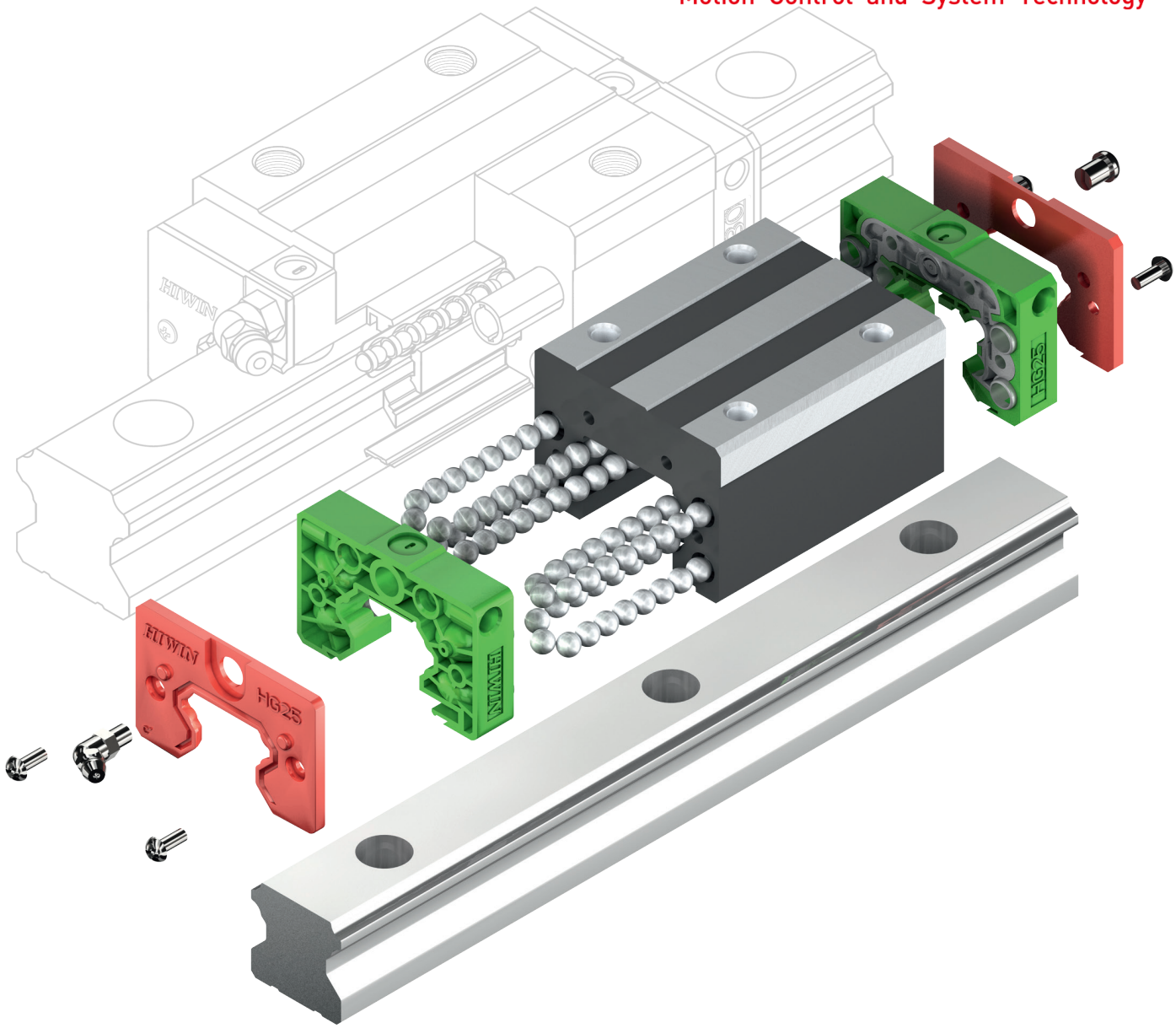
HIWIN®

Motion Control and System Technology



Linear Guideways

Assembly Instruction Manual

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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
01-0	January 2022	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.us.

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 Supplier's details

Table 1.3 **Supplier's details**

Address	HIWIN USA 12455 Jim Dhamer Drive Huntley, IL 60142 USA
Phone	(847) 827 2270
Fax	(847) 827 2291
E-mail	info@hiwin.com
Website	www.hiwin.us

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 component of a machine or automated system which guides a machine element along a straight path.
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

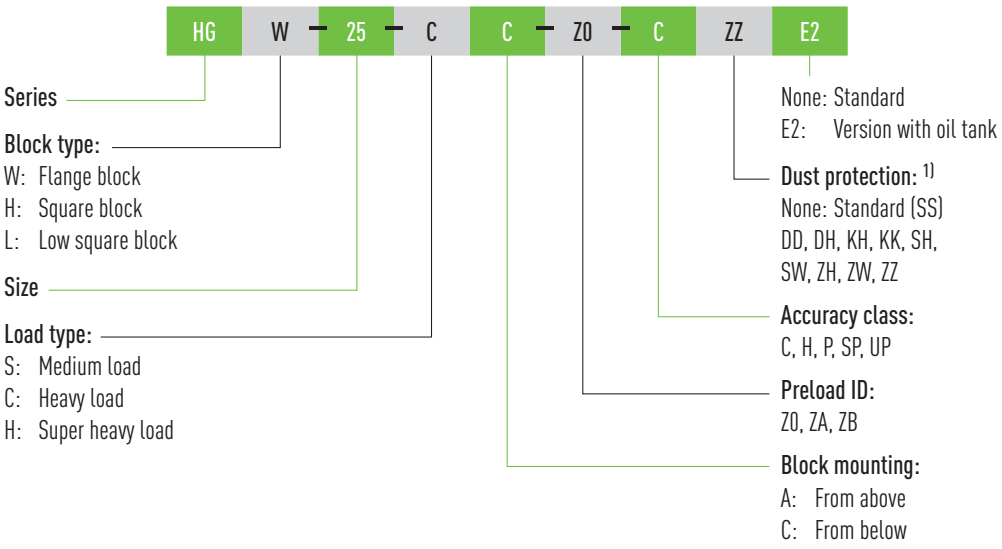
The linear guideways may only be assembled, integrated into higher-level systems, commissioned, operated and maintained by qualified personnel. Qualified personnel are those who:

- 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.

