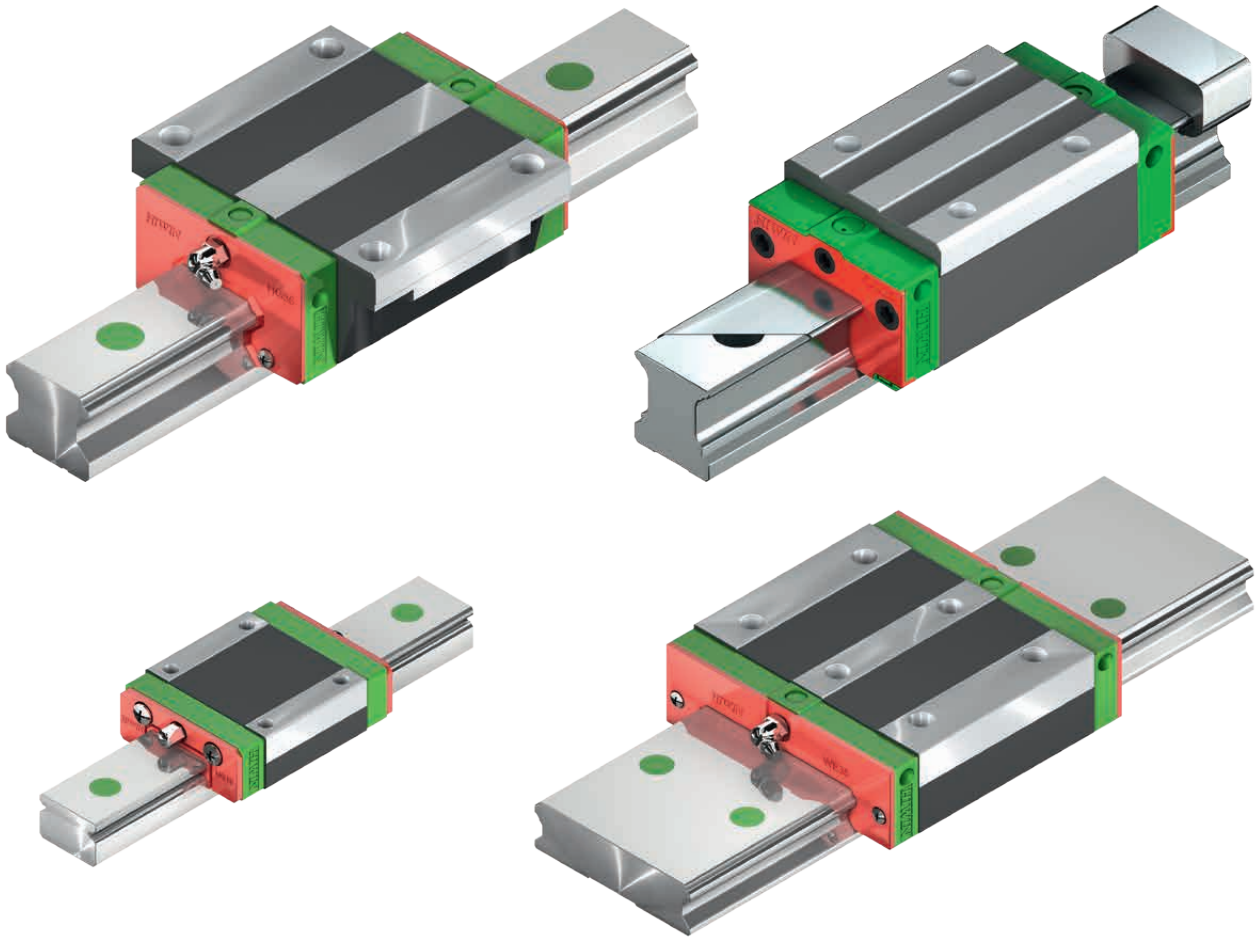
HIWIN®

Motion Control & Systems



Assembly Instructions

Linear Guideways

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Contents

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
04-1	July 2020	Update
04-0	October 2019	Complete revision of document
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. The assembly instructions are also available at www.hiwin.de.

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.
- ▶ 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).
The following signal words and risk levels are used:

⚠ DANGER!

Imminent danger!
Noncompliance with the safety notices will result in serious injury or death!
▶ Follow the safety instructions!

⚠ WARNING!

Potentially dangerous situation!
Noncompliance with the safety notices runs the risk of serious injury or death!
▶ Follow the safety instructions!

⚠ CAUTION!

Potentially dangerous situation!
Noncompliance with the safety notices runs the risk of slight to moderate injury!
▶ Follow the safety instructions!

ATTENTION!

Potentially dangerous situation!
Noncompliance with the safety notices runs the risk of damage to property or environmental pollution!
▶ Follow the safety instructions!

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!
	Warning of danger of cuts!		

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 1.3 **Manufacturer's details**

Address	HIWIN GmbH Brücklesbünd 1 D-77654 Offenburg, Germany
Phone	+49 (0) 781 / 9 32 78 - 0
Technical customer service	+49 (0) 781 / 9 32 78 - 77
Fax	+49 (0) 781 / 9 32 78 - 90
Technical customer service fax	+49 (0) 781 / 9 32 78 - 97
E-mail	support@hiwin.de
Website	www.hiwin.de

1.5 Copyright

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!

Failure to comply with the following notices could be dangerous!
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.

▶ Make sure you comply with the following notices.

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

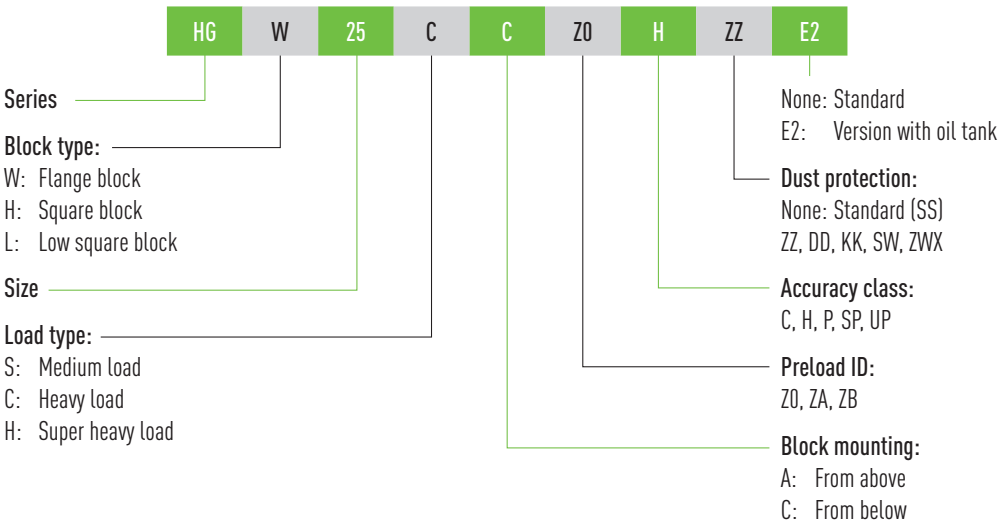
The linear guideways may only be assembled, integrated into higher-level systems, commissioned, operated and maintained by qualified personnel. Qualified personnel are those who:

- 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 the Assembly Instructions at all times.

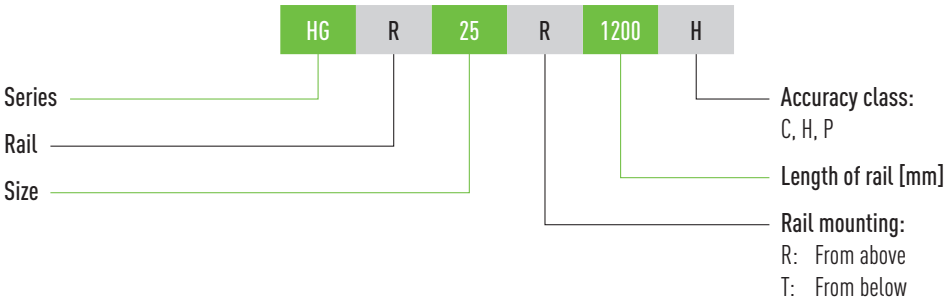
3. Product description

3.1 Order code of the linear guideways

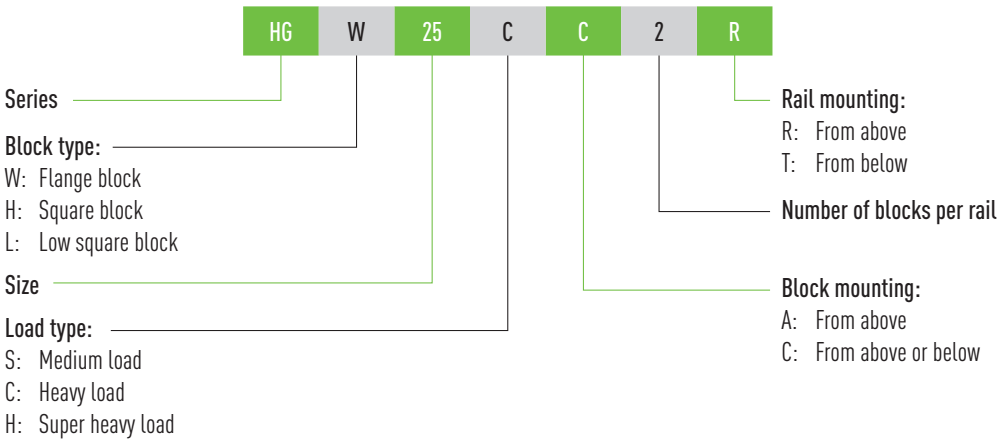
3.1.1 Order code for block (unmounted)



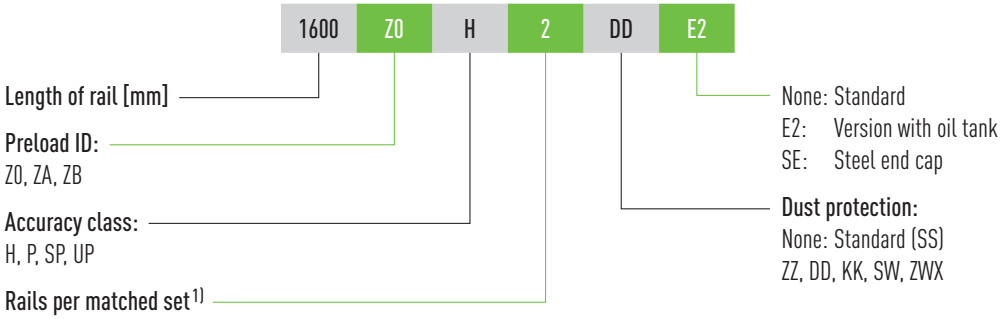
3.1.2 Order code for rail (unmounted)



3.1.3 Order code for linear guideway (fully assembled)



Order code for linear guideway (fully assembled) – continuation



Note:
[1] 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.

3.2 Setup and operation of the linear guideway

A linear guideway enables linear movement with the aid of rolling elements. By using balls or rollers between the rail and the block, a linear guideway can achieve an extremely precise linear movement. Compared to a conventional sliding guide, the coefficient of friction is only one fiftieth. The high degree of efficiency and zero backlash make HIWIN linear guideways extremely versatile.
The following figure shows the design and the components used.

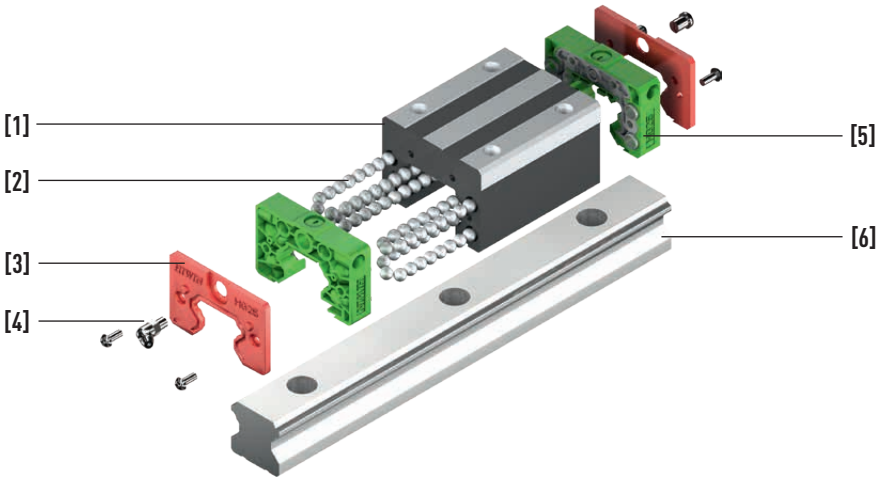


Fig. 3.1 **Exploded view of the design of a linear guideway**

Table 3.1 **Key for Fig. 3.1**

Pos.	Name	Pos.	Name
1	Basic unit	**4**	Grease nipple
2	Rolling element	**5**	Deflection system
3	Wiper	**6**	Profile rail

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.

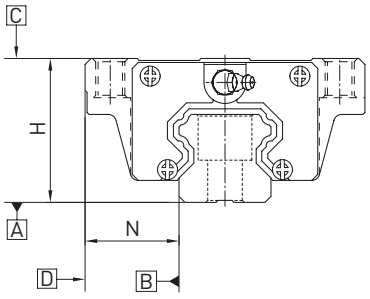


Fig. 3.2 **Tolerances of the HIWIN linear guideways**

3.4 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 3.2 **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 – 1100	24	16	9	6	3
1100 – 1500	26	18	11	7	4
1500 – 1900	28	20	13	8	4
1900 – 2500	31	22	15	10	5
2500 – 3100	33	25	18	11	6
3100 – 3600	36	27	20	14	7
3600 – 4000	37	28	21	15	7

Unit: µm

Table 3.3 **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
1,200 – 1,300	25	18	11.0
1,300 – 1,400	26	19	12.0
1,400 – 1,500	27	19	12.0
1,500 – 1,600	28	20	13.0
1,600 – 1,700	29	20	14.0
1,700 – 1,800	30	21	14.0
1,800 – 1,900	30	21	15.0
1,900 – 2,000	31	22	15.0

Unit: µm

3.5 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 3.4 **Height and width tolerances – HG, QH, EG, QE, CG, WE, QW, RG and QR series**

Size	Accuracy class	Height tolerance of H ($_{TH}$)	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 [1] ± 0.015 [2]	0/– 0.03 [1] ± 0.015 [2]	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 [1] ± 0.02 [2]	0/– 0.04 [1] ± 0.02 [2]	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 [1] ± 0.025 [2]	0/– 0.05 [1] ± 0.025 [2]	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 [1] ± 0.035 [2]	0/– 0.07 [1] ± 0.035 [2]	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

[1] Full assembled linear guideway
[2] Unmounted linear guideway

Table 3.5 **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 state

The following delivery states are possible for linear guideways:

- **Fully assembled:** blocks are already mounted on the rail, the block is secured on the profile rail with the transportation safety device.
- **Unmounted:** Blocks and rails are supplied separately

4.2 Scope of delivery

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

4.3 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!

NOTE

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.

4.3.1 Ambient conditions

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

Safety equipment to be provided by the operator

Possible safety equipment/measures:

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

4.4 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.

5. Assembly

⚠ WARNING!

Danger of injury!
There is an increased risk of injury during assembly.
- 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!

⚠ CAUTION!

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!

5.1 Preliminary work

- 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.
- If you have ordered a one-piece profile rail from the CG series with a cover strip, disassemble the cover strip first in accordance with Section 5.3.4.
- Avoid getting the profile rail dirty during installation. Chippings and other items must be removed. All cleaning information can be found in Section 7.1.

5.2 Profile rail

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.

ATTENTION!

Damage caused by tension on the linear guideway!
Linear guideways are extremely precise guides. Tension due to incorrect installation can result in premature failure of the linear guideways.
- You must observe the assembly instructions described in Chapter 5!

NOTE

Please observe the assembly tolerances in Section 12.3.

5.2.1 Identification of the reference edge of rails and blocks

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

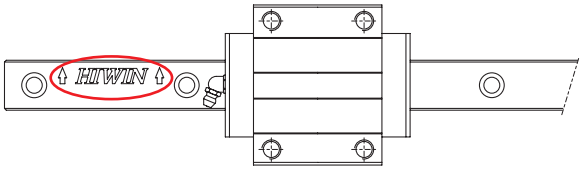


Fig. 5.1 **Identification of the reference side of a rail**

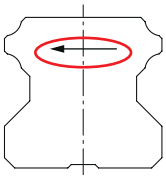


Fig. 5.2 **Identification of the reference side of a short rail and of a PG series rail**

5.2.2 Different types of linear guideways

R-rails are assembled using fixing screws from above; T-rails are assembled using fixing screws from below. The information below describes the process of assembling the R-rail; the T-rail is assembled in the same way from below.

Fig. 5.3 **T-rail**

Fig. 5.4 **R-rail**

5.2.3 Cleaning the mounting surface

- Remove all dirt from the mounting surface.
- Mounting holes and stop edge must be free of burrs. If necessary, remove burrs using an oil stone **[1]**.

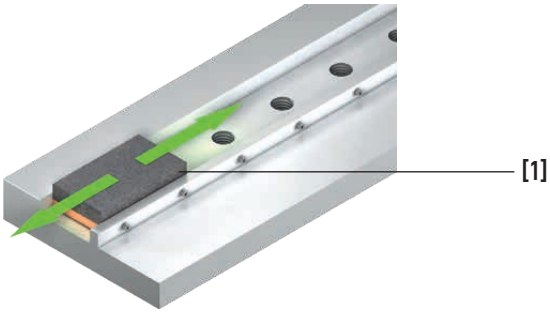


Fig. 5.5 **Cleaning the mounting surface**

5.2.4 Assembling the profile rail at a stop edge

A. Aligning the profile rail.

- Place the reference side of the profile (see Section 5.2.1) rail against the machine bed's stop edge.
- Loosely attach the fixing screws.

