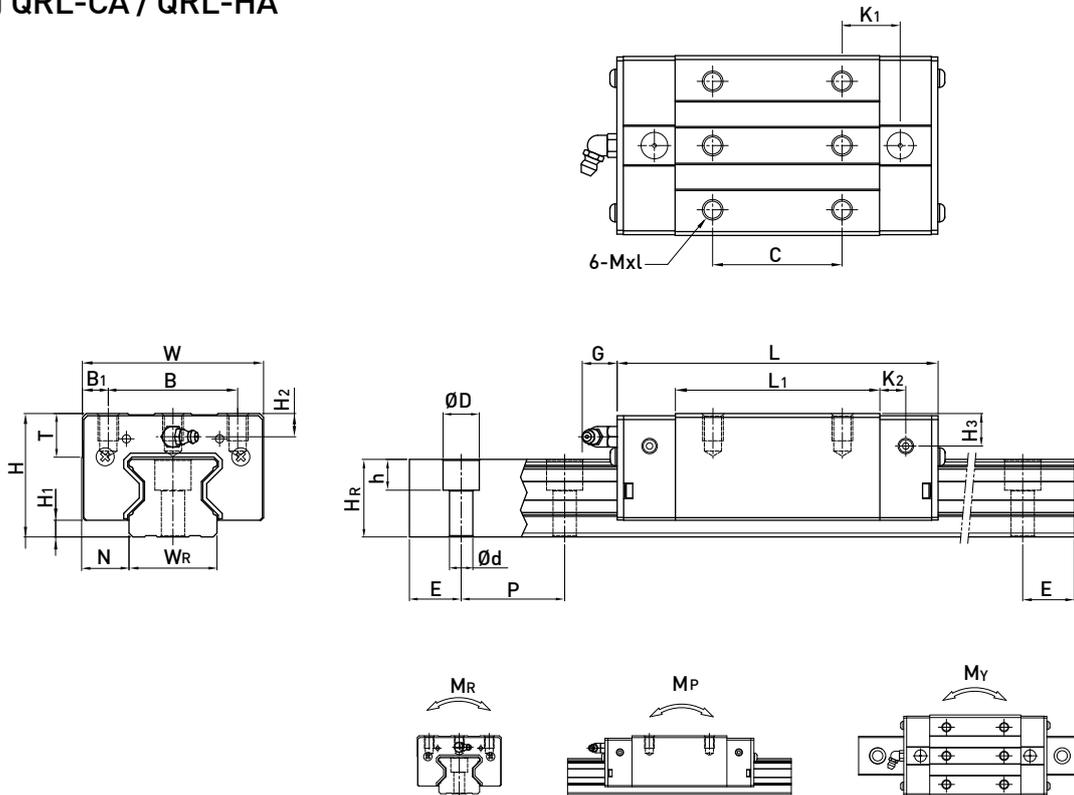


| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |    |                |    |                |       |                |                |      |          |     |                |                |                | Dimensions of Rail (mm) |     |     |    | Mounting Bolt for Rail (mm) | Basic Dynamic Load Rating C (kN) | Basic Static Load Rating C <sub>0</sub> (kN) | Static Rated Moment |       |                | Weight         |                |       |      |
|-----------|-----------------------------|----------------|------|--------------------------|----|----------------|----|----------------|-------|----------------|----------------|------|----------|-----|----------------|----------------|----------------|-------------------------|-----|-----|----|-----------------------------|----------------------------------|--|---------------------|-------|----------------|----------------|----------------|-------|------|
|           | 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    | Mxl      | T   | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub>          | D   | h   | d  |                             |                                  |  | P                   | E     | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail |
|           | kgf                         | mm             | mm   | mm                       | mm | mm             | mm | mm             | mm    | mm             | mm             | mm   | mm       | mm  | mm             | mm             | mm             | mm                      | mm  | mm  | mm |                             |                                  |  | mm                  | mm    | mm             | kN-m           | kN-m           | kN-m  | kg   |
| QRH20CA   | 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 x 20                                      | 26.3                | 38.9  | 0.591          | 0.453          | 0.453          | 0.40  | 2.76 |
| QRH25CA   | 40                          | 5.5            | 12.5 | 48                       | 35 | 6.5            | 35 | 66             | 97.9  | 20.75          | 7.25           | 12   | M6 x 8   | 9.5 | 10.2           | 10             | 23             | 23.6                    | 11  | 9   | 7  | 30                          | 20                               | M6 x 20                                      | 38.5                | 54.4  | 0.722          | 0.627          | 0.627          | 0.60  | 3.08 |
| QRH25HA   |                             |                |      |                          |    |                | 50 | 81             | 112.9 | 21.5           |                |      |          |     |                |                | 23             | 23.6                    | 11  | 9   | 7  | 30                          | 20                               | M6 x 20                                      | 44.7                | 65.3  | 0.867          | 0.907          | 0.907          | 0.74  | 3.08 |
| QRH30CA   | 45                          | 6              | 16   | 60                       | 40 | 10             | 40 | 71             | 109.8 | 23.5           | 8              | 12   | M8 x 10  | 9.5 | 9.5            | 10.3           | 28             | 28                      | 14  | 12  | 9  | 40                          | 20                               | M8 x 25                                      | 51.5                | 73.0  | 1.284          | 0.945          | 0.945          | 0.89  | 4.41 |
| QRH30HA   |                             |                |      |                          |    |                | 60 | 93             | 131.8 | 24.5           |                |      |          |     |                |                | 28             | 28                      | 14  | 12  | 9  | 40                          | 20                               | M8 x 25                                      | 64.7                | 95.8  | 1.685          | 1.63           | 1.63           | 1.15  | 4.41 |
| QRH35CA   | 55                          | 6.5            | 18   | 70                       | 50 | 10             | 50 | 79             | 124   | 22.5           | 10             | 12   | M8 x 12  | 12  | 16             | 19.6           | 34             | 30.2                    | 14  | 12  | 9  | 40                          | 20                               | M8 x 25                                      | 77.0                | 94.7  | 1.955          | 1.331          | 1.331          | 1.56  | 6.06 |
| QRH35HA   |                             |                |      |                          |    |                | 72 | 106.5          | 151.5 | 25.25          |                |      |          |     |                |                | 34             | 30.2                    | 14  | 12  | 9  | 40                          | 20                               | M8 x 25                                      | 95.7                | 126.3 | 2.606          | 2.335          | 2.335          | 2.04  | 6.06 |
| QRH45CA   | 70                          | 8              | 20.5 | 86                       | 60 | 13             | 60 | 106            | 153.2 | 31             | 10             | 12.9 | M10 x 17 | 16  | 20             | 24             | 45             | 38                      | 20  | 17  | 14 | 52.5                        | 22.5                             | M12 x 35                                     | 123.2               | 156.4 | 3.959          | 2.666          | 2.666          | 3.16  | 9.97 |
| QRH45HA   |                             |                |      |                          |    |                | 80 | 139.8          | 187   | 37.9           |                |      |          |     |                |                | 45             | 38                      | 20  | 17  | 14 | 52.5                        | 22.5                             | M12 x 35                                     | 150.8               | 208.6 | 5.278          | 4.694          | 4.694          | 4.10  | 9.97 |

Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

(2) QRL-CA / QRL-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 C <sub>0</sub> (kN) | Static Rated Moment |        |       | Weight |                |                |                |       |      |
|-----------|-----------------------------|----------------|------|--------------------------|------|----------------|------|----------------|-------|----------------|----------------|------|--------|-------------------------|----------------|----------------|----------------|----------------|-----|-----------------------------|----------------------------------|--|---------------------|--------|-------|--------|----------------|----------------|----------------|-------|------|
|           | 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    | Mxl    | T                       | H <sub>2</sub> | H <sub>3</sub> | W <sub>R</sub> | H <sub>R</sub> | D   |                             |                                  |  | h                   | d      | P     | E      | M <sub>R</sub> | M <sub>P</sub> | M <sub>Y</sub> | Block | Rail |
|           | kg                          | kg/m           | kN-m | kN-m                     | kN-m | kg             | kg/m |                |       |                |                |      |        |                         |                |                |                |                |     |                             |                                  |  |                     |        |       |        |                |                |                |       |      |
| QRL20CA   | 30                          | 5              | 12   | 44                       | 32   | 6              | 36   | 57.5           | 86    | 15.8           | 6              | 5.3  | M5x6   | 8                       | 4.3            | 4.3            | 20             | 21             | 9.5 | 8.5                         | 6                                | 30   | 20                  | M5x20  | 26.3  | 38.9   | 0.591          | 0.453          | 0.453          | 0.32  | 2.76 |
| QRL25CA   | 36                          | 5.5            | 12.5 | 48                       | 35   | 6.5            | 35   | 66             | 97.9  | 20.75          | 7.25           | 12   | M6x8   | 9.5                     | 6.2            | 6              | 23             | 23.6           | 11  | 9                           | 7                                | 30   | 20                  | M6x20  | 38.5  | 54.4   | 0.722          | 0.627          | 0.627          | 0.50  | 3.08 |
| QRL25HA   |                             |                |      |                          |      |                | 50   | 81             | 112.9 | 21.5           |                |      |        |                         |                |                |                |                |     |                             |                                  |  |                     | M6x20  | 44.7  | 65.3   | 0.867          | 0.907          | 0.907          | 0.62  |      |
| QRL30CA   | 42                          | 6              | 16   | 60                       | 40   | 10             | 40   | 71             | 109.8 | 23.5           | 8              | 12   | M8x10  | 9.5                     | 6.5            | 7.3            | 28             | 28             | 14  | 12                          | 9                                | 40   | 20                  | M8x25  | 51.5  | 73.0   | 1.284          | 0.945          | 0.945          | 0.79  | 4.41 |
| QRL30HA   |                             |                |      |                          |      |                | 60   | 93             | 131.8 | 24.5           |                |      |        |                         |                |                |                |                |     |                             |                                  |  |                     | M8x25  | 64.7  | 95.8   | 1.685          | 1.63           | 1.63           | 1.02  |      |
| QRL35CA   | 48                          | 6.5            | 18   | 70                       | 50   | 10             | 50   | 79             | 124   | 22.5           | 10             | 12   | M8x12  | 12                      | 9              | 12.6           | 34             | 30.2           | 14  | 12                          | 9                                | 40   | 20                  | M8x25  | 77.0  | 94.7   | 1.955          | 1.331          | 1.331          | 1.26  | 6.06 |
| QRL35HA   |                             |                |      |                          |      |                | 72   | 106.5          | 151.5 | 25.25          |                |      |        |                         |                |                |                |                |     |                             |                                  |  |                     | M8x25  | 95.7  | 126.3  | 2.606          | 2.335          | 2.335          | 1.63  |      |
| QRL45CA   | 60                          | 8              | 20.5 | 86                       | 60   | 13             | 60   | 106            | 153.2 | 31             | 10             | 12.9 | M10x17 | 16                      | 10             | 14             | 45             | 38             | 20  | 17                          | 14                               | 52.5   | 22.5                | M12x35 | 123.2 | 156.4  | 3.959          | 2.666          | 2.666          | 2.45  | 9.97 |
| QRL45HA   |                             |                |      |                          |      |                | 80   | 139.8          | 187   | 37.9           |                |      |        |                         |                |                |                |                |     |                             |                                  |  |                     | M12x35 | 150.8 | 208.6  | 5.278          | 4.694          | 4.694          | 3.17  |      |

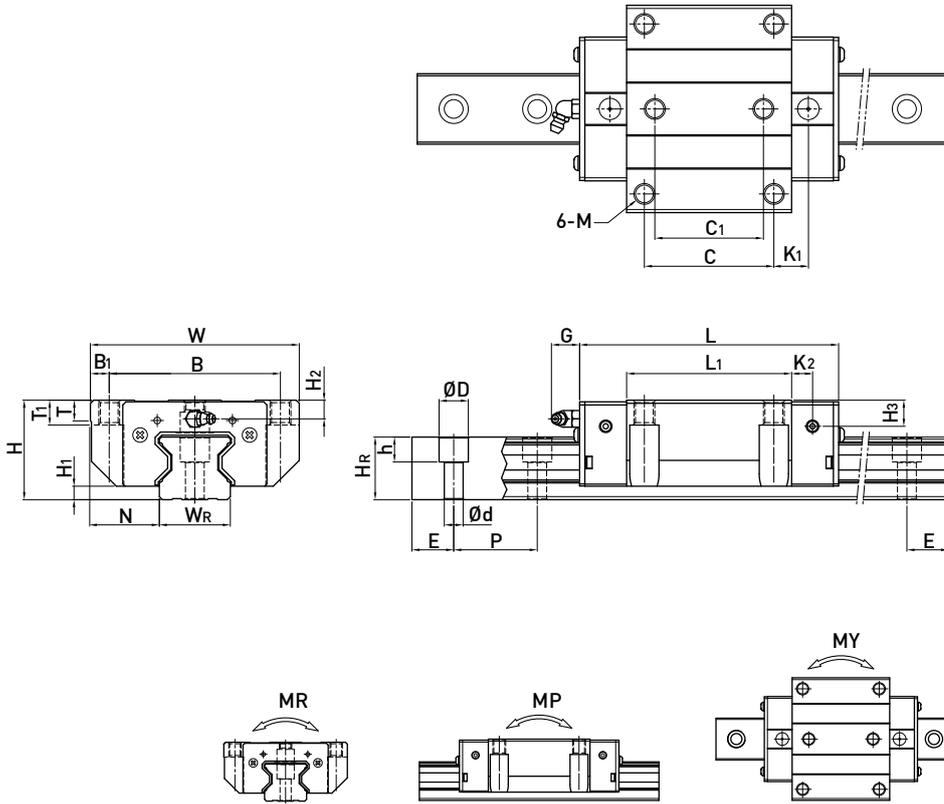
Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

# QR Series

## Roller Type

### (3) QRW-CC / QRW-HC



| 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 C <sub>0</sub> (kN) | 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    | M <sub>R</sub> |                             |                                  |  | M <sub>P</sub>      | M <sub>Y</sub> | Block kg | Rail kg/m |  |
|           |                             |                |      |                          |     |                |    |                |                |       |                |                |      |     |     |                |                         |                |                |                |     |     |    |      |      |                |                             |                                  |  |                     |                |          |           |  |
| QRW20CC   | 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          | 26.3                        | 38.9                             | 0.591  | 0.453               | 0.453          | 0.47     | 2.76      |  |
| QRW25CC   | 36                          | 5.5            | 23.5 | 70                       | 57  | 6.5            | 45 | 40             | 66             | 97.9  | 15.75          | 7.25           | 12   | M8  | 9.5 | 10             | 6.2                     | 6              | 23             | 23.6           | 11  | 9   | 7  | 30   | 20   | M6x20          | 38.5                        | 54.4                             | 0.722  | 0.627               | 0.627          | 0.71     | 3.08      |  |
| QRW25HC   |                             |                |      |                          |     |                |    |                | 81             | 112.9 | 24             |                |      |     |     |                |                         |                |                |                |     |     |    |      |      |                |                             |                                  |  |                     |                |          |           |  |
| QRW30CC   |                             |                |      |                          |     |                |    |                | 71             | 109.8 | 17.5           |                |      |     |     |                |                         |                |                |                |     |     |    |      |      |                |                             |                                  |  |                     |                |          |           |  |
| QRW30HC   | 42                          | 6              | 31   | 90                       | 72  | 9              | 52 | 44             | 93             | 131.8 | 28.5           | 8              | 12   | M10 | 9.5 | 10             | 6.5                     | 7.3            | 28             | 28             | 14  | 12  | 9  | 40   | 20   | M8x25          | 64.7                        | 95.8                             | 1.685  | 1.63                | 1.63           | 1.51     | 4.41      |  |
| QRW35CC   |                             |                |      |                          |     |                |    |                | 79             | 124   | 16.5           |                |      |     |     |                |                         |                |                |                |     |     |    |      |      |                |                             |                                  |  |                     |                |          |           |  |
| QRW35HC   | 48                          | 6.5            | 33   | 100                      | 82  | 9              | 62 | 52             | 106.5          | 151.5 | 30.25          | 10             | 12   | M10 | 12  | 13             | 9                       | 12.6           | 34             | 30.2           | 14  | 12  | 9  | 40   | 20   | M8x25          | 77.0                        | 94.7                             | 1.955  | 1.331               | 1.331          | 1.74     | 6.06      |  |
| QRW45CC   |                             |                |      |                          |     |                |    |                | 106            | 153.2 | 21             |                |      |     |     |                |                         |                |                |                |     |     |    |      |      |                |                             |                                  |  |                     |                |          |           |  |
| QRW45HC   | 60                          | 8              | 37.5 | 120                      | 100 | 10             | 80 | 60             | 139.8          | 187   | 37.9           | 10             | 12.9 | M12 | 14  | 15             | 10                      | 14             | 45             | 38             | 20  | 17  | 14 | 52.5 | 22.5 | M12x35         | 123.2                       | 156.4                            | 3.959  | 2.666               | 2.666          | 3.41     | 9.97      |  |
|           |                             |                |      |                          |     |                |    |                |                |       |                |                |      |     |     |                |                         |                |                |                |     |     |    |      |      |                |                             |                                  |  |                     |                |          |           |  |

Note : 1. 1 kgf = 9.81 N

2. The theoretical dynamic rated load is C<sub>100R</sub>, if necessary C<sub>50R</sub> conversion formula is as follows : C<sub>50R</sub> = 1.23 x C<sub>100R</sub>

## 2-12 AG Series - Angle Linear Guideway

AG series angle linear guideway is designed with circular-arc groove and the same structure as HG series, and are ground with special procedure to make sure the X-Y translation is in high perpendicularity. The integrated design increases the stiffness by 50%, reduces weight and lowers the assembly height by 15%, which contributes to higher precision translation and achieves higher production quality.

### 2-12-1 Product Features

**(1) More compact design**

Eliminates fastener plate for saving equipment weight and increasing work space.