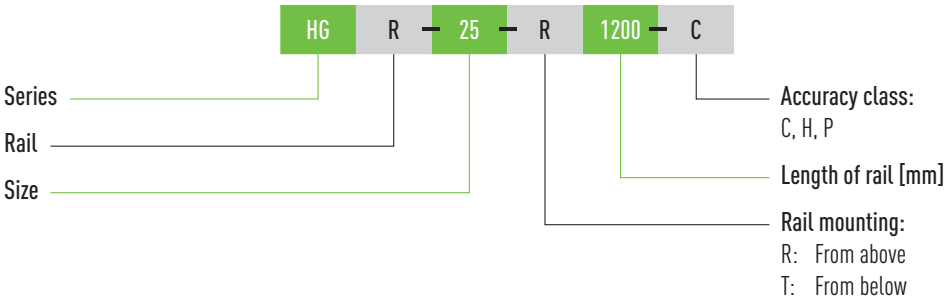
3. Product description

3.1 Order code of the linear guideways

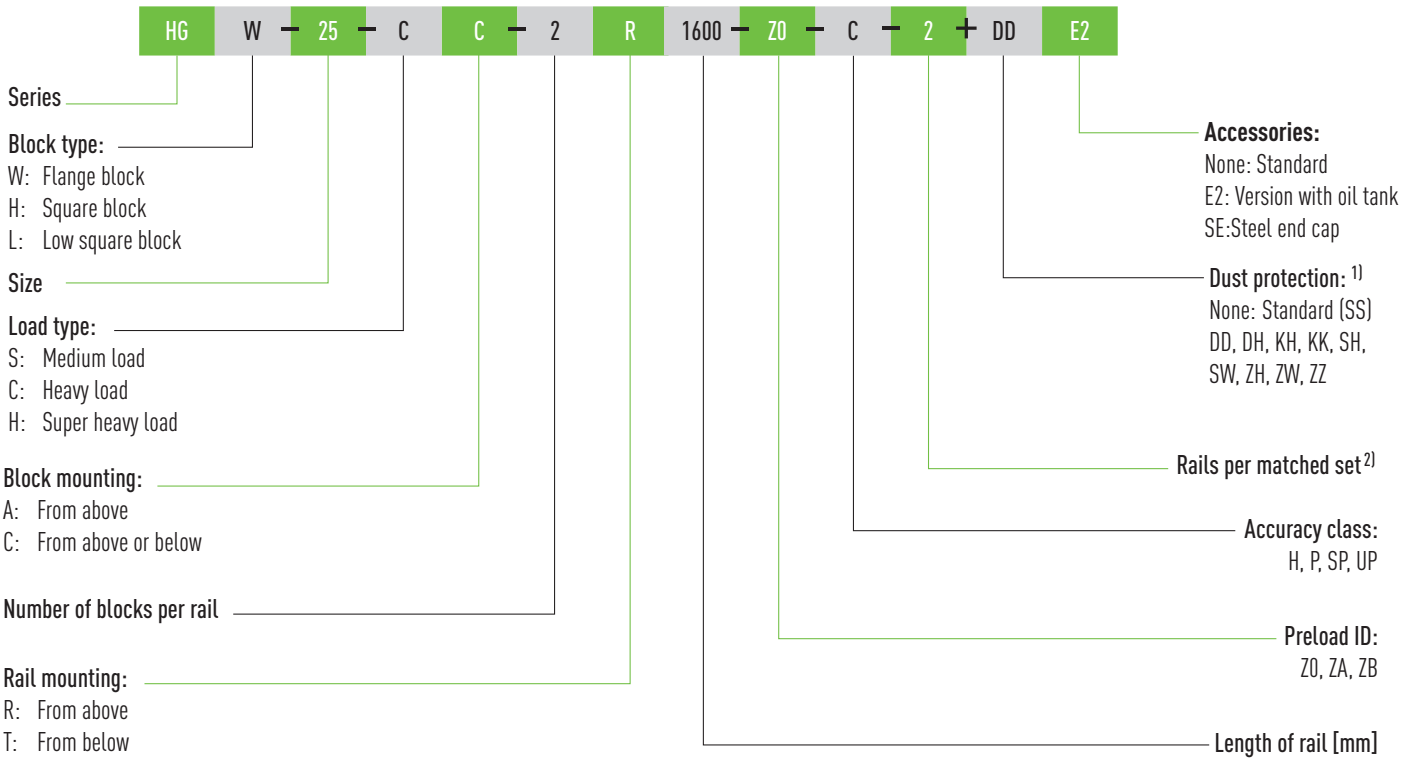
3.1.1 Order code for block (unmounted)



3.1.2 Order code for rail (unmounted)



3.1.3 Order code for linear guideway (fully assembled)



Note:
1) Dust proof availability varies by series and size.
2) Matched set not available for lower accuracy requirements. Contact HIWIN with application info if matched set is required.
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.

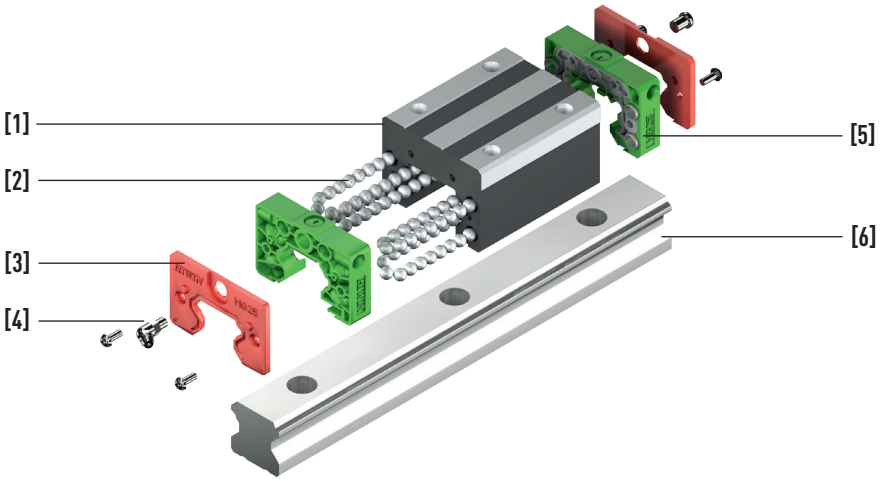


Fig. 3.1 **Exploded view of the design of a linear guideway**

Table 3.1 **Key for Fig. 3.1**

Pos.	Name	Pos.	Name
1	Basic unit	**4**	Grease nipple
2	Rolling element	**5**	Deflection system (End cap)
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, CRG and QR series and three for the MG series.

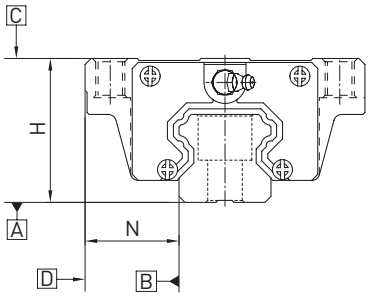


Fig. 3.2 **Tolerances of the HIWIN linear guideways**

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, CRG 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, CRG 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] Matched set tolerance
[2] Interchangable tolerance

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
02, 03, 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	+40 °F to +105 °F (+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 OSHA (Occupational Safety and Health Administration)
- 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 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 (typically a zip-tie or rubber band) 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.
- Avoid getting the profile rail dirty during installation. Chips and other debris 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 12.2.

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.

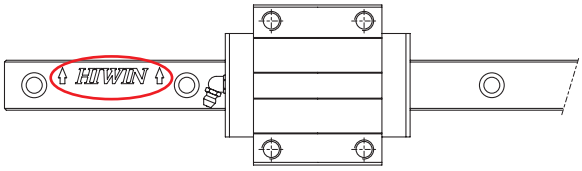


Fig. 5.1 **Identification of the reference side of a rail**

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.

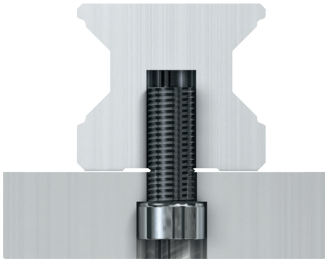


Fig. 5.2 **T-rail**

Fig. 5.3 **R-rail**

5.2.3 Cleaning the mounting surface

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

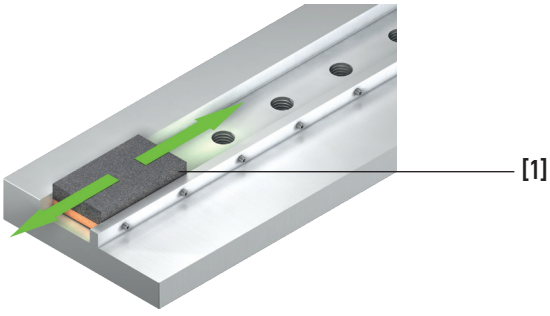


Fig. 5.4 **Cleaning the mounting surface**

5.2.4 Assembling the profile rail against a mounting edge

A. Aligning the profile rail.

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

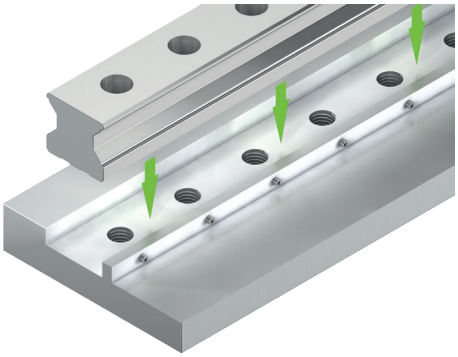


Fig. 5.5 **Aligning of the profile rail with the mounting edge**

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 push screws or clamps.

Tensioning the profile rail using a push screws:

- Tighten the push screws sequentially to press the profile rail firmly on to the machine's mounting edge as shown in Figure 5.6.
- Working in three steps, tighten the fixing screws on the profile rail using a torque wrench to the specified tightening torque.

NOTE

A list of recommended tightening torques can be found in Section 5.5.