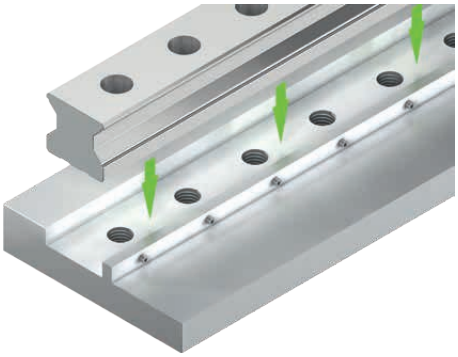


Fig. 5.6 **Aligning of the profile rail with the stop edge**

B. Tensioning the profile rail with the machine bed

NOTE

Maintain the permissible tolerances for the mounting surfaces and mounting deviations of the relevant series, in accordance with Sections 3.3, 3.4 and 3.5.

NOTE

The profile rails can be tensioned using a terminal block or vices.

Tensioning the profile rail using a terminal block:

- Tighten the terminal block's allen set screws in order to press the profile rail firmly on to the machine's stop edge.
- Working in three steps, tighten the fixing screws on the profile rail using a torque spanner to the specified tightening torque.

NOTE

A list of optimum screw tightening torques can be found in Section 12.2 on page 57.

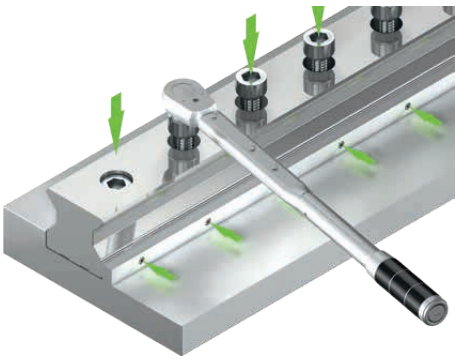


Fig. 5.7 **Tensioning using a terminal block**

✓ The profile rail has now been assembled.

Tensioning the profile rail using vices:

- Use the vices to press the profile rail against the machine bed's stop edge.
- Tighten the profile rail's fixing screws.
- Repeat this process for all fixing points.
- Working in three steps, tighten all fixing screws on the profile rail using a torque spanner to the specified tightening torque.

A list of optimum screw tightening torques can be found in Section 12.2 on page 57. NOTE

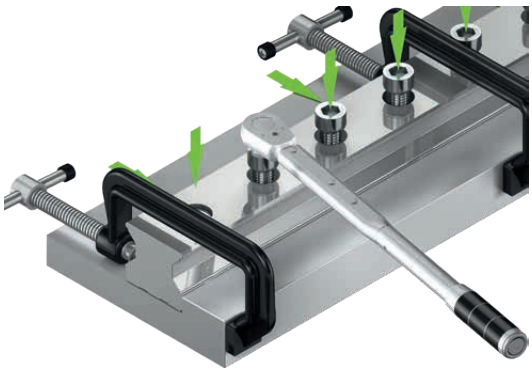


Fig. 5.8 **Tensioning using vices**

✓ The profile rail has now been assembled.

5.2.4.1 Assembling the profile rail without a stop edge

- Mount a block on the reference rail.

Mount the block in accordance with Section 5.4.2. NOTE

- Mount a dial gauge on the block.
- Align the dial gauge with a reference edge.

The reference edge should stretch from the beginning to the very end of the machine bed so that the profile rail can be aligned across the entire length of the machine bed. NOTE

- Move the block a few centimetres along the reference edge in order to align the profile rail.
- Tighten the profile rail's fixing screws.
- Repeat this process for all fixing points.
- Tighten the fixing screws using a torque spanner to the specified tightening torque.

A list of optimum screw tightening torques can be found in Section 12.2 on page 57. NOTE

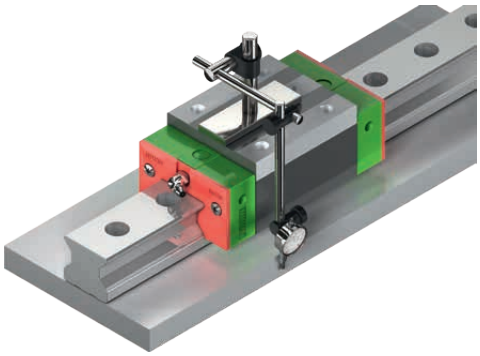


Fig. 5.9 **Block with mounted dial gauge**

✓ The profile rail has now been assembled.

5.2.5 Mounting the profile rail on the follow-on side

5.2.5.1 Requirements

➔ A reference rail must be mounted.
➔ A block is mounted on the reference rail.

5.2.5.2 Aligning the follow-on rail with a reference rail using a dial gauge

▶ Place the dial gauge on the mounted block of the aligned reference rail.
▶ Attach the dial gauge sensor to the follow-on rail.

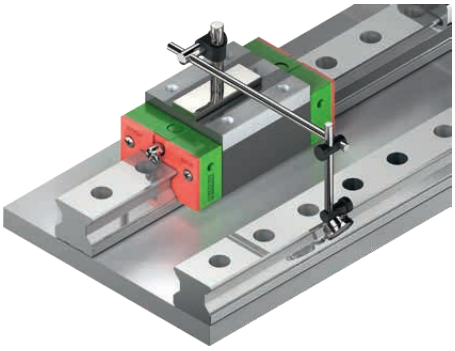


Fig. 5.10 **Scanning and aligning the follow-on rail with the reference rail**

▶ Move the block that the dial gauge is mounted on, gradually over the reference rail.
▶ Tighten the fixing screws of the follow-on rail one after the other, working from one end of the guideway to the other.
▶ Tighten the fixing screws using a torque spanner to the specified tightening torque.

NOTE

A list of optimum screw tightening torques can be found in Section 12.2 on page 57.

✓ The follow-on rail is mounted and aligned parallel with the reference rail.

5.2.5.3 Aligning the follow-on rail with a reference rail using a plate

▶ Mount a plate on two blocks on the aligned reference rail.
▶ Mount the other side of the plate on two blocks on the follow-on rail to be aligned.

✓ This setup results in the second rail being positioned in parallel.

▶ Gradually move the plate over the rails.

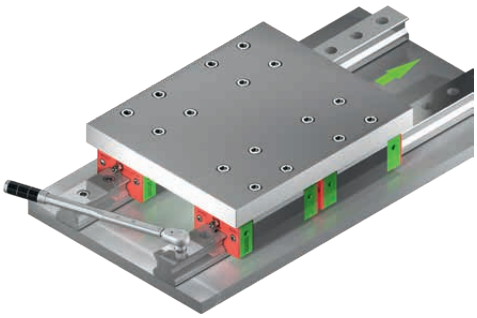


Fig. 5.11 **Plate mounted on the block**

- Tighten the fixing screws of the follow-on rail one after the other, working from one end of the guideway to the other.
- Tighten the fixing screws using a torque spanner to the specified tightening torque.

A list of optimum screw tightening torques can be found in Section 12.2 on page 57.

NOTE

✓ The follow-on rail is mounted and aligned parallel with the reference rail.

5.2.6 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.

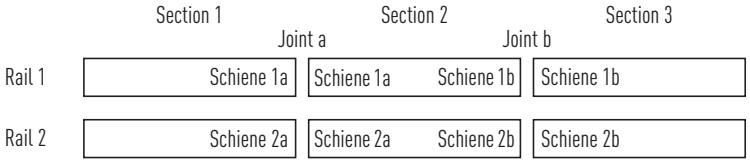


Fig. 5.12 **Identification of jointed multi-part rails**

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.

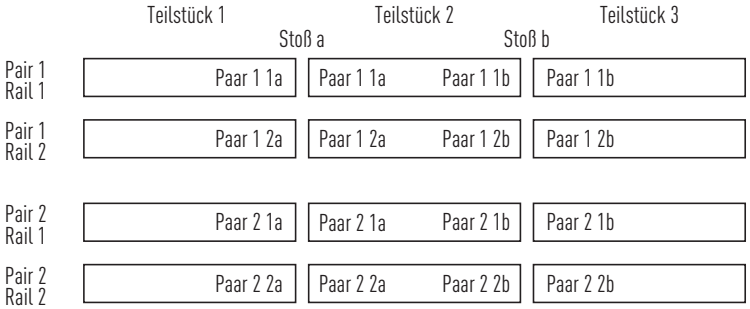


Fig. 5.13 **Identification of jointed multi-part paired rails**

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

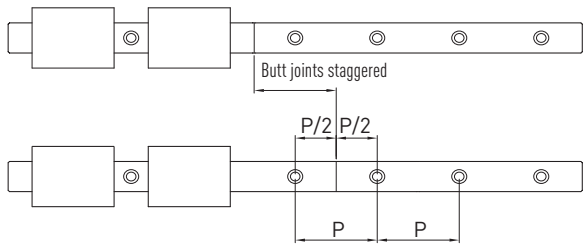


Fig. 5.14 **Configuration of jointed multi-part rails**

5.3 Protection of the mounting holes

To protect the block from soiling and to protect the dust protection sealing lips, the profile rails' mounting holes must be closed using cover caps (in the case of R-rails, fixing is carried out from above). The type of cover depends on the environmental and operating conditions: plastic, steel or brass cover caps, or a cover strip, may be used. Plastic cover caps are mounted as described in Section 5.3.1.2. Steel and brass cover caps are pressed in using an assembly tool as described in Section 5.3.1.3. Cover strips are mounted as described in Section 5.3.2.

5.3.1 Bolt caps

ATTENTION!

Damage caused by cover caps that have been incorrectly pressed in!
Pressing in the cover caps can result in a burr or result in the cover caps being pressed in too deep. This can later result in damage to the block and dust protection.

- Use an oil stone to remove any burrs that have occurred!
- Remove any cover caps that have been pressed in too deep and press in new cover caps!

5.3.1.1 Requirements

- ➔ The profile rails are mounted and fixed in accordance with the descriptions in Section 5.2.4/5.2.5.
- ➔ The profile rails are free of dust and oil (see Section 7.1).

5.3.1.2 Mounting of plastic cover caps

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

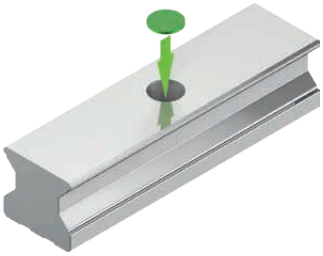


Fig. 5.15 **Positioning of the plastic cover cap**

- Place an eligible press-in block upright on the cap
- With a plastic hammer hit in the cover 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.

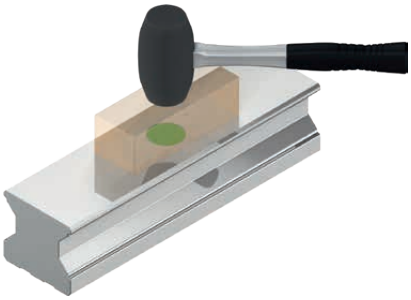


Fig. 5.16 **Pressing in of the plastic cover cap with the help of a press-in block**

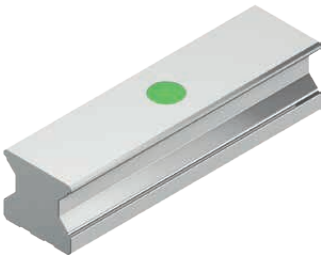


Fig. 5.17 **Fully assembled plastic cover cap**

- ✓ The plastic cover cap has been mounted.

5.3.1.3 Mounting of steel and brass bolt caps

We recommend using the HIWIN assembly tool to ensure correct mounting of the steel and brass cover caps. Information on this can be found in Section 11.2.

NOTE

- 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.

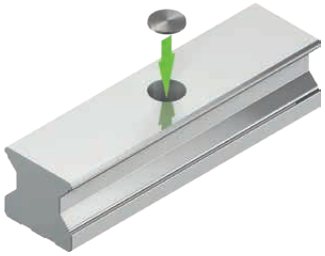


Fig. 5.18 **Positioning of the steel or brass bolt cap**

- Move the press-in piston **[4]** (see Fig. 5.20) of the assembly tool **[2]** into the upper end position by loosening the screw **[1]**.
- Push the assembly tool from the front side onto the rail.

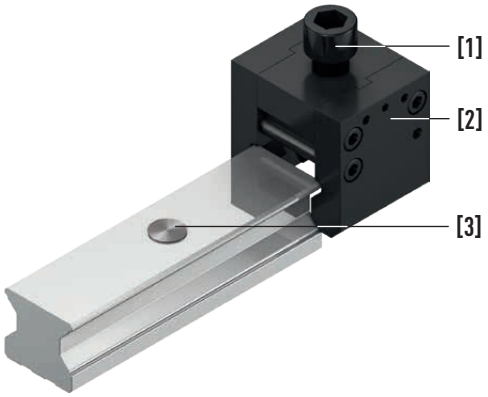


Fig. 5.19 **Position the press-in piston on the profile rail**

- Position the press-in piston **[4]** (see Fig. 5.20) centred over the bolt cap **[3]**.
- Move out the press-in piston by tightening the screw **[1]** until the stamp makes contact with the cover cap and some resistance can be felt when tightening the screw.
- Before actually pressing in the cover cap, check to make sure the cover cap has not tilted.
- Press in the cover cap by continuing to tighten the screw **[1]** until the press-in piston makes contact with the profile rail.

NOTE

The required tightening torque for pressing in the cover caps depends on several factors and can vary considerably. Please observe the specified maximum values in Table 5.1.

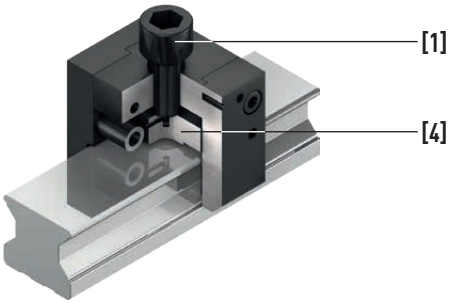


Fig. 5.20 **Pressing in the cover cap by tightening the screw**

- Loosen the screw **[1]**.
- Check the results of the pressing process.
- If the cap is not yet fully pressed in, repeat the procedure.

Fig. 5.21 **Fully assembled steel or brass bolt cap**

✓ The steel or brass cover cap has been mounted.

Table 5.1 **Recommended maximum tightening torques for pressing in steel and brass cover 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

5.3.2 Cover strip

⚠ CAUTION!

Risk of injury from sharp-edged cover strip!
The edges of the cover strips can be very sharp.
- 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!
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. 5.22 !
- Replace damaged cover strips immediately!

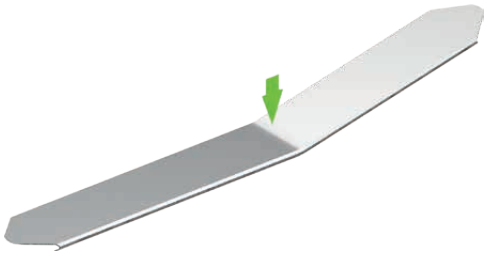


Fig. 5.22 **Damaged cover strip**

In addition to the cover caps, a cover strip is available for the CG series as an alternative way to close the mounting holes.

NOTE

5.3.2.1 Delivery state

One-piece profile rails, as shown in Fig. 5.23, are supplied with mounted cover strip. The cover strip ends are bent and protective clamps are mounted.

Fig. 5.23 **Cover strip mounted on rail**

In the case of multi-part rails, the cover strip is delivered in a separate carton as shown in Fig. 5.24. The protective caps are included.

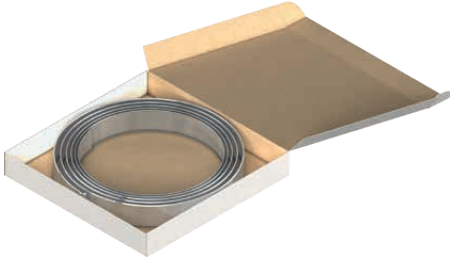


Fig. 5.24 **Cover strip in transport carton**

5.3.2.2 Mounting the cover strip without a mounted block

NOTE

We recommend using the HIWIN assembly/disassembly tool to ensure correct mounting of the cover strip. Information on this can be found in Section 11.2.

A. Positioning the cover strip

- Clean the profile rail using a suitable cleaning agent (see Section 7.1).
- Place the cover strip on the profile rail.
- Maintain the distance L_S in accordance with Table 5.2.

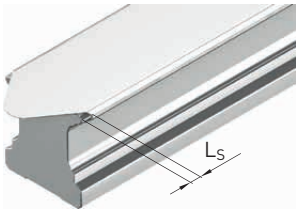


Fig. 5.25 **Cover strip with finished ends and distance L_S**

Table 5.2 **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

B. Clamping the cover strip

- Clip the cover strip onto the profile rail, over a length of approx. 15 cm.
- Press down the fold of the cover strip on the reference side of the profile rail.
- Press down the second fold on the opposite side.

Fig. 5.26 **Mount cover strip**

C. Assembly using the HIWIN assembly tool

We recommend using the HIWIN assembly/disassembly tool to ensure correct mounting of the cover strip. Information on this can be found in Section 11.2.

NOTE

- Place the mounting tool on the front side of the rail (see Fig. 5.27).
- Push the assembly tool over the entire rail.

