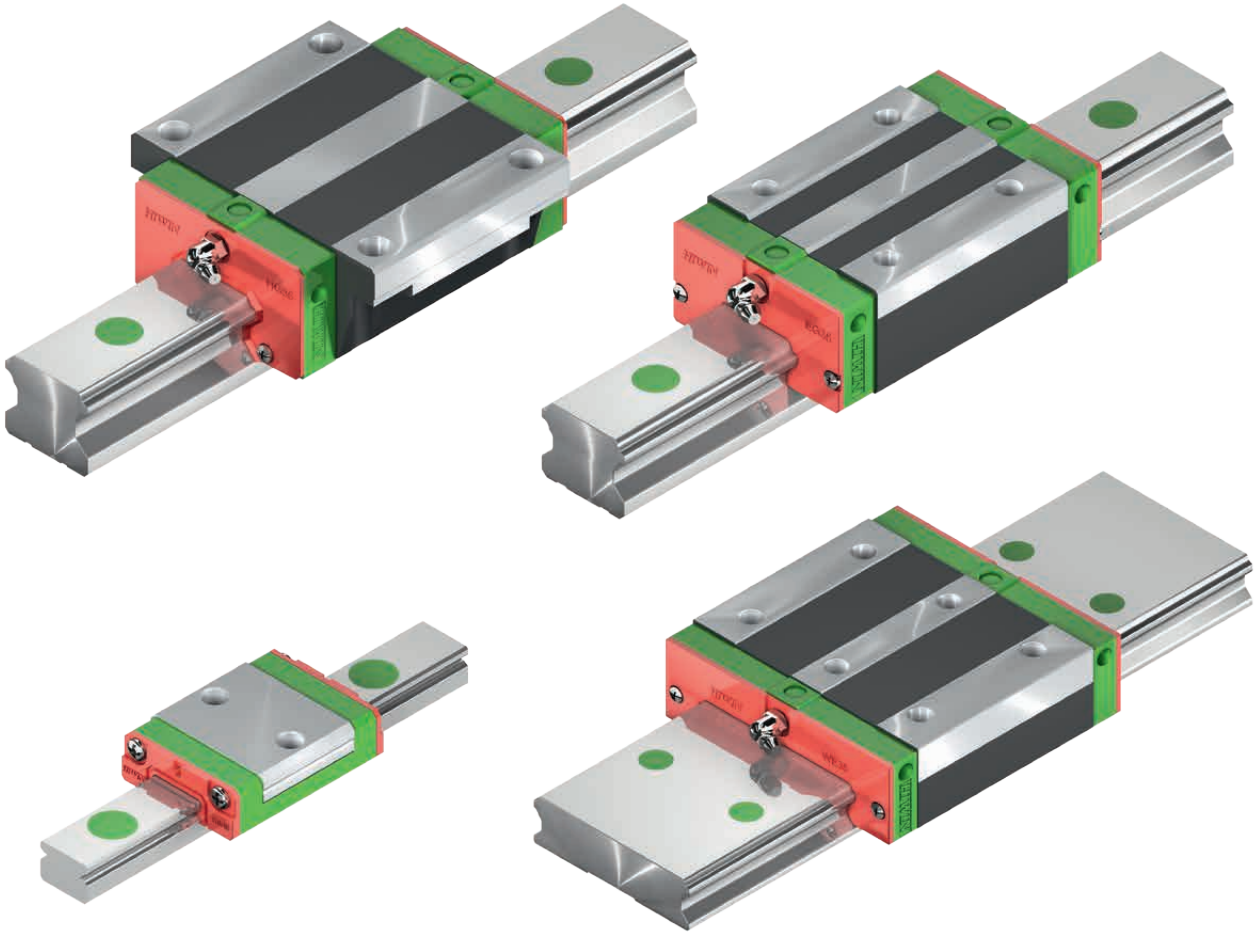
HIWIN®

Motion Control & Systems



Assembly Instructions

Linear Guideways

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Contents

1. Information about the document

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 Applicability of these assembly instructions

These assembly instructions are applicable to all HIWIN linear guideways.

1.2 Depiction of safety notices

Safety notices are always indicated using a signal word and sometimes also a symbol for the specific risk.
In these instructions, the following signal words and risk levels are used:

⚠ DANGER!

Imminent danger!
Non-compliance with the safety notices will result in serious injury or death!

⚠ WARNING!

Potentially dangerous situation!
Non-compliance with the safety notices runs the risk of serious injury or death!

⚠ CAUTION!

Potentially dangerous situation!
Non-compliance with the safety notices runs the risk of slight to moderate injury!

WARNING!

Potentially dangerous situation!
Non-compliance with the safety notices runs the risk of damage to property or environmental pollution!

1.3 Symbols used

The following symbols are used in these instructions.

NOTE Please note: Describes general information and recommendations.

Instructions: Instructions are marked with the checklist symbol. The actions described must be carried out and adhered to in the sequence given.

2. Safety

⚠ WARNING!

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

2.1 Intended use

The linear guideway is a linear guidance element that is used inside a machine or an automated system to guide a linear movement.
The linear guideways are designed for installation and operation in horizontal and vertical positions. In the case of vertical assembly, a suitable clamping or braking device must be provided in order to prevent unintended lowering of the load. The linear guideways may only be used for the intended purpose as described.

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

No alterations may be made to the linear guideways that are not described in these assembly instructions. If it is necessary to alter the design, please contact the manufacturer.
In the event of alterations or improper assembly, installation, commissioning, operation, maintenance or repair, the manufacturer shall assume no liability.
Only original parts from HIWIN may be used as spare parts and accessories. Spare parts and accessories not supplied by HIWIN are not tested for operation with HIWIN linear guideways and may compromise operational safety. The manufacturer shall accept no liability for damage caused as a result of using non-approved spare parts and accessories.

2.3 Qualified personnel

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

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

2.4 General safety information

⚠ WARNING!

The following safety notices must be observed. Non-compliance with safety notices may endanger life and limb.

- Before and during all assembly, disassembly or repair work, the higher-level system must be disconnected from the power supply, and you must ensure that the power supply cannot be restored by anyone else. Otherwise, there is a danger of death and injury.
- During assembly and disassembly, the linear guideway must be transported horizontally. If this is not possible, a suitable holding device must be installed to prevent the mounted blocks from coming off the rail.
- For long linear guideways, a hoist may be used for assembly.

2.5 Safety information for storage of the linear guideways

⚠ CAUTION!

Risk of crushing!
Only remove transportation safety device upon assembly!

If the linear guideway is to be put into storage, it must be kept in its transport packaging. It must be stored in a dry location and protected from impact.

2.6 Safety information for transport of the linear guideways

WARNING!

Damage caused by tilting or falling!
If no transportation safety device is used, the linear guideway may tilt or fall over.
- Before transport, secure the linear guideway to prevent tilting!

For weights of 25 kg or over, suitable hoists of a corresponding size must be used for transportation. Observe the applicable occupational health and safety regulations when handling suspended loads.
When transporting long linear guideways, use support at various locations so that they do not bend. Bending during transport compromises the function and precision of the linear guideways.

2.7 Further information

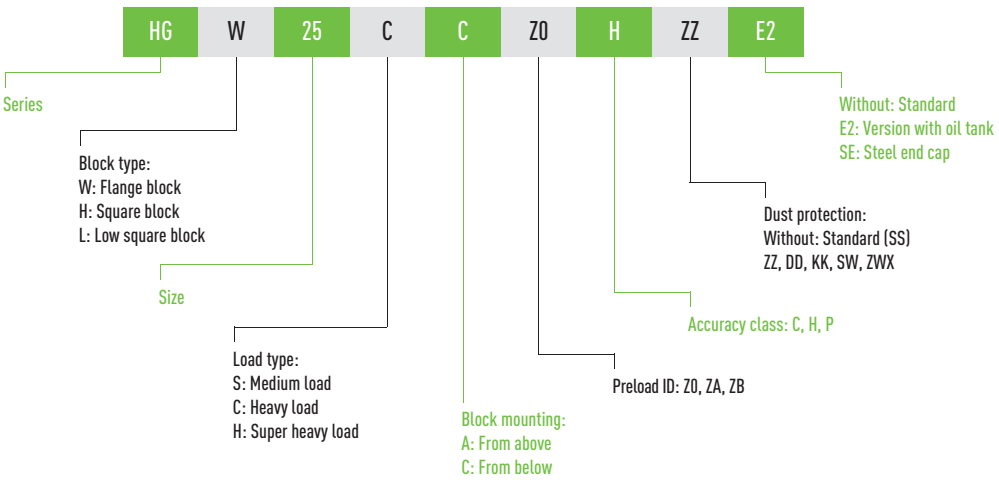
If you have any questions, please contact our sales organisation:
Tel.: +49 (0) 781 / 9 32 78-0
Fax: +49 (0) 781 / 9 32 78-90
If you have questions, suggestions or corrections concerning the documentation, please send a fax to the following number:
+49 (0) 781 / 9 32 78-90

3. Product descriptions

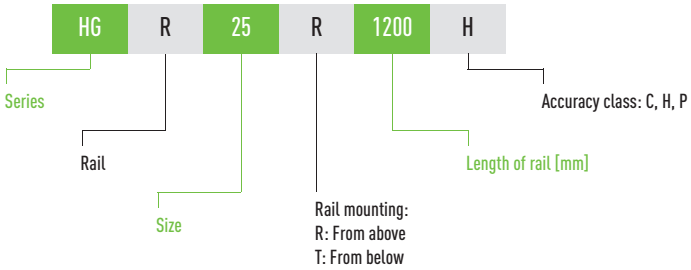
3.1 Article numbers of the linear guideways

3.1.1 Non-assembled type

- Article number of the block

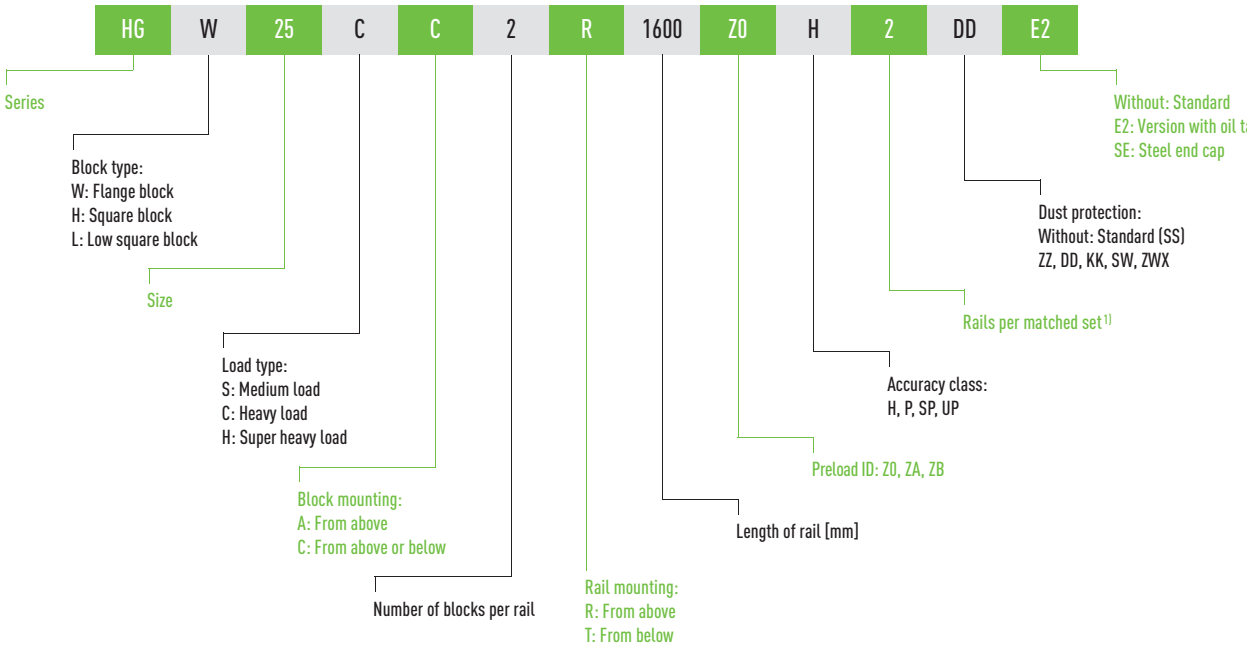


- Article number of the rail



3.1.2 Assembled type

- Article number of the fully assembled linear guideway



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.

3.2 Design and function of the linear guideway

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

4. Assembly

⚠ DANGER!

Before and during all assembly, disassembly or repair work, the higher-level system must be disconnected from the power supply, and you must ensure that the power supply cannot be restored by anyone else. Otherwise, there is a danger of death and significant danger of injury.

⚠ WARNING!

If required, use a suitable hoist for the assembly of linear guideways; lifting heavy loads without using tools may be harmful to health. Observe the applicable occupational health and safety regulations when handling suspended loads.

Linear guideways are either fully assembled or with blocks and rails supplied separately. In order to avoid damaging the linear guideway, the following procedures must be adhered to.

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

4.1 Assembly of the blocks on the rail

- Non-assembled blocks are always supplied with a block insert. The block insert prevents the rolling elements from coming off the block and protects them from dirt.
  Only remove the block insert once the block has been assembled upon the rail.
- Check the front sides of the rail for formation of burrs. Remove burrs with an oil stone or brass brush.
- Lubricate the end seals before assembly. This will facilitate assembly and reduce the risk of damaging the seal during assembly.
- Place the block in the desired assembly direction at a right angle and flush on the rail, and slide it on to the rail. In doing so, the block insert is automatically ejected. At this moment, do not tilt the block in any circumstance.
- Blocks with medium and high preload require higher force when being slid on to the rail than blocks with light preload. Make sure to take extra care when doing this. Blocks with high preload should preferably be supplied assembled.
- Before commissioning, the blocks should be lubricated as specified in chapter 6.

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

- The travel of the block on the rail is to be reduced to a minimum as long as the assembly holes have not yet been closed using protective caps, since otherwise the sealing lips of the scraper may also be damaged.
- Blocks with end seals/scrapers should not be slid on to rails that do not have bevels on the cutting edge.

This particularly applies to blocks whose sealing systems have the following properties:

- Higher preload
- End seals with double-lip
- Multi-part end seals

4.2 Disassembly of the blocks on the rail

- Disassembly occurs in the corresponding reverse order of the assembly. The block must always be slid on to a block insert. This prevents balls from falling out of the block and dirt from entering the block.

Please note:

NOTE

If the following instructions are not followed, the seals may be damaged and thus may not work properly.
If the rail has no bevel or only a very small one, the use of an assembly aid is recommended.
Generally, a length of rail in the appropriate size is used as an assembly aid, with the process carried out as follows:

- An end with a strong bevel/round edge
- An end without bevel
- The block is first assembled on the assembly aid and then on the rail.
- Place the assembly aid and the block without a bevel end flush on the (assembled) rail.

Carefully slide the block over the joint on to the (assembled) rail. In doing so, press the assembly aid against the rail in order to avoid creating a gap.
If no such assembly aid is available, one can be obtained from HIWIN GmbH.

4.3 Assembly of the linear guideway

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

4.3.1 Identification of the datum plane of rails and blocks

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

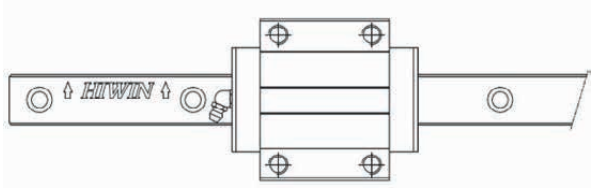


Fig. 4.1 **Identification of the datum plane of a rail**

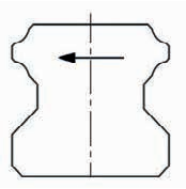


Fig. 4.2 **Identification of the datum plane of a short rail**

The datum plane of the block is the smooth ground lateral surface.

4.3.2 Procedure for the assembly of a linear guideway

a) Clean the mounting surface

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

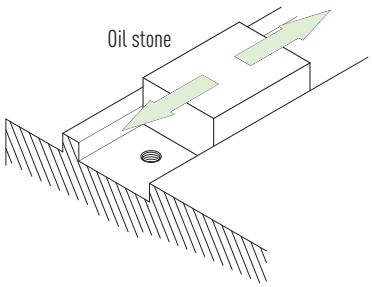


Fig. 4.3 **Cleaning the mounting surface**

b) Assembly of the rail

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

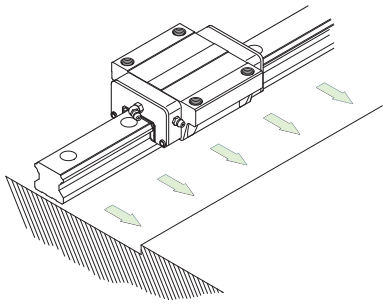


Fig. 4.4 **Aligning with the datum plane**

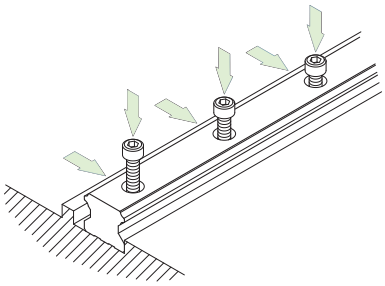


Fig. 4.5 **Adjusting the rail on the bed and assembly of the screws**

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

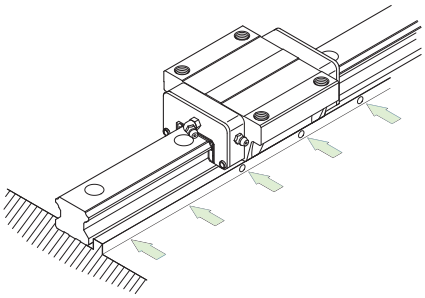


Fig. 4.6 **Tightening the push screws**

Screw in the retaining bolts in three stages using a torque wrench until the specified torque is reached. A list of the optimum tightening torques for the screws can be found in chapter 4.5.
When using a pair of rails, assemble the second rail in the same way as the first.
In this case, the permissible tolerances of the mounting surfaces and assembly deviations of the corresponding series must be adhered to (see chapter 4.4, mounting tolerances of the particular series).

