

## Assembly Instructions

Linear Guideways



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Information about the document

**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:

 <b>DANGER!</b>
<b>Imminent danger!</b> Non-compliance with the safety notices will result in serious injury or death!
 <b>WARNING!</b>
<b>Potentially dangerous situation!</b> Non-compliance with the safety notices runs the risk of serious injury or death!
 <b>CAUTION!</b>
<b>Potentially dangerous situation!</b> Non-compliance with the safety notices runs the risk of slight to moderate injury!
<b>WARNING!</b>
<b>Potentially dangerous situation!</b> 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.



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.

Safety/product descriptions

**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**

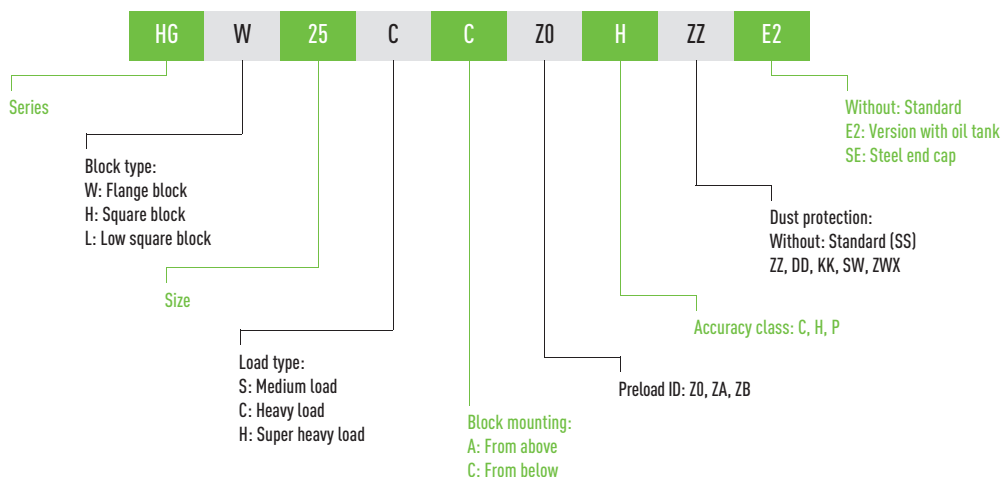
If you have any questions, please contact our sales organisation:  
Tel.: +49 (0) 781 / 9 32 78-0  
Fax: +49 (0) 781 / 9 32 78-90  
If you have questions, suggestions or corrections concerning the documentation, please send a fax to the following number:  
+49 (0) 781 / 9 32 78-90

**3. Product descriptions**

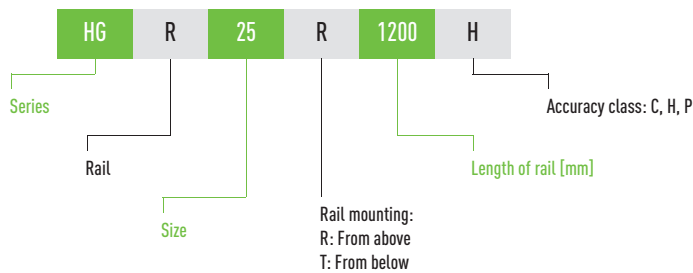
**3.1 Article numbers of the linear guideways**

