

Hiwin Linear Guideways

HG Series (for Hiwin's EG Low Profile Series please visit our website www.tea.net.au to download data sheets)

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.

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.

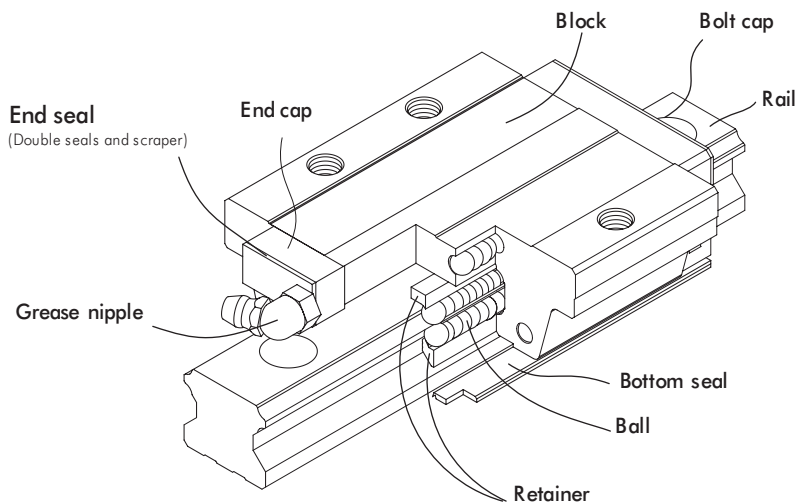
(2) Interchangeability

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.

Construction of HG Series



Rolling circulation system: Block, Rail, End Cap and Retainer

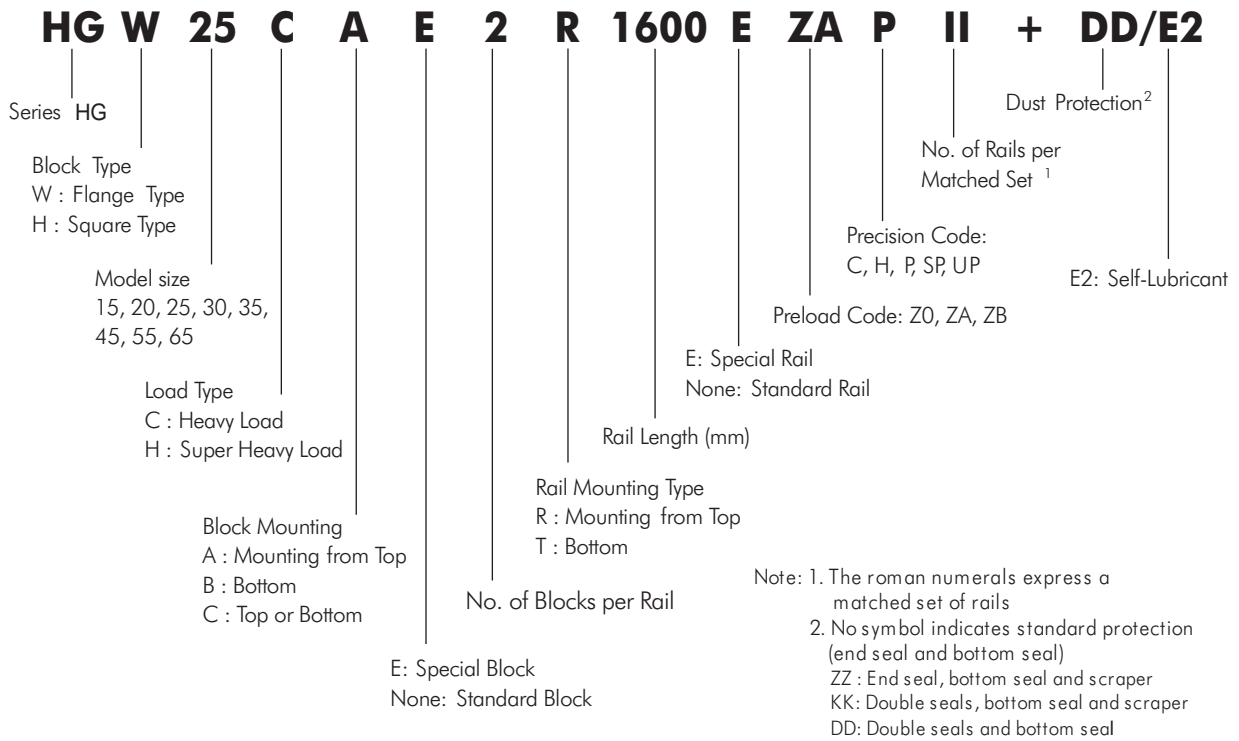
Lubrication system: Grease Nipple and Piping Joint