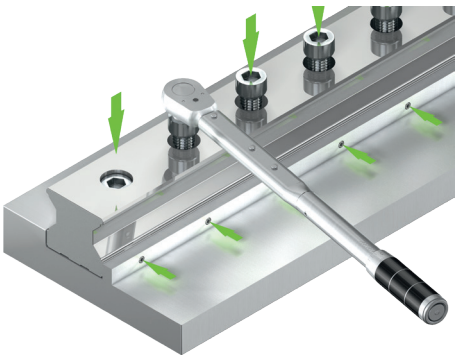


Fig. 5.6 **Tensioning using a push screws**

✓ The profile rail has now been assembled.

Tensioning the profile rail using clamp:

- Use the clamp to press the profile rail against the machine bed's mounting 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 wrench to the specified tightening torque.

A list of recommended tightening torques can be found in Section 5.5 on page 25. NOTE

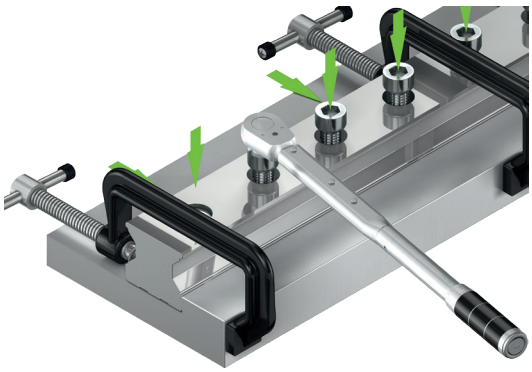


Fig. 5.7 **Tensioning using clamps**

✓ The profile rail has now been assembled.

5.2.4.1 Assembling the profile rail without contacting a mounting edge

- Place the reference rail on the mounting surface.
- Loosely attach the fixing screws.
- 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 as in Figure 5.8.

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 wrench to the specified tightening torque.

A list of recommended tightening torques can be found in Section 5.5 on page 25. NOTE

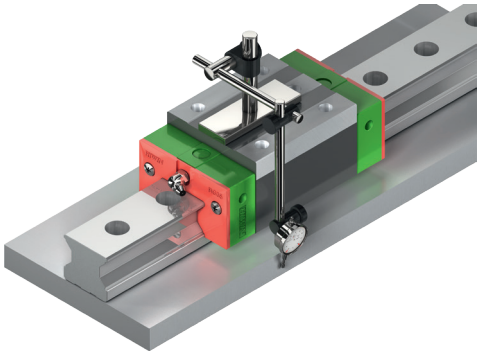


Fig. 5.8 **Block with mounted dial gauge**

✓ The profile rail has now been assembled.

5.2.5 Mounting the subsidiary rail

5.2.5.1 Requirements

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

5.2.5.2 Aligning the subsidiary rail with a reference rail using a dial gauge

▶ Connect the base of the dial gauge to the block mounted on the reference rail.
▶ Align the dial gauge with the reference edge of the subsidiary rail..

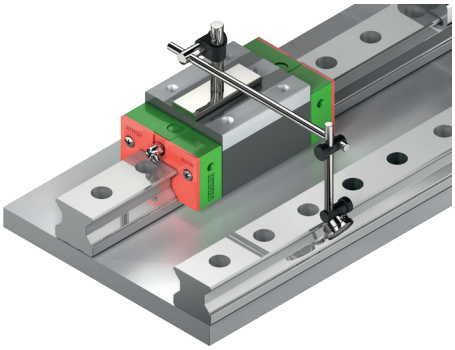


Fig. 5.9 **Aligning the subsidiary rail to the reference rail**

▶ Move the block gradually along the reference rail, using the dial gauge to align the subsidiary rail.
▶ Tighten the fixing screws of the subsidiary rail sequentially, working from one end of the guideway to the other.
▶ Tighten the fixing screws using a torque wrench to the specified tightening torque.

NOTE

A list of recommended tightening torques can be found in Section 5.5 on page 25.

✓ The subsidiary rail is mounted and aligned parallel with the reference rail.

5.2.5.3 Aligning the subsidiary 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 subsidiary rail to be aligned.

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

▶ Gradually move the plate over the rails.

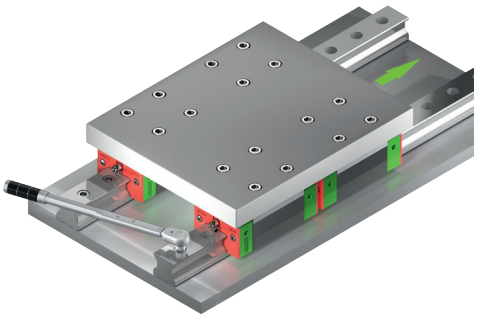


Fig. 5.10 **Plate mounted on the block**

- Tighten the fixing screws of the subsidiary rail sequentially, working from one end of the guideway to the other.
- Tighten the fixing screws using a torque wrench to the specified tightening torque.

A list of recommended tightening torques can be found in Section 5.5 on page 25.

NOTE

✓ The subsidiary 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 joint ends of each section are identified in a consecutive numerical order, so that 1 pairs with 2, 3 pairs with 4, etc.

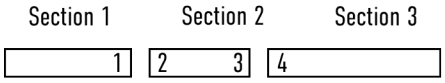


Fig. 5.11 **Single jointed rails**

In the case of multiple jointed rails, each rail is assigned a letter, and each jointed end bears the letter and number.

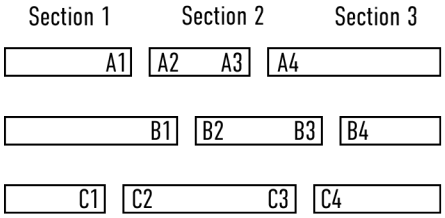


Fig. 5.12 **Multiple jointed rails**

For some rails, including matched sets and higher accuracies assemblies, the jointed rail will be provided directly from the factory in Taiwan. Therefore, the marking convention may differ. Please contact Hiwin if clarification is needed.

5.3 Protection of the mounting holes

To protect the block and end seals from contamination, an appropriate rail cap or cover strip must be applied over the mounting holes. The type of cover depends on the environmental and operating conditions: plastic, steel or brass rail caps, or a cover strip, may be used. Plastic rail caps are generally recommended when using coated rails. Plastic rail caps are mounted as described in Section 5.3.1.2.

5.3.1 Bolt caps

ATTENTION!

Damage caused by rail caps that have been incorrectly pressed in!

Pressing in the rail caps can result in a burr or result in the rail 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 rail caps that have been pressed in too deep and press in new rail 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 rail caps (plastic, reinforced plastic, brass and steel)

- Place the rail cap centrally on the counterbore.
- Ensure parallelism between the top of the rail and the top of the rail cap.

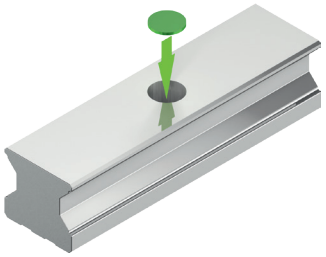


Fig. 5.13 **Positioning of the plastic rail cap**

- Place a wood or plastic block over the rail cap. The block should be a rigid and non-marking material.
- With a plastic hammer, hit the block directly over the rail cap to press it in..
- If the cap is not yet fully pressed in, repeat the procedure until the cap is flush with the rail top.
- Ensure the top surface is smooth and free of burrs. If needed, run a whetstone across the top surface to remove burrs.

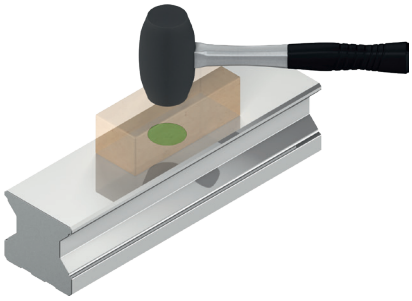


Fig. 5.14 **Pressing in of the plastic rail cap with the help of a press-in block**

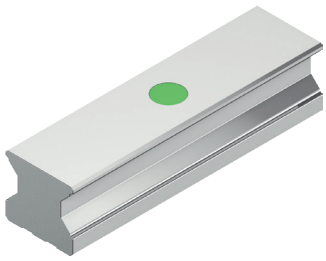


Fig. 5.15 **Fully assembled plastic rail cap**

- ✓ The plastic rail cap has been mounted.