4.3.3 Mounting of bolt caps

Before mounting the bolt caps the linear guideways must be assembled and fixed according to the descriptions earlier in this chapter.
To protect the sealing lips of the seals, mounting holes in the rails (R-rails, mounting from above) must be closed with bolt caps. The sealing lips of the seals need to be protected when the sliding carriage is to be moved over uncovered counter-bores of mounting holes.

Depending on the ambient and operating conditions bolt caps made of plastic, steel or brass are used. Plastic bolt caps have to be mounted as described in section 4.3.3.1. The steel and brass bolt caps are pressed into the mounting hole using an assembly tool as described in section 4.3.3.2.

4.3.3.1 Mounting of plastic bolt caps

Step 1: Place the plastic bolt cap centrally on the bore. Ensure parallelism between the top of the rail and the top of the bolt cap.

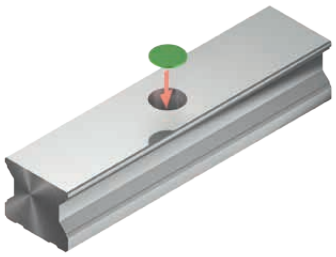


Fig. 4.7 **Positioning of the plastic bolt cap**

Step 2: Place an eligible press-in block upright on the cap. With a plastic hammer hit in the bolt cap through a central blow to the press-in block. If the cap is not yet fully pressed in, repeat the procedure until the cap is flush with the rail top.
With plastic bolt caps a burr may form during pressing in. Remove this burr.

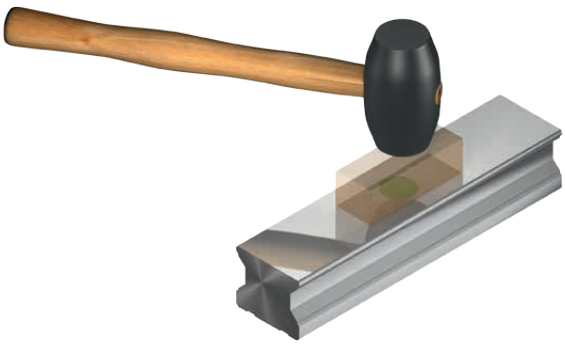


Fig. 4.8 **Pressing in of the plastic bolt cap with the help of a press-in block**

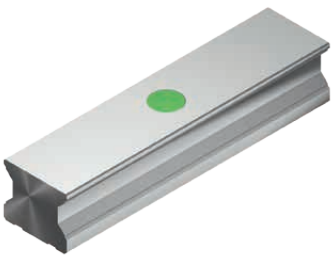


Fig. 4.9 **Fully assembled plastic bolt cap**

4.3.3.2 Mounting of steel and brass bolt caps

Step 1: 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. 4.10 **Positioning of the steel or brass bolt cap**

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

Fig. 4.11 **Positioning of the assembly tool on the rail**

Step 3: By tightening the screw (2) extend the press-in piston (1) until it is seated on the cap and a resistance is noticeable when tightening the screw. Before the actual pressing in of the cap, make sure that the cap is not jammed. Then by further tightening the screw (2) press in the bolt cap until the press-in piston sits on the rail. The required torque for pressing the caps is dependent on several factors and can vary greatly. Please note the maximum values specified in Table 4.2.

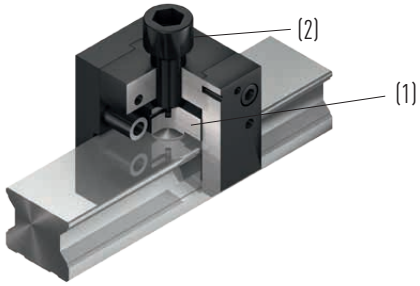


Fig. 4.12 **Pressing in of the bolt cap by tightening the screw (2)**

Step 4: After pressing in the bolt cap loosen the screw (2) and shift assembly tool as far as that the pressing process can be verified. If the cap is not yet fully pressed in, repeat the procedure until the cap is flush with the upper side of the rail.
In brass bolt caps, a burr may form during the process of pressing. Remove this burr using an oil stone.

Fig. 4.13 **Fully assembled bolt cap**

Table 4.1 **Article numbers for the assembly tool**

Series/size	Article number
HG15	5-000914
HG20	5-000915
HG25	5-000916
HG30	5-000917
HG35	5-000918
HG45	5-000919
HG55	5-000920
HG65	5-000921
RG25	12-000309
RG30	12-000310
RG35	12-000311
RG45	12-000312
RG55	12-000313
RG65	12-000314

Table 4.2 **Recommended maximum tightening torques for pressing in steel and brass bolt caps**

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

4.4 Mounting surface accuracy tolerances

4.4.1 Tolerance of the mounting surface of the rail

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

NOTE

Please 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.

4.4.1.1 HG and QH series

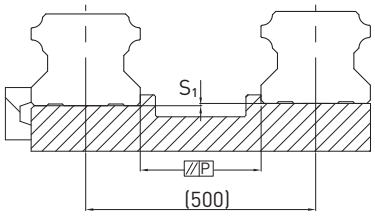


Fig. 4.14 **Parallelism of the reference surface P – HG/QH series**

Table 4.3 **Maximum tolerances for the parallel alignment (P) – HG/QH series**

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

Unit: µm

Table 4.4 **Maximum tolerances for the parallel alignment (P) – HG/QH series**

Series/size	Preload class		
	Z0	**ZA**	**ZB**
HG/QH_15	130	85	–
HG/QH_20	130	85	50
HG/QH_25	130	85	70
HG/QH_30	170	110	90
HG/QH_35	210	150	120
HG/QH_45	250	170	140
HG_55	300	210	170
HG_65	350	250	200

Unit: µm

4.4.1.2 EG and QE series

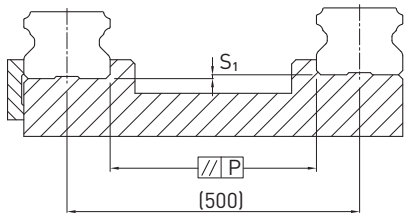


Fig. 4.15 **Parallelism of the reference surface P – EG/QE series**

Table 4.5 **Maximum tolerances for the parallel alignment (P) – EG/QE series**

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

Unit: µm

Table 4.6 **Maximum tolerance for the height of the reference surface (S_1) – EG/QE series**

Series/size	Preload class		
	Z0	**ZA**	**ZB**
EG/QE_15	130	85	–
EG/QE_20	130	85	50
EG/QE_25	130	85	70
EG/QE_30	170	110	90
EG/QE_35	210	150	120

Unit: µm

4.4.1.3 WE series

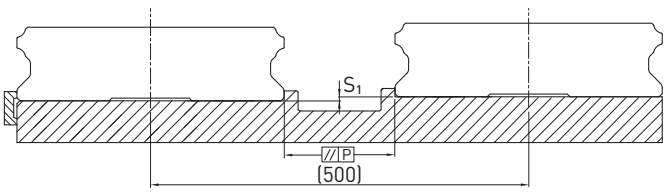


Fig. 4.16 **Parallelism of the reference surface P – WE series**

Table 4.7 **Maximum tolerances for the parallel alignment (P) – WE series**

Series/size	Preload class		
	Z0	**ZA**	**ZB**
WE_17	20	15	9
WE_21	25	18	9
WE_27	25	20	13
WE_35	30	22	20

Unit: µm

Table 4.8 **Maximum tolerance for the height of the reference surface (S_1) – WE series**

Series/size	Preload class		
	Z0	**ZA**	**ZB**
WE_17	65	20	–
WE_21	130	85	45
WE_27	130	85	45
WE_35	130	85	70

Unit: µm

4.4.1.4 MG series

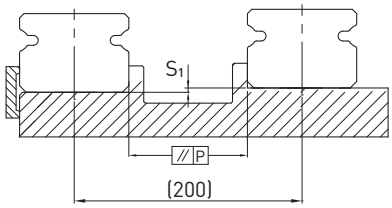


Fig. 4.17 **Parallelism of the reference surface P – MG series**

Table 4.9 **Maximum tolerances for the parallel alignment (P) – MG series**

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

Unit: µm

Table 4.10 **Maximum tolerance for the height of the reference surface (S_1) – MG series**

Series/size	Preload class		
	ZF	**Z0**	**Z1**
MG_07	25	25	3
MG_09	35	35	6
MG_12	50	50	12
MG_15	60	60	20

Unit: µm

Table 4.11 **Requirements for the mounting surface – MG series**

Series/size	Required evenness of the mounting surface
MG_07	0.025/200
MG_09	0.035/300
MG_12	0.050/200
MG_15	0.060/200

Unit: mm
Note: The values in Table 4.11 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.

4.4.1.5 PM series

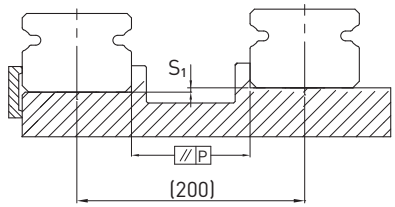


Fig. 4.18 **Parallelism of the reference surface P – PM series**

Table 4.12 **Maximum tolerances for the parallel alignment (P) – PM series**

Series/size	Preload class		
	ZF	**Z0**	**Z1**
PM_05	2	2	2
PM_09	4	4	3
PM_12	9	9	5

Unit: µm

Table 4.13 **Maximum tolerance for the height of the reference surface (S_1) – PM series**

Series/size	Preload class		
	ZF	**Z0**	**Z1**
PM_05	20	20	2
PM_09	35	35	6
PM_12	50	50	12

Unit: µm

Table 4.14 **Requirements for the mounting surface – PM series**

Series/size	Required evenness of the mounting surface
PM_05	0.015/200
PM_09	0.035/300
PM_12	0.050/200

Unit: mm
Note: The values in Table 4.14 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.

4.4.1.6 RG and QR series

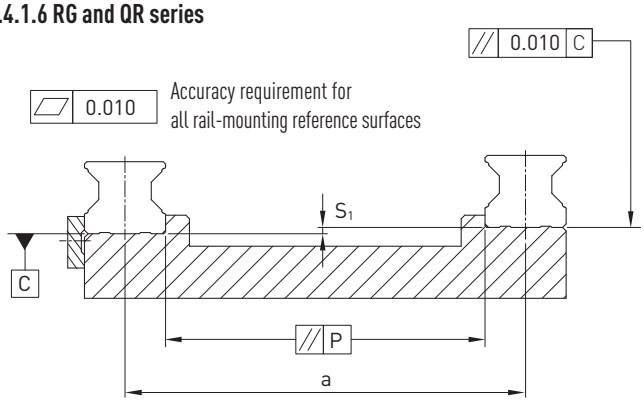


Fig. 4.19 **Parallelism of the reference surface P – RG/QR series**

- **Tolerances for the parallelism of the reference surface (P)**

Table 4.15 **Maximum tolerances for the parallel alignment (P) – RG/QR series**

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

Unit: μm

- **Tolerances for the height of the reference surface (S_1)**

$$S_1 = a \times K$$

S_1: Max. height tolerance
a: Distance between rails
K: Coefficient of the height tolerance

Table 4.16 **Coefficient of the height tolerance (K) – RG/QR series**

Series/size	Preload		
	Z0	**ZA**	**ZB**
RG_15 – 60/QR_25 – 60	2.2×10^{-4}	1.7×10^{-4}	1.2×10^{-4}

Height tolerance of the block mounting surface
Due to the high rigidity of the RG series, the following tolerances must be used for the mounting surfaces of the blocks in the parallel use of two or more blocks:

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

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

S_2: Max. height tolerance
b: Distance between blocks

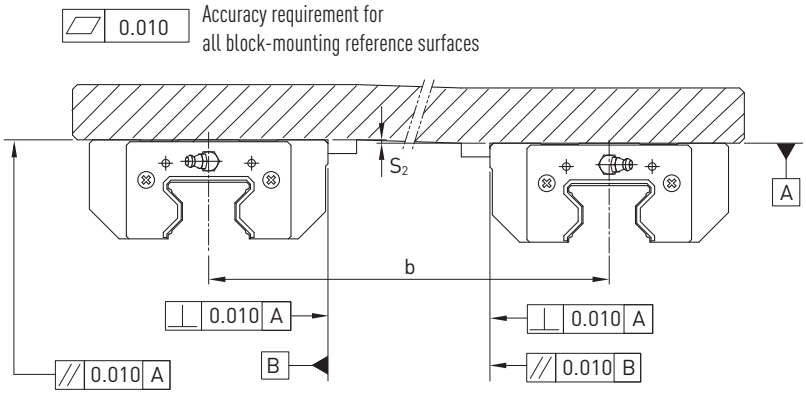


Fig. 4.20 **Maximum height tolerance S_2**

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

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

S_3: Max. height tolerance
c: Distance between blocks

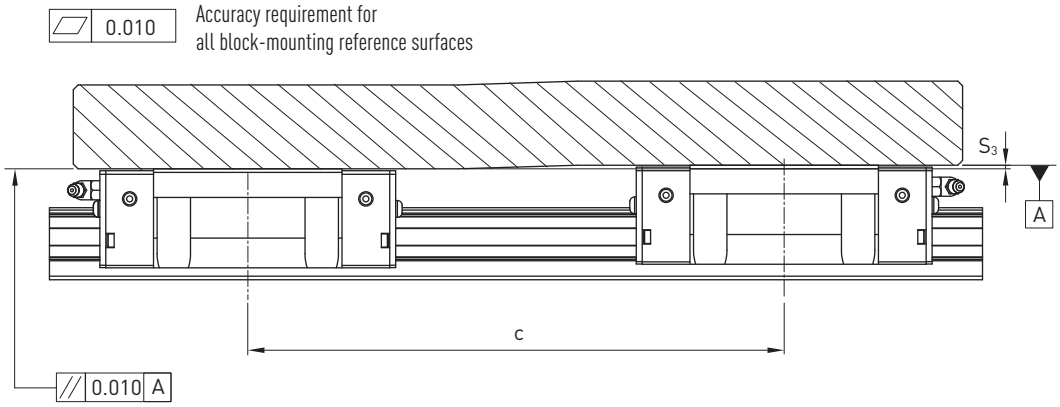


Fig. 4.21 **Maximum height tolerance S_3**

4.4.2 Shoulder heights and fillets

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

4.4.2.1 HG and QH series

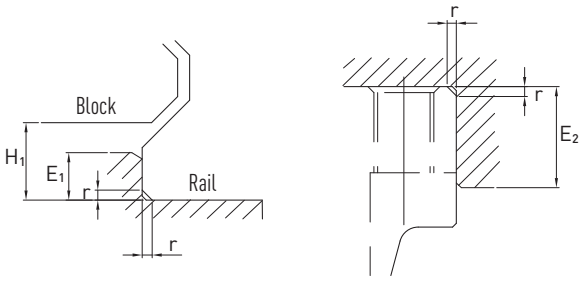


Fig. 4.22 **Shoulder heights and fillets – HG/QH series**

Table 4.17 **Shoulder heights and fillets**

Series/ size	Max. radius of fillets r	Shoulder height of the rail E_1	Shoulder height of the 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

4.4.2.2 EG and QE series

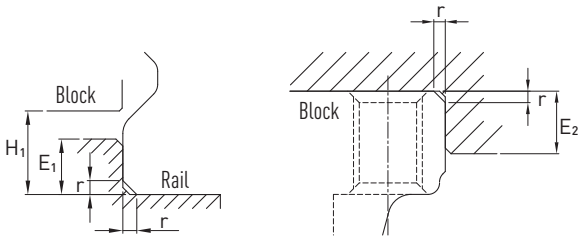


Fig. 4.23 **Shoulder heights and fillets – EG/QE series**

Table 4.18 **Shoulder heights and fillets – EG/QE series**

Series/ size	Max. radius of fillets r_1	Max. radius of fillets r_2	Shoulder height of the rail E_1	Shoulder height of the 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

4.4.2.3 WE series

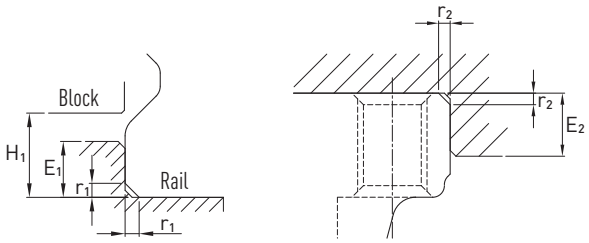


Fig. 4.24 **Shoulder heights and fillets – WE series**

Table 4.19 **Shoulder heights and fillets – WE series**

Series/ size	Max. radius of fillets r_1	Max. radius of fillets r_2	Shoulder height of the rail E_1	Shoulder height of the block E_2	Clearance under block H_1
WE_17	0.4	0.4	2.5	4.0	3.0
WE_21	0.4	0.4	2.5	5.0	3.0
WE_27	0.5	0.4	2.5	7.0	4.0
WE_35	0.5	0.5	2.5	10.0	4.0

Unit: mm

4.4.2.4 MG and PM series

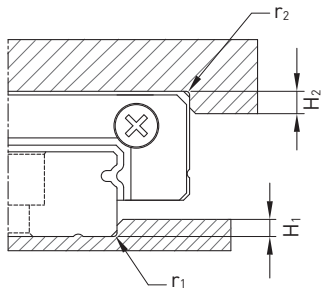


Fig. 4.25 **Shoulder heights and fillets – MG and PM series**

Table 4.20 **Shoulder heights and fillets – MG series**

Series/ size	Max. radius of fillets r_1	Max. radius of fillets r_2	Shoulder height of H_1	Shoulder height of H_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
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

Table 4.21 **Shoulder heights and fillets – PM series**

Series/ size	Max. radius of fillets r_1	Max. radius of fillets r_2	Shoulder height of H_1	Shoulder height of H_2
PMN05	0.1	0.2	1.2	2
PMN09	0.2	0.3	1.7	3
PMN12	0.3	0.4	1.7	4

Unit: mm

4.4.2.5 RG and QR series

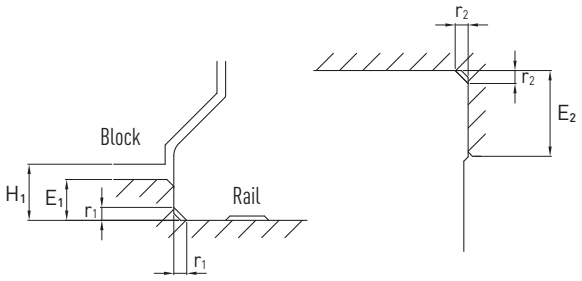


Fig. 4.26 **Shoulder heights and fillets – RG/QR series**

Table 4.22 **Shoulder heights and fillets – RG/QR series**

Series/ size	Max. radius of fillets r_1	Max. radius of fillets r_2	Shoulder height of the rail E_1	Shoulder height of the block E_2	Clearance under block H_1
RG_15	0.5	0.5	4.0	4.0	4.0
RG_20	0.5	0.5	5.0	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

4.5 Tightening torques for fixing screws

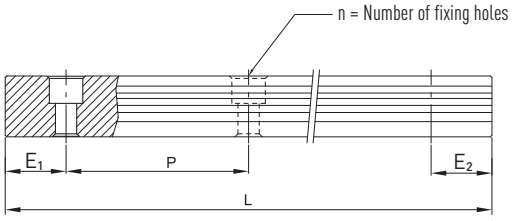
Insufficient tightening of the fixing screws strongly compromises the precision of the linear guideway; the following tightening torques are therefore recommended for the relevant screw sizes.