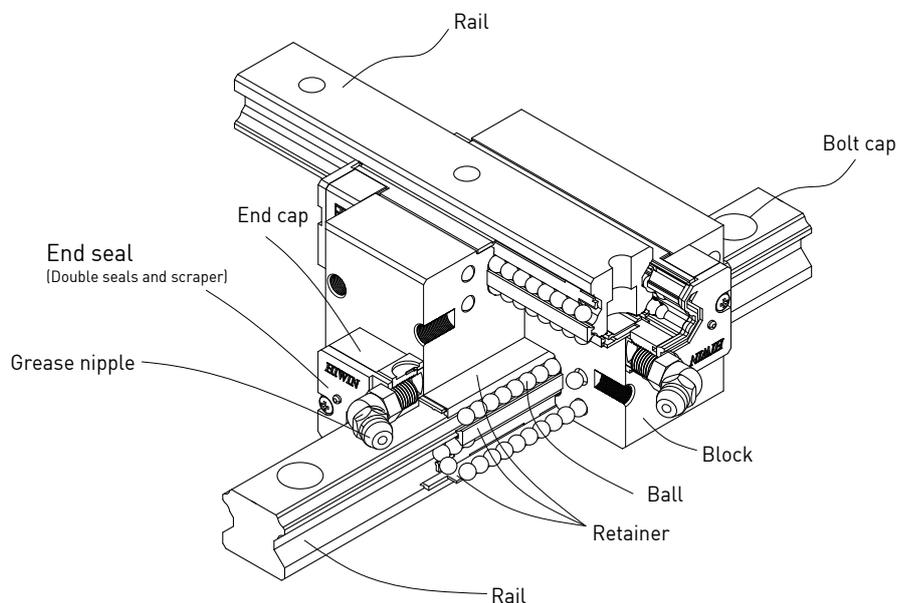
**(2) High positional accuracy**

Two rails are machined with high precision in relative straightness. Extremely high accuracy in verticality is achieved.

**(3) High torsional rigidity**

The rigidity of AG block is 50% higher than a combination of two HG blocks which secured back to back together.

### 2-12-2 Construction of AG 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

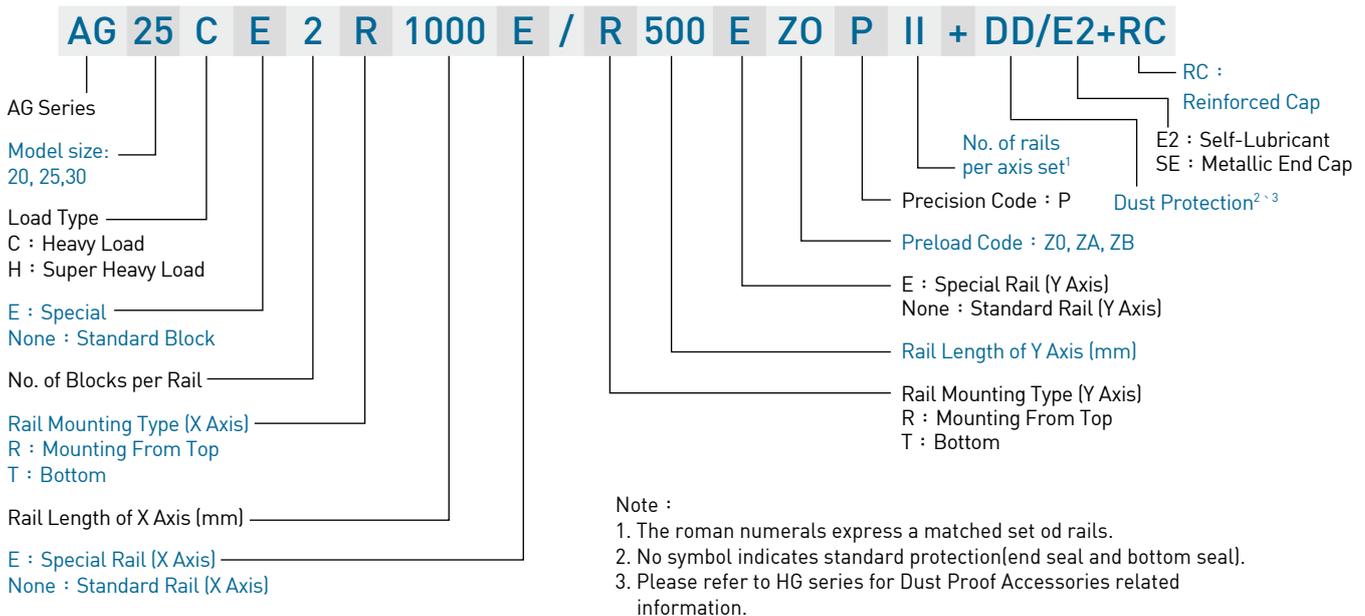
# AG Series

## Angle Linear Guideway

### 2-12-3 Model Number of AG Series

The AG series linear guideway only has non-interchangeable type to ensure perpendicularity of two rails.  
If other accuracy grade is required, please contact HIWIN.  
The model number of AG series contains the size, type, accuracy and preload class, etc.

○ Non-interchangeable type



### 2-12-4 Types

#### (1) Block Types

HIWIN provides AG series linear guideway in cross and rectangular type, which has high accuracy in perpendicularity of two rails.

Table 2-12-1 Block Types

| Type   | Model | Shape | Height (mm) | Rail Length (mm) | Main Application  |
|--------|-------|-------|-------------|------------------|---|
| Square | AG-H  |       | 57          | 100              | <ul style="list-style-type: none"> <li>○ Sliding Head Lathe (Swiss lathe)</li> <li>○ Vibration Test Machine</li> <li>○ Automated Robot Dispenser</li> <li>○ XY moving platform</li> <li>○ Measuring instrument</li> <li>○ Vertical Lathe</li> <li>○ Slant Bed Lathes</li> </ul> |
|        |       |       | 82          | 1200             |   |
|        | AG-C  |       | 70          | 100              |   |
|        |       |       | 82          | 1200             |   |

## (2) Rail types

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

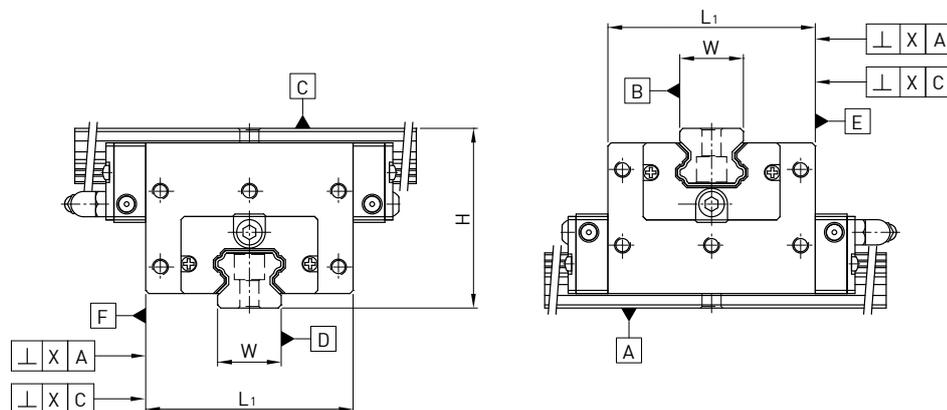
Table 2-12-2 Rail Types



Note: Please refer to the HG series for relevant rail dimensions.

## 2-12-5 Accuracy Classes

Accuracy of AG series linear guideway has only one accuracy grade to ensure the perpendicularity of two rails. If other accuracy grade is required, please contact HIWIN.



## (1) Accuracy of non-interchangeable guideways

Table 2-12-3 Accuracy Standards

Unit: mm

| Item   | AG20                   | AG25                   | AG30                  |
|--|------------------------|------------------------|-----------------------|
| Accuracy Classes   | Precision (P)          | Precision (P)          | Precision (P)         |
| Pair variation of height H                               | 0.01                   | 0.01                   | 0.01                  |
| Perpendicularity of rail surface B to rail surface D     | 0.005 / Block length*1 | 0.008 / Block length*1 | 0.01 / Block length*1 |
| Running parallelism of rail surface C to rail surface A  | See Table 2-12-4       |                        |                       |
| Running parallelism of rail surface A to rail surface C  | See Table 2-12-4       |                        |                       |
| Running parallelism of block surface F to rail surface D | See Table 2-12-4       |                        |                       |
| Running parallelism of block surface E to rail surface B | See Table 2-12-4       |                        |                       |

Note: \*1

| Size  | Block length (mm) |
|-------|-------------------|
| AG20H | 65.2              |
| AG25C | 58                |
| AG25H | 78.6              |
| AG30C | 70                |
| AG30H | 93                |

# AG Series

## Angle Linear Guideway

### (2) Accuracy of running parallelism

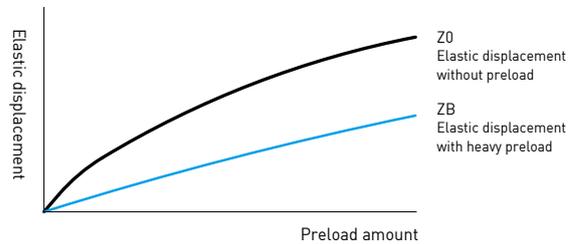
Table 2-12-4 Accuracy of Running Parallelism

| Rail Length (mm) | Accuracy (μm)<br>P | Rail Length (mm) | Accuracy (μm)<br>P |
|------------------|--------------------|------------------|--------------------|
| ~ 100            | 2                  | 500 ~ 700        | 4                  |
| 100 ~ 200        | 2                  | 700 ~ 900        | 5                  |
| 200 ~ 300        | 3                  | 900 ~ 1,100      | 6                  |
| 300 ~ 500        | 3                  | 1,100 ~ 1,200    | 7                  |

### 2-12-6 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.



#### (2) Preload classes

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

Table 2-12-5 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 |

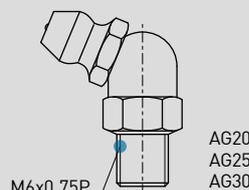
| Class           | Non-Interchangeable Guideway |
|-----------------|------------------------------|
| Preload classes | Z0, ZA, ZB                   |

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

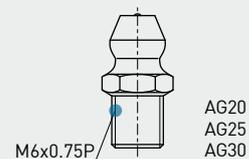
### 2-12-7 Lubrication

#### (1) Grease

##### ○ Grease nipple



NO.34320001



NO.34310003(OPTION)

○ Mounting location

The standard location of the grease fitting is at both ends of the block, 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.

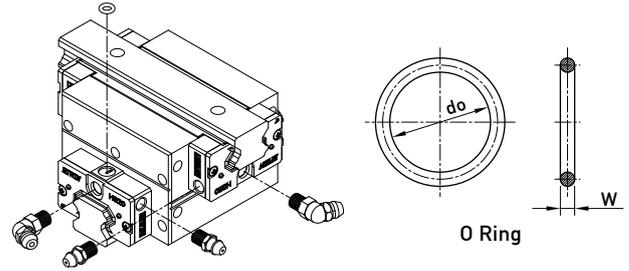
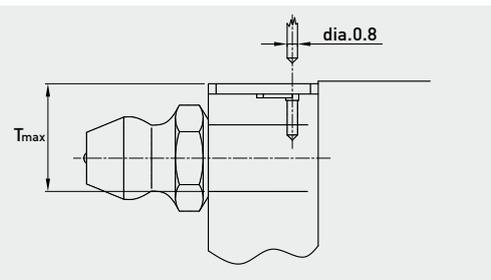


Table 2-12-6 O-Ring size and max. permissible depth for piercing

| Size  | O-Ring   |          | Lube hole at top: max. permissible depth for piercing |
|-------|----------|----------|---|
|       | do (mm)  | W (mm)   | T <sub>max</sub> (mm)                                 |
| AG 20 | 4.5±0.15 | 1.5±0.15 | 5.7   |
| AG 25 | 4.5±0.15 | 1.5±0.15 | 5.8   |
| AG 30 | 4.5±0.15 | 1.5±0.15 | 6.3   |



○ The lubricant amount for a block filled with grease

Table 2-12-7 The lubricant Amount for a Block Filled with Grease

| Size  | Heavy load [cm <sup>3</sup> ] | Super heavy load [cm <sup>3</sup> ] |
|-------|-------------------------------|-------------------------------------|
| AG 20 | 4                             | 6                                   |
| AG 25 | 10                            | 12                                  |
| AG 30 | 14                            | 16                                  |

○ Frequency of replenishment

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

(2) Oil

The recommended viscosity of oil is about 30~150cSt. If customers need to use oil-type lubrication, please inform us.

○ Types of oil piping joint

|   |   |
|---|---|
| <p>LF-76</p> <p>AG20<br/>AG25<br/>AG30</p> <p>NO.970002A1</p> | <p>SF-76</p> <p>AG20<br/>AG25<br/>AG30</p> <p>NO.970001A1</p> |
| <p>LF-86</p> <p>AG20<br/>AG25<br/>AG30</p> <p>NO.970004A1</p> | <p>SF-86</p> <p>AG20<br/>AG25<br/>AG30</p> <p>NO.970003A1</p> |

## AG Series

### Angle Linear Guideway

[3] Dimensions of block equipped with the parts

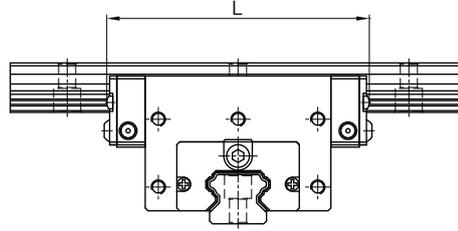


Table 2-12-8 Overall block length

unit: mm

| Size   | Overall block length (L) |               |               |               |               |               |
|--------|--------------------------|---------------|---------------|---------------|---------------|---------------|
|        | SS/SH                    | ZZ/ZH         | DD/DH         | KK/KH         | SW            | ZW            |
| *AG20H | 92.2 (94.0)              | 97.2 (99.2)   | 97.5 (99.0)   | 102.2 (104.2) | 93.2 (93.2)   | 101.0 (102.4) |
| *AG25C | 84.0 (85.0)              | 89.0 (91.0)   | 89.0 (90.0)   | 94.0 (96.0)   | 85.0 (85.0)   | 92.8 (94.8)   |
| *AG25H | 104.6 (105.6)            | 109.6 (111.6) | 109.6 (110.6) | 114.6 (116.6) | 105.6 (105.6) | 113.4 (115.4) |
| *AG30C | 97.4 (99.4)              | 105.4 (107.4) | 104.8 (106.8) | 112.8 (114.8) | 99.0 (100.4)  | 107.2 (109.2) |
| *AG30H | 120.4 (122.4)            | 128.4 (130.4) | 127.8 (129.8) | 135.8 (137.8) | 122.0 (123.4) | 130.2 (132.2) |

Note : 1. For the marking of “\*”, it means this specification is available for SH/ZH/DH/KH dust proof accessories.  
2. The marking of “[ ]” denotes the maximum block length with screws, lips of end seals, etc.

### 2-12-8 Friction

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

Table 2-12-9 Seal Resistance

| Size | Resistance N (kgf) |
|------|--------------------|
| AG20 | 2.75 (0.28)        |
| AG25 | 3.14 (0.32)        |
| AG30 | 3.53 (0.36)        |

Note: 1. 1kgf=9.81N  
2. Please inform HIWIN if low friction request is required.

### 2-12-9 The Accuracy Tolerance of Mounting Surface

Because of the circular-arc contact design, the AG 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. For fast installation and smooth movement, HIWIN offers the normal clearance type of preload to customers of its high absorption ability of the deviation in mounting surface accuracy.

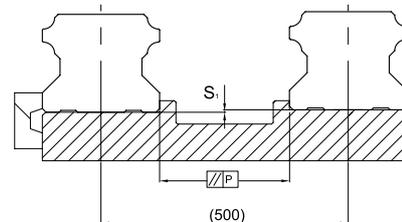


Table 2-12-10 Max. Parallelism Tolerance (P)

unit:  $\mu\text{m}$

| Size | Preload classes |    |    |
|------|-----------------|----|----|
|      | Z0              | ZA | ZB |
| AG20 | 25              | 20 | 18 |
| AG25 | 30              | 22 | 20 |
| AG30 | 40              | 30 | 27 |

Table 2-12-11 Max. Tolerance of Reference Surface Height ( $S_1$ )

unit:  $\mu\text{m}$

| Size | Preload classes |     |    |
|------|-----------------|-----|----|
|      | Z0              | ZA  | ZB |
| AG20 | 130             | 85  | 50 |
| AG25 | 130             | 85  | 70 |
| AG30 | 170             | 110 | 90 |

Note : Permissible value is proportional to the axial distance

## 2-12-10 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 rail or block. As long as the recommended shoulder heights and fillets are followed, installation inaccuracies should be eliminated.