Dust protection system: End seal, Bottom Seal, Bolt Cap, Double Seals and Scraper

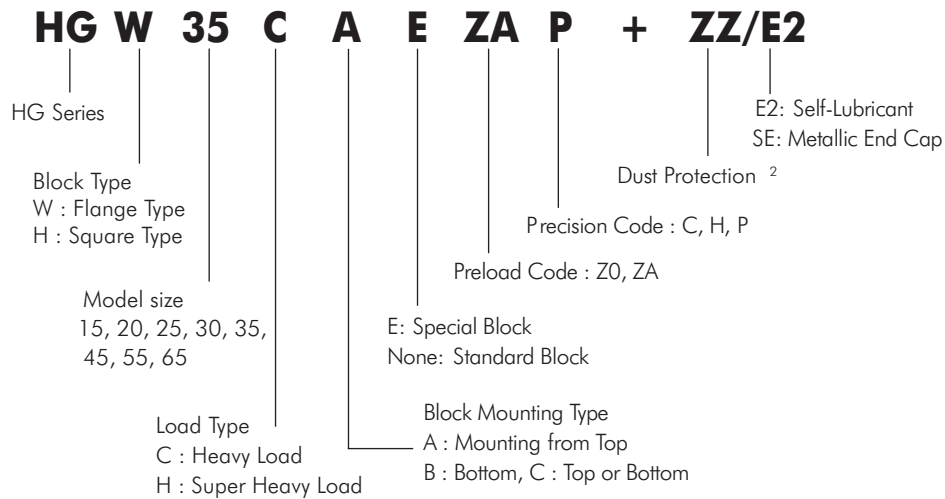
Part Numbers of HG Series

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..

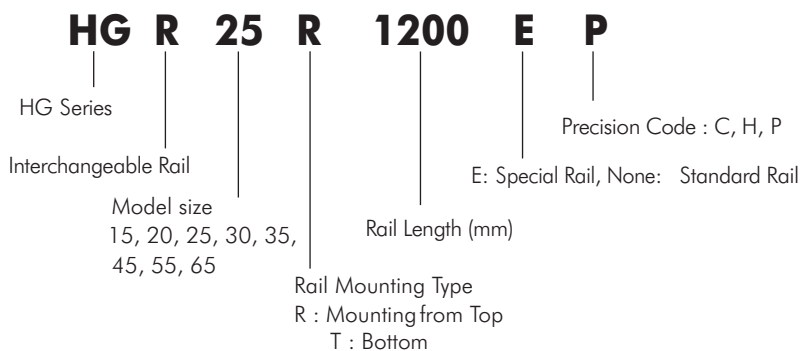
**Non-interchangeable type
Part Number of Hiwin HG Block**



**Interchangeable type
Part Number of Hiwin HG Block**



Part Number of Hiwin HG Rail



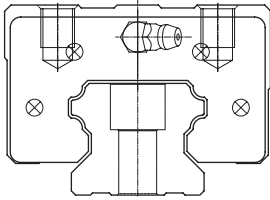
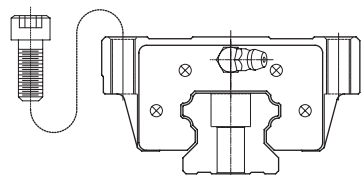
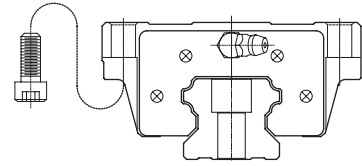
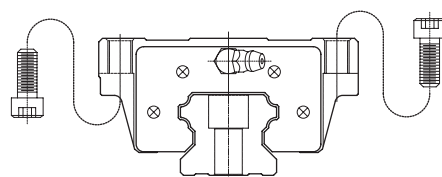
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Types

(1) Block types

HIWIN offers two types of linear guideway which are flange and square types. Because of the low assembly height and larger mounting surface, the flange type is suitable for heavy moment load application.