Table 4.23 **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	**M10**	70
M4	4	**M12**	120
M5	9	**M14**	160
M6	14	**M16**	200

4.6 Calculating the length of rails

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



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

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

Values for the maximum lengths of rails are to be found in the dimension charts in the appendix from page 65 onwards.

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

NOTE

Please note:
For some of our QH, QE and QW type linear guideways, the boreholes for fixing the slider on the block are connected with recirculation channels. (see Fig. 4.27). Therefore, it is important that the screws used do not exceed the maximum lengths shown in Table 4.24. **Non-observance may result in damage to the rolling elements and thus to a failure of the profile rail.**

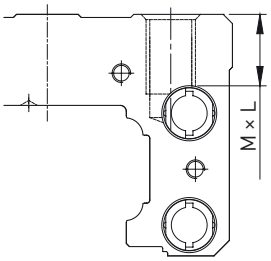


Fig. 4.27 **Depiction of bore hole and recirculation channel**

Table 4.24 **Maximum lengths for fixing screws – QH, QE and QW blocks**

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

4.8 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.

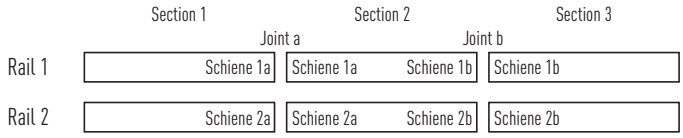


Fig. 4.28 **Identification of jointed multi-part rails***

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.

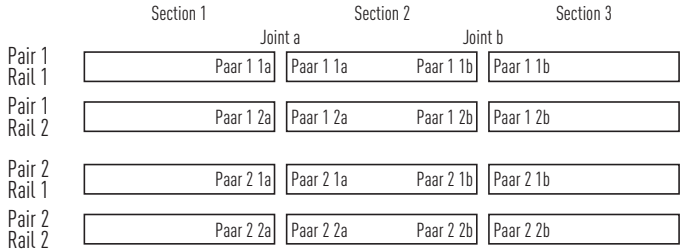


Fig. 4.29 **Identification of jointed multi-part paired rails***

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

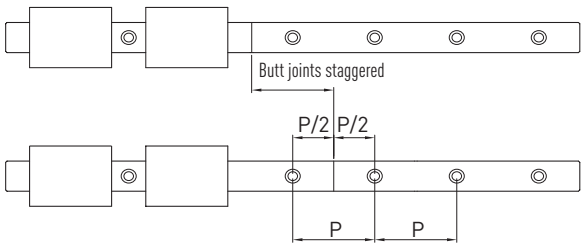


Fig. 4.30 **Configuration of jointed multi-part rails**

* Paar: Pair
Schiene: Rail

5. Maintenance

⚠ DANGER!

Before and during any maintenance work on the linear guideways, the higher-level system must be disconnected from the power supply, and you must ensure that the power supply cannot be restored by anyone else. Otherwise, there is a danger of death and injury.

5.1 Cleaning

WARNING!

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 in all circumstances.
When cleaning, make sure that no metal particles end up or remain in the block.

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

6. Lubrication

6.1 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.

6.1.1 Safety

WARNING!

This chapter covers the safe handling of lubricants. Improper handling of lubricants can create a health hazard or the danger of fatal injury. The following instructions must be complied with. Before handling lubricants, always check the corresponding safety data sheet.

6.1.2 Proper use of lubricants

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

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

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

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

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

6.1.3 Safety instructions for the storage of lubricants

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

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

6.2 Lubrication condition at delivery

Depending on the product group, HIWIN linear guideways are supplied either preserved or with basic lubrication. Preserved blocks are completely coated with an anticorrosive oil. Before commissioning, an initial lubrication must take place according to chapter 6.9.
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 chapter 6.9.

Table 6.1 **Lubrication condition at delivery**

Lubrication condition preserved	Basic lubrication
RG, MG, PM	HG, QH, EG, QE, WE, QW, QR

For initial lubrication of the linear guideways use grease suitable for rolling and slide bearings with mineral oil as base oil and thickeners according to DIN 51825 (K2K), NLGI class 2. See Table 6.2 for base oil viscosity.

6.3 Selection of 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.

Table 6.2 **Base oil viscosity**

Series	Base oil viscosity [mm^2/s at 40 °C]
QR	100
HG, QH, EG, QE, WE, QW	200

Please note:
Lubricants containing MoS_2 or graphite must not be used.

NOTE

6.4 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.

6.5 Operating conditions

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

Chapter 6.11 contains a list of applications and suitable lubricants. If you have any doubts, consult the lubricant supplier to ensure optimum lubrication.

6.6 Use of greases and oils in centralized lubrication systems

We recommend that you carry out the initial lubrication separately before connection to a centralized lubrication system, using a grease gun. It is also important to ensure that all lines and elements up to the consumer are filled with lubricant and contain no air pockets.
Avoid long lines and lines of low diameter. Lines must be routed with an upward gradient.
The number of pulses depends on the partial quantities and the size of the piston distributor.
In addition, the lubrication system manufacturers' instructions must be observed.

6.7 Lubricant pressure

HIWIN linear guideways can be lubricated with grease, semi-fluid grease or oil depending on the application. The lubricant pressure required depends on the installation size, lubricant, length of the feed pipe and the type of lubrication connection. For permanent lubrication systems, a minimum pressure of 4 to 6 bar is recommended. The maximum permissible lubricant pressure is 30 bar.

NOTE

Please note:
If lubricant pressures or quantities are too high, this can damage the block.
In particular, for blocks with double sealing, SW sealing or ZWX sealing, lubrication must be carried out very carefully, otherwise the seals may be damaged.

6.8 Lubrication connections

HIWIN blocks offer three possibilities for installing a lubrication connection:

6.8.1 Lubrication connection on the front side

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

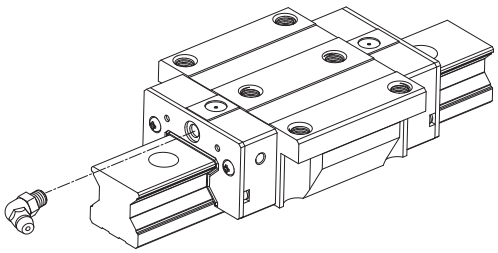


Fig. 6.1 **Lubrication connection on the front side**

6.8.2 Lubrication connection on the side

WARNING!

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

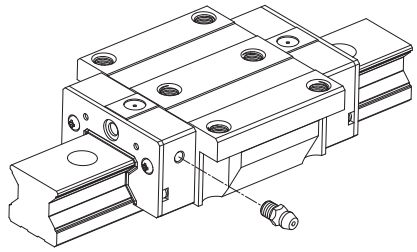


Fig. 6.2 **Lubrication connection on the side**

NOTE

Please note:
Before using the side lubrication connection, a thread must be cut in the prepared side hole using a screw tap for cutting blind holes. The maximum thread depth acc. Table 6.3 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

Please note:
When the first wall is broken, do not push any further as this could break through the guide of the rolling elements.

NOTE

Please 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 datum plane of the block.

NOTE

Please 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 6.3), because of the reduced distance between flange and grease nipple.

Table 6.3 **Lubrication hole on the side – Dimensions and grease nipple**

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

Fig. 6.3 **Grease nipple M3 × 0,5 P**
Article number 20-000275

Fig. 6.4 **Grease nipple M4 × 0,7 P**
Article number 20-000272

Fig. 6.5 **Grease nipple M6 × 0,75 P**
Article number 20-000273

Fig. 6.6 **Grease nipple 1/8 P**
Article number 20-000280

Fig. 6.7 **Funnel type grease nipple M4 × 0,7 P**
Article number 20-000325

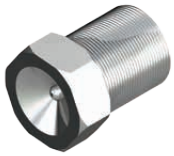


Fig. 6.8 **Funnel type grease nipple M6 × 0,75 PT**
Article number 20-000283

Fig. 6.9 **Funnel type grease nipple M3 × 0,5 P**
Article number 5-000061

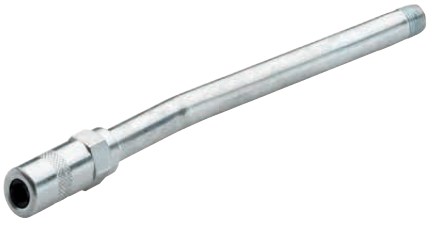


Fig. 6.10 **A1 – Hydraulic coupling**

Fig. 6.11 **A2 – Hollow mouthpiece 10 mm**

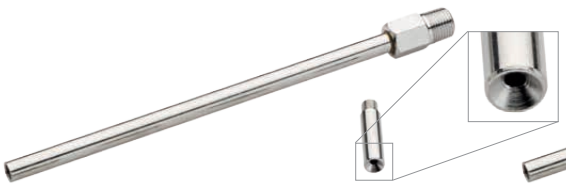


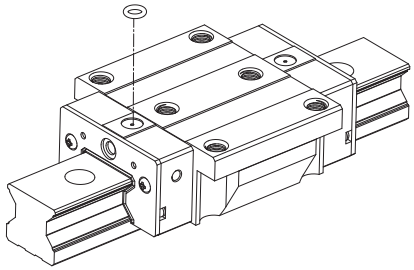
Fig. 6.12 **A3 – Hollow mouthpiece 6 mm**

Fig. 6.13 **A4 – Ball type mouthpiece 6 mm**

6.8.3 Lubrication connection on the top

WARNING!

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



Alternatively, lubrication of the block can also be carried out from above. In doing so, an O-ring is used as a seal. The size of the O-ring is to be found in Table 6.4. The O-ring is not included in the standard shipment.

Fig. 6.14 **Lubrication connection on the top**

When using the lubrication connection on the top, it must first be opened.
A further recess is located in the counterbore that receives the O-ring. This is pierced using a hot metal spike with diameter 0.8 mm to a maximum depth of D_{max} according to Table 6.4.

NOTE

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

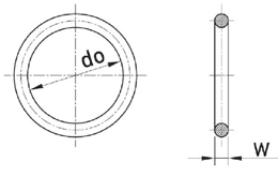


Fig. 6.15 **O-ring to cover the lubrication connection on the top**

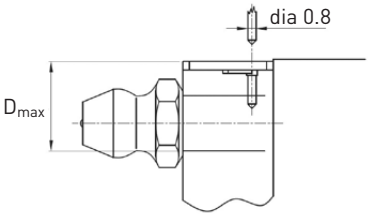


Fig. 6.16 **Maximum piercing depth D_{max}**

Table 6.4 **O-ring specifications for lubrication connection on the top – Part 1**

Series/size	O-ring			Lubrication hole on the top
	Article number	do [mm]	W [mm]	max. depth D_{max} [mm]
HG/QH_15	3451001B	2.5 ± 0.15	1.5 ± 0.15	3.75
HG/QH_20	3451001C	4.5 ± 0.15	1.5 ± 0.15	5.70
HG/QH_25	3451001C	4.5 ± 0.15	1.5 ± 0.15	5.80
HG/QH_30	3451001C	4.5 ± 0.15	1.5 ± 0.15	6.30
HG/QH_35	3451001C	4.5 ± 0.15	1.5 ± 0.15	8.80
HG/QH_45	3451001C	4.5 ± 0.15	1.5 ± 0.15	8.20
HG_55	3451001C	4.5 ± 0.15	1.5 ± 0.15	11.80
HG_65	3451001C	4.5 ± 0.15	1.5 ± 0.15	10.80
EG/QE_15	3451001B	2.5 ± 0.15	1.5 ± 0.15	6.90
EG/QE_20	3451001C	4.5 ± 0.15	1.5 ± 0.15	8.40
EG/QE_25	3451001C	4.5 ± 0.15	1.5 ± 0.15	10.40
EG/QE_30	3451001C	4.5 ± 0.15	1.5 ± 0.15	10.40
EG/QE_35	3451001C	4.5 ± 0.15	1.5 ± 0.15	10.80
WE/QW_21	3451001C	4.5 ± 0.15	1.5 ± 0.15	6.80
WE/QW_27	3451001C	4.5 ± 0.15	1.5 ± 0.15	8.40
WE/QW_35	3451001C	4.5 ± 0.15	1.5 ± 0.15	10.20

The HIWIN lubrication adapter can be used for lubrication connections.

Table 6.4 **O-ring specifications for lubrication connection on the top – Part 2**

Series/size	O-ring			Lubrication hole on the top
	Article number	**do [mm]**	**W [mm]**	**max. depth D_{max} [mm]**
RG_15	3451001B	2.5 ± 0.15	1.5 ± 0.15	3.45
RG_20	3451001B	2.5 ± 0.15	1.5 ± 0.15	4.00
RG/QR_25	3451000W	7.5 ± 0.15	1.5 ± 0.15	5.80
RG/QR_30	3451000W	7.5 ± 0.15	1.5 ± 0.15	6.20
RG/QR_35	3451000W	7.5 ± 0.15	1.5 ± 0.15	8.65
RG/QR_45	3451000W	7.5 ± 0.15	1.5 ± 0.15	9.50
RG_55	3451000W	7.5 ± 0.15	1.5 ± 0.15	11.60
RG_65	3451000W	7.5 ± 0.15	1.5 ± 0.15	14.50

The HIWIN lubrication adapter can be used for lubrication connections.

6.8.4 Lubrication adapter

In the series HG and RG (models HGH and RGH) spacers (lubrication adapter TCN, Top-CoNnector) must be mounted, to compensate for the height difference between recirculation system and block mounting surface.
The adapters are only delivered assembled, the appropriate O-ring is included when ordering this option.

Table 6.5 **Availability of the lubrication adapter TCN**

Available for series/size	
RG-25	HG-25
RG-30	HG-30
RG-35	HG-35
RG-45	
RG-55	

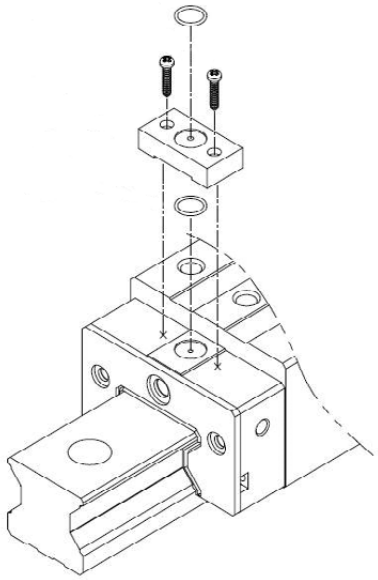


Fig. 6.17 **Structure of the lubrication adapter**

6.9 Initial lubrication upon commissioning

Before the HIWIN linear guideways are commissioned, an initial lubrication must take place according to these lubrication instructions. At initial lubrication the blocks are supplied with the amount of grease that is needed to reach the lubrication intervals specified in chapter 6.12. 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.

HIWIN linear guideways are supplied either preserved or with basic lubrication (see chapter 6.2)

The initial lubrication takes place in three steps:
Feed in the quantity of grease specified in the table for the corresponding series by slowly operating the grease gun. Move the block three times by approx. three block lengths. Repeat the above mentioned process twice more.
Then proceed the block over the entire travel distance and check whether a film of grease can be seen on the total rail. If this is not the case, increase the lubricant quantity.
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 %.