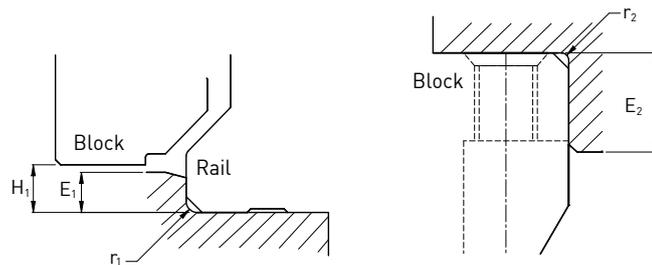


Table 2-12-12 Shoulder Heights and Fillets

| Size | Max. radius of fillets | Max. radius of fillets | Shoulder height beside the rail | Shoulder height beside the block | Clearance under block |
|------|------------------------|------------------------|---------------------------------|----------------------------------|-----------------------|
|      | $r_1$ (mm)             | $r_2$ (mm)             | $E_1$ (mm)                      | $E_2$ (mm)                       | $H_1$ (mm)            |
| AG20 | 0.5                    | 0.5                    | 3.5                             | 5.0                              | 4.6                   |
| AG25 | 1.0                    | 1.0                    | 5.0                             | 5.0                              | 5.5                   |
| AG30 | 1.0                    | 1.0                    | 5.0                             | 5.0                              | 6.0                   |

### (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 2-12-13 Mounting Torque

| Size  | Bolt size    | Torque N-cm (kgf-cm) |           |           |
|-------|--------------|----------------------|-----------|-----------|
|       |              | Iron                 | Casting   | Aluminum  |
| AG 20 | M5×0.8P×16L  | 883(90)              | 588(60)   | 441(45)   |
| AG 25 | M6×1P×20L    | 1373(140)            | 921(94)   | 686(70)   |
| AG 30 | M8×1.25P×25L | 3041(310)            | 2010(205) | 1470(150) |

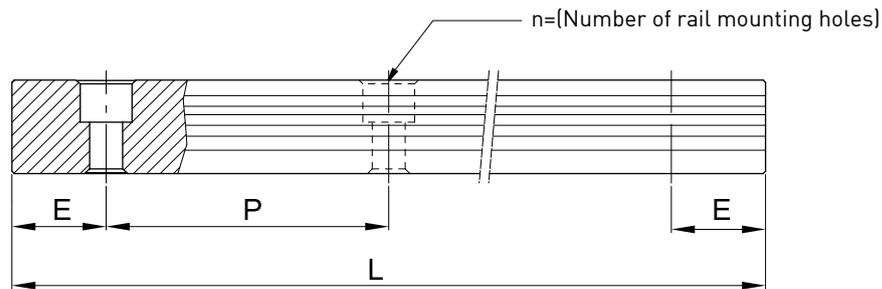
Note: 1 kgf=9.81 N

## AG Series

### Angle Linear Guideway

#### 2-12-11 Standard and Maximum Lengths of Rail

HIWIN offers standard rail lengths for customer needs. For non-standard E-values, the recommended dimension should no greater than 1/2 of the pitch (P) dimension. This will prevent an unstable rail end.



$$L = (n - 1) \times P + 2 \times E \quad \text{Eq.2.1}$$

L : Total length of rail (mm)

n : Number of mounting holes

P : Distance between any two holes (mm)

E : Distance from the center of the last hole to the edge (mm)

Table 2-12-14 Rail Standard Length and Max. Length

unit: mm

| Item                              | AG20      | AG25      | AG30      |
|-----------------------------------|-----------|-----------|-----------|
| Standard Length L(n)              | 220(4)    | 220(4)    | 280(4)    |
|                                   | 280(5)    | 280(5)    | 440(6)    |
|                                   | 340(6)    | 340(6)    | 600(8)    |
|                                   | 460(8)    | 460(8)    | 760(10)   |
|                                   | 640(11)   | 640(11)   | 1,000(13) |
|                                   | 820(14)   | 820(14)   |           |
|                                   | 1,000(17) | 1,000(17) |           |
| Pitch (P)                         | 60        | 60        | 80        |
| Distance to End (E <sub>s</sub> ) | 20        | 20        | 20        |
| Max. Standard Length              | 1,180(19) | 1,180(19) | 1,180(19) |
| Max. Length                       | 1,200     | 1,200     | 1,200     |

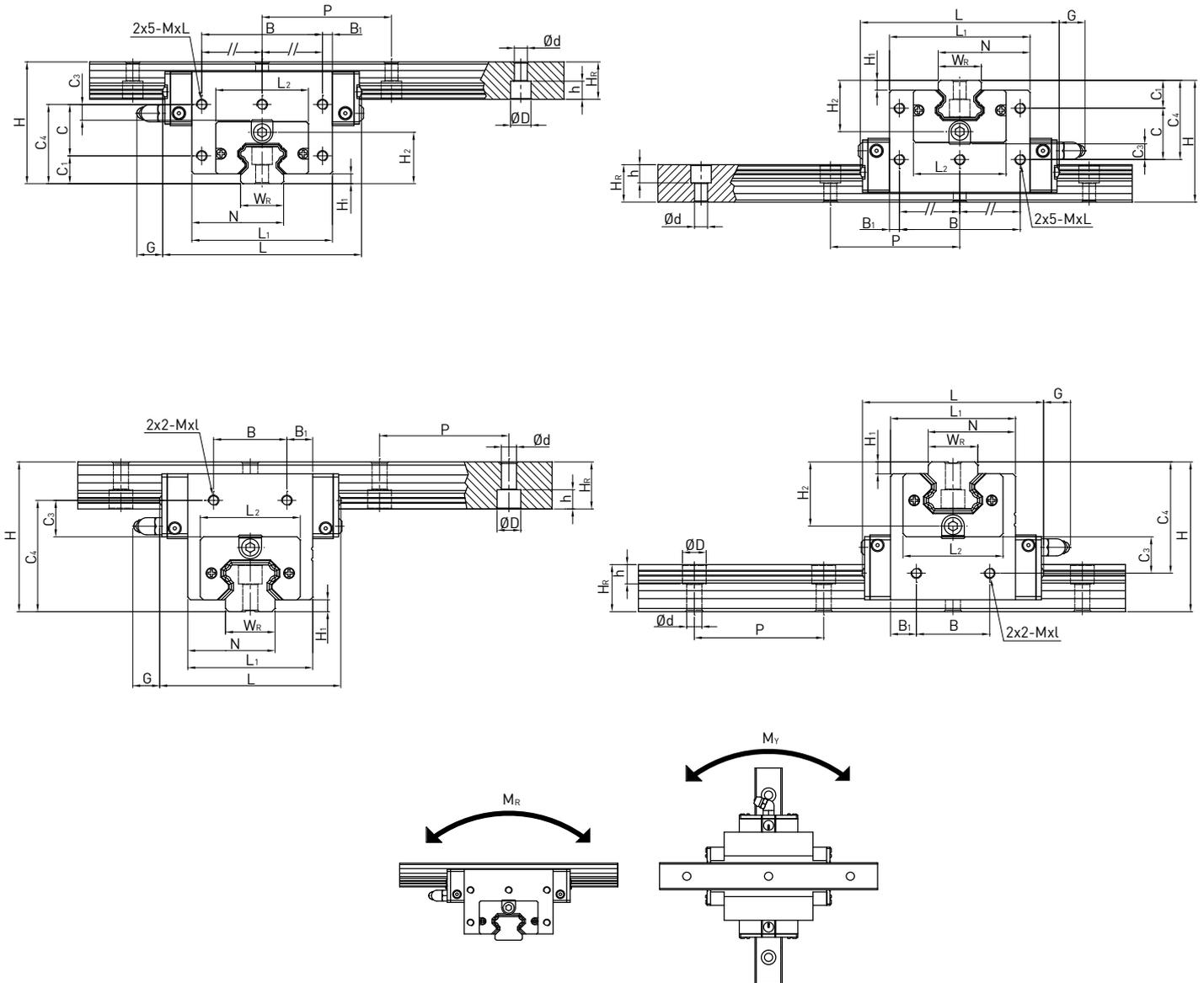
Note : 1. Tolerance of E value for standard rail is 0.5~0.5 mm. Tolerance of E value for jointed rail is 0~0.3 mm.

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.

4. AG20/25 of stainless steel is supplied with the maximum length of 1200mm.

### 2-12-12 Dimensions for AG Series



| Model No. | Dimensions of Assembly (mm) |                | Dimensions of Block (mm) |       |                |                |                |                |    |                |    |                |                |                |       | Dimensions of Rail (mm) |    |                |                |     |     | Basic Dynamic Load Rating | Basic Static Load Rating | Static Rated Moment |       |        |                     |
|-----------|-----------------------------|----------------|--------------------------|-------|----------------|----------------|----------------|----------------|----|----------------|----|----------------|----------------|----------------|-------|-------------------------|----|----------------|----------------|-----|-----|---------------------------|--------------------------|---------------------|-------|--------|---------------------|
|           | H                           | H <sub>1</sub> | N                        | L     | L <sub>1</sub> | L <sub>2</sub> | K <sub>1</sub> | K <sub>2</sub> | B  | B <sub>1</sub> | C  | C <sub>1</sub> | C <sub>3</sub> | C <sub>4</sub> | M x l | H <sub>2</sub>          | G  | W <sub>R</sub> | H <sub>R</sub> | D   | h   |                           |                          | d                   | P     | C [kN] | C <sub>0</sub> [kN] |
| AG20H     | 57                          | 4.6            | 42.6                     | 92.2  | 65.2           | 43             | 5              | 6              | 56 | 4.6            | 24 | 13             | 7.2            | 37             | M5x8  | 24                      | 12 | 20             | 17.5           | 9.5 | 8.5 | 6                         | 60                       | 32.7                | 47.96 | 0.35   | 0.35                |
| AG25C     | 70                          | 5.5            | 40.5                     | 84    | 58             | 46.4           | 4.2            | 6              | 34 | 12             | -  | -              | 16.2           | 52             | M6x10 | 30                      | 12 | 23             | 22             | 11  | 9   | 7                         | 60                       | 34.9                | 52.82 | 0.42   | 0.33                |
| AG25H     |                             |                | 50.8                     | 104.6 | 78.6           |                |                |                | 64 | 7.3            | 26 | 18             | 8.2            | 44             |       |                         |    |                |                |     |     |                           |                          | 42.2                | 69.07 | 0.56   | 0.57                |
| AG30C     | 82                          | 6              | 49                       | 97.4  | 70             | 58             | 5.25           | 6              | 40 | 15             | -  | -              | 19.2           | 61             | M6x10 | 58                      | 12 | 28             | 26             | 14  | 12  | 9                         | 80                       | 48.5                | 71.87 | 0.66   | 0.53                |
| AG30H     |                             |                | 60.5                     | 120.4 | 93             |                |                |                | 76 | 8.5            | 32 | 21             | 11.2           | 53             |       |                         |    |                |                |     |     |                           |                          | 58.6                | 93.99 | 0.88   | 0.92                |

Note: 1 kgf = 9.81 N

## E2 Type

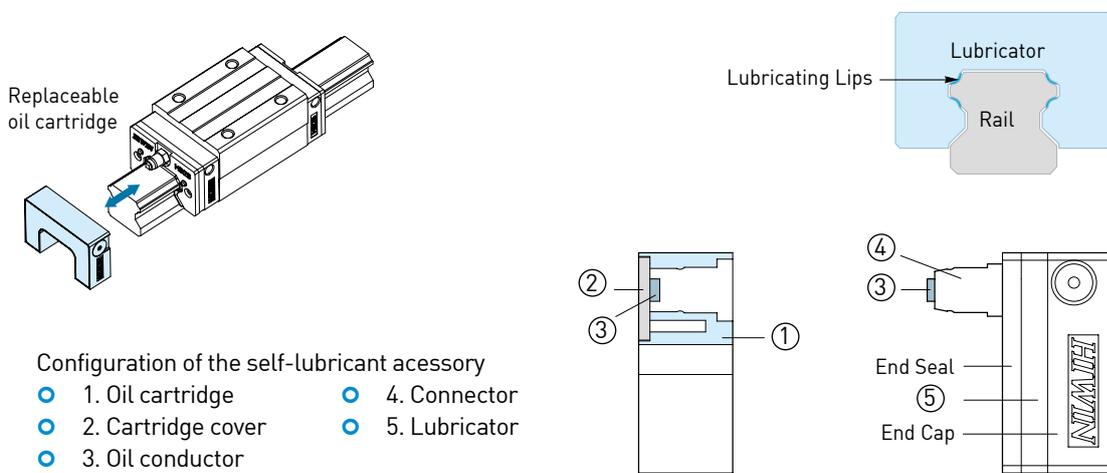
### Self Lubrication Kit

## 2-13 E2 Type - Self lubrication Kit for Linear Guideway

### 2-13-1 Construction of E2 Type

E2 self-lubricating linear guideway contains a lubricator between the end cap and end seal. Outside of the block is equipped with a replaceable oil cartridge, the configuration of which is listed below.

Lubrication oil flows from the replaceable oil cartridge to the lubricator and then lubricates grooves of rails. The Oil cartridge comprises a oil conductor with 3D structure that enables the lubricator to contact oil despite that blocks are placed at a random position , and thus the lubrication oil inside the oil cartridge can be used up via capillary action.



### 2-13-2 Feature of E2 Type

(1) Cost reduction: Save costs by reducing oil usage and maintenance.

Table 2-13-1

| Item  | Standard Block  | E2 (Self-lubricant) Block               |
|---|---|---|
| Lubricant device                            | \$ XXX  | -                                       |
| Design and installation of lubricant device | \$ XXX  | -                                       |
| Cost of oil purchase                        | 0.3cc / hr x 8hrs / day x 280 days / year x 5 year = 3360 cc x cost / cc = \$ XXX | 10 cc(5 years10000km) x cost/cc = \$ XX |
| Cost of refillin                            | 3-5hrs / time x 3-5times / year x 5year x cost / time = \$ XXX                    | -                                       |
| Waste oil disposal                          | 3-5 times / year x 5year x cost / time = \$ XXX                                   | -                                       |

(2) Clean and environmentally friendly: Optimized oil usage prevents leaking, making it the ideal solution for clean working environments.

(3) Long lasting and low maintenance: Self-lubricating block is maintenance free in most applications.

(4) No installation limitations: The linear guideway can be lubricated by E2 self-lubricating module irrespective of mounting directions.

(5) Easy to be assembled and disassembled: The cartridge can be added or removed from the block even when the guideway is installed on a machine.

(6) Different oils can be selected: The replaceable oil cartridge can be refilled with any approved lubrication oil depending on different requirements.

(7) Applications for special environments: Sealing grease into the block leads to better lubrication effects, especially in dusty, dirty, or wet environments.

### 2-13-3 Applications

- (1) Automation machinery
- (2) Manufacturing Machines : Injection molding machines, printing, paper making, textile machines, food processing machines, wood working machines, and so on.
- (3) Electronic Machinery : Semiconductor equipment, robotics, X-Y table, measuring and inspecting equipment.
- (4) Others : Medical equipment, transporting equipment, construction equipment.

### 2-13-4 Specification

- (1) Add "/ E2" after the specification of linear guideway  
Ex. HGW25CC2R1600ZAPII + ZZ / E2

### 2-13-5 Lubrication Capability

- (1) Life testing with light load

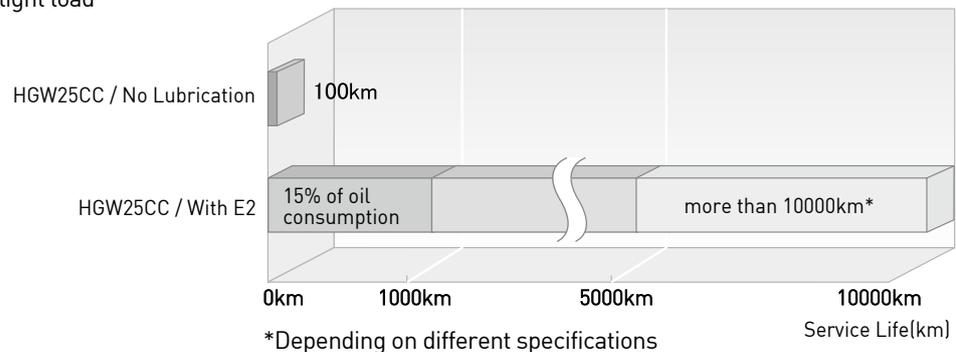


Table 2-13-2 Test condition

| Model No. | HGW25CC   |
|-----------|-----------|
| Speed     | 60m / min |
| Stroke    | 1500mm    |
| Load      | 500kgf    |

- (2) Characteristic of lubricating oil

The standard oil is a fully synthetic lubricant with a main constituent, synthetic hydrocarbons (PAO). The viscosity class of the oil is 680 (ISO VG680). Its characteristics are as follows.

- Compatible with lubrication grease of which the base oil is synthetic hydrocarbon oil, mineral oil or ester oil.
  - Synthetic oil with superb high temperature thermal/oxidation resistance.
  - High viscosity index to provide outstanding performance in service applications at extremely high and low temperatures.
  - Low traction coefficient to reduce power consumption.
  - Anti-corrosion and rust-proof.
- ★ Lubricants with the same viscosity class can also be used; however, their compatibility should be taken into consideration.

### 2-13-6 Temperature Range for Application

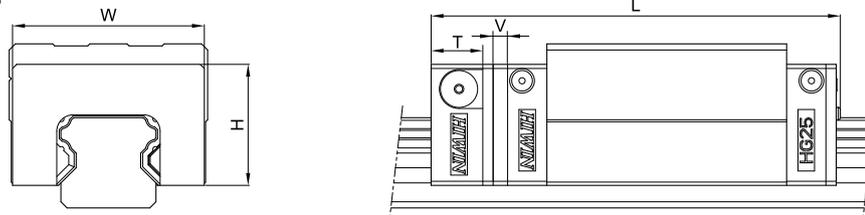
Not for high heat environments exceeding 50°C and lower than -10°C. Please contact with HIWIN for further discussion and information if the temperature is out of this range.

