

## Assembly Instructions

Linear Guideways



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General information

## 1. General information

### 1.1 About these assembly instructions

These assembly instructions are intended for planners, developers and operators of systems who plan for and install linear guideways as machine elements. They are also intended for persons who perform the following tasks:

- Transportation
- Assembly
- Retrofitting or upgrading
- Setup
- Commissioning
- Operation
- Cleaning
- Maintenance
- Troubleshooting and error elimination
- Shutdown, disassembly and disposal

#### 1.1.1 Version management

Table 1.1 Version management

Version	Date	Notes
03-1	September 2018	Update
03-0	July 2017	Complete revision of document; addition of CG and QW series; taking out of MG-0 series
02-5	January 2017	Update
02-4	May 2015	Update
02-3	January 2015	Update
02-2	October 2014	Change of TM → PM, addition in Chapter „lubrication“
02-1	July 2014	Update of Chapter „Lubrication“
02-0	June 2014	Revision of Chapter „Lubrication“
01-0	March 2014	Initial creation of this document

#### 1.1.2 Requirements

We assume that

- operating personnel are trained in the safe operation practices for HIWIN linear guideways and have read and understood these assembly instructions in full;
- maintenance personnel maintain and repair the HIWIN linear guideways in such a way that they pose no danger to people, property or the environment.

#### 1.1.3 Availability

These assembly instructions must remain constantly available to all persons who work with or on the HIWIN linear guideways.

### 1.2 Depictions used in these assembly instructions

#### 1.2.1 Instructions

Instructions are indicated by triangular bullet points in the order in which they are to be carried out. Results of the actions carried out are indicated by ticks.

Example:

- ▶ Place an eligible press-in block upright on the cap. With a plastic hammer hit in the bolt cap through a central blow to the press-in block. If the cap is not yet fully pressed in, repeat the procedure until the cap is flush with the rail top.
- ▶ With plastic bolt caps a burr may form during pressing in. Remove this burr.
- ✓ Bolt cap has now been mounted.

#### 1.2.2 Lists

Lists are indicated by bullet points.

Example:

Lubricants

- reduce wear
- protect against dirt
- ...

#### 1.2.3 Depiction of safety notices

Safety notices are always indicated using a signal word and sometimes also a symbol for the specific risk (see Section [1.2.4](#), "Symbols used").

The following signal words and risk levels are used:

 <b>DANGER!</b>
<b>Imminent danger!</b> Noncompliance with the safety notices will result in serious injury or death!
 <b>WARNING!</b>
<b>Potentially dangerous situation!</b> Noncompliance with the safety notices runs the risk of serious injury or death!
 <b>CAUTION!</b>
<b>Potentially dangerous situation!</b> Noncompliance with the safety notices runs the risk of slight to moderate injury!
<b>ATTENTION!</b>
<b>Potentially dangerous situation!</b> Noncompliance with the safety notices runs the risk of damage to property or environmental pollution!

General information

### 1.2.4 Symbols used

The following symbols are used in these assembly instructions:

Table 1.2 **Warning signs**





	Warning of crushing!		Warning of dangerous electrical voltage!
	Warning of danger from suspended loads!		Substance hazardous to the environment!

Table 1.3 **Mandatory signs**

	Wear protective gloves!
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### 1.2.5 Information

**NOTE**

Describes general information and recommendations.

### 1.3 Warranty and liability

The manufacturer's "General conditions of sale and delivery" apply.

### 1.4 Manufacturer's details

Table 1.4 **Manufacturer's details**

<b>Address</b>	HIWIN GmbH Brücklesbünd 2 D-77654 Offenburg
<b>Phone</b>	+49 (0) 781 / 9 32 78 - 0
<b>Technical customer service</b>	+49 (0) 781 / 9 32 78 - 77
<b>Fax</b>	+49 (0) 781 / 9 32 78 - 90
<b>Technical customer service fax</b>	+49 (0) 781 / 9 32 78 - 97
<b>E-mail</b>	support@hiwin.de
<b>Website</b>	www.hiwin.de

### 1.5 Copyright

These assembly instructions are protected by copyright. Any reproduction, publication in whole or in part, modification or abridgement requires the written approval of HIWIN GmbH.

### 1.6 Product monitoring

Please inform HIWIN, the manufacturer of the linear guideways of:

- Accidents
- Potential sources of danger in the linear guideways
- Anything in these assembly instructions which is difficult to understand

## 2. Basic safety notices

### **WARNING!**

This chapter serves to ensure the safety of everyone working with the linear guideways and those who assemble, install, operate, maintain or disassemble them. Non-compliance with the following information results in dangerous working conditions.

### 2.1 Intended use

The linear guideway is a linear guidance element that is used inside a machine or an automated system to guide a linear movement.

The linear guideways are designed for installation and operation in horizontal and vertical positions. In the case of vertical assembly, a suitable clamping or braking device must be provided in order to prevent unintended lowering of the load. The linear guideways may only be used for the intended purpose as described.

### 2.2 Exclusion of liability in the event of alterations or improper use

No alterations may be made to the linear guideways that are not described in these assembly instructions. If it is necessary to alter the design, please contact the manufacturer.

In the event of alterations or improper assembly, installation, commissioning, operation, maintenance or repair, the manufacturer shall assume no liability.

Only original parts from HIWIN may be used as spare parts and accessories. Spare parts and accessories not supplied by HIWIN are not tested for operation with HIWIN linear guideways and may compromise operational safety. The manufacturer shall accept no liability for damage caused as a result of using non-approved spare parts and accessories.

### 2.3 Qualified personnel

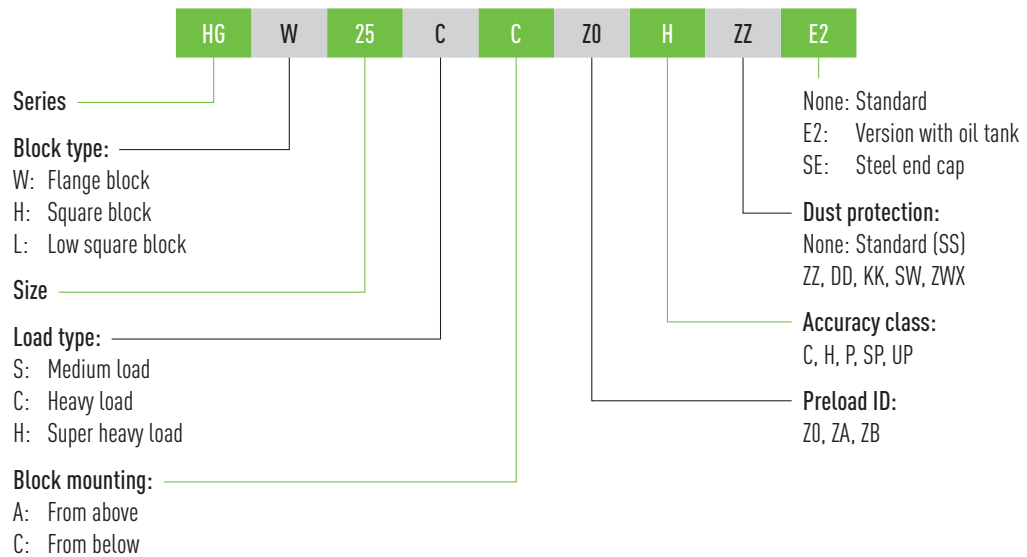
The linear guideways may only be assembled, integrated into higher-level systems, commissioned, operated and maintained by qualified personnel. Qualified personnel are those who:

- have received appropriate technical training  
and
- have received training from the machine operator concerning machine operation and the applicable safety guidelines,  
and can assess the risks to be expected  
and
- have read and understood these assembly instructions in their entirety and have access to them at all times.

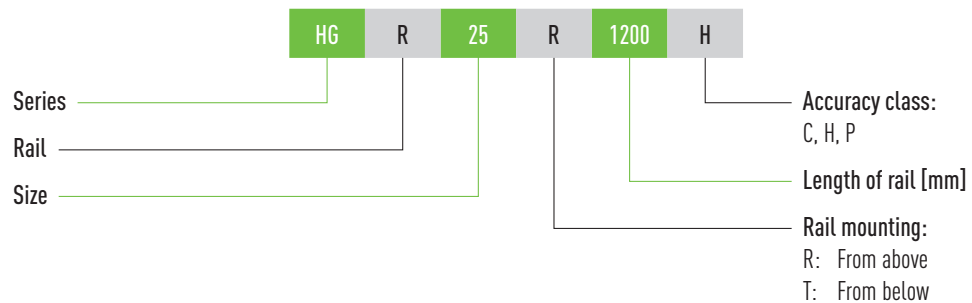
### 3. Product descriptions

#### 3.1 Order code of the linear guideways

##### 3.1.1 Order code for block (unmounted)

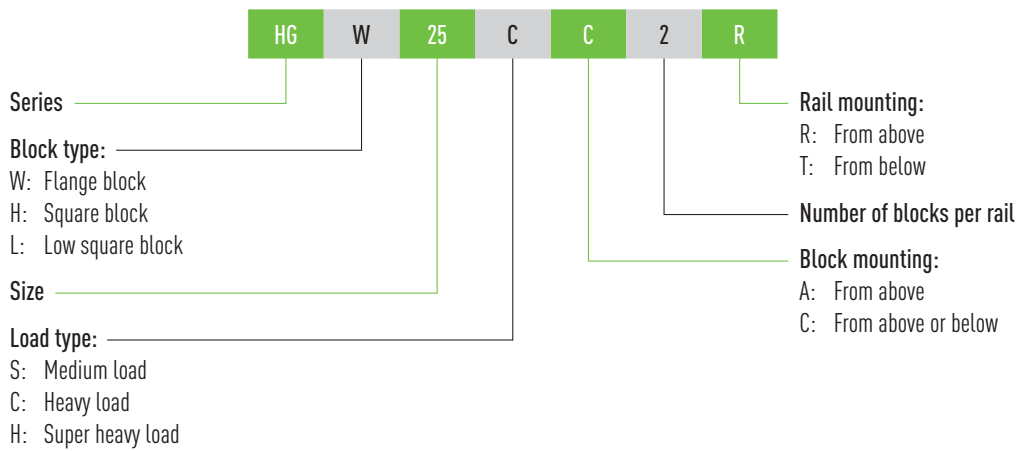


##### 3.1.2 Order code for rail (unmounted)

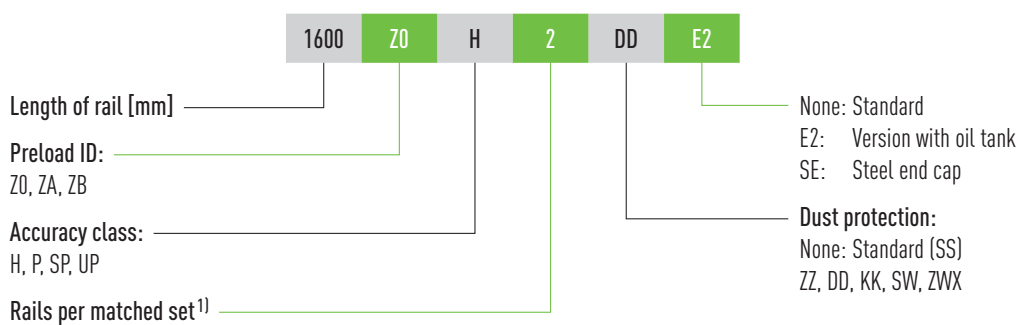




### 3.1.3 Order code for linear guideway (fully assembled)



### Order code for linear guideway (fully assembled) – continuation



Note:

<sup>1)</sup> The figure 2 is also a quantity statement, i.e. a part of the article described above consists of a pair of rails.

No figures are provided for individual linear guideways. By default multi-part rails are delivered with staggered butt joints.

Product descriptions

### 3.2 Design and function of the linear guideway

A linear guideway essentially consists of rails, blocks and the rolling elements located between the blocks and rails. The rolling elements rotate inside the blocks in a closed circuit. The block is guided along the rails by the rotating rolling elements. This mostly generates rolling friction and hardly any sliding friction. The friction coefficient thus amounts to around a fiftieth of that produced by conventional sliding guides. HIWIN linear guideways are designed so that they can bear loads from all directions.

### 3.3 Tolerances depending on accuracy class

Linear guideways are offered in different accuracy classes depending on the parallelism between block and rail, the height accuracy H and the accuracy of width N.

Five accuracy classes are available for the HG, QH, EG, QE, CG, WE, QW, RG and QR series and three for the MG series. The choice of accuracy class is determined by the machine requirements.

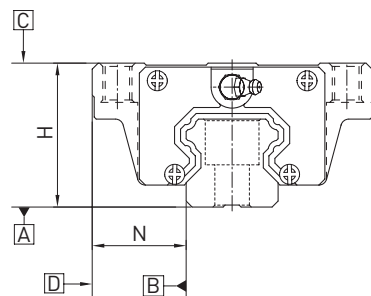


Fig. 3.1 Tolerances of the HG, QH, EG, QE, CG, WE, QW, RG and QR series

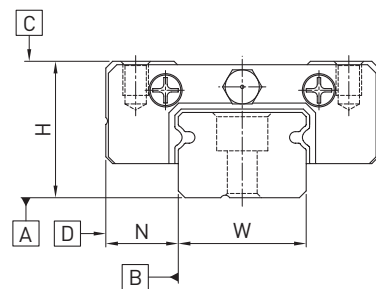


Fig. 3.2 Tolerances of the MG series

### 3.3.3.1 Parallelism

Parallelism of stop surfaces D and B of block and rail and parallelism of top of block C to mounting surface A of rail. Ideal linear guideway installation is required, as is a measurement in the centre of the block.

Table 3.1 Tolerance of parallelism between block and rail – HG, QH, EG, QE, CG, WE, QW, RG and QR series

Rail length [mm]	Accuracy class				
	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

Unit:  $\mu\text{m}$

Table 3.2 Tolerance of parallelism between block and rail – MG series

Rail length [mm]	Accuracy class		
	C	H	P
– 50	12	6	2.0
50 – 80	13	7	3.0
80 – 125	14	8	3.5
125 – 200	15	9	4.0
200 – 250	16	10	5.0
250 – 315	17	11	5.0
315 – 400	18	11	6.0
400 – 500	19	12	6.0
500 – 630	20	13	7.0
630 – 800	22	14	8.0
800 – 1.000	23	16	9.0
1.000 – 1.200	25	18	11.0

Unit:  $\mu\text{m}$

Product descriptions

**3.3.1 Accuracy – height and width**

**Height tolerance of H:** Permissible absolute dimension variance of height H, measured between centre of screw-on surface C and underside of rail A, with block in any position on the rail.

**Height variance of H:** Permissible variance of height H between several blocks on a rail, measured in the same rail position.

**Width tolerance of N:** Permissible absolute dimension variance of width N, measured between centre of screw-on surfaces D and B, with block in any position on the rail.

**Width variance of N:** Permissible variance of width N between several blocks on a rail, measured in the same rail position.

Table 3.3 Height and width tolerances – HG, QH, EG, QE, CG, WE, QW, RG and QR series

Size	Accuracy class	Height tolerance of H (T <sub>H</sub> )	Width tolerance of N	Height variance of H	Width variance of N
15, 17, 20, 21	C (Normal)	± 0.1	± 0.1	0.02	0.02
	H (High)	± 0.03	± 0.03	0.01	0.01
	P (Precision)	0/– 0.03 <sup>1)</sup> ± 0.015 <sup>2)</sup>	0/– 0.03 <sup>1)</sup> ± 0.015 <sup>2)</sup>	0.006	0.006
	SP (Super precision)	0/– 0.015	0/– 0.015	0.004	0.004
	UP (Ultra precision)	0/– 0.008	0/– 0.008	0.003	0.003
25, 27, 30, 35	C (Normal)	± 0.1	± 0.1	0.02	0.03
	H (High)	± 0.04	± 0.04	0.015	0.015
	P (Precision)	0/– 0.04 <sup>1)</sup> ± 0.02 <sup>2)</sup>	0/– 0.04 <sup>1)</sup> ± 0.02 <sup>2)</sup>	0.007	0.007
	SP (Super precision)	0/– 0.02	0/– 0.02	0.005	0.005
	UP (Ultra precision)	0/– 0.01	0/– 0.01	0.003	0.003
45, 50, 55	C (Normal)	± 0.1	± 0.1	0.03	0.03
	H (High)	± 0.05	± 0.05	0.015	0.02
	P (Precision)	0/– 0.05 <sup>1)</sup> ± 0.025 <sup>2)</sup>	0/– 0.05 <sup>1)</sup> ± 0.025 <sup>2)</sup>	0.007	0.01
	SP (Super precision)	0/– 0.03	0/– 0.03	0.005	0.007
	UP (Ultra precision)	0/– 0.02	0/– 0.02	0.003	0.005
65	C (Normal)	± 0.1	± 0.1	0.03	0.03
	H (High)	± 0.07	± 0.07	0.02	0.025
	P (Precision)	0/– 0.07 <sup>1)</sup> ± 0.035 <sup>2)</sup>	0/– 0.07 <sup>1)</sup> ± 0.035 <sup>2)</sup>	0.01	0.015
	SP (Super precision)	0/– 0.05	0/– 0.05	0.007	0.01
	UP (Ultra precision)	0/– 0.03	0/– 0.03	0.005	0.007

Unit: mm

<sup>1)</sup> Fully assembled linear guideway

<sup>2)</sup> Unmounted linear guideway

Table 3.4 Height and width tolerances – MG series

Size	Accuracy class	Height tolerance of H	Width tolerance of N	Height variance of H	Width variance of N
05, 07, 09, 12, 15	C (Normal)	± 0.04	± 0.04	0.03	0.03
	H (High)	± 0.02	± 0.025	0.015	0.02
	P (Precision)	± 0.01	± 0.015	0.007	0.01

Unit: mm

## 4. Transport and installation

### 4.1 Delivery

#### 4.1.1 Delivery state

The following delivery states are possible for linear guideways:

- Fully assembled: blocks are already mounted on the rail
- Unmounted: Blocks and rails are supplied separately

#### 4.1.2 Scope of delivery

The contents of delivery vary depending on the ordered model, accessories, and options.

### 4.2 Transport to the installation site

#### **WARNING!**



##### **Danger from suspended loads or falling parts!!**

Lifting heavy loads may damage your health!

- ▶ Only qualified personnel may assemble, install, and service the linear guideways!
- ▶ Note the mass when transporting the parts. Use suitable hoisting gear!
- ▶ Observe the applicable occupational health and safety regulations when handling suspended loads!
- ▶ Before transport, secure the linear guideways against tilting!

#### **CAUTION!**



##### **Danger of impacts and crushing!**

If no transportation safety device is used, the block can move uncontrolled on the profile rail and cause injuries.

- ▶ Only remove transportation safety device upon assembly!

#### **ATTENTION!**

##### **Risk of material damage!**

Deflection during transport impairs the function and accuracy of the linear guideways.

- ▶ Support long linear guideways during transport at several points!

The linear guideways are precision products and must be treated with care. Impacts of any kind may damage the product. The result may be compromised running precision and service life. Transport the packaged linear guideway as close as possible to its installation site. Remove the packaging at this site only.

#### 4.2.1 Ambient conditions

Ambient temperature	+ 5 °C to + 40 °C
Installation site	flat, dry, vibration-free
Atmosphere	not corrosive, not explosive

#### 4.2.2 Safety equipment to be provided by the operator

Possible safety equipment/measures:

- Personal protective equipment in accordance with UW (German accident prevention regulations)
- Zero-contact protective equipment
- Mechanical protective equipment

Transport and installation

**4.3 Storage**

- ▶ Store the linear guideways in their transport packaging.
- ▶ Only store the linear guideways in dry, frost-free areas with a corrosion-free atmosphere.
- ▶ Clean and protect used linear guideways axis systems before storage.

**4.4 Unpacking and installing**

**ATTENTION!**



**Warning! Health and environmental hazards!**

Contact with lubricants may cause irritation, poisoning, allergic reactions, and damage to the environment.

- ▶ Use only suitable, non-hazardous agents. Note the manufacturer's safety data sheets!
- ▶ Ensure proper disposal!

**4.6 Unpacking and installing**

In order to avoid damaging the linear guideway, the following procedures must be adhered to.

- ▶ Only remove transport packaging directly before assembly.
- ▶ Only remove the transportation safety device from the block directly before assembly of the rail. Once the transportation safety device has been removed, keep the rail as horizontal as possible, since otherwise the blocks may run on the rail in an uncontrolled manner.
- ▶ Linear guideways are high-precision, largely backlash-free guides. The following assembly instructions must be adhered to. Incorrectly installed linear guideways lead to tensions which may cause premature failure of the guides.
- ▶ During installation, ensure that dirt does not accumulate on the rail. Chippings and other contaminants can be removed using petroleum, thin oil or white spirit. Paint solvents and cold cleaning solvents damage the linear guideways and should not be used.

**4.5 Further information**

If you have any questions, please contact our sales organisation:

Phone: +49 (0) 781 / 9 32 78-0

Fax: +49 (0) 781 / 9 32 78-90

If you have questions, suggestions or corrections concerning the documentation, please send a fax to the following number:

+49 (0) 781 / 9 32 78-90

### 5. Assembly

#### **⚠ DANGER!**



##### **Danger from electrical voltage!**

Before and during assembly, disassembly and repair work, dangerous currents may flow.

- ▶ Work may only be carried out by a qualified electrician and with the power supply disconnected!
- ▶ Before working, disconnect the higher-level system from the power supply, and secure it against restarting!

#### **⚠ WARNING!**

##### **Danger of injury!**

- ▶ During assembly and disassembly, the linear guideway must be transported horizontally. If this is not possible, a suitable holding device must be installed to prevent the mounted blocks from coming off the rail!
- ▶ For long linear guideways, a hoist may be used for assembly!

#### 5.1 Assembly of the profile rail

The specific configuration of the tracks ensures that a linear guideway can bear loads from all directions. The mounting position depends on the requirements of the machine and the loading direction. The precision of the rails is defined by the straightness and evenness of the installation surfaces, since the rail is attached to these while the screws are being tightened. Rails that are not attached to an installation surface may have larger tolerances in terms of straightness.

##### 5.1.1 Identification of the reference edge of rails and blocks

The reference edge of the rail is identified by arrows on the top of the rail. For very short rails, the datum plane is identified by an arrow on the front side of the rail.

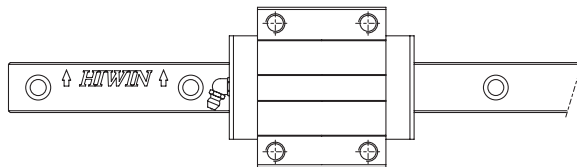


Fig. 5.1 Identification of the reference edge of a rail

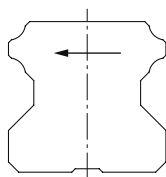


Fig. 5.2 Identification of the reference edge of a short rail and of a series PG rail

The reference edge of the block is the smooth ground lateral surface.

**NOTE**

### 5.1.2 Procedure for the assembly of a profile rail

#### a) Cleaning the mounting surface

- Before beginning assembly, remove all dirt from the mounting surface of the machine. Mounting holes and reference edges must be free of burrs. If necessary, remove burrs using an oil stone.

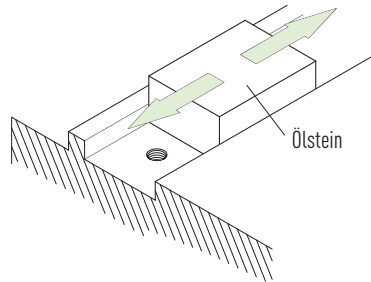


Fig. 5.3 Cleaning the mounting surface

#### b) Assembling the profile rail

- Place the rail carefully on the bed and align it with the reference edge. This ensures that the rail is installed flush on the reference edge. When adjusting the rail, ensure correct thread engagement when inserting a bolt into the mounting hole.

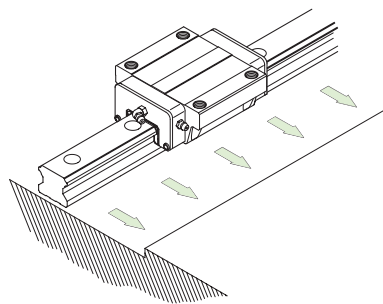


Fig. 5.4 Aligning with the reference edge

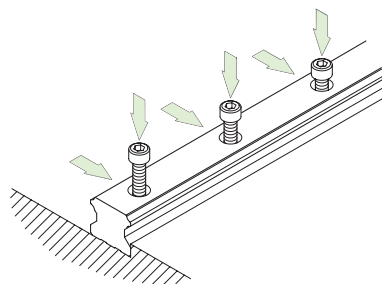


Fig. 5.6 Adjusting the rail on the bed and assembly of the screws

- If using push screws, tighten them one after another in order to ensure good contact between the rail and the reference edge.

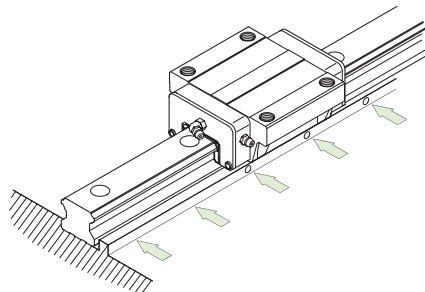


Fig. 5.5 Tightening the push screws

- Screw in the retaining bolts in three stages using a torque wrench until the specified torque is reached. A list of the optimum tightening torques for the screws can be found in Section 5.4.
- When using a pair of rails, assemble the second rail in the same way as the first.
- In this case, the permissible tolerances of the mounting surfaces and assembly deviations of the corresponding series must be adhered to (see Section 5.3, mounting tolerances of the particular series).