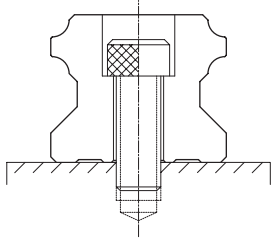
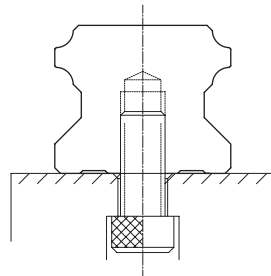
Table 2.4 Block Types

Type	Model	Shape	Height (mm)	Rail Length (mm)	Main Application
Square	HGH-CA		28	100	Machine Centers NCLathes Grinding Machines Precision Machining Machines Heavy Cutting Machines Automation Devices Transportation Equipment Measuring Equipment Devices Requiring High Positional Accuracy
	HGH-HA		90	4000	
Flange	HGW-CA		24	100	
	HGW-HA		90	4000	
	HGW-CB		24	100	
	HGW-HB		90	4000	
	HGW-CC		24	100	
	HGW-HC		90	4000	

(2) Rail types

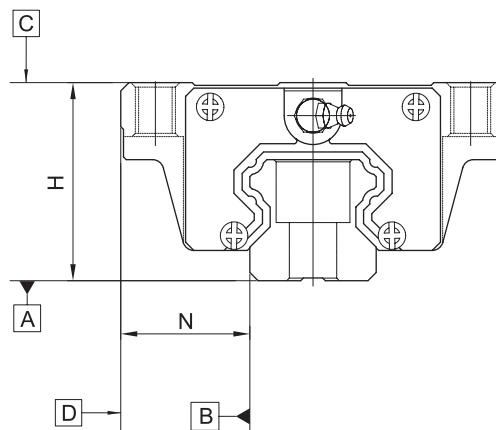
Besides the standard top mounting type, bottom mounting type of rails are also available.

Table 2.5 Rail Types

Mounting from Top - dimensions same tables as Blocks	Mounting from Bottom - see page 299 for dimensions
	

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

Table 2.6 Accuracy Standards

Unit: mm

Item	HG - 15, 20				
	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.03	0 - 0.03	0 - 0.015	0 - 0.008
Dimensional tolerance of width N	± 0.1	± 0.03	0 - 0.03	0 - 0.015	0 - 0.008
Variation of height H	0.02	0.01	0.006	0.004	0.003
Variation of width N	0.02	0.01	0.006	0.004	0.003
Running parallelism of block surface C to surface A	see Table 2.14				
Running parallelism of block surface D to surface B	see Table 2.14				

Table 2.7 Accuracy Standards

Unit: mm

Item	HG - 25, 30 35				
	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.04	0 - 0.04	0 - 0.02	0 - 0.01
Dimensional tolerance of width N	± 0.1	± 0.04	0 - 0.04	0 - 0.02	0 - 0.01
Variation of height H	0.02	0.015	0.007	0.005	0.003
Variation of width N	0.03	0.015	0.007	0.005	0.003
Running parallelism of block surface C to surface A	see Table 2.14				
Running parallelism of block surface D to surface B	see Table 2.14				

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Table 2.8 Accuracy Standards

Unit: mm

Item	HG - 45, 55				
	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.05	0 - 0.05	0 - 0.03	0 - 0.02
Dimensional tolerance of width N	± 0.1	± 0.05	0 - 0.05	0 - 0.03	0 - 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	s ee Table 2.14				
Running parallelism of block surface D to surface B	s ee Table 2.14				

Table 2.9 Accuracy Standards

Unit: mm

Item	HG - 65				
	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.07	0 - 0.07	0 - 0.05	0 - 0.03
Dimensional tolerance of width N	± 0.1	± 0.07	0 - 0.07	0 - 0.05	0 - 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	s ee Table 2.14				
Running parallelism of block surface D to surface B	s ee Table 2.14				