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. 5.23 !
- Replace damaged cover strips immediately!

In the case of multi-part rails, the cover strip is delivered in a separate carton as shown in Fig. 5.25. The protective caps are included.

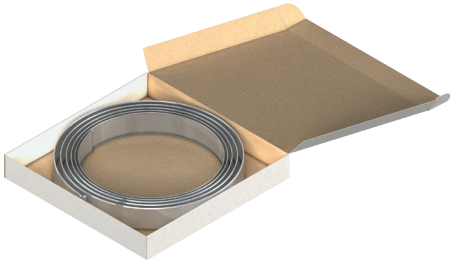


Fig. 5.16 **Cover strip in transport carton**

5.3.1.3 Mounting the cover strip

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.

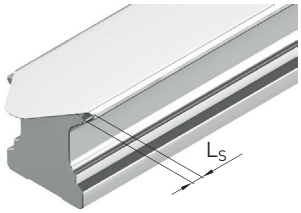


Fig. 5.17 **Cover strip with finished ends and distance L_S**

Table 5.1 **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. 5.18 **Mount cover strip**

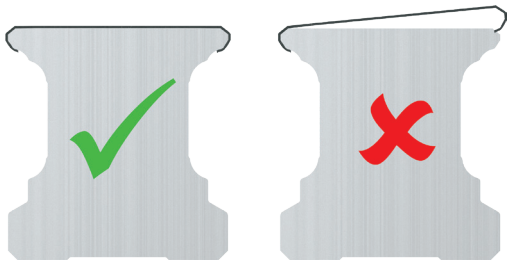


Fig. 5.19 **Correctly and incorrectly installed cover strip**

A. Bending the cover strip ends

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

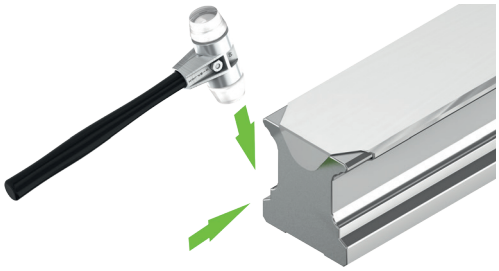


Fig. 5.20 **Bending the cover strip ends**

✓ The cover strip has now been mounted.

5.3.3 Protective caps

To prevent the cover strip from lifting up, ensure that it is secured at both ends of the profile rail.

5.3.3.1 Securing the cover strip using steel clamps

- Ensure the profile rail has been mounted, the cover strip has been mounted and the block(s) have been mounted properly.
- Place plastic or steel clamps **[2]** on both sides of the profile rail.
- If the steel clamps, screw in the allen set screw **[1]** until the steel clamps are fixed securely.

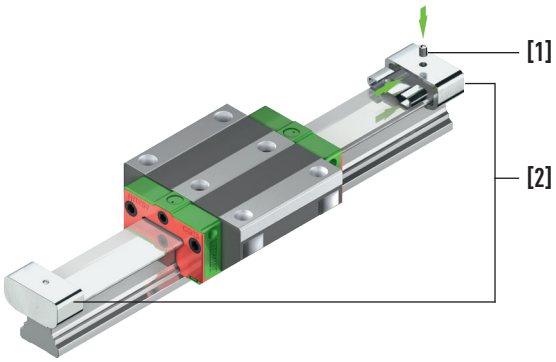


Fig. 5.21 **Placing the steel clamps on the profile rail**

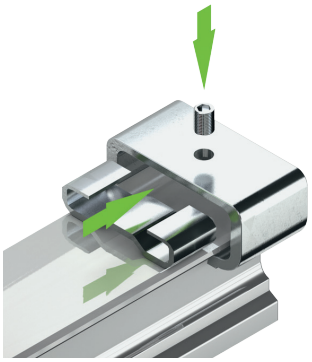


Fig. 5.22 **Mounting the steel clamp**

✓ The cover strip has been secured.

5.4 Blocks

ATTENTION!

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

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.

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

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

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 rail 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. NOTE

- 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.

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

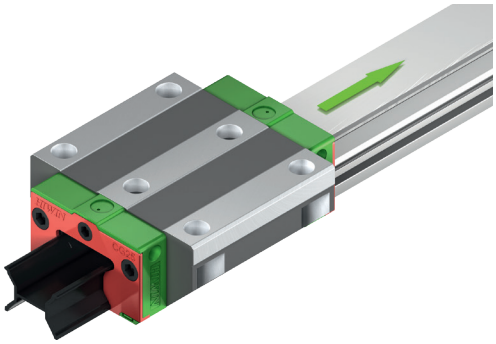


Fig. 5.23 **Pushing the block on to the profile rail.**

✓ The mounting insert 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. 5.45). Using screws that are too long can damage the rolling elements.
▶ Do not exceed the maximum screw lengths specified in Table 5.3!

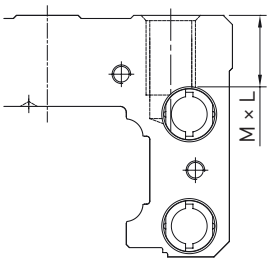


Fig. 5.24 **Depiction of bore hole and recirculation channel**

Table 5.2 **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.

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.

5.5 Tightening torques for fixing screws

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

Table 5.3 **Tightening torques of the fixing screws according to ISO 4762-12.9**

Screw size	Torque [Nm]	Screw size	Torque [Nm]
M2	0.65	**M8**	40
M3	2.3	**M10**	70
M4	5.0	**M12**	100
M5	10.0	**M14**	170
M6	18.0	**M16**	250

Recommended tightening torques of 12.9 DIN EN ISO 4762
Fixing screws according to VDI 2230 for μK = μG = 0.125

NOTE

The tightening torque will depend on screw strength and mounting surface material.

NOTE

In general mounting holes should be threaded to at least 2x the thread diameter.

NOTE

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!

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

NOTE

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 mineral spirits 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!

8.2.1 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.

8.2.2 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

NOTE

Not all blocks have a lubrication connection.

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 plug screw. This is the HIWIN standard configuration.

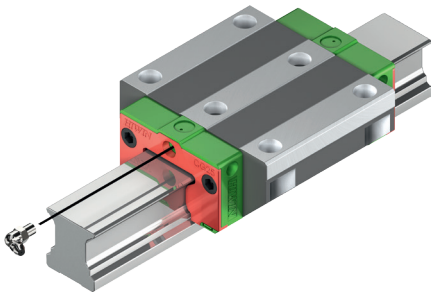


Fig. 8.1 **Lubrication connection on the front side**

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!

Lubricant connections on the side of the block can be tapped to accomodate fittings. For side lubrication connection, please contact HIWIN.

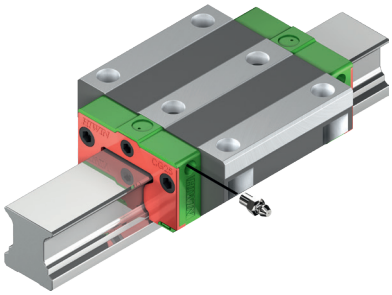


Fig. 8.2 **Lubrication connection on the side**

8.3.3 Lubrication connection on the top

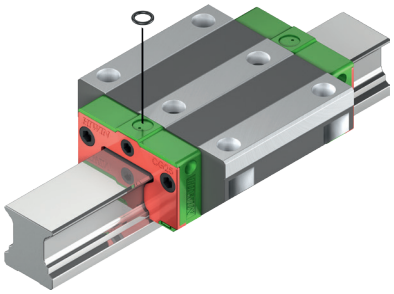


Fig. 8.3 **Lubrication connection on the top**

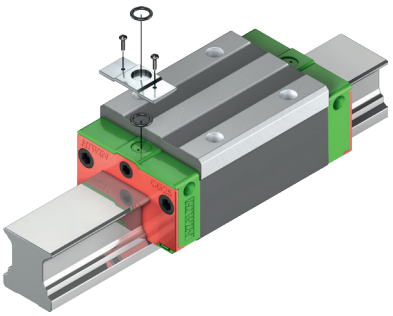


Fig. 8.4 **Lubrication connection on the top (HGH, CGH, RGH), see Section 8.3.3.1**

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 require top lubrication, please contact HIWIN.