**3.1.1 Non-assembled type**

- Article number of the block

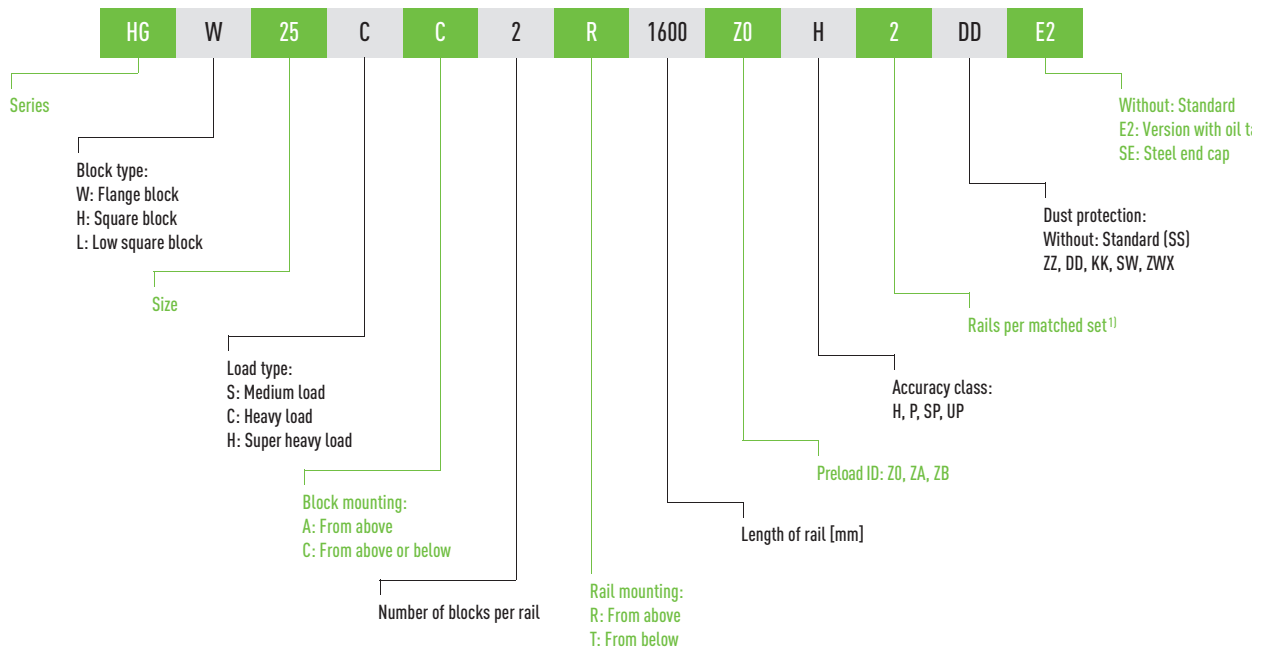


○ Article number of the rail



### 3.1.2 Assembled type

○ Article number of the fully assembled linear guideway



Note:

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

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

### 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:**

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.

**NOTE**

### 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.

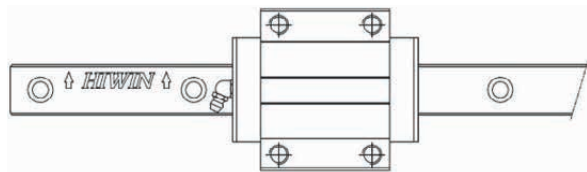


Fig. 4.1 Identification of the datum plane of a rail

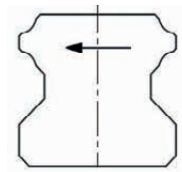


Fig. 4.2 Identification of the datum plane of a short rail and of a series PG rail

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.

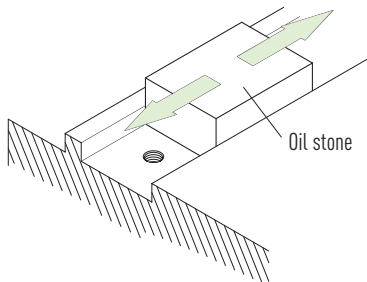


Fig. 4.3 Cleaning the mounting surface

Assembly

**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.

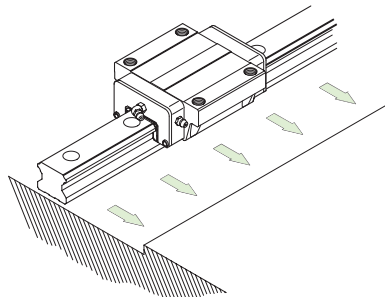


Fig. 4.4 **Aligning with the datum plane**

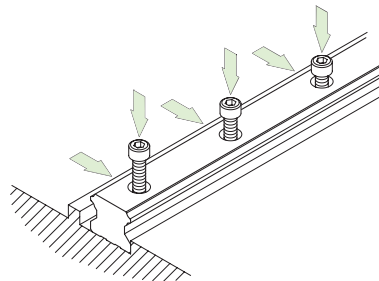


Fig. 4.5 **Adjusting the rail on the bed and assembly of the screws**

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

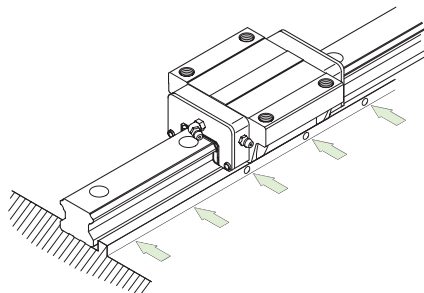


Fig. 4.6 **Tightening the push screws**

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 section 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 section 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.