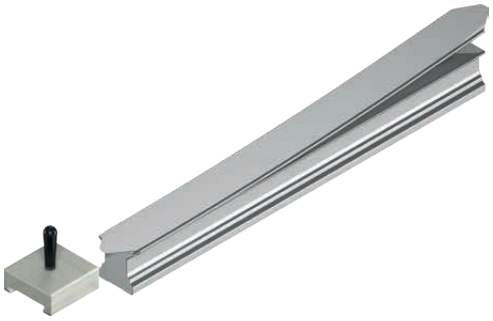


Fig. 5.27 **Mounting the cover strip using the assembly tool**

✓ The cover strip is resting flush on the upper side of the profile rail.

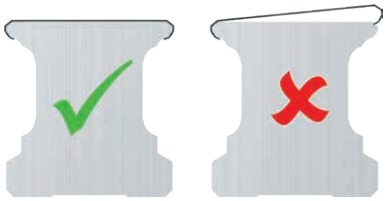


Fig. 5.28 **Correctly and incorrectly installed cover strip**

D. Bending the cover strip ends

- Carefully bend the two ends of the cover strip with a rubber mallet.

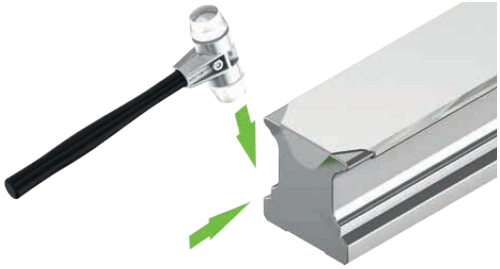


Fig. 5.29 **Bending the cover strip ends**

✓ The cover strip has now been mounted.

5.3.2.3 Mounting the cover strip with a mounted block

ATTENTION!

Damage to the cover strip!
Pushing the cover strip on to the rail or moving it under the block can result in the cover strip snapping off due to excessively high levels of pressure being exerted on it.
- Push the cover strip carefully on to the rail.
- If the cover strip is difficult to push on, repeat the work steps described in B.

If a cover strip needs to be retrofitted or a damaged one needs to be replaced while one or more blocks are mounted on the rail, it is necessary to create a pushing area on the cover strip. An expanding mandrel is required for this purpose.

A. Setting the position of the pushing area

NOTE

The minimum length of the pushing area must be 150 mm longer than the block length L_{GW}.

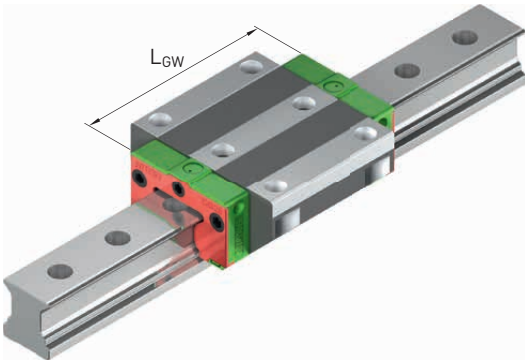


Fig. 5.30 **Block length (L_{GW})**

B. Creating the pushing area

NOTE

We recommend using an expanding mandrel to widen the cover strip. For information on this see Section 11.2.

- Place the expanding mandrel on the inner end of the pushing area so that the flat sides are aligned parallel with the cover strip.
- Turn the mandrel 90°.
- Pull the mandrel with one hand to the beginning of the cover strip, keeping hold of it with your other hand as you do so.

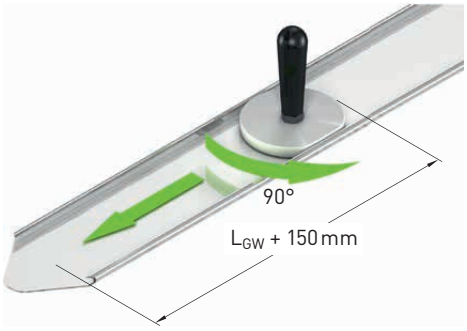


Fig. 5.31 **Widening the pushing area using the expanding mandrel**

✓ The cover strip's pushing area has been widened.

C. Checking the pushing area

- Place the cover strip at the beginning of the profile rail.
- Push the cover strip slightly on to the profile rail.

Repeat the steps in B if it is still not possible to push the cover strip on to the profile rail. NOTE

D. Assembly

- Clean the profile rail using a suitable cleaning agent (see Section 7.1).
- Position the block at the end of the profile rail.
- Push the cover strip on to the profile rail with one hand. The widened pushing area must be pushed under the block at this point.
- Use your other hand to hold up the area of the cover strip that has not been widened.

Ensure that the strip does not snap. NOTE

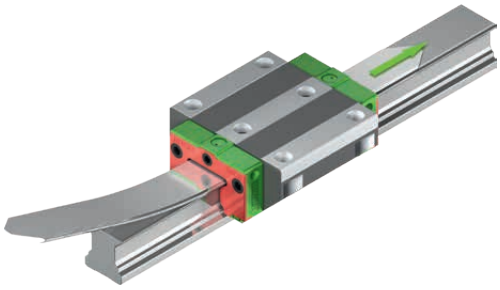


Fig. 5.32 **Pushing on the cover strip with a mounted block**

- Center the cover strip on the profile rail.

The distance L_S must be maintained in accordance with Table 5.2. NOTE

- Press down the cover strip fold that has not been widened on the reference side of the profile rail.
- Press down the second fold on the opposite side.

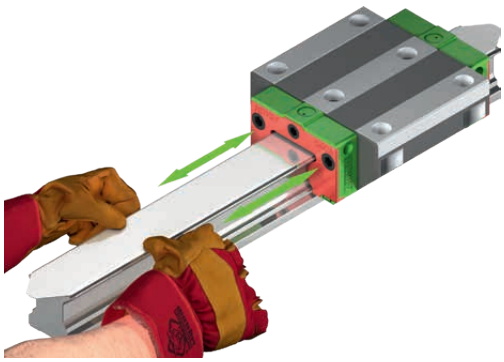


Fig. 5.33 **Assembly of the cover strip**

✓ The cover strip is resting flush on the upper side of the profile rail.

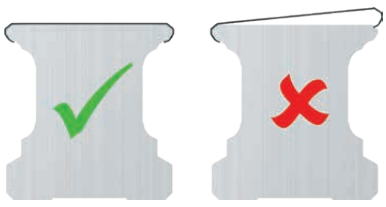


Fig. 5.34 **Correctly and incorrectly installed cover strip**

▶ Carefully bend the two ends of the cover strip with a rubber mallet (see Fig. 5.35).

Fig. 5.35 **Bending the cover strip ends**

✓ The cover strip has now been mounted.

5.3.3 Protective caps

To prevent the cover strip lifting up, it is secured at both front sides of the profile rail. There are two different methods of securing the cover strip:

- Securing the cover strip via steel clamps
- Securing the cover strip via front-side clamping screws

5.3.3.1 Requirements

➔ The profile rail has been mounted.
➔ The cover strip has been mounted.
➔ The block has been mounted.

5.3.3.2 Securing the cover strip using steel clamps

▶ Place the steel clamps **[2]** on both sides of the profile rail.
▶ Screw in the allen set screw **[1]** until the steel clamps are fixed securely.

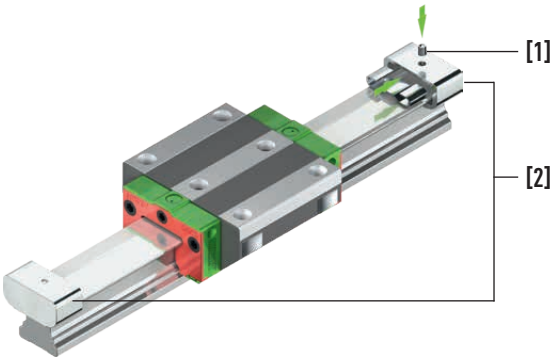


Fig. 5.36 **Placing the steel clamps on the profile rail**

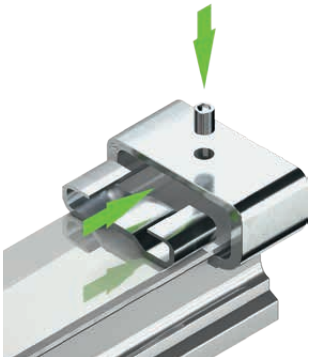


Fig. 5.37 **Mounting the steel clamp**

✓ The cover strip has been secured.

5.3.3.3 Securing the cover strip using front-side clamping screws

- Screw the clamping screws **[3]** to the front sides of the profile rail.

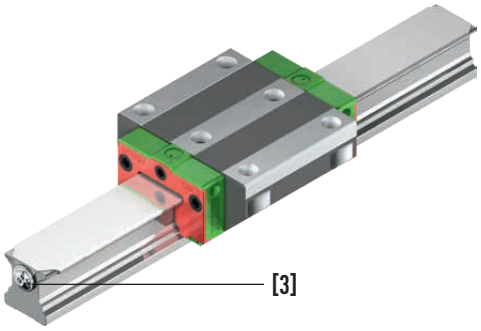


Fig. 5.38 **Mounting the front-side cover strip protection**

✓ The cover strip has been secured.

5.3.4 Removal of cover strip

We recommend using the HIWIN assembly/disassembly tool to ensure correct disassembly of the cover strip. Information on this can be found in Section 11.2.

NOTE

- Lift the cover strip on the front side of the profile rail using the disassembly tool **[1]** (see Fig. 5.39).
- Lift it carefully over the entire length of the rail.

Ensure that the cover strip does not snap.

NOTE

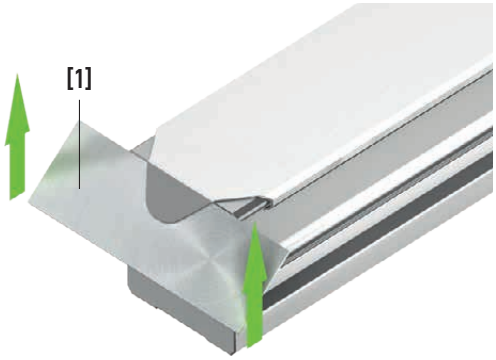


Fig. 5.39 **Removal of cover strip**

5.4 Blocks

ATTENTION!

Damage to the block can be caused by removing the mounting mandrel too early.
Removing the mounting mandrel too early can cause damage to the block and result in rolling elements being lost.
- Only remove the mounting mandrel by pushing on the block!

ATTENTION!

Damage to the block can be caused if cut edges have not been deburred.
Cut edges that have not been deburred can damage the end seals on the block.
- Always check the cut edges of the profile rail for burrs!
- If necessary, remove burrs with an oil stone or a brass wire brush.

NOTE

For the assembly of the following blocks, we generally recommend a bevel at the front end of the profile rail

5.4.1 Requirements

➔ The end seals on the block have been greased. This makes assembly easier and reduces the risk of damage to the seal during assembly.

5.4.2 Assembly

NOTE

**Be careful when pushing the block on to the profile rail:
Blocks with medium and high preloads require more force to push them on compared to those with low preloads. Ideally, blocks with high preloads should be delivered already mounted.**

NOTE

**Please bear in mind the following when working with R-rails (with bored holes for mounting from above):
Provided that the mounting holes have not yet been sealed with cover caps or a cover strip, reduce the amount by which the block moves on the profile rail to a minimum. Otherwise, the dust protection sealing lips can become damaged.**

- Attach the block to the rail in the required mounting direction on the front side, so that it is resting flush on the rail.
- Carefully push the block on to the rail.

NOTE

During this process, make sure that the block does not tilt.

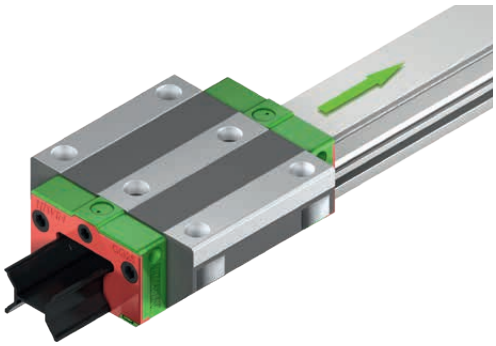


Fig. 5.40 **Pushing the block on to the profile rail.**

✓ The mounting mandrel is automatically pressed out in the process and the block is mounted on the profile rail.

5.4.2.1 Specificity in the assembly of QH, QE and QW blocks

ATTENTION!

Failure to comply with the maximum screw length can cause damage to the block.
The block mounting holes for the HIWIN rail guideways in the QH, QE and QW series are linked to the ball return channels (see Fig. 5.41). Using screws that are too long can damage the rolling elements.
▶ Do not exceed the maximum screw lengths specified in Table 5.3!

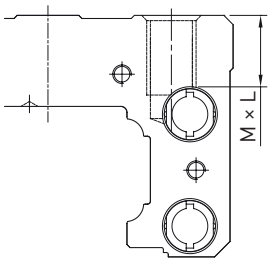


Fig. 5.41 **Depiction of bore hole and recirculation channel**

Table 5.3 **Maximum lengths for fixing screws – QH, QE and QW blocks**

Model	Max. screw length M × L [mm]	Model	Max. screw length 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		

NOTE

The linear guideway's load-bearing capacity is often restricted – not by its load-bearing strength, but by the screw connection. We therefore recommend checking the screw connection's maximum permissible load-bearing capacity in accordance with VDI 2230.

5.4.2.2 Specific features to bear in mind when assembling an adjacent structure on RG, QR and CG blocks

Each block in the RG, QR and CG series is provided with two additional central threaded holes. These are sealed with green seal stoppers on delivery.
In order to achieve high rigidity for the linear guideway even in cases of high loads, we generally recommend using all available threaded holes to fix the adjacent structure in place.

NOTE

In blocks from the RGW and QRW series, you also have the option of securing your adjacent structure from below. Before the block is assembled, it must be secured to the adjacent structure.

6. Commissioning

⚠ CAUTION!

Risk of damage to health and the environment!
Contact with lubricants can cause irritation, poisoning and allergic reactions as well as damage to the environment.

- Only use suitable substances that are safe for humans. Observe the manufacturer's safety data sheets.
- Dispose of substances appropriately.

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!

NOTE

If you have ordered a mounted linear guideway, remove the green stoppers before commissioning. These stoppers secure the block on the profile rail.

The standard lubrication conditions for the products can be found in Section 8.10. Please follow the commissioning instructions in accordance with Section 8.11.

7. Maintenance and cleaning

Maintenance is only required in the form of lubrication. See chapter 8.

7.1 Cleaning

ATTENTION!

Damage to the linear guideway due to improper cleaning!

Using non-approved cleaning agents and tools can cause damage to the profile rail.

- 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!

Permissible cleaning and maintenance actions:

- 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.

8. Lubrication

8.1 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.

8.2 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!

7.1.1 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.

7.1.2 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:

- Food
- Oxidising agents

8.3 Lubrication connections

HIWIN blocks offer three possibilities for installing a lubrication connection:

- On the front end
- On the side
- From above

Not all blocks have a lubrication connection. NOTE

8.3.1 Lubrication connection on the front side

It is possible to install a lubrication connection on either side of the block. Each lubrication connection that is not in use is sealed with a sealing screw. This is the HIWIN standard configuration.

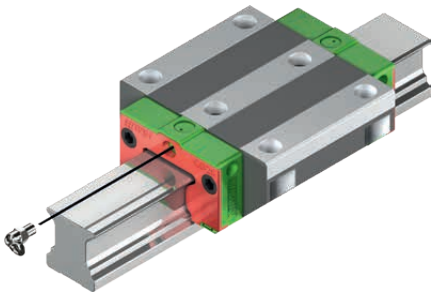


Fig. 8.1 **Lubrication connection on the front side**

8.3.2 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!

In the CG series, these holes are prepared so they are ready for use and sealed with a sealing screw. NOTE

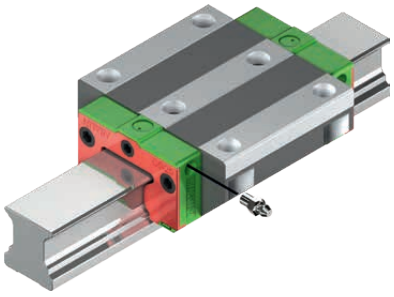


Fig. 8.2 **Lubrication connection on the side**

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 8.1 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

NOTE

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 8.1), because of the reduced distance between flange and grease nipple. Alternatively, funnel type grease nipples can also be used.

Table 8.1 **Lubrication hole on the side – Dimensions and grease nipple**

Block type	Thread	Thread length	Grease nipple [1] and recommended adapter for grease gun (A) [2]					
			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	⅛ PT	10	20-000280	1	20-000280	1	On 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	⅛ PT	10.0	20-000280	1	20-000280	2	On request	—

[1] See Section 8.3.4
[2] See Section 8.9

8.3.3 Lubrication connection on the top

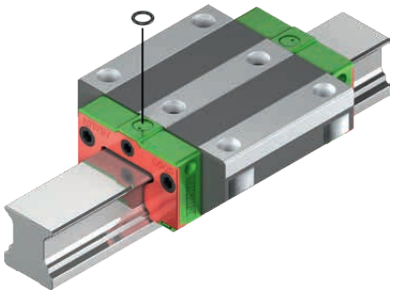


Fig. 8.3 **Lubrication connection on the top**

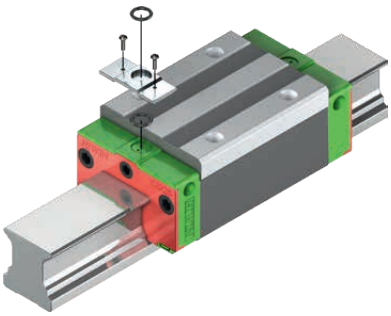


Fig. 8.4 **Lubrication connection on the top (HGH, CGH, RGH), see Section 8.3.3.1**

Alternatively, the block can be lubricated from above. In this case, an O-ring is used as a seal. See Table 8.2 for the size of the O-ring. If you order the block with the option of lubrication from above selected, the lubrication hole will be open and the required O-ring enclosed. If the block is ordered without lubrication, the hole must first be opened.