(2) Accuracy of interchangeable

Table 2.10 Accuracy Standards

Unit: mm

Item	HG - 15, 20		
	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	s ee Table 2.14		
Running parallelism of block surface D to surface B	s ee Table 2.14		

Table 2.11 Accuracy Standards

Unit: mm

Item	HG - 25, 30, 35		
	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	s ee Table 2.14		
Running parallelism of block surface D to surface B	s ee Table 2.14		

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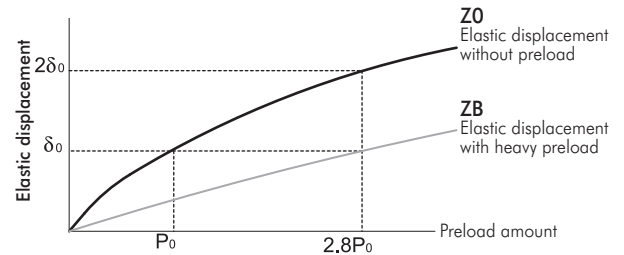
HG Series

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 not 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 2.15 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	0.05~0.07C	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

Note : 1. The C in preload column means basic dynamic load rating.

2. preload Classes of Interchangeable Guideway: Z0, ZA.

preload Classes of Non-Interchangeable Guideway: Z0, ZA, ZB

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Table 2.12 Accuracy Standards

Unit: mm

Item	HG - 45, 55		
	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.05	± 0.025
Dimensional tolerance of width N	± 0.1	± 0.05	± 0.025
Variation of height H	0.03	0.015	0.007
Variation of width N	0.03	0.02	0.01
Running parallelism of block surface C to surface A	see Table 2.14		
Running parallelism of block surface D to surface B	see Table 2.14		

Table 2.13 Accuracy Standards

Unit: mm

Item	HG - 65		
	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.07	± 0.035
Dimensional tolerance of width N	± 0.1	± 0.07	± 0.035
Variation of height H	0.03	0.02	0.01
Variation of width N	0.03	0.025	0.015
Running parallelism of block surface C to surface A	see Table 2.14		
Running parallelism of block surface D to surface B	see Table 2.14		

(3) Accuracy of running parallelism

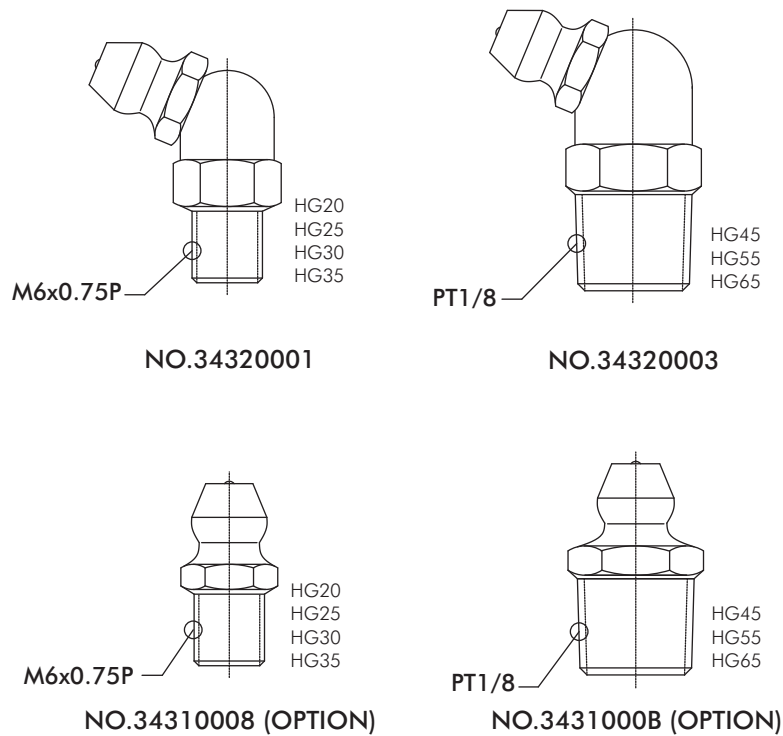
Table 2.14 Accuracy of Running Parallelism