- ✓ The profile rail has now been assembled.



### 5.1.3 Mounting the bolt caps/cover strip

To protect the sealing lips of the seals, mounting holes in the rails (R-rails, mounting from above) must be closed with bolt caps or with a cover strip.

Before mounting the bolt caps/the cover strip the linear guideways must be assembled and fixed according to the descriptions in Section 5.1.2.

#### Bolt caps:

Depending on the ambient and operating conditions bolt caps made of plastic, steel or brass are used. Plastic bolt caps have to be mounted as described in Section 5.1.3.1. The steel and brass bolt caps are pressed into the mounting hole using an assembly tool as described in Section 5.1.3.2.

#### Cover strip:

In order to close the mounting holes, a cover strip is available as an alternative to the bolt caps for the CG series. The cover strip is mounted as described in Section 5.1.4.

#### 5.1.3.1 Mounting of plastic bolt caps

- Place the plastic bolt cap centrally on the bore. Ensure parallelism between the top of the rail and the top of the bolt cap.

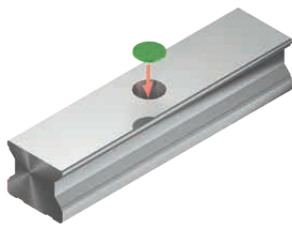


Fig. 5.7 Positioning of the plastic bolt cap

- Place an eligible press-in block upright on the cap. With a plastic hammer hit in the bolt cap through a central blow to the press-in block. If the cap is not yet fully pressed in, repeat the procedure until the cap is flush with the rail top.
  - With plastic bolt caps a burr may form during pressing in. Remove this burr.
- ✓ The plastic bolt cap has been mounted.

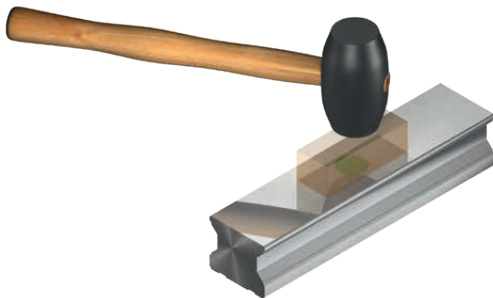


Fig. 5.8 Pressing in of the plastic bolt cap with the help of a press-in block

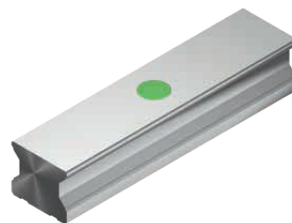


Fig. 5.9 Fully assembled plastic bolt cap

Assembly

**5.1.3.2 Mounting of steel and brass bolt caps**

- Place the steel or brass bolt cap centrally on the bore. Ensure parallelism between the top of the rail and the top of the bolt cap.



Fig. 5.10 Positioning of the steel or brass bolt cap

- Bring the press-in piston [1] into the upper end position by loosening the screw [2]. Push the assembly tool from the front side onto the rail, and position with the press-in piston centered over the bore or the bolt cap.



Fig. 5.11 Positioning of the assembly tool on the rail

- By tightening the screw [2] extend the press-in piston [1] until it is seated on the cap and a resistance is noticeable when tightening the screw. Before the actual pressing in of the cap, make sure that the cap is not jammed. Then by further tightening the screw [2] press in the bolt cap until the press-in piston sits on the rail. The required torque for pressing the caps is dependent on several factors and can vary greatly. Please note the maximum values specified in [Table 5.2](#).

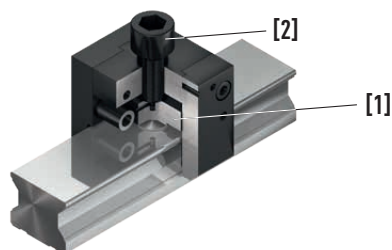


Fig. 5.12 Pressing in of the bolt cap by tightening the screw [2]

- ▶ After pressing in the bolt cap loosen the screw [2] and shift assembly tool as far as that the pressing process can be verified. If the cap is not yet fully pressed in, repeat the procedure until the cap is flush with the upper side of the rail. In brass bolt caps, a burr may form during the process of pressing. Remove this burr using an oil stone.

- ✓ The steel or brass bolt cap has been mounted.



Fig. 5.13 Fully assembled steel or brass bolt cap

Table 5.1 Article numbers for the assembly tool

Series/size	Article number
HG15	5-002519
HG20	5-000915
HG25	5-000916
HG30	5-000917
HG35	5-000918
HG45	5-000919
HG55	5-000920
HG65	5-000921
RG25	12-000309
RG30	12-000310
RG35	12-000311
RG45	12-000312
RG55	12-000313
RG65	12-000314

Table 5.2 Recommended maximum tightening torques for pressing in steel and brass bolt caps

Series/size	Bolt cap		
	Brass	Steel	Max. tightening torque [Nm]
HG15, RG15	5-001344	—	15
HG20, RG20	5-001350	5-001352	20
HG25, RG25	5-001355	5-001357	20
HG30, HG35, RG30, RG35	5-001360	5-001362	20
HG45, RG45	5-001324	5-001327	85
HG55, RG55	5-001330	5-001332	85
HG65, RG65	5-001335	5-001337	110

Assembly

### 5.1.4 Mounting the cover strip

#### ⚠ CAUTION!



#### Risk of injury from sharp-edged cover strip!

- ▶ Wear protective gloves for unpacking, mounting and disassembling!
- ▶ Avoid uncontrolled leaping up of rolled up cover strips by holding the band ends!

#### ATTENTION!

#### Damage to the linear guideway due to damaged cover strips!

Cover strips are very precise components. Damaged cover strips impair the dust protection and lead to premature wear of the linear guideway.

- ▶ Avoid deformations or creases of the cover strip as shown in [Fig. 5.14](#)!
- ▶ Replace damaged cover strips immediately!

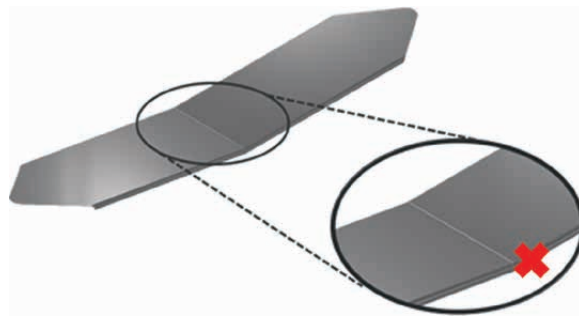
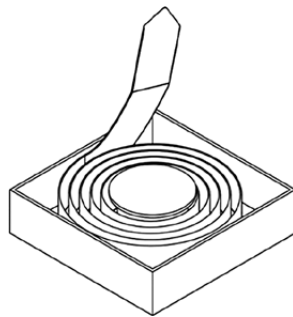


Fig. 5.14 Damaged cover strips

#### 5.1.4.1 Delivery state

In the case of one-piece profile rails, these are supplied with mounted cover strip. The cover strip ends are bent and protective caps are mounted.

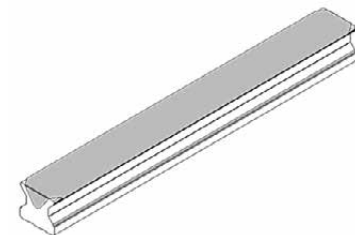


Fig. 5.15 Cover strip mounted on rail

In order to mount the one-piece profile rail, the cover strip has to be removed as shown in [Section 5.1.4.2](#).

In the case of multi-part rails, the cover strip is delivered in a separate carton as shown in [Fig. 5.16](#). The protective caps are included.

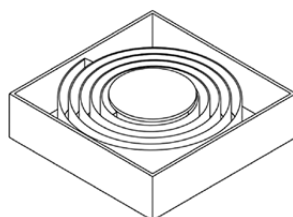


Fig. 5.16 Cover strip in transport carton

### 5.1.4.2 Removal of cover strip

- Use the removing tool [1] as shown in Fig. 5.17 to lift the cover strip from below at the bent end of the strip at the front side of the profile rail. Then carefully peel it off over the entire length, without bending it.

For removal and re-assembly of the cover strip we recommend the use of the removing and mounting tool from HIWIN (see Table 5.4).

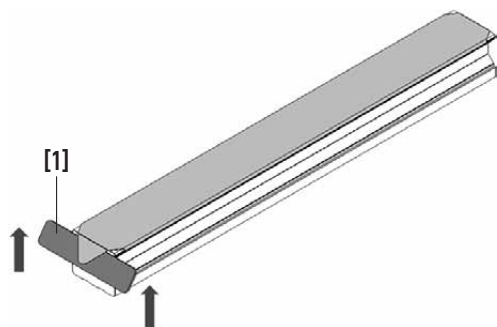


Fig. 5.17 Removal of cover strip

### 5.1.4.3 Mounting the cover strip

In the case of custom-assembled profile rails the cover strip is delivered separately, each in the needed length and with the ends finished according to Fig. 5.18.

- Clean the profile rail before mounting the cover strip. During assembly the distance  $L_S$  (according to Table 5.3) must be maintained. Generally we recommend to center the cover strip on the profile rail before assembly.

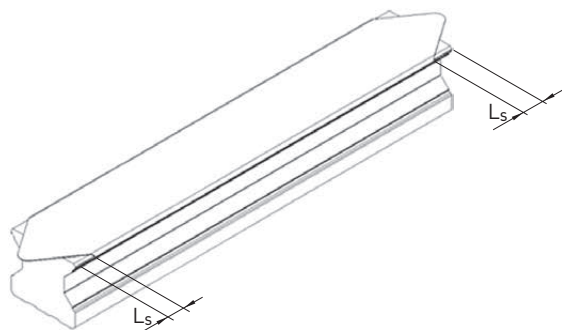


Fig. 5.18 Cover strip with finished ends and distance  $L_S$

Table 5.3 Dimension  $L_S$  of cover strip end

Size	Distance $L_S$ [mm]
15	5.0
20	8.0
25	9.5
30	10.0
35	10.0
45	11.0
55	12.0
65	14.5

Assembly

- ▶ After centering, clip the cover strip onto the profile rail, starting from one side as shown in Fig. 5.19, over a length of approx. 15 cm.
- ▶ To do this, press down the fold of the cover strip first on the reference side of the profile rail. Then, press down the second fold of the cover strip starting from the front side, until the cover strip rests flush on the upper side of the profile rail, see Fig. 5.20.

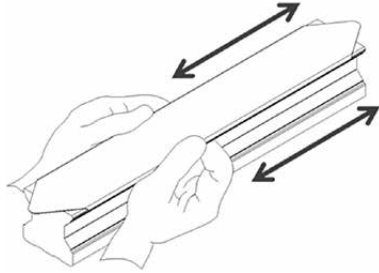


Fig. 5.19 Starting to mount the cover strip

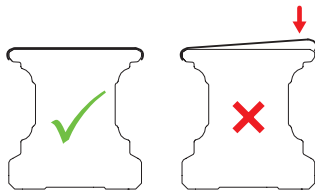


Fig. 5.20 Correctly and incorrectly installed cover tape

The remaining cover strip is installed using the mounting tool.

- ▶ To do this, place the mounting tool on the front side of the rail as shown in Fig. 5.21, and slide it over the entire rail.

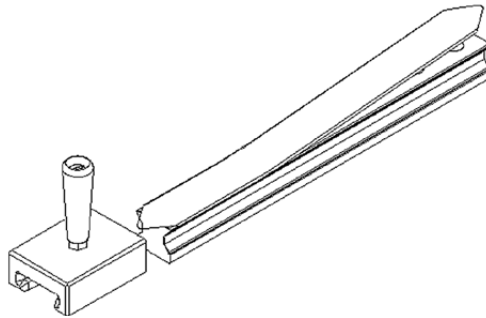


Fig. 5.21 Mounting the cover strip with the help of the HIWIN mounting tool

- ▶ Finally, carefully bend the two ends of the cover strip with a rubber mallet as shown in Fig. 5.22.

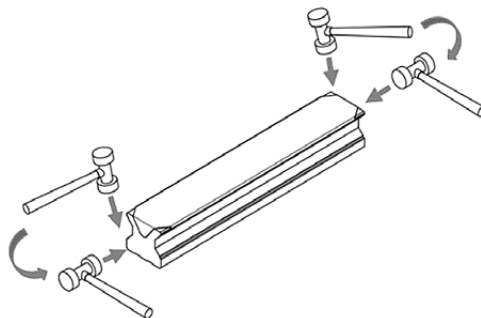


Fig. 5.22 Bending the cover strip ends

Now the block can be mounted on the profile rail.

- In order to prevent the cover strip from being lifted off, install the protective caps on both end faces of the profile rail in the last step (see Fig. 5.23).

- ✓ The cover strip has now been mounted.

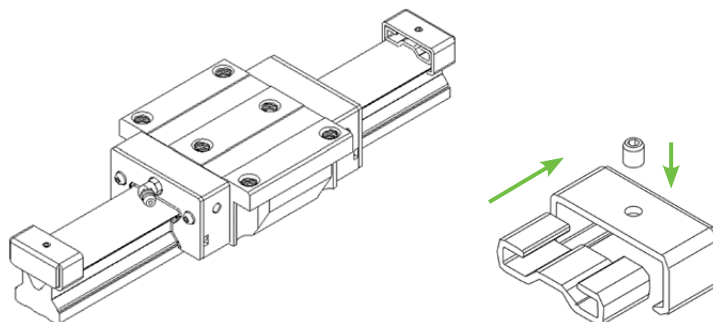


Fig. 5.23 Metal protective cap

Table 5.4 Article numbers for mounting and removal tool (CG cover strip)

Article number	Description
5-002417	Mounting and removal tool CG20
5-002416	Mounting and removal tool CG25
5-002554	Mounting and removal tool CG30
5-002555	Mounting and removal tool CG35

Table 5.5 Article numbers for protective caps (CG cover strip)

Article number	Description
5-002485	Steel protective caps CG20 (set 2 pcs.)
5-002486	Steel protective caps CG25 (set 2 pcs.)
5-002487	Steel protective caps (set 2 pcs.)
5-002488	Steel protective caps CG35 (set 2 pcs.)

## 5.2 Assembly of the blocks on the rail

### NOTE

**If the following instructions are not followed, the seals may be damaged and thus may not work properly.**

Non-assembled blocks are always supplied with a block insert. The block insert prevents the rolling elements from coming off the block and protects them from dirt.

► **Only remove the block insert once the block has been assembled upon the rail!**

Blocks with end seals must not be slid on to profile rails which do not have deburred cutting edges. Always check the front sides of the rail for formation of burrs. If needed remove burrs with an oil stone or brass brush.

For the assembly of the following blocks, we generally recommend a bevel at the front end of the profile rail or the use of a suitable mounting aid (see Section 5.2.1):

- Higher preload (ZA, ZB)
- Multi-part and optimised dust protection (DD, KK, SW, ZW, ZWX)
- All blocks of the CG series

- Lubricate the end seals before assembly of the block. This will facilitate assembly and reduce the risk of damaging the seal during assembly.
- Place the block in the desired assembly direction at a right angle and flush on the rail, and slide it on to the rail. In doing so, the block insert is automatically ejected. At this moment, do not tilt the block in any circumstance.

Blocks with medium and high preload require higher force when being slid on to the rail than blocks with light preload. Make sure to take extra care when doing this. Blocks with high preload should preferably be supplied assembled.

- Before commissioning, lubricate the blocks as specified in Chapter 7.

For R-shaped rails (with bored holes to be screwed from above), the following should also be noted:

### NOTE

**The travel of the block on the rail is to be reduced to a minimum as long as the assembly holes have not yet been closed using bolt caps or cover strips, since otherwise the sealing lips of the scraper may be damaged.**

### 5.2.1 Assembly aid for blocks

If a bevel is required on the profile rail to mount the block, a suitable assembly aid can be used as an alternative to the bevel. We recommend a piece of rail in the appropriate size, which is designed as follows:

- One end with a strong bevel
- One end without bevel

- On the bevelled end, slide the block onto of the assembly aid. Place the assembly aid and slid-on block with its non-bevelled end flush on the assembled rail. Carefully slide the block over the joint on to the assembled rail. In doing so, press the assembly aid against the rail in order to avoid creating a gap. If no such assembly aid is available, one can be obtained from HIWIN GmbH.

- ✓ The block has now been mounted on the rail.



### 5.3 Mounting tolerances

#### 5.3.1 Tolerance of the mounting surface of the rail

Once the precision requirements for the mounting surface have been fulfilled, the high precision and rigidity of the linear guideways can be achieved without problems. In order to ensure quick assembly and smooth movement, HIWIN offers linear guideways with light preload (Z0) which compensate deviations on the mounting surface over a wide area.

If the displacement forces of the blocks increase sharply after assembly, tension is very likely present. If this is the case, check the mounting surfaces for contaminants and burrs, as well as the permissible accuracy tolerances.

**NOTE**

##### 5.3.1.1 HG and QH series

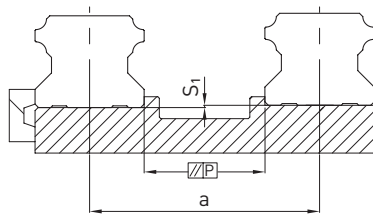


Fig. 5.24 Parallelism of the reference surface P – HG/QH series

#### Tolerance for the parallelism of the reference surface (P)

Table 5.6 Maximum tolerance for parallelism (P) – HG/QH series

Series/size	Preload class		
	Z0	ZA	ZB
HG/QH_15	25	18	—
HG/QH_20	25	20	18
HG/QH_25	30	22	20
HG/QH_30	40	30	27
HG/QH_35	50	35	30
HG/QH_45	60	40	35
HG_55	70	50	45
HG_65	80	60	55

Unit:  $\mu\text{m}$

#### Tolerance for the height of the reference surface ( $S_1$ )

$$S_1 = a \times K$$

$S_1$  Max. height tolerance [mm]  
 $a$  Distance between rails [mm]  
 $K$  Coefficient of the height tolerance

Assembly

Table 5.7 Coefficient of the height tolerance (K) – HG/QH series

Series/size	Preload class		
	Z0	ZA	ZB
HG/QH_15	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	—
HG/QH_20	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.0 \times 10^{-4}$
HG/QH_25	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.4 \times 10^{-4}$
HG/QH_30	$3.4 \times 10^{-4}$	$2.2 \times 10^{-4}$	$1.8 \times 10^{-4}$
HG/QH_35	$4.2 \times 10^{-4}$	$3.0 \times 10^{-4}$	$2.4 \times 10^{-4}$
HG/QH_45	$5.0 \times 10^{-4}$	$3.4 \times 10^{-4}$	$2.8 \times 10^{-4}$
HG_55	$6.0 \times 10^{-4}$	$4.2 \times 10^{-4}$	$3.4 \times 10^{-4}$
HG_65	$7.0 \times 10^{-4}$	$5.0 \times 10^{-4}$	$4.0 \times 10^{-4}$

5.3.1.2 EG and QE series

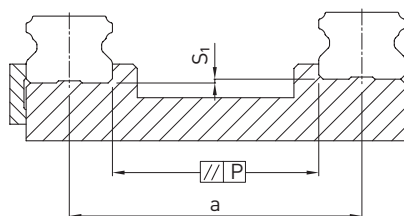


Fig. 5.25 Parallelism of the reference surface P – EG/QE series

Tolerance for the parallelism of the reference surface (P)

Table 5.8 Maximum tolerance for parallelism (P) – EG/QE series

Series/size	Preload class		
	Z0	ZA	ZB
EG/QE_15	25	18	—
EG/QE_20	25	20	18
EG/QE_25	30	22	20
EG/QE_30	40	30	27
EG/QE_35	50	35	30

Unit:  $\mu\text{m}$

Tolerance for the height of the reference surface ( $S_1$ )

$$S_1 = a \times K$$

- $S_1$  Max. height tolerance [mm]
- $a$  Distance between rails [mm]
- $K$  Coefficient of the height tolerance

Table 5.9 Coefficient of the height tolerance (K) – EG/QE series

Series/size	Preload class		
	Z0	ZA	ZB
EG/QE_15	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	—
EG/QE_20	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.0 \times 10^{-4}$
EG/QE_25	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.4 \times 10^{-4}$
EG/QE_30	$3.4 \times 10^{-4}$	$2.2 \times 10^{-4}$	$1.8 \times 10^{-4}$
EG/QE_35	$4.2 \times 10^{-4}$	$3.0 \times 10^{-4}$	$2.4 \times 10^{-4}$

### 5.3.1.3 CG series

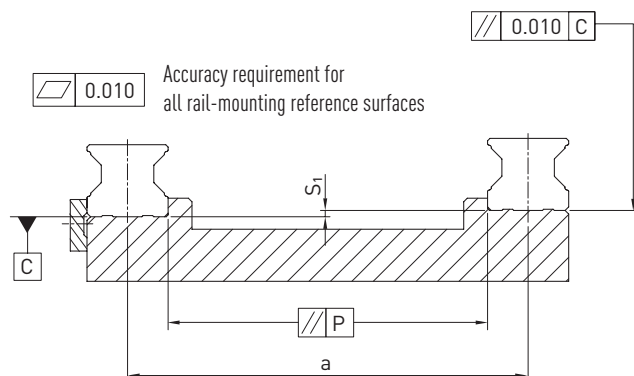


Fig. 5.26 Parallelism of the reference surface P – CG series

#### Tolerance for the parallelism of the reference surface (P)

Table 5.10 Maximum tolerance for parallelism (P) – CG series

Series/size	Preload class		
	Z0	ZA	ZB
CG_15	9	5	4
CG_20	11	7	5
CG_25	12	8	6
CG_30	14	9	7
CG_35	15	11	8
CG_45	19	12	10

Unit:  $\mu\text{m}$

#### Tolerance for the height of the reference surface ( $S_1$ )

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

$S_1$  Max. height tolerance [mm]  
 $a$  Distance between rails [mm]  
 $K$  Coefficient of the height tolerance  
 $T_H$  Tolerance of height H acc. to Table 3.3


Table 5.11 Coefficient of the height tolerance (K) – CG series

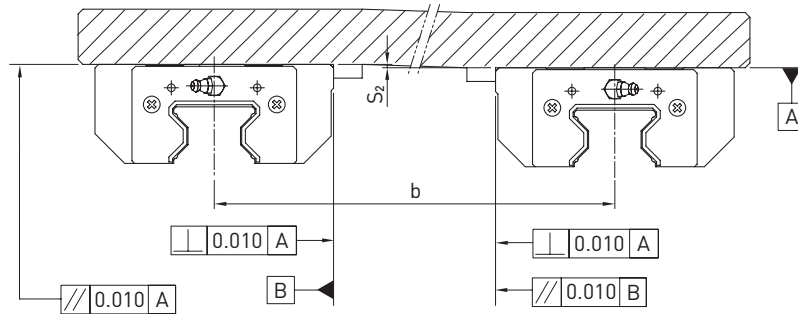
Series/size	Preload class		
	Z0	ZA	ZB
CG_15 – CG_45	$2.8 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.2 \times 10^{-4}$

Assembly

**Height tolerance of the block mounting surface**

The height tolerance of the reference surface in the parallel use of two or more blocks ( $S_2$ )

 0.010 Accuracy requirement for all block-mounting reference surfaces

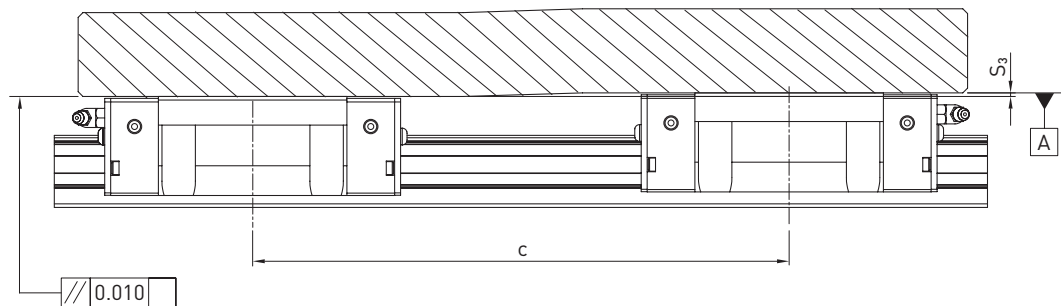


$$S_2 = b \times K$$

$S_2$  Max. height tolerance [mm]  
 $b$  Distance between two blocks [mm]  
 $K$  Coefficient of the height tolerance

The height tolerance of the reference surface in the parallel use of two or more blocks ( $S_3$ )

 0.010 Accuracy requirement for all block-mounting reference surfaces



$$S_3 = c \times K$$

$S_3$  Max. height tolerance [mm]  
 $c$  Distance between two blocks [mm]  
 $K$  Coefficient of the height tolerance

Table 5.12 Coefficient of the height tolerance (K) – CG series

Series/size	Load type	
	CG_C	CG_H
CG_15 – CG_45	$4.2 \times 10^{-5}$	$3.0 \times 10^{-5}$

### 5.3.1.4 WE and QW series

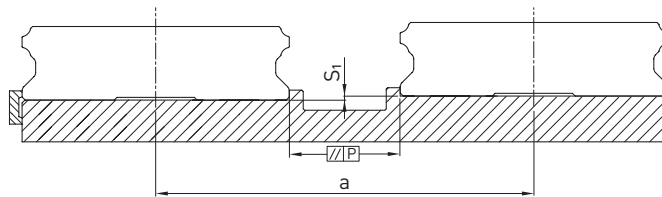


Fig. 5.27 Parallelism of the reference surface P – WE/QW series

#### Tolerance for the parallelism of the reference surface (P)

Table 5.13 Maximum tolerance for parallelism (P) – WE/QW series

Series/size	Preload class		
	Z0	ZA	ZB
WE_15	20	15	9
WE/QW_21	25	18	9
WE/QW_27	25	20	13
WE/QW_35	30	22	20
WE_50	40	30	27

Unit:  $\mu\text{m}$

#### Tolerance for the height of the reference surface ( $S_1$ )

$$S_1 = a \times K$$

$S_1$  Max. height tolerance [mm]  
 $a$  Distance between rails [mm]  
 $K$  Coefficient of the height tolerance

Table 5.14 Coefficient of the height tolerance (K) – WE/QW series

Series/size	Preload class		
	Z0	ZA	ZB
WE_15	$1.3 \times 10^{-4}$	$0.4 \times 10^{-4}$	—
WE/QW_21	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$0.9 \times 10^{-4}$
WE/QW_27	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$0.9 \times 10^{-4}$
WE/QW_35	$2.6 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.4 \times 10^{-4}$
WE_50	$3.4 \times 10^{-4}$	$2.2 \times 10^{-4}$	$1.8 \times 10^{-4}$

### 5.3.1.5 MG series

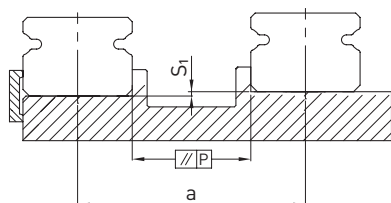


Fig. 5.28 Parallelism of the reference surface P – MG series

Assembly

**Tolerance for the parallelism of the reference surface (P)**

Table 5.15 Maximum tolerance for parallelism (P) – MG series

Series/size	Preload class		
	ZF	Z0	Z1
MG_05	2	2	2
MG_07	3	3	3
MG_09	4	4	3
MG_12	9	9	5
MG_15	10	10	6

Unit:  $\mu\text{m}$

**Tolerance for the height of the reference surface ( $S_1$ )**

$$S_1 = a \times K$$

- $S_1$  Max. height tolerance [mm]  
 $a$  Distance between rails [mm]  
 $K$  Coefficient of the height tolerance

Table 5.16 Coefficient of the height tolerance (K) – MG series

Series/size	Preload class		
	ZF	Z0	Z1
MG_05	$0.4 \times 10^{-4}$	$0.4 \times 10^{-4}$	$0.04 \times 10^{-4}$
MG_07	$0.5 \times 10^{-4}$	$0.5 \times 10^{-4}$	$0.06 \times 10^{-4}$
MG_09	$0.7 \times 10^{-4}$	$0.7 \times 10^{-4}$	$0.12 \times 10^{-4}$
MG_12	$1.0 \times 10^{-4}$	$1.0 \times 10^{-4}$	$0.24 \times 10^{-4}$
MG_15	$1.2 \times 10^{-4}$	$1.2 \times 10^{-4}$	$0.40 \times 10^{-4}$

Table 5.17 Requirements for the mounting surface – MG series

Series/size	Required evenness of the mounting surface
MG_05	0.015/200
MG_07	0.025/200
MG_09	0.035/200
MG_12	0.050/200
MG_15	0.060/200

Unit: mm

Note: The values in the table are applicable to the preload classes ZF and Z0. For Z1 or if more than one rail is to be mounted on the same surface, the table values must be at least halved.