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

NOTE

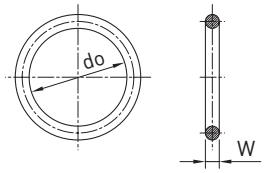


Fig. 8.5 **O-ring to cover the lubrication connection on the top**

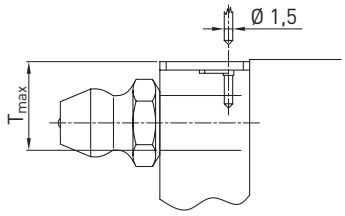


Fig. 8.6 **Maximum piercing depth T_{max}**

Table 8.1 **O-ring specifications for lubrication connection on the top**

Series/Size	O-ring	
	do [mm]	W [mm]
HG/QH_15	2.5 ± 0.15	1.5 ± 0.15
HG/QH_20	4.5 ± 0.15	1.5 ± 0.15
HG/QH_25	4.5 ± 0.15	1.5 ± 0.15
HG/QH_30	4.5 ± 0.15	1.5 ± 0.15
HG/QH_35	4.5 ± 0.15	1.5 ± 0.15
HG/QH_45	4.5 ± 0.15	1.5 ± 0.15
HG_55	4.5 ± 0.15	1.5 ± 0.15
HG_65	4.5 ± 0.15	1.5 ± 0.15
EG/QE_15	2.5 ± 0.15	1.5 ± 0.15
EG/QE_20	4.5 ± 0.15	1.5 ± 0.15
EG/QE_25	4.5 ± 0.15	1.5 ± 0.15
EG/QE_30	4.5 ± 0.15	1.5 ± 0.15
EG/QE_35	4.5 ± 0.15	1.5 ± 0.15
CG_15	2.5 ± 0.15	1.5 ± 0.15
CG_20	4.5 ± 0.15	1.5 ± 0.15
CG_25	4.5 ± 0.15	1.5 ± 0.15
CG_30	4.5 ± 0.15	1.5 ± 0.15
CG_35	4.5 ± 0.15	1.5 ± 0.15
CG_45	4.5 ± 0.15	1.5 ± 0.15
WE_21	2.5 ± 0.15	1.5 ± 0.15
WE_27	4.5 ± 0.15	1.5 ± 0.15
WE/QW_35	4.5 ± 0.15	1.5 ± 0.15
QW_21	7.5 ± 0.15	1.5 ± 0.15
QW_21	7.5 ± 0.15	1.5 ± 0.15
RG_15	2.5 ± 0.15	1.5 ± 0.15
RG_20	2.5 ± 0.15	1.5 ± 0.15
RG/QR_25	7.5 ± 0.15	1.5 ± 0.15
RG/QR_30	7.5 ± 0.15	1.5 ± 0.15
RG/QR_35	7.5 ± 0.15	1.5 ± 0.15
RG/QR_45	7.5 ± 0.15	1.5 ± 0.15
RG_55	7.5 ± 0.15	1.5 ± 0.15
RG_65	7.5 ± 0.15	1.5 ± 0.15

NOTE

It may be necessary to use a spacer (HIWIN lubrication adapter) to mount the o-ring at the correct height..

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_15, HG_25, HG_30, HG_35, HG_45, HG_55
- RG_15, RG_20, RG_25, RG_30, RG_35, RG_45, RG_55
- *[1]CG_15, *[1]CG_25, CG_30, CG_35, *[1]CG_45

***[1] Contact HIWIN for availability.**

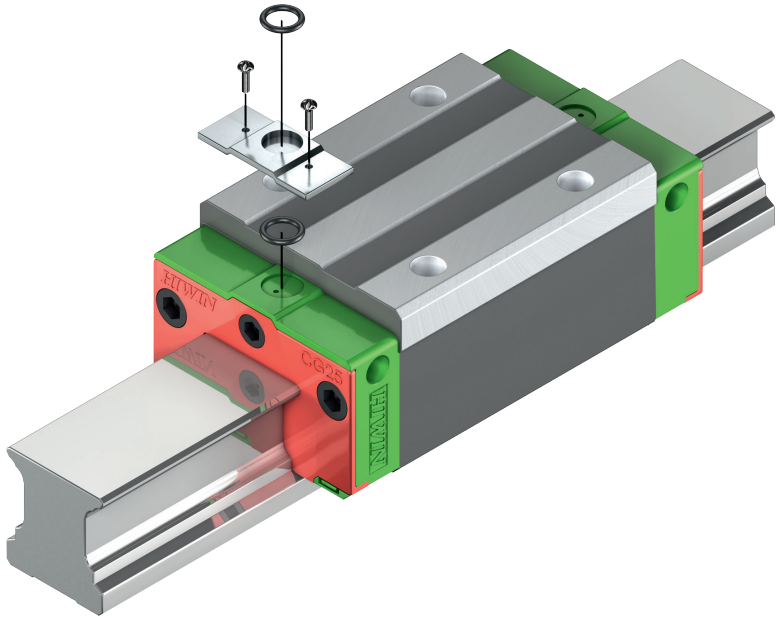


Fig. 8.7 **Design of lubrication adapter**

8.3.4 Grease nipple

NOTE

Below are a few standard grease nipples. Please note that series, size and dust protection affect the type of nipple and length of thread.

Fig. 8.8 **Grease nipple M6 x 0.75 P, angled**
Part No. 34320001 or 3432000E

Fig. 8.9 **Grease nipple PT 1/8, angled**
Part No. 34320003

Fig. 8.10 **Grease nipple M6 x 0.75 P, straight**
Part No. 3431003 or 34310008

Fig. 8.11 **Grease nipple PT 1/8, straight**
Part No. 3431000B

Fig. 8.12 **Grease nipple M3 x 0.5 P, straight**
Part No. 34310010

Fig. 8.13 **Grease nipple M4 x 0.7 P, straight**
Part No. 34310002

NOTE

Don't see what you're looking for? Additonal grease nipples are available and vary for each linear guideway series. Please contact Hiwin for more information.

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 ZW 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

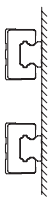
For grease lubrication, we recommend lubricating greases for rolling bearings and friction bearings with mineral oil as the base oil and thickeners specified by DIN 51825 (K1K, K2K). In heavy-duty applications, we recommend using EP additives (KP1K, KP2K), NLGI class 1 or 2. Using greases of other consistency 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. With oil lubrication, contact HIWIN, as there may be insufficient lubrication depending on the installation position.

8.7 HIWIN lubricants

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!

Table 8.2 **Overview HIWIN greases**

Grease type	Application	Number		
		Cartridge 70 g	Cartridge 400 g	Can 1 kg
				
G01	Heavy-duty applications	G-01-70g	G-01-400g	G-01-1000g
G02	Clean room applications	G-02-70g	G-02-400g	G-02-1000g
G03	Clean room applications at high speeds	G-03-70g	G-03-400g	G-03-1000g
G04	Applications with high speeds	G-04-70g	G-04-400g	G-04-1000g
G05	Standard grease	G-05-70g	G-05-400g	G-05-1000g
G06	Short stroke and high frequencies	G-06-70g	G-06-400g	G-06-1000g
G07	Low temperatures	G-07-70g	G-07-400g	G-07-1000g

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.

8.7.4.1 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

Short stroke and high frequencies
Load: Max. 50% dynamic load rating
Temperature range: –10 °C to +80 °C
Acceleration: 15–30 m/s^2

Low temperatures
Load: Max. 50% dynamic load rating
Temperature range: –50 °C to 0 °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

8.8 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 8.3 **Miscibility of HIWIN greases**

	G01	G02	G03	G04	G05	G06	G07
G01	■	■	■	●	●	●	●
G02	■	■	■	■	■	■	■
G03	■	■	■	■	■	■	■
G04	●	■	■	■	■	■	■
G05	●	■	■	■	■	■	■
G06	●	■	■	■	■	■	■
G07	●	■	■	■	■	■	■

■ 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.