In the countersink for the O-ring, there is a further recess.

- Open the recess with a 0.8 mm diameter drill to a maximum depth of T_{max} according to Table 8.2.

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

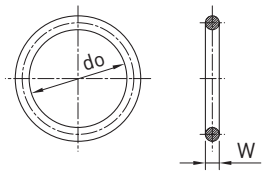


Fig. 8.5 **O-ring to cover the lubrication connection on the top**

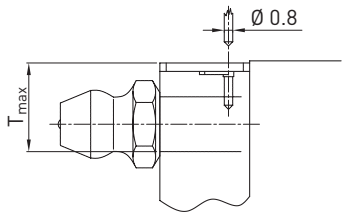


Fig. 8.6 **Maximum piercing depth T_{max}**

Table 8.2 **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 ± 0.15	1.5 ± 0.15	3.75
HG/QH_20	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.70
HG/QH_25	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.80
HG/QH_30	20-000387	4.5 ± 0.15	1.5 ± 0.15	6.30
HG/QH_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.80
HG/QH_45	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.20
HG_55	20-000387	4.5 ± 0.15	1.5 ± 0.15	11.80
HG_65	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.80
EG/QE_15	20-000386	2.5 ± 0.15	1.5 ± 0.15	6.90
EG/QE_20	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.40
EG/QE_25	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.40
EG/QE_30	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.40
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_21	20-000386	2.5 ± 0.15	1.5 ± 0.15	4.20
WE_27	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.80
WE/QW_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	7.60
QW_21	20-000376	7.5 ± 0.15	1.5 ± 0.15	4.20
QW_21	20-000376	7.5 ± 0.15	1.5 ± 0.15	5.80
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

NOTE

It may be necessary to use a spacer (HIWIN lubrication adapter) to mount the lubrication.

8.3.3.1 Spacers (lubrication adapter)

In the series HG, RG and CG (models HGH, RGH and CGH) 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
- CG_15, CG_20, CG_25, CG_30, CG_35, CG_45

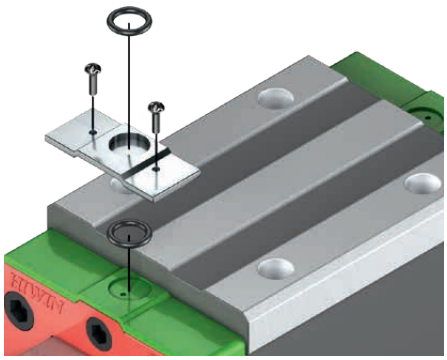


Fig. 8.7 **Design of lubrication adapter**

8.3.4 Grease nipple

Fig. 8.8 **Grease nipple M3 × 0,5 P**
Art.-No. 20-000275

Fig. 8.9 **Grease nipple M4 × 0,7 P**
Art.-No. 20-000272

Fig. 8.10 **Grease nipple M6 × 0,75 P**
Art.-No. 20-000273

Fig. 8.11 **Grease nipple ⅛ PT**
Art.-No. 20-000280

Fig. 8.12 **Funnel type grease nipple M4 × 0,7 P**
Art.-No. 20-000325

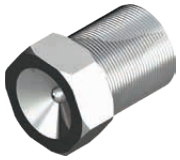


Fig. 8.13 **Funnel type grease nipple M6 × 0,75 P**
Art.-No. 20-000283

Fig. 8.14 **Funnel type grease nipple M3 × 0,5 P**
Art.-No. 20-000370

8.4 Use of central lubrication system

We recommend that you carry out the initial lubrication (see Section 8.12) 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.

8.5 Lubricating pressure

HIWIN rail guideways can be lubricated using oil, grease or low-viscosity grease, depending on the specific application.
The required lubricating pressure depends on the size, the lubricant, the length of the feed line and the type of lubrication connection used.

Minimum lubricating pressure on the block:

- Grease or low-viscosity grease: 6 bar
- Oil lubrication: 3 bar

The maximum permissible lubricating pressure on the block is 30 bar.

ATTENTION!

Damage to the block can be caused by excessive lubricating pressure levels or lubricant quantities.
Seals are at particular risk of damage on blocks with double seals, SW seals or ZWX seals.

- ▶ Carry out lubrication according to the assembly instructions.
- ▶ Make sure you use the right lubricating pressure levels and lubricant quantities.

8.6 Selecting a lubricant

Oils, greases or low-viscosity greases can be used as lubricants. The same lubricants are used as for antifriction 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 or short-stroke applications. Special requirements – such as use in combination with strong or aggressive media, in clean rooms, in a vacuum or in the food industry – also need to be considered.

Grease lubrication

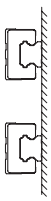
For grease lubrication, we recommend lubricating greases for rolling bearings and friction bearings with mineral oil as the base oil and thickeners specified by DIN 51825 (K1K, K2K). In heavy-duty applications, we recommend using EP additives (KP1K, KP2K), NLGI class 1 or 2. Using greases of other consistency classes is possible subject to the approval of the lubricant supplier.

Lubrication with low-viscosity grease

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

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 cause soiling more quickly. For this reason, higher quantities of lubricant are required than with grease lubrication. As a rule, oil lubrication is only suitable when a centralised lubrication system is being used or for products equipped with a lubrication unit.



NOTE

For wall mounting, we generally recommend grease or low-viscosity grease lubrication, for oil lubrication, we basically ask for consultation, as there may be insufficient lubrication depending on the installation position

8.6.1 Recommended lubricants

Examples of applications and suitable lubricants are given in the table below.

ATTENTION!

Damage caused by using the wrong greases!
Greases with solid particles such as graphite or MOS_2 can cause damage.
▶ Do not use any grease containing solid particles such as graphite or MoS_2!

NOTE

The information on lubricants serves to provide examples and is only intended as an aid to selection. Other lubricants may be selected after clarification of the specific application with the lubricant supplier. In addition, the lubrication system manufacturers' instructions must be observed.

Table 8.3 **Recommended lubricants – grease, low-viscosity grease and oil**

Type of application	Grease		Low-viscosity grease		Oil	
	Manufacturer	**Name**	**Manufacturer**	**Name**	**Manufacturer**	**Name**
Standard	HIWIN	G05	Klüber Lubrication München	MICROLUBE GB 00	Klüber Lubrication München	Klüberoil GEM 1-150 N
	Klüber Lubrication München	MICROLUBE GL 261	Mobil	Mobilux EP 004	FUCHS	GEARMASTER CLP 320
	Mobil	Mobilux EP 1	FUCHS	GEARMASTER LI 400	FUCHS	RENOLIN CLP 150
	FUCHS	LAGERMEISTER BF 2	FUCHS	RENOLIT EPLITH 00	–	–
	LUBCON	Turmogrease CAK 2502	–	–	–	–
	FUCHS	RENOLIT LZR 2 H	–	–	–	–
	Klüber Lubrication München [1]	ISOFLEX TOPAS AK 50 [1]	–	–	–	–
Heavy-duty	HIWIN	G01	We recommend that you consult a lubricant manufacturer regarding the use of these lubricants for heavy-duty applications.			
	Klüber Lubrication München	Klüberlub BE 71-501				
	FUCHS	LAGERMEISTER EP 2				
	LUBCON	TURMOGREASE Li 802 EP				
	FUCHS	RENOLIT LZR 2 H				
Clean room	HIWIN	G02	We recommend that you consult a lubricant manufacturer regarding the use of these lubricants for heavy-duty applications.		Klüber Lubrication München	Klüber Tyreno Fluid E-95V
	Klüber Lubrication München	ISOFLEX TOPAS NCA 152			Mobil	Mobilgear 626
	FUCHS	GLEITMO 591			FUCHS	RENOLIN CLP 100
Clean room at high speeds	HIWIN	G03	–	–	–	–
	Klüber Lubrication München	ISOFLEX TOPAS NCA 52	–	–	–	–

[1] Recommended for the MG series.

Table 8.4 **Recommended lubricants – grease, low-viscosity grease and oil (continued)**

Type of application	Grease		Low-viscosity grease		Oil	
	Manufacturer	**Name**	**Manufacturer**	**Name**	**Manufacturer**	**Name**
High speeds	HIWIN	G04	Klüber Lubrication München	ISOFLEX TOPAS NCA 5051	Klüber	Klüberoil GEM 1-46 N
	Klüber Lubrication München	ISOFLEX NCA 15	Mobil	Mobilux EP 004	FUCHS	RENOLIN ZAF B 46 HT
	LUBCON	Turmogrease Highspeed L 252	FUCHS	GEARMASTER LI 400	–	–
	FUCHS	RENOLIT HI-Speed 2	FUCHS	RENOLIT SF 7-041	–	–
Foodstuffs industry in acc. with USDA H1	Klüber Lubrication München	Klübersynth UH1 14-151	Klüber Lubrication München	Klübersynth UH1 14-1600	Klüber	Klüberoil 4 UH1-68 N
	Mobil	Mobilgrease FM 102	Mobil	Mobilgrease FM 003	–	–
	FUCHS	GERALYN 1	FUCHS	GERALYN 00	–	–

8.6.1.1 Description of types of application

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

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

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

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

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

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

8.7 HIWIN lubricants

Table 8.5 **Overview HIWIN greases**

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

8.8 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 8.6 **Miscibility of HIWIN greases**

	G01	G02	G03	G04	G05
G01	■	■	■	●	●
G02	■	■	■	■	■
G03	■	■	■	■	■
G04	●	■	■	■	■
G05	●	■	■	■	■

■ miscible
● partly miscible

Table 8.7 **Compatibility of basically lubricated products with HIWIN greases**

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

■ miscible
● partly miscible

NOTE

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.

8.9 Grease guns and lubrication adapters

A1: Hydraulic coupling
Suitable for conical grease nipples acc. to DIN 71412, outer diameter 15 mm

Fig. 8.15 **A1**

A2: Hollow mouthpiece
Suitable for conical or ball grease nipples acc. to DIN 71412/ DIN 3402, outer diameter 10 mm

Fig. 8.16 **A2**

A3: Hollow mouthpiece with lubrication adapter
Suitable for ball grease nipples acc. to DIN 3402, outer diameter 6 mm

Fig. 8.17 **A3**

A4: Ball type mouthpiece
Suitable for funnel-type grease nipples acc. to DIN 3405, outer diameter 6 mm

Fig. 8.18 **A4**

A5: Tip mouthpiece with lubrication adapter

Fig. 8.19 **A5**

A6: Angled tip mouthpiece with lubrication adapter

Fig. 8.20 **A6**

Set of lubrication adapter and nozzles

Fig. 8.21 **Lubrication adapter and nozzles A3, A4, A5, A6**

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

Fig. 8.22 **GN-400C**

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

Fig. 8.23 **GN-80M**

Table 8.8 **Overview HIWIN grease guns and accessories**

Item no.	Content			Direct filling	Cartridge	Grease quantity per stroke
	GN-80M (Fig. 8.23) 	**GN-400C (Fig. 8.22)** 	**Set of lubrication adapter and nozzles (Fig. 8.21)** 			
20-000352	■	–	–	■	70 g	0.5–0.6 cm^3
20-000332	■	–	■	■	70 g	0.5–0.6 cm^3
20-000353	–	■	–	■	400 g	0.8–0.9 cm^3
20-000333	–	■	■	■	400 g	0.8–0.9 cm^3
20-000358	–	–	■	–	–	–

Table 8.9 **Overview grease nipples and recommended adapter for grease gun**

	Grease nipple	Recommended adapter for grease gun
	Ball type grease nipple	
	M3 × 0.5 P	A2, A3 [1]
	M4 × 0.7 P	A2, A3 [1]
	Conical grease nipple	
	M6 × 0.75 P	A1, A2 [1]
	⅛ PT	A1, A2 [1]
	Funnel type grease nipple	
	M3 × 0.5 P	A4
	M4 × 0.7 P	A4
	M6 × 0.75 P	A4

[1] Optional for limited installation space

8.10 Standard 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 8.11.
- **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 8.11.
- **Blocks with initial lubrication** are delivered with the recommended amount of grease acc. to Section 8.13.

Table 8.10 **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 8.11 **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 for QR: 100 mm²/s at 40 °C; base oil viscosity for QH, QE, QW: 200 mm²/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.

NOTE

8.11 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.

NOTE

8.11.1 Performance

- Apply the amount of grease specified in Section 8.13 by slowly pressing the grease gun.
- Move the block by about three block lengths.
- Repeat this process two more times.
- Move the block over the entire travel path and check the entire profile rail to see whether a lubricant film can be detected.

✓ The initial lubrication process for the linear guideway has been carried out.

If a lubricant film cannot be detected along the entire length of the profile rail, increase the quantity of lubricant used.

NOTE

8.11.1.1 Initial lubrication for short-stroke applications

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

Stroke < 2 × block length:
Provide lubrication connections on both sides of the block and carry out lubrication according to Section 8.11.1 for the corresponding lubrication connection.

Stroke < 0,5 × block length: Please consult with HIWIN.

NOTE

8.11.1.2 Initial lubrication – MG series

A lubricating nipple for grease lubrication is available for size 15 in the case of miniature type MG. For sizes 5, 7, 9 and 12, we recommend using a suitable spray grease (such as FUCHS PLANTO Multispray S).

- Apply the lubricant evenly to the ball bearing races along the entire length of the profile rail.
- Move the block along the entire stroke.
- Remove any surplus grease if necessary.

✓ The initial lubrication process for the MG linear guideway has been carried out.

If minimum displacement resistance is required or the environmental conditions are very clean, we recommend lubricating the MG series with oil (see Section 8.13.3).

NOTE

8.12 Changing lubricant

Before you change to a different lubricant, the entire block must be thoroughly cleaned. More information on this can be found in Section 7.1.

NOTE

The removal of the existing lubricant is only necessary if the lubricants are not miscible.

8.13 Lubricant quantities

NOTE

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 %.

8.13.1 Lubricant quantities for grease lubrication

Table 8.12 **Lubricant quantities for grease lubrication – HG, QH, EG, QE, CG, WE, QW, RG, QR series**

Size	Initial lubrication partial quantity [cm³]			Relubrication quantity [cm³]		
	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 8.13 **Lubricant quantities for grease lubrication – MG series**

Size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	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

8.13.2 Lubricant quantities for low-viscosity grease lubrication

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

NOTE

8.13.2.1 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:

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

8.13.3 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 8.14 **Lubricant quantities for oil lubrication – HG, QH, EG, QE, CG, WE, QW, RG, QR series**

Size	Initial lubrication partial quantity [cm³]			Relubrication quantity [cm³]		
	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.

NOTE

8.13.3.1 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.

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

8.14 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 8.13 by operating the grease gun in a single action or by adjusting the central lubrication system accordingly.

NOTE

Check whether a film of oil can be seen on the total rail. If this is not the case, increase the lubricant quantity.

8.14.1 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.

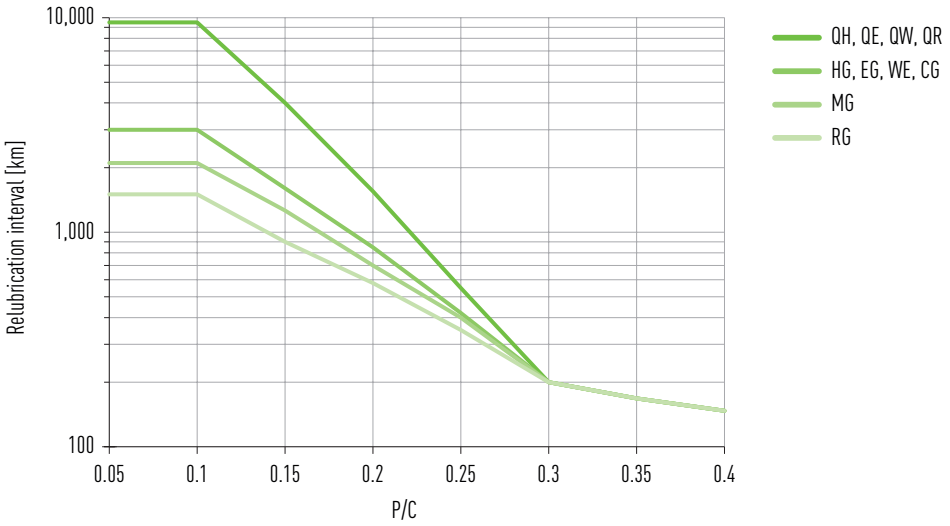


Fig. 8.24 **Load-dependent relubrication intervals for grease lubrication**

NOTE

The relubrication intervals can possibly be shortened under the following conditions. In such cases, please consult HIWIN: v > 3 m/s, a > 30 m/s², contact with media, temperatures < 20 °C or > 30 °C, soiled ambient conditions.

8.14.2 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 8.14.1).

8.14.3 Relubrication intervals for oil lubrication

The relubrication intervals for oil lubrication are reduced to 50 % of the relubrication intervals for grease lubrication (see Section 8.14.1).

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. Procedure for incidents

Interference	Possible cause	Remedy
High level of operating noise while the linear guideway is running	Travel speed of the linear guideway is too high	Check the permissible travel speed (see Section 12.1)
	Insufficient lubrication	Lubricate the linear guideway as specified in the lubrication instructions
Blocks require high displacement forces	Preload of the block on the rail is too high	Check the required preload of the block
	Insufficient lubrication	Lubricate the linear guideway as specified by the lubrication instructions
Block is losing balls	The block is damaged or the seals on the block are damaged.	Contact the HIWIN support.