### 5.3.1.6 RG and QR series

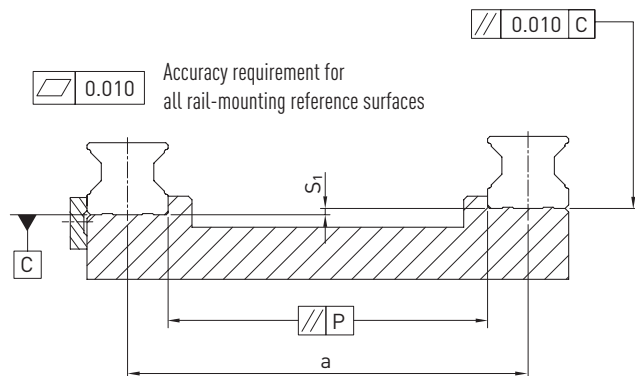


Fig. 5.29 Parallelism of the reference surface P – RG/QR series

#### Tolerance for the parallelism of the reference surface (P)

Table 5.18 Maximum tolerance for parallelism (P) – RG/QR series

Series/size	Preload class		
	Z0	ZA	ZB
RG_15	5	3	3
RG_20	8	6	4
RG/QR_25	9	7	5
RG/QR_30	11	8	6
RG/QR_35	14	10	7
RG/QR_45	17	13	9
RG_55	21	14	11
RG_65	27	18	14

Unit:  $\mu\text{m}$

#### Tolerance for the height of the reference surface ( $S_1$ )

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

$S_1$  Max. height tolerance [mm]  
 $a$  Distance between rails [mm]  
 $K$  Coefficient of the height tolerance  
 $T_H$  Tolerance of height H acc. to Table 3.3

Table 5.19 Coefficient of the height tolerance (K) – RG/QR series

Series/size	Preload class		
	Z0	ZA	ZB
RG_15 – 65/QR_25 – 45	$2.2 \times 10^{-4}$	$1.7 \times 10^{-4}$	$1.2 \times 10^{-4}$

Assembly

**Height tolerance of the block mounting surface**

The height tolerance of the reference surface in the parallel use of two or more blocks ( $S_2$ )

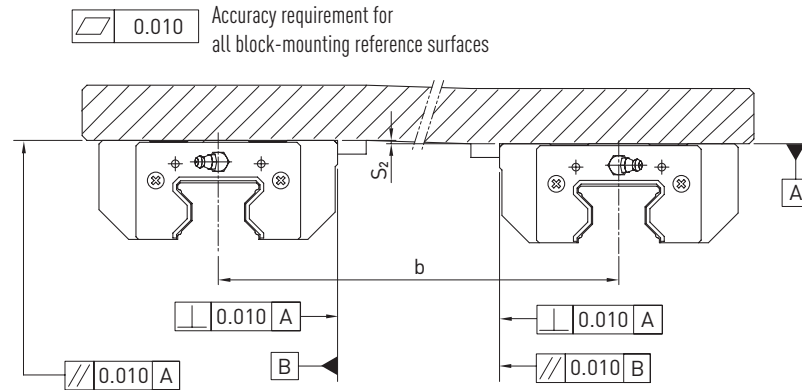


Fig. 5.30 **Max. height tolerance  $S_2$**

$$S_2 = b \times K$$

$S_2$  Max. height tolerance [mm]  
b Distance between two blocks [mm]  
K Coefficient of the height tolerance

The height tolerance of the reference surface in the parallel use of two or more blocks ( $S_3$ )

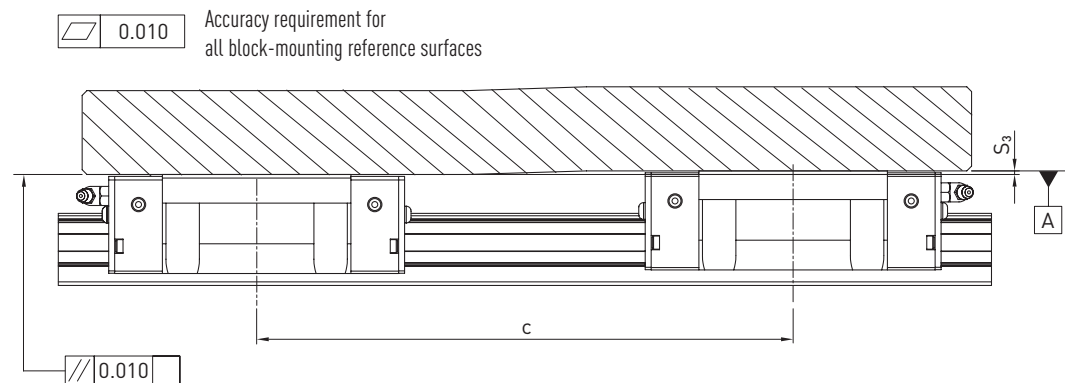


Fig. 5.31 **Max. height tolerance  $S_3$**

$$S_3 = c \times K$$

$S_3$  Max. height tolerance [mm]  
c Distance between two blocks [mm]  
K Coefficient of the height tolerance

Table 5.20 **Coefficient of the height tolerance (K) – RG series**

Series/size	Load type	
	RG_C/QR_C	RG_H/QR_H
RG_15 – 65/QR_25 – 45	$4.2 \times 10^{-5}$	$3.0 \times 10^{-5}$



### 5.3.2 Shoulder heights and fillets

Imprecise shoulder heights and fillets of mounting surfaces compromise precision and may lead to conflicts with the block or rail profiles. The following shoulder heights and edge profiles must be observed in order to avoid assembly problems.

#### 5.3.2.1 HG and QH series

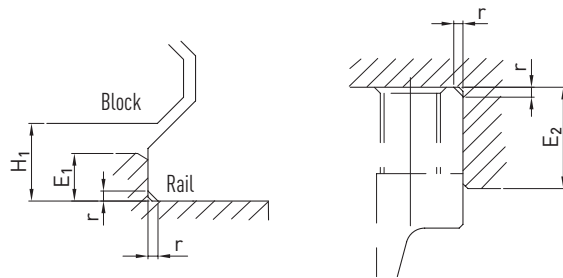


Fig. 5.32 Shoulder heights and fillets – HG/QH series

Table 5.21 Shoulder heights and fillets

Series/size	Max. edge radius $r$	Shoulder height of reference edge of rail $E_1$	Shoulder height of reference edge of block $E_2$	Clearance under block $H_1$
HG_15	0.5	3.0	4.0	4.3
QH_15	0.5	3.0	4.0	4.0
HG/QH_20	0.5	3.5	5.0	4.6
HG/QH_25	1.0	5.0	5.0	5.5
HG/QH_30	1.0	5.0	5.0	6.0
HG/QH_35	1.0	6.0	6.0	7.5
HG/QH_45	1.0	8.0	8.0	9.5
HG_55	1.5	10.0	10.0	13.0
HG_65	1.5	10.0	10.0	15.0

Unit: mm

#### 5.3.2.2 EG and QE series

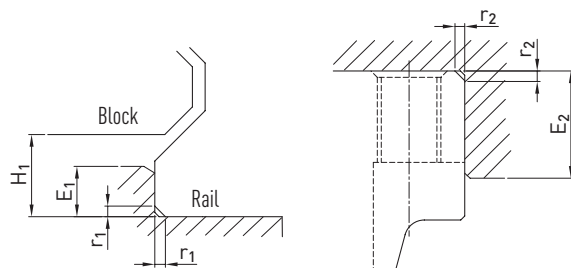


Fig. 5.33 Shoulder heights and fillets – EG/QE series

Table 5.22 Shoulder heights and fillets – EG/QE series

Series/size	Max edge radius $r_1$	Max edge radius $r_2$	Shoulder height of reference edge of rail $E_1$	Shoulder height of reference edge of block $E_2$	Clearance under block $H_1$
EG/QE_15	0.5	0.5	2.7	5.0	4.5
EG/QE_20	0.5	0.5	5.0	7.0	6.0
EG/QE_25	1.0	1.0	5.0	7.5	7.0
EG/QE_30	1.0	1.0	7.0	7.0	10.0
EG_35	1.0	1.0	7.5	9.5	11.0
QE_35	1.0	1.5	7.5	9.5	11.0

Unit: mm

### 5.3.2.3 CG series

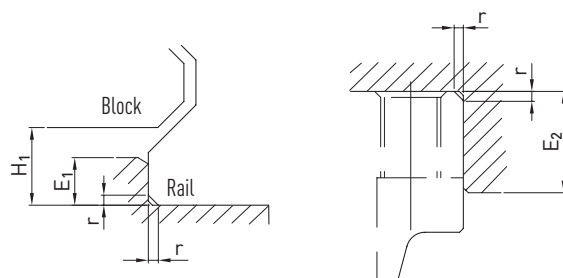


Fig. 5.34 Shoulder heights and fillets – CG series

Table 5.23 Shoulder heights and fillets – CG series

Series/size	Max. edge radius $r$	Shoulder height of reference edge of rail $E_1$	Shoulder height of reference edge of block $E_2$	Clearance under block $H_1$
CG_15	0.5	3.0	4.0	4.3
CG_20	0.5	3.5	5.0	4.6
CG_25	1.0	5.0	5.0	6.1
CG_30	1.0	5.0	5.0	7.0
CG_35	1.0	6.0	6.0	7.6
CG_45	1.0	8.0	8.0	9.5

Unit: mm

### 5.3.2.4 WE and QW series

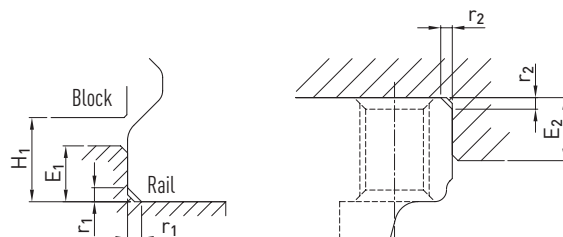


Fig. 5.35 Shoulder heights and fillets – WE/QW series

Table 5.24 Shoulder heights and fillets – WE/QW series

Series/size	Max edge radius $r_1$	Max edge radius $r_2$	Shoulder height of reference edge of rail $E_1$	Shoulder height of reference edge of block $E_2$	Clearance under block $H_1$
WE_17	0.4	0.4	2.0	4.0	2.5
WE/QW_21	0.4	0.4	2.5	5.0	3.0
WE/QW_27	0.5	0.5	3.0	7.0	4.0
WE/QW_35	0.5	0.5	3.5	10.0	4.0
WE_50	0.8	0.8	6.0	10.0	7.5

Unit: mm

### 5.3.2.5 MG series

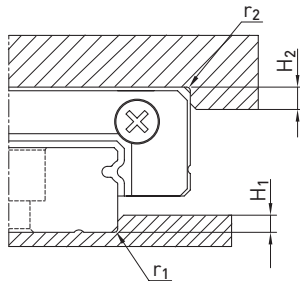


Fig. 5.36 Shoulder heights and fillets – MG series

Table 5.25 Shoulder heights and fillets – MG series

Series/size	Max. edge radius $r_1$	Max. edge radius $r_2$	Shoulder height of $H_1$	Shoulder height of $H_2$
MGN05	0.1	0.2	1.2	2
MGN07	0.2	0.2	1.2	3
MGN09	0.2	0.3	1.7	3
MGN12	0.3	0.4	1.7	4
MGN15	0.5	0.5	2.5	5
MGW05	0.1	0.2	1.2	2
MGW07	0.2	0.2	1.7	3
MGW09	0.3	0.3	2.5	3
MGW12	0.4	0.4	3.0	4
MGW15	0.4	0.8	3.0	5

Unit: mm

### 5.3.2.6 Series RG and QR

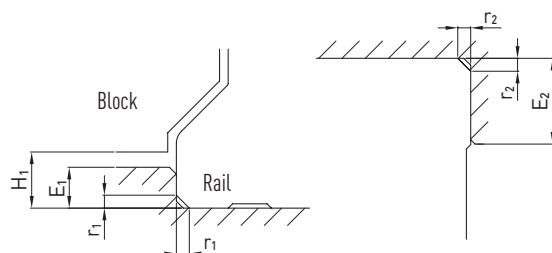


Fig. 5.37 Shoulder heights and fillets – RG/QR series

Table 5.26 Shoulder heights and fillets – RG/QR series

Series/size	Max edge radius $r_1$	Max edge radius $r_2$	Shoulder height of reference edge of rail $E_1$	Shoulder height of reference edge of block $E_2$	Clearance under block $H_1$
RG_15	0.5	0.5	3.0	4.0	4.0
RG_20	0.5	0.5	3.5	5.0	5.0
RG/QR_25	1.0	1.0	5.0	5.0	5.5
RG/QR_30	1.0	1.0	5.0	5.0	6.0
RG/QR_35	1.0	1.0	6.0	6.0	6.5
RG/QR_45	1.0	1.0	7.0	8.0	8.0
RG_55	1.5	1.5	9.0	10.0	10.0
RG_65	1.5	1.5	10.0	10.0	12.0

Unit: mm

### 5.4 Tightening torques for fixing screws

Insufficient tightening of the fixing screws strongly compromises the precision of the linear guideway; the following tightening torques are therefore recommended for the relevant screw sizes.

Table 5.27 Tightening torques of the fixing screws according to ISO 4762-12.9

Screw size	Torque [Nm]	Screw size	Torque [Nm]
M2	0.6	M8	31
M3	2.0	M10	70
M4	4.0	M12	120
M5	9.0	M14	160
M6	14.0	M16	200

The load-bearing capacity of the linear guideway is often limited not by its load-bearing strength, but the screw connection. We therefore recommend checking the maximum permitted load-bearing capacity of the screw connection in accordance with VDI 2230.

**NOTE**

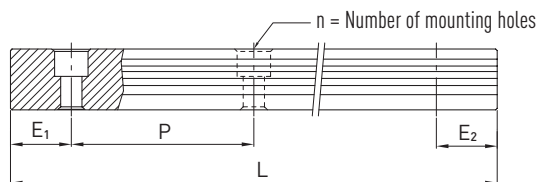
In the RG, QR and CG series, the blocks are each equipped with 2 additional threaded holes. Upon delivery these are sealed with green sealing plugs.

In order to achieve a high rigidity of the linear guideway even under high loads, we generally recommend using all available threaded holes for fastening the adjacent construction.

**NOTE**

### 5.5 Calculating the length of rails

HIWIN offers rails in customised lengths. To prevent the risk of the end of the rail becoming unstable, the value E must not exceed half of the distance between the fixing holes (P). Simultaneously, the value  $E_{1/2}$  should be between  $E_{1/2}$  min and  $E_{1/2}$  max so that the fixing hole does not rupture.



$$L = (n - 1) \times P + E_1 + E_2$$

- L Total length of the rail [mm]
- n Number of mounting holes
- P Distance between two mounting holes [mm]
- $E_{1/2}$  Distance from the middle of the last mounting hole to the end of the rail [mm]

Values for the maximum lengths of rails are to be found in the dimension charts in the appendix from [Page 77](#) onwards.

### 5.6 Specificity in the assembly of QH, QE and QW blocks

#### NOTE

For some of the HIWIN QH, QE and QW type linear guideways, the boreholes for fixing the slider on the block are connected with recirculation channels (see Fig. 5.38). Therefore, it is important that the screws used do not exceed the maximum lengths shown in Table 5.28. Non-observance may result in damage to the rolling elements and thus to a failure of the linear guideway.

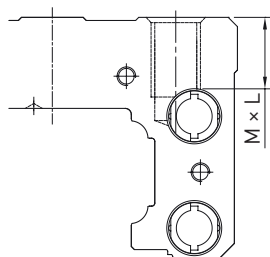


Fig. 5.38 Depiction of bore hole and recirculation channel

Table 5.28 Maximum lengths for fixing screws – QH, QE and QW blocks

Model	Max. length of fixing screw M × L [mm]	Model	Max. length of fixing screw M × L [mm]
QHH20	M5 × 6	QEH25	M6 × 9
QHH25	M6 × 8	QEH30	M8 × 10
QHH30	M8 × 10	QWH27	M6 × 6
QHH35	M8 × 12	QWH35	M8 × 8
QEH20	M5 × 7		

### 5.7 Assembly of jointed rails

Jointed (multi-part) rails must be assembled according to the markings applied. The joints of each section are identified in a consecutive alphabetical order as well as by the rail/pair number so that each rail section can be clearly assigned.

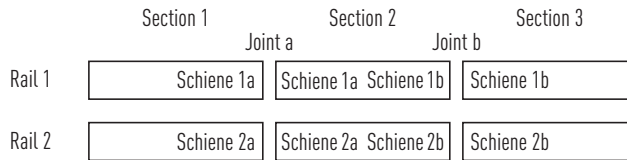


Fig. 5.39 Identification of jointed multi-part rails<sup>1)</sup>

Each joint has a printed label on the top side of the rail. The printing provides aid for the initial assembly and can be removed at any time using a suitable cleaning agent (e.g. ethyl alcohol). For jointed multi-part rails, the word "Paar" must also be provided in addition to the rail number.

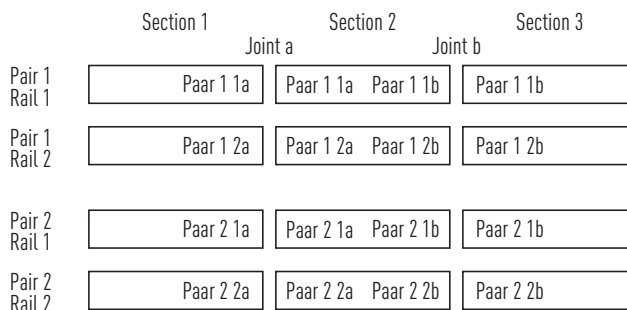


Fig. 5.40 Identification of jointed multi-part paired rails<sup>1)</sup>

For paired multi-part rails, the butt joints should be staggered.

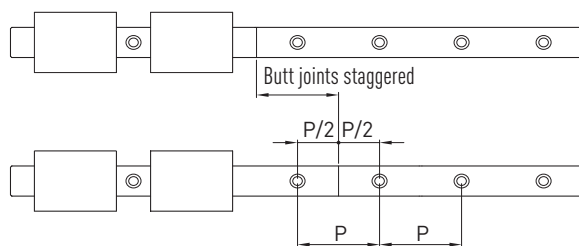


Fig. 5.41 Configuration of jointed multi-part rails

<sup>1)</sup> Paar: Pair  
Schiene: Rail

## 6. Maintenance

### **DANGER!**



#### **Danger from electrical voltage!**

Before and during assembly, disassembly and repair work, dangerous currents may flow

- ▶ Work may only be carried out by a qualified electrician and with the power supply disconnected!
- ▶ Before working, disconnect the higher-level system from the power supply, and secure it against restarting!

### 6.1 Cleaning

#### **ATTENTION!**

##### **Damage to the linear guideway due to improper cleaning!**

- ▶ The legal regulations and the manufacturer's regulations concerning the use of cleaning agents must be observed!
- ▶ Damage of the rail by pointed objects must be avoided!
- ▶ When cleaning, make sure that no metal particles end up or remain in the block!

- Linear guideways can be cleaned using white spirit and oil.
- Trichlorethylene or an equivalent cleaning agent can be used as a degreasing agent.
- In order to avoid corrosion, all parts must be dried and preserved/lubricated after cleaning.



## 7. Lubrication

### 7.1 Basic information on lubrication

Linear technology machine elements must be adequately supplied with lubricant to ensure correct functioning and a long service life.

These lubricating instructions are intended to assist the user in selecting suitable lubricants and lubricant quantities and in determining the appropriate lubrication intervals.

The information provided here does not release the user from his obligation to carry out practical testing to check the specified lubrication intervals and to make adjustments where necessary. After every lubrication process, a check must be carried out to ascertain whether the machine element is still adequately lubricated (check for lubricant film).

#### Lubricants

- reduce wear
- protect against dirt
- provide protection against corrosion

The lubricant is a constructional element and should already be taken into consideration when designing a machine. The operating temperature range and operating and ambient conditions must be considered when selecting a lubricant.

#### 7.1.1 Safety

##### ATTENTION!

##### Damage from wrong lubricant!

Using a wrong lubricant can cause damage to property and pollute the environment.

- ▶ Use the correct lubricant type (grease, oil) as specified in these assembly instructions!
- ▶ Note the manufacturer's safety data sheets!

#### 7.1.2 Proper use of lubricants

Prolonged and repeated contact with the skin should be avoided as far as possible. Areas of the skin splashed with lubricant should be cleaned with soap and water. Apply skin protection while working and a greasing skin cream after completing work. Where appropriate, wear oil-resistant protective clothing (e.g. gloves, apron). Do not wash your hands with petroleum, solvents or cooling lubricants which can be or are already mixed with water. Oil mist must be extracted at the point where it arises.

Protective goggles must be worn to prevent contact with the eyes. If lubricant should nevertheless get into the eyes, rinse the affected area with copious amounts of water. If irritation of the eyes persists, consult an ophthalmologist.

Under no circumstances should you induce vomiting if lubricant is accidentally swallowed. Seek medical help immediately.

As a rule, safety data sheets are available for lubricants, in accordance with 91/155/EEC. Here, you will find detailed information on health and environmental protection and accident prevention.

Most lubricants are hazardous to water. For this reason, they must never be allowed to get into the soil, water or sewage system.

#### 7.1.3 Safety instructions for the storage of lubricants

Lubricants must be stored in well-sealed packaging in a cool, dry location. They must be protected against direct sunlight and frost. Lubricants must not be stored together with foodstuffs. Lubricants must not be stored together with oxidizing agents.

**The instructions on the safety data sheet provided by the lubricant supplier must be observed.**

**NOTE**

Lubrication

## 7.2 Lubrication connections

HIWIN blocks offer three possibilities for installing a lubrication connection.

### 7.2.1 Lubrication connection on the front side

It is possible to install a lubrication connection on either side of the block. Unused connections are closed.