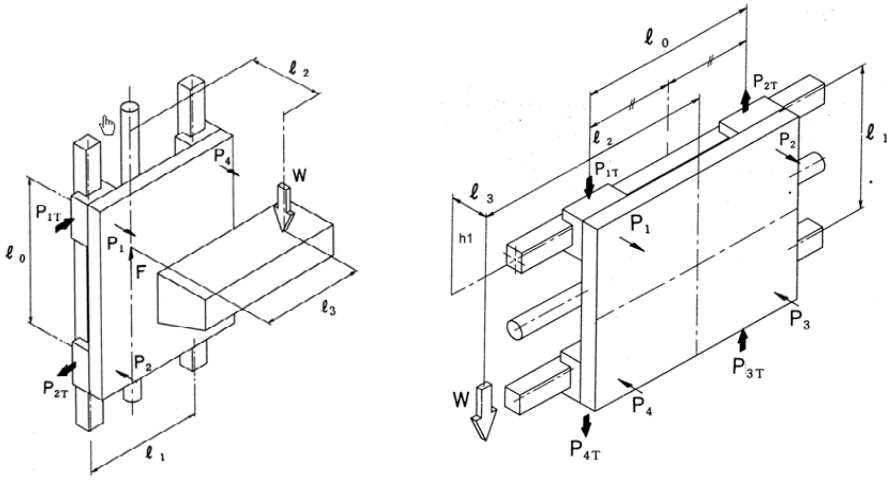


Fig. 6.18 **Mounting positions of profile rails**

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

Initial lubrication for short-stroke applications

Stroke < 2 × block length:	Provide lubrication connections on both sides of the block and carry out lubrication according to the above description for the corresponding lubrication connection.
Stroke < 0.5 × block length:	Provide lubrication connections on both sides of the block and carry out lubrication. In doing so, move the block by two block lengths several times. If this is not possible, please contact us.

6.10 Relubrication

The lubrication intervals depend heavily on the operating conditions (loads, speed, acceleration) and environmental conditions (temperature, fluids etc.). Environmental influences such as high loads, vibrations, long travel distances and dirt shorten the lubrication intervals. For clean environmental conditions, short travel distances and light loads, the lubrication intervals can be extended. Once the lubrication interval has passed, feed in the lubricant quantity specified in the table for the corresponding series by slowly operating the grease gun in a single action.
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 %.
Check whether a film of grease can be seen on the total rail. If this is not the case, increase the lubricant quantity.

Relubrication for short-stroke applications

For short-stroke applications (stroke < 2 × block length), the relubrication is to be carried out as described in chapter 6.12.
For normal operating conditions, the relubrication intervals provided shall apply.

6.11 Recommended lubricants

Essentially, the selection of a lubricant depends on the operating temperature and various operation-related factors, e.g. load, vibrations, oscillation, short-stroke applications. Special requirements such as use in combination with strong or aggressive media, in clean rooms, in a vacuum or in the foodstuff industry also need to be considered.
There follows a list of applications and suitable lubricants. If you have any doubts, consult the lubricant supplier to ensure optimum lubrication.

6.11.1 Grease lubrication

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

Please note:
Greases with solid particles such as graphite or MOS_2 must not be used.

NOTE

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

6.11.1.1 Standard applications

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

Table 6.6 **Recommended greases for standard applications**

HIWIN	G05
Klüber	Klüberlub GL-261
Mobil	Mobilux EP1
Fuchs Lubritech	Lagermeister BF2
Lubcon	TURMOGREASE CAK 2502

6.11.1.2 Heavy-duty applications

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

Table 6.7 **Recommended greases for heavy-duty applications**

HIWIN	G01
Klüber	Klüberlub BE 71-501
Fuchs Lubritech	Lagermeister EP2
Lubcon	TURMOGREASE Li 802EP

6.11.1.3 Clean room/vacuum applications

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

Table 6.8 **Recommended greases for clean room/vacuum applications**

HIWIN	G02
Klüber	Klüberalfa HX 83-302
Fuchs Lubritech	gleitmo 591

6.11.1.4 Clean room/vacuum applications at high speeds

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

Table 6.9 **Recommended greases for clean room/vacuum applications at high speeds**

HIWIN	G03
Klüber	Isoflex Topas NCA52

6.11.1.5 Applications with high speeds

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

Table 6.10 **Recommended greases for applications with high speeds**

HIWIN	G04
Klüber	Isoflex NCA15
Lubcon	TURMOGREASE Highspeed L252

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

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

Table 6.11 **Recommended greases for applications in the foodstuffs industry in acc. with USDA H1**

Klüber	Klübersynth UH1 14-151
Mobil	Mobilgrease FM102
Fuchs Lubritech	GERALYN 1

6.11.2 Lubrication with low-viscosity grease

In centralized lubrication systems, low-viscosity greases are frequently used, as they are distributed more effectively over the whole system due to their soft structure.
Observe the lubrication system manufacturers' instructions.
The following information on lubricants serves to provide examples and is only intended as an aid to selection. Other lubricants may be used after clarification of the specific application and the centralized lubrication system used with the lubricant supplier.
In addition, the lubricant manufacturers' instructions must be observed.

6.11.2.1 Standard applications

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

Table 6.12 **Recommended low-viscosity greases for standard applications**

Klüber	MICROLUBE GB 00
Mobil	Mobilux EP004
Fuchs Lubritech	GEARMASTER LI 400

6.11.2.2 Heavy-duty applications

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

Recommended low-viscosity greases for heavy-duty applications:

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

NOTE

6.11.2.3 Clean room/vacuum applications

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

Recommended low-viscosity greases for clean room/vacuum applications:

Please note:
We recommend that you consult a lubricant manufacturer regarding the use of low-viscosity greases for clean room/vacuum applications

NOTE

6.11.2.4 Applications with high speeds

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

Table 6.13 **Recommended low-viscosity greases for applications with high speeds**

Klüber	Isoflex Topas NCA5051
Mobil	Mobilux EP004
Fuchs Lubritech	GEARMASTER LI 400

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

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

Table 6.14 **Recommended low-viscosity greases for applications in the foodstuffs industry in acc. with USDA H1**

Klüber	Klübersynth UH1 14-1600
Mobil	Mobilgrese FM 003
Fuchs Lubritech	GERLYNN 00

6.11.3 Oil lubrication

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

Observe the lubrication system manufacturer's instructions.

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

6.11.3.1 Standard applications

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

Table 6.15 **Recommended oils for standard applications**

Klüber	Klüberoil GEM 1-150 N
Mobil	Mobilgear 630
Fuchs Lubritech	GEARMASTER CLP 320

6.11.3.2 Heavy-duty applications

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

Recommended oils for heavy-duty applications:

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

NOTE

6.11.3.3 Clean room/vacuum applications

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

Table 6.16 **Recommended oils for clean room/vacuum applications**

Klüber	Tyreno Fluid E-95 V
Mobil	Mobilgear 626

6.11.3.4 Applications with high speeds

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

Table 6.17 **Recommended oils for applications with high speeds**

Klüber	Klüberoil GEM 1-46 N

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

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

Table 6.18 **Recommended oils for applications in the foodstuffs industry in acc. with USDA H1**

Klüber	Klüberoil 4 UH1-68 N

6.11.4 HIWIN lubricants

6.11.4.1 HIWIN greases

Table 6.19 **Overview HIWIN greases**

Grease type	Application	Article number		
		Cartridge 70 g	Cartridge 400 g	Can 1 kg
				
G01	Heavy-duty applications	20-000335	20-000336	20-000337
G02	Clean room applications	20-000338	20-000339	20-000340
G03	Clean room applications at high speeds	20-000341	20-000342	20-000343
G04	Applications with high speeds	20-000344	20-000345	20-000346
G05	Standard grease	20-000347	20-000348	20-000349

Table 6.20 **HIWIN grease guns**

Article no.	Description	Scope of delivery	Comment
5-12-0009	Grease gun GN-80M incl. set of lubrication adapter and nozzles (see Fig. 6.19)	Grease gun GN-80M consisting of: ○ Grease gun ○ Hydraulic coupling A1 suitable for conical grease nipples acc. to DIN 71412, outer diameter 15 mm ○ Hollow mouthpiece A2 suitable for conical or ball grease nipples acc. to DIN 71412/DIN 3402, outer diameter 10 mm ○ Set of lubrication adapter and nozzles	Suitable for 70 g cartridge or direct filling
5-12-0010	Grease gun GN-400C incl. set of lubrication adapter and nozzles (see Fig. 6.20)	Grease gun GN-400-C consisting of: ○ Grease gun ○ Hydraulic coupling A1 suitable for conical grease nipples acc. to DIN 71412, outer diameter 15 mm ○ Hollow mouthpiece A2 suitable for conical or ball grease nipples acc. to DIN 71412/DIN 3402, outer diameter 10 mm ○ Set of lubrication adapter and nozzles	Suitable for 400 g cartridge or direct filling
5-12-0035	Set of lubrication adapter and nozzles (see Fig. 6.21)	Set of lubrication adapter and nozzles consisting of: ○ Hollow mouthpiece A3 suitable for ball grease nipples acc. to DIN 3402, outer diameter 6 mm ○ Ball type mouthpiece A4 for funnel type grease nipples acc. to DIN 3405 outer diameter 6 mm ○ Tip mouthpiece A5 ○ Tip mouthpiece angled A6	

Fig. 6.19 **Grease gun GN-80M**

Fig. 6.20 **Grease gun GN-400C**

Fig. 6.21 **Set of lubrication adapter and nozzles**

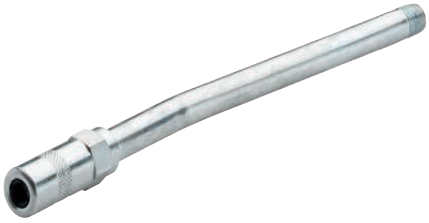


Fig. 6.22 **A1 – Hydraulic coupling**

Fig. 6.23 **A2 – Hollow mouthpiece 10 mm**

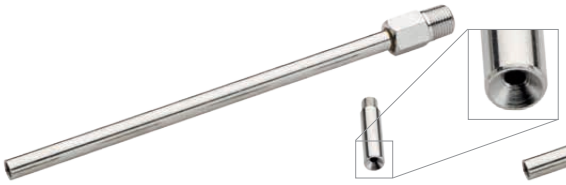


Fig. 6.24 **A3 – Hollow mouthpiece 6 mm**

Fig. 6.25 **A4 – Ball type mouthpiece 6 mm**

Table 6.21 **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]
	1/8 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

6.11.4.2 HIWIN oils

Table 6.22 **HIWIN oils**

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

6.12 Lubricant quantities and lubrication intervals

WARNING!

Never commission linear guideways without carrying out basic lubrication.
In general, if lubricant quantities or lubrication pressure are too high, this can damage or destroy the product. The specified procedure must be observed in order to avoid damaging the product.

The lubricant quantities specified below are reference values that may fluctuate according to the environmental conditions. 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. More information concerning these values can be found in the appendix.

6.12.1 Lubricant quantities and lubrication intervals for grease lubrication

6.12.1.1 Lubricant quantities for grease lubrication of the HG/QH series

Table 6.23 **Lubricant quantities for grease lubrication of the HG series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	**Super heavy duty (H)**	**Heavy duty (C)**	**Super heavy duty (H)**
HG_15	0.3 (3 ×)	—	0.3	—
HG_20	0.5 (3 ×)	0.7 (3 ×)	0.5	0.7
HG_25	0.8 (3 ×)	1.0 (3 ×)	0.8	1.0
HG_30	1.3 (3 ×)	1.7 (3 ×)	1.3	1.7
HG_35	1.9 (3 ×)	2.4 (3 ×)	1.9	2.4
HG_45	3.8 (3 ×)	4.6 (3 ×)	3.8	4.6
HG_55	6.3 (3 ×)	7.7 (3 ×)	6.3	7.7
HG_65	10.0 (3 ×)	13.5 (3 ×)	10.0	13.5

Table 6.24 **Lubricant quantities for grease lubrication of the QH series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	**Super heavy duty (H)**	**Heavy duty (C)**	**Super heavy duty (H)**
QH_15	0.3 (3 ×)	—	0.3	—
QH_20	0.5 (3 ×)	0.6 (3 ×)	0.5	0.6
QH_25	0.6 (3 ×)	0.8 (3 ×)	0.6	0.8
QH_30	1.1 (3 ×)	1.3 (3 ×)	1.1	1.3
QH_35	1.6 (3 ×)	1.9 (3 ×)	1.6	1.9
QH_45	3.0 (3 ×)	3.7 (3 ×)	3.0	3.7

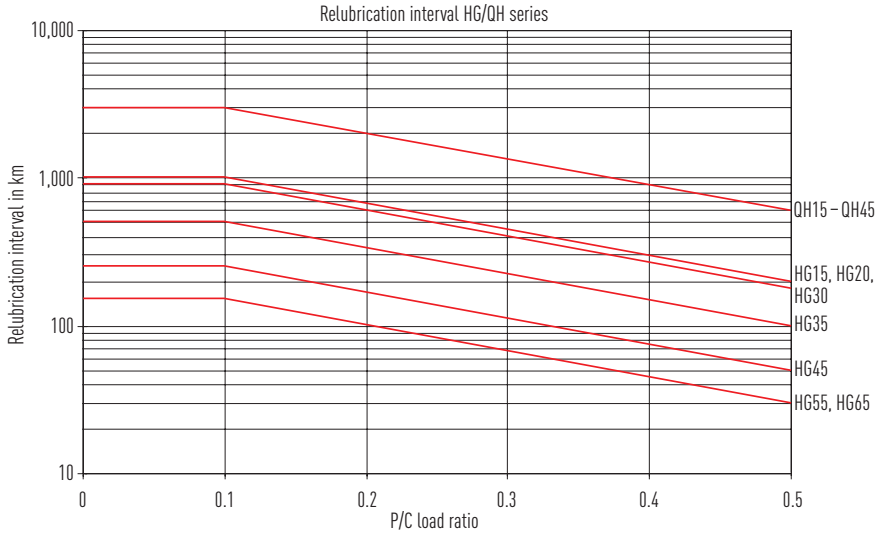


Fig. 6.26 **Load-dependent relubrication intervals for grease lubrication – HG/QH series**

6.12.1.2 Lubricant quantities for grease lubrication of the EG/QE series

Table 6.25 **Lubricant quantities for grease lubrication of the EG series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Average load (S)	Heavy duty (C)	Average load (S)	Heavy duty (C)
EG_15	0.2 (3×)	0.3 (3×)	0.2	0.3
EG_20	0.3 (3×)	0.4 (3×)	0.3	0.4
EG_25	0.5 (3×)	0.8 (3×)	0.5	0.8
EG_30	0.7 (3×)	1.1 (3×)	0.7	1.1
EG_35	0.9 (3×)	1.4 (3×)	0.9	1.4

Table 6.26 **Lubricant quantities for grease lubrication of the QE series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Average load (S)	Heavy duty (C)	Average load (S)	Heavy duty (C)
QE_15	0.2 (3×)	0.3 (3×)	0.2	0.3
QE_20	0.3 (3×)	0.4 (3×)	0.3	0.4
QE_25	0.4 (3×)	0.7 (3×)	0.4	0.7
QE_30	0.6 (3×)	0.9 (3×)	0.6	0.9
QE_35	0.8 (3×)	1.2 (3×)	0.8	1.2

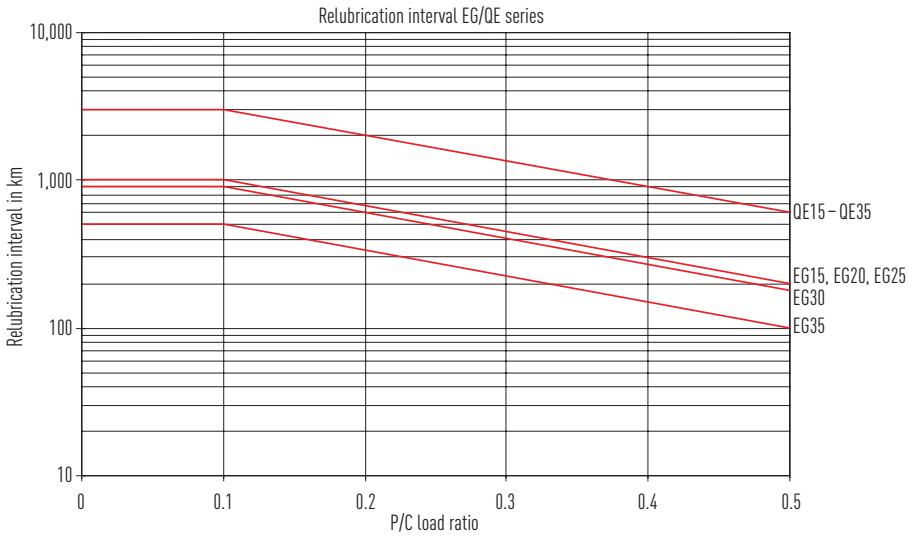


Fig. 6.27 **Load-dependent relubrication intervals for grease lubrication – EG series**

6.12.1.3 Lubricant quantities for grease lubrication of the WE series

Table 6.27 **Lubricant quantities for grease lubrication of the WE series**

Series/ size	Initial lubrication partial quantity [cm³]	Relubrication quantity [cm³]
WE_17	0.1 (3 ×)	0.1
WE_21	0.2 (3 ×)	0.2
WE_27	0.6 (3 ×)	0.3
WE_35	1.6 (3 ×)	0.4
WE_50	7.7 (3 ×)	7.7