11. Accessories

11.1 Self-lubricating block

11.1.1 Self-lubricating E2 block for the HG, EG and RG series

The self-lubricating E2 block consists of a lubricating unit **[5]** located between the deflection system **[4]** and the end seal **[3]**, s connection piece **[2]**, and an interchangeable oil tank **[1]**. Lubricant from the oil tank passes via the connection piece to the lubrication unit, from where the lubricant is transferred to the track of the profile rail.

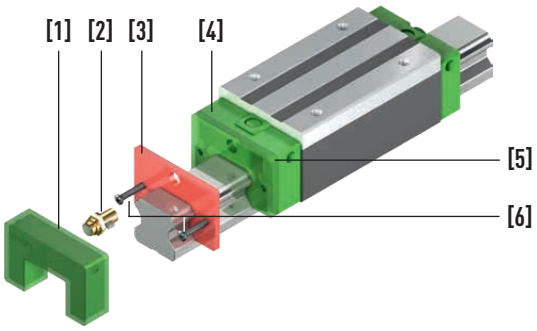


Fig. 11.1 **Exploded view of self-lubricating E2 block for the HG, EG and RG series**

Table 11.1 **Key for Fig. 11.1**

Pos.	Name
1	Oil tank
2	Connection piece
3	End seal
4	Deflection system
5	Lubrication unit
6	Fixing screws

11.1.1.1 Assembly

- If necessary disassemble the existing grease nipple and the end seal(s).
- Place the lubricating unit **[5]** on the block.
- Place the end seal(s) **[3]** in front of the lubricating unit **[5]**.
- Tighten the fixing screws **[6]**.
- Mount the connection piece **[2]**.

The screw size and the size of the connection piece can vary depending on which type of dust protection is used. **NOTE**

- Push the oil tank **[1]** on to the lubricating unit until you hear a click.

✓ The self-lubricating E2 block has been mounted.

11.1.2 Self-lubricating EC block for the CG series

The self-lubricating EC block for the CG series consists of a lubrication unit with oil tank **[2]** and an additional end seal **[1]**. The ball bearing track is lubricated via the lubrication unit.

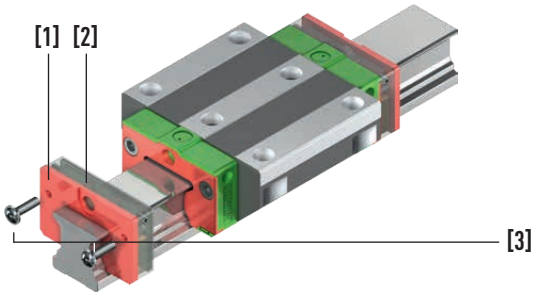


Fig. 11.2 **Exploded view of self-lubricating EC block for the CG series**

Table 11.2 **Key for Fig. 11.2**

Pos.	Name
1	End seal
2	Lubrication unit with oil tank
3	Fixing screws

11.1.2.1 Assembly

- If necessary disassemble the existing grease nipple and the end seal(s).
- Place the lubricating unit **[2]** on the block.
- Place the end seal(s) **[1]** in front of the lubricating unit **[2]**.
- Tighten the fixing screws **[3]**.

NOTE

The screw size and the size of the connection piece can vary depending on which type of dust protection is used.

✓ The self-lubricating E2 block has been mounted.

11.1.3 Replacement intervals

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. NOTE

Table 11.3 indicates the maximum interval at which the fill level of the oil tank should be checked. NOTE

You can either fill the oil tank using an injector via the fill holes on the side or you can replace the whole component. NOTE

Table 11.3 **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.

11.2 Additional assembly and disassembly tool

Table 11.4 **Steel or brass cover cap assembly tool**

Series/Size	Article number
HG_15	5-002519
HG_20	5-000915
HG_25	5-000916
HG_30	5-000917
HG_35	5-000918
HG_45	5-000919
HG_55	5-000920
HG_65	5-000921
RG_20	12-000542
RG_25	12-000309
RG_30	12-000310
RG_35	12-000311
RG_45	12-000312
RG_55	12-000313
RG_65	12-000314

Table 11.5 **Cover strip assembly/disassembly tool**

Size (all series)	Article number
15	5-002557
20	5-002417
25	5-002416
30	5-002554
35	5-002555
45	5-002556

Table 11.6 **Cover strip expanding mandrel**

Size (all series)	Article number
15	5-002725
20	5-002726
25	5-002727
30	5-002728
35	5-002729
45	5-002730
55	5-002731
65	5-002732

12. Appendix

12.1 Maximum speeds and accelerations for HIWIN linear guideways

The following maximum speeds and accelerations are permitted for HIWIN linear guideways[1]:

Table 12.1 **Permissible maximum speeds and accelerations for HIWIN linear guideways**

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

[1] Depending on the application, higher values are possible. Please consult HIWIN on this matter.

12.2 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 12.2 **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

NOTE

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.

12.3 Mounting tolerances

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.

NOTE

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..

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

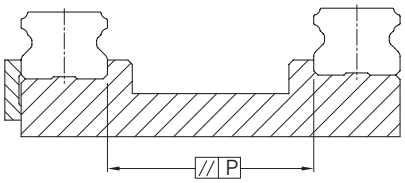


Fig. 12.1 **Parallelism of the reference surface (P)**

Table 12.3 **Maximum tolerance for parallelism (P)**

Series	Size	Preload class		
		Z0	ZA	ZB
HG/QH	15	25	18	–
	20	25	20	18
	25	30	22	20
	30	40	30	27
	35	50	35	30
	45	60	40	35
HG	55	70	50	45
	65	80	60	55
EG/QE	15	25	18	–
	20	25	20	18
	25	30	22	20
	30	40	30	27
	35	50	35	30
CG	15	9	5	4
	20	11	7	5
	25	12	8	6
	30	14	9	7
	35	15	11	8
	45	19	12	10
WE	15	20	15	9
	50	40	30	27
WE/QW	21	25	18	9
	27	25	20	13
	35	30	22	20

Unit: μm

Series	Size	Preload class		
		ZO	ZA	ZB
RG	15	5	3	3
	20	8	6	4
	55	21	14	11
	65	27	18	14
RG/QR	25	9	7	5
	30	11	8	6
	35	14	10	7
	45	17	13	9

Unit: μm

Series	Size	Preload class		
		ZF	ZO	Z1
MG	05	2	2	2
	07	3	3	3
	09	4	4	3
	12	9	9	5
	15	10	10	6

Unit: μm

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

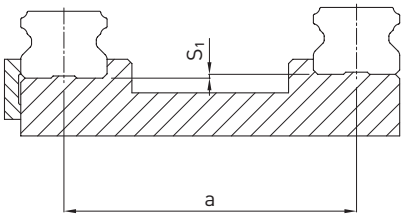


Fig. 12.2 **Tolerance for the height of the reference surface (S_1)**

Valid for series HG/QH/EG/QE/WE/QW/MG

$$S_1 = a \times K$$

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

Valid for series CG/RG/QR

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

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 3.4

Table 12.4 **Coefficient of the height tolerance (K)**

Series	Size	Preload class		
		Z0	**ZA**	**ZB**
HG	**55**	6.0×10^{-4}	4.2×10^{-4}	3.4×10^{-4}
	65	7.0×10^{-4}	5.0×10^{-4}	4.0×10^{-4}
HG/QH	**15**	2.6×10^{-4}	1.7×10^{-4}	–
	20	2.6×10^{-4}	1.7×10^{-4}	1.0×10^{-4}
	25	2.6×10^{-4}	1.7×10^{-4}	1.4×10^{-4}
	30	3.4×10^{-4}	2.2×10^{-4}	1.8×10^{-4}
	35	4.2×10^{-4}	3.0×10^{-4}	2.4×10^{-4}
	45	5.0×10^{-4}	3.4×10^{-4}	2.8×10^{-4}
EG/QE	**15**	2.6×10^{-4}	1.7×10^{-4}	–
	20	2.6×10^{-4}	1.7×10^{-4}	1.0×10^{-4}
	25	2.6×10^{-4}	1.7×10^{-4}	1.4×10^{-4}
	30	3.4×10^{-4}	2.2×10^{-4}	1.8×10^{-4}
	35	4.2×10^{-4}	3.0×10^{-4}	2.4×10^{-4}
CG	**15 – 45**	2.8×10^{-4}	1.7×10^{-4}	1.2×10^{-4}
WE	**15**	1.3×10^{-4}	0.4×10^{-4}	–
	50	3.4×10^{-4}	2.2×10^{-4}	1.8×10^{-4}
WE/QW	**21**	2.6×10^{-4}	1.7×10^{-4}	0.9×10^{-4}
	27	2.6×10^{-4}	1.7×10^{-4}	0.9×10^{-4}
	35	2.6×10^{-4}	1.7×10^{-4}	1.4×10^{-4}
RG	**15 – 65**	2.2×10^{-4}	1.7×10^{-4}	1.2×10^{-4}
QR	**25 – 45**	2.2×10^{-4}	1.7×10^{-4}	1.2×10^{-4}

Table 12.5 **Coefficient of the height tolerance (K) – MG series**

Series	Size	Preload class		
		ZF	**Z0**	**Z1**
MG	**05**	0.4×10^{-4}	0.4×10^{-4}	0.04×10^{-4}
	07	0.5×10^{-4}	0.5×10^{-4}	0.06×10^{-4}
	09	0.7×10^{-4}	0.7×10^{-4}	0.12×10^{-4}
	12	1.0×10^{-4}	1.0×10^{-4}	0.24×10^{-4}
	15	1.2×10^{-4}	1.2×10^{-4}	0.40×10^{-4}

12.3.3 Height tolerance for mounting areas on block (S_2/S_3)

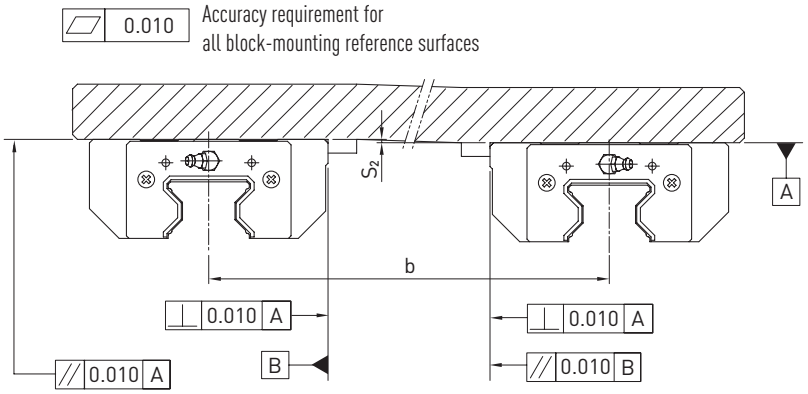


Fig. 12.3 **Max. height tolerance S_2**

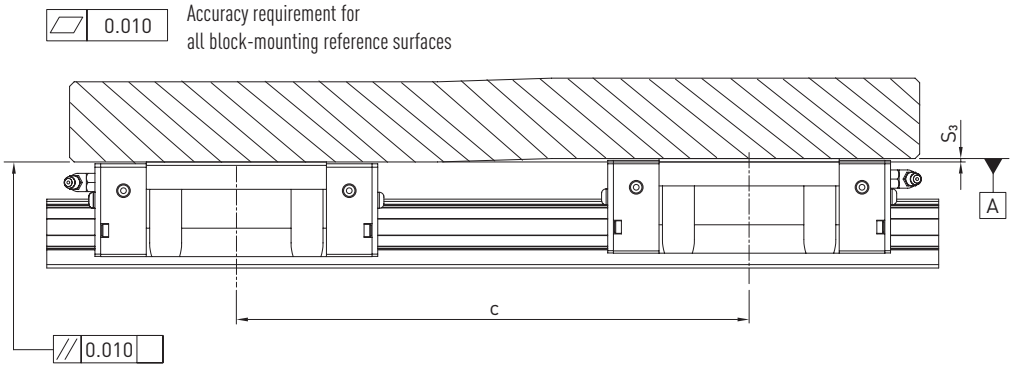


Fig. 12.4 **Max. height tolerance S_3**

The height tolerance of the reference surface in the parallel use of two or more blocks (S2/S3)

$S_2 = b \times K$

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

$S_3 = c \times K$

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

Table 12.6 **Coefficient of the height tolerance (K) – CG series**

Series	Size	Load type	
		CG_C	CG_H
CG	15 – 45	4.2×10^{-5}	3.0×10^{-5}

Table 12.7 **Coefficient of the height tolerance (K)**

Series	Size	Load type	
		RG_C/QR_C	RG_H/QR_H
RG	15 – 65	4.2×10^{-5}	3.0×10^{-5}
QR	25 – 45	4.2×10^{-5}	3.0×10^{-5}

12.3.4 Requirements for the mounting surface – MG series

The following requirements for the mounting surface must also be adhered to in the case of the MG series.

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.

Table 12.8 **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

12.3.5 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.

12.3.5.1 HG and QH series

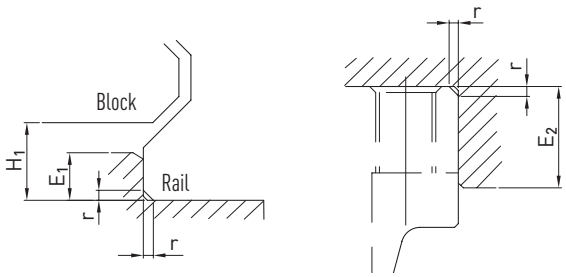


Fig. 12.5 **Shoulder heights and fillets – HG/QH series**

Table 12.9 **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

12.3.5.2 EG and QE series

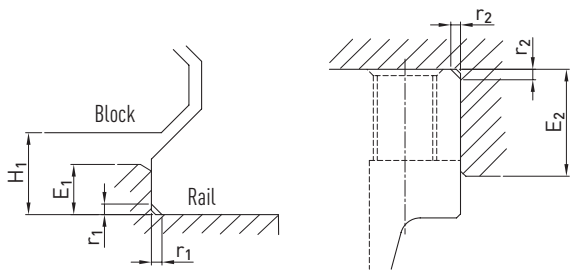


Fig. 12.6 **Shoulder heights and fillets – EG/QE series**

Table 12.10 **Shoulder heights and fillets – EG/QE series**

Series/Size	Max. radius of edges r_1	Max. radius of edges 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

12.3.5.3 CG series

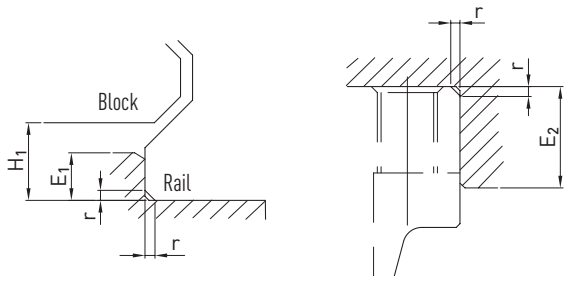


Fig. 12.7 **Shoulder heights and fillets – CG series**

Table 12.11 **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

12.3.5.4 WE and QW series

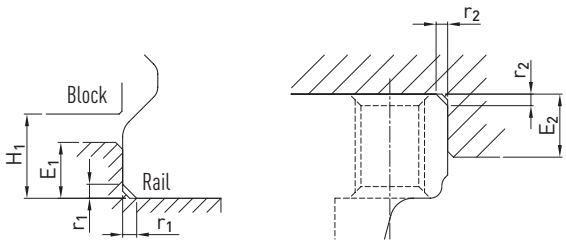


Fig. 12.8 **Shoulder heights and fillets – WE/QW series**

Table 12.12 **Shoulder heights and fillets – WE/QW series**

Series/Size	Max. radius of edges r_1	Max. radius of edges 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