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

2-1-7 Lubrication

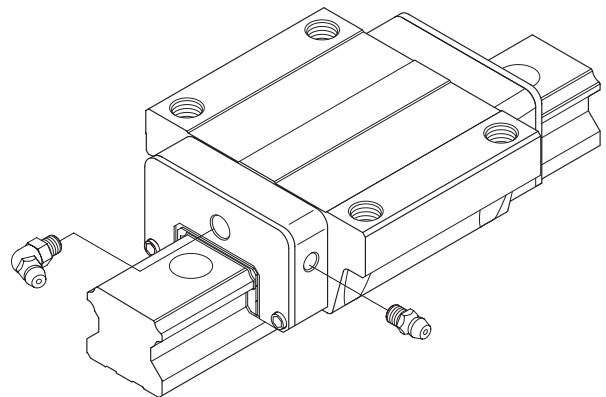
(1) Grease

Grease nipple



Mounting location

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



The lubricant amount for a block filled with grease

Table 2.16 The lubricant Amount for a Block Filled with Grease

Size	Heavy load (cm ³)	Super heavy load (cm ³)	Size	Heavy load (cm ³)	Super heavy load (cm ³)
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.

All dimensions are in mm.

All dimensions are subject to change without notice.

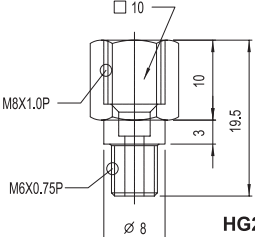
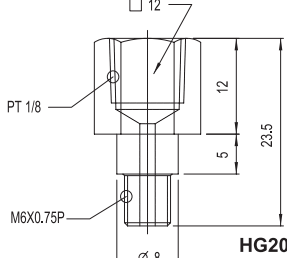
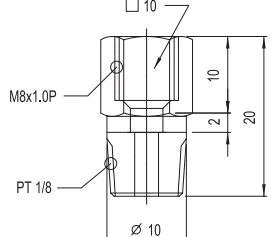
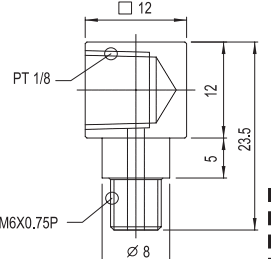
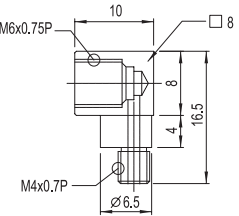
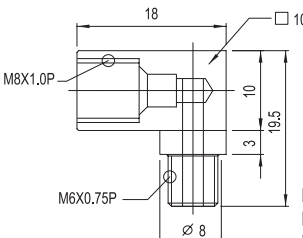
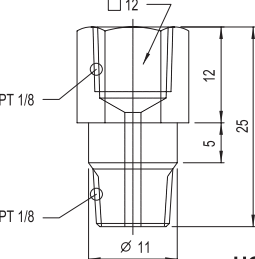
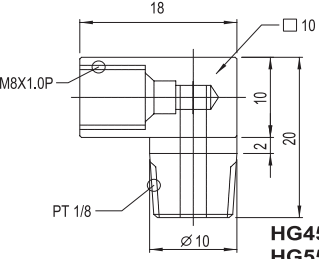
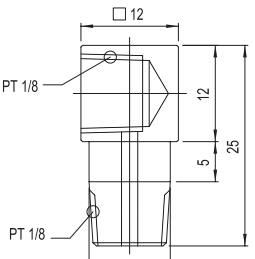
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(2) Oil

The recommended viscosity of oil is about 30~150cSt. If customers need to use oil-type lubrication, please inform us, and the block will not be prelubricated with grease before shipment.