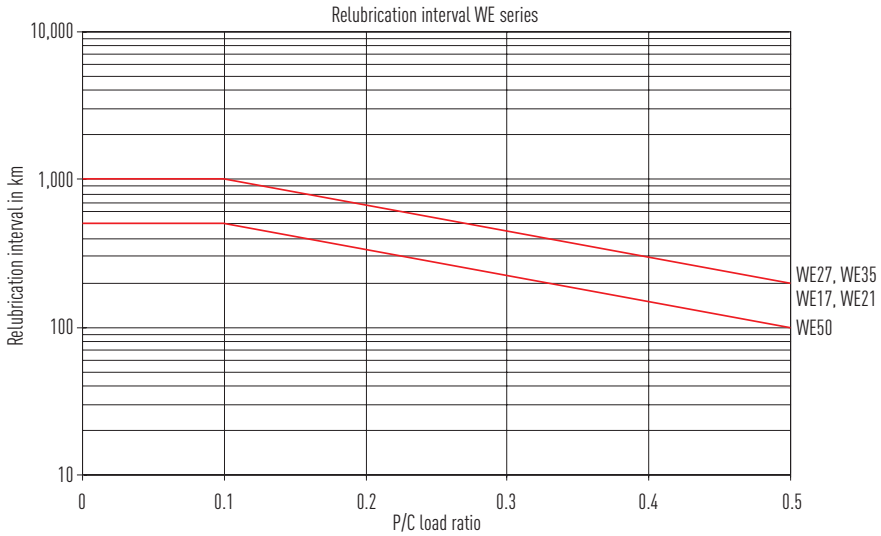


Fig. 6.28 **Load-dependent relubrication intervals for grease lubrication – WE series**

6.12.1.4 Lubricant quantities for grease lubrication of the MG series

Table 6.28 **Lubricant quantities for grease lubrication of the MG series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	Super heavy duty (H)	Heavy duty (C)	Super heavy duty (H)
MGN07	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
MGN09	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
MGN12	0.03 (3 ×)	0.03 (3 ×)	0.04	0.07
MGN15	0.04 (3 ×)	0.06 (3 ×)	0.07	0.09
MGW07	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
MGW09	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
MGW12	0.04 (3 ×)	0.07 (3 ×)	0.04	0.07
MGW15	0.07 (3 ×)	0.09 (3 ×)	0.07	0.09

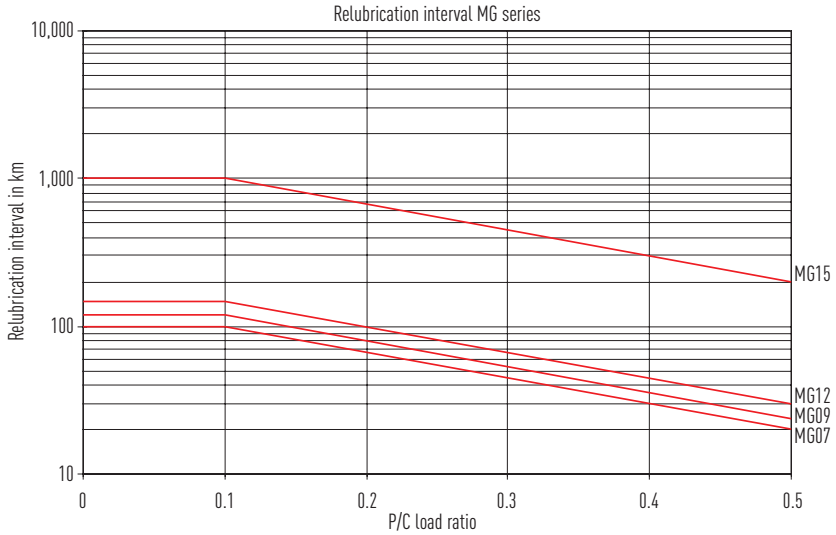


Fig. 6.29 **Load-dependent relubrication intervals for grease lubrication – MG series**

6.12.1.5 Lubricant quantities for grease lubrication of the PM series

Table 6.29 **Lubricant quantities for grease lubrication of the PM series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	Super heavy duty (H)	Heavy duty (C)	Super heavy duty (H)
PMN05	0.002 (3 ×)	0.003 (3 ×)	0.002	0.003
PMN07	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
PMN09	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
PMN12	0.03 (3 ×)	0.03 (3 ×)	0.04	0.07
PMN15	0.04 (3 ×)	0.06 (3 ×)	0.07	0.09

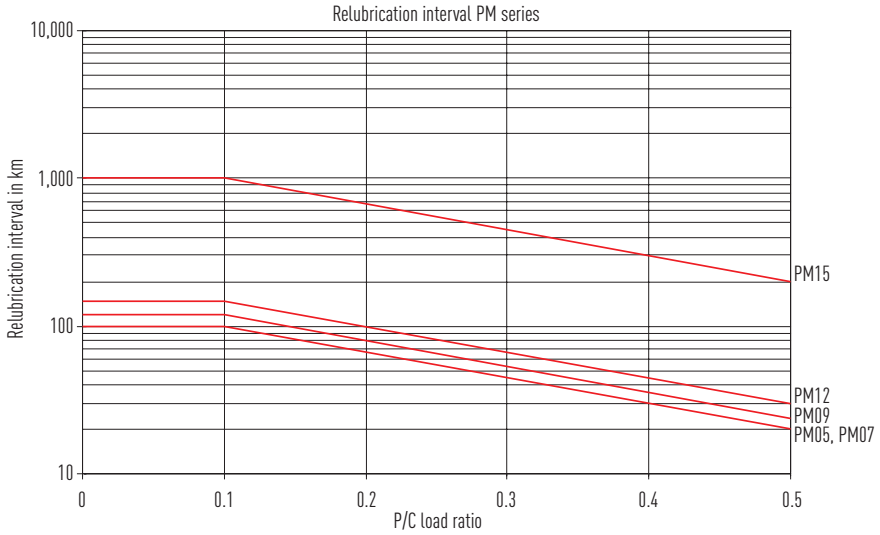


Fig. 6.30 **Load-dependent relubrication intervals for grease lubrication – PM series**

6.12.1.6 Lubricant quantities for grease lubrication of the RG/QR series

Table 6.30 **Lubricant quantities for grease lubrication of the RG series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	Super heavy duty (H)	Heavy duty (C)	Super heavy duty (H)
RG_15	0.5 (3 ×)	–	0.3	–
RG_20	0.8 (3 ×)	1.0 (3 ×)	0.8	1.0
RG_25	1.2 (3 ×)	1.4 (3 ×)	1.2	1.4
RG_30	1.5 (3 ×)	1.7 (3 ×)	1.5	1.7
RG_35	2.0 (3 ×)	2.4 (3 ×)	2.0	2.4
RG_45	3.2 (3 ×)	3.9 (3 ×)	3.2	3.9
RG_55	4.7 (3 ×)	5.9 (3 ×)	4.7	5.9
RG_65	8.7 (3 ×)	10.5 (3 ×)	8.7	10.5

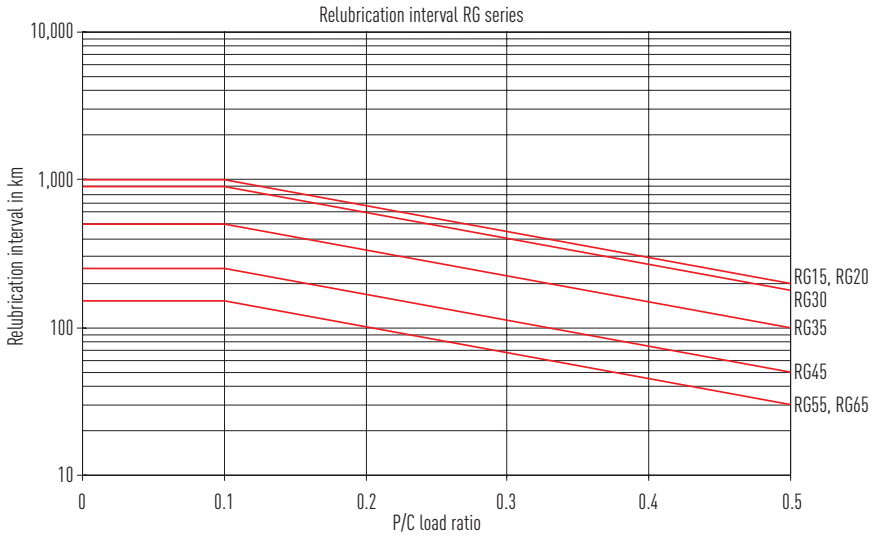


Fig. 6.31 **Load-dependent relubrication intervals for grease lubrication – RG series**

6.12.2 Lubricant quantities and lubrication intervals for semi-fluid grease lubrication

When using a central lubrication system, it is recommended that the initial lubrication (see chapter 6.9)is carried out separately using a manual grease gun before connection to the system.
Furthermore, make sure that all pipes and elements up to the user are filled with lubricant and that no air pockets are present. Long pipelines and narrow pipe diameters are to be avoided. The pipes are to be installed on an incline.
The pulse count results from the partial quantities and the piston distributor sizes.
In addition, the lubrication system manufacturer's regulations must be observed.

Lubricant quantities for semi-fluid grease lubrication

The quantities for lubrication with semi-fluid grease are identical to those for grease lubrication.

Relubrication interval for semi-fluid grease lubrication

The relubrication intervals for semi-fluid grease lubrication are reduced by 25 %, based on the relubrication intervals for grease lubrication (period between two lubrications).

Piston distributor sizes for feed units (single-line systems) for semi-fluid 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:

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

Table 6.31 **Piston distributor sizes for feed units**

Size	Piston distributor size [cm³]		
	Mounting position horizontal	**Mounting position vertical**	**Mounting position wall mounting**
15	0.03	0.06	0.06
20	0.03	0.06	0.06
25	0.06	0.10	0.10
30	0.10	0.20	0.20
35	0.16	0.30	0.30
45	0.20	0.40	0.40
55	0.30	0.60	0.60
65	0.30	0.60	0.60

6.12.3 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 6.32 **Lubricant quantities for oil lubrication of the HG/QH and EG/QE 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	0.3 (3 ×)	0.3 (3 ×)	–	0.3	0.3	–
20	0.5 (3 ×)	0.5 (3 ×)	0.5 (3 ×)	0.5	0.5	0.5
25	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
55	–	2.5 (3 ×)	2.8 (3 ×)	–	2.5	2.8
65	–	4.5 (3 ×)	4.8 (3 ×)	–	4.5	4.8

Table 6.33 **Lubricant quantities for oil lubrication of the WE series**

Series/ size	Initial lubrication partial quantity [cm³]	Relubrication quantity [cm³]
	Heavy duty (C)	Heavy duty (C)
WE_17	0.3 (3 ×)	0.3
WE_21	0.4 (3 ×)	0.4
WE_27	0.7 (3 ×)	0.7
WE_35	1.2 (3 ×)	1.2
WE_50	2.8 (3 ×)	2.8

Table 6.34 **Lubricant quantities for oil lubrication of the MG series**

Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	Super heavy duty (H)	Heavy duty (C)	Super heavy duty (H)
MGN07	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
MGN09	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
MGN12	0.03 (3 ×)	0.03 (3 ×)	0.04	0.07
MGN15	0.04 (3 ×)	0.06 (3 ×)	0.07	0.09
MGW07	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
MGW09	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
MGW12	0.04 (3 ×)	0.07 (3 ×)	0.04	0.07
MGW15	0.07 (3 ×)	0.09 (3 ×)	0.07	0.09

Table 6.35 **Lubricant quantities for oil lubrication of the RG/QR series**

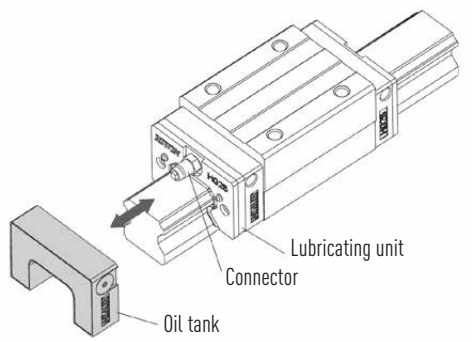
Series/ size	Initial lubrication partial quantity [cm³]		Relubrication quantity [cm³]	
	Heavy duty (C)	Super heavy duty (H)	Heavy duty (C)	Super heavy duty (H)
RG_15	0.3 (3 ×)	–	0.3	–
RG_20	0.5 (3 ×)	0.5 (3 ×)	0.5	0.5
RG_25	0.8 (3 ×)	1.0 (3 ×)	0.8	1.0
RG_30	1.0 (3 ×)	1.2 (3 ×)	1.0	1.2
RG_35	1.3 (3 ×)	1.7 (3 ×)	1.3	1.7
RG_45	1.6 (3 ×)	1.8 (3 ×)	1.6	1.8
RG_55	2.2 (3 ×)	2.6 (3 ×)	2.2	2.6
RG_65	4.2 (3 ×)	4.5 (3 ×)	4.2	4.5

Relubrication interval for oil lubrication

The relubrication intervals for oil lubrication are reduced to 50 % of the relubrication intervals for grease lubrication (period between two lubrications).

6.13 Self-lubricating linear guideway E2

The self-lubricating E2 linear guideway consists of a lubricator between the end cap and the end seal, and a replaceable oil cartridge. The block does not need to be disassembled in order to replace the oil cartridge.



Lubrication passes from the oil cartridge via the connector to the lubricator which then lubricates the track of the rail. Due to the specific design of the oil tank, the block can be assembled in any position without influencing the lubrication effect.
The replacement intervals of the oil tank depend heavily on the loads and the environmental conditions. Environmental influences such as high loads, vibrations and dirt shorten the replacement intervals.

Table 6.36 indicates the maximum interval at which the fill level of the oil tank should be checked.

Table 6.36 **Oil quantities in the oil tank**

Model	Oil quantity [cm³]	Mileage [km]
HG15E2	1.6	2000
HG20E2	3.9	4000
HG25E2	5.1	6000
HG30E2	7.8	8000
HG35E2	9.8	10000
HG45E2	18.5	20000
HG55E2	25.9	30000
HG65E2	50.8	40000
EG15E2	1.7	2000
EG20E2	2.9	3000
EG25E2	4.8	5000
EG30E2	8.9	9000
RG25E2	5.0	6000
RG30E2	7.5	8000
RG35E2	10.7	10000
RG45E2	18.5	20000
RG55E2	26.5	30000
RG65E2	50.5	40000

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.

7. Procedures for incidents

Interference	Possible cause	Correction
High level of operating noise while the linear guideway is running	Travel speed of the rail is too high	Verification of the permissible travel speed
	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

8. Disposal

WARNING!

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

9. Appendix

9.1 Maximum speed and acceleration for HIWIN linear guideways

The following maximum speeds and accelerations are permitted for HIWIN linear guideways*:

Table 9.1 **Permissible maximum speeds and accelerations for HIWIN linear guideways**

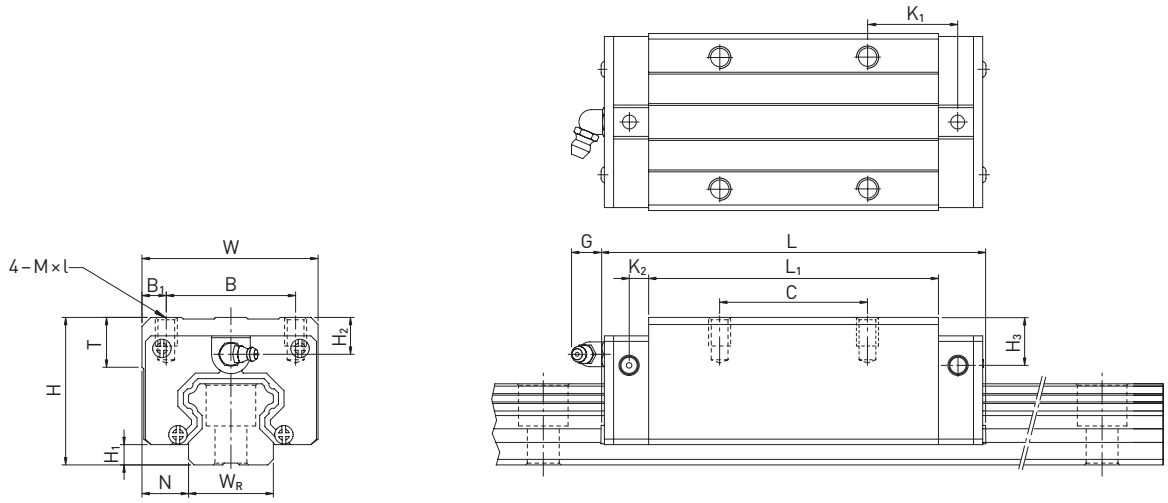
Model	Max. speed v_{max} [m/s]	Max. acceleration a_{max} [m/s²]
QH, QE, QW	5	50
HG, EG, WE, QR	4	40
RG	3	30
MG, PM	2	30

* Depending on the application, higher values are possible. Please consult HIWIN on this matter.