## E2 Type

### Self Lubrication Kit

#### 2-13-7 Dimension Table for E2 Type

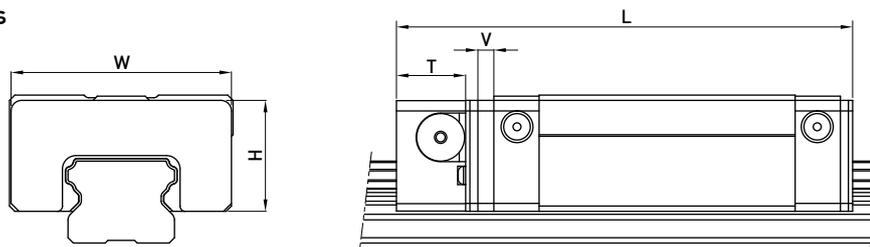
##### (1) HG Series



| Model No. | E2 self-lubricating module dimensions |      |      |     |               |               |               |               |
|-----------|---------------------------------------|------|------|-----|---------------|---------------|---------------|---------------|
|           | W                                     | H    | T    | V   | L             | SS            | ZZ            | DD            |
| HG15C     | 32.4                                  | 19.5 | 12.5 | 3.0 | 75.4 (75.6)   | 82.5 (82.7)   | 82.0 (82.2)   | 89.1 (89.3)   |
| HG20C     | 43.0                                  | 24.4 | 13.5 | 3.5 | 93.5 (94.4)   | 97.5 (98.5)   | 98.5 (99.4)   | 102.5 (103.5) |
| HG20H     |                                       |      |      |     | 108.2 (109.1) | 112.2 (113.2) | 113.2 (114.1) | 117.2 (118.2) |
| HG25C     | 46.4                                  | 29.5 | 13.5 | 3.5 | 100.0 (100.5) | 104.0 (105.0) | 105.0 (105.5) | 109.0 (110.0) |
| HG25H     |                                       |      |      |     | 120.6 (121.1) | 124.6 (125.6) | 125.6 (126.1) | 129.6 (130.6) |
| HG30C     | 58.0                                  | 35.0 | 13.5 | 3.5 | 112.9 (113.9) | 120.4 (121.4) | 120.3 (121.3) | 127.8 (128.8) |
| HG30H     |                                       |      |      |     | 135.9 (136.9) | 143.4 (144.4) | 143.3 (144.3) | 150.8 (151.8) |
| HG35C     | 68.0                                  | 38.5 | 13.5 | 3.5 | 127.9 (128.9) | 135.4 (136.4) | 135.3 (136.3) | 142.8 (143.8) |
| HG35H     |                                       |      |      |     | 153.7 (154.7) | 161.2 (162.2) | 161.1 (162.1) | 168.6 (169.6) |
| HG45C     | 82.0                                  | 49.0 | 16.0 | 4.5 | 157.2 (157.2) | 166.5 (166.5) | 167.2 (167.2) | 176.5 (176.5) |
| HG45H     |                                       |      |      |     | 189.0 (189.0) | 198.3 (198.3) | 199.0 (199.0) | 208.3 (208.3) |
| HG55C     | 97.0                                  | 55.5 | 16.0 | 4.5 | 183.9 (183.9) | 193.6 (193.6) | 194.3 (194.3) | 204.0 (204.0) |
| HG55H     |                                       |      |      |     | 222.0 (222.0) | 231.7 (231.7) | 232.4 (232.4) | 242.1 (242.1) |
| HG65C     | 121.0                                 | 69.0 | 16.0 | 4.5 | 219.2 (219.2) | 224.7 (224.7) | 228.2 (228.2) | 233.7 (233.7) |
| HG65H     |                                       |      |      |     | 278.6 (278.6) | 284.1 (284.1) | 287.6 (287.6) | 293.1 (293.1) |

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

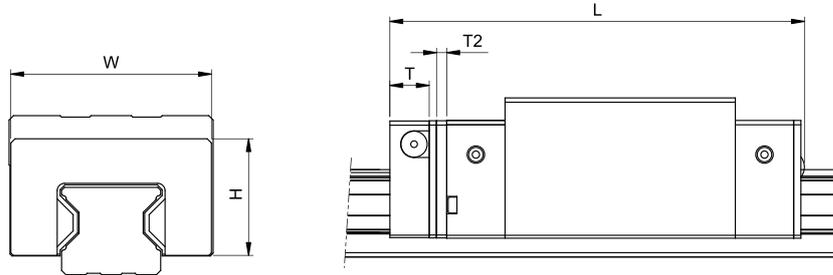
##### (2) EG Series



| Model No. | E2 self-lubricating module dimensions |      |      |     |               |               |               |               |
|-----------|---------------------------------------|------|------|-----|---------------|---------------|---------------|---------------|
|           | W                                     | H    | T    | V   | L             | SS            | ZZ            | DD            |
| EG15S     | 33.3                                  | 18.7 | 11.5 | 3.0 | 54.6 (55.8)   | 56.2 (58.4)   | 58.6 (59.8)   | 60.2 (62.4)   |
| EG15C     |                                       |      |      |     | 71.3 (72.5)   | 72.9 (75.1)   | 75.3 (76.5)   | 76.9 (79.1)   |
| EG20S     | 41.3                                  | 20.9 | 13.0 | 3.0 | 66.0 (68.0)   | 67.6 (70.6)   | 70.0 (72.0)   | 71.6 (74.6)   |
| EG20C     |                                       |      |      |     | 85.1 (87.1)   | 86.7 (89.7)   | 89.1 (91.1)   | 90.7 (93.7)   |
| EG25S     | 47.3                                  | 24.9 | 13.0 | 3.0 | 75.1 (77.1)   | 77.1 (80.1)   | 79.1 (81.1)   | 81.1 (84.1)   |
| EG25C     |                                       |      |      |     | 98.6 (100.6)  | 100.6 (103.6) | 102.6 (104.6) | 104.6 (107.6) |
| EG30S     | 59.3                                  | 31.0 | 13.0 | 3.0 | 85.5 (87.5)   | 87.5 (90.5)   | 89.5 (91.5)   | 91.5 (94.5)   |
| EG30C     |                                       |      |      |     | 114.1 (116.1) | 116.1 (119.1) | 118.1 (120.1) | 120.1 (123.1) |
| EG35S     | 68.0                                  | 33.5 | 13.0 | 3.0 | 91.0 (93.0)   | 94.0 (97.0)   | 95.0 (97.0)   | 98.0 (101.0)  |
| EG35C     |                                       |      |      |     | 124.0 (126.0) | 127.0 (130.0) | 128.0 (130.0) | 131.0 (134.0) |

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

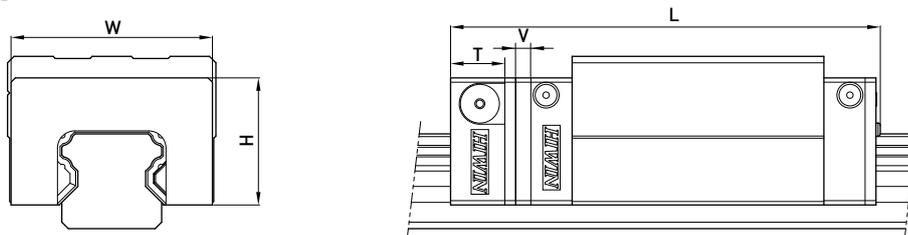
(3) RG Series



| Model No. | E2 self-lubricating module dimensions |      |      |     |               |               |               |               |    |
|-----------|---------------------------------------|------|------|-----|---------------|---------------|---------------|---------------|----|
|           | W                                     | H    | T    | V   | L             | SS            | ZZ            | DD            | KK |
| RG15C     | 33.0                                  | 19.2 | 12.5 | 3.5 | 84.0 (85.2)   | 86.0 (88.2)   | 88.4 (89.6)   | 90.4 (92.6)   |    |
| RG20C     | 43.4                                  | 24.2 | 12.5 | 3.5 | 102 (103.2)   | 104.0 (106.2) | 106.4 (107.6) | 108.4 (110.6) |    |
| RG20H     |                                       |      |      |     | 122 (123.2)   | 124.0 (126.2) | 126.4 (127.6) | 128.4 (130.6) |    |
| RG25C     | 46.8                                  | 29.2 | 13.5 | 3.5 | 114.9 (116.7) | 116.9 (119.9) | 119.3 (121.1) | 121.3 (124.3) |    |
| RG25H     |                                       |      |      |     | 131.4 (133.2) | 133.4 (136.4) | 135.8 (137.6) | 137.8 (140.8) |    |
| RG30C     | 58.8                                  | 34.9 | 13.5 | 3.5 | 126.8 (128.6) | 129.8 (132.8) | 131.6 (133.4) | 134.6 (137.6) |    |
| RG30H     |                                       |      |      |     | 148.8 (150.6) | 151.8 (154.8) | 153.6 (155.4) | 156.6 (159.6) |    |
| RG35C     | 68.8                                  | 40.3 | 13.5 | 3.5 | 141 (143.7)   | 144.0 (148.0) | 146.0 (148.7) | 149.0 (153.0) |    |
| RG35H     |                                       |      |      |     | 168.5 (171.2) | 171.5 (175.5) | 173.5 (176.2) | 176.5 (180.5) |    |
| RG45C     | 83.8                                  | 50.2 | 16.0 | 4.5 | 173.7 (175.3) | 176.7 (180.7) | 180.9 (182.5) | 183.9 (187.9) |    |
| RG45H     |                                       |      |      |     | 207.5 (209.1) | 210.5 (214.5) | 214.7 (216.3) | 217.7 (221.7) |    |
| RG55C     | 97.6                                  | 58.4 | 16.0 | 4.5 | 204.2 (205.8) | 207.2 (211.2) | 211.4 (213)   | 214.4 (218.4) |    |
| RG55H     |                                       |      |      |     | 252.5 (254.1) | 255.5 (259.5) | 259.7 (261.3) | 262.7 (266.7) |    |
| RG65C     | 121.7                                 | 76.1 | 16.0 | 4.5 | 252.5 (254.5) | 255.5 (260.5) | 261.3 (263.3) | 264.3 (269.3) |    |
| RG65H     |                                       |      |      |     | 315.5 (317.5) | 318.5 (323.5) | 324.3 (326.3) | 327.3 (332.3) |    |

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

(4) QH Series



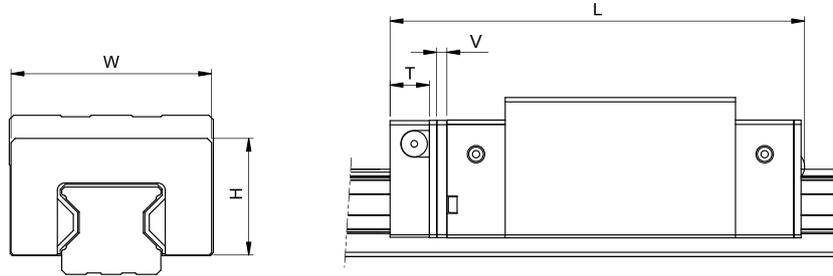
| Model No. | E2 self-lubricating module dimensions |      |      |     |               |               |               |               |    |
|-----------|---------------------------------------|------|------|-----|---------------|---------------|---------------|---------------|----|
|           | W                                     | H    | T    | V   | L             | SS            | ZZ            | DD            | KK |
| QH15C     | 32.4                                  | 19.5 | 12.5 | 3.0 | 75.4 (75.6)   | 82.2 (82.7)   | 82.0 (82.2)   | 88.8 (89.3)   |    |
| QH20C     | 43.0                                  | 24.4 | 13.5 | 3.5 | 93.1 (94.2)   | 97.2 (98.5)   | 98.1 (99.2)   | 102.2 (103.5) |    |
| QH20H     |                                       |      |      |     | 107.8 (108.9) | 111.9 (113.2) | 112.8 (113.9) | 116.9 (118.2) |    |
| QH25C     | 46.4                                  | 29.5 | 13.5 | 3.5 | 100.2 (101.5) | 104.7 (106.0) | 105.2 (106.5) | 109.7 (111.0) |    |
| QH25H     |                                       |      |      |     | 120.8 (122.1) | 125.3 (126.6) | 125.8 (127.1) | 130.3 (131.6) |    |
| QH30C     | 58.0                                  | 35.0 | 13.5 | 3.5 | 112.9 (113.9) | 120.1 (121.4) | 120.3 (121.3) | 127.5 (128.8) |    |
| QH30H     |                                       |      |      |     | 135.9 (136.9) | 143.1 (144.4) | 143.3 (144.3) | 150.5 (151.8) |    |
| QH35C     | 68.0                                  | 38.5 | 16.0 | 3.5 | 129.3 (129.7) | 133.5 (134.0) | 134.3 (134.7) | 138.5 (139.0) |    |
| QH35H     |                                       |      |      |     | 155.1 (155.5) | 159.3 (159.8) | 160.1 (160.5) | 164.3 (164.8) |    |
| QH45C     | 82.0                                  | 49.0 | 16.0 | 4.5 | 158.3 (158.3) | 163.7 (163.7) | 165.5 (165.5) | 170.9 (170.9) |    |
| QH45H     |                                       |      |      |     | 190.1 (190.1) | 195.5 (195.5) | 197.3 (197.3) | 202.7 (202.7) |    |

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

## E2 Type

### Self Lubrication Kit

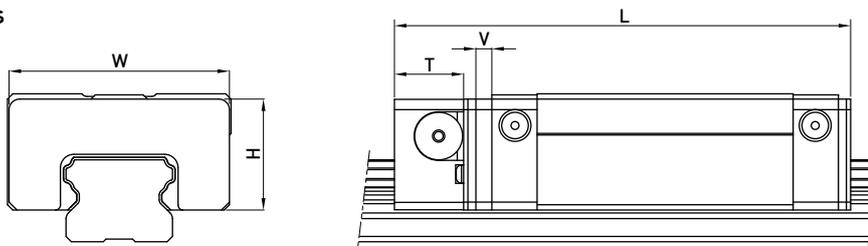
#### (5) QR Series



| Model No. | E2 self-lubricating module dimensions |      |      |     |               |               |               |               |
|-----------|---------------------------------------|------|------|-----|---------------|---------------|---------------|---------------|
|           | W                                     | H    | T    | V   | L             |               |               |               |
|           |                                       |      |      |     | SS            | ZZ            | DD            | KK            |
| QR 20C    | 43.4                                  | 24.2 | 12.5 | 3.5 | 102.0 (103.2) | 104.0 (106.2) | 106.4 (107.4) | 108.4 (110.6) |
| QR 25C    | 46.8                                  | 29.2 | 13.5 | 3.5 | 114.9 (116.7) | 116.9 (119.9) | 119.3 (121.1) | 121.3 (124.3) |
| QR 25H    |                                       |      |      |     | 129.9 (131.7) | 131.9 (134.9) | 134.3 (136.1) | 136.3 (139.3) |
| QR 30C    | 58.8                                  | 34.9 | 13.5 | 3.5 | 126.8 (128.6) | 129.8 (132.8) | 131.6 (133.4) | 134.6 (137.6) |
| QR 30H    |                                       |      |      |     | 148.8 (150.6) | 151.5 (154.8) | 153.6 (155.4) | 156.6 (159.6) |
| QR 35C    | 68.8                                  | 40.3 | 13.5 | 3.5 | 141.0 (143.7) | 144.0 (148.0) | 146.0 (148.7) | 149.0 (153.0) |
| QR 35H    |                                       |      |      |     | 168.5 (171.2) | 171.5 (175.5) | 173.5 (176.2) | 176.5 (180.5) |
| QR 45C    | 83.8                                  | 50.2 | 16.0 | 4.5 | 173.7 (175.3) | 176.7 (180.7) | 180.9 (182.5) | 183.9 (187.9) |
| QR 45H    |                                       |      |      |     | 207.5 (209.1) | 210.5 (214.5) | 214.7 (216.3) | 217.7 (221.7) |

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

#### (6) QE Series



| Model No. | E2 self-lubricating module dimensions |      |      |     |               |               |               |               |
|-----------|---------------------------------------|------|------|-----|---------------|---------------|---------------|---------------|
|           | W                                     | H    | T    | V   | L             |               |               |               |
|           |                                       |      |      |     | SS            | ZZ            | DD            | KK            |
| QE15S     | 33.3                                  | 19.2 | 11.5 | 3.0 | 54.6 (56.0)   | 56.6 (58.8)   | 58.6 (60.0)   | 60.6 (62.8)   |
| QE15C     |                                       |      |      |     | 71.3 (72.7)   | 73.3 (75.5)   | 75.3 (76.7)   | 77.3 (79.5)   |
| QE20S     | 41.3                                  | 20.9 | 13.0 | 3.0 | 66.0 (68.0)   | 68.0 (71.0)   | 70.0 (72.0)   | 72.0 (75.0)   |
| QE20C     |                                       |      |      |     | 85.1 (87.1)   | 87.1 (90.1)   | 89.1 (91.1)   | 91.1 (94.1)   |
| QE25S     | 47.3                                  | 24.9 | 13.0 | 3.0 | 76.1 (77.8)   | 78.1 (81.1)   | 81.1 (82.8)   | 83.1 (86.1)   |
| QE25C     |                                       |      |      |     | 99.6 (101.3)  | 101.6 (104.6) | 104.6 (106.3) | 106.6 (109.6) |
| QE30S     | 59.3                                  | 31.0 | 13.0 | 3.0 | 83.5 (88.4)   | 85.5 (88.5)   | 88.5 (90.4)   | 90.5 (93.5)   |
| QE30C     |                                       |      |      |     | 112.1 (114.0) | 114.1 (117.1) | 117.1 (119.0) | 119.1 (122.1) |
| QE35S     | 68.0                                  | 35.5 | 13.0 | 3.0 | 92.0 (94.0)   | 95.0 (98.0)   | 96.0 (98.0)   | 99.0 (102.0)  |
| QE35C     |                                       |      |      |     | 124.0 (126.0) | 127.0 (130.0) | 128.0 (130.0) | 131.0 (134.0) |

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

## 2-14 PG Type - Positioning Guideway

### (1) Construction

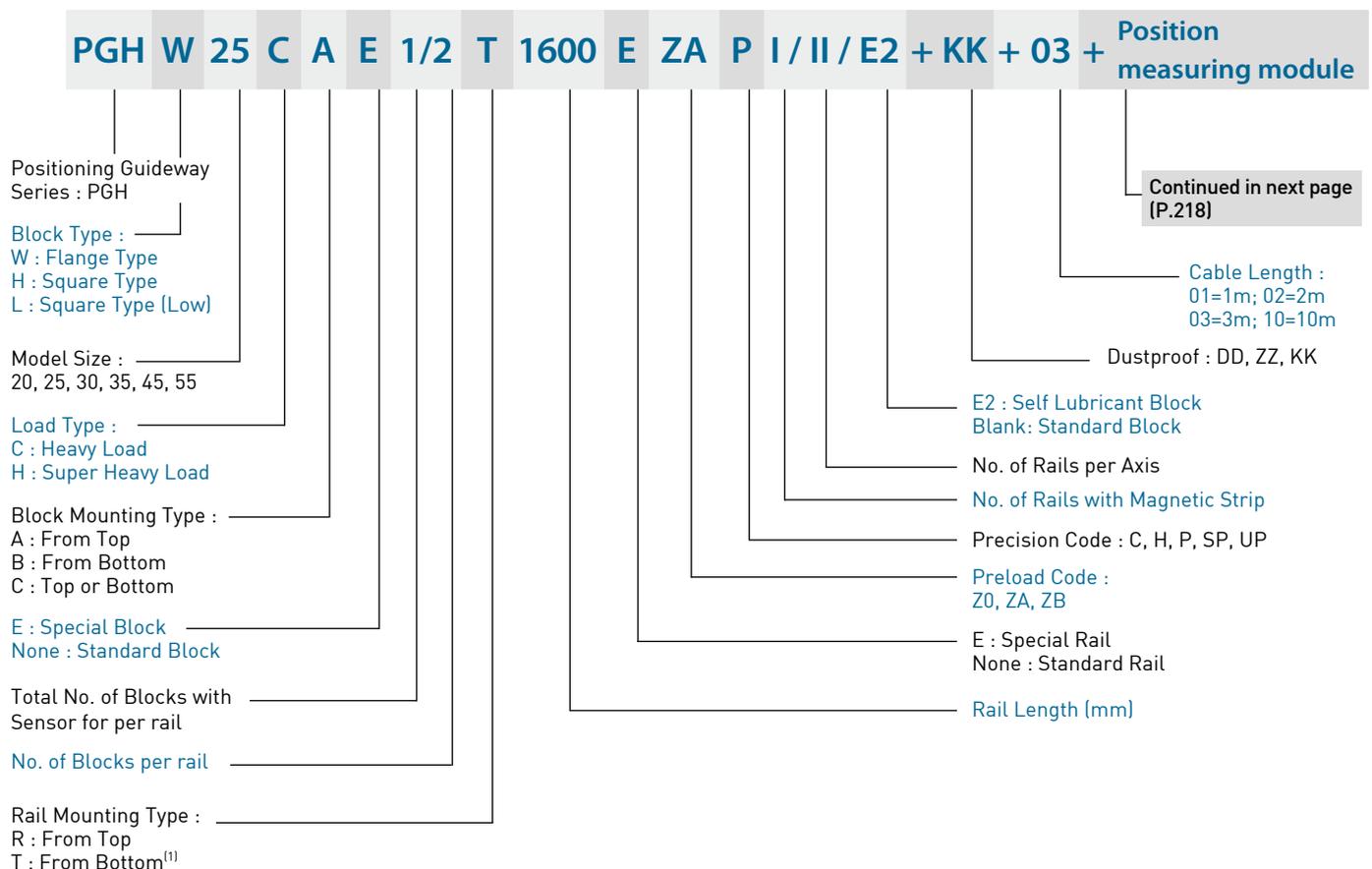
The PG is a linear guideway assembly integrated with a magnetic encoder for position measurement.