12.3.5.5 MG series

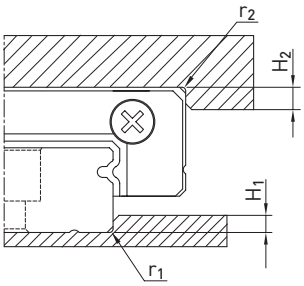


Fig. 12.9 **Shoulder heights and fillets – MG series**

Table 12.13 **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

12.3.5.6 RG and QR series

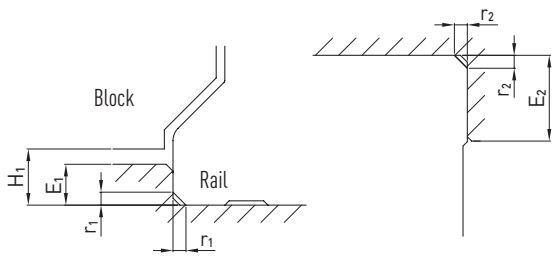


Fig. 12.10 **Shoulder heights and fillets – RG/QR series**

Table 12.14 **Shoulder heights and fillets – RG/QR series**

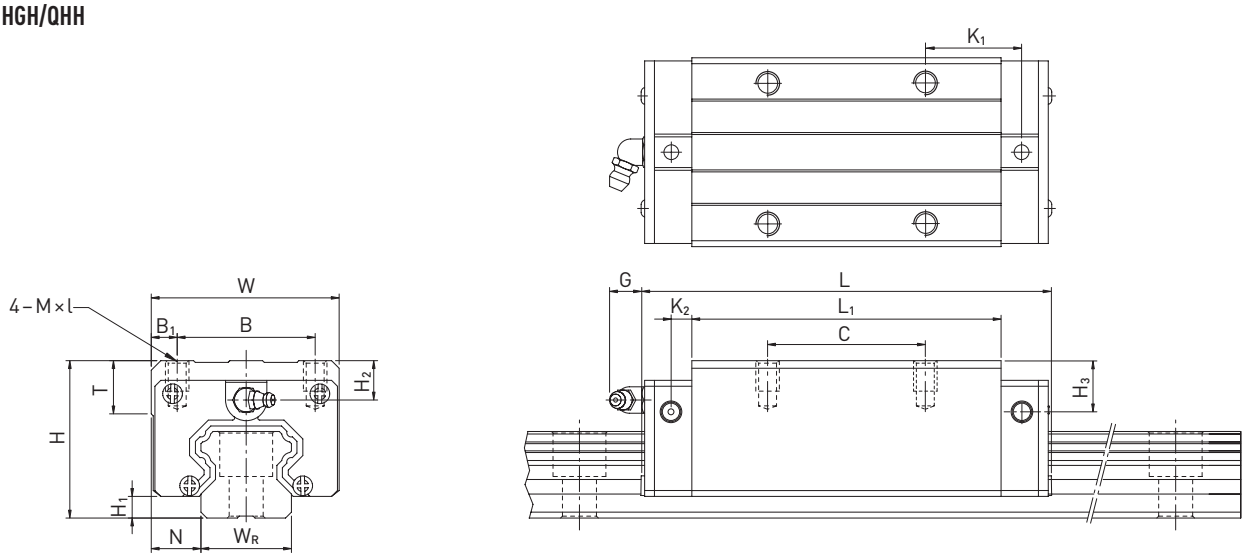
Series/Size	Max. radius of edges r_1	Max. radius of edges r_2	Shoulder height of reference edge of rail E_1	Shoulder height of reference edge of block E_2	Clearance under block H_1
RG_15	0.5	0.5	3.0	4.0	4.0
RG_20	0.5	0.5	3.5	5.0	5.0
RG/QR_25	1.0	1.0	5.0	5.0	5.5
RG/QR_30	1.0	1.0	5.0	5.0	6.0
RG/QR_35	1.0	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

12.4 Technical data for blocks

12.4.1 Dimensions of the HG/QH blocks

HGH/QHH

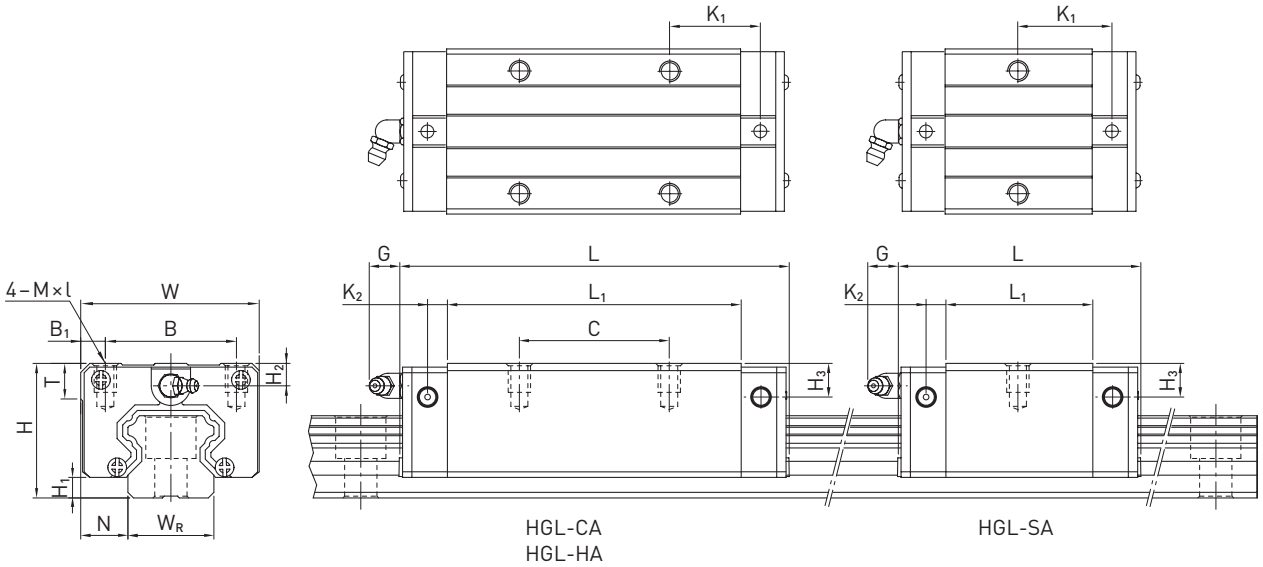


Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
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

[1] 98.8 for version SE; [2] 121.8 for version SE

HGL

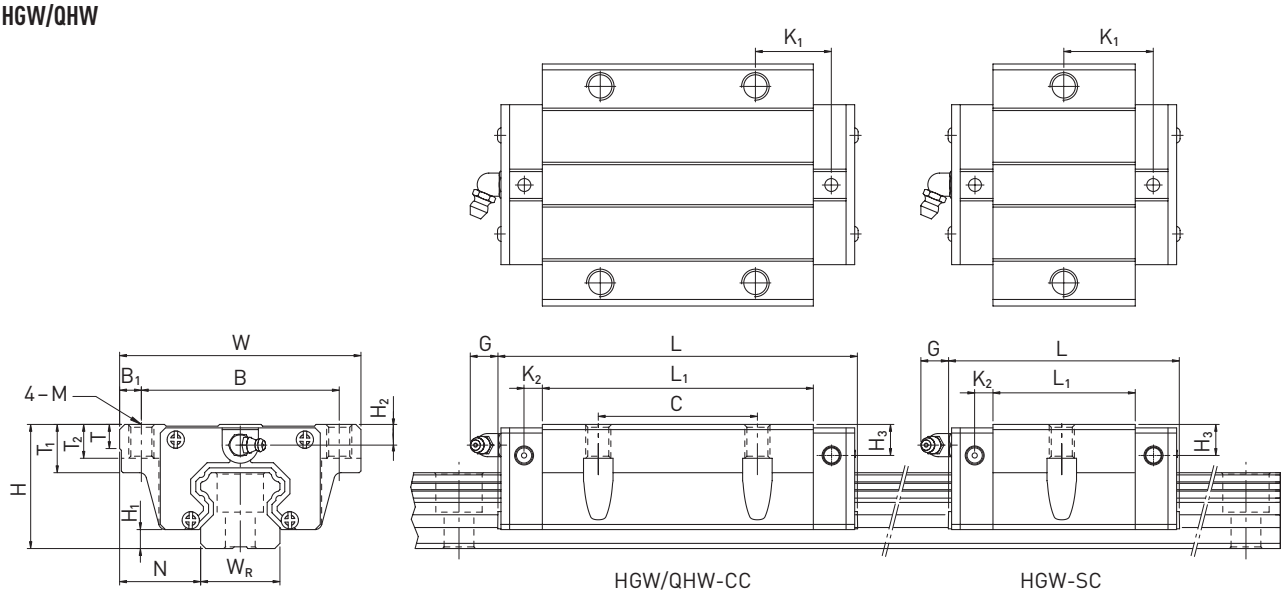


Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
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[1]	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[2]	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

[1] 98.8 for version SE

HGW/QHW



HGW/QHW-CC
HGW/QHW-HC

HGW-SC

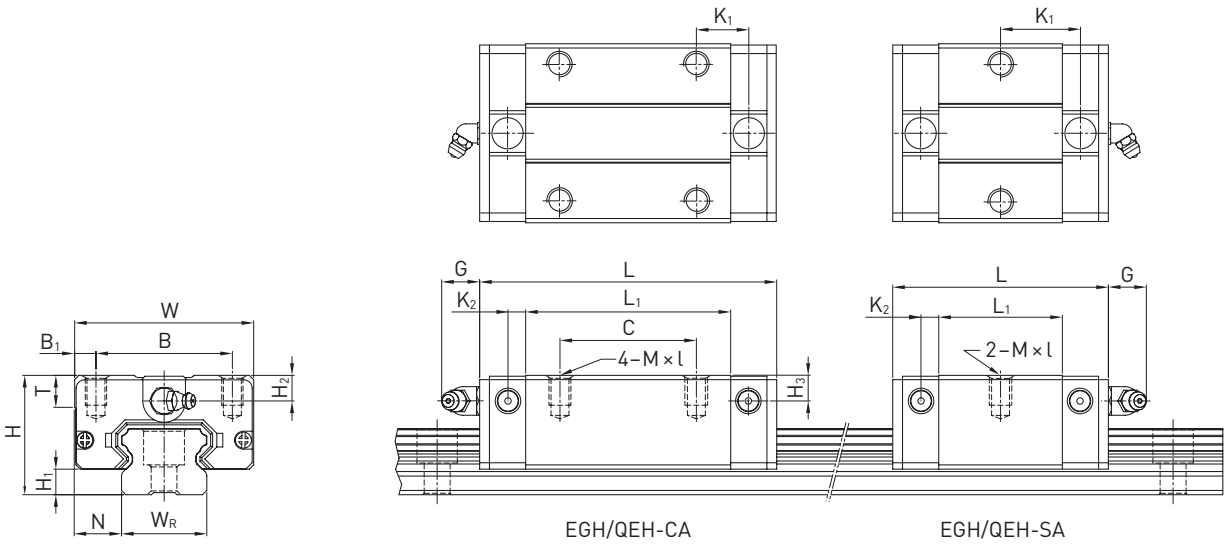
Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	M	G	T	T_1	T_2	H_2	H_3	C_{dyn}	C_0	
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[1)]	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[2)]	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

[1)] 98.8 for version SE; [2)] 121.8 for version SE

12.4.2 Dimensions of the EG/QE blocks

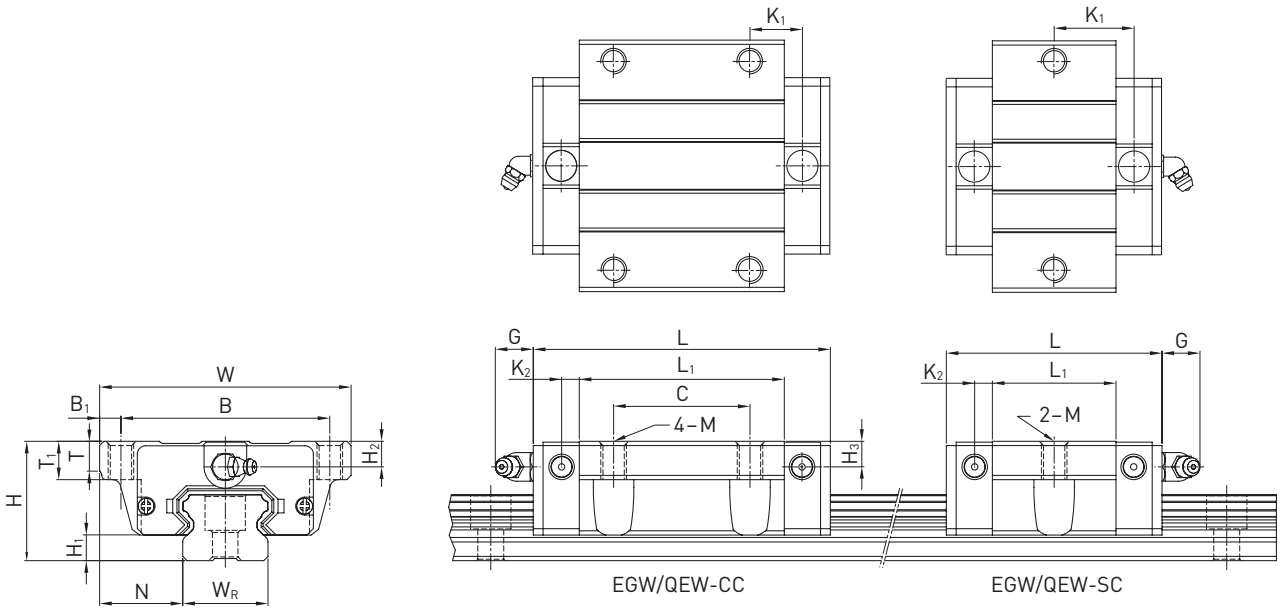
EGH/QEH



Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
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

EGW/QEW

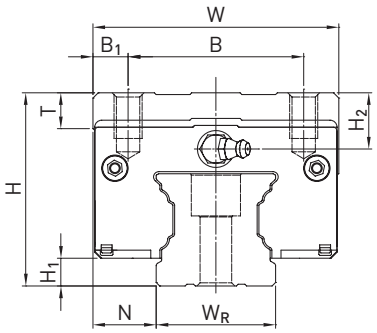


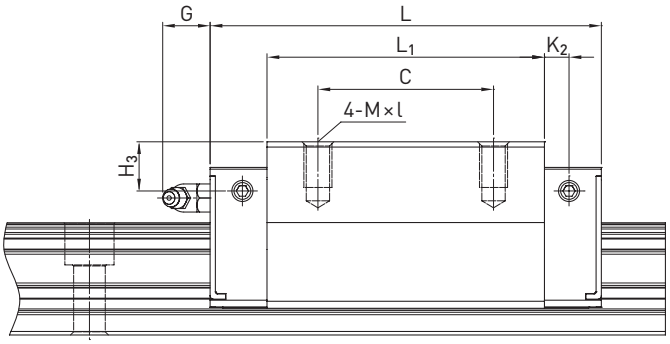
Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	C_{dyn}	C_0	
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

12.4.3 Dimensions of the CG blocks

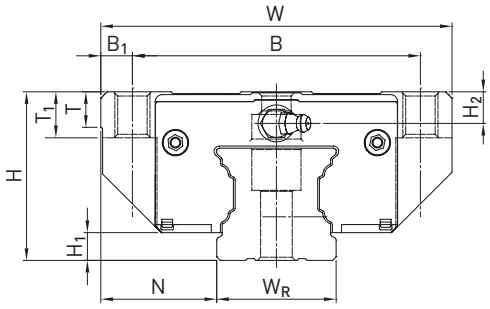
CGH

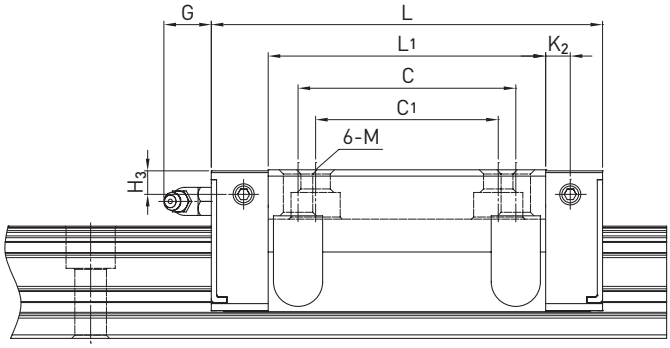




Dimensions of the block																	
Series/size	Installation dimensions [mm]			Dimensions of the block [mm]												Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
CGH15CA	28	4.1	9.5	34	26	4.0	26	39.6	58.2	4.25	6.0	M4 × 6	6.0	7.8	7.8	14,700	19,520	0.15
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	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	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	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	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	98,430	112,660	2.38
CGH45HA							80	133.6	174.0							125,580	159,600	3.01

CGW



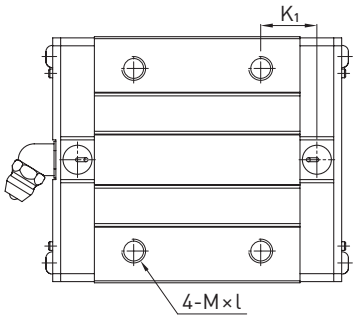


Dimensions of the block

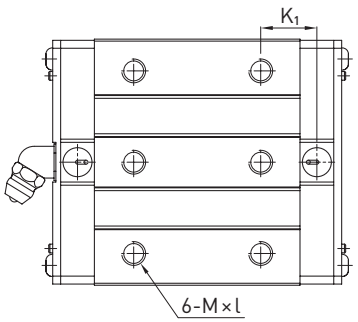
Series/size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	C_1	L_1	L	K_2	G	M	T	T_1	H_2	H_3	C_{dyn}	C_0	
CGW15CC	24	4.1	16.0	47	38	4.5	30	26	39.6	58.2	4.25	6.0	M5	6.0	6.5	3.8	3.8	14,700	19,520	0.14
CGW20CC	30	4.6	21.5	63	53	5.0	40	35	52.5	74.9	5.50	6.0	M6	6.5	7.7	3.7	3.5	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	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	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	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	98,430	112,660	2.45
CGW45HC									133.6	174.0								125,580	159,600	3.00