9.2 Technical data for blocks

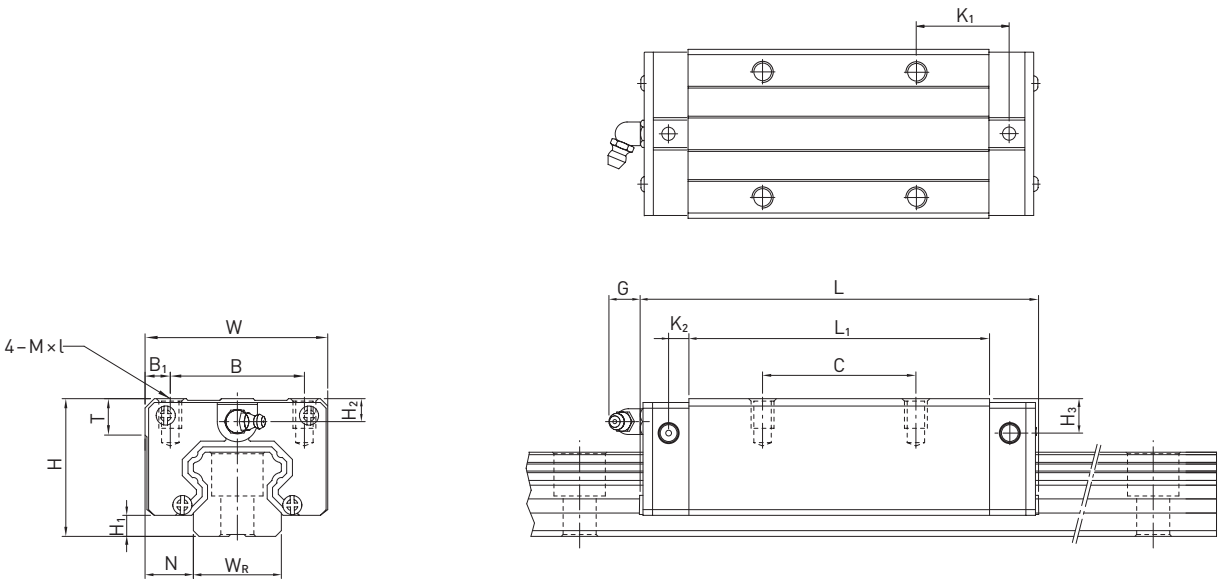
9.2.1 Dimensions of the HG/QH blocks

HGH/QHH



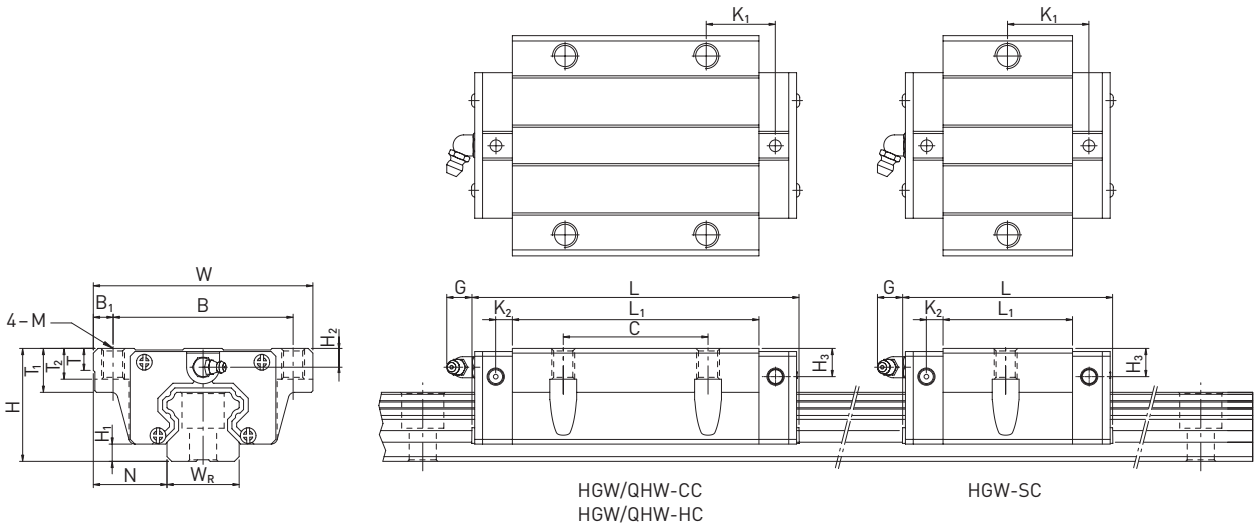
Series Size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Mass [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M × l	T	H_2	H_3	C_{dyn}	C_0	
HGH15CA	28	4.3	9.5	34	26	4.0	26	39.4	61.4	10.00	4.85	5.3	M4 × 5	6.0	7.95	7.7	11380	16970	0.18
QHH15CA	28	4.0	9.5	34	26	4.0	26	39.4	61.4	10.00	5.00	5.3	M4 × 5	6.0	7.95	8.2	13880	14360	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	17750	27760	0.30
HGH20HA							50	65.2	92.2	12.60							21180	35900	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	23080	25630	0.29
QHH20HA							50	65.2	91.4	12.10							27530	31670	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	26480	36490	0.51
HGH25HA							50	78.6	104.6	18.50							32750	49440	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	31780	33680	0.50
QHH25HA							50	78.6	104.0	18.50							39300	43620	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	38740	52190	0.88
HGH30HA							60	93.0	120.4	21.75							47270	69160	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	46490	48170	0.87
QHH30HA							60	93.0	120.4	21.75							56720	65090	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	49520	69160	1.45
HGH35HA							72	105.8	138.2	22.50							60210	91630	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	60520	63840	1.44
QHH35HA							72	105.8	139.4	20.90							73590	86240	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	77570	102710	2.73
HGH45HA							80	128.8	171.2	28.90							94540	136460	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	89210	94810	2.72
QHH45HA							80	128.8	171.2	29.09							108720	128430	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	114440	148330	4.17
HGH55HA							95	155.8	204.8	36.40							139350	196200	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	163630	215330	7.00
HGH65HA							120	203.6	259.6	47.80							208360	303130	9.82

HGL



Series Size	Installation dimensions [mm]			Dimensions of the block [mm]												Load ratings [N]		Mass [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	11380	16970	0.14
HGL25CA	36	5.5	12.5	48	35	6.5	35	58.0	84.0	15.70	6.00	12.0	M6 × 6	8.0	6.00	5.0	26480	36490	0.42
HGL25HA							50	78.6	104.6	18.50							32750	49440	0.57
HGL30CA	42	6.0	16.0	60	40	10.0	40	70.0	97.4	20.25	6.00	12.0	M8 × 10	8.5	6.50	10.8	38740	52190	0.78
HGL30HA							60	93.0	120.4	21.75							47270	69160	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	49520	69160	1.14
HGL35HA							72	105.8	138.2	22.50							60210	91630	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	77570	102710	2.08
HGL45HA							80	128.8	171.2	28.90							94540	136460	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	114440	148330	3.25
HGL55HA							95	155.8	204.8	36.40							139350	196200	4.27

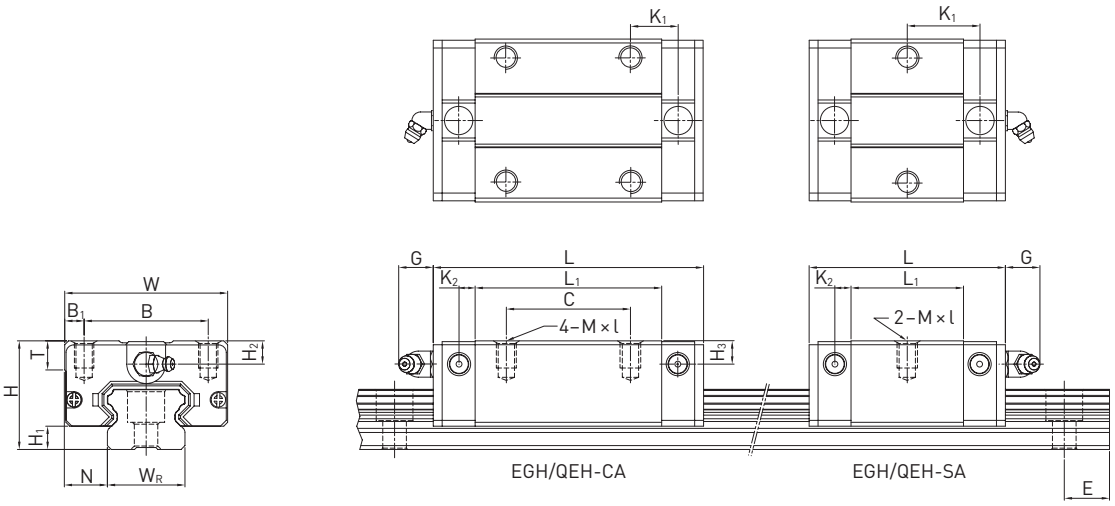
HGW/QHW



Series Size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Mass [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	11380	16970	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	13880	14360	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	12190	16110	0.28
HGW20CC							40	50.5	77.5	10.25									17750	27760	0.40
HGW20HC								65.2	92.2	17.60									21180	35900	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	23080	25630	0.40
QHW20HC								65.2	91.4	17.10									27530	31670	0.52
HGW25CC	36	5.5	23.5	70	57	6.5	45	58.0	84.0	10.70	6.00	M8	12.0	8.0	14.0	10.0	6.00	5.0	26480	36490	0.59
HGW25HC								78.6	104.6	21.00									32750	49440	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	31780	33680	0.59
QHW25HC								78.6	104.0	21.00									39300	43620	0.80
HGW30CC	42	6.0	31.0	90	72	9.0	52	70.0	97.4	14.25	6.00	M10	12.0	8.5	16.0	10.0	6.50	10.8	38740	52190	1.09
HGW30HC								93.0	120.4	25.75									47270	69160	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	46490	48170	1.09
QHW30HC								93.0	120.4	25.75									56720	65090	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	49520	69160	1.56
HGW35HC								105.8	138.2	27.50									60210	91630	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	60520	63840	1.56
QHW35HC								105.8	139.4	25.90									73590	86240	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	77570	102710	2.79
HGW45HC								128.8	171.2	28.90									94540	136460	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	89210	94810	2.79
QHW45HC								128.8	171.2	28.90									108720	128430	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	114440	148330	4.52
HGW55HC								155.8	204.8	36.40									139350	196200	5.96
HGW65CC	90	15.0	53.5	170	142	14.0	110	144.2	200.2	23.10	14.00	M16	12.9	25.0	37.5	23.0	15.00	15.0	163630	215330	9.17
HGW65HC								203.6	259.6	52.80									208360	303130	12.89

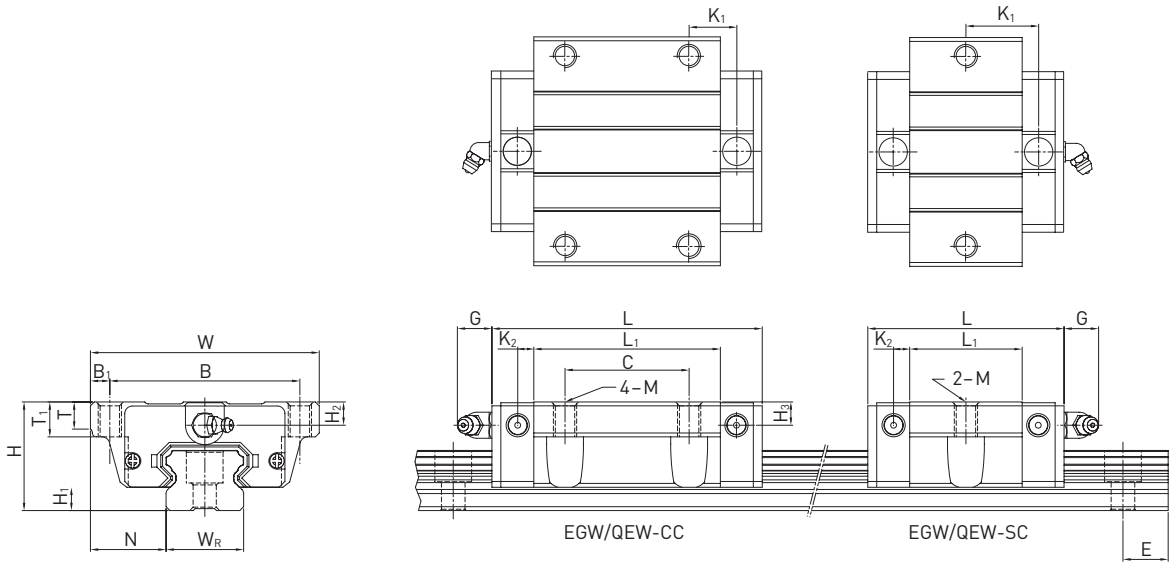
9.2.2 Dimensions of the EG/QE blocks

EGH/QEH



Series Size	Installation dimensions [mm]			Dimensions of the block [mm]												Load ratings [N]		Mass [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	5350	9400	0.09
EGH15CA							26	39.8	56.8	10.15							7830	16190	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	8560	8790	0.09
QEH15CA							26	39.8	56.8	10.15							12530	15280	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	7230	12740	0.15
EGH20CA							32	48.1	69.1	12.30							10310	21130	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	11570	12180	0.15
QEH20CA							32	48.1	69.1	12.30							16500	20210	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	11400	19500	0.25
EGH25CA							35	59.0	82.6	16.15							16270	32400	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	18240	18900	0.24
QEH25CA							35	59.0	83.6	16.15							26030	31490	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	16420	28100	0.45
EGH30CA							40	70.1	98.1	21.05							23700	47460	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	26270	27820	0.44
QEH30CA							40	70.1	96.1	20.05							37920	46630	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	22660	37380	0.74
EGH35CA							50	78.0	108.0	20.00							33350	64840	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	36390	36430	0.58
QEH35CA							50	83.0	108.0	21.30							51180	59280	0.90

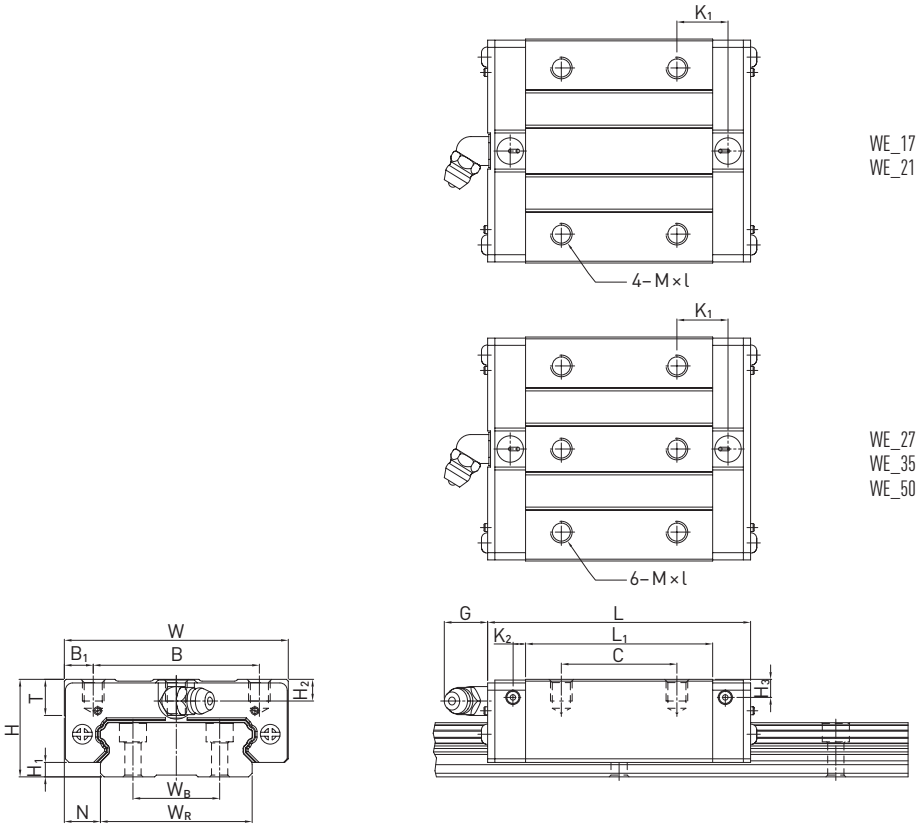
EGW/QEW



Series Size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Mass [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	5350	9400	0.12
EGW15CC							26	39.8	56.8	10.15								7830	16190	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	7	5.5	6.0	8560	8790	0.12
QEW15CC							26	39.8	56.8	10.15								12530	15280	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	7230	12740	0.19
EGW20CC							32	48.1	69.1	12.30								10310	21130	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	9	6.0	6.5	11570	12180	0.19
QEW20CC							32	48.1	69.1	12.30								16500	20210	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	11400	19500	0.35
EGW25CC							35	59.0	82.6	16.15								16270	32400	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	10	8.0	8.0	18240	18900	0.34
QEW25CC							35	59.0	83.6	16.15								26030	31490	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	16420	28100	0.62
EGW30CC							40	70.1	98.1	21.05								23700	47460	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	10	8.0	9.0	26270	27820	0.61
QEW30CC							40	70.1	96.1	20.05								37920	46630	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	22660	37380	0.91
EGW35CC							50	78.0	108.0	20.00								33350	64840	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	36390	36430	0.77
QEW35CC							50	83.0	108.0	21.30								51180	59280	1.19

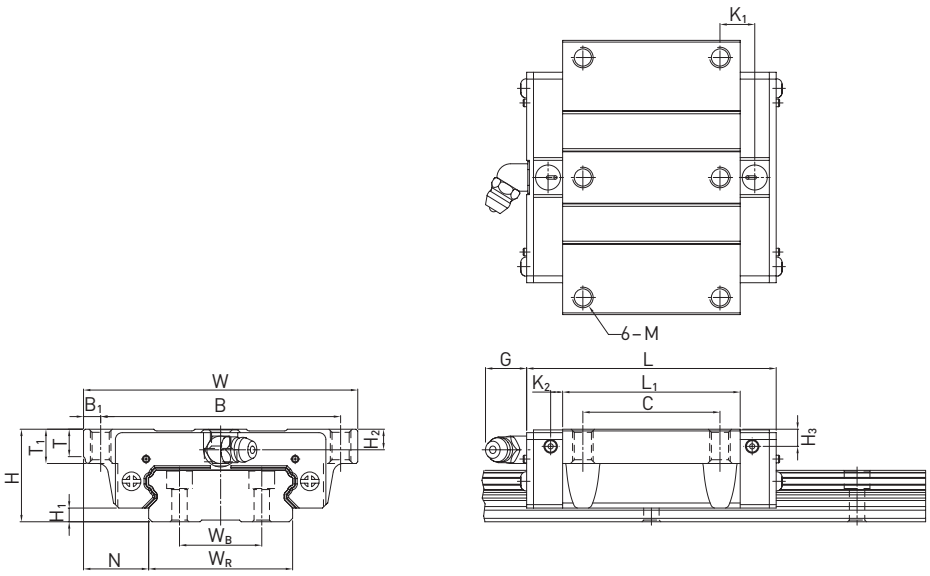
9.2.3 Dimensions of the WE blocks

WEH



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	5230	9640	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	7210	13700	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	12400	21600	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	29800	49400	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	61520	97000	3.16