### (2) Features

1. Magnetic encoder is built into the rail, saving installation space.
2. Maintains high rigidity as well as high accuracy.
3. Both the sensor and the magnetic strip are protected from harmful external contaminants such as dust, iron chips, etc.
4. Non-contact measuring sensor for longer life.
5. Can measure distances up to 30 m.
6. Can withstand humidity and high-temperature environments, along with oily, dusty and high vibration applications.
7. High resolution
8. Easy installation



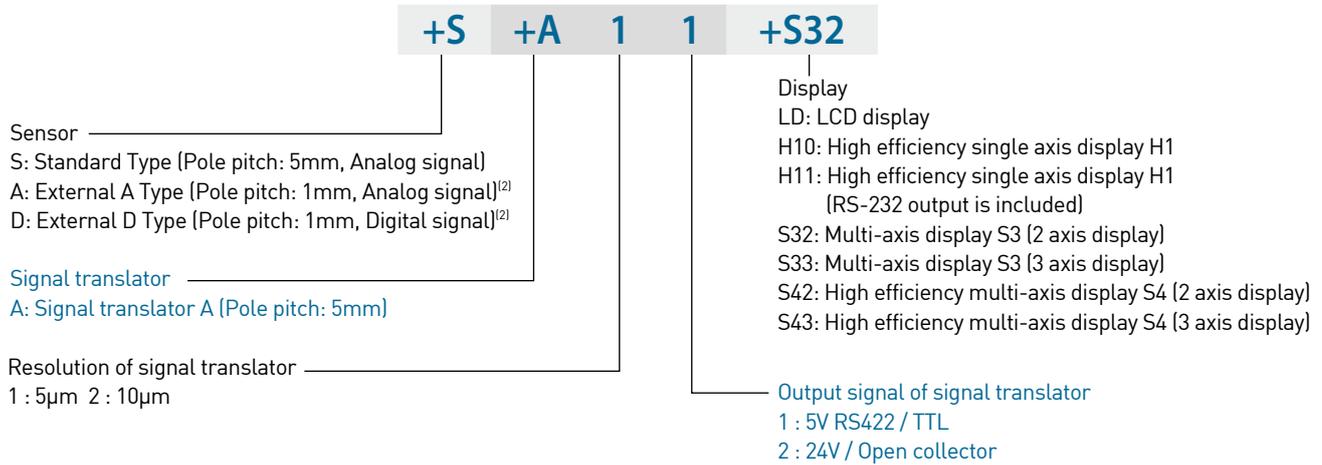
### 2-14-1 Model Number of PG Type



# PG Type

## Positioning Guideway

### Position measuring module (Continued from last page, P.217)



Note: (1) If rail mounting configuration is from bottom, magnetic strip will be affixed on the rail.  
 (2) External type sensors (A and D) are only available for size 20 and 25.

Table 2-14-1 The help of selecting the components for the position measuring module.

| Sensor   | Signal translator                           | Resolution of signal translator | Output signal of signal translator     | Display   |
|--|---|---------------------------------|--|---|
| S: Standard Type<br>(Pole pitch: 5mm, Analog signal)   | A: Signal translator A<br>(Pole pitch: 5mm) | 1:5µm<br>2:10µm                 | 1:5V RS422/TTL<br>2:24V/Open collector | S32: Multi-axis display S3 (2 axis display)<br>S33: Multi-axis display S3 (3 axis display)<br>S42: High efficiency multi-axis display S4 (2 axis display)<br>S43: High efficiency multi-axis display S4 (3 axis display)  |
|  | Does not need a signal translator           |                                 |  | LD: LCD display<br>H10: High efficiency single axis display H1<br>H11: High efficiency single axis display H1<br>(RS-232 output is included)  |
| A: External A Type<br>(Pole pitch: 1mm, Analog signal)<br>(Only available for size 20 and 25)  | Does not need a signal translator           |                                 |  | H10: High efficiency single axis display H1<br>H11: High efficiency single axis display H1<br>(RS-232 output is included)   |
| D: External D Type<br>(Pole pitch: 1mm, Digital signal)<br>(Only available for size 20 and 25) | Does not need a signal translator           |                                 |  | H10: High efficiency single axis display H1<br>H11: High efficiency single axis display H1<br>(RS-232 output is included)<br>S32: Multi-axis display S3 (2 axis display)<br>S33: Multi-axis display S3 (3 axis display)<br>S42: High efficiency multi-axis display S4 (2 axis display)<br>S43: High efficiency multi-axis display S4 (3 axis display) |

## 2-14-2 Technical data for PG Type

### (1) Sensor technical data

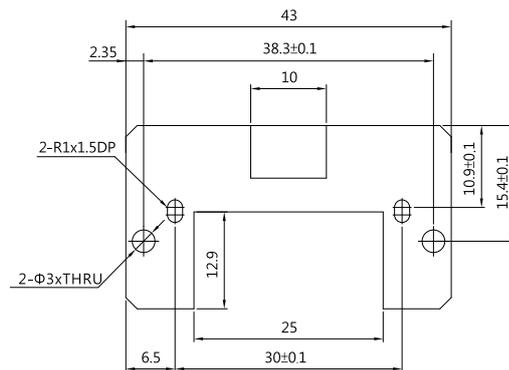
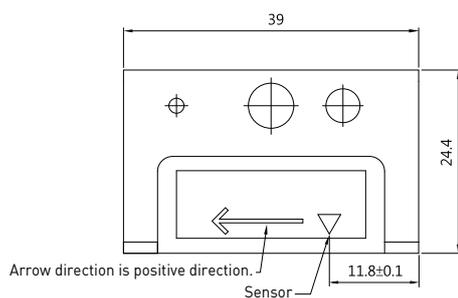
Table 2-14-2 Technical data for the sensor

| Type                  | Specification              |                           |                           |
|-----------------------|----------------------------|---------------------------|---------------------------|
|                       | Standard                   | External                  |                           |
|                       |                            | A type (analog signal)    | D type (digital signal)   |
| Resolution            | 5mm                        | 1mm                       | 1mm                       |
| Repeatability         | $\pm 10 \mu\text{m}^{(1)}$ | $\pm 3 \mu\text{m}^{(2)}$ | $\pm 2 \mu\text{m}^{(2)}$ |
| Reference signal      | -                          | 1mm/pulse                 | 1mm/pulse                 |
| Max. speed            | 10m/sec                    | 10m/sec                   | 5m/sec                    |
| Output signal         | SIN/COS 50mVp-p            | SIN/COS 1Vp-p             | 5V RS422/TTL              |
| Max. output frequency | 2KHz                       | 10KHz                     | 1.25MHz                   |
| Input power           | 3.3VDC $\pm 5\%$           | 5VDC $\pm 5\%$            | 5VDC $\pm 5\%$            |
| Input current         | 0.1A                       | 0.1A                      | 0.1A                      |
| Operating temperature | 0°C~50°C                   | 0°C~50°C                  | 0°C~50°C                  |
| Storage temperature   | -5°C~70°C                  | -5°C~70°C                 | -5°C~70°C                 |
| IP class              | IP67                       | IP67                      | IP67                      |

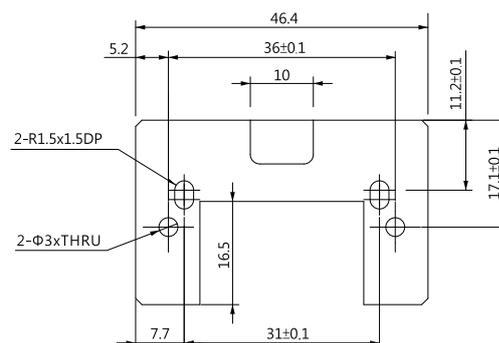
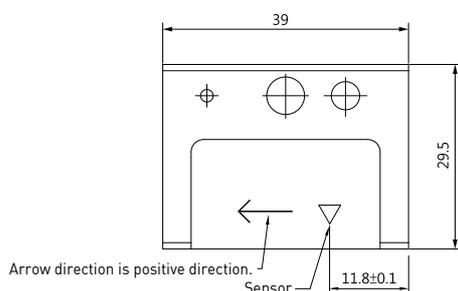
Note : (1) Repeatability is measured at a gap of 1mm.

(2) Repeatability is measured at a gap of 0.1mm.

### ○ Dimensions for the external type sensor



Note: These dimensions are suitable for HIWIN PG20 linear guideway.



Note: These dimensions are suitable for HIWIN PG25 linear guideway.

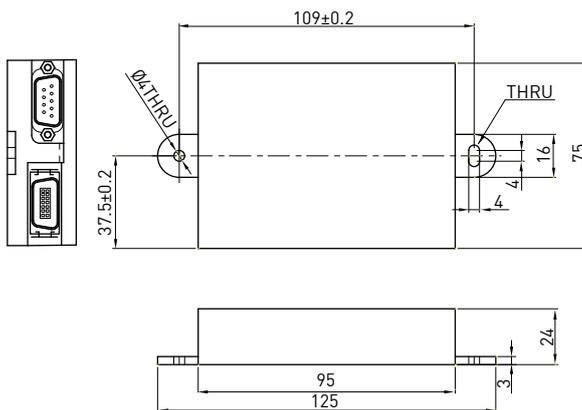
## PG Type Positioning Guideway

### (2) Signal translator technical data

Table 2-14-3 Technical data for the signal translator

| Type                  |  |        |                    |        |
|-----------------------|---|--------|--------------------|--------|
| Specification         | Signal translator A   |        |                    |        |
| Output signal         | 5V RS422 / TTL  |        | 24V/Open collector |        |
| Resolution            | 5 μm  | 10 μm  | 5 μm               | 10 μm  |
| Repeatability         | ±10 μm  | ±20 μm | ±10 μm             | ±20 μm |
| Max. output frequency | 64KHz   | 32KHz  | 64KHz              | 32KHz  |
| Accuracy              | ±[80 μm+15 μm/m×L] , L: Scale Length (m)  |        |                    |        |
| Max. speed            | 1.5m/sec  |        |                    |        |
| Input signal          | SIN/COS 50mVp-p   |        |                    |        |
| Input power           | 5VDC±5% / 24VDC±10%   |        |                    |        |
| Input current         | 0.5A  |        |                    |        |
| Operating temperature | 0°C ~ 50°C  |        |                    |        |
| Storage temperature   | -5°C ~ 70°C   |        |                    |        |
| IP class              | IP43  |        |                    |        |

### ○ Dimensions of signal translator A



### (3) Display technical data

Table 2-14-4 Technical data for the single axis display

| Type                  |  |  |
|-----------------------|---|---|
| Specification         | LCD display, LD   | High efficiency single axis display, H1   |
| Display               | 8 digital LCD display with +/- sign   | 8 digital LED display   |
| Resolution            | 5µm   | 1µm, 2µm, 5µm, 10µm   |
| Accuracy              | ±[80µm+15µm/m×L]<br>L: Scale Length (m)   | -   |
| Repeatability         | ±10µm   | -   |
| Max. speed            | 3m/sec  | -   |
| Max. acceleration     | 2G  | 2G  |
| Input signal          | Analog:SIN/COS 50mVp-p  | Analog:SIN/COS 1Vp-p<br>Digital:5V RS422/TTL  |
| Input frequency       | 0.6KHz  | Analog:2KHz<br>Digital:0.5MHz   |
| Input power           | Two commercial AA No.3 batteries  | 5VDC±5%   |
| Input current         | -   | 1A  |
| Relay contact rating  | -   | DC24V/2A  |
| Battery life          | 1 year by setting it at 1.5m/s  | -   |
| Operating temperature | 0°C ~ 50°C  | 0°C ~ 50°C  |
| Storage temperature   | -5°C ~ 70°C   | -5°C ~ 70°C   |
| IP class              | IP43  | IP43  |

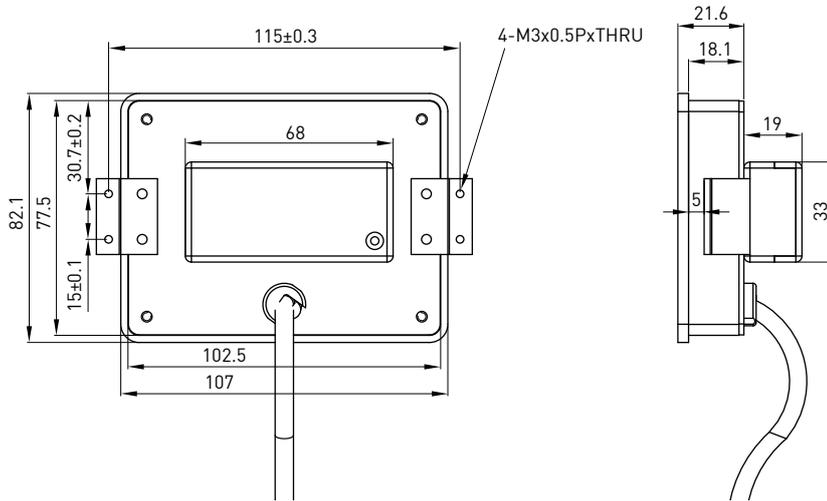
Table 2-14-5 Technical data for the multi-axis display

| Type                  |  |  |
|-----------------------|---|---|
| Specification         | Multi-axis display, S3  | High efficiency multi-axis display, S4  |
| Display               | 8 digital LED display   | 8 digital LED display   |
| Resolution            | 0.1µm, 0.2µm, 0.5µm, 1µm,<br>2µm, 5µm, 10µm, 20µm, 50µm                             | 0.1µm, 0.2µm, 0.5µm, 1µm,<br>2µm, 5µm, 10µm, 20µm, 50µm                               |
| Input signal          | 5V/TTL  | 5V/TTL  |
| Max. output frequency | <1.5MHz   | <2MHz   |
| Input power           | DC 8V~30V   | AC 90V~240V   |
| Input current         | 0.08A   | -   |
| Operating temperature | 0°C~50°C  | 0°C~50°C  |
| Storage temperature   | -5°C~70°C   | -5°C~70°C   |
| IP class              | IP43  | IP43  |

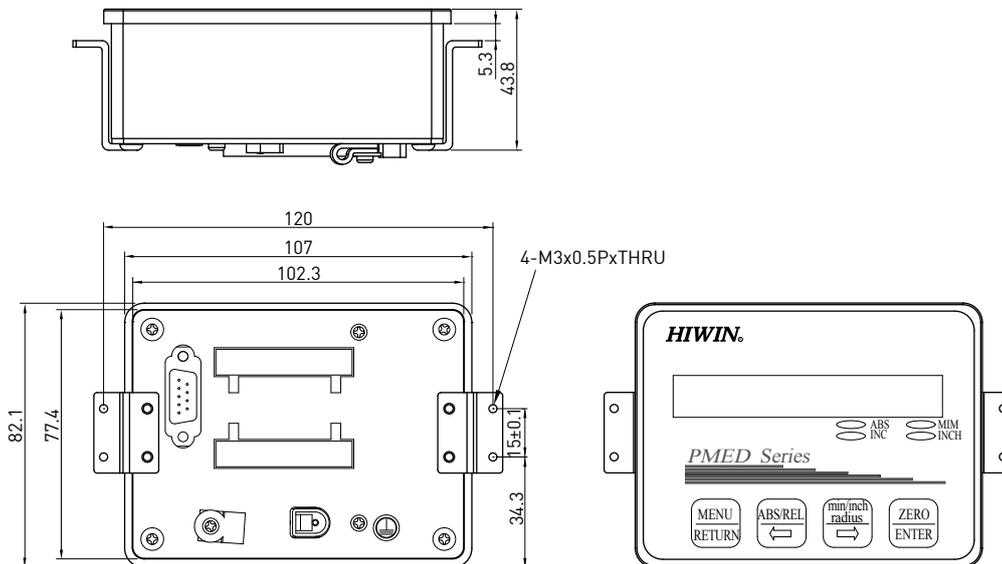
Note: An additional signal transfer cable is needed when one of the displays (S3, S4) is selected. The type of cable will be selected by HIWIN depending on the type of display.