Types of oil piping joint

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

Oil refilling rate

Table 2.17

Size	Refilling rate (cm ³ /hr)	Size	Refilling rate (cm ³ /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

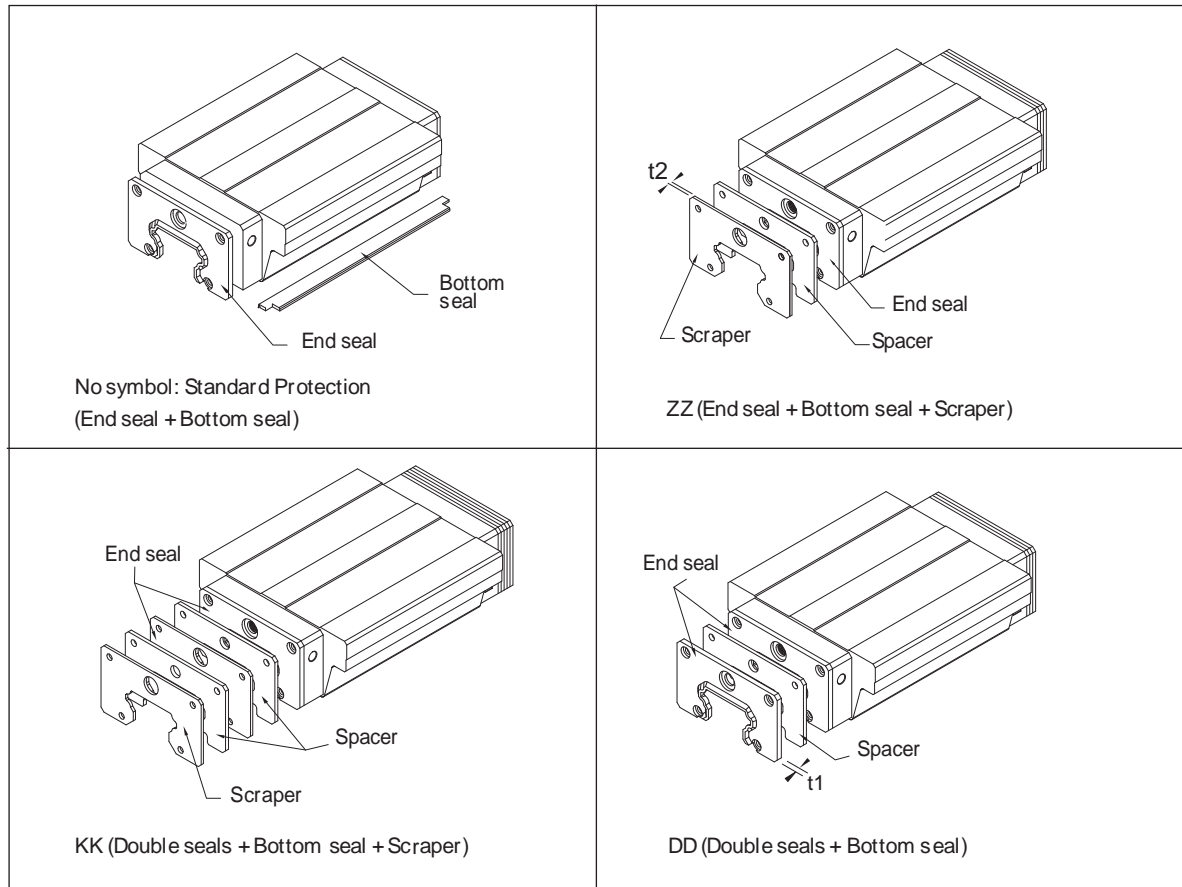
All dimensions are in mm.

All dimensions are subject to change without notice.

Dust Proof Accessories

(1) Codes of accessories

If the following accessories are needed, please add 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

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

Table 2.18 Dimensions of end seal

Size	Thickness (t1) (mm)	Size	Thickness (t1) (mm)
HG15 ES	3	HG35 ES	3.2
HG20 ES	3	HG45 ES	4.5
HG25 ES	3	HG55 ES	5
HG30 ES	3.2	HG65 ES	5

(4) Scraper

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

Table 2.19 Dimensions of scraper

Size	Thickness (t2) (mm)	Size	Thickness (t2) (mm)
HG15 SC	1.5	HG35 SC	1.5
HG20 SC	1.5	HG45 SC	1.5
HG25 SC	1.5	HG55 SC	1.7
HG30 SC	1.5	HG65 SC	1.7

All dimensions are in mm.

All dimensions are subject to change without notice.