12.4.4 Dimensions of the WE/QW blocks

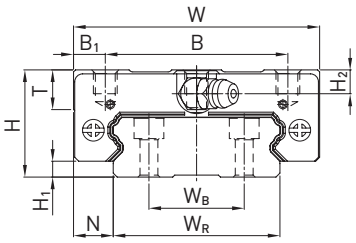
WEH/QWH

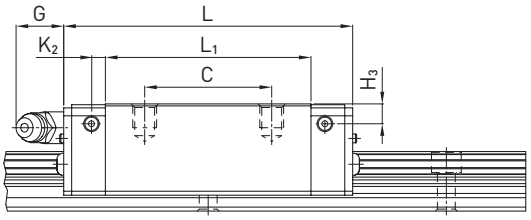


WE_17
WE/QW_21



WE/QW_27
WE/QW_35
WE_50

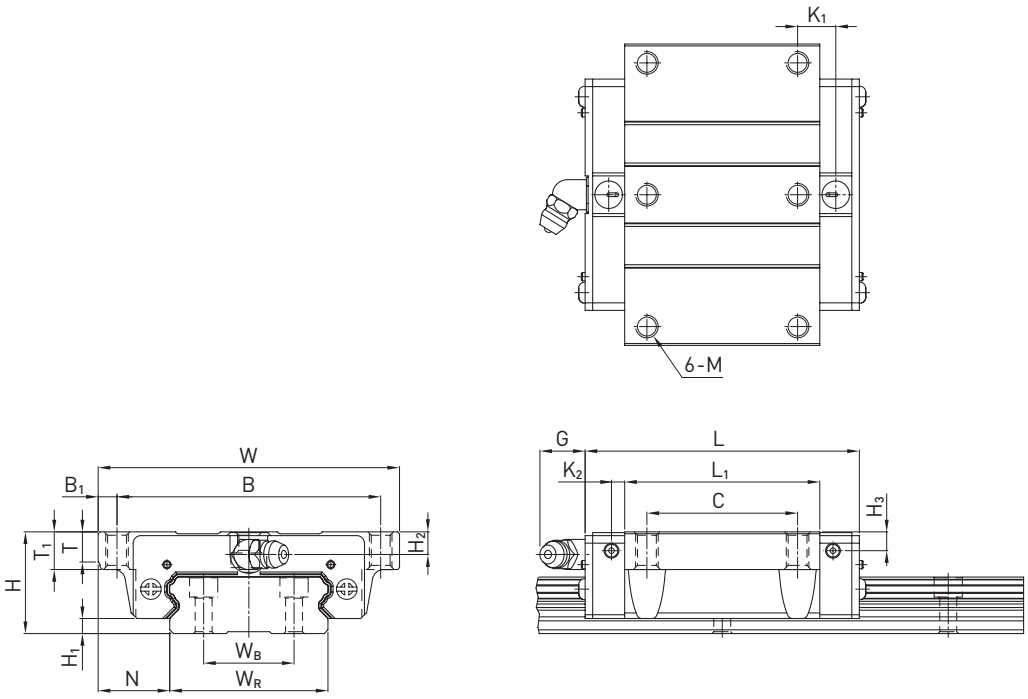




Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
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

WEW



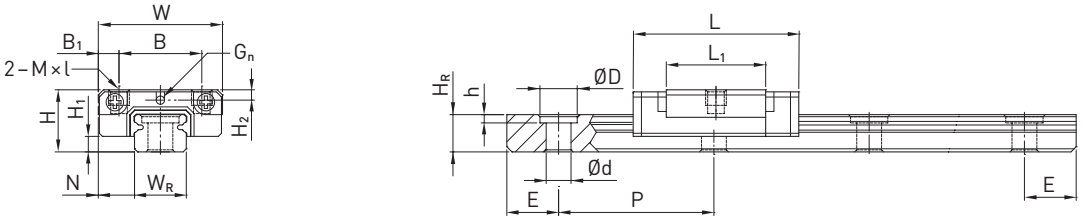
Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	C_{dyn}	C_0	
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

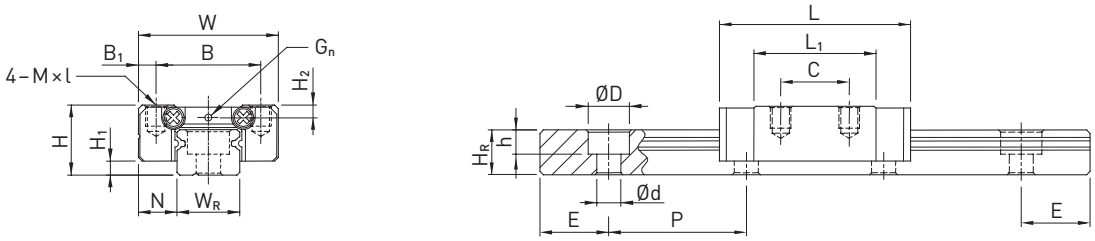
12.4.5 Dimensions of the MG blocks

MGN

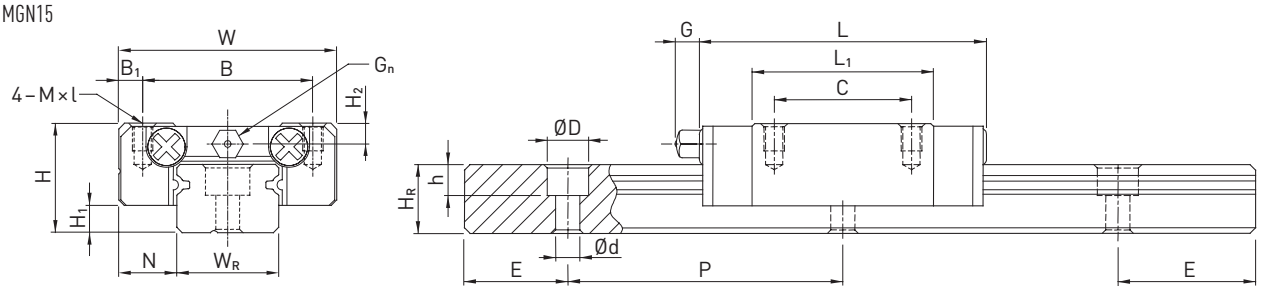
MGN05



MGN07, MGN09, MGN12



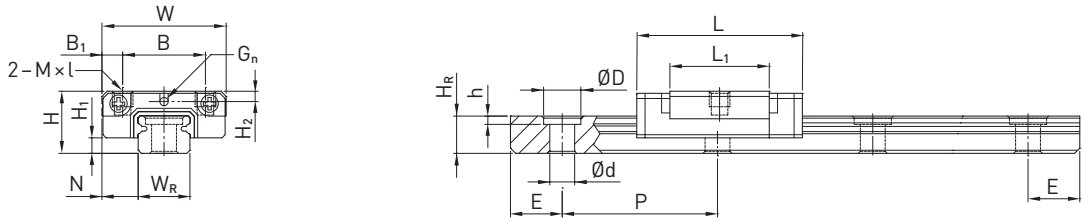
MGN15



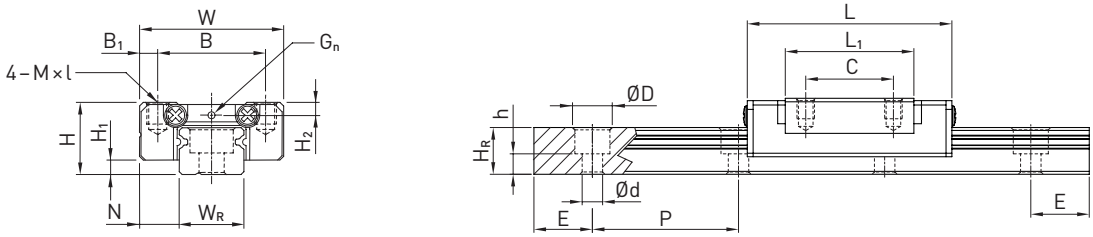
Dimensions of the block																
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	M × l	H_2	C_{dyn}	C_0	
MGN05C	6	1.5	3.5	12	8	2.0	–	9.6	16.0	–	Ø0.8	M2 × 1.5	1.0	540	840	0.008
MGN05H							–	12.6	19.0					670	1,080	0.010
MGN07C	8	1.5	5.0	17	12	2.5	8	13.5	22.5	–	Ø1.2	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	–	Ø1.4	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	–	Ø2	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

MGW

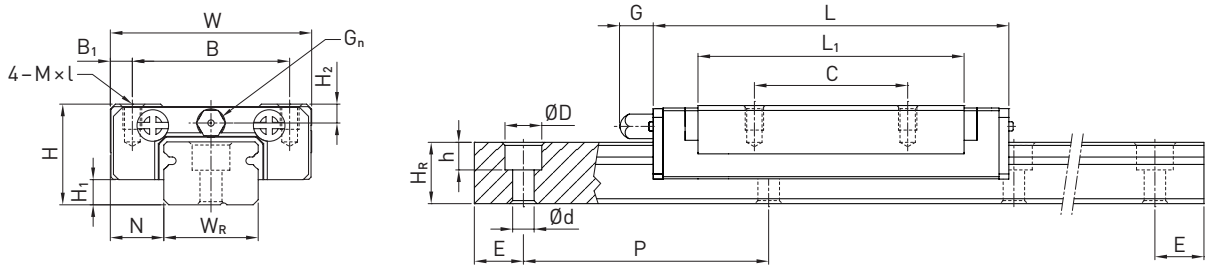
MGN05-0



MGN09-0, MGN12-0



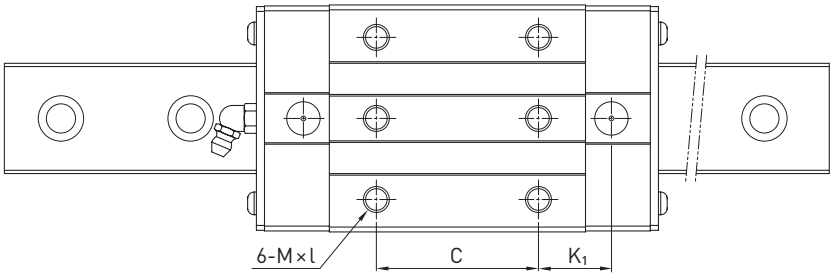
MGN15-0

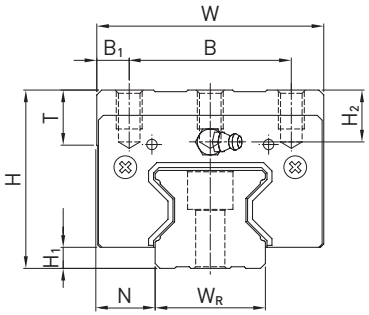


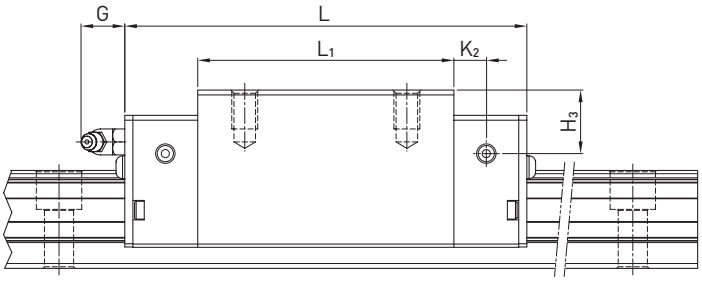
Dimensions of the block															
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	M × l	H_2	C_{dyn}	C_0	
MGN05C-0	6	1.5	3.5	12	8	2.0	–	9.6	16.0	–	Ø0.8	M2 × 1.5	1.0	540	840	0.008
MGN05H-0	6	1.5	3.5	12	8	2.0	–	12.6	19.0	–	Ø0.8	M2 × 1.5	1.0	670	1,080	0.010
MGN09C-0	10	2.2	5.5	20	15	2.5	10	19.4	30.0	–	Ø1.4	M3 × 3.0	1.8	2,010	2,840	0.012
MGN09H-0	10	2.2	5.5	20	15	2.5	16	29.3	39.9	–	Ø1.4	M3 × 3.0	1.8	2,500	3,930	0.020
MGN12C-0	13	3.0	7.5	27	20	3.5	15	22.0	35.0	–	Ø2.0	M3 × 3.5	2.5	2,840	3,920	0.025
MGN12H-0	13	3.0	7.5	27	20	3.5	20	34.6	47.6	–	Ø2.0	M3 × 3.5	2.5	4,270	5,900	0.047
MGN15C-0	16	4.0	8.5	32	25	3.5	20	26.7	41.3	4.5	M3	M3 × 4.0	3.0	4,610	5,590	0.057
MGN15H-0	16	4.0	8.5	32	25	3.5	25	43.4	58.0	4.5	M3	M3 × 4.0	3.0	6,370	9,110	0.088

12.4.6 Dimensions of the RG/QR blocks

RGH/QRH



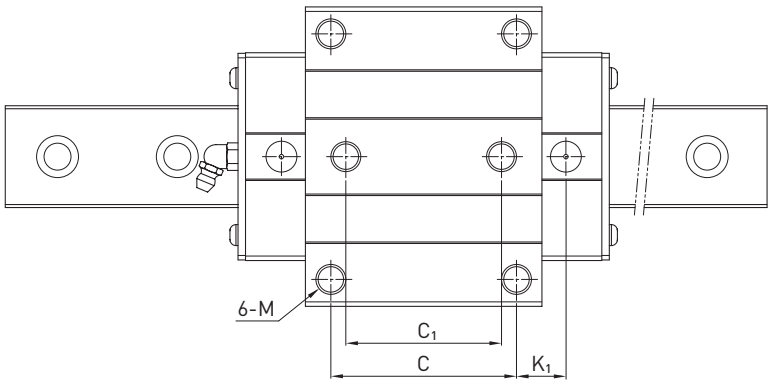


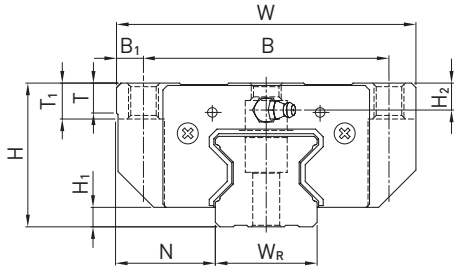


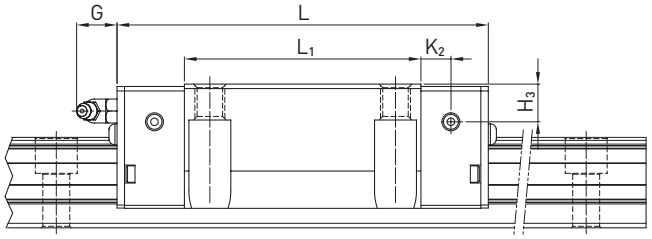
Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
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

RGW/QRW







Dimensions of the block

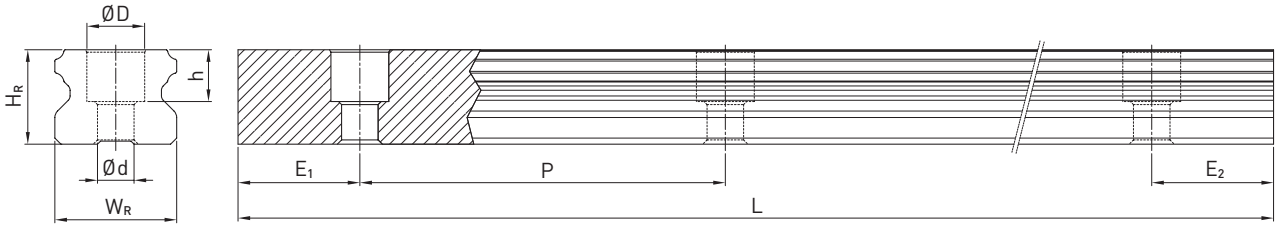
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]															Load ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	C_1	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	C_{dyn}	C_0	
RGW15CC	24	4.0	16.0	47	38	4.5	30	26	45.0	68.0	11.40	4.70	5.3	M5	6.0	7	3.6	6.1	11,300	24,000	0.22
RGW20CC	30	5.0	21.5	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

12.5 Technical data for rails

12.5.1 Dimensions of the HG rails

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

HGR_R

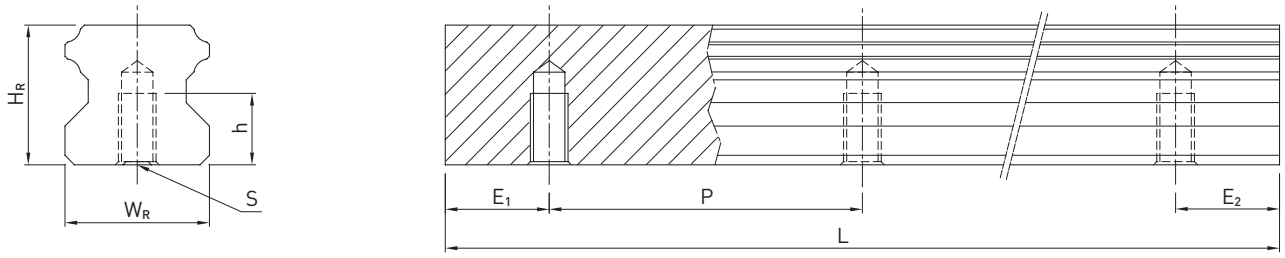


Dimensions of rail HGR_R

Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [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						
HGR15R	M4 × 20	15	15.0	7.5	5.3	4.5	60	4,000	3,900	132	6	54	1.45
HGR20R	M5 × 20	20	17.5	9.5	8.5	6.0	60	4,000/5,600 [1]	3,900/5,520 [1]	134	7	53	2.21
HGR25R	M6 × 25	23	22.0	11.0	9.0	7.0	60	4,000/5,600 [1]	3,900/5,520 [1]	136	8	52	3.21
HGR30R	M8 × 3,	28	26.0	14.0	12.0	9.0	80	4,000/5,600 [1]	3,920/5,520 [1]	178	9	71	4.47
HGR35R	M8 × 35	34	29.0	14.0	12.0	9.0	80	4,000/5,600 [1]	3,920/5,520 [1]	178	9	71	6.30
HGR45R	M12 × 45	45	38.0	20.0	17.0	14.0	105	4,000/5,600 [1]	3,885/5,460 [1]	234	12	93	10.41
HGR55R	M14 × 55	53	44.0	23.0	20.0	16.0	120	4,000/5,600 [1]	3,840/5,440 [1]	268	14	106	15.08
HGR65R	M16 × 65	63	53.0	26.0	22.0	18.0	150	4,000/5,600 [1]	3,750/5,350 [1]	330	15	135	21.18

[1] Optional version on request

HGR_T



Dimensions of rail HGR_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						
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 [1]	30	150	4,000	3,750	330	15	135	21.73

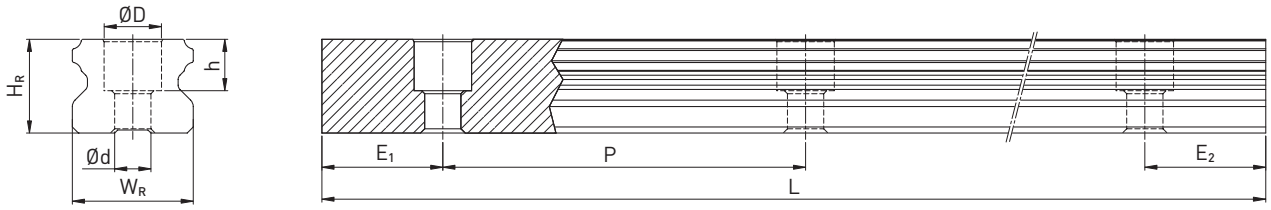
[1] Deviating from DIN 645

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.