WEW

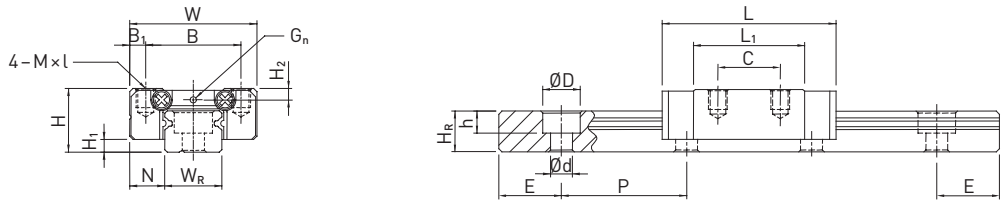


Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]														Load Ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	C_{dyn}	C_0	
WEW17CC	17	2.5	13.5	60	53	3.5	26	35.0	50.6	—	3.10	4.9	M4	5.3	6	4.0	3.0	5230	9640	0.13
WEW21CC	21	3.0	15.5	68	60	4.0	29	41.7	59.0	9.68	3.65	12.0	M5	7.3	8	4.5	4.2	7210	13700	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	12400	21600	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	29800	49400	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	61520	97000	3.71

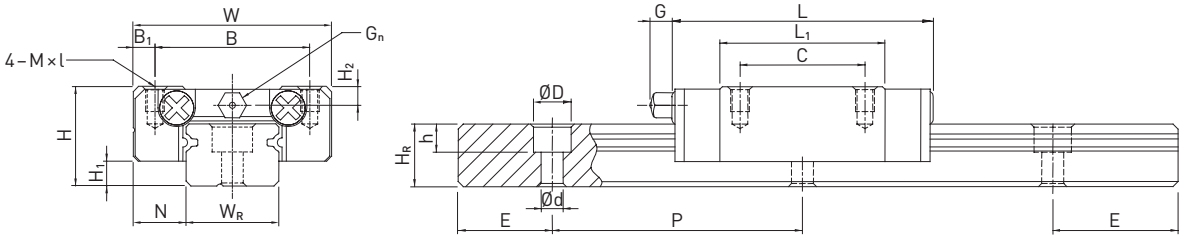
9.2.4 Dimensions of the MG blocks

MGN

MGN7, MGN9, MGN12



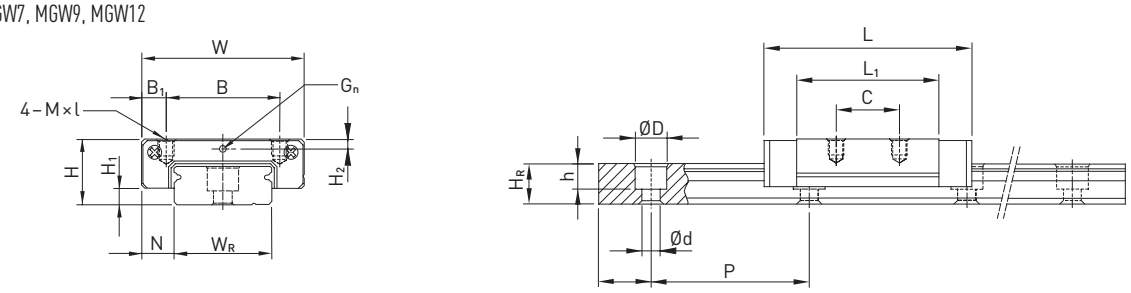
MGN15



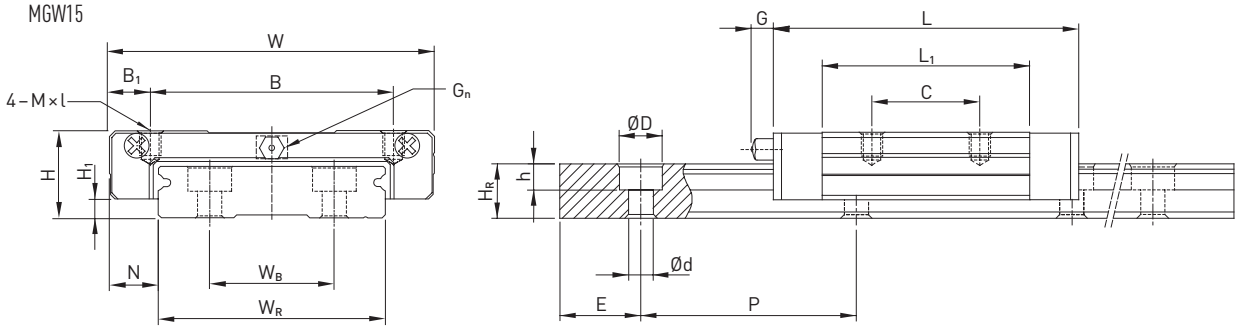
Series Size	Installation dimensions [mm]			Dimensions of the block [mm]									Load ratings [N]		Mass [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	M × l	H_2	C_{dyn}	C_0	
MGN07C	8	1.5	5.0	17	12	2.5	8	13.5	22.5	—	Ø 1.2	M2 × 2.5	1.5	980	1240	0.01
MGN07H							13	21.8	30.8					1370	1960	0.02
MGN09C	10	2.0	5.5	20	15	2.5	10	18.9	28.9	—	Ø 1.4	M3 × 3	1.8	1860	2550	0.02
MGN09H							16	29.9	39.9					2550	4020	0.03
MGN12C	13	3.0	7.5	27	20	3.5	15	21.7	34.7	—	Ø 2	M3 × 3.5	2.5	2840	3920	0.03
MGN12H							20	32.4	45.4					3720	5880	0.05
MGN15C	16	4.0	8.5	32	25	3.5	20	26.7	42.1	4.5	M3	M3 × 4	3.0	4610	5590	0.06
MGN15H							25	43.4	58.8					6370	9110	0.09

MGW

MGW7, MGW9, MGW12



MGW15

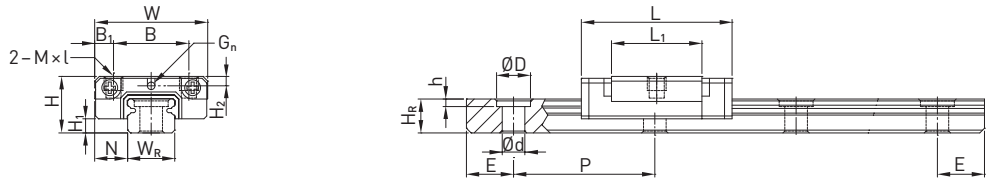


Series Size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Mass [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	G	G_n	M × l	H_2	C_{dyn}	C_0	
MGW07C	9	1.9	5.5	25	19	3.0	10	21.0	31.2	–	Ø1.2	M3 × 3	1.85	1370	2060	0.02
MGW07H							19	30.8	41.0					1770	3140	0.03
MGW09C	12	2.9	6.0	30	21	4.5	12	27.5	39.3	–	Ø1.4	M3 × 3	2.40	2750	4120	0.04
MGW09H					23	3.5	24	38.5	50.7					3430	5890	0.06
MGW12C	14	3.4	8.0	40	28	6.0	15	31.3	46.1	–	Ø2	M3 × 3.6	2.80	3920	5590	0.07
MGW12H							28	45.6	60.4					5100	8240	0.10
MGW15C	16	3.4	9.0	60	45	7.5	20	38.0	54.8	5.2	M3	M4 × 4.2	3.20	6770	9220	0.14
MGW15H							35	57.0	73.8					8930	13380	0.22

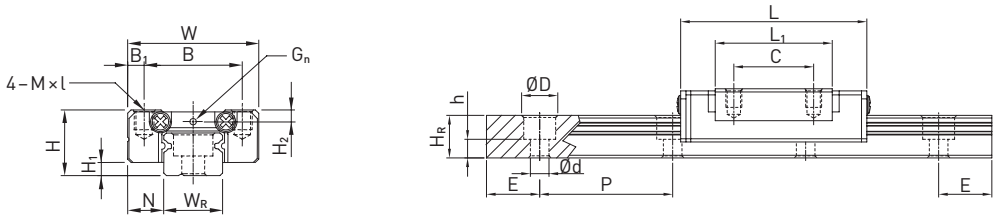
9.2.5 Dimensions of the PM blocks

PMN

PMN05



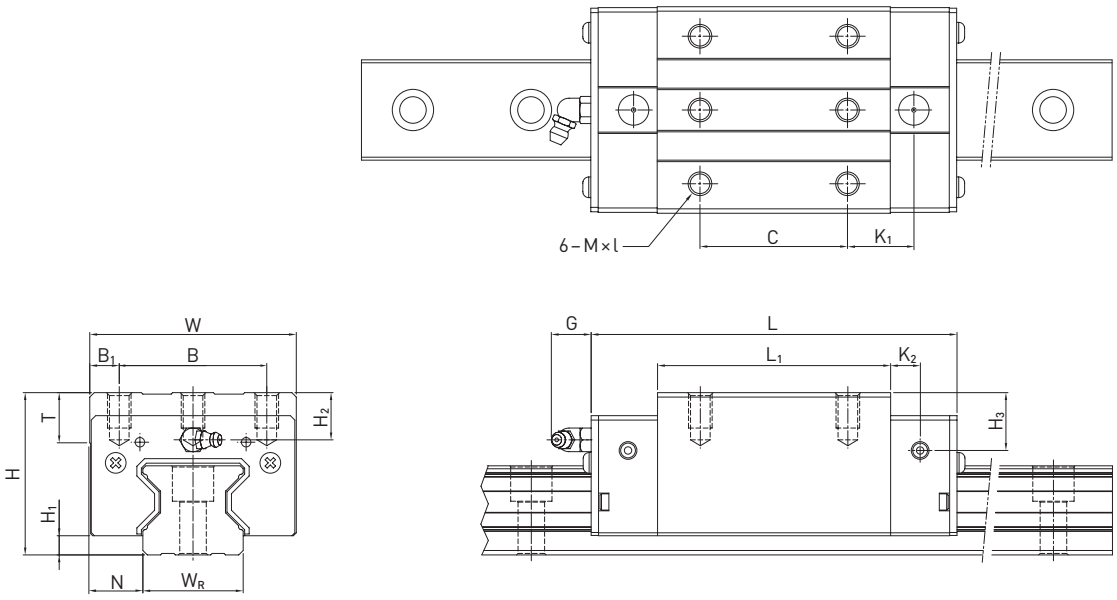
PMN09, PMN12



Series Size	Installation dimensions [mm]			Dimensions of the block [mm]									Load ratings [N]		Mass [kg]
	H	H_1	N	W	B	B_1	C	L_1	L	G_n	M × l	H_2	C_{dyn}	C_0	
PMN05C	6	1.5	3.5	12	8	2.0	—	9.6	16	Ø0.8	M2 × 1.5	1.0	540	840	0.01
PMN05H								12.6	19				667	1089	
PMN09C	10	2.2	5.5	20	15	2.5	10	19.4	30	Ø1.4	M3 × 8	1.8	2010	2840	0.01
PMN12C	13	3.0	7.5	27	20	3.5	15	22.0	35	Ø2	M3 × 3.5	2.5	2840	3920	0.03

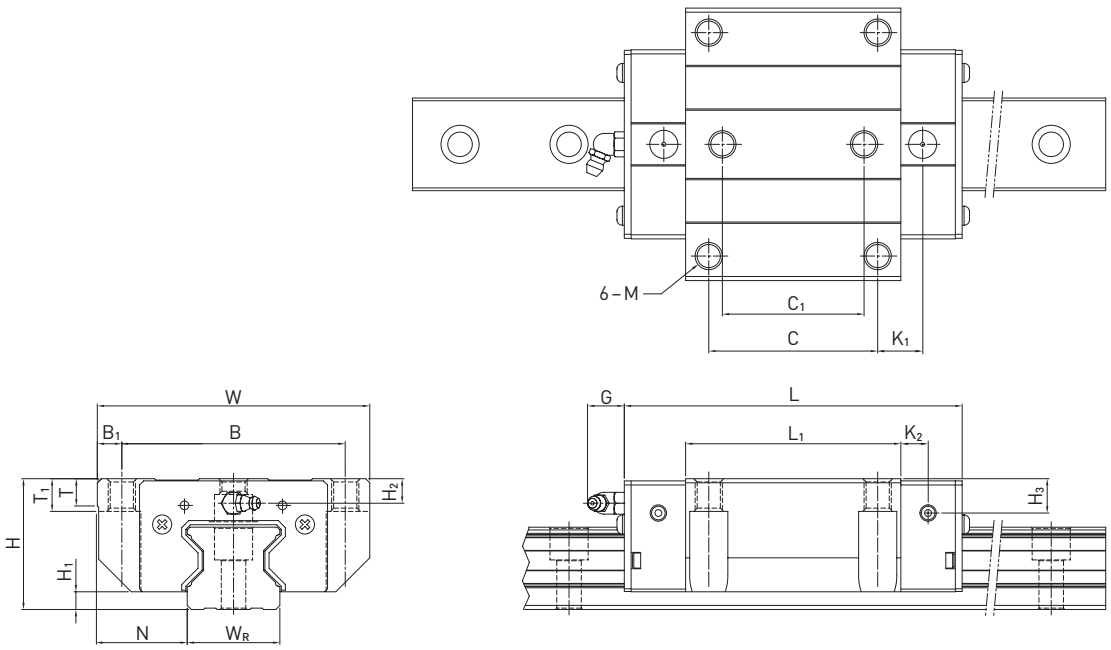
9.2.6 Dimensions of the RG/QR blocks

RGH/QRH



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	11300	24000	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	21300	46700	0.40
RGH20HA							50	77.5	106.0	18.80							26900	63000	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	27700	57100	0.61
RGH25HA							50	81.0	114.4	21.50							33900	73400	0.75
QRH25CA	40	5.5	12.5	48	35	6.5	35	66.0	97.9	20.75	7.25	12.0	M6 × 8	9.5	10.2	10.0	38500	54400	0.60
QRH25HA							50	81.0	112.9	21.50							44700	65300	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	39100	82100	0.90
RGH30HA							60	93.0	131.8	24.50							48100	105000	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	51500	73000	0.89
QRH30HA							60	93.0	131.8	24.50							64700	95800	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	57900	105200	1.57
RGH35HA							72	106.5	151.5	25.25							73100	142000	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	77000	94700	1.56
QRH35HA							72	106.5	151.5	25.25							95700	126300	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	92600	178800	3.18
RGH45HA							80	139.8	187.0	37.90							116000	230900	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	123200	156400	3.16
QRH45HA							80	139.8	187.0	37.90							150800	208600	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	130500	252000	4.89
RGH55HA							95	173.8	232.0	51.90							167800	348000	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	213000	411600	8.89
RGH65HA							120	223.0	295.0	67.30							275300	572700	12.13

RGW/QRW



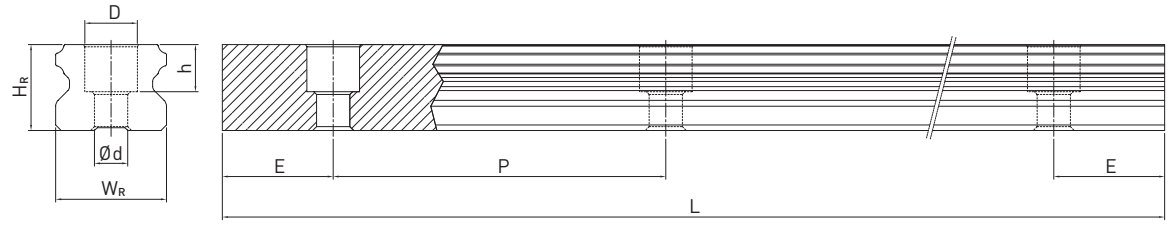
Series Size	Installation dimensions [mm]			Dimensions of the block [mm]														Load Ratings [N]		Weight [kg]
	H	H_1	N	W	B	B_1	C	C_1	L_1	L	K_1	K_2	G	M	T	T_1	H_2	H_3	C_{dyn}	C_0	
RGW15CC	24	4.0	16.0	47	38	4.5	30	26	45.0	68.0	11.40	4.70	5.3	M5	6.0	7	3.60	6.1	11300	24000	0.22
RGW20CC	30	5.0	21.5	63	53	5.0	40	35	57.5	86.0	13.80	6.00	5.3	M6	8.0	10	4.30	4.3	21300	46700	0.47
RGW20HC									77.5	106.0	23.80								26900	63000	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	6.20	6.0	27700	57100	0.72
RGW25HC									81.0	114.4	24.00								33900	73400	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	6.20	6.0	38500	54400	0.71
QRW25HC									81.0	112.9	24.00								44700	65300	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	6.50	7.3	39100	82100	1.16
RGW30HC									93.0	131.8	28.50								48100	105000	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	6.50	7.3	51500	73000	1.15
QRW30HC									93.0	131.8	28.50								64700	95800	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	9.00	12.6	57900	105200	1.75
RGW35HC									106.5	151.5	30.25								73100	142000	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	9.00	12.6	77000	94700	1.74
QRW35HC									106.5	151.5	30.25								95700	126300	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	10.00	14.0	92600	178800	3.43
RGW45HC									139.8	187.0	37.90								116000	230900	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	10.00	14.0	123200	156400	3.41
QRW45HC									139.8	187.0	37.90								150800	208600	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	12.00	17.5	130500	252000	5.43
RGW55HC									173.8	232.0	51.90								167800	348000	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	15.00	15.0	213000	411600	11.63
RGW65HC									223.0	295.0	72.30								275300	572700	16.58

9.3 Technical data for rails

9.3.1 Dimensions of the HG rails

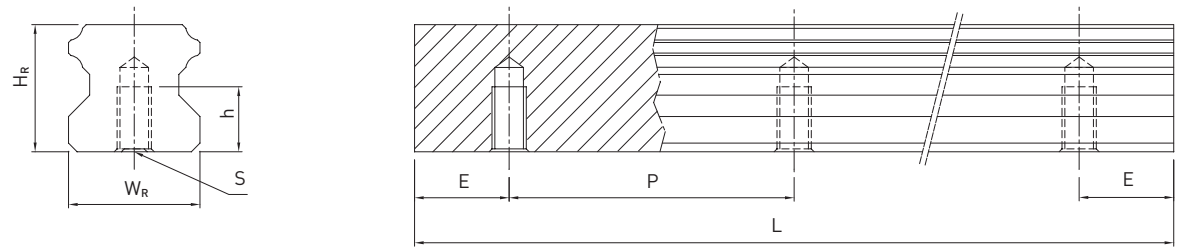
The HG rails are used for both the HG and QH blocks.