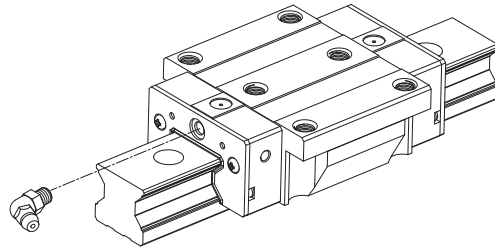


Fig. 7.1 Lubrication connection on the front side

### 7.2.2 Lubrication connection on the side

#### ATTENTION!

**Damage to the block due to improper opening of the lubrication hole!**

► Do not use a drill to open a lubrication hole as this creates the risk of chippings entering the block!

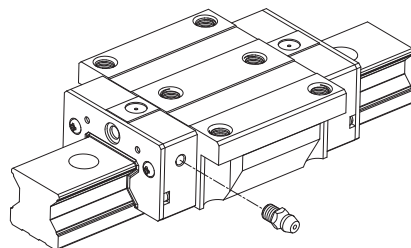


Fig. 7.2 Lubrication connection on the side

The block has a bore on the left and on the right hand side in each of the two plastic deflection systems, to install a lubricating adapter laterally. In the case of the CG series, these holes are prepared ready for use and closed with a screw plug.

For the HG, QH, EG, QE, WE, QW, RG and QR series, a thread has to be cut into the prepared side hole using a screw tap for cutting blind holes. The maximum thread depth acc. to Table 7.1 must not be exceeded. Then clean the bore hole, it must be free of chips and other contaminants. Finally, the side lubrication connection must be opened at the base of the hole using a hot metal spike.

Diameter of the metal spike:

Diameter 2.5 mm up to size 35

Diameter 3.0 mm from size 45

When the first wall is broken, do not push any further, otherwise a breakthrough into the deflection system of the rolling elements occurs.

**NOTE**

When using the side lubrication connection, it should not be fitted on the reference side but rather on the opposite side. If it should be necessary to install the lubrication connection on the reference side, make sure that the lubrication connection does not protrude beyond the reference edge of the block. Open side lubrication holes can be closed with a screw plug if necessary.

**NOTE**

For side lubrication use straight conical or ball grease nipples. In flange blocks we recommend the use the respective HIWIN lubrication adapter (see Table 7.1), because of the reduced distance between flange and grease nipple. Alternatively, funnel type grease nipples can also be used.

**NOTE**

Table 7.1 Lubrication hole on the side – Dimensions and grease nipple

Block type	Thread	Thread length	Grease nipple and recommended adapter for grease gun (A) <sup>1)</sup>					
			Standard				Optional	
			Square block	A	Flange block	A	Square/flange block	A
HG 15 EG 15 RG 15, 20	M4	4.5	20-000272	2	20-000272	3	20-000325	4
HG 20, 25, 30, 35 QH 20, 25, 30 EG 30, 35 QE 25, 30, 35 CG 25, 30, 35 WE 21, 27, 35 QW 21, 27, 35 RG 25 QR 25	M6 × 0.75	6	20-000273	1	20-000273	2	20-000283	4
HG 45, 55, 65 QH 45 RG 45, 55, 65 QR 45	1/8 PT	10	20-000280	1	20-000280	1	Upon request	—
QH, QE 15, QR 20	M4	4.5	20-000272	2	20-000272	2	20-000325	4
QH 35 RG 30, 35 QR 30, 35	M6 × 0.75	6	20-000273	1	20-000273	1	20-000283	4
EG 20, 25 QE 20	M6 × 0.75	6	20-000273	1	20-000283	4	—	—
CG 20 WE 17 QW 17	M3	4.5	20-000275	2	20-000275	3	5-000061	4
WE 50	1/8 PT	10	20-000280	1	20-000280	2	Upon request	—

<sup>1)</sup> See Fig. 7.3 to Fig. 7.9 and Table 7.19

Lubrication



Fig. 7.3 Grease nipple M3 × 0.5 P  
Art.-no. 20-000275



Fig. 7.7 Grease nipple M4 × 0.7 P  
Art.-no. 20-000272



Fig. 7.4 Grease nipple M6 × 0.75 P  
Art.-no. 20-000273



Fig. 7.8 Grease nipple 1/8 PT  
Art.-no. 20-000280



Fig. 7.5 Funnel type grease nipple M4 × 0.7 P  
Art.-no. 20-000325



Fig. 7.9 Funnel type grease nipple M6 × 0.75 P  
Art.-no. 20-000283



Fig. 7.6 Funnel type grease nipple M3 × 0.5 P  
Art.-no. 20-000370

### 7.2.3 Lubrication connection on the top

#### ATTENTION!

##### Damage to the block due to improper opening of the lubrication hole!

- Do not use a drill to open a lubrication hole as this creates the risk of chippings entering the block!

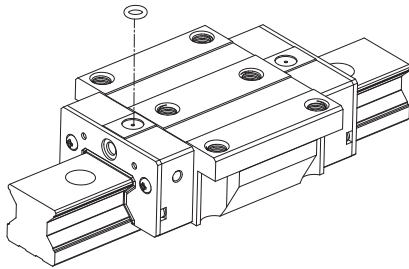


Fig. 7.10 Lubrication connection on the top

Alternatively, lubrication of the block can also be carried out from above. In doing so, an O-ring is used as a seal. The size of the O-ring is to be found in Table 7.2. The O-ring is not included in the standard shipment.

When using the lubrication connection on the top, it must first be opened.

- A further recess is located in the counterbore that receives the O-ring. This is pierced using a hot metal spike with diameter 0.8 mm to a maximum depth of  $T_{max}$  according to Table 7.2.

Once opened, lubrication holes for lubrication from above can not be subsequently closed with a screw plug.

**NOTE**

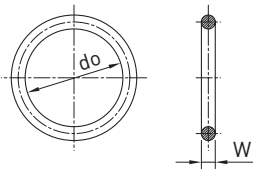


Fig. 7.11 O-ring to cover the lubrication connection on the top

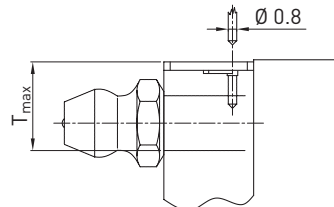


Fig. 7.12 Maximum piercing depth  $T_{max}$

Table 7.2 O-ring specifications for lubrication connection on the top

Series/size	O-ring			Lubrication hole on the top
	Article number	do [mm]	W [mm]	Max. depth $T_{max}$ [mm]
HG/QH_15	20-000386	$2.5 \pm 0.15$	$1.5 \pm 0.15$	3.75
HG/QH_20	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	5.70
HG/QH_25	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	5.80
HG/QH_30	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	6.30
HG/QH_35	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	8.80
HG/QH_45	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	8.20
HG_55	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	11.80
HG_65	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	10.80
EG/QE_15	20-000386	$2.5 \pm 0.15$	$1.5 \pm 0.15$	6.90
EG/QE_20	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	8.40
EG/QE_25	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	10.40
EG/QE_30	20-000387	$4.5 \pm 0.15$	$1.5 \pm 0.15$	10.40

The HIWIN lubrication adapter can be used for lubrication connections.

Lubrication

Table 7.2 O-ring specifications for lubrication connection on the top (continuation)

Series/size	O-ring			Lubrication hole on the top
	Article number	do [mm]	W [mm]	Max. depth T <sub>max</sub> [mm]
EG/QE_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.80
CG_15	20-000386	2.5 ± 0.15	1.5 ± 0.15	3.75
CG_20	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.70
CG_25	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.80
CG_30	20-000387	4.5 ± 0.15	1.5 ± 0.15	6.30
CG_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.80
CG_45	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.20
WE/QW_21	20-000387	4.5 ± 0.15	1.5 ± 0.15	6.80
WE/QW_27	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.40
WE/QW_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.20
RG_15	20-000386	2.5 ± 0.15	1.5 ± 0.15	3.45
RG_20	20-000386	2.5 ± 0.15	1.5 ± 0.15	4.00
RG/QR_25	20-000376	7.5 ± 0.15	1.5 ± 0.15	5.80
RG/QR_30	20-000376	7.5 ± 0.15	1.5 ± 0.15	6.20
RG/QR_35	20-000376	7.5 ± 0.15	1.5 ± 0.15	8.65
RG/QR_45	20-000376	7.5 ± 0.15	1.5 ± 0.15	9.50
RG_55	20-000376	7.5 ± 0.15	1.5 ± 0.15	11.60
RG_65	20-000376	7.5 ± 0.15	1.5 ± 0.15	14.50

The HIWIN lubrication adapter can be used for lubrication connections.

#### 7.2.4 Lubrication adapter

In the series HG and RG (models HGH and RGH) spacers (lubrication adapter TCN, Top-CoNnector) must be mounted, to compensate for the height difference between recirculation system and block mounting surface.

The adapters are only delivered assembled, the appropriate O-ring is included when ordering this option.

#### Availability of the lubrication adapter TCN:

- HG-25, HG-30, HG-35
- RG-25, RG-30, RG-35, RG-45, RG-55

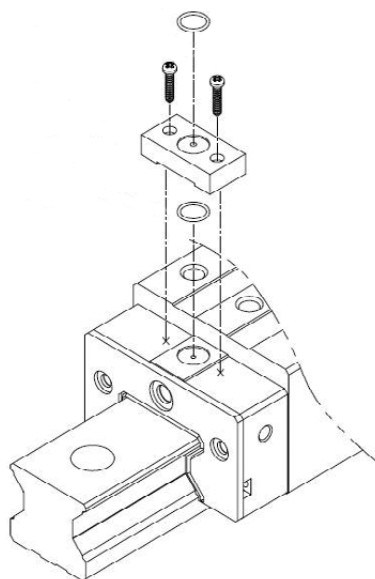


Fig. 7.13 Structure of the lubrication adapter

### 7.3 Use of greases and oils in central lubrication systems

We recommend that you carry out the initial lubrication (see Section 7.6) separately before connection to a central lubrication system, using a manual grease gun. It is also important to ensure that all pipes and elements up to the user are filled with lubricant and contain no air pockets.

Long pipelines and narrow pipe diameters are to be avoided. The pipes are to be installed on an incline.

The pulse count results from the partial quantities and the piston distributor sizes.

In addition, the lubrication system manufacturer's regulations must be observed.

#### 7.3.1 Lubricant pressure

HIWIN linear guideways can be lubricated with grease, low-viscosity grease or oil depending on the application. The lubricant pressure required depends on the installation size, lubricant, length of the feed pipe and the type of lubrication connection. The minimum lubricant pressure on the block must be 6 bar for grease or low-viscosity grease lubrication, and 3 bar for oil lubrication. The maximum permissible lubricant pressure on the block is 30 bar.

**If lubricant pressures or quantities are too high, this can damage the block.**

**In particular, for blocks with double sealing, SW sealing, ZW sealing or ZWX sealing, lubrication must be carried out very carefully, otherwise the seals may be damaged.**

**NOTE**

### 7.4 Selection of a lubricant

Oils, greases or low-viscosity greases can be used as lubricants. The same lubricants are used as for rolling bearings. As a rule, the selection of a lubricant and the infeed method can be adapted to fit in with the lubrication of the other machine components.

Essentially, the selection of a lubricant depends on the operating temperature and various operation-related factors, e.g. load, vibrations, oscillation, short-stroke applications. Special requirements such as use in combination with strong or aggressive media, in clean rooms, in a vacuum or in the foodstuff industry also need to be considered.

Section 7.4.1 contains a list of applications and suitable lubricants. If you have any doubts, consult the lubricant supplier to ensure optimum lubrication.

#### 7.4.1 Recommended lubricants

Examples of applications and suitable lubricants are given below. If you have any doubts, consult the lubricant supplier to ensure optimum lubrication.

##### 7.4.1.1 Grease lubrication

For grease lubrication we recommend grease suitable for rolling and slide bearings with mineral oil as base oil and thickeners according to DIN51825 (K1K, K2K), in heavy-duty applications with EP-additives (KP1K, KP2K), NLGI class 1 or 2. The use of greases of other consistency classes is possible subject to the approval of the lubricant supplier.

**Greases with solid particles such as graphite or MoS<sub>2</sub> must not be used.**

**NOTE**

The following informations on lubricants serve to provide examples and are only intended as an aid for selection. Other lubricants may be selected after clarification of the specific application with the lubricant supplier.

Lubrication

**Standard applications**

Load: max. 15 % of the dynamic basic load rating

Temperature range: -10 °C to +80 °C

Speed: < 1 m/s

Table 7.3 Recommended greases for standard applications (series HG, QH, EG, QE, CG, WE, QW, RG, QR)

<b>HIWIN</b>	G05
<b>Klüber Lubrication München</b>	MICROLUBE GL 261
<b>Mobil</b>	Mobilux EP 1
<b>FUCHS</b>	LAGERMEISTER BF 2
<b>LUBCON</b>	Turmogrease CAK 2502
<b>FUCHS</b>	RENOLIT LZR 2 H

Table 7.4 Recommended greases for standard applications (series MG)

<b>Klüber Lubrication München</b>	ISOFLEX TOPAS AK 50
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**Heavy-duty applications**

Load: max. 50 % of the dynamic basic load rating

Temperature range: 0 °C to +80 °C

Speed: < 1 m/s

Table 7.5 Recommended greases for heavy-duty applications

<b>HIWIN</b>	G01
<b>Klüber Lubrication München</b>	Klüberlub BE 71-501
<b>FUCHS</b>	LAGERMEISTER EP 2
<b>LUBCON</b>	TURMOGREASE Li 802 EP
<b>FUCHS</b>	RENOLIT LZR 2 H

**Clean room applications**

Load: max. 50 % of the dynamic basic load rating

Temperature range: -10 °C to +80 °C

Speed: < 1 m/s

Table 7.6 Recommended greases for clean room applications

<b>HIWIN</b>	G02
<b>Klüber Lubrication München</b>	ISOFLEX TOPAS NCA 152
<b>FUCHS</b>	GLEITMO 591

**Clean room applications at high speeds**

Load: max. 50 % of the dynamic basic load rating

Temperature range: -10 °C to +80 °C

Speed: > 1 m/s

Table 7.7 Recommended greases for clean room applications at high speeds

<b>HIWIN</b>	G03
<b>Klüber Lubrication München</b>	ISOFLEX TOPAS NCA 52



### Applications with high speeds

Load: max. 50 % of the dynamic basic load rating

Temperature range: -10 °C to + 80 °C

Speed: > 1 m/s

Table 7.8 Recommended greases for applications with high speeds

<b>HIWIN</b>	GD4
<b>Klüber Lubrication München</b>	ISOFLEX NCA 15
<b>LUBCON</b>	Turmogrease Highspeed L 252
<b>FUCHS</b>	RENOLIT HI-Speed 2

### Applications in the foodstuffs industry in acc. with USDA H1

Load: max. 15 % of the dynamic basic load rating

Temperature range: -10 °C to + 80 °C

Speed: < 1 m/s

Table 7.9 Recommended greases for applications in the foodstuffs industry in acc. with USDA H1

<b>Klüber Lubrication München</b>	Klübersynth UH1 14-151
<b>Mobil</b>	Mobilgrease FM 102
<b>FUCHS</b>	GERALYN 1

### 7.4.1.2 Lubrication with low-viscosity grease

In centralized lubrication systems, low-viscosity greases are frequently used, as they are distributed more effectively over the whole system due to their soft structure.

Observe the lubrication system manufacturers' instructions.

The following information on lubricants serves to provide examples and is only intended as an aid to selection. Other lubricants may be used after clarification of the specific application and the centralized lubrication system used with the lubricant supplier.

In addition, the lubricant manufacturers' instructions must be observed.

### Standard applications

Load: max. 15 % of the dynamic basic load rating

Temperature range: -10 °C to + 80 °C

Speed: < 1 m/s

Table 7.10 Recommended low-viscosity greases for standard applications

<b>Klüber Lubrication München</b>	MICROLUBE GB 00
<b>Mobil</b>	Mobilux EP 004
<b>FUCHS</b>	GEARMASTER LI 400
<b>FUCHS</b>	RENOLIT EPLITH 00

Lubrication

**Heavy-duty applications**

Load: max. 50 % of the dynamic basic load rating  
Temperature range: 0 °C to +80 °C  
Speed: < 1 m/s

**Recommended low-viscosity greases for heavy-duty applications:**

**NOTE**

**We recommend that you consult a lubricant manufacturer regarding the use of low-viscosity greases for heavy-duty applications**

**Clean room applications**

Load: max. 50 % of the dynamic basic load rating  
Temperature range: -10 °C to +80 °C  
Speed: < 1 m/s

**Recommended low-viscosity greases for clean room applications:**

**NOTE**

**We recommend that you consult a lubricant manufacturer regarding the use of low-viscosity greases for clean room applications**

**Applications with high speeds**

Load: max. 50 % of the dynamic basic load rating  
Temperature range: -10 °C to +80 °C  
Speed: > 1 m/s

Table 7.11 Recommended low-viscosity greases for applications with high speeds

<b>Klüber Lubrication München</b>	ISOFLEX TOPAS NCA 5051
<b>Mobil</b>	Mobilux EP 004
<b>FUCHS</b>	GEARMASTER LI 400
<b>FUCHS</b>	RENOLIT SF 7-041

**Applications in the foodstuffs industry in acc. with USDA H1**

Load: max. 15 % of the dynamic basic load rating  
Temperature range: -10 °C to +80 °C  
Speed: < 1 m/s

Table 7.12 Recommended low-viscosity greases for applications in the foodstuffs industry in acc. with USDA H1

<b>Klüber Lubrication München</b>	Klübersynth UH1 14-1600
<b>Mobil</b>	Mobilgrease FM 003
<b>FUCHS</b>	GERALYN 00

### 7.4.1.3 Oil lubrication

Lubricating oils offer the advantage of more even distribution and reach the contact surfaces more effectively. However, this also means that lubricating oils collect in the lower area of the product as a result of the force of gravity and thus more quickly cause soiling. For this reason, higher quantities of lubricant are required than with grease lubrication. Oil lubrication is as a rule only suitable where a centralized lubrication system is used or for products equipped with a lubrication unit.

Observe the lubrication system manufacturer's instructions.

The following information on lubricants serves to provide examples and is only intended as an aid to selection. Other lubricants may be used after clarification of the specific application and the centralized lubrication system used with the lubricant supplier.

#### Standard applications

Load: max. 15 % of the dynamic basic load rating

Temperature range: -10 °C to + 80 °C

Speed: < 1 m/s

Table 7.13 Recommended oils for standard applications

<b>Klüber Lubrication München</b>	Klüberoil GEM 1-150 N
<b>FUCHS</b>	GEARMASTER CLP 320
<b>FUCHS</b>	RENOLIN CLP 150

#### Heavy-duty applications

Load: max. 50 % of the dynamic basic load rating

Temperature range: 0 °C to + 80 °C

Speed: < 1 m/s

#### Recommended oils for heavy-duty applications:

We recommend that you consult a lubricant manufacturer regarding the use of oils for heavy-duty applications

**NOTE**

#### Clean room applications

Load: max. 50 % of the dynamic basic load rating

Temperature range: -10 °C to + 80 °C

Speed: < 1 m/s

Table 7.14 Recommended oils for clean room applications

<b>Klüber Lubrication München</b>	Klüber Tyreno Fluid E-95V
<b>Mobil</b>	Mobilgear 626
<b>FUCHS</b>	RENOLIN CLP 100

Lubrication

**Applications with high speeds**

Load: max. 50 % of the dynamic basic load rating

Temperature range: -10 °C to +80 °C

Speed: > 1 m/s

Table 7.15 Recommended oils for applications with high speeds

<b>KLÜBER</b>	KLüberoil GEM 1-46 N
<b>FUCHS</b>	RENOLIN ZAF B 46 HT

**Applications in the foodstuffs industry in acc. with USDA H1**

Load: max. 15 % of the dynamic basic load rating

Temperature range: -10 °C to +80 °C

Speed: < 1 m/s



Table 7.16 Recommended oils for applications in the foodstuffs industry in acc. with USDA H1

<b>KLÜBER</b>	KLüberoil 4 UH1-68 N
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**7.4.1.4 HIWIN lubricants**

**HIWIN greases**

Table 7.17 Overview HIWIN greases

Grease type	Application	Article number	
		Cartridge 70 g	Cartridge 400 g
			
<b>G01</b>	Heavy-duty applications	20-000335	20-000336
<b>G02</b>	Clean room applications	20-000338	20-000339
<b>G03</b>	Clean room applications at high speeds	20-000341	20-000342
<b>G04</b>	Applications with high speeds	20-000344	20-000345
<b>G05</b>	Standard grease	20-000347	20-000348

### 7.4.1.5 Grease guns and lubrication adapters

#### A1: Hydraulic coupling

Suitable for conical grease nipples acc. to DIN 71412, outer diameter 15 mm



Fig. 7.14 A1

#### A2: Hollow mouthpiece

Suitable for conical or ball grease nipples acc. to DIN 71412/ DIN 3402, outer diameter 10 mm



Fig. 7.15 A2

#### A3: Hollow mouthpiece with lubrication adapter

Suitable for ball grease nipples acc. to DIN 3402, outer diameter 6 mm



Fig. 7.16 A3

#### A4: Ball type mouthpiece

Suitable for funnel-type grease nipples acc. to DIN 3405, outer diameter 6 mm



Fig. 7.17 A4

#### A5: Tip mouthpiece with lubrication adapter



Fig. 7.18 A5

#### A6: Angled tip mouthpiece with lubrication adapter



Fig. 7.19 A6

#### Set of lubrication adapter and nozzles



Fig. 7.20 Lubrication adapter and nozzles A3, A4, A5, A6

#### Set GN-400C: Large grease gun and adapters A1, A2



Fig. 7.21 GN-400C

#### Set GN-80M: Small grease gun and adapters A1, A2



Fig. 7.22 GN-80M

Lubrication

Table 7.18 Overview HIWIN grease guns and accessories







Art.-No.	Content			Direct filling	Cartridge
	GN-80M (Fig. 7.22)	GN-400C (Fig. 7.21)	Set of lubrication adapter and nozzles (Fig. 7.20)		
					
20-000352	●	—	—	●	70 g
20-000332	●	—	●	●	70 g
20-000353	—	●	—	●	400 g
20-000333	—	●	●	●	400 g
20-000358	—	—	●	—	—

Table 7.19 Overview grease nipples and recommended adapter for grease gun

	Grease nipples	Recommended adapter for grease gun
	Ball type grease nipple	
	M3 × 0,5 P	A2, A3 <sup>1)</sup>
	M4 × 0,7 P	A2, A3 <sup>1)</sup>
	Conical grease nipple	
	M6 × 0,75 P	A1, A2 <sup>1)</sup>
	1/8 PT	A1, A2 <sup>1)</sup>
	Funnel-type grease nipple	
	M3 × 0,5 P	A4
	M4 × 0,7 P	A4
	M6 × 0,75 P	A4

<sup>1)</sup> Optional for limited installation space

### HIWIN oils

Table 7.20 HIWIN oils

Article number	Description	Scope of delivery	Comment
20-000350	Mobil SHC 636	1 l bottle	Oil for E2 lubrication unit

### 7.4.2 Miscibility

Always check the miscibility of different lubricants. Lubricant oils based on mineral oil of the same classification (e.g. CL) and of a similar viscosity (maximum one class difference) can be mixed.

Greases can be mixed if their base oil and the thickening type are the same. The viscosity of the base oil must be similar. The maximum difference in NLGI class is one level..

The use of lubricants other than those listed can mean shorter lubrication intervals and reduced performance. Chemical reactions between plastics, lubricants and preserving agents may also occur.

Table 7.21 Miscibility of HIWIN greases

	G01	G02	G03	G04	G05
G01	●	●	●	○	○
G02	●	●	●	●	●
G03	●	●	●	●	●
G04	○	●	●	●	●
G05	○	●	●	●	●

Table 7.22 Compatibility of basically lubricated products with HIWIN greases

	G01	G02	G03	G04	G05
QH, QE, QW, QR	○	●	●	●	●

- miscible
- partly miscible

### Recommendation:

Using lubricants, which are only partially miscible, the old grease should be used up as much as possible before the new grease is introduced. The relubrication quantity of the new grease should be temporarily increased.

Using lubricants, which are immiscible, the old grease should be removed completely before the new grease is introduced.

Lubrication

**7.5 Lubrication condition at delivery**

Depending on the product group, HIWIN linear guideways are supplied either preserved, with basic lubrication or with initial lubrication.

- Preserved blocks are completely coated with an anticorrosive oil. Before commissioning, an initial lubrication must take place according to Section 7.6.
- Blocks with basic lubrication are delivered with a reduced amount of grease. The lubrication channels are largely free of lubrication grease. This facilitates lubricant changeover and enables the change from grease to oil lubrication. The basic lubrication is sufficient for the commissioning of the linear guideway. Once it has been successfully commissioned, an initial lubrication must take place according to Section 7.6.
- Blocks with initial lubrication are delivered with the recommended amount of grease acc. to Section 7.7.

**7.5.1 Standard lubrication condition at delivery**

Table 7.23 Standard lubrication condition for blocks mounted on rails

Series	Lubrication condition
HG, EG, CG, WE, QH, QE, QW, QR	Initial lubrication
RG, MG	Preserved

Table 7.24 Standard lubrication condition for blocks not mounted on rails

Series	Lubrication condition
HG, EG, CG, WE, RG, MG	Preserved
QH, QE, QW, QR	Basic lubrication

For basic lubrication of the linear guideways a grease suitable for rolling and slide bearings with mineral oil as base oil and thickeners according to DIN 51825 (K2K), NLGI class 2 is used. Base oil viscosity QR: 100 mm<sup>2</sup>/s at 40 °C, QH, QE, QW: 200 mm<sup>2</sup>/s at 40 °C.