12.5.2 Dimensions of the EG rails

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

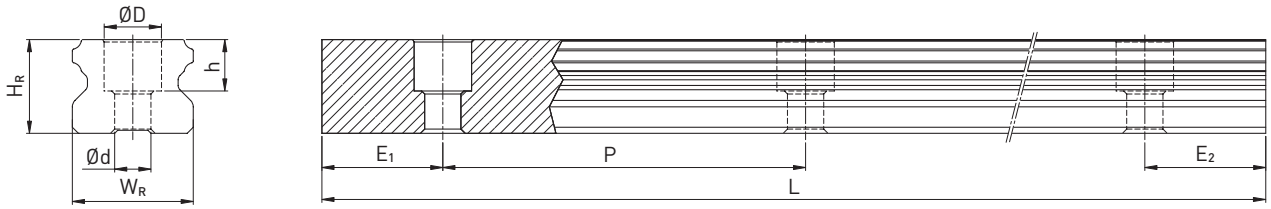
EGR_R



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 × 20	20	15.5	9.5	8.5	6.0	60	4,000	3,900	134	7	53	2.08
EGR25R	M6 × 25	23	18.0	11.0	9.0	7.0	60	4,000	3,900	136	8	52	2.67
EGR30R	M6 × 30	28	23.0	11.0	9.0	7.0	80	4,000	3,920	178	9	71	4.35
EGR35R	M8 × 35	34	27.5	14.0	12.0	9.0	80	4,000	3,920	178	9	71	6.14

EGR_U

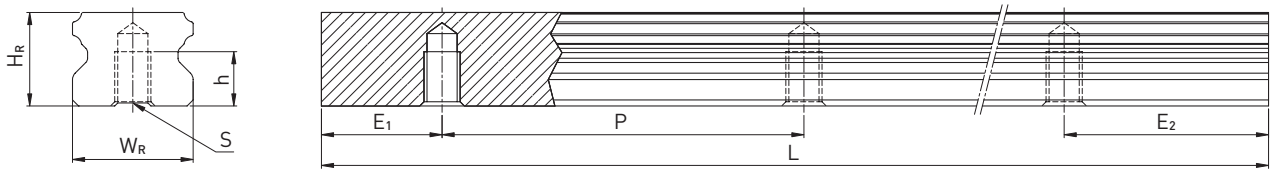


Dimensions of rail EGR_U

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 × 30	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



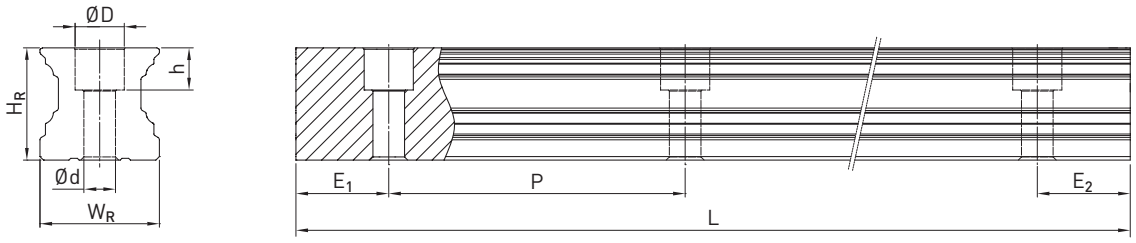
Dimensions of rail EGR_T

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**						
EGR15T	15	12.5	M5	7	60	4,000	3,900	132	6	54	1.26
EGR20T	20	15.5	M6	9	60	4,000	3,900	134	7	53	2.15
EGR25T	23	18.0	M6	10	60	4,000	3,900	136	8	52	2.79
EGR30T	28	23.0	M8	14	80	4,000	3,920	178	9	71	4.42
EGR35T	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.

12.5.3 Dimensions of the CG rails

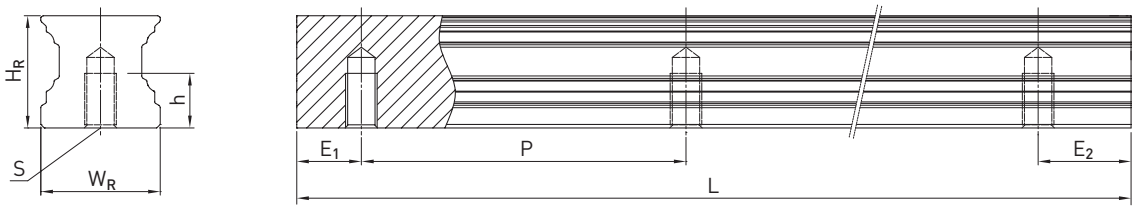
CGR_R



Dimensions of rail CGR_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						
CGR15R	M4 × 20	15	16.20	7.5	5.9	4.5	60	4,000	3,900	132	6	54	1.58
CGR20R	M5 × 25	20	20.55	9.5	8.5	6.0	60	4,000	3,900	134	7	53	2.48
CGR25R	M6 × 30	23	24.25	11.0	9.0	7.0	60	4,000	3,900	136	8	52	3.38
CGR30R	M8 × 35	28	28.35	14.0	12.4	9.0	80	4,000	3,920	178	9	71	5.10
CGR35R	M8 × 40	34	31.85	14.0	12.0	9.0	80	4,000	3,920	178	9	71	7.14
CGR45R	M12 × 50	45	39.85	20.0	17.0	14.0	105	4,000	3,885	234	12	93	11.51

CGR_T



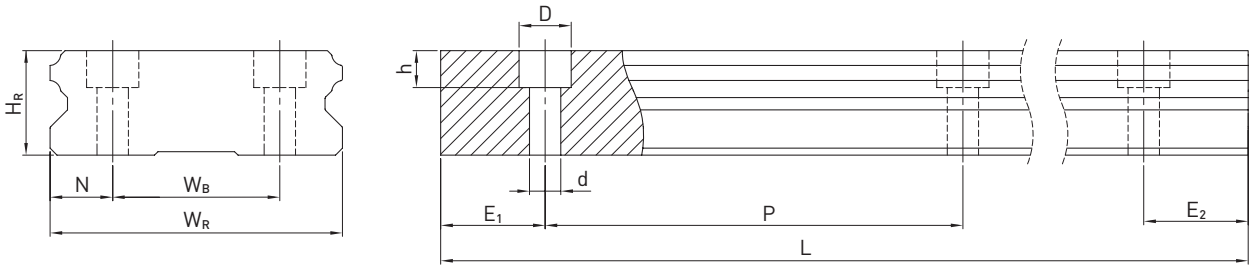
Dimensions of rail CGR_T

Series/ size	Dimensions of rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
	W_R	H_R	S	h	P						
CGR15T	15	16.20	M5	8	60	4,000	3,900	132	6	54	1.58
CGR20T	20	20.55	M6	10	60	4,000	3,900	134	7	53	2.48
CGR25T	23	24.25	M6	12	60	4,000	3,900	136	8	52	3.38
CGR30T	28	28.35	M8	15	80	4,000	3,920	178	9	71	5.10
CGR35T	34	31.85	M8	17	80	4,000	3,920	178	9	71	7.14
CGR45T	45	39.85	M12	24	105	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 $E_{1/2}$ 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.

12.5.4 Dimensions of the WE rail

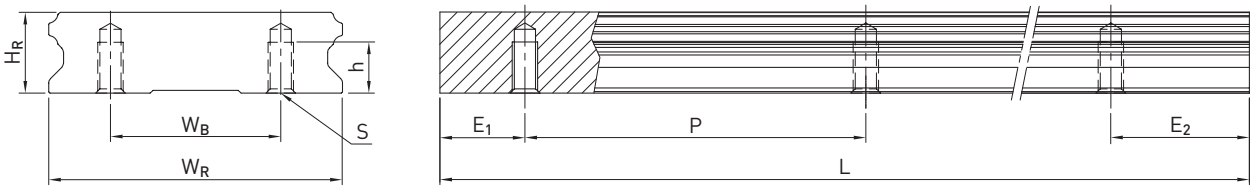
WER_R



Dimensions of rail WER_R

Series/ size	Assembly screw for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		W_R	W_B	H_R	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 × 16	37	22	11.0	7.5	5.3	4.5	50	4,000	3,950	112	6	44	3.0
WER27R	M4 × 20	42	24	15.0	7.5	5.3	4.5	60	4,000	3,900	132	6	54	4.7
WER35R	M6 × 25	69	40	19.0	11.0	9.0	7.0	80	4,000	3,920	176	8	72	9.7
WER50R	M8 × 30	90	60	24.0	14.0	12.0	9.0	80	4,000	3,920	178	9	71	14.6

WER_T



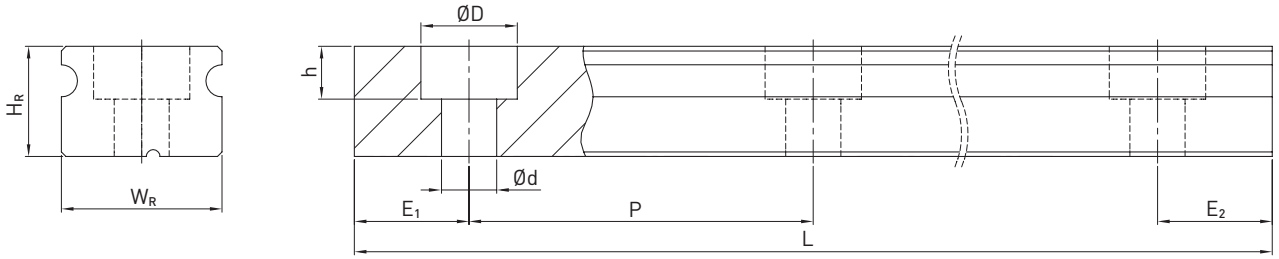
Dimensions of rail WER_T

Series/ size	Dimensions of the 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	W_B	H_R	S	h	P						
WER21T	37	22	11	M4	7.0	50	4,000	3,950	112	6	44	3.0
WER27T	42	24	15	M5	7.5	60	4,000	3,900	132	6	54	4.7
WER35T	69	40	19	M6	12.0	80	4,000	3,920	176	8	72	9.7

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.

12.5.5 Dimensions of the MG rails

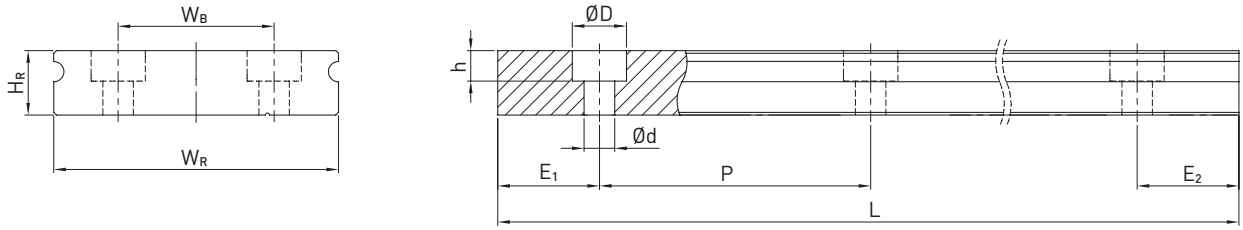
MGN_R



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						
MGNR05R	M2 × 8	5	3.6	3.6	0.8	2.4	15	250	225	38	4	11	0.15
MGNR07R	M2 × 8	7	4.8	4.2	2.3	2.4	15	600	585	40	5	12	0.22
MGNR09R	M3 × 10	9	6.5	6.0	3.5	3.5	20	1,200	1,180	50	5	15	0.38
MGNR12R	M3 × 10	12	8.0	6.0	4.5	3.5	25	2,000	1,975	60	5	20	0.65
MGNR15R	M3 × 12	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

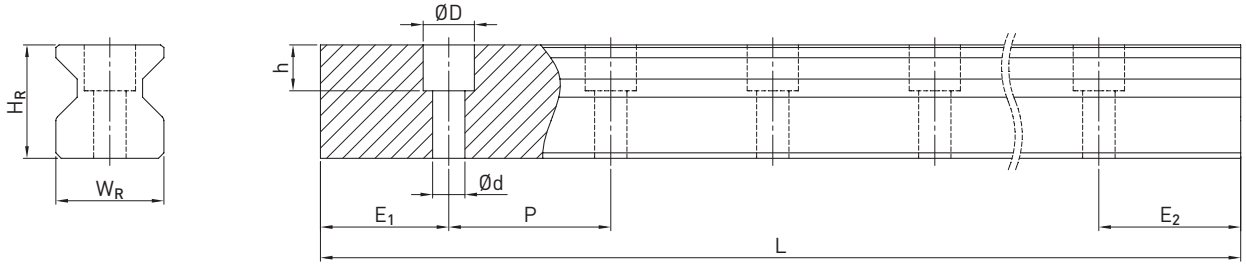
Series/ size	Assembly screw for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		W_R	H_R	W_B	D	h	d	P						
MGWR05R	M2.5 × 8	10	4.0	–	5.5	1.6	3.0	20	250	220	48	4	11	0.34
MGWR07R	M3 × 8	14	5.2	–	6.0	3.2	3.5	30	600	570	72	6	24	0.51
MGWR09R	M3 × 10	18	7.0	–	6.0	4.5	3.5	30	2,000	1,170	72	6	24	0.91
MGWR12R	M4 × 12	24	8.5	–	8.0	4.5	4.5	40	2,000	1,960	96	8	32	1.49
MGWR15R	M4 × 16	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.

12.5.6 Dimensions of the RG rails

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

RGR_R

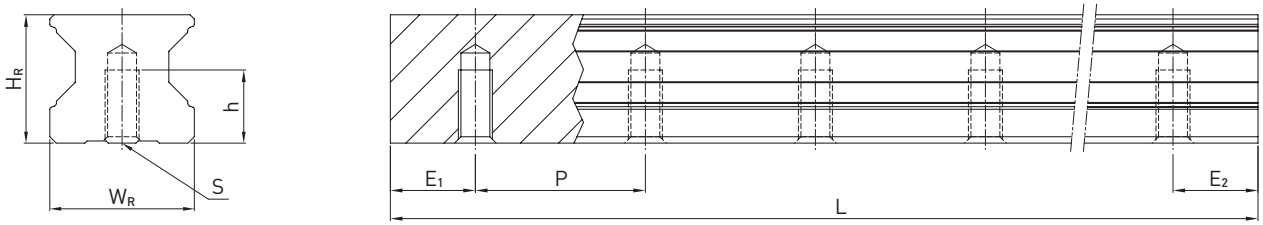


Dimensions of rail RGR_R

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 × 20	15	16.5	7.5	5.7	4.5	30.0	4,000	3,960.0	72	6	24.0	1.70
RGR20R	M5 × 25	20	21.0	9.5	8.5	6.0	30.0	4,000	3,960.0	74	7	23.0	2.66
RGR25R	M6 × 30	23	23.6	11.0	9.0	7.0	30.0	4,000	3,960.0	76	8	22.0	3.08
RGR30R	M8 × 35	28	28.0	14.0	12.0	9.0	40.0	4,000	3,920.0	98	9	31.0	4.41
RGR35R	M8 × 35	34	30.2	14.0	12.0	9.0	40.0	4,000	3,920.0	98	9	31.0	6.06
RGR45R	M12 × 45	45	38.0	20.0	17.0	14.0	52.5	4,000/5,600 [1]	3,937.5/5,437.5 [1]	129	12	40.5	9.97
RGR55R	M14 × 55	53	44.0	23.0	20.0	16.0	60.0	4,000/5,600 [1]	3,900.0/5,500 [1]	148	14	46.0	13.98
RGR65R	M16 × 65	63	53.0	26.0	22.0	18.0	75.0	4,000/5,600 [1]	3,900.0/5,500 [1]	180	15	60.0	20.22

[1] Optional version on request

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 [1]	30.0	75.0	4,000	3,900.0	180	15	60.0	21.24

[1] Deviating from DIN 645

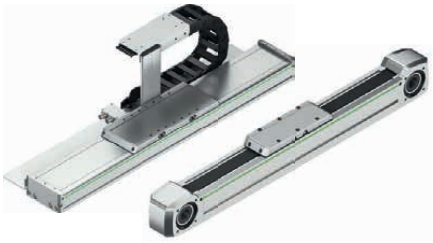
Note:
1. The tolerance for E is +0.5 to −1 mm for standard rails and 0 to −0.3 mm for joint connections.
2. If the $E_{1/2}$ dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the $E_{1/2}$ min.
3. The rails are shortened to the required length.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

Notes

We live motion.

Linear Guideways

Ballscrews



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