## PG Type Positioning Guideway

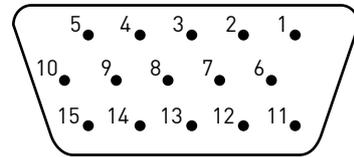
○ Dimensions of LCD display, LD



○ Dimensions of high efficiency single axis display, H1



○ Pin assignment of high efficiency single axis display, H1

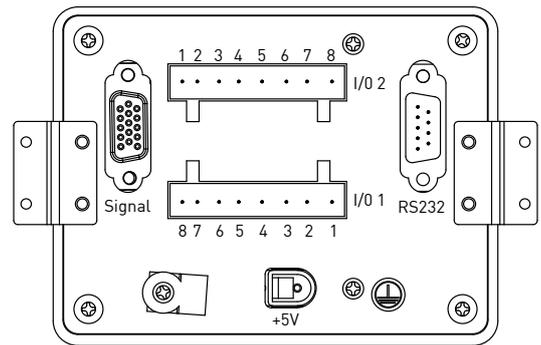


Pin definition for signal input connector

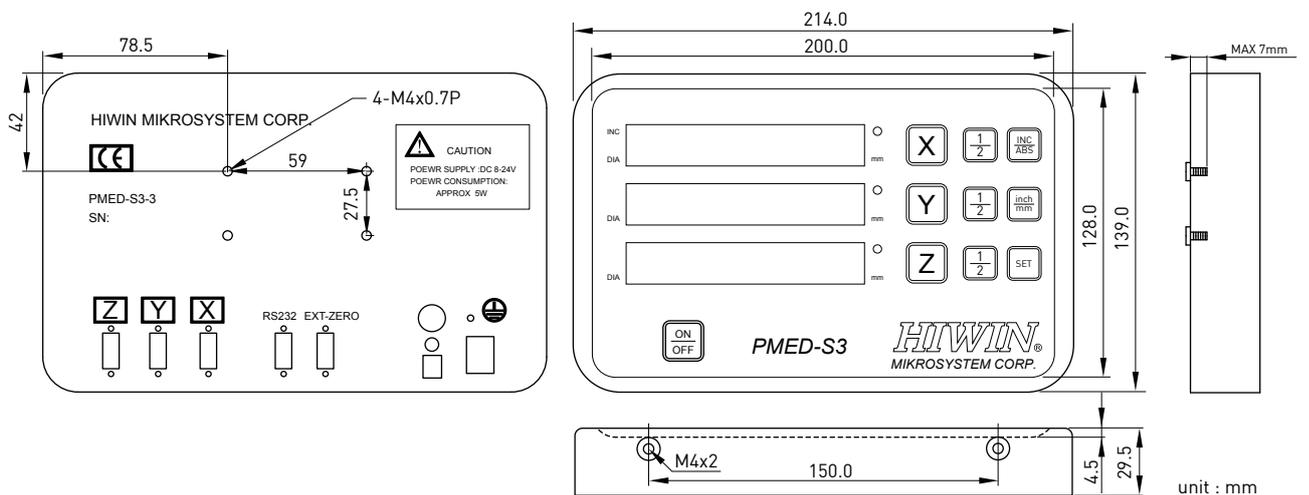
| Pin | Designation | Pin | Designation | Pin | Designation |
|-----|-------------|-----|-------------|-----|-------------|
| 1   | +5V         | 6   | FG          | 11  | A+(Analog)  |
| 2   | GND         | 7   | Z+          | 12  | A-(Analog)  |
| 3   | A+(Digital) | 8   | Z-          | 13  | B+(Analog)  |
| 4   | B+(Digital) | 9   | A-(Digital) | 14  | B-(Analog)  |
| 5   | NC          | 10  | B-(Digital) | 15  | NC          |

Pin definition for signal output connector

| I/O 1 |               | I/O 2 |               |
|-------|---------------|-------|---------------|
| Pin   | Designation   | Pin   | Designation   |
| 1     | NC            | 1     | NC            |
| 2     | NC            | 2     | NC            |
| 3     | NC            | 3     | NC            |
| 4     | NC            | 4     | NC            |
| 5     | Relay 0[CH-0] | 5     | Relay 2[CH-2] |
| 6     | Relay 1[CH-1] | 6     | Relay 3[CH-3] |
| 7     | Relay 1[CH-1] | 7     | Relay 3[CH-3] |
| 8     | Relay 1[CH-1] | 8     | Relay 3[CH-3] |



○ Dimensions of multi-axis display, S3



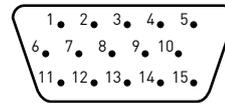
## PG Type

### Positioning Guideway

#### Pin assignment of multi-axis display, S3

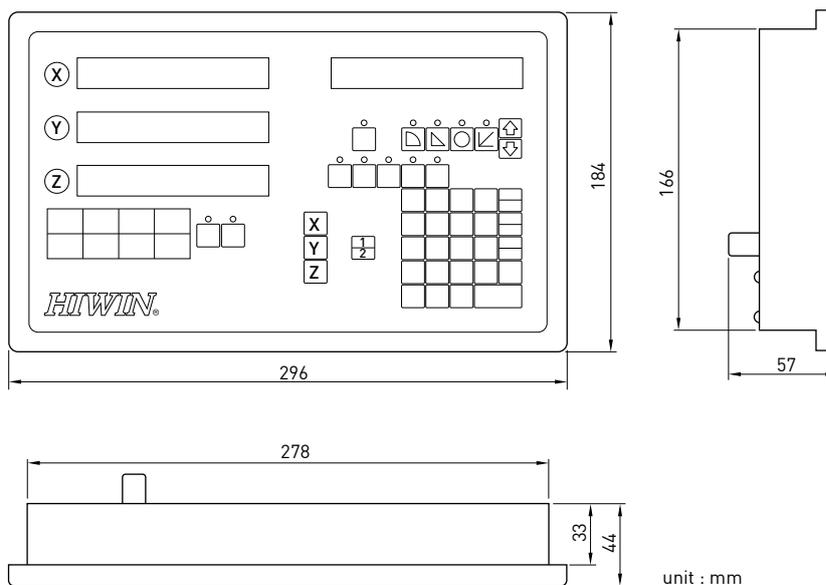
15 pin D-Sub signal  
(female)

NC : No connection  
FG : Frame ground



| Pin | Designation | Pin | Designation | Pin | Designation |
|-----|-------------|-----|-------------|-----|-------------|
| 1   | +5V         | 6   | FG          | 11  | NC          |
| 2   | GND         | 7   | NC          | 12  | NC          |
| 3   | A+          | 8   | NC          | 13  | NC          |
| 4   | B+          | 9   | NC          | 14  | NC          |
| 5   | ABS-        | 10  | NC          | 15  | NC          |

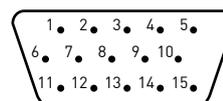
#### Dimensions of high efficiency multi-axis display, S4



#### Pin assignment of high efficiency multi-axis display, S4

15 pin D-Sub signal  
(female)

NC : No connection  
FG : Frame ground



| Pin | Designation | Pin | Designation | Pin | Designation |
|-----|-------------|-----|-------------|-----|-------------|
| 1   | +5V         | 6   | FG          | 11  | NC          |
| 2   | GND         | 7   | NC          | 12  | NC          |
| 3   | A+          | 8   | NC          | 13  | NC          |
| 4   | B+          | 9   | NC          | 14  | NC          |
| 5   | ABS-        | 10  | NC          | 15  | NC          |

## 2-14-3 Accuracy Classes

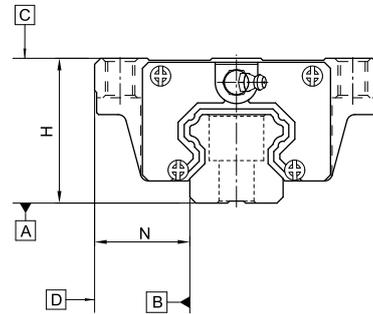


Table 2-14-6 Accuracy Standards of PGH 25, 30, 35

Unit: mm

| Accuracy classes                                    | Normal<br>(C)    | High<br>(H) | Precision<br>(P) | Super Precision<br>(SP) | Ultra Precision<br>(UP) |
|---|------------------|-------------|------------------|-------------------------|-------------------------|
| Dimensional tolerance of height H                   | ± 0.1            | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 0.01             |
| Dimensional tolerance of width N                    | ± 0.1            | ± 0.04      | 0<br>- 0.04      | 0<br>- 0.02             | 0<br>- 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 2-13-7 |             |                  |                         |                         |
| Running parallelism of block surface D to surface B | See table 2-13-7 |             |                  |                         |                         |

Note: See table 2-1-3 and 2-1-5 in section 2-1(HG series) for the accuracy standards of PGH 20, 45, 55

Table 2-14-7 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  |

## 2-14-4 Preload

Table 2-14-8 PGH-series

| Class          | Code | Preload     |
|----------------|------|-------------|
| Light Preload  | Z0   | 0~0.02C     |
| Medium Preload | ZA   | 0.05C~0.07C |
| Heavy Preload  | ZB   | 0.10C~0.12C |

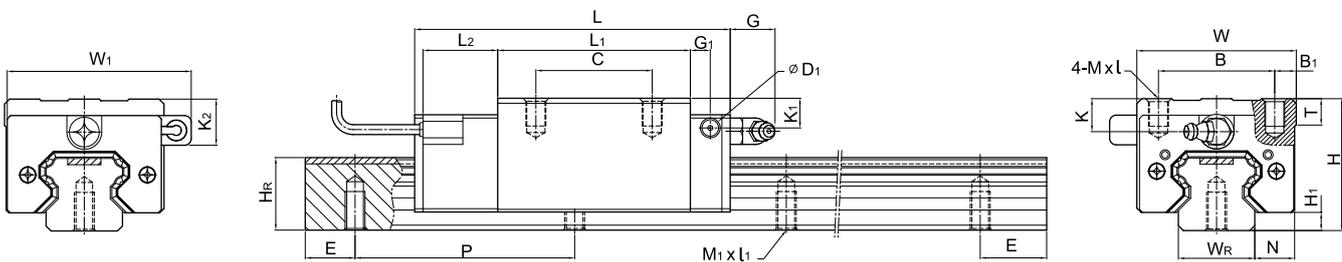
Note: "C" in preload column means basic dynamic load rating

# PG Type

## Positioning Guideway

### 2-14-5 Dimensions for PG Series

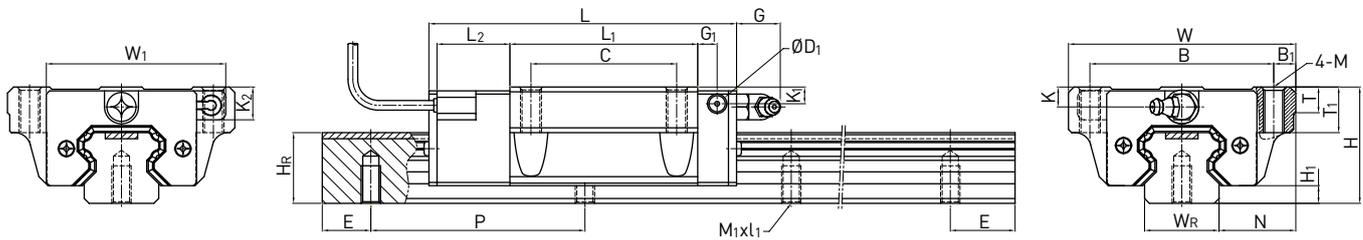
#### (1) PGHH-CA / PGHH-HA



| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |                |    |                |    |       |                |                |      |                |                |      |                |                |        |      |                | Dimensions of Rail (mm) |                                 |     |      |        | Basic Dynamic Load Rating | Basic Static Load Rating | Weight              |       |
|-----------|-----------------------------|----------------|------|--------------------------|----------------|----|----------------|----|-------|----------------|----------------|------|----------------|----------------|------|----------------|----------------|--------|------|----------------|-------------------------|---------------------------------|-----|------|--------|---------------------------|--------------------------|---------------------|-------|
|           | H                           | H <sub>1</sub> | N    | W                        | W <sub>1</sub> | B  | B <sub>1</sub> | C  | L     | L <sub>1</sub> | L <sub>2</sub> | G    | G <sub>1</sub> | D <sub>1</sub> | K    | K <sub>1</sub> | K <sub>2</sub> | M x L  | T    | W <sub>R</sub> | H <sub>R</sub>          | M <sub>1</sub> x L <sub>1</sub> | P   | E    | C (kN) |                           |                          | C <sub>0</sub> (kN) | Block |
| PGHH20CA  | 30                          | 4.6            | 12   | 44                       | 52             | 32 | 6              | 36 | 90.5  | 50.5           | 25             | 12   | 6              | 5              | 6    | 6              | 10             | M5x6   | 8    | 20             | 17.5                    | M6x10                           | 60  | 20   | 27.1   | 36.68                     | 0.38                     | 2.05                |       |
| PGHH20HA  |                             |                |      |                          |                |    |                | 50 | 105.2 | 65.2           |                |      |                |                |      |                |                |        |      |                |                         |                                 |     |      | 32.7   | 47.96                     | 0.39                     |                     |       |
| PGHH25CA  | 40                          | 5.5            | 12.5 | 48                       | 55.4           | 35 | 6.5            | 35 | 95    | 58             | 22.5           | 12   | 6              | 5              | 10   | 9              | 14             | M6x8   | 8    | 23             | 22                      | M6x12                           | 60  | 20   | 34.9   | 52.82                     | 0.51                     | 3.05                |       |
| PGHH25HA  |                             |                |      |                          |                |    |                | 50 | 116   | 78.6           |                |      |                |                |      |                |                |        |      |                |                         |                                 |     |      | 42.2   | 69.07                     | 0.69                     |                     |       |
| PGHH30CA  | 45                          | 6              | 16   | 60                       | 67             | 40 | 10             | 40 | 110   | 70             | 23             | 12   | 6              | 5              | 9.5  | 13.8           | 19             | M8x10  | 8.5  | 28             | 26                      | M8x15                           | 80  | 20   | 48.5   | 71.87                     | 0.88                     | 4.31                |       |
| PGHH30HA  |                             |                |      |                          |                |    |                | 60 | 133   | 93             |                |      |                |                |      |                |                |        |      |                |                         |                                 |     |      | 58.6   | 93.99                     | 1.16                     |                     |       |
| PGHH35CA  | 55                          | 7.5            | 18   | 70                       | 77             | 50 | 10             | 50 | 123   | 80             | 23.4           | 12   | 7              | 5              | 16   | 19.6           | 23.5           | M8x12  | 10.2 | 34             | 29                      | M8x17                           | 80  | 20   | 64.6   | 93.88                     | 1.45                     | 6.14                |       |
| PGHH35HA  |                             |                |      |                          |                |    |                | 72 | 148.8 | 105.8          |                |      |                |                |      |                |                |        |      |                |                         |                                 |     |      | 77.9   | 122.77                    | 1.92                     |                     |       |
| PGHH45CA  | 70                          | 9.5            | 20.5 | 86                       | 91             | 60 | 13             | 60 | 148   | 97             | 24.5           | 12.9 | 10             | 8.5            | 18.5 | 30.5           | 30.5           | M10x17 | 16   | 45             | 38                      | M12x24                          | 105 | 22.5 | 103.8  | 146.71                    | 2.73                     | 10.25               |       |
| PGHH45HA  |                             |                |      |                          |                |    |                | 80 | 179.8 | 128.8          |                |      |                |                |      |                |                |        |      |                |                         |                                 |     |      | 125.3  | 191.85                    | 3.61                     |                     |       |
| PGHH55CA  | 80                          | 13             | 23.5 | 100                      | 106            | 75 | 12.5           | 75 | 172.7 | 117.7          | 26             | 12.9 | 11             | 8.5            | 22   | 29             | 28.5           | M12x18 | 17.5 | 53             | 44                      | M14x25                          | 120 | 30   | 153.2  | 211.23                    | 4.17                     | 14.92               |       |
| PGHH55HA  |                             |                |      |                          |                |    |                | 95 | 210.8 | 155.8          |                |      |                |                |      |                |                |        |      |                |                         |                                 |     |      | 184.9  | 276.23                    | 5.49                     |                     |       |

Note: 1 kgf = 9.81N

(2) PGHW-CA / PGHW-HA



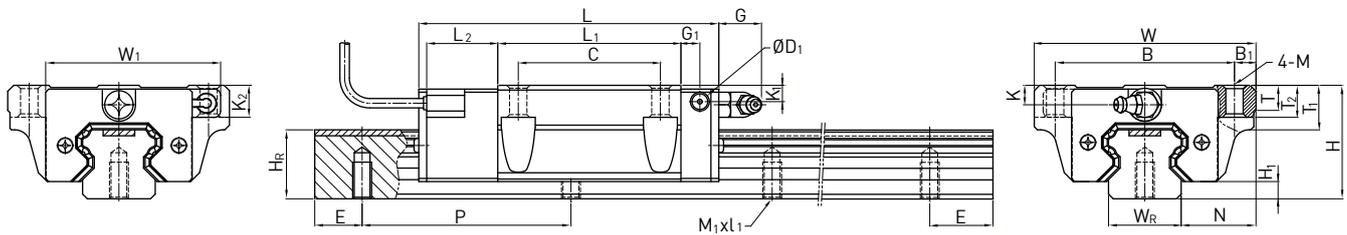
| Model No. | Dimensions of Assembly (mm) |                |      | Dimensions of Block (mm) |                |     |                |    |       |                |                |      |                |                |     |     |                |                |      |                | Dimensions of Rail (mm) |                |                                |     |      | Basic Dynamic Load Rating | Basic Static Load Rating | Weight |                     |       |
|-----------|-----------------------------|----------------|------|--------------------------|----------------|-----|----------------|----|-------|----------------|----------------|------|----------------|----------------|-----|-----|----------------|----------------|------|----------------|-------------------------|----------------|--------------------------------|-----|------|---------------------------|--------------------------|--------|---------------------|-------|
|           | H                           | H <sub>1</sub> | N    | W                        | W <sub>1</sub> | B   | B <sub>1</sub> | C  | L     | L <sub>1</sub> | L <sub>2</sub> | G    | G <sub>1</sub> | D <sub>1</sub> | M   | K   | K <sub>1</sub> | K <sub>2</sub> | T    | T <sub>1</sub> | W <sub>R</sub>          | H <sub>R</sub> | M <sub>1</sub> xL <sub>1</sub> | P   | E    |                           |                          | C(kN)  | C <sub>0</sub> (kN) | Block |
| PGHW20CA  | 30                          | 4.6            | 21.5 | 63                       | 52             | 53  | 5              | 40 | 90.5  | 50.5           | 25             | 12   | 6              | 5              | M6  | 6   | 6              | 10             | 8    | 10             | 20                      | 17.5           | M6x10                          | 60  | 20   | 27.1                      | 36.68                    | 0.40   | 2.05                |       |
| PGHW20HA  |                             |                |      |                          |                |     |                |    | 105.2 | 65.2           |                |      |                |                |     |     |                |                |      |                |                         |                |                                |     |      |                           |                          |        |                     |       |
| PGHW25CA  | 36                          | 5.5            | 23.5 | 70                       | 55.4           | 57  | 6.5            | 45 | 95    | 58             | 22.5           | 12   | 6              | 5              | M8  | 6   | 5              | 10             | 8    | 14             | 23                      | 22             | M6x12                          | 60  | 20   | 34.9                      | 52.82                    | 0.59   | 3.05                |       |
| PGHW25HA  |                             |                |      |                          |                |     |                |    | 116   | 78.6           |                |      |                |                |     |     |                |                |      |                |                         |                |                                |     |      |                           |                          |        |                     |       |
| PGHW30CA  | 42                          | 6              | 31   | 90                       | 67             | 72  | 9              | 52 | 110   | 70             | 23             | 12   | 6              | 5              | M10 | 6.5 | 10.8           | 16             | 8.5  | 16             | 28                      | 26             | M8x15                          | 80  | 20   | 48.5                      | 71.87                    | 1.09   | 4.31                |       |
| PGHW30HA  |                             |                |      |                          |                |     |                |    | 133   | 93             |                |      |                |                |     |     |                |                |      |                |                         |                |                                |     |      |                           |                          |        |                     |       |
| PGHW35CA  | 48                          | 7.5            | 33   | 100                      | 77             | 82  | 9              | 62 | 123   | 80             | 23.4           | 12   | 7              | 5              | M10 | 9   | 12.6           | 16.5           | 10.1 | 18             | 34                      | 29             | M8x17                          | 80  | 20   | 64.6                      | 93.88                    | 1.56   | 6.14                |       |
| PGHW35HA  |                             |                |      |                          |                |     |                |    | 148.8 | 105.8          |                |      |                |                |     |     |                |                |      |                |                         |                |                                |     |      |                           |                          |        |                     |       |
| PGHW45CA  | 60                          | 9.5            | 37.5 | 120                      | 91             | 100 | 10             | 80 | 148   | 97             | 24.5           | 12.9 | 10             | 8.5            | M12 | 8.5 | 20             | 20             | 15.1 | 22             | 45                      | 38             | M12x24                         | 105 | 22.5 | 103.8                     | 146.71                   | 2.79   | 10.25               |       |
| PGHW45HA  |                             |                |      |                          |                |     |                |    | 179.8 | 128.8          |                |      |                |                |     |     |                |                |      |                |                         |                |                                |     |      |                           |                          |        |                     |       |
| PGHW55CA  | 70                          | 13             | 43.5 | 140                      | 106            | 116 | 12             | 95 | 172.7 | 117.7          | 26             | 12.9 | 11             | 8.5            | M14 | 12  | 19             | 18.5           | 17.5 | 26.5           | 53                      | 44             | M14x25                         | 120 | 30   | 153.2                     | 211.23                   | 4.52   | 14.92               |       |
| PGHW55HA  |                             |                |      |                          |                |     |                |    | 210.8 | 155.8          |                |      |                |                |     |     |                |                |      |                |                         |                |                                |     |      |                           |                          |        |                     |       |