Table 8.4 **Compatibility of basically lubricated products with HIWIN greases**

	G01	G02	G03	G04	G05	G06	G07
QH, QE, QW, QR	●	■	■	■	■	■	■

■ miscible
● partly miscible

NOTE

Q series come with basic lubrication, but need to be greased before service. Please contact Hiwin for more information.

8.9 Grease guns and lubrication adapters

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

Fig. 8.14 **A1**

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

Fig. 8.15 **A2**

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

Fig. 8.16 **A3**

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

Fig. 8.17 **A4**

A5: Tip mouthpiece with lubrication adapter

Fig. 8.18 **A5**

A6: Angled tip mouthpiece with lubrication adapter

Fig. 8.19 **A6**

Set of lubrication adapter and nozzles

Fig. 8.20 **Lubrication adapter and nozzles A3, A4, A5, A6**

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

Fig. 8.21 **GN-400C**

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

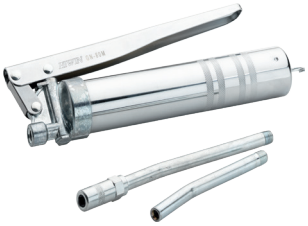


Fig. 8.22 **GN-80M**

Table 8.5 **Overview HIWIN grease guns and accessories**

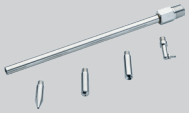
Item no.	Content			Direct filling	Cartridge	Grease quantity per stroke
	GN-80M (Fig. 8.23) 	**GN-400C (Fig. 8.22)** 	**Set of lubrication adapter and nozzles (Fig. 8.21)** 			
20-000352	■	–	–	■	70 g	0.5–0.6 cm^3
20-000332	■	–	■	■	70 g	0.5–0.6 cm^3
20-000353	–	■	–	■	400 g	0.8–0.9 cm^3
20-000333	–	■	■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

Table 8.6 **Overview grease nipples and recommended adapter for grease gun**

	Grease nipple	Part No.	Recommended adapter for grease gun
	Ball type grease nipple		
	M3 × 0.5 P	34310010	A2, A3 [1]
	M4 × 0.7 P	34310002	A2, A3 [1]
	Straight grease nipple		
	M6 × 0.75 P	3431003 or 34310008	A1, A2 [1]
	1/8 PT	3431000B	A1, A2 [1]
	Angled grease nipple		
	Grease nipple M6 x 0.75 P	34320001 or 3432000E	A1, A2 [1]
	Grease nipple PT 1/8	34320003	A1, A2 [1]

[1] Optional for limited installation space

Don't see what you're looking for? Additonal grease nipples are available and vary for each linear guideway series. Please contact Hiwin for more information.

NOTE

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 according to Section 8.13.

Table 8.7 **Standard lubrication condition for blocks mounted on rails**

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

Table 8.8 **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

NOTE

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.

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!

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.

NOTE

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

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.

Additional lubrication connections can be requested as an "E" special instruction in the part number. For more information or questions, please contact HIWIN

NOTE

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

8.13.1.1 Initial lubrication – MG series

A lubricating nipple for grease lubrication is available for size 15 in the case of miniature type MG. For sizes 2, 3, 5, 7, 9 and 12, grease can be applied using a syringe or grease gun with an appropriate nozzle. Alternately, a suitable spray grease can be applied to the rails as follows:

- 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.

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

8.13 Lubricant quantities

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

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

8.13.1 Lubricant quantities for grease lubrication

Table 8.9 **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 8.10 **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

NOTE

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

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 8.11 **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

NOTE

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.

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.

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

NOTE

If the long-term lubrication unit is empty and will not be refilled or replaced, the "Grease lubrication" relubrication interval applies.

NOTE

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.

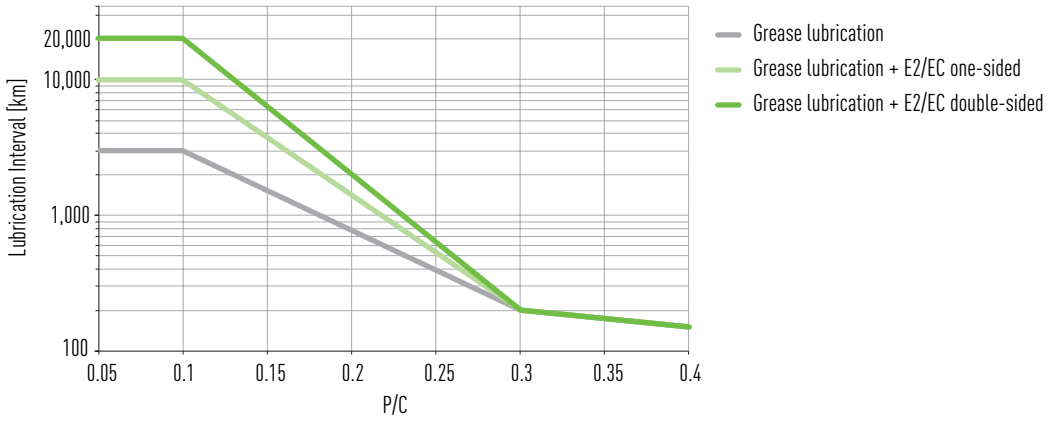


Fig. 8.23 **Relubrication intervals with grease lubrication, one-sided and two-sided long-term lubrication unit (E2/EC) for HG, EG, CG, WE.**
The long-term lubrication unit (E2/EC) is not available for the WE series.

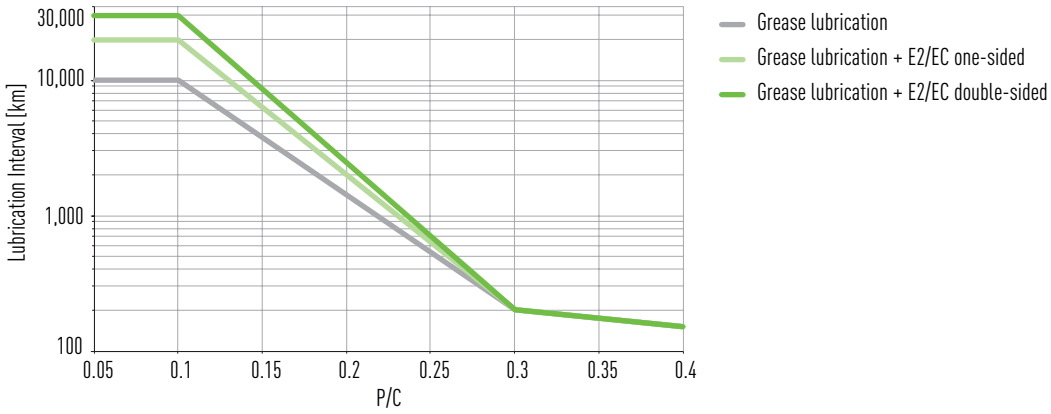


Fig. 8.24 **Relubrication intervals with grease lubrication, one-sided and two-sided long-term lubrication unit (E2/EC) for QH, QE and QW.**
The long-term lubrication unit (E2/EC) is not available for the QW series.