**NOTE**

The lubrication condition can deviate from the standard mentioned here, the lubrication condition in the respective order documents is binding.

**7.6 Initial lubrication upon commissioning**

**ATTENTION!**

**Danger of damage to the linear guideways due to missing or incorrect lubrication!**

Missing initial lubrication or excessive lubricant quantities/excessive lubrication pressure can damage or destroy the product.

- ▶ Never put the linear guideway into operation without initial lubrication!
- ▶ The specified procedure must be observed in order to avoid damaging the product!

At initial lubrication the blocks are supplied with the amount of grease that is needed to reach the lubrication intervals specified. Afterwards the lubrication channels are completely filled with grease, a switch from grease to oil lubrication is not possible anymore without a complete cleaning of the block.

**The initial lubrication takes place in three steps:**

Feed in the quantity of grease specified in Section 7.7 by slowly operating the grease gun. Move the block three times by approx. three block lengths. Repeat the above mentioned process twice more.

Then proceed the block over the entire travel distance and check whether a film of grease can be seen on the total rail. If this is not the case, increase the lubricant quantity.



For short-stroke applications (stroke < 2 × block length), the initial lubrication is to be carried out as follows:

### Initial lubrication for short-stroke applications

- Stroke < 2 × block length: Provide lubrication connections on both sides of the block and carry out lubrication according to the above description for the corresponding lubrication connection.
- Stroke < 0,5 × block length: Provide lubrication connections on both sides of the block and carry out lubrication. In doing so, move the block by two block lengths several times. If this is not possible, please contact us.

## 7.7 Lubricant quantities

The lubricant quantities given below are reference values, which may vary depending on the ambient conditions.

**NOTE**

If the linear guideways are installed vertically, on the side or with the rail on the top, the relubrication quantities must be increased by approx. 50 %.

**NOTE**

### 7.7.1 Lubricant quantities for grease lubrication

Table 7.25 Lubricant quantities for grease lubrication – HG, QH, EG, QE, CG, WE, QW, RG, QR series

Size	Initial lubrication partial quantity [cm <sup>3</sup> ]			Relubrication quantity [cm <sup>3</sup> ]		
	Average load (S)	Heavy duty (C)	Super heavy duty (H)	Average load (S)	Heavy duty (C)	Super heavy duty (H)
15, 17	0.2 (3 ×)	0.3 (3 ×)	—	0.2	0.3	—
20, 21	0.3 (3 ×)	0.5 (3 ×)	0.7 (3 ×)	0.3	0.5	0.7
25, 27	0.4 (3 ×)	0.8 (3 ×)	1.0 (3 ×)	0.4	0.8	1.0
30	0.6 (3 ×)	1.3 (3 ×)	1.7 (3 ×)	0.6	1.3	1.7
35	0.8 (3 ×)	1.9 (3 ×)	2.4 (3 ×)	0.8	1.9	2.4
45	—	3.8 (3 ×)	4.6 (3 ×)	—	3.8	4.6
50, 55	—	6.3 (3 ×)	7.7 (3 ×)	—	6.3	7.7
65	—	10.0 (3 ×)	13.5 (3 ×)	—	10.0	13.5

Table 7.26 Lubricant quantities for grease lubrication – MG series

Size	Initial lubrication partial quantity [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	Average load (C)	High load (H)	Average load (C)	High load (H)
MGN15	0.04 (3 ×)	0.06 (3 ×)	0.04	0.06
MGW15	0.07 (3 ×)	0.09 (3 ×)	0.07	0.09

In the case of the miniature guideway MG, a grease nipple for grease lubrication is available for size 15. For sizes 5, 7, 9 and 12, we recommend the use of a suitable spray-on grease (e.g. FUCHS PLANTO Multispray S). Apply the lubricant evenly onto the ball tracks over the entire length of the profile rail. Then proceed the block over the entire travel distance and remove excess grease.

If a minimum displacement resistance is required or in very clean ambient conditions, we recommend lubrication with oil in the MG series (see Section 7.7.3).

Lubrication

### 7.7.2 Lubricant quantities for low-viscosity grease lubrication

When using a central lubrication system, it is recommended that the initial lubrication (see Section 7.6) is carried out separately using a manual grease gun before connection to the system.

Furthermore, make sure that all pipes and elements up to the user are filled with lubricant and that no air pockets are present. Long pipelines and narrow pipe diameters are to be avoided. The pipes are to be installed on an incline.

The pulse count results from the partial quantities and the piston distributor sizes.

In addition, the lubrication system manufacturer's regulations must be observed.

**The quantities for lubrication with low-viscosity grease are identical to the lubricant quantities for grease lubrication.**

### Piston distributor sizes for feed units (single-line systems) for low-viscosity grease lubrication

In order to ensure sufficient lubrication, the following minimum sizes for the piston distributors must be observed. The interval between the individual lubrication pulses results from the relubrication quantity, the relubrication interval and the piston distributor size:

$$\text{Interval between lubrication pulses [km]} = \frac{\text{Piston distributor size [cm}^3\text{]}}{\text{Relubrication quantity [cm}^3\text{]}} \times \text{Relubrication interval [km]}$$

### 7.7.3 Lubricant quantities for oil lubrication

When using a central lubrication system, make sure that all pipes and elements up to the user are filled with lubricant and that no air pockets are present. Long pipelines and narrow pipe diameters are to be avoided. The pipes are to be installed on an incline.

The pulse count results from the partial quantities and the piston distributor sizes. The interval between two pulses can be calculated from the ratio of the pulse count and the relubrication interval.

In addition, the lubrication system manufacturer's regulations must be observed.

Table 7.27 Lubricant quantities for oil lubrication – HG, QH, EG, QE, CG, WE, QW, RG, QR series

Size	Initial lubrication partial quantity [cm <sup>3</sup> ]			Relubrication quantity [cm <sup>3</sup> ]		
	Average load (S)	Heavy duty (C)	Super heavy duty (H)	Average load (S)	Heavy duty (C)	Super heavy duty (H)
15, 17	0.3 (3 ×)	0.3 (3 ×)	—	0.3	0.3	—
20, 21	0.5 (3 ×)	0.5 (3 ×)	0.5 (3 ×)	0.5	0.5	0.5
25, 27	0.7 (3 ×)	0.8 (3 ×)	1.0 (3 ×)	0.7	0.8	1.0
30	0.9 (3 ×)	1.0 (3 ×)	1.2 (3 ×)	0.9	1.0	1.2
35	1.2 (3 ×)	1.5 (3 ×)	1.8 (3 ×)	1.2	1.5	1.8
45	—	1.7 (3 ×)	2.0 (3 ×)	—	1.7	2.0
50, 55	—	2.5 (3 ×)	2.8 (3 ×)	—	2.5	2.8
65	—	4.5 (3 ×)	4.8 (3 ×)	—	4.5	4.8

In the case of the miniature guideway MG, we recommend that oil lubrication is carried out via the profile rail. In this case, apply the lubricant uniformly, for example with a suitable brush, onto the ball tracks over the entire length of the profile rail. Then proceed the block over the entire travel distance and remove excess oil.

### Piston distributor sizes for feed units (single-line systems) for oil lubrication

In order to ensure sufficient lubrication, the following minimum sizes for the piston distributors must be observed. The interval between the individual lubrication pulses results from the relubrication quantity, the relubrication interval and the piston distributor size:

$$\text{Interval between lubrication pulses [km]} = \frac{\text{Piston distributor size [cm}^3\text{]}}{\text{Relubrication quantity [cm}^3\text{]}} \times \text{Relubrication interval [km]}$$

### 7.8 Relubrication

#### ATTENTION!

##### **Danger of damage to the linear guideways due to insufficient lubricant quantities!**

Insufficient or excessive lubricant quantities/excessive lubrication pressure can damage or destroy the product.

- ▶ Ensure sufficient and regular relubrication!
- ▶ The specified procedure must be observed in order to avoid damaging the product!

The lubrication intervals depend heavily on the operating conditions (loads, speed, acceleration) and environmental conditions (temperature, fluids, soiling etc.). Environmental influences such as high loads, vibrations, long travel distances and dirt may shorten the lubrication intervals. Once the lubrication interval has passed, feed in the lubricant quantity as specified in Section 7.7 by operating the grease gun in a single action or by adjusting the central lubrication system accordingly. Check whether a film of oil can be seen on the total rail. If this is not the case, increase the lubricant quantity.

#### 7.8.1 Relubrication intervals for grease lubrication

Among other conditions, the relubrication intervals depend on the P/C load ratio, where P stands for the dynamically equivalent load and C stands for the dynamic load rating.

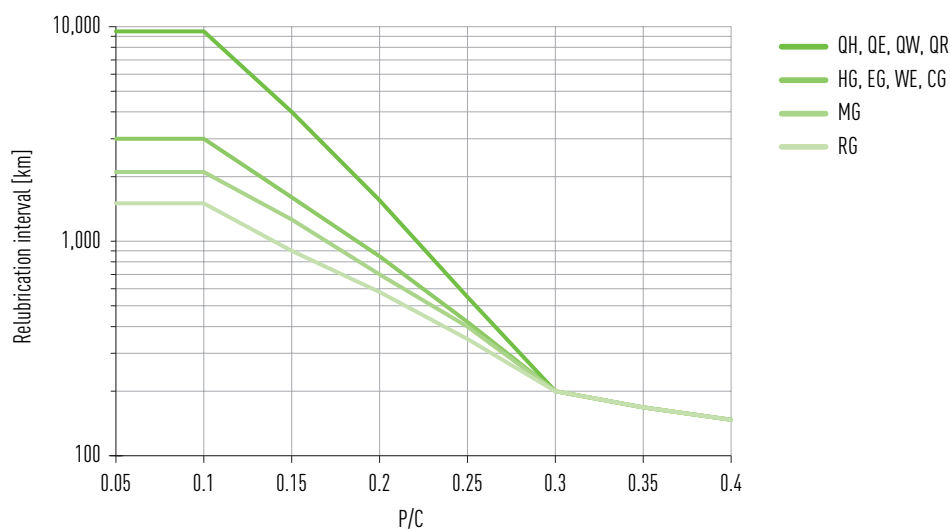


Fig. 7.23 Load-dependent relubrication intervals for grease lubrication

The relubrication intervals can possibly be shortened under the following conditions. In such cases, please consult HIWIN:  
 $v > 3 \text{ m/s}$ ,  $a > 30 \text{ m/s}^2$ , contact with media, temperatures  $< 20^\circ\text{C}$  or  $> 30^\circ\text{C}$ , soiled ambient conditions.

#### 7.8.2 Relubrication intervals for lubrication with low-viscosity grease

The relubrication intervals for lubrication with low-viscosity grease are reduced by 25 %, based on the relubrication intervals for grease lubrication (see Section 7.8.1)

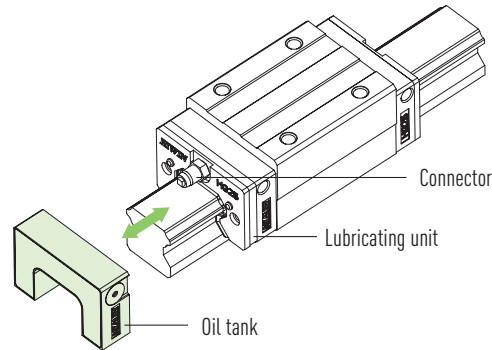
#### 7.8.3 Relubrication intervals for oil lubrication

The relubrication intervals for oil lubrication are reduced to 50 % of the relubrication intervals for grease lubrication (see Section 7.8.1)

Lubrication

**7.9 Self-lubricating linear guideway E2**

The self-lubricating E2 block consists of a lubricating unit between the deflection system and the end seal, and an interchangeable oil tank. The block does not need to be disassembled in order to replace the oil tank.



Lubrication passes from the oil tank via the connector to the lubricating unit which then lubricates the ball track of the rail. Due to the specific design of the oil tank, the block can be assembled in any position without influencing the lubrication effect.

The replacement intervals of the oil tank depend greatly on the loads and the environmental conditions. Environmental influences such as high loads, vibrations and dirt shorten the replacement intervals.

Table 7.28 indicates the maximum interval at which the fill level of the oil tank should be checked.

Table 7.28 Oil quantities in the oil tank

Model	Oil quantity [cm³]	Mileage [km]
HG15E2	1.6	2,000
HG20E2	3.9	4,000
HG25E2	5.1	6,000
HG30E2	7.8	8,000
HG35E2	9.8	10,000
HG45E2	18.5	20,000
HG55E2	25.9	30,000
HG65E2	50.8	40,000
EG15E2	1.7	2,000
EG20E2	2.9	3,000
EG25E2	4.8	5,000
EG30E2	8.9	9,000
RG25E2	5.0	6,000
RG30E2	7.5	8,000
RG35E2	10.7	10,000
RG45E2	18.5	20,000
RG55E2	26.5	30,000
RG65E2	50.5	40,000

Standard oil:  
Mobil SHC 636  
Fully synthetic with a hydrocarbon base (PAO)  
Viscosity grade: ISO VG 680  
Alternatively, oils of the same classification and viscosity may be used.

### 8. Procedures for incidents

Interference	Possible cause	Remedy
<b>High level of operating noise while the linear guideway is running</b>	Travel speed of the linear guideway is too high	Verification of the permissible travel speed
	Insufficient lubrication	Lubricate the linear guideway as specified in the lubrication instructions
<b>Blocks require high displacement forces</b>	Preload of the block on the rail is too high	Check the required preload of the block

## 9. Disposal

### ATTENTION!



#### **Danger caused by environmentally hazardous substances!**

The danger to the environment depends on the type of substance used.

- ▶ Clean contaminated parts thoroughly before disposal!
- ▶ Clarify the requirements for safe disposal with disposal companies and, where appropriate, with the competent authorities!

#### Fluids

Lubricants	Dispose of as hazardous waste in an environmentally friendly way
Soiled cleaning cloths	Dispose of as hazardous waste in an environmentally friendly way

#### Blocks

Steel components	Dispose of separately
Plastic components	Dispose of as residual waste

#### Rails

Steel components	Dispose of separately
Plastic bolt caps	Dispose of as residual waste

## 10. Appendix

### 10.1 Maximum speeds and accelerations for HIWIN linear guideways

The following maximum speeds and accelerations are permitted for HIWIN linear guideways<sup>1)</sup>:

Table 10.1 Permissible maximum speeds and accelerations for HIWIN linear guideways

Model	Max. speed $v_{\max}$ [m/s]	Max. acceleration $a_{\max}$ [m/s <sup>2</sup> ]
QH, QE, QW	5	50
HG, EG, CG, WE, QR	4	40
RG	3	30
MG	2	30

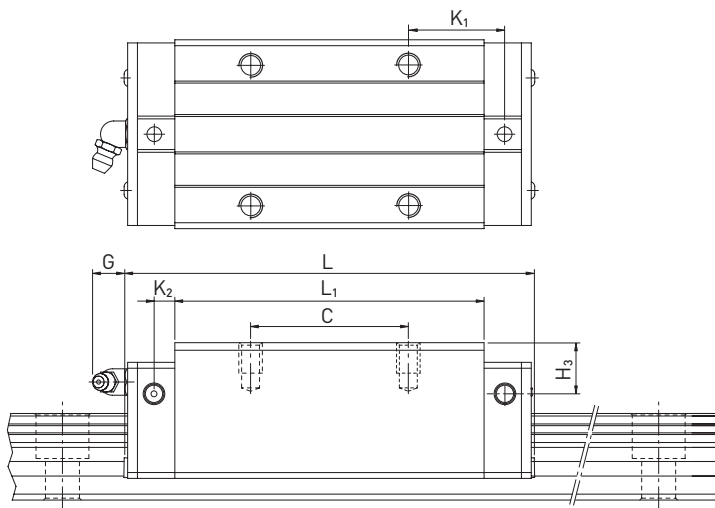
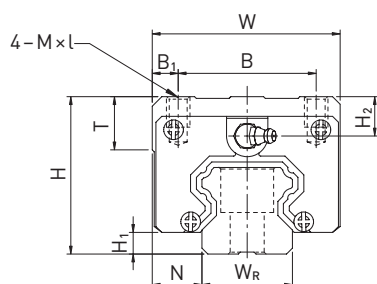
<sup>1)</sup> Depending on the application, higher values are possible. Please consult HIWIN on this matter.

Appendix

10.2 Technical data for blocks

10.2.1 Dimensions of the HG/QH blocks

HGH/QHH

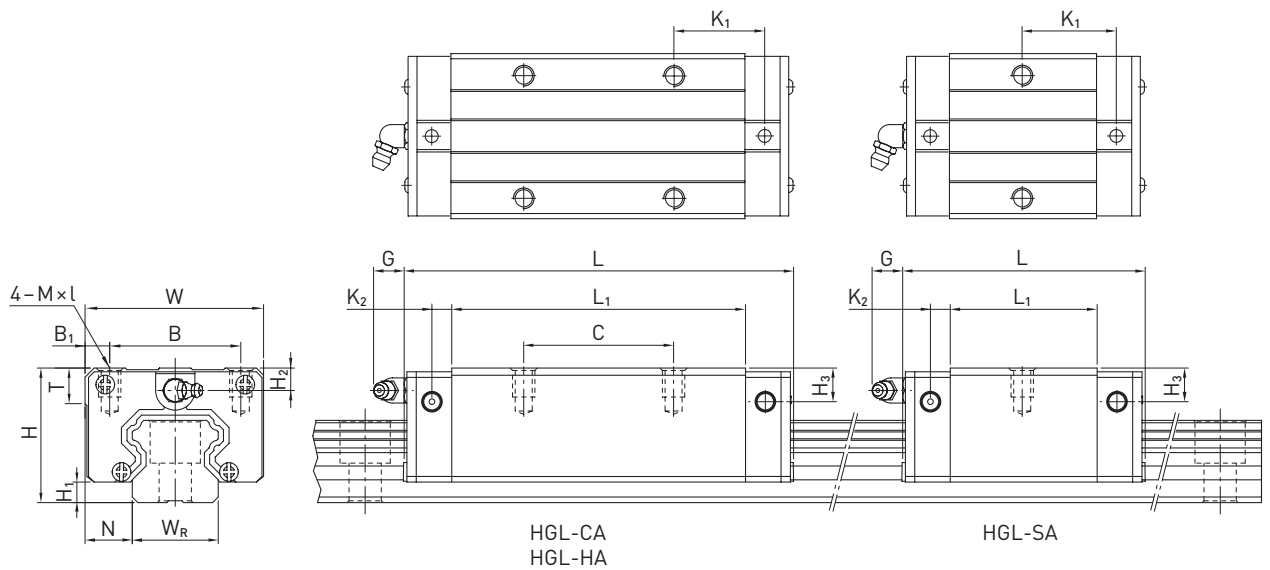


Dimensions of the block																				
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]	
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>		
HGH15CA	28	4.3	9.5	34	26	4.0	26	39.4	61.4	10.00	4.85	5.3	M4 × 5	6.0	7.95	7.7	11,380	16,970	0.18	
QHH15CA	28	4.0	9.5	34	26	4.0	26	39.4	61.4	10.00	5.00	5.3	M4 × 5	6.0	7.95	8.2	13,880	14,360	0.18	
HGH20CA	30	4.6	12.0	44	32	6.0	36	50.5	77.5	12.25	6.00	12.0	M5 × 6	8.0	6.00	6.0	17,750	27,760	0.30	
HGH20HA							50	65.2	92.2	12.60							21,180	35,900	0.39	
QHH20CA	30	4.6	12.0	44	32	6.0	36	50.5	76.7	11.75	6.00	12.0	M5 × 6	8.0	6.00	6.0	23,080	25,630	0.29	
QHH20HA							50	65.2	91.4	12.10							27,530	31,670	0.38	
HGH25CA	40	5.5	12.5	48	35	6.5	35	58.0	84.0	15.70	6.00	12.0	M6 × 8	8.0	10.00	9.0	26,480	36,490	0.51	
HGH25HA							50	78.6	104.6	18.50							32,750	49,440	0.69	
QHH25CA	40	5.5	12.5	48	35	6.5	35	58.0	83.4	15.70	6.00	12.0	M6 × 8	8.0	10.00	9.0	31,780	33,680	0.50	
QHH25HA							50	78.6	104.0	18.50							39,300	43,620	0.68	
HGH30CA	45	6.0	16.0	60	40	10.0	40	70.0	97.4	20.25	6.00	12.0	M8 × 10	8.5	9.50	13.8	38,740	52,190	0.88	
HGH30HA							60	93.0	120.4	21.75							47,270	69,160	1.16	
QHH30CA	45	6.0	16.0	60	40	10.0	40	70.0	97.4	19.50	6.25	12.0	M8 × 10	8.5	9.50	9.0	46,490	48,170	0.87	
QHH30HA							60	93.0	120.4	21.75							56,720	65,090	1.15	
HGH35CA	55	7.5	18.0	70	50	10.0	50	80.0	112.4	20.60	7.00	12.0	M8 × 12	10.2	16.00	19.6	49,520	69,160	1.45	
HGH35HA							72	105.8	138.2	22.50							60,210	91,630	1.92	
QHH35CA	55	7.5	18.0	70	50	10.0	50	80.0	113.6	19.00	7.50	12.0	M8 × 12	10.2	15.50	13.5	60,520	63,840	1.44	
QHH35HA							72	105.8	139.4	20.90							73,590	86,240	1.90	
HGH45CA	70	9.5	20.5	86	60	13.0	60	97.0	139.4	23.00	10.00	12.9	M10 × 17	16.0	18.50	30.5	77,570	102,710	2.73	
HGH45HA							80	128.8	171.2	28.90							94,540	136,460	3.61	
QHH45CA	70	9.2	20.5	86	60	13.0	60	97.0	139.4	23.00	10.00	12.9	M10 × 17	16.0	18.50	20.0	89,210	94,810	2.72	
QHH45HA							80	128.8	171.2	29.09							108,720	128,430	3.59	
HGH55CA	80	13.0	23.5	100	75	12.5	75	117.7	166.7	27.35	11.00	12.9	M12 × 18	17.5	22.00	29.0	114,440	148,330	4.17	
HGH55HA							95	155.8	204.8	36.40							139,350	196,200	5.49	
HGH65CA	90	15.0	31.5	126	76	25.0	70	144.2	200.2	43.10	14.00	12.9	M16 × 20	25.0	15.00	15.0	163,630	215,330	7.00	
HGH65HA							120	203.6	259.6	47.80							208,360	303,130	9.82	

<sup>1)</sup> 98.8 for version SE; <sup>2)</sup> 121.8 for version SE



### HGL



Dimensions of the block

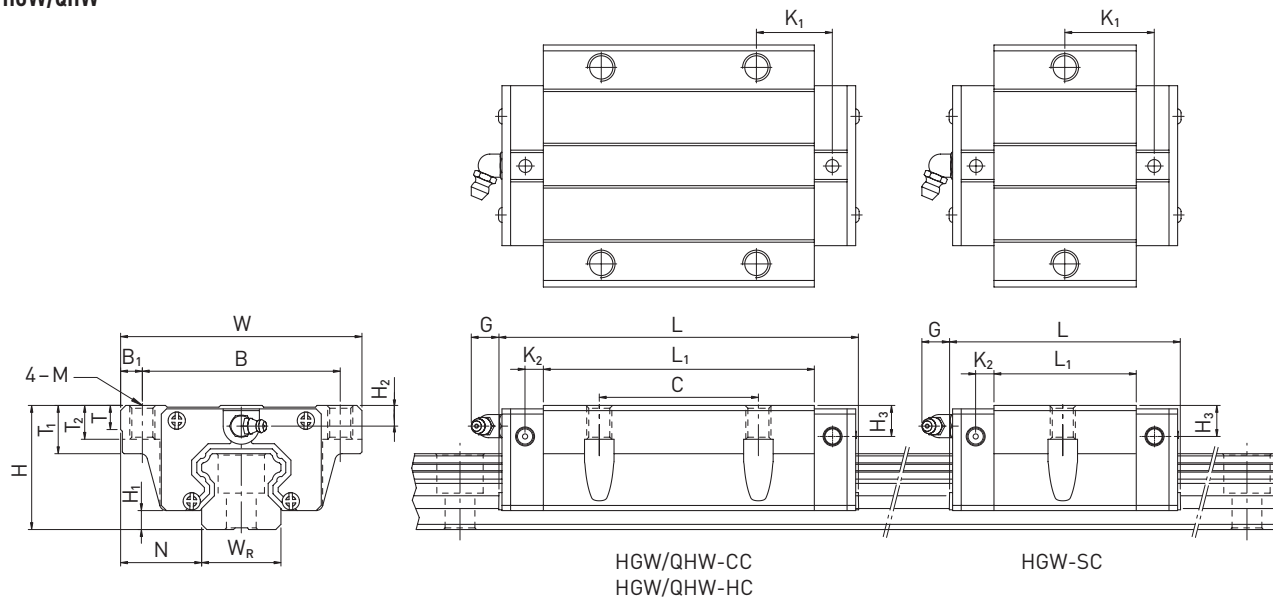
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
HGL15CA	24	4.3	9.5	34	26	4.0	26	39.4	61.4	10.00	4.85	5.3	M4 × 4	6.0	3.95	3.7	11,380	16,970	0.14
HGL25SA	36	5.5	12.5	48	35	6.5	—	38.2	64.2	23.20	6.00	12.0	M6 × 6	8.0	6.00	5.0	18,650	24,290	0.32
HGL25CA							35	58.0	84.0	15.70							26,480	36,490	0.42
HGL25HA							50	78.6	104.6	18.50							32,750	49,440	0.57
HGL30CA	42	6.0	16.0	60	40	10.0	40	70.0	97.4 <sup>1)</sup>	20.25	6.00	12.0	M8 × 10	8.5	6.50	10.8	38,740	52,190	0.78
HGL30HA							60	93.0	120.4 <sup>2)</sup>	21.75							47,270	69,160	1.03
HGL35CA	48	7.5	18.0	70	50	10.0	50	80.0	112.4	20.60	7.00	12.0	M8 × 12	10.2	9.00	12.6	49,520	69,160	1.14
HGL35HA							72	105.8	138.2	22.50							60,210	91,630	1.52
HGL45CA	60	9.5	20.5	86	60	13.0	60	97.0	139.4	23.00	10.00	12.9	M10 × 17	16.0	8.50	20.5	77,570	102,710	2.08
HGL45HA							80	128.8	171.2	28.90							94,540	136,460	2.75
HGL55CA	70	13.0	23.5	100	75	12.5	75	117.7	166.7	27.35	11.00	12.9	M12 × 18	17.5	12.00	19.0	114,440	148,330	3.25
HGL55HA							95	155.8	204.8	36.40							139,350	196,200	4.27