Note: 1 kgf = 9.81N

# PG Type

## Positioning Guideway

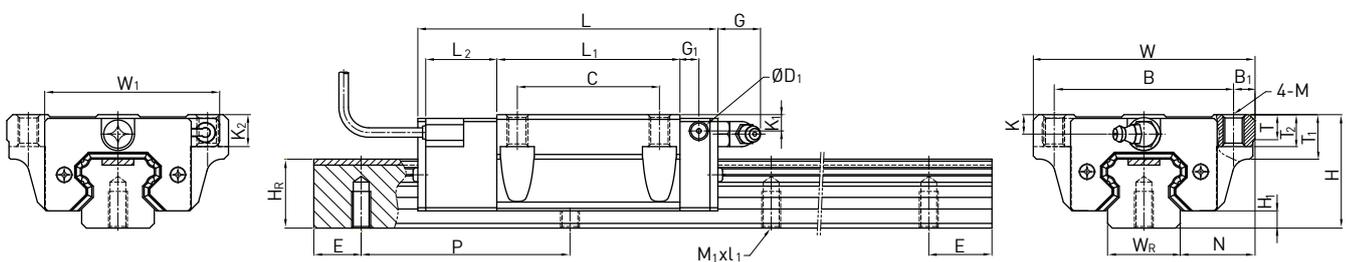
### (3) PGHW-CB/ PGHW-HB



| Model No. | Dimensions of Assembly (mm) |                |      |     |                |     |                |    |       | Dimensions of Block (mm) |                |      |                |                |     |     |                |                |      |                |                |                |                | Dimensions of Rail (mm)        |     |      |                     | Basic Dynamic Load Rating | Basic Static Load Rating | Weight              |       |
|-----------|-----------------------------|----------------|------|-----|----------------|-----|----------------|----|-------|--------------------------|----------------|------|----------------|----------------|-----|-----|----------------|----------------|------|----------------|----------------|----------------|----------------|--------------------------------|-----|------|---------------------|---------------------------|--------------------------|---------------------|-------|
|           | H                           | H <sub>1</sub> | N    | W   | W <sub>1</sub> | B   | B <sub>1</sub> | C  | L     | L <sub>1</sub>           | L <sub>2</sub> | G    | G <sub>1</sub> | D <sub>1</sub> | M   | K   | K <sub>1</sub> | K <sub>2</sub> | T    | T <sub>1</sub> | T <sub>2</sub> | W <sub>R</sub> | H <sub>R</sub> | M <sub>1</sub> xL <sub>1</sub> | P   | E    | C <sub>0</sub> (kN) |                           |                          | C <sub>0</sub> (kN) | Block |
| PGHW20CB  | 30                          | 4.6            | 21.5 | 63  | 52             | 53  | 5              | 40 | 90.5  | 50.5                     | 25             | 12   | 6              | 5              | Ø6  | 6   | 6              | 10             | 8    | 10             | 9.5            | 20             | 17.5           | M6x10                          | 60  | 20   | 27.1                | 36.68                     | 0.40                     | 2.05                |       |
| PGHW20HB  |                             |                |      |     |                |     |                |    | 105.2 | 65.2                     |                |      |                |                |     |     |                |                |      |                |                |                |                |                                |     |      |                     |                           |                          |                     |       |
| PGHW25CB  | 36                          | 5.5            | 23.5 | 70  | 55.4           | 57  | 6.5            | 45 | 95    | 58                       | 22.5           | 12   | 6              | 5              | Ø7  | 6   | 5              | 10             | 8    | 14             | 10             | 23             | 22             | M6x12                          | 60  | 20   | 34.9                | 52.82                     | 0.59                     | 3.05                |       |
| PGHW25HB  |                             |                |      |     |                |     |                |    | 116   | 78.6                     |                |      |                |                |     |     |                |                |      |                |                |                |                |                                |     |      |                     |                           |                          |                     |       |
| PGHW30CB  | 42                          | 6              | 31   | 90  | 67             | 72  | 9              | 52 | 110   | 70                       | 23             | 12   | 6              | 5              | Ø9  | 6.5 | 10.8           | 16             | 8.5  | 16             | 10             | 28             | 26             | M8x15                          | 80  | 20   | 48.5                | 71.87                     | 1.09                     | 4.31                |       |
| PGHW30HB  |                             |                |      |     |                |     |                |    | 133   | 93                       |                |      |                |                |     |     |                |                |      |                |                |                |                |                                |     |      |                     |                           |                          |                     |       |
| PGHW35CB  | 48                          | 7.5            | 33   | 100 | 77             | 82  | 9              | 62 | 123   | 80                       | 23.4           | 12   | 7              | 5              | Ø9  | 9   | 12.6           | 16.5           | 10.1 | 18             | 13             | 34             | 29             | M8x17                          | 80  | 20   | 64.6                | 93.88                     | 1.56                     | 6.14                |       |
| PGHW35HB  |                             |                |      |     |                |     |                |    | 148.8 | 105.8                    |                |      |                |                |     |     |                |                |      |                |                |                |                |                                |     |      |                     |                           |                          |                     |       |
| PGHW45CB  | 60                          | 9.5            | 37.5 | 120 | 91             | 100 | 10             | 80 | 148   | 97                       | 24.5           | 12.9 | 10             | 8.5            | Ø11 | 8.5 | 20             | 20             | 15.1 | 22             | 15             | 45             | 38             | M12x24                         | 105 | 22.5 | 103.8               | 146.71                    | 2.79                     | 10.25               |       |
| PGHW45HB  |                             |                |      |     |                |     |                |    | 179.8 | 128.8                    |                |      |                |                |     |     |                |                |      |                |                |                |                |                                |     |      |                     |                           |                          |                     |       |
| PGHW55CB  | 70                          | 13             | 43.5 | 140 | 106            | 116 | 12             | 95 | 172.7 | 117.7                    | 26             | 12.9 | 11             | 8.5            | Ø14 | 12  | 19             | 18.5           | 17.5 | 26.5           | 17             | 53             | 44             | M14x25                         | 120 | 30   | 153.2               | 211.23                    | 4.52                     | 14.92               |       |
| PGHW55HB  |                             |                |      |     |                |     |                |    | 210.8 | 155.8                    |                |      |                |                |     |     |                |                |      |                |                |                |                |                                |     |      |                     |                           |                          |                     |       |

Note: 1 kgf = 9.81N

(4) PGHW-CC/ PGHW-HC



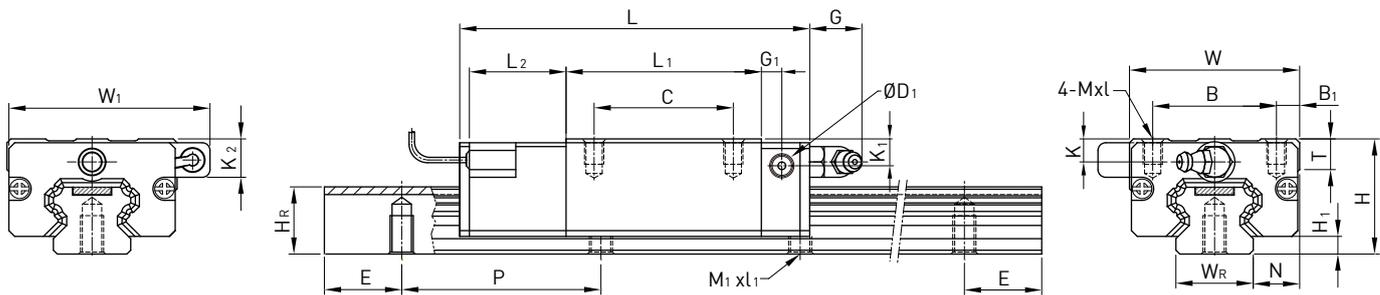
| Model No. | Dimensions of Assembly (mm) |                |      |     | Dimensions of Block (mm) |     |                |    |       |                |                |      |                |                |     |     |                |                |      |                |                | Dimensions of Rail (mm) |                |                                |     | Basic Dynamic Load Rating | Basic Static Load Rating | Weight |        |                     |            |
|-----------|-----------------------------|----------------|------|-----|--------------------------|-----|----------------|----|-------|----------------|----------------|------|----------------|----------------|-----|-----|----------------|----------------|------|----------------|----------------|-------------------------|----------------|--------------------------------|-----|---------------------------|--------------------------|--------|--------|---------------------|------------|
|           | H                           | H <sub>1</sub> | N    | W   | W <sub>1</sub>           | B   | B <sub>1</sub> | C  | L     | L <sub>1</sub> | L <sub>2</sub> | G    | G <sub>1</sub> | D <sub>1</sub> | M   | K   | K <sub>1</sub> | K <sub>2</sub> | T    | T <sub>1</sub> | T <sub>2</sub> | W <sub>R</sub>          | H <sub>R</sub> | M <sub>1</sub> xL <sub>1</sub> | P   |                           |                          | E      | C (kN) | C <sub>0</sub> (kN) | Block (kg) |
| PGHW20CC  | 30                          | 4.6            | 21.5 | 63  | 52                       | 53  | 5              | 40 | 90.5  | 50.5           |                |      |                |                |     |     |                |                |      |                |                |                         |                |                                |     |                           |                          | 27.1   | 36.68  | 0.40                | 2.05       |
| PGHW20HC  |                             |                |      |     |                          |     |                |    | 105.2 | 65.2           | 25             | 12   | 6              | 5              | M6  | 6   | 6              | 10             | 8    | 10             | 9.5            | 20                      | 17.5           | M6x10                          | 60  | 20                        | 32.7                     | 47.96  | 0.52   |                     |            |
| PGHW25CC  | 36                          | 5.5            | 23.5 | 70  | 55.4                     | 57  | 6.5            | 45 | 95    | 58             |                |      |                |                |     |     |                |                |      |                |                |                         |                |                                |     |                           | 34.9                     | 52.82  | 0.59   | 3.05                |            |
| PGHW25HC  |                             |                |      |     |                          |     |                |    | 116   | 78.6           | 22.5           | 12   | 6              | 5              | M8  | 6   | 5              | 10             | 8    | 14             | 10             | 23                      | 22             | M6x12                          | 60  | 20                        | 42.2                     | 69.07  | 0.80   |                     |            |
| PGHW30CC  | 42                          | 6              | 31   | 90  | 67                       | 72  | 9              | 52 | 110   | 70             |                |      |                |                |     |     |                |                |      |                |                |                         |                |                                |     |                           | 48.5                     | 71.87  | 1.09   | 4.31                |            |
| PGHW30HC  |                             |                |      |     |                          |     |                |    | 133   | 93             | 23             | 12   | 6              | 5              | M10 | 6.5 | 10.8           | 16             | 8.5  | 16             | 10             | 28                      | 26             | M8x15                          | 80  | 20                        | 58.6                     | 93.99  | 1.44   |                     |            |
| PGHW35CC  | 48                          | 7.5            | 33   | 100 | 77                       | 82  | 9              | 62 | 123   | 80             |                |      |                |                |     |     |                |                |      |                |                |                         |                |                                |     |                           | 64.6                     | 93.88  | 1.56   | 6.14                |            |
| PGHW35HC  |                             |                |      |     |                          |     |                |    | 148.8 | 105.8          | 23.4           | 12   | 7              | 5              | M10 | 9   | 12.6           | 16.5           | 10.1 | 18             | 13             | 34                      | 29             | M8x17                          | 80  | 20                        | 77.9                     | 122.77 | 2.06   |                     |            |
| PGHW45CC  | 60                          | 9.5            | 37.5 | 120 | 91                       | 100 | 10             | 80 | 148   | 97             |                |      |                |                |     |     |                |                |      |                |                |                         |                |                                |     |                           | 103.8                    | 146.71 | 2.79   | 10.25               |            |
| PGHW45HC  |                             |                |      |     |                          |     |                |    | 179.8 | 128.8          | 24.5           | 12.9 | 10             | 8.5            | M12 | 8.5 | 20             | 20             | 15.1 | 22             | 15             | 45                      | 38             | M12x24                         | 105 | 22.5                      | 125.3                    | 191.85 | 3.69   |                     |            |
| PGHW55CC  | 70                          | 13             | 43.5 | 140 | 106                      | 116 | 12             | 95 | 172.7 | 117.7          |                |      |                |                |     |     |                |                |      |                |                |                         |                |                                |     |                           | 153.2                    | 211.23 | 4.52   | 14.92               |            |
| PGHW55HC  |                             |                |      |     |                          |     |                |    | 210.8 | 155.8          | 26             | 12.9 | 11             | 8.5            | M14 | 12  | 19             | 18.5           | 17.5 | 26.5           | 17             | 53                      | 44             | M14x25                         | 120 | 30                        | 184.9                    | 276.23 | 5.96   |                     |            |

Note: 1 kgf = 9.81N

# PG Type

## Positioning Guideway

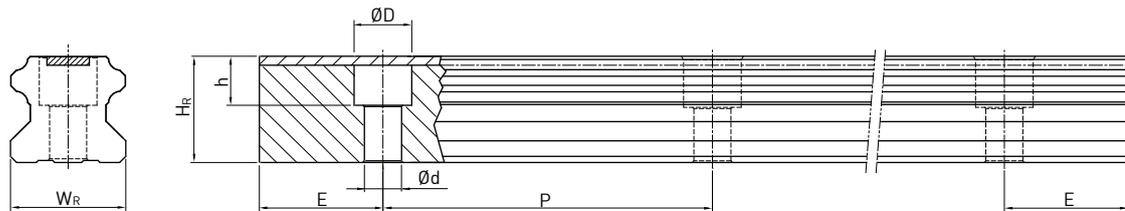
### (5) PGHL-CA / PGHL-HA



| Model No. | Dimensions of Assembly (mm) |                |      |     | Dimensions of Block (mm) |    |                |    |       |                |                |      |                |                |     |                |                |        |      |                | Dimensions of Rail (mm) |                                |     |      |        | Basic Dynamic Load Rating | Basic Static Load Rating | Weight              |    |
|-----------|-----------------------------|----------------|------|-----|--------------------------|----|----------------|----|-------|----------------|----------------|------|----------------|----------------|-----|----------------|----------------|--------|------|----------------|-------------------------|--------------------------------|-----|------|--------|---------------------------|--------------------------|---------------------|----|
|           | H                           | H <sub>1</sub> | N    | W   | W <sub>1</sub>           | B  | B <sub>1</sub> | C  | L     | L <sub>1</sub> | L <sub>2</sub> | G    | G <sub>1</sub> | D <sub>1</sub> | K   | K <sub>1</sub> | K <sub>2</sub> | Mxl    | T    | W <sub>R</sub> | H <sub>R</sub>          | M <sub>1</sub> xl <sub>1</sub> | P   | E    | C (kN) |                           |                          | C <sub>0</sub> (kN) | kg |
| PGHL25CA  | 36                          | 5.5            | 12.5 | 48  | 55.4                     | 35 | 6.5            | 35 | 95    | 58             | 22.5           | 12   | 6              | 5              | 6   | 9              | 14             | M6x6   | 8    | 23             | 22                      | M6x12                          | 60  | 20   | 34.9   | 52.82                     | 0.51                     | 3.05                |    |
| PGHL25HA  |                             |                |      |     |                          |    |                | 50 | 116   | 78.6           |                |      |                |                |     |                |                |        |      |                |                         |                                |     |      |        |                           |                          |                     |    |
| PGHL30CA  | 42                          | 6              | 16   | 60  | 67                       | 40 | 10             | 40 | 110   | 70             | 23             | 12   | 6              | 5              | 6.5 | 10.8           | 16             | M8x10  | 8.5  | 28             | 26                      | M8x15                          | 80  | 20   | 48.5   | 71.87                     | 0.88                     | 4.31                |    |
| PGHL30HA  |                             |                |      |     |                          |    |                | 60 | 133   | 93             |                |      |                |                |     |                |                |        |      |                |                         |                                |     |      |        |                           |                          |                     |    |
| PGHL35CA  | 48                          | 7.5            | 18   | 70  | 77                       | 50 | 10             | 50 | 123   | 80             | 23.4           | 12   | 7              | 5              | 9   | 12.6           | 16.5           | M8x12  | 10.2 | 34             | 29                      | M8x17                          | 80  | 20   | 64.6   | 93.88                     | 1.45                     | 6.14                |    |
| PGHL35HA  |                             |                |      |     |                          |    |                | 72 | 148.8 | 105.8          |                |      |                |                |     |                |                |        |      |                |                         |                                |     |      |        |                           |                          |                     |    |
| PGHL45CA  | 60                          | 9.5            | 20.5 | 86  | 91                       | 60 | 13             | 60 | 148   | 97             | 24.5           | 12.9 | 10             | 8.5            | 8.5 | 20.5           | 20.5           | M10x17 | 16   | 45             | 38                      | M12x24                         | 105 | 22.5 | 103.8  | 146.71                    | 2.73                     | 10.25               |    |
| PGHL45HA  |                             |                |      |     |                          |    |                | 80 | 179.8 | 128.8          |                |      |                |                |     |                |                |        |      |                |                         |                                |     |      |        |                           |                          |                     |    |
| PGHL55CA  | 70                          | 13             | 23.5 | 100 | 106                      | 75 | 12.5           | 75 | 172.7 | 117.7          | 26             | 12.9 | 11             | 8.5            | 12  | 19             | 18.5           | M12x18 | 17.5 | 53             | 44                      | M14x25                         | 120 | 30   | 153.2  | 211.23                    | 4.17                     | 14.92               |    |
| PGHL55HA  |                             |                |      |     |                          |    |                | 95 | 210.8 | 155.8          |                |      |                |                |     |                |                |        |      |                |                         |                                |     |      |        |                           |                          |                     |    |