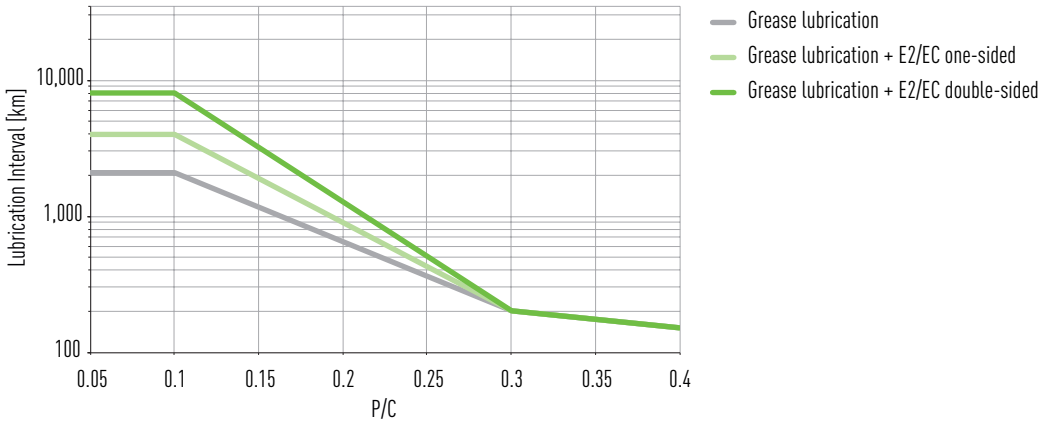


Fig. 8.25 **Relubrication intervals with grease lubrication, one-sided and two-sided long-term lubrication unit (E2/EC) for RG.**

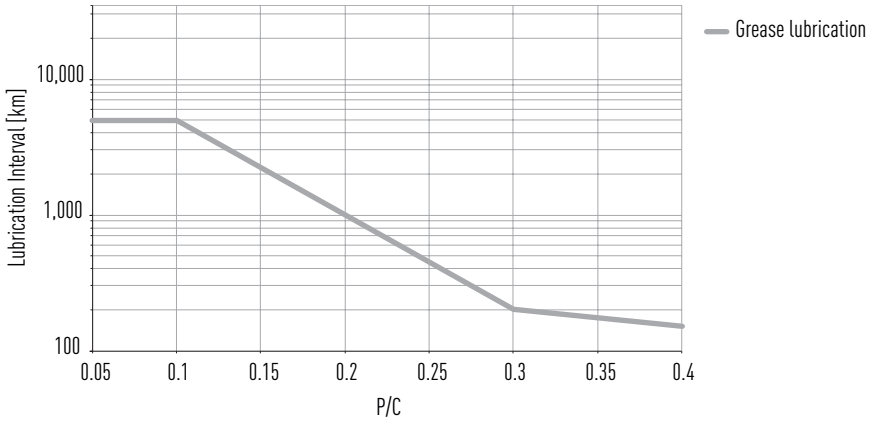


Fig. 8.26 **Relubrication intervals with grease lubrication, one-sided and two-sided long-term lubrication unit (E2/EC) for QR.**
The long-term lubrication unit (E2/EC) is not available for the QR series.

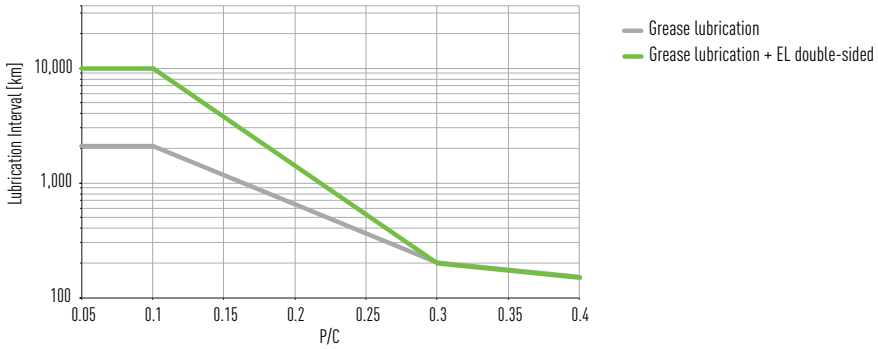


Fig. 8.27 **Relubrication intervals with grease lubrication, one-sided and two-sided long-term lubrication unit (E2/EC/EL) for MG.**
The long-term lubrication unit (EL) for MG cannot be refilled. ISOFLEX TOPAS AK 50 is recommended for lubrication.

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 HIWIN support.
	The block has been removed or partially removed from the rail without using the appropriate insert.	

11. Accessories

11.1 Self-lubricating block

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

The long-term lubrication unit can be mounted on one or both sides of the block. The self-lubricating E2 block consists of a lubricating unit **[5]** located between the end caps **[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.

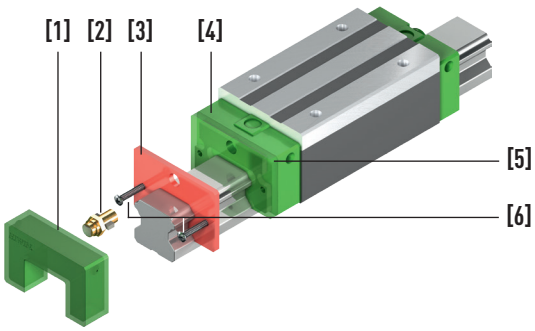


Fig. 11.1 **Exploded view of self-lubricating E2 block for the HG, EG and RG series**

Table 11.1 **Key for Fig. 11.1**

Pos.	Name
1	Oil tank
2	Connection piece
3	End seal
4	End cap
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]**.

NOTE

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

- 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 Replacement intervals

The relubrication intervals or running performances can be found in chapter 8.14.1. 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

The long-term lubrication unit (EL) for MG cannot be refilled. NOTE

Table 11.2 **Oil quantities in the oil tank**

Model	Oil quantity [cm³]
HG15E2/QH15E2	1.6
HG20E2/QH20E2	3.9
HG25E2/QH25E2	5.1
HG30E2/QH30E2	7.8
HG35E2/QH35E2	9.8
HG45E2/QH45E2	18.5
HG55E2	25.9
HG65E2	50.8
EG15E2/QE15E2	1.7
EG20E2/QE20E2	2.9
EG25E2/QE25E2	4.8
EG30E2/QE30E2	8.9
EG35E2/QE35E2	10.3
CG15EC	1.2
CG20EC	1.8
CG25EC	1.8
RG25E2	5.0
RG30E2	7.5
RG35E2	10.7
RG45E2	18.5
RG55E2	26.5
RG65E2	50.5
MGN07EL	0,05
MGN09EL	0,10
MGN09EL	0,19
MGW09EL	0,29
MGW12EL	0,33

E2/EL:
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.

EC:
Standard oil:
Total Carter SH 680
Synthetic oil (PAO)
Viscosity class: ISO VG 680

11.2 Additional assembly and disassembly tool

Table 11.3 **Brass Bolt Cap**

Series/Size	Bolt Size	Diameter (mm)		Series/Size	Bolt Size	Diameter (mm)	
		D	H			D	H
C3-C	M3	6.15	1.2	C8-C	M8	14.15	3.5
C4-C	M4	7.65	1.2	C12-C	M12	20.15	4
C5-C	M5	9.65	2.5	C14-C	M14	23.15	4
C6-C	M6	11.15	2.8	C16-C	M16	26.15	4

Table 11.4 **Reinforced Plastic Bolt Cap**

Series/Size	Bolt Size	Diameter (mm)		Rail Size				
		D	H	HGR	EGR	WER	MGNR	RGR
RC3	M3	6.15	1.3	–	15	–	12,15	–
RC4	M4	7.65	1.1	15	15U	17, 21, 27	–	15
RC5	M5	9.8	3	20	20	–	–	20
RC6	M6	11.4	2.8	25	25,30	35	–	25
RC8	M8	14.6	3.5	30,35	35,30U	–	–	30,35
RC12	M12	20.5	4	45	–	–	–	45
RC14	M14	23.5	5	55	–	–	–	55
RC16	M16	26.6	5	65	–	–	–	65

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. Ensure the mounting material can handle the specified torque.

Table 12.2 **Tightening torques of the fixing screws accodring to ISO 4762-12.9**

Screw Size	Torque (Nm)	Screw Size	Torque (Nm)
M2	**0.65**	**M8**	**40**
M3	**2.3**	**M10**	**70**
M4	**5.0**	**M12**	**100**
M5	**10.0**	**M14**	**170**
M6	**18.0**	**M16**	**250**

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.

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 inserts.
In order to acheive a high rigidity of the linear guidewar even under high loads, we generally recommend using all available threaded holes.