HGR_R



Series Size	Screws for rail [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
		W_R	H_R	D	h	d	P					
HGR15R	M4 × 16	15	15.0	7.5	5.3	4.5	60	4000	3900	6	54	1.45
HGR20R	M5 × 16	20	17.5	9.5	8.5	6.0	60	4000	3900	7	53	2.21
HGR25R	M6 × 20	23	22.0	11.0	9.0	7.0	60	4000	3900	8	52	3.21
HGR30R	M8 × 25	28	26.0	14.0	12.0	9.0	80	4000	3920	9	71	4.47
HGR35R	M8 × 25	34	29.0	14.0	12.0	9.0	80	4000	3920	9	71	6.30
HGR45R	M12 × 35	45	38.0	20.0	17.0	14.0	105	4000	3885	12	93	10.41
HGR55R	M14 × 45	53	44.0	23.0	20.0	16.0	120	4000	3840	14	106	15.08
HGR65R	M16 × 50	63	53.0	26.0	22.0	18.0	150	4000	3750	15	135	21.18

HGR_T



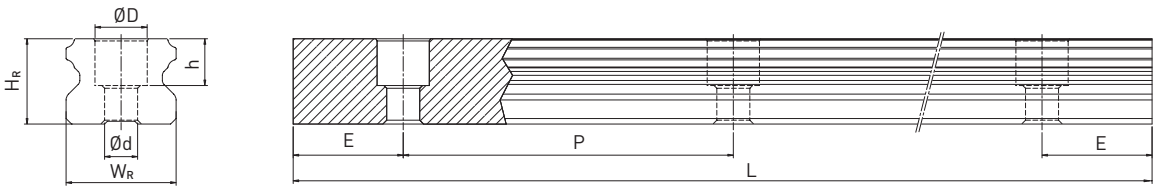
Series Size	Dimensions of the rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
	W_R	H_R	S	h	P					
HGR15T	15	15.0	M5	8	60	4000	3900	6	54	1.48
HGR20T	20	17.5	M6	10	60	4000	3900	7	53	2.29
HGR25T	23	22.0	M6	12	60	4000	3900	8	52	3.35
HGR30T	28	26.0	M8	15	80	4000	3920	9	71	4.67
HGR35T	34	29.0	M8	17	80	4000	3920	9	71	6.51
HGR45T	45	38.0	M12	24	105	4000	3885	12	93	10.87
HGR55T	53	44.0	M14	24	120	4000	3840	14	106	15.67
HGR65T	63	53.0	M20	30	150	4000	3750	15	135	21.73

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.

9.3.2 Dimensions of the EG rails

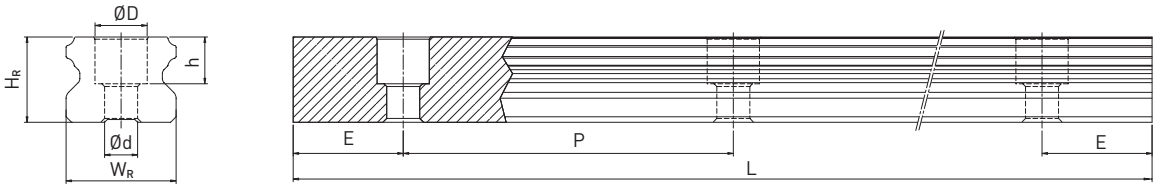
The EG rails are used for both the EG and QE blocks.

EGR_R



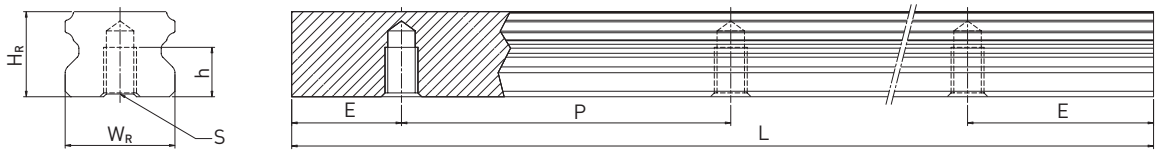
Series Size	Screws for rail [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
		W_R	H_R	D	h	d	P					
EGR15R	M3 × 16	15	12.5	6.0	4.5	3.5	60	4000	3900	6	54	1.25
EGR20R	M5 × 16	20	15.5	9.5	8.5	6.0	60	4000	3900	7	53	2.08
EGR25R	M6 × 20	23	18.0	11.0	9.0	7.0	60	4000	3900	8	52	2.67
EGR30R	M6 × 25	28	23.0	11.0	9.0	7.0	80	4000	3920	9	71	4.35
EGR35R	M8 × 25	34	27.5	14.0	12.0	9.0	80	4000	3920	9	71	6.14

EGR_U



Series Size	Screws for rail [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
		W_R	H_R	D	h	d	P					
EGR15U	M4 × 16	15	12.5	7.5	5.3	4.5	60	4000	3900	6	54	1.23
EGR30U	M8 × 25	28	23.0	14.0	12.0	9.0	80	4000	3920	9	71	4.23

EGR_T

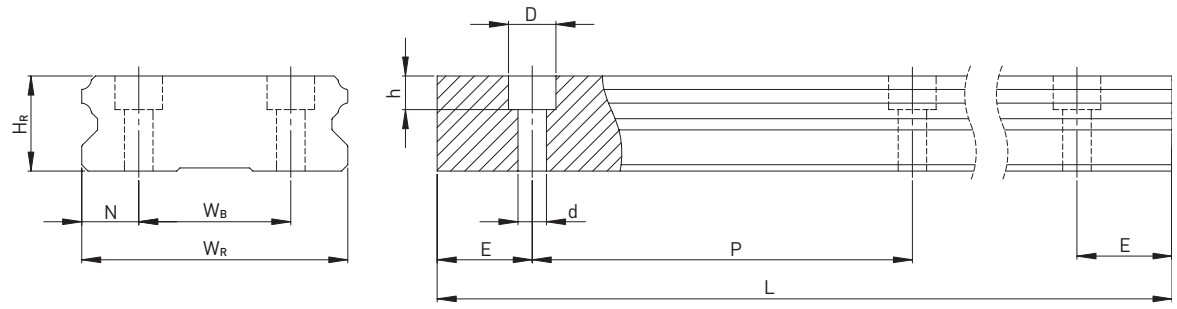


Series Size	Dimensions of the rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
	W_R	H_R	S	h	P					
EGR15T	15	12.5	M5	7	60	4000	3900	6	54	1.26
EGR20T	20	15.5	M6	9	60	4000	3900	7	53	2.15
EGR25T	23	18.0	M6	10	60	4000	3900	8	52	2.79
EGR30T	28	23.0	M8	14	80	4000	3920	9	71	4.42
EGR35T	34	27.5	M8	17	80	4000	3920	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 E1/2 dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the E1/2 min.
3. The rails are shortened to the required length. If the E1/2 dimensions are not indicated, these will be carried out symmetrically.

9.3.3 Dimensions of the WE rails

WER_R

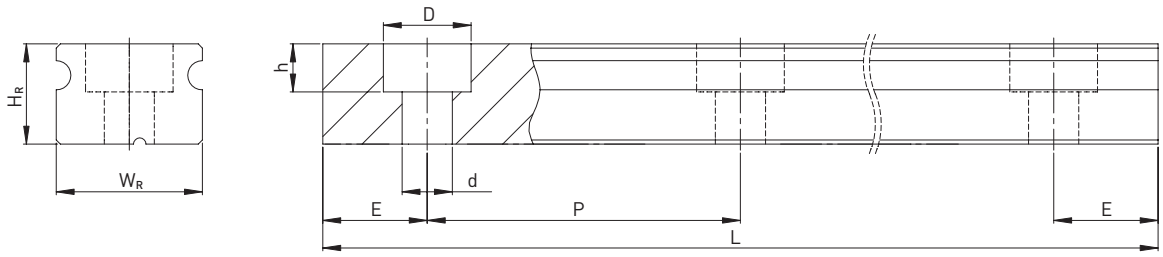


Series/ size	Assembly screw for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		W_R	W_B	H_R	D	h	d	P				
WER17R	M4 × 12	33	18	9.3	7.5	5.3	4.5	40	4000	6	34	2.2
WER21R	M4 × 12	37	22	11.0	7.5	5.3	4.5	50	4000	6	44	3.0
WER27R	M4 × 16	42	24	15.0	7.5	5.3	4.5	60	4000	6	54	4.7
WER35R	M6 × 20	69	40	19.0	11.0	9.0	7.0	80	4000	8	72	9.7
WER50R	M8 × 25	90	60	24.0	14.0	12.0	9.0	80	4000	9	71	14.6

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

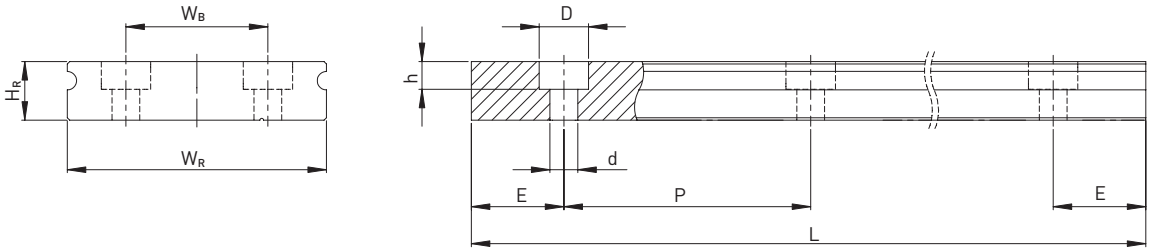
9.3.4 Dimensions of the MG rails

MGN_R



Series Size	Screws for rails [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
		W_R	H_R	D	h	d	P					
MGNR07R	M2 × 6	7	4.8	4.2	2.3	2.4	15	600	585	5	10	0.22
MGNR09R	M3 × 8	9	6.5	6.0	3.5	3.5	20	1200	1180	5	15	0.38
MGNR12R	M3 × 8	12	8.0	6.0	4.5	3.5	25	2000	1975	5	20	0.65
MGNR15R	M3 × 10	15	10.0	6.0	4.5	3.5	40	2000	1960	6	34	1.06

MGW_R

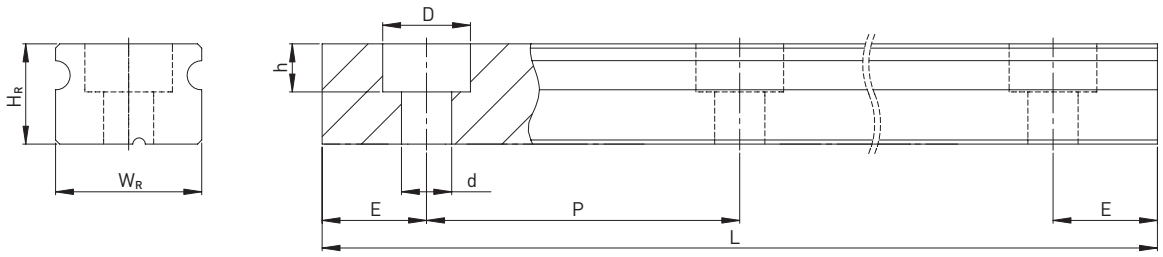


Series Size	Screws for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Mass [kg/m]
		W_R	H_R	W_B	D	h	d	P					
MGWR07R	M3 × 6	14	5.2	—	6	3.2	3.5	30	600	570	6	24	0.51
MGWR09R	M3 × 8	18	7.0	—	6	4.5	3.5	30	1200	1170	6	24	0.91
MGWR12R	M4 × 8	24	8.5	—	8	4.5	4.5	40	2000	1960	8	32	1.49
MGWR15R	M4 × 10	42	9.5	23	8	4.5	4.5	40	2000	1960	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.

9.3.5 Dimensions of the PM rail

PMN_R



Series Size	Screws for rail [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	mass [kg/m]
		W_R	H_R	D	h	d	P					
PMNR05R	M2 × 6	5	3.6	3.6	0.8	2.4	15.0	250	240	4	11	0.15
PMNR09R	M3 × 8	9	6.5	6.0	3.5	3.5	20.0	1200	1180	5	15	0.38
PMNR12R	M3 × 8	12	8.0	6.0	4.5	3.5	25.0	2000	1975	5	20	0.65

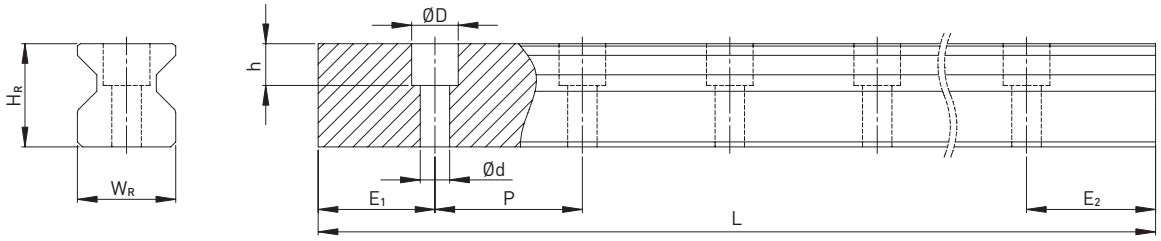
The special screws needed for mounting rail PMN05R are delivered with the rail order.

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.

9.3.6 Dimensions of the RG rails

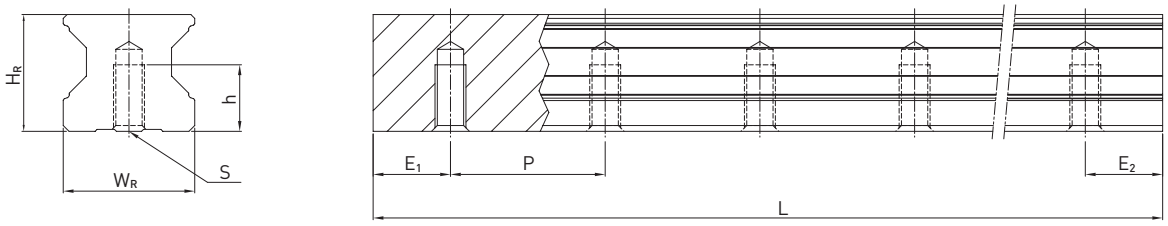
The RG rails are used for both the RG and QR blocks.

RGR_R



Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		W_R	H_R	D	h	d	P					
RGR15R	M4 × 16	15	16.5	7.5	5.7	4.5	30.0	4000	3960.0	6	24.0	1.70
RGR20R	M5 × 20	20	21.0	9.5	8.5	6.0	30.0	4000	3960.0	7	23.0	2.66
RGR25R	M6 × 20	23	23.6	11.0	9.0	7.0	30.0	4000	3960.0	8	22.0	3.08
RGR30R	M8 × 25	28	28.0	14.0	12.0	9.0	40.0	4000	3920.0	9	31.0	4.41
RGR35R	M8 × 25	34	30.2	14.0	12.0	9.0	40.0	4000	3920.0	9	31.0	6.06
RGR45R	M12 × 35	45	38.0	20.0	17.0	14.0	52.5	4000	3937.5	12	40.5	9.97
RGR55R	M14 × 45	53	44.0	23.0	20.0	16.0	60.0	4000	3900.0	14	46.0	13.98
RGR65R	M16 × 50	63	53.0	26.0	22.0	18.0	75.0	4000	3900.0	15	60.0	20.22

RGR_T



Series/ size	Dimensions of rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
	W_R	H_R	S	h	P					
RGR15T	15	16.5	M5	8	30.0	4000	3960.0	6	24.0	1.86
RGR20T	20	21.0	M6	10	30.0	4000	3960.0	7	23.0	2.76
RGR25T	23	23.6	M6	12	30.0	4000	3960.0	8	22.0	3.36
RGR30T	28	28.0	M8	15	40.0	4000	3920.0	9	31.0	4.82
RGR35T	34	30.2	M8	17	40.0	4000	3920.0	9	31.0	6.48
RGR45T	45	38.0	M12	24	52.5	4000	3937.5	12	40.5	10.83
RGR55T	53	44.0	M14	24	60.0	4000	3900.0	14	46.0	15.15
RGR65T	63	53.0	M20	30	75.0	4000	3900.0	15	60.0	21.24

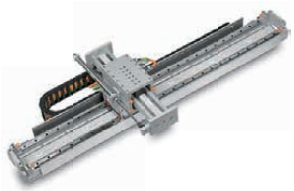
Note:

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

Linear Guideways

Ballscrews



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