Note: 1 kgf = 9.81N

(6) Dimensions for PGHR-R (Rail Mounting from Top)



| Model No. | Dimensions of Rail (mm) |      |     |     |    |     |      | Mounting Bolt for Rail | Weight |
|-----------|-------------------------|------|-----|-----|----|-----|------|------------------------|--------|
|           | WR                      | HR   | D   | h   | d  | P   | E    | (mm)                   | (kg/m) |
| PGH20R    | 20                      | 17.5 | 9.5 | 8.5 | 6  | 60  | 20   | M5×16                  | 2.05   |
| PGH25R    | 23                      | 22   | 11  | 9   | 7  | 60  | 20   | M6×20                  | 3.05   |
| PGH30R    | 28                      | 26   | 14  | 12  | 9  | 80  | 20   | M8×25                  | 4.31   |
| PGH35R    | 34                      | 29   | 14  | 12  | 9  | 80  | 20   | M8×25                  | 6.14   |
| PGH45R    | 45                      | 38   | 20  | 17  | 14 | 105 | 22.5 | M12×35                 | 10.25  |
| PGH55R    | 53                      | 44   | 23  | 20  | 16 | 120 | 30   | M14×45                 | 14.92  |

## SE Type Metallic End Cap

### 2-15 SE Type - Metal End Cap Linear Guideway

#### 2-15-1 General Information

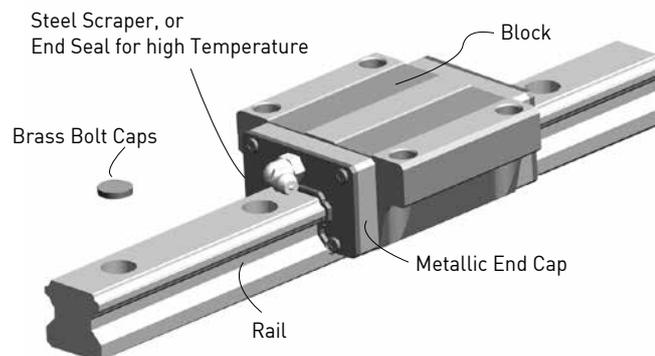
(1) Features

- Use of Metallic parts; (if end seal is needed, the high-temperature rubber in end seal is available).
- Excellent temperature resistance; service temperature under 150 °C.

(2) Applications

- Heat treatment equipment,
- Applications using vacuums (no vapor dispersion from plastic or rubber)
- Welding equipment.

#### 2-15-2 Structure



#### 2-15-3 Specification

(1) Add “/ SE” after the specification of linear guideway

Ex. HGW25CA2R1000Z0PII + ZZ / SE

#### 2-15-4 Dimensions of Bolt Cap

Table 2-15-1 Dimensions of Copper Bolt Cap

| Item | Bolt Size | Diameter (mm) |     | Item  | Bolt Size | Diameter (mm) |     |
|------|-----------|---------------|-----|-------|-----------|---------------|-----|
|      |           | D             | H   |       |           | D             | H   |
| C3-C | M3        | 6.15          | 1.2 | C8-C  | M8        | 14.15         | 3.5 |
| C4-C | M4        | 7.65          | 1.2 | C12-C | M12       | 20.15         | 4   |
| C5-C | M5        | 9.65          | 2.5 | C14-C | M14       | 23.15         | 4   |
| C6-C | M6        | 11.15         | 2.8 | C16-C | M16       | 26.15         | 4   |

Table 2-15-2 Dimensions of Stainless Bolt Cap

| Item | Bolt Size | Diameter (mm) |     | Item  | Bolt Size | Diameter (mm) |     |
|------|-----------|---------------|-----|-------|-----------|---------------|-----|
|      |           | D             | H   |       |           | D             | H   |
| C3-S | M3        | 6.15          | 1.2 | C8-S  | M8        | 14.22         | 3.5 |
| C4-S | M4        | 7.65          | 1.2 | C12-S | M12       | 20.25         | 4   |
| C5-S | M5        | 9.65          | 2.5 | C14-S | M14       | 23.25         | 4   |
| C6-S | M6        | 11.22         | 2.8 | C16-S | M16       | 26.20         | 4   |

## 2-16 Stainless Steel Linear Guideway

### 2-16-1 Features

**(1) Same features as standard linear guideway**

- Stiffness, Hardness, Service Life, Dimensions remain the same

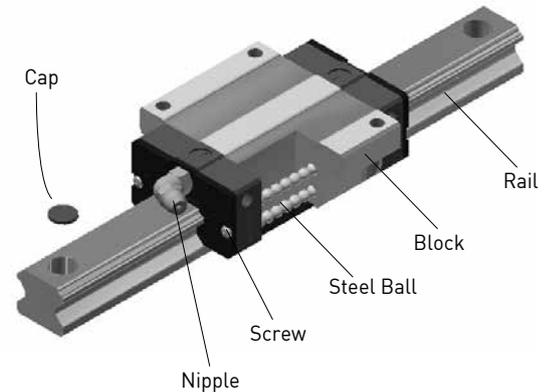
**(2) Suitable for specific extreme environments**

- With metal components, it can be used in low and medium vacuum environments

**(3) Great corrosion resistance**

-Block, Rail, Steel Balls, Grease nipple, Screws are all made of stainless steel material

Note: 1. Currently available in HG15C、HG20C、HG25C、EG15C  
 2. Maximum length available is 2000mm  
 3. Add "/M" after the specification of linear guideway  
 Ex. HGW25CA2R1600ZAPII /M



### 2-16-2 Suitable for below environments

- Chemicals
- Humid

### 2-16-3 Main Applications

- Food processing, transportation and storage
- Vacuum equipment
- Liquid and gas processing equipment
- Cleanroom equipment

| Salt Spray Test |                        |                  |
|-----------------|------------------------|------------------|
|                 | Stainless Steel Series | Regular Series   |
| Before          |                        |                  |
| After           |                        |                  |
| Result          | Slight Corrosion       | Severe Corrosion |

Note: Test conditions: -Salt Solution: 5 % NaCl  
 -Salt spray chamber temperature: 35°C±2°C  
 -Pressure: 1 bar

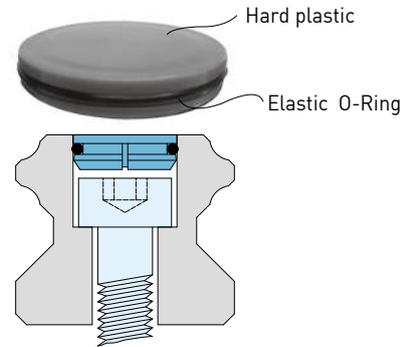
# RC Type

## Reinforced Cap

### 2-17 RC Type - Reinforced Cap

The RC Reinforced Cap consists of a piece of hard plastic and a piece of an elastic O-ring.

The hard plastic is made of synthetic resin which is characterized by oil resistance and abrasion resistance; the O-ring is made of rubber which is characterized by oil resistance and elasticity. The structure is shown on the illustration to the right.



#### 2-17-1 Features of the Reinforced Cap

**(1) Absorb the machining error**

The elastic O-ring can eliminate some of the machining error caused during the creation of the mounting holes by maintaining the tight fit between the cap and the mounting hole.

**(2) Vibration and shock resistance**

The elastic O-ring can prevent the cap from loosening by absorbing the vibrations caused by external forces acting on the guideways.

**(3) High performance dust protection**

The reinforced cap is designed with an elastic O-ring to contact the mounting hole perfectly by eliminating the clearance between the cap and the mounting hole resulting in excellent dust protection.

**(4) Service life prolongation**

The service life of the guideway increases due to the smoothness of the rail surface after installation of the Reinforced Cap preventing any damage to the end seals during operation.

#### 2-17-2 Specification

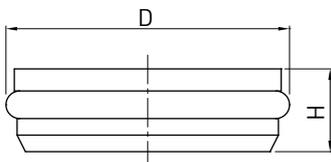
**(1) Non-interchangeable type - Add "+RC" after the specification of the linear guideway**

Ex. HGW25CC2R1600ZAPII+ZZ+RC

**(2) Interchangeable type -Add "+RC" after the specification of the linear guideway**

EX. HGR25R1600P +RC

#### 2-17-3 Dimensions of Reinforced Cap

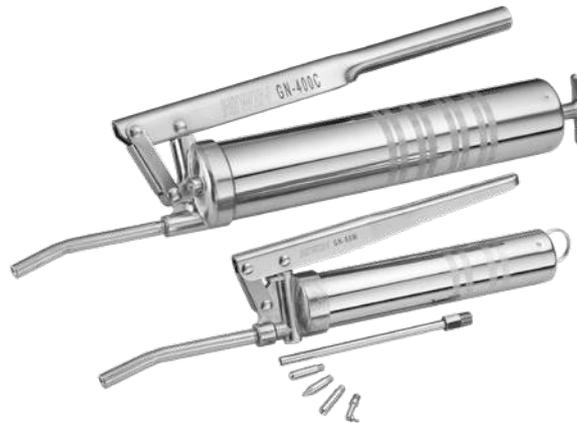


| Model Number | Bolt Size | Diameter (mm) |     | Rail size |         |            |      |        |        |
|--------------|-----------|---------------|-----|-----------|---------|------------|------|--------|--------|
|              |           | D             | H   | HGR       | EGR     | WER        | MGNR | RGR    | CRG    |
| RC3          | M3        | 6.15          | 1.3 |           | 15      |            |      | 12, 15 |        |
| RC4          | M4        | 7.65          | 1.1 | 15        | 15U     | 17, 21, 27 |      | 15     | 15     |
| RC5          | M5        | 9.8           | 3   | 20        | 20      |            |      | 20     | 20     |
| RC6          | M6        | 11.4          | 2.8 | 25        | 25, 30  | 35         |      | 25     | 25     |
| RC8          | M8        | 14.6          | 3.5 | 30, 35    | 35, 30U |            |      | 30, 35 | 30, 35 |
| RC12         | M12       | 20.5          | 4   | 45        |         |            |      | 45     |        |
| RC14         | M14       | 23.5          | 5   | 55        |         |            |      | 55     |        |
| RC16         | M16       | 26.6          | 5   | 65        |         |            |      | 65     |        |

## 2-18 Grease

### 2-18-1 Grease Gun Unit

HIWIN offers different capacities and packages for grease gun reload, depending on various requirements. The grease gun could not only be equipped with normal grease nozzle, but also be replaced with other nozzles for other kinds of grease nipples.



Grease Nipple : M6, PT1/8

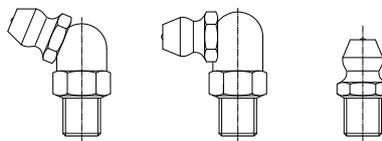


Table 2-18-1

| Model no. | GN-80M   | GN-400C   |
|-----------|--|---|
| Dimension |  |   |
| Spec.     | <ol style="list-style-type: none"> <li>Working pressure: 15 MPa</li> <li>Output: 0.5~0.6 c.c./Stroke</li> <li>Weight: 520 g (grease excluded)</li> <li>Grease reload: 70 g flexible tube or 120 ml bulk loading</li> </ol> | <ol style="list-style-type: none"> <li>Working pressure: 15 MPa</li> <li>Output: 0.8~0.9 c.c./Stroke</li> <li>Weight: 1150 g (grease excluded)</li> <li>Grease reload: 14 o.z. cartridge pipe or 400 ml bulk loading</li> </ol> |

## Grease

### 2-18-2 Grease Nozzle Kit (Model no. GNZ-05-BOX)

HIWIN grease nozzle kit with various nozzles offers grease reload for different kinds of grease nipples.

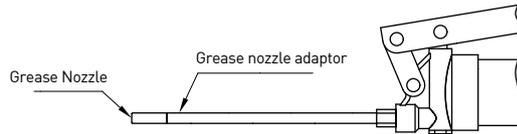


Table 2-18-2 Grease Nozzle Adaptor

| Model no.   | Dimensions |
|-------------|------------|
| GT-PT1/8-M5 |            |

Table 2-18-3 Grease Nozzle

| Model no. | Dimensions | Lubricating Type       |
|-----------|------------|------------------------|
| GNZ-L-M5  |            | Minimized grease hole  |
| GNZ-P-M5  |            | Minimized grease hole  |
| GNZ-R-M5  |            | Dent nipple (DIN3405)  |
| GNZ-C-M5  |            | Nipple (M3, M4 thread) |

## 2-18-3 Grease

HIWIN offers various lubricants for environment such as general type, heavy load, low particle emitting, high speed, etc. According to the ways of grease reload, choices for different capacities and packages of grease are available.

Packing :70g Flexible tube, 400g Pipe, 1kg Can

### ○ HIWIN G01 Grease of Heavy-loading

**Features:**

1. Excellent wear and pressure resistance under heavy load condition
2. Low friction in low temperatures
3. Water resistant
4. Available for central lubrication system

**Basic Properties :**

|                          |                 |     |
|--------------------------|-----------------|-----|
| Color                    | Light yellow    |     |
| Base Oil                 | Mineral oil     |     |
| Consistency Enhancer     | Polyurea        |     |
| Additive                 | Solid lubricant |     |
| Service Temperature (°C) | -15~115         |     |
| NLGI-grade (0.1mm)       | 310-340         |     |
| Viscosity (cst)          | 40°C            | 500 |
|                          | 100°C           | 30  |
| Drop Point (°C)          | > 170           |     |

### ○ HIWIN G02 Grease of Low Particle-emitting

**Features:**

1. Low particle emitting rate and suitable for clean room environment
2. Wear resistant
3. For long term usage and wide temperature range
4. Consisting of synthetic hydrocarbon oil and special calcium soap, also resistant to oxidation and corrosion

**Basic Properties:**

|                         |                           |     |
|-------------------------|---------------------------|-----|
| Color                   | Beige                     |     |
| Base Oil                | Synthetic hydrocarbon oil |     |
| Consistency Enhancer    | Special calcium soap      |     |
| Service Temperature(°C) | -30~140                   |     |
| NLGI-grade (0.1mm)      | 265-295                   |     |
| Viscosity (cst)         | 40°C                      | 100 |
|                         | 100°C                     | 15  |
| Drop Point (°C)         | > 180                     |     |

### ○ HIWIN G03 Grease of Low Particle-emitting (High Speed)

**Features:**

1. Low particle emitting rate and suitable for clean room environment
2. Wear resistant
3. For long term usage and wear resistance under high speed condition

**Basic Properties:**

|                          |                           |     |
|--------------------------|---------------------------|-----|
| Color                    | Beige                     |     |
| Base Oil                 | Synthetic hydrocarbon oil |     |
| Consistency Enhancer     | Special calcium soap      |     |
| Service Temperature (°C) | -45~125                   |     |
| NLGI-grade (0.1mm)       | 265-295                   |     |
| Viscosity (cst)          | 40°C                      | 30  |
|                          | 100°C                     | 5.9 |
| Drop Point(°C)           | > 210                     |     |

### ○ HIWIN G04 Grease of High Speed

**Features:**

1. Wear resistant under high speed condition
2. Low friction under high speed condition
3. Water resistant

**Basic Properties:**

|                          |              |    |
|--------------------------|--------------|----|
| Color                    | Beige        |    |
| Base Oil                 | Ester/PAO    |    |
| Consistency Enhancer     | Lithium soap |    |
| Service Temperature (°C) | -35~120      |    |
| NLGI-grade (0.1mm)       | 260-280      |    |
| Viscosity (cst)          | 40°C         | 25 |
|                          | 100°C        | 6  |
| Drop Point(°C)           | > 225        |    |

## Grease

### ○ HIWIN G05 Grease of General Type

**Features:**

1. Wear resistance
2. Low friction resistance
3. Long-life
4. Low oxidation tendency
5. Water resistant
6. Corrosion resistant

**Basic Properties:**

|                          |              |
|--------------------------|--------------|
| Color                    | Brown        |
| Base Oil                 | Mineral      |
| Consistency Enhancer     | Lithium Soap |
| Service Temperature [°C] | -15~120      |
| NLGI-grade (0.1mm)       | 270-285      |
| Viscosity (cst) 40°C     | 200          |
| Drop Point(°C)           | 190          |

### ○ HIWIN G07 Grease for Low Temperature Condition

**Features:**

1. For low temperature condition: -50°C to 0°C.
2. Low starting and running torques particularly at low temperatures

**Basic Properties:**

|                          |                       |
|--------------------------|-----------------------|
| Color                    | Beige                 |
| Base Oil                 | Mineral               |
| Consistency Enhancer     | Lithium- calcium soap |
| Service Temperature [°C] | -50~80                |
| NLGI-grade (0.1mm)       | 310-340               |
| Viscosity (cst) 40°C     | 14                    |
| 100°C                    | 3                     |

### ○ HIWIN G06 Grease for High Frequency or Short-stroke Condition

**Features:**

1. Well wear resistance under high frequency(1.5~3G) or short-stroke condition.
2. Long term grease, suitable for wide temperature range
3. Can be used in plastic/steel and plastic/ plastic components, compatible with elastomers and plastic materials

**Basic Properties:**

|                          |                      |
|--------------------------|----------------------|
| Color                    | Beige                |
| Base Oil                 | PAO                  |
| Consistency Enhancer     | Special lithium soap |
| Service Temperature [°C] | -45~130              |
| NLGI-grade (0.1mm)       | 265-295              |
| Viscosity (cst) 40°C     | 32                   |
| 100°C                    | 6                    |
| Drop Point(°C)           | 190                  |





## Linear Guideway Technical Information

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