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)

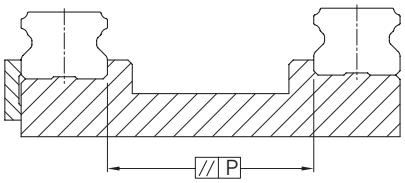


Fig. 12.1 **Parallelism of the reference surface (P)**

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 CRG	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	02	2	2	2
	03	2	2	2
	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)

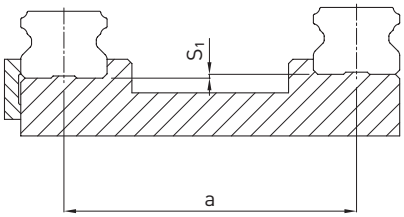


Fig. 12.2 **Tolerance for the height of the reference surface (S_1)**

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)

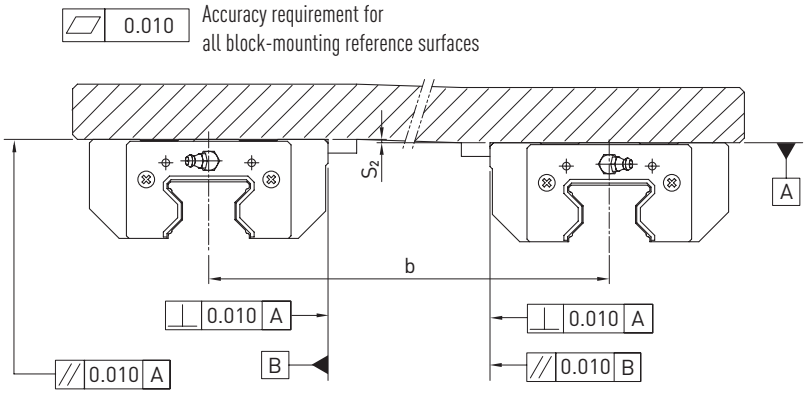


Fig. 12.3 **Max. height tolerance S_2**

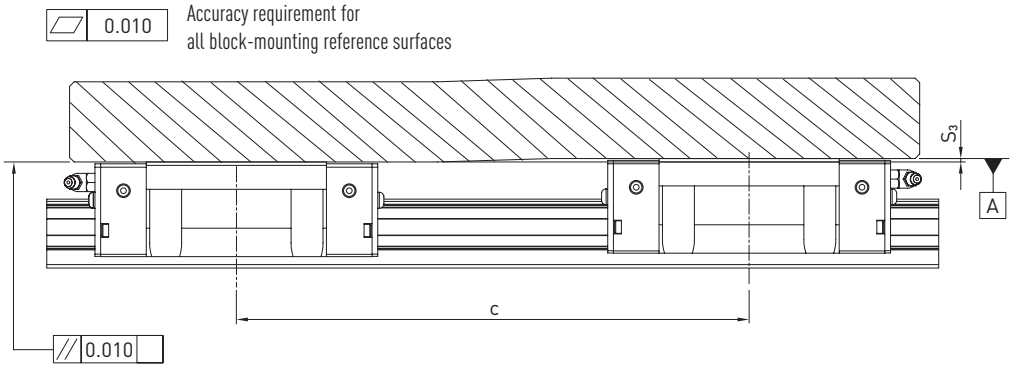


Fig. 12.4 **Max. height tolerance S_3**

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

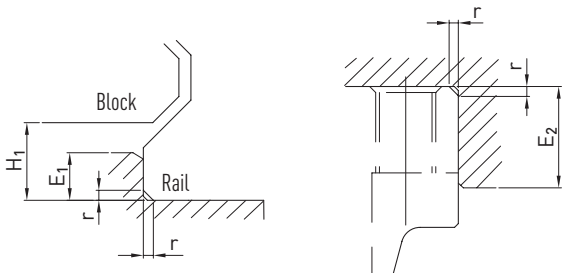


Fig. 12.5 **Shoulder heights and fillets – HG/QH series**

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

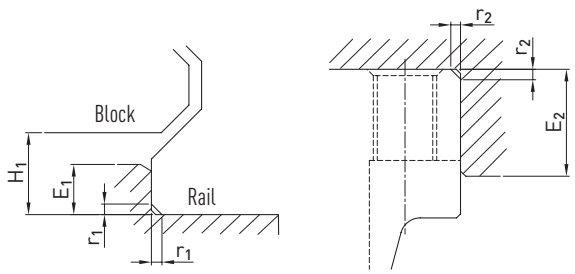


Fig. 12.6 **Shoulder heights and fillets – EG/QE series**

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

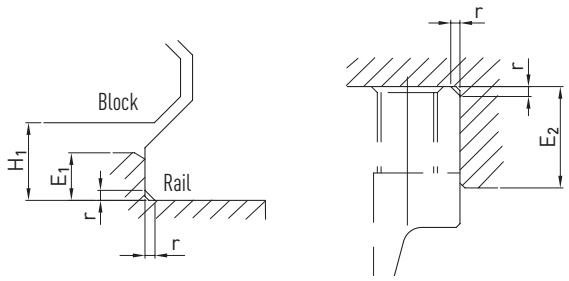


Fig. 12.7 **Shoulder heights and fillets – CG series**

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

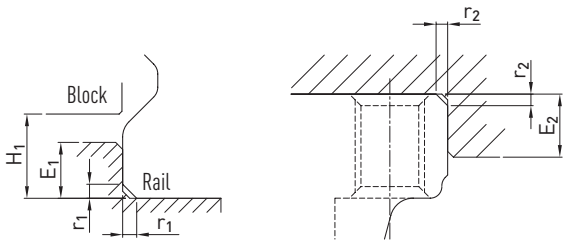


Fig. 12.8 **Shoulder heights and fillets – WE/QW series**

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

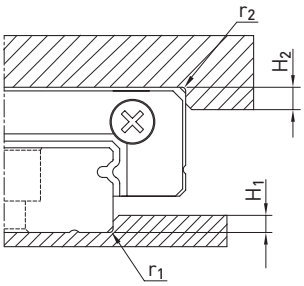


Fig. 12.9 **Shoulder heights and fillets – MG series**

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
MGN02	0.1	0.2	0.5	1.5
MGN03	0.1	0.2	0.6	1.5
MGN05	0.1	0.2	1.2	2.0
MGN07	0.2	0.2	1.2	3.0
MGN09	0.2	0.3	1.7	3.0
MGN12	0.3	0.4	1.7	4.0
MGN15	0.5	0.5	2.5	5.0
MGW05	0.1	0.2	1.2	2.0
MGW07	0.2	0.2	1.7	3.0
MGW09	0.3	0.3	2.5	3.0
MGW12	0.4	0.4	3.0	4.0
MGW15	0.4	0.8	3.0	5.0

Unit: mm

12.3.5.6 RG and QR series

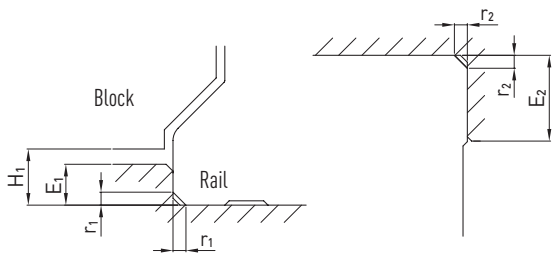


Fig. 12.10 **Shoulder heights and fillets – RG/QR series**

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

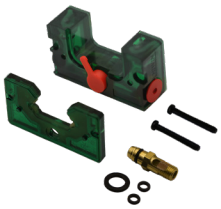
Unit: mm

Notes

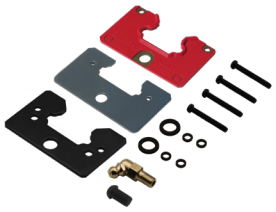
HIWIN®
Motion Control and System Technology

Linear Guideway
Assembly Instruction Manual

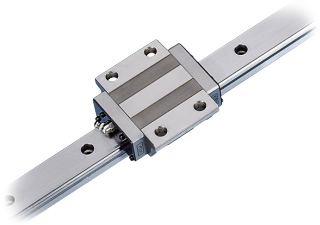
HIWIN Linear Guideway Accessories



Self-Lubrication Attachment



Dust-Proof Attachment



Metal End Cap

Reinforced Cap

HIWIN Grease, Grease Guns & Accessories

Grease Gun

Grease
(70g, 400g, 1kg)

Grease Gun
Nozzle Kit

This assembly instruction manual provides a comprehensive overview of linear guideways, their components, and step-by-step instructions for their assembly. Linear guideways are essential components in various industrial and mechanical applications, ensuring precise linear motion and reducing friction.

For more information on HIWIN Linear Guideways, check out our Linear Guideway Catalog.

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