<sup>1)</sup> 98.8 for version SE

<sup>2)</sup> 121.8 for version SE

Appendix

HGW/QHW

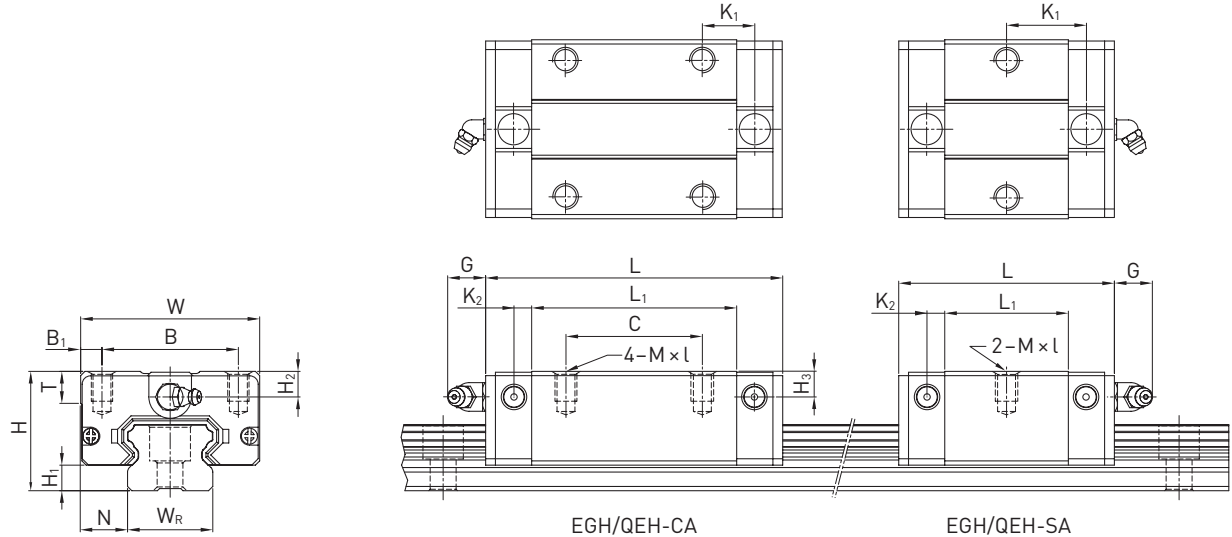


Dimensions of the block																						
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]																Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	M	G	T	T <sub>1</sub>	T <sub>2</sub>	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>		
HGW15CC	24	4.3	16.0	47	38	4.5	30	39.4	61.4	8.00	4.85	M5	5.3	6.0	8.9	7.0	3.95	3.7	11,380	16,970	0.17	
QHW15CC	24	4.0	16.0	47	38	4.5	30	39.4	61.4	8.00	5.00	M5	5.3	6.0	8.9	7.0	3.95	4.2	13,880	14,360	0.17	
HGW20SC	30	4.6	21.5	63	53	5.0	—	29.5	54.3	19.65	6.00	M6	12.0	8.0	10.0	9.5	6.00	6.0	12,190	16,110	0.28	
HGW20CC							40	50.5	77.5	10.25									17,750	27,760	0.40	
HGW20HC							65.2	92.2	17.60	21,180									35,900	0.52		
QHW20CC	30	4.6	21.5	63	53	5.0	40	50.5	76.7	9.75	6.00	M6	12.0	8.0	10.0	9.5	6.00	6.0	23,080	25,630	0.40	
QHW20HC							65.2	91.4	17.10	27,530									31,670	0.52		
HGW25SC	36	5.5	23.5	70	57	6.5	—	38.2	64.2	23.20	6.00	M8	12.0	8.0	14.0	10.0	6.00	5.0	18,650	24,290	0.42	
HGW25CC							45	58.0	84.0	10.70									26,480	36,490	0.59	
HGW25HC							78.6	104.6	21.00	32,750									49,440	0.80		
QHW25CC	36	5.5	23.5	70	57	6.5	45	58.0	83.4	10.70	6.00	M8	12.0	8.0	14.0	10.0	6.00	5.0	31,780	33,680	0.59	
QHW25HC							78.6	104.0	21.00	39,300									43,620	0.80		
HGW30CC	42	6.0	31.0	90	72	9.0	52	70.0	97.4 <sup>1)</sup>	14.25	6.00	M10	12.0	8.5	16.0	10.0	6.50	10.8	38,740	52,190	1.09	
HGW30HC								93.0	120.4 <sup>2)</sup>	25.75									47,270	69,160	1.44	
QHW30CC	42	6.0	31.0	90	72	9.0	52	70.0	97.4	13.50	6.25	M10	12.0	8.5	16.0	10.0	6.50	6.0	46,490	48,170	1.09	
QHW30HC								93.0	120.4	25.75									56,720	65,090	1.44	
HGW35CC	48	7.5	33.0	100	82	9.0	62	80.0	112.4	14.60	7.00	M10	12.0	10.1	18.0	13.0	9.00	12.6	49,520	69,160	1.56	
HGW35HC								105.8	138.2	27.50									60,210	91,630	2.06	
QHW35CC	48	7.5	33.0	100	82	9.0	62	80.0	113.6	13.00	7.50	M10	12.0	10.1	18.0	13.0	8.50	6.5	60,520	63,840	1.56	
QHW35HC								105.8	139.4	25.90									73,590	86,240	2.06	
HGW45CC	60	9.5	37.5	120	100	10.0	80	97.0	139.4	13.00	10.00	M12	12.9	15.1	22.0	15.0	8.50	20.5	77,570	102,710	2.79	
HGW45HC								128.8	171.2	28.90									94,540	136,460	3.69	
QHW45CC	60	9.2	37.5	120	100	10.0	80	97.0	139.4	13.00	10.00	M12	12.9	15.1	22.0	15.0	8.50	10.0	89,210	94,810	2.79	
QHW45HC								128.8	171.2	28.90									108,720	128,430	3.69	
HGW55CC	70	13.0	43.5	140	116	12.0	95	117.7	166.7	17.35	11.00	M14	12.9	17.5	26.5	17.0	12.00	19.0	114,440	148,330	4.52	
HGW55HC								155.8	204.8	36.40									139,350	196,200	5.96	
HGW65CC	90	15.0	53.5	170	142	14.0	110	144.2	200.2	23.10	14.00	M16	12.9	25	37.5	23.0	15.00	15.0	163,630	215,330	9.17	
HGW65HC								203.6	259.6	52.80									208,360	303,130	12.89	

<sup>1)</sup> 98.8 for version SE; <sup>2)</sup> 121.8 for version SE

### 10.2.2 Dimensions of the EG/QE blocks

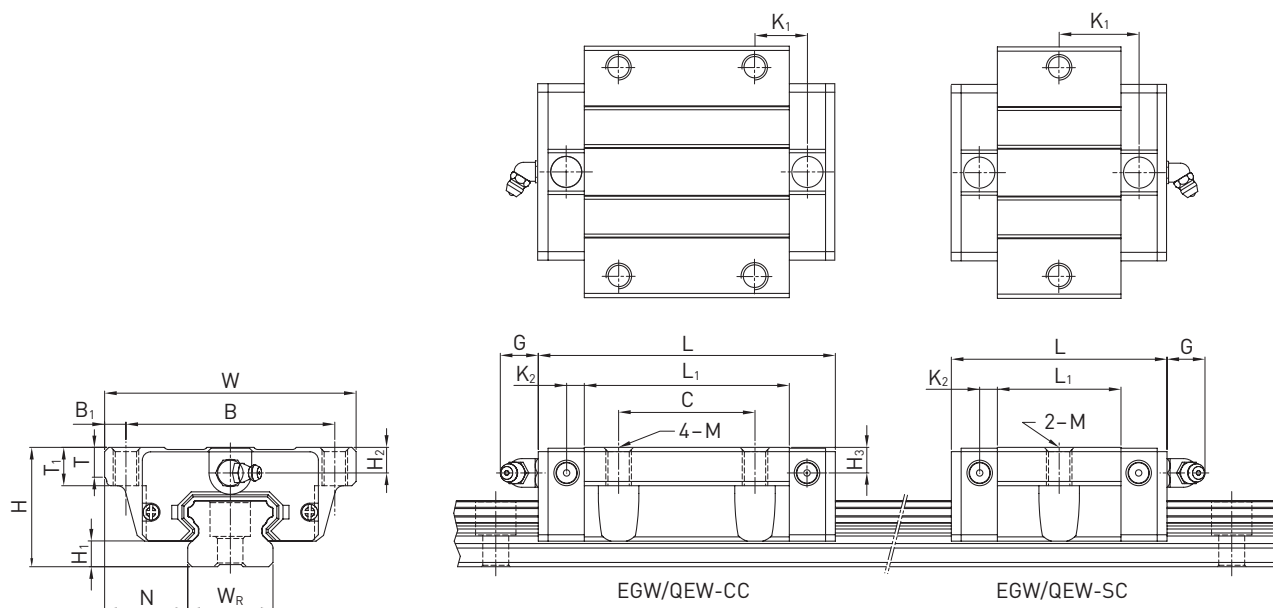
#### EGH/QEH



Dimensions of the block																			
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	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 × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
EGH15SA	24	4.5	9.5	34	26	4.0	—	23.1	40.1	14.80	3.50	5.7	M4 × 6	6.0	5.5	6.0	5,350	9,400	0.09
EGH15CA							26	39.8	56.8	10.15							7,830	16,190	0.15
QEH15SA	24	4.0	9.5	34	26	4.0	—	23.1	40.1	14.80	3.50	5.7	M4 × 6	6.0	5.5	6.0	8,560	8,790	0.09
QEH15CA							26	39.8	56.8	10.15							12,530	15,280	0.15
EGH20SA	28	6.0	11.0	42	32	5.0	—	29.0	50.0	18.75	4.15	12.0	M5 × 7	7.5	6.0	6.0	7,230	12,740	0.15
EGH20CA							32	48.1	69.1	12.30							10,310	21,130	0.24
QEH20SA	28	6.0	11.0	42	32	5.0	—	29.0	50.0	18.75	4.15	12.0	M5 × 7	7.5	6.0	6.5	11,570	12,180	0.15
QEH20CA							32	48.1	69.1	12.30							16,500	20,210	0.23
EGH25SA	33	7.0	12.5	48	35	6.5	—	35.5	59.1	21.90	4.55	12.0	M6 × 9	8.0	8.0	8.0	11,400	19,500	0.25
EGH25CA							35	59.0	82.6	16.15							16,270	32,400	0.41
QEH25SA	33	6.2	12.5	48	35	6.5	—	35.5	60.1	21.90	5.00	12.0	M6 × 9	8.0	8.0	8.0	18,240	18,900	0.24
QEH25CA							35	59.0	83.6	16.15							26,030	31,490	0.40
EGH30SA	42	10.0	16.0	60	40	10.0	—	41.5	69.5	26.75	6.00	12.0	M8 × 12	9.0	8.0	9.0	16,420	28,100	0.45
EGH30CA							40	70.1	98.1	21.05							23,700	47,460	0.76
QEH30SA	42	10.0	16.0	60	40	10.0	—	41.5	67.5	25.75	6.00	12.0	M8 × 12	9.0	8.0	9.0	26,270	27,820	0.44
QEH30CA							40	70.1	96.1	20.05							37,920	46,630	0.75
EGH35SA	48	11.0	18.0	70	50	10.0	—	45.0	75.0	28.50	7.00	12.0	M8 × 12	10.0	8.5	8.5	22,660	37,380	0.74
EGH35CA							50	78.0	108.0	20.00							33,350	64,840	1.10
QEH35SA	48	11.0	18.0	70	50	10.0	—	51.0	76.0	30.30	6.25	12.0	M8 × 12	10.0	8.5	8.5	36,390	36,430	0.58
QEH35CA							50	83.0	108.0	21.30							51,180	59,280	0.90

Appendix

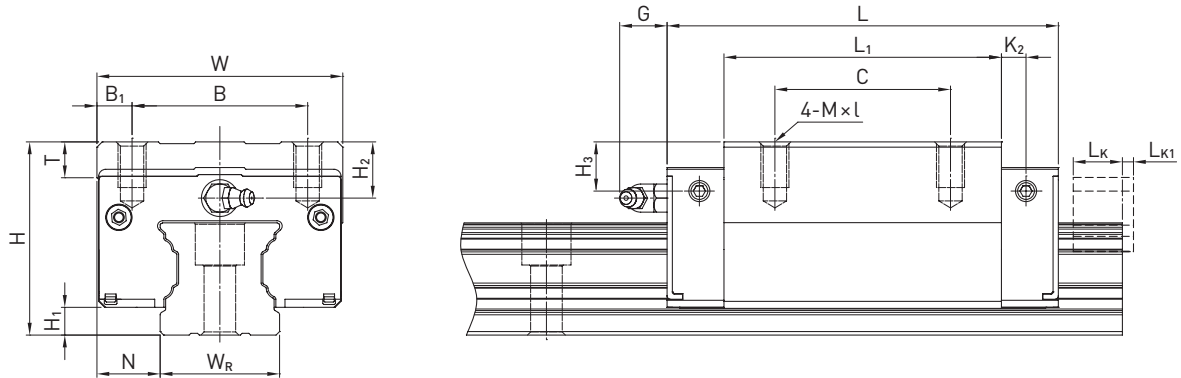
EGW/QEW



Dimensions of the block																					
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]															Load ratings [N]		Weight [kg]
	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>	C <sub>dyn</sub>	C <sub>0</sub>		
EGW15SC	24	4.5	18.5	52	41	5.5	—	23.1	40.1	14.80	3.50	5.7	M5	5.0	7	5.5	6.0	5,350	9,400	0.12	
EGW15CC							26	39.8	56.8	10.15								7,830	16,190	0.21	
QEW15SC	24	4.0	18.5	52	41	5.5	—	23.1	40.1	14.80	3.50	5.7	M5	5.0	—	5.5	6.0	8,560	8,790	0.12	
QEW15CC							26	39.8	56.8	10.15								12,530	15,280	0.21	
EGW20SC	28	6.0	19.5	59	49	5.0	—	29.0	50.0	18.75	4.15	12.0	M6	7.0	9	6.0	6.0	7,230	12,740	0.19	
EGW20CC							32	48.1	69.1	12.30								10,310	21,130	0.32	
QEW20SC	28	6.0	19.5	59	49	5.0	—	29.0	50.0	18.75	4.15	12.0	M6	7.0	—	6.0	6.5	11,570	12,180	0.19	
QEW20CC							32	48.1	69.1	12.30								16,500	20,210	0.31	
EGW25SC	33	7.0	25.0	73	60	6.5	—	35.5	59.1	21.90	4.55	12.0	M8	7.5	10	8.0	8.0	11,400	19,500	0.35	
EGW25CC							35	59.0	82.6	16.15								16,270	32,400	0.59	
QEW25SC	33	6.2	25.0	73	60	6.5	—	35.5	60.1	21.90	5.00	12.0	M8	7.5	—	8.0	8.0	18,240	18,900	0.34	
QEW25CC							35	59.0	83.6	16.15								26,030	31,490	0.58	
EGW30SC	42	10.0	31.0	90	72	9.0	—	41.5	69.5	26.75	6.00	12.0	M10	7.0	10	8.0	9.0	16,420	28,100	0.62	
EGW30CC							40	70.1	98.1	21.05								23,700	47,460	1.04	
QEW30SC	42	10.0	31.0	90	72	9.0	—	41.5	67.5	25.75	6.00	12.0	M10	7.0	—	8.0	9.0	26,270	27,820	0.61	
QEW30CC							40	70.1	96.1	20.05								37,920	46,630	1.03	
EGW35SC	48	11.0	33.0	100	82	9.0	—	45.0	75.0	28.50	7.00	12.0	M10	10.0	13	8.5	8.5	22,660	37,380	0.91	
EGW35CC							50	78.0	108.0	20.00								33,350	64,840	1.40	
QEW35SC	48	11.0	33.0	100	82	9.0	—	51.0	76.0	30.30	6.25	12.0	M10	10.0	13	8.5	8.5	36,390	36,430	0.77	
QEW35CC							50	83.0	108.0	21.30								51,180	59,280	1.19	

### 10.2.3 Dimensions of the CG blocks

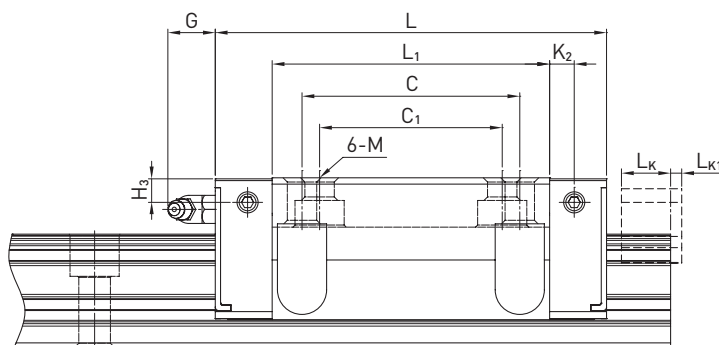
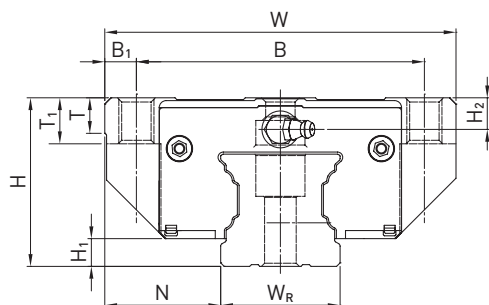
#### CGH



Dimensions of the block																					
Series/size	Installation dimensions [mm]			Dimensions of the block [mm]															Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	L <sub>K</sub>	L <sub>K1</sub>	C <sub>dyn</sub>	C <sub>0</sub>		
CGH15CA	28	4.1	9.5	34	26	4.0	26	39.6	58.2	4.25	6.0	M4 × 6	6.0	7.8	7.8	12.8	2.2	14,700	19,520	0.15	
CGH20CA	30	4.6	12.0	44	32	6.0	36	52.5	74.9	5.50	6.0	M5 × 6	8.0	3.7	3.5	10.8	2.2	23,700	30,510	0.25	
CGH20HA							50	68.5	90.9									28,600	39,900	0.33	
CGH25CA	40	6.1	12.5	48	35	6.5	35	61.0	84.0	5.00	12.0	M6 × 8	8.0	10.0	9.5	12.8	2.2	34,960	43,940	0.46	
CGH25HA							50	78.4	101.4									40,500	54,080	0.59	
CGH30CA	45	7.0	16.0	60	40	10.0	40	69.0	97.4	8.70	12.0	M8 × 10	9.5	9.7	10.0	9.8	2.2	46,000	55,190	0.71	
CGH30HA							60	91.5	119.9									58,590	78,180	0.94	
CGH35CA	55	7.6	18.0	70	50	10.0	50	79.0	111.4	7.00	12.0	M8 × 13	10.2	16.0	14.0	15.8	2.2	61,170	79,300	1.24	
CGH35HA							72	103.4	135.8									77,900	112,340	1.62	
CGH45CA	70	9.7	20.5	86	60	13.0	60	97.2	137.6	8.70	12.9	M10 × 17	16.0	18.5	18.2	15.8	2.2	103,830	122,040	2.38	
CGH45HA							80	132.3	172.3									124,430	217,200	3.01	

Appendix

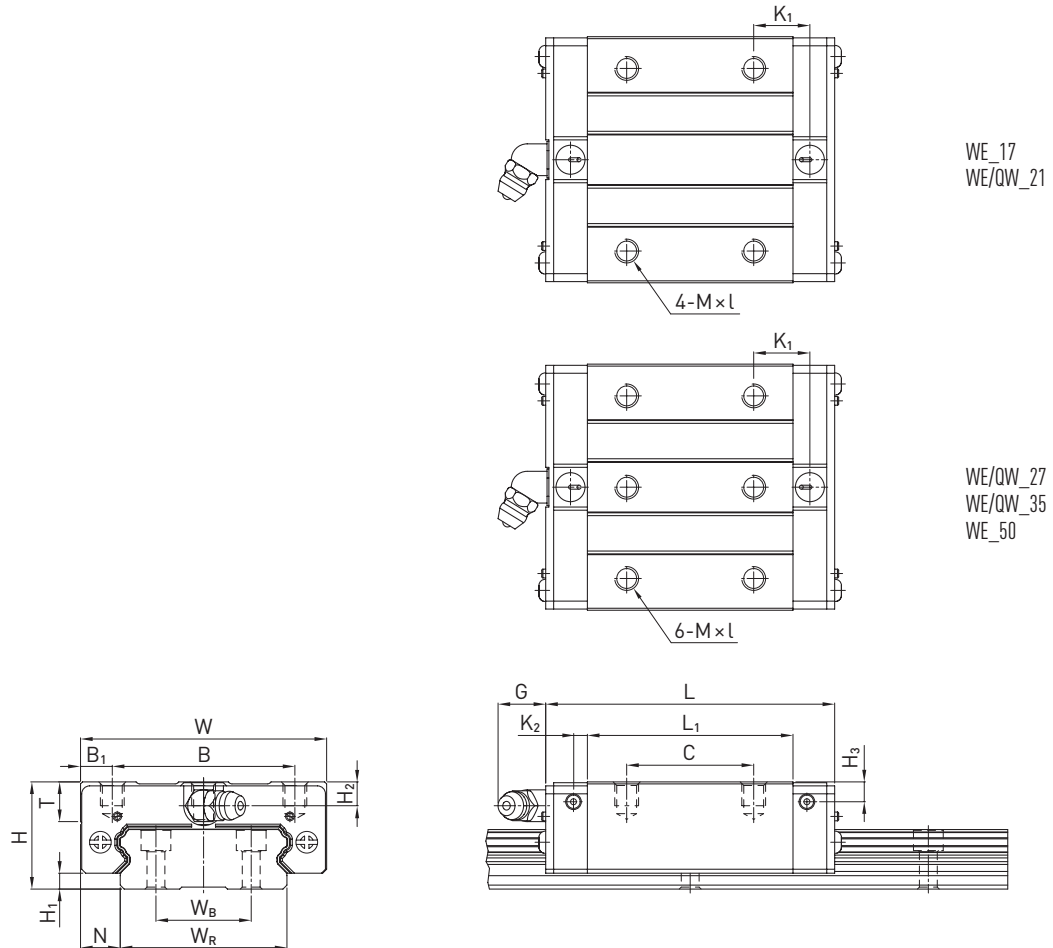
CGW



Dimensions of the block																								
Series/size	Installation dimensions [mm]			Dimensions of the block [mm]																		Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	C <sub>1</sub>	L <sub>1</sub>	L	K <sub>2</sub>	G	M	T	T <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	L <sub>K</sub>	L <sub>K1</sub>	C <sub>dyn</sub>	C <sub>0</sub>			
CGW15CC	24	4.1	16.0	47	38	4.5	30	26	39.6	58.2	4.25	6.0	M5	6.0	6.5	3.8	3.8	12.8	2.2	14,700	19,520	0.14		
CGW20CC	30	4.6	21.5	63	53	5.0	40	35	52.5	74.9	5.50	6.0	M6	6.5	7.7	3.7	3.5	10.8	2.2	23,700	30,510	0.36		
CGW20HC									68.5	90.9										28,600	39,900	0.47		
CGW25CC	36	6.1	23.5	70	57	6.5	45	40	61.0	84.0	5.00	12.0	M8	7.0	9.3	6.0	5.5	12.8	2.2	34,960	43,940	0.53		
CGW25HC									78.4	101.4										40,500	54,080	0.68		
CGW30CC	42	7.0	31.0	90	72	9.0	52	44	69.0	97.4	8.70	12.0	M10	10.5	12.0	6.7	7.0	9.8	2.2	46,000	55,190	0.90		
CGW30HC									91.5	119.9										58,590	78,180	1.19		
CGW35CC	48	7.6	33.0	100	82	9.0	62	52	79.0	111.4	7.00	12.0	M10	10.1	13.1	9.0	7.0	15.8	2.2	61,170	79,300	1.37		
CGW35HC									103.4	135.8										77,900	112,340	1.79		
CGW45CC	60	9.7	37.5	120	100	10.0	80	60	97.2	137.6	8.70	12.9	M12	15.1	15.0	8.5	8.1	15.8	2.2	103,830	122,040	2.45		
CGW45HC									132.3	172.3										124,430	217,200	3.00		

### 10.2.4 Dimensions of the WE/QW blocks

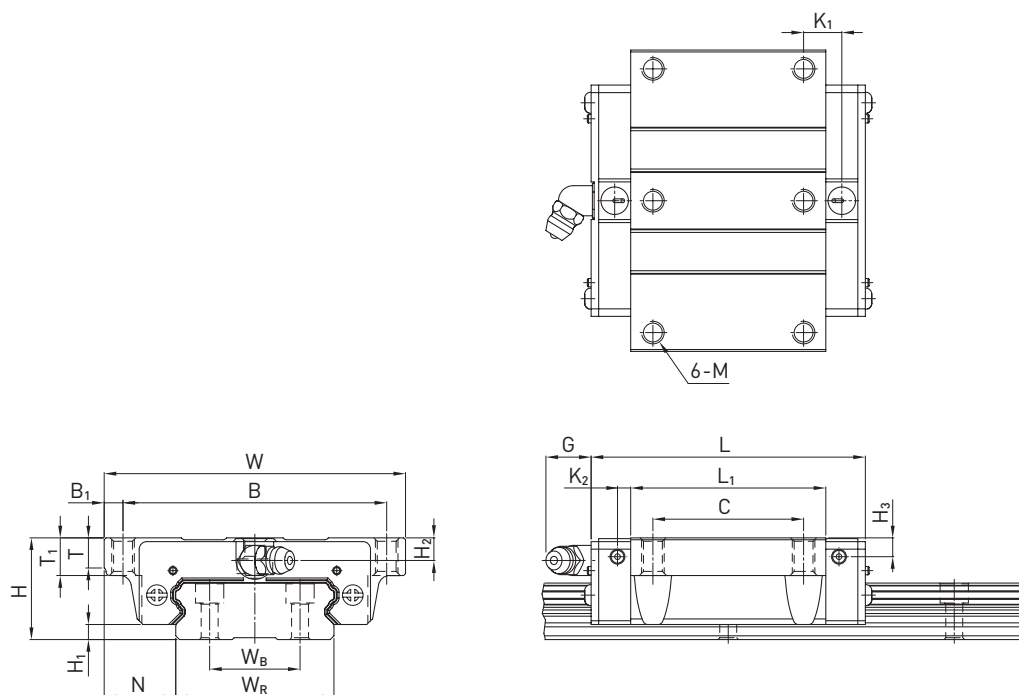
#### WEH/QWH



Dimensions of the block																			
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	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 × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
WEH17CA	17	2.5	8.5	50	29	10.5	15	35.0	50.6	—	3.10	4.9	M4 × 5	6.0	4.0	3.0	5,230	9,640	0.12
WEH21CA	21	3.0	8.5	54	31	11.5	19	41.7	59.0	14.68	3.65	12.0	M5 × 6	8.0	4.5	4.2	7,210	13,700	0.20
QWH21CA	21	3.0	8.5	54	31	11.5	19	41.7	59.0	14.68	3.65	12.0	M5 × 6	8.0	4.5	4.2	9,000	12,100	0.20
WEH27CA	27	4.0	10.0	62	46	8.0	32	51.8	72.8	14.15	3.50	12.0	M6 × 6	10.0	6.0	5.0	12,400	21,600	0.35
QWH27CA	27	4.0	10.0	62	46	8.0	32	56.6	73.2	15.45	3.15	12.0	M6 × 6	10.0	6.0	5.0	16,000	22,200	0.35
WEH35CA	35	4.0	15.5	100	76	12.0	50	77.6	102.6	18.35	5.25	12.0	M8 × 8	13.0	8.0	6.5	29,800	49,400	1.10
QWH35CA	35	4.0	15.5	100	76	12.0	50	73.0	107.0	21.5	5.50	12.0	M8 × 8	13.0	8.0	6.5	36,800	49,200	1.10
WEH50CA	50	7.5	20.0	130	100	15.0	65	112.0	140.0	28.05	6.00	12.9	M10 × 15	19.5	12.0	10.5	61,520	97,000	3.16

Appendix

WEW/QWW



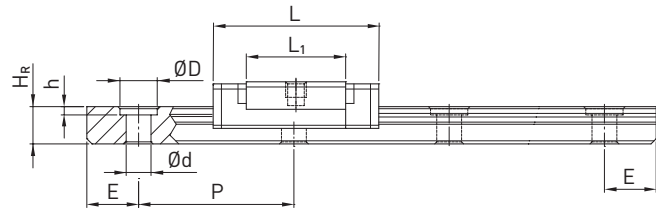
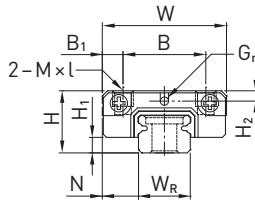
Dimensions of the block																					
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]															Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M	T	T <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>		
WEW17CC	17	2.5	13.5	60	53	3.5	26	35.0	50.6	—	3.10	4.9	M4	5.3	6	4.0	3.0	5,230	9,640	0.13	
WEW21CC	21	3.0	15.5	68	60	4.0	29	41.7	59.0	9.68	3.65	12.0	M5	7.3	8	4.5	4.2	7,210	13,700	0.23	
QWW21CC	21	3.0	15.5	68	60	4.0	29	41.7	59.0	9.68	3.65	12.0	M5	7.3	8	4.5	4.2	9,000	12,100	0.23	
WEW27CC	27	4.0	19.0	80	70	5.0	40	51.8	72.8	10.15	3.50	12.0	M6	8.0	10	6.0	5.0	12,400	21,600	0.43	
QWW27CC	27	4.0	19.0	80	70	5.0	40	56.6	73.2	15.45	3.15	12.0	M6	8.0	10	6.0	5.0	16,000	22,200	0.43	
WEW35CC	35	4.0	25.5	120	107	6.5	60	77.6	102.6	13.35	5.25	12.0	M8	11.2	14	8.0	6.5	29,800	49,400	1.26	
QWW35CC	35	4.0	25.5	120	107	6.5	60	83.0	107.0	21.50	5.50	12.0	M8	11.2	14	8.0	6.5	36,800	49,200	1.26	
WEW50CC	50	7.5	36.0	162	144	9.0	80	112.0	140.0	20.55	6.00	12.9	M10	14.0	18	12.0	10.5	61,520	97,000	3.71	



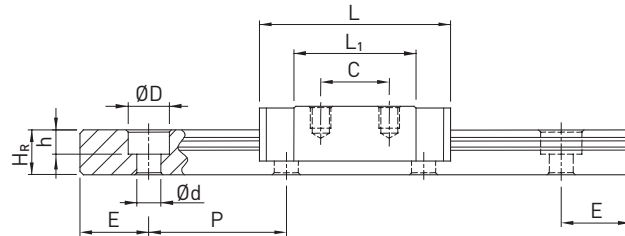
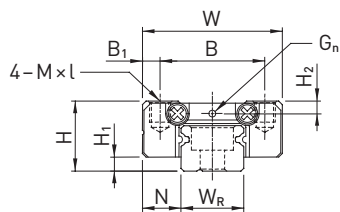
### 10.2.5 Dimensions of the MG blocks

#### MG

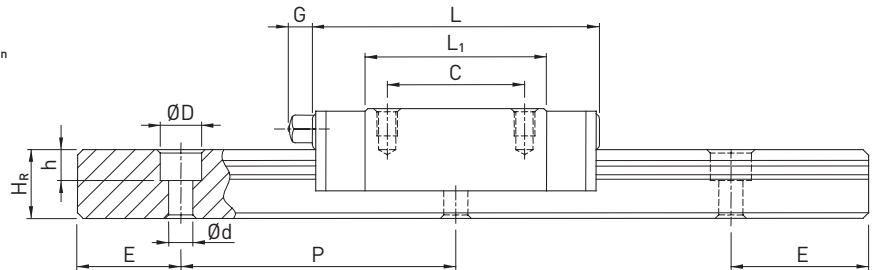
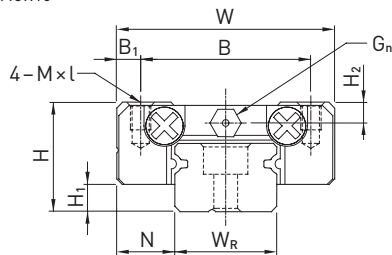
MGN05



MGN07, MGN09, MGN12



MGN15

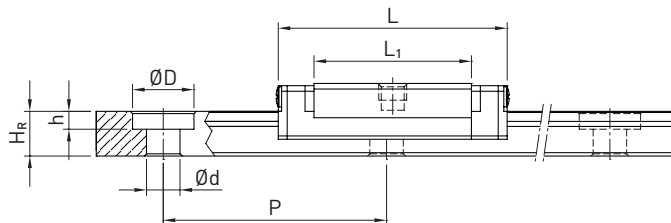
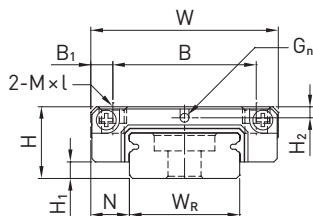


Dimensions of the block																
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	G	G <sub>n</sub>	M × l	H <sub>2</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
MGN05C	6	1.5	3.5	12	8	2.0	—	9.6	16.0	—	Ø 0.8	M2 × 1.5	1.0	540	840	0.008
MGN05H							—	12.6	19.0					670	1,080	0.010
MGN07C	8	1.5	5.0	17	12	2.5	8	13.5	22.5	—	Ø 1.2	M2 × 2.5	1.5	980	1,245	0.010
MGN07H							13	21.8	30.8					1,372	1,960	0.020
MGN09C	10	2.0	5.5	20	15	2.5	10	18.9	28.9	—	Ø 1.4	M3 × 3	1.8	1,860	2,550	0.020
MGN09H							16	29.9	39.9					2,550	4,020	0.030
MGN12C	13	3.0	7.5	27	20	3.5	15	21.7	34.7	—	Ø 2	M3 × 3.5	2.5	2,840	3,920	0.030
MGN12H							20	32.4	45.4					3,720	5,880	0.050
MGN15C	16	4.0	8.5	32	25	3.5	20	26.7	42.1	4.5	M3	M3 × 4	3.0	4,610	5,590	0.060
MGN15H							25	43.4	58.8					6,370	9,110	0.090

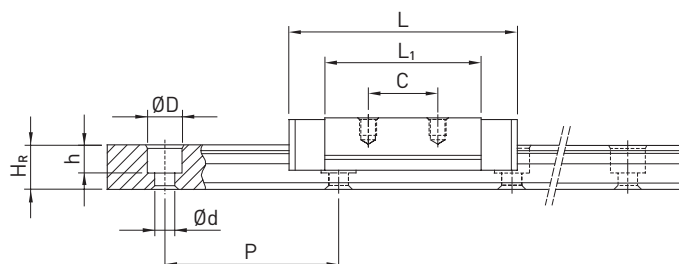
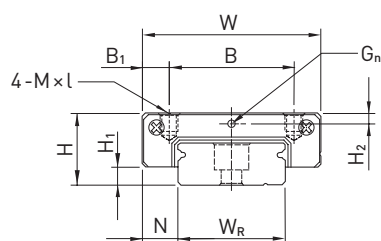
Appendix

**MGW**

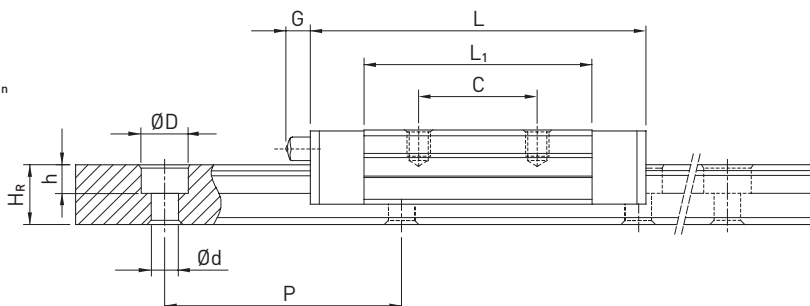
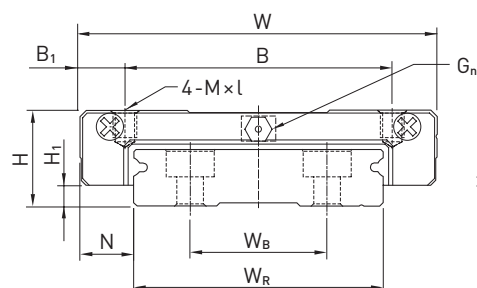
MGW05



MGW07, MGW09, MGW12



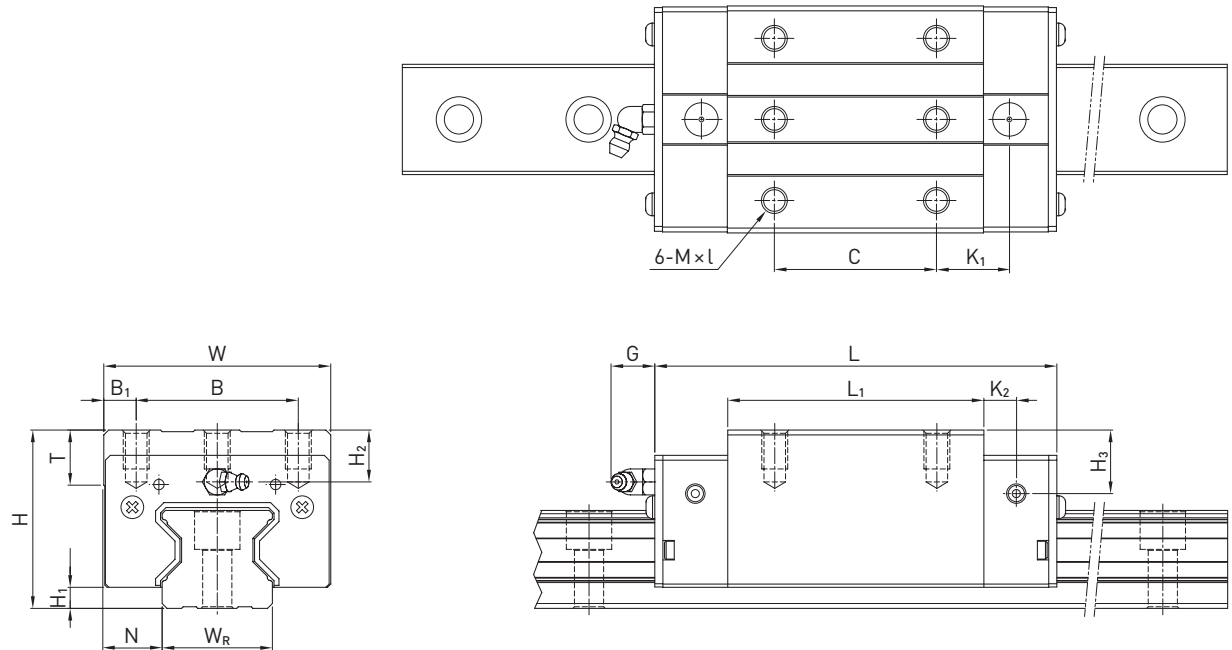
MGW15



Dimensions of the block																
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	G	G <sub>n</sub>	M × l	H <sub>2</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
MGW05C	6.5	1.5	3.5	17	13	2.0	—	14.1	20.5	—	Ø 1.2	M2.5 × 1.5	1.00	680	1,180	0.02
MGW07C	9.0	1.9	5.5	25	19	3.0	10	21.0	31.2	—	Ø 1.2	M3 × 3	1.85	1,370	2,060	0.02
MGW07H							19	30.8	41.0					1,770	3,140	0.03
MGW09C	12.0	2.9	6.0	30	21	4.5	12	27.5	39.3	—	Ø 1.4	M3 × 3	2.40	2,750	4,120	0.04
MGW09H					23	3.5	24	38.5	50.7					3,430	5,890	0.06
MGW12C	14.0	3.4	8.0	40	28	6.0	15	31.3	46.1	—	Ø 2	M3 × 3.6	2.80	3,920	5,590	0.07
MGW12H							28	45.6	60.4					5,100	8,240	0.10
MGW15C	16.0	3.4	9.0	60	45	7.5	20	38.0	54.8	5.2	M3	M4 × 4.2	3.20	6,770	9,220	0.14
MGW15H							35	57.0	73.8					8,930	13,380	0.22

### 10.2.6 Dimensions of the RG/QR blocks

#### RGH/QRH

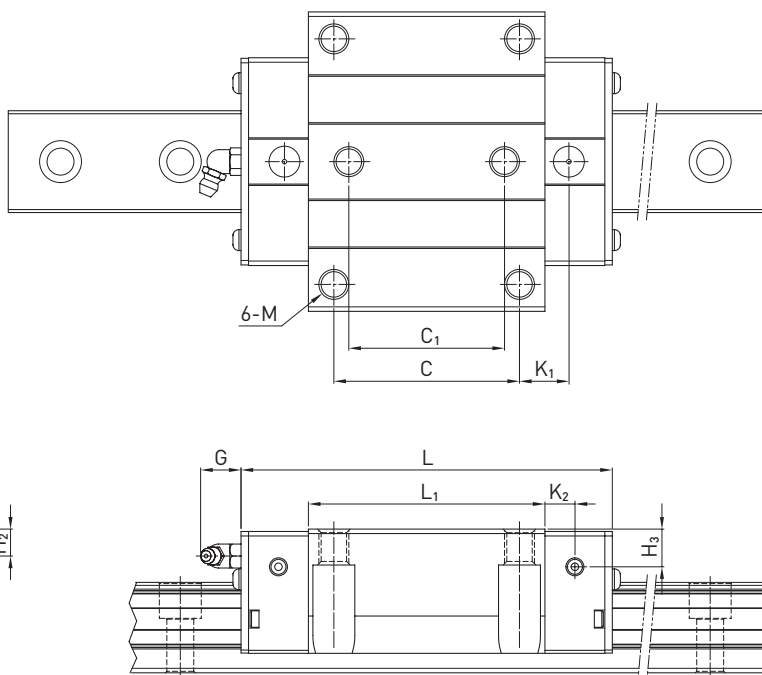


Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	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 × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
RGH15CA	28	4.0	9.5	34	26	4.0	26	45.0	68.0	13.40	4.70	5.3	M4 × 8	6.0	7.6	10.1	11,300	24,000	0.20
RGH20CA	34	5.0	12.0	44	32	6.0	36	57.5	86.0	15.80	6.00	5.3	M5 × 8	8.0	8.3	8.3	21,300	46,700	0.40
RGH20HA							50	77.5	106.0	18.80							26,900	63,000	0.53
RGH25CA	40	5.5	12.5	48	35	6.5	35	64.5	97.9	20.75	7.25	12.0	M6 × 8	9.5	10.2	10.0	27,700	57,100	0.61
RGH25HA							50	81.0	114.4	21.50							33,900	73,400	0.75
QRH25CA	40	5.5	12.5	48	35	6.5	35	66.0	9.9	20.75	7.25	12.0	M6 × 8	9.5	10.2	10.0	38,500	54,400	0.60
QRH25HA							50	81.0	112.9	21.50							44,700	65,300	0.74
RGH30CA	45	6.0	16.0	60	40	10.0	40	71.0	109.8	23.50	8.00	12.0	M8 × 10	9.5	9.5	10.3	39,100	82,100	0.90
RGH30HA							60	93.0	131.8	24.50							48,100	105,000	1.16
QRH30CA	45	6.0	16.0	60	40	10.0	40	71.0	109.8	23.50	8.00	12.0	M8 × 10	9.5	9.5	10.3	51,500	73,000	0.89
QRH30HA							60	93.0	131.8	24.50							64,700	95,800	1.15
RGH35CA	55	6.5	18.0	70	50	10.0	50	79.0	124.0	22.50	10.00	12.0	M8 × 12	12.0	16.0	19.6	57,900	105,200	1.57
RGH35HA							72	106.5	151.5	25.25							73,100	142,000	2.06
QRH35CA	55	6.5	18.0	70	50	10.0	50	79.0	124.0	22.50	10.00	12.0	M8 × 12	12.0	16.0	19.6	77,000	94,700	1.56
QRH35HA							72	106.5	151.5	25.25							95,700	126,300	2.04
RGH45CA	70	8.0	20.5	86	60	13.0	60	106.0	153.2	31.00	10.00	12.9	M10 × 17	16.0	20.0	24.0	92,600	178,800	3.18
RGH45HA							80	139.8	187.0	37.90							116,000	230,900	4.13
QRH45CA	70	8.0	20.5	86	60	13.0	60	106.0	153.2	31.00	10.00	12.9	M10 × 17	16.0	20.0	24.0	123,200	156,400	3.16
QRH45HA							80	139.8	187.0	37.90							150,800	208,600	4.10
RGH55CA	80	10.0	23.5	100	75	12.5	75	125.5	183.7	37.75	12.50	12.9	M12 × 18	17.5	22.0	27.5	130,500	252,000	4.89
RGH55HA							95	173.8	232.0	51.90							167,800	348,000	6.68
RGH65CA	90	12.0	31.5	126	76	25.0	70	160.0	232.0	60.80	15.80	12.9	M16 × 20	25.0	15.0	15.0	213,000	411,600	8.89
RGH65HA							120	223.0	295.0	67.30							275,300	572,700	12.13

Appendix

RGW/QRW



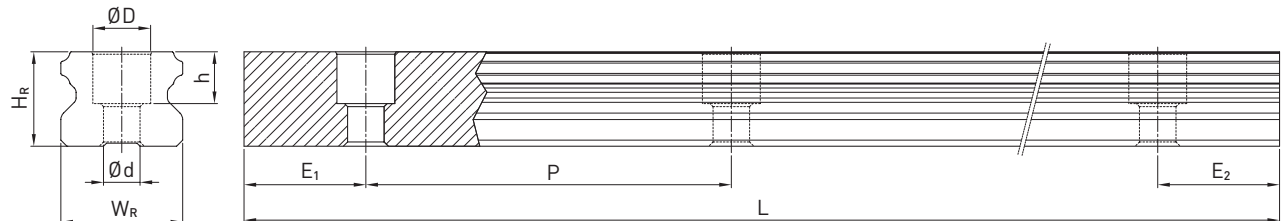
Dimensions of the block																					
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]															Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	C <sub>1</sub>	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M	T	T <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
RGW15CC	24	4.0	16.0	47	38	4.5	30	26	45.0	68.0	11.40	4.70	5.3	M5	6.0	7	3.6	6.1	11,300	24,000	0.22
RGW20CC	30	5.0	21.5	63	53	5.0	40	35	57.5	86.0	13.80	6.00	5.3	M6	8.0	10	4.3	4.3	21,300	46,700	0.47
RGW20HC									77.5	106.0	23.80								26,900	63,000	0.63
RGW25CC	36	5.5	23.5	70	57	6.5	45	40	64.5	97.9	15.75	7.25	12.0	M8	9.5	10	6.2	6.0	27,700	57,100	0.72
RGW25HC									81.0	114.4	24.00								33,900	73,400	0.91
QRW25CC	36	5.5	23.5	70	57	6.5	45	40	66.0	97.9	15.75	7.25	12.0	M8	9.5	10	6.2	6.0	38,500	54,400	0.71
QRW25HC									81.0	112.9	24.00								44,700	65,300	0.90
RGW30CC	42	6.0	31.0	90	72	9.0	52	44	71.0	109.8	17.50	8.00	12.0	M10	9.5	10	6.5	7.3	39,100	82,100	1.16
RGW30HC									93.0	131.8	28.50								48,100	105,000	1.52
QRW30CC	42	6.0	31.0	90	72	9.0	52	44	71.0	109.8	17.50	8.00	12.0	M10	9.5	10	6.5	7.3	51,500	73,000	1.15
QRW30HC									93.0	131.8	28.50								64,700	95,800	1.51
RGW35CC	48	6.5	33.0	100	82	9.0	62	52	79.0	124.0	16.50	10.00	12.0	M10	12.0	13	9.0	12.6	57,900	105,200	1.75
RGW35HC									106.5	151.5	30.25								73,100	142,000	2.40
QRW35CC	48	6.5	33.0	100	82	9.0	62	52	79.0	124.0	16.50	10.00	12.0	M10	12.0	13	9.0	12.6	77,000	94,700	1.74
QRW35HC									106.5	151.5	30.25								95,700	126,300	2.38
RGW45CC	60	8.0	37.5	120	100	10.0	80	60	106.0	153.2	21.00	10.00	12.9	M12	14.0	15	10.0	14.0	92,600	178,800	3.43
RGW45HC									139.8	187.0	37.90								116,000	230,900	4.57
QRW45CC	60	8.0	37.5	120	100	10.0	80	60	106.0	153.2	21.00	10.00	12.9	M12	14.0	15	10.0	14.0	123,200	156,400	3.41
QRW45HC									139.8	187.0	37.90								150,800	208,600	4.54
RGW55CC	70	10.0	43.5	140	116	12.0	95	70	125.5	183.7	27.75	12.50	12.9	M14	16.0	17	12.0	17.5	130,500	252,000	5.43
RGW55HC									173.8	232.0	51.90								167,800	348,000	7.61
RGW65CC	90	12.0	53.5	170	142	14.0	110	82	160.0	232.0	40.80	15.80	12.9	M16	22.0	23	15.0	15.0	213,000	411,600	11.63
RGW65HC									223.0	295.0	72.30								275,300	572,700	16.58

### 10.3 Technical data for rails

#### 10.3.1 Dimensions of the HG rails

The HG rails are used for both the HG and QH blocks.

##### HGR\_R

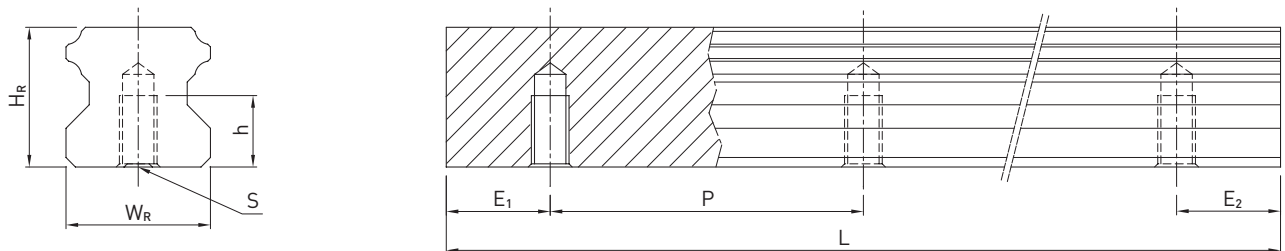


Dimensions of rail HGR\_R

Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	Min. length [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
		W <sub>R</sub>	H <sub>R</sub>	D	h	d	P						
HGR15R	M4 × 16	15	15.0	7.5	5.3	4.5	60	4,000	3,900	132	6	54	1.45
HGR20R	M5 × 16	20	17.5	9.5	8.5	6.0	60	4,000/5,600 <sup>1)</sup>	3,900/5,520 <sup>1)</sup>	134	7	53	2.21
HGR25R	M6 × 20	23	22.0	11.0	9.0	7.0	60	4,000/5,600 <sup>1)</sup>	3,900/5,520 <sup>1)</sup>	136	8	52	3.21
HGR30R	M8 × 25	28	26.0	14.0	12.0	9.0	80	4,000/5,600 <sup>1)</sup>	3,920/5,520 <sup>1)</sup>	178	9	71	4.47
HGR35R	M8 × 25	34	29.0	14.0	12.0	9.0	80	4,000/5,600 <sup>1)</sup>	3,920/5,520 <sup>1)</sup>	178	9	71	6.30
HGR45R	M12 × 35	45	38.0	20.0	17.0	14.0	105	4,000/5,600 <sup>1)</sup>	3,885/5,460 <sup>1)</sup>	234	12	93	10.41
HGR55R	M14 × 45	53	44.0	23.0	20.0	16.0	120	4,000	3,840	268	14	106	15.08
HGR65R	M16 × 50	63	53.0	26.0	22.0	18.0	150	4,000	3,750	330	15	135	21.18

<sup>1)</sup> Optional version on request

##### HGR\_T



Dimensions of rail HGR\_T

Series/ size	Dimensions of rail [mm]					Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	Min. length [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
	W <sub>R</sub>	H <sub>R</sub>	S	h	P						
HGR15T	15	15.0	M5	8	60	4,000	3,900	132	6	54	1.48
HGR20T	20	17.5	M6	10	60	4,000	3,900	134	7	53	2.29
HGR25T	23	22.0	M6	12	60	4,000	3,900	136	8	52	3.35
HGR30T	28	26.0	M8	15	80	4,000	3,920	178	9	71	4.67
HGR35T	34	29.0	M8	17	80	4,000	3,920	178	9	71	6.51
HGR45T	45	38.0	M12	24	105	4,000	3,885	234	12	93	10.87
HGR55T	53	44.0	M14	24	120	4,000	3,840	268	14	106	15.67
HGR65T	63	53.0	M20 <sup>1)</sup>	30	150	4,000	3,750	330	15	135	21.73

<sup>1)</sup> Deviating from DIN 645

Note:

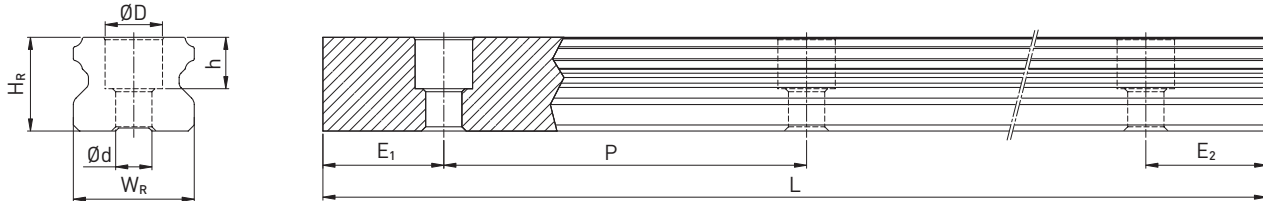
1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the E<sub>1/2</sub> dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the E<sub>1/2</sub> min.
3. The rails are shortened to the required length. If the E<sub>1/2</sub> dimensions are not indicated, these will be carried out symmetrically.

Appendix

**10.3.2 Dimensions of the EG rails**

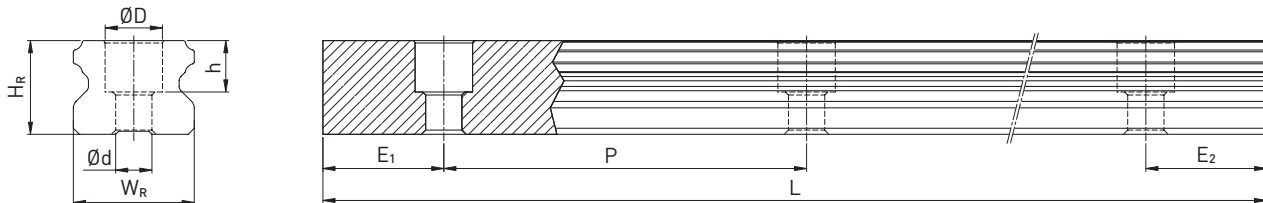
The EG rails are used for both the EG and QE blocks.

**EGR\_R**



Dimensions of rail EGR_R													
Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		$W_R$	$H_R$	$D$	$h$	$d$	$P$						
EGR15R	M3 × 16	15	12.5	6.0	4.5	3.5	60	4,000	3,900	132	6	54	1.25
EGR20R	M5 × 16	20	15.5	9.5	8.5	6.0	60	4,000	3,900	134	7	53	2.08
EGR25R	M6 × 20	23	18.0	11.0	9.0	7.0	60	4,000	3,900	136	8	52	2.67
EGR30R	M6 × 25	28	23.0	11.0	9.0	7.0	80	4,000	3,920	178	9	71	4.35
EGR35R	M8 × 25	34	27.5	14.0	12.0	9.0	80	4,000	3,920	178	9	71	6.14

**EGR\_U**

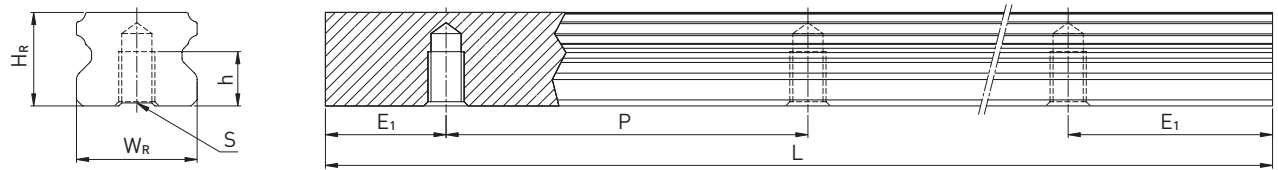


Dimensions of rail EGR_U													
Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		$W_R$	$H_R$	$D$	$h$	$d$	$P$						
EGR15U	M4 × 16	15	12.5	7.5	5.3	4.5	60	4,000	3,900	132	6	54	1.23
EGR30U	M8 × 25	28	23.0	14.0	12.0	9.0	80	4,000	3,920	178	9	71	4.23

Note:

1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the  $E_{1/2}$  dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the  $E_{1/2}$  min.
3. The rails are shortened to the required length. If the  $E_{1/2}$  dimensions are not indicated, these will be carried out symmetrically.

### EGR\_T



Dimensions of rail EGR\_T

Series/ size	Dimensions of rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
	$W_R$	$H_R$	S	h	P						
<b>EGR15T</b>	15	12.5	M5	7	60	4,000	3,900	132	6	54	1.26
<b>EGR20T</b>	20	15.5	M6	9	60	4,000	3,900	134	7	53	2.15
<b>EGR25T</b>	23	18.0	M6	10	60	4,000	3,900	136	8	52	2.79
<b>EGR30T</b>	28	23.0	M8	14	80	4,000	3,920	178	9	71	4.42
<b>EGR35T</b>	34	27.5	M8	17	80	4,000	3,920	178	9	71	6.34

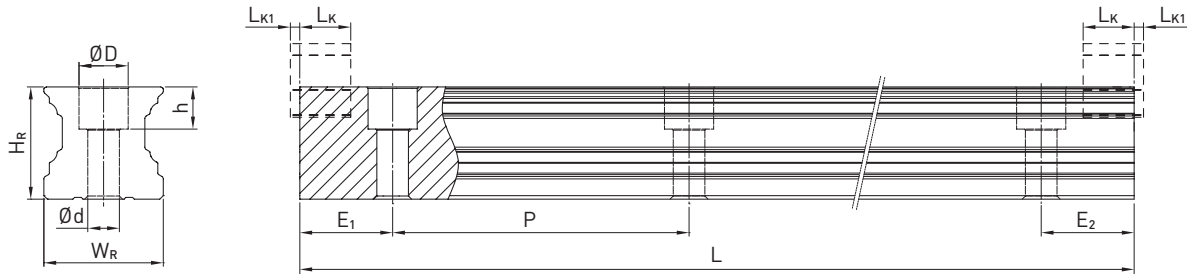
Note:

1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the  $E_{1/2}$  dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the  $E_{1/2}$  min.
3. The rails are shortened to the required length. If the  $E_{1/2}$  dimensions are not indicated, these will be carried out symmetrically.

Appendix

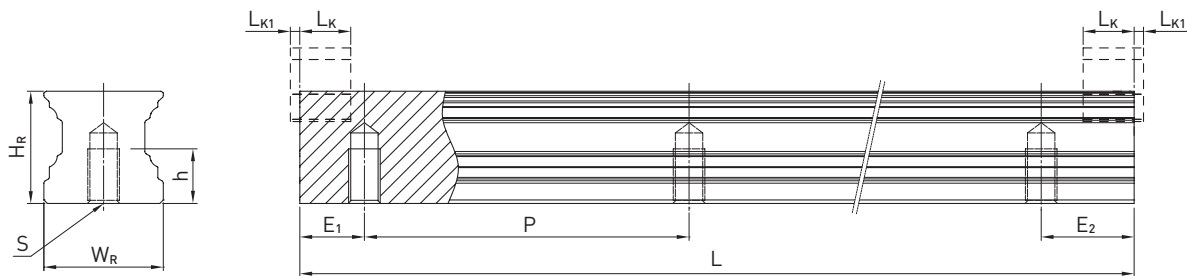
10.3.3 Dimensions of the CG rail

**CGR\_R**



Dimensions of rail CGR_R															
Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]								Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	Min. length [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
		W <sub>R</sub>	H <sub>R</sub>	D	h	d	P	L <sub>K</sub>	L <sub>K1</sub>						
CGR15R	M4 × 16	15	16.20	7.5	5.9	4.5	60	12.8	2.2	4,000	3,900	132	6	54	1.58
CGR20R	M5 × 20	20	20.55	9.5	8.5	6.0	60	10.8	2.2	4,000	3,900	134	7	53	2.48
CGR25R	M6 × 22	23	24.25	11.0	9.0	7.0	60	12.8	2.2	4,000	3,900	136	8	52	3.38
CGR30R	M8 × 25	28	28.35	14.0	12.4	9.0	80	9.8	2.2	4,000	3,920	178	9	71	5.10
CGR35R	M8 × 30	34	31.85	14.0	12.0	9.0	80	15.8	2.2	4,000	3,920	178	9	71	7.14
CGR45R	M12 × 35	45	39.85	20.0	17.0	14.0	105	15.8	2.2	4,000	3,885	234	12	93	11.51

**CGR\_T**



Dimensions of rail CGR_T													
Series/ size	Dimensions of rail [mm]							Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	Min. length [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
	W <sub>R</sub>	H <sub>R</sub>	S	h	P	L <sub>K</sub>	L <sub>K1</sub>						
CGR15T	15	16.20	M5 × 0.8P	8	60	12.8	2.2	4,000	3,900	132	6	54	1.58
CGR20T	20	20.55	M6 × 1P	10	60	10.8	2.2	4,000	3,900	134	7	53	2.48
CGR25T	23	24.25	M6 × 1P	12	60	12.8	2.2	4,000	3,900	136	8	52	3.38
CGR30T	28	28.35	M8 × 1.25P	15	80	9.8	2.2	4,000	3,920	178	9	71	5.10
CGR35T	34	31.85	M8 × 1.25P	17	80	15.8	2.2	4,000	3,920	178	9	71	7.14
CGR45T	45	39.85	M12 × 1.75P	24	105	15.8	2.2	4,000	3,885	234	12	93	11.51

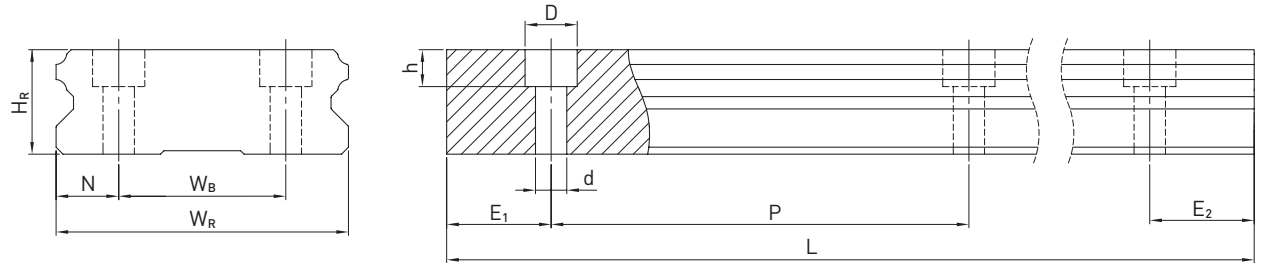
Note:

1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the E<sub>1/2</sub> dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the E<sub>1/2</sub> min.
3. The rails are shortened to the required length. If the E<sub>1/2</sub> dimensions are not indicated, these will be carried out symmetrically.



### 10.3.4 Dimensions of the WE rail

#### WER\_R



Dimensions of rail WER_R														
Series/ size	Assembly screw for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	Min. length [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
		W <sub>R</sub>	W <sub>B</sub>	H <sub>R</sub>	D	h	d	P						
WER17R	M4 × 12	33	18	9.3	7.5	5.3	4.5	40	4,000	3,960	92	6	34	2.2
WER21R	M4 × 12	37	22	11.0	7.5	5.3	4.5	50	4,000	3,950	112	6	44	3.0
WER27R	M4 × 16	42	24	15.0	7.5	5.3	4.5	60	4,000	3,900	132	6	54	4.7
WER35R	M6 × 20	69	40	19.0	11.0	9.0	7.0	80	4,000	3,920	176	8	72	9.7
WER50R	M8 × 25	90	60	24.0	14.0	12.0	9.0	80	4,000	3,920	178	9	71	14.6

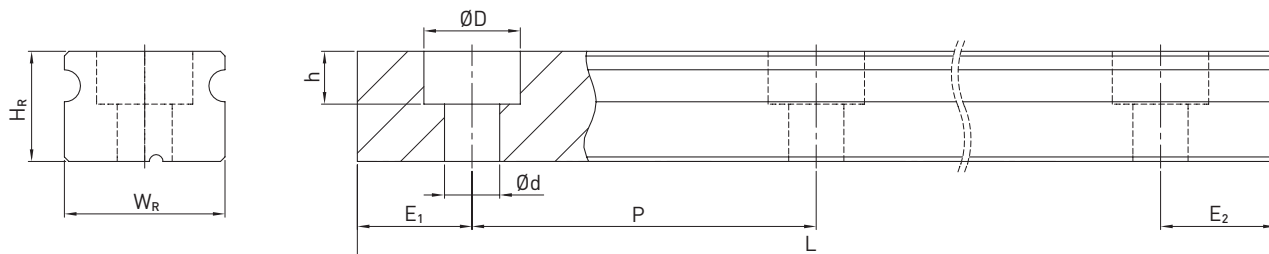
Note:

1. The tolerance for  $E$  is  $+0.5$  to  $-1$  mm for standard rails and  $0$  to  $-0.3$  mm for joint connections.
2. If the  $E_{1/2}$  dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the  $E_{1/2}$  min.
3. The rails are shortened to the required length. If the  $E_{1/2}$  dimensions are not indicated, these will be carried out symmetrically.

Appendix

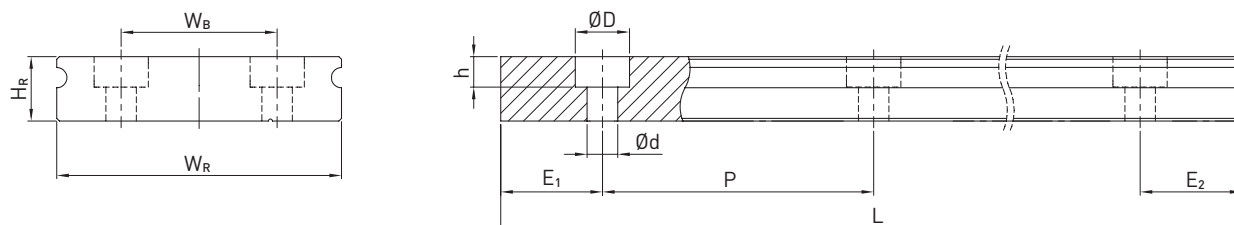
10.3.5 Dimensions of the MG rails

**MGN\_R**



Dimensions of rail MGN_R													
Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		$W_R$	$H_R$	$D$	$h$	$d$	$P$						
<b>MGNR05R</b>	M2 × 6	5	3.6	3.6	0.8	2.4	15	250	225	38	4	11	0.15
<b>MGNR07R</b>	M2 × 6	7	4.8	4.2	2.3	2.4	15	600	585	40	5	12	0.22
<b>MGNR09R</b>	M3 × 8	9	6.5	6.0	3.5	3.5	20	1,200	1,180	50	5	15	0.38
<b>MGNR12R</b>	M3 × 8	12	8.0	6.0	4.5	3.5	25	2,000	1,975	60	5	20	0.65
<b>MGNR15R</b>	M3 × 10	15	10.0	6.0	4.5	3.5	40	2,000	1,960	92	6	34	1.06

**MGW\_R**



Dimensions of rail MGW_R														
Series/ size	Assembly screw for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	Min. length [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
		W <sub>R</sub>	H <sub>R</sub>	W <sub>B</sub>	D	h	d	P						
MGWR05R	M2.5 × 7	10	4.0	—	5.5	1.6	3.0	20	250	220	48	4	11	0.34
MGWR07R	M3 × 6	14	5.2	—	6.0	3.2	3.5	30	600	570	72	6	24	0.51
MGWR09R	M3 × 8	18	7.0	—	6.0	4.5	3.5	30	2,000	1,170	72	6	24	0.91
MGWR12R	M4 × 8	24	8.5	—	8.0	4.5	4.5	40	2,000	1,960	96	8	32	1.49
MGWR15R	M4 × 10	42	9.5	23	8.0	4.5	4.5	40	2,000	1,960	96	8	32	2.86

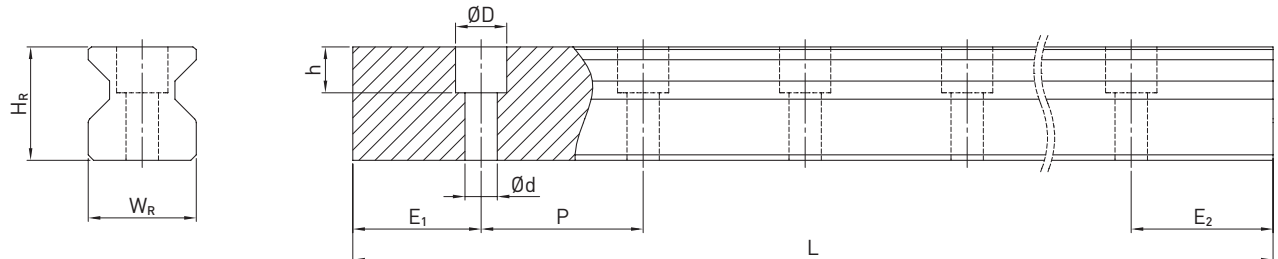
Note:

1. The tolerance for  $E$  is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the  $E_{1/2}$  dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the  $E_{1/2}$  min.
3. The rails are shortened to the required length. If the  $E_{1/2}$  dimensions are not indicated, these will be carried out symmetrically.

### 10.3.6 Dimensions of the RG rails

The RG rails are used for both the RG and QR blocks.

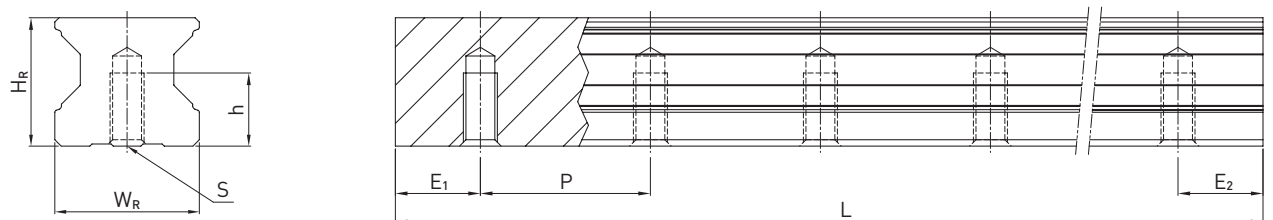
#### RGR\_R



Dimensions of rail RGR\_R

Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		$W_R$	$H_R$	D	h	d	P						
RGR15R	M4 × 16	15	16.5	7.5	5.7	4.5	30.0	4,000	3,960.0	72	6	24.0	1.70
RGR20R	M5 × 20	20	21.0	9.5	8.5	6.0	30.0	4,000	3,960.0	74	7	23.0	2.66
RGR25R	M6 × 20	23	23.6	11.0	9.0	7.0	30.0	4,000	3,960.0	76	8	22.0	3.08
RGR30R	M8 × 25	28	28.0	14.0	12.0	9.0	40.0	4,000	3,920.0	98	9	31.0	4.41
RGR35R	M8 × 25	34	30.2	14.0	12.0	9.0	40.0	4,000	3,920.0	98	9	31.0	6.06
RGR45R	M12 × 35	45	38.0	20.0	17.0	14.0	52.5	4,000	3,937.5	129	12	40.5	9.97
RGR55R	M14 × 45	53	44.0	23.0	20.0	16.0	60.0	4,000	3,900.0	148	14	46.0	13.98
RGR65R	M16 × 50	63	53.0	26.0	22.0	18.0	75.0	4,000	3,900.0	180	15	60.0	20.22

#### RGR\_T



Dimensions of rail RGR\_T

Series/ size	Dimensions of rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
	$W_R$	$H_R$	S	h	P						
RGR15T	15	16.5	M5	8.0	30.0	4,000	3,960.0	72	6	24.0	1.86
RGR20T	20	21.0	M6	10.0	30.0	4,000	3,960.0	74	7	23.0	2.76
RGR25T	23	23.6	M6	12.0	30.0	4,000	3,960.0	76	8	22.0	3.36
RGR30T	28	28.0	M8	15.0	40.0	4,000	3,920.0	98	9	31.0	4.82
RGR35T	34	30.2	M8	17.0	40.0	4,000	3,920.0	98	9	31.0	6.48
RGR45T	45	38.0	M12	24.0	52.5	4,000	3,937.5	129	12	40.5	10.83
RGR55T	53	44.0	M14	24.0	60.0	4,000	3,900.0	148	14	46.0	15.15
RGR65T	63	53.0	M20 <sup>1)</sup>	30.0	75.0	4,000	3,900.0	180	15	60.0	21.24

<sup>1)</sup> Deviating from DIN 645

Note:

1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the  $E_{1/2}$  dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the  $E_{1/2}$  min.
3. The rails are shortened to the required length. If the  $E_{1/2}$  dimensions are not indicated, these will be carried out symmetrically.

## Notes

[illegible]

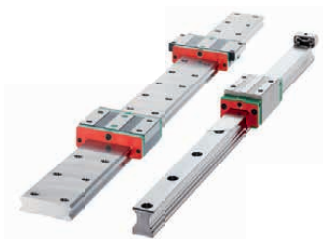


## Notes

[illegible]



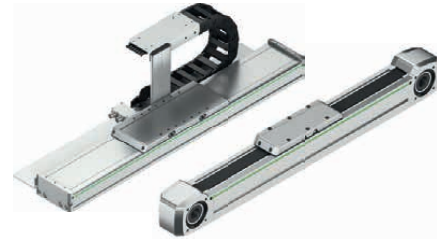
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