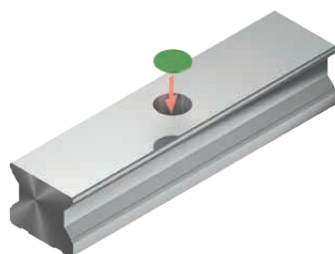


Fig. 4.7 Positioning of the plastic bolt cap

**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.

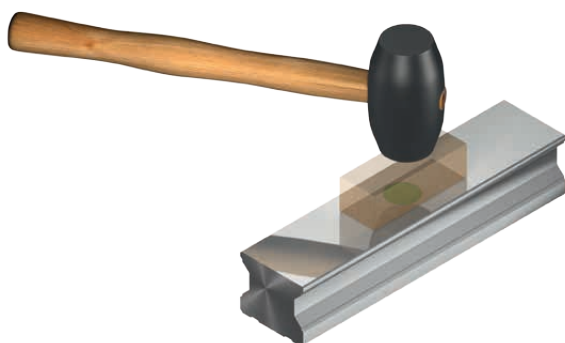


Fig. 4.8 Pressing in of the plastic bolt cap with the help of a press-in block

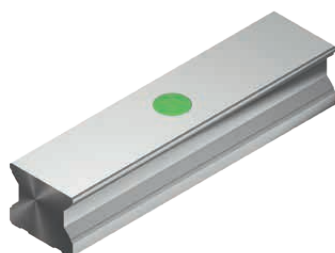


Fig. 4.9 Fully assembled plastic bolt cap



#### 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.

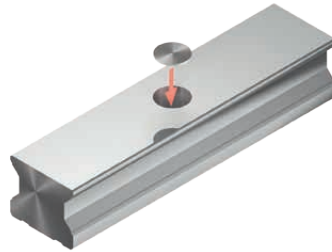


Fig. 4.10 Positioning of the steel or brass bolt cap

**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.

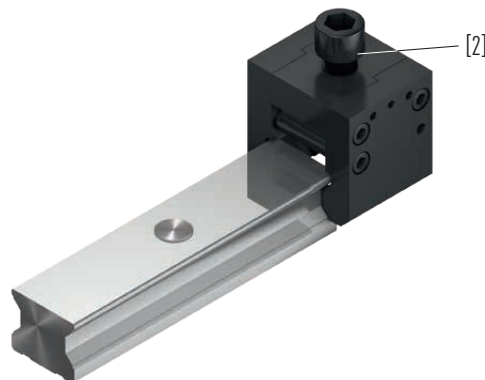


Fig. 4.11 Positioning of the assembly tool on the rail

**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](#).

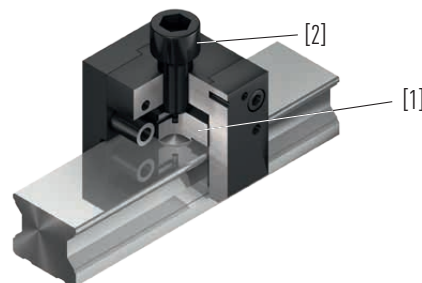


Fig. 4.12 Pressing in of the bolt cap by tightening the screw [2]

**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

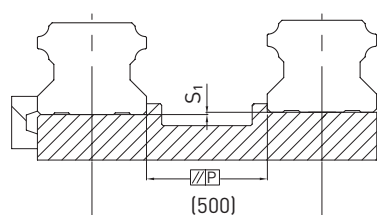


Fig. 4.14 Parallelism of the reference surface P – HG/QH series

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:  $\mu\text{m}$

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:  $\mu\text{m}$

### 4.4.1.2 EG and QE series

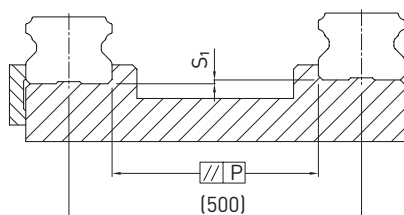


Fig. 4.15 Parallelism of the reference surface P – EG/QE series

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:  $\mu\text{m}$

Table 4.6 Maximum tolerance for the height of the reference surface (S<sub>1</sub>) – 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:  $\mu\text{m}$

### 4.4.1.3 WE series

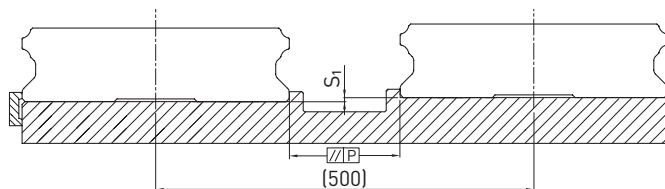


Fig. 4.16 Parallelism of the reference surface P – WE series

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:  $\mu\text{m}$

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:  $\mu\text{m}$

#### 4.4.1.4 MG series

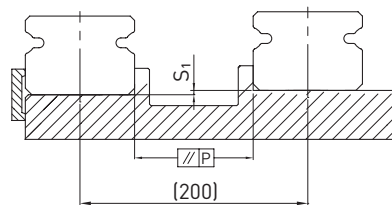


Fig. 4.17 Parallelism of the reference surface P – MG series

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

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

Unit:  $\mu\text{m}$



Table 4.10 Maximum tolerance for the height of the reference surface (S<sub>1</sub>) – MG series

Series/size	Preload class		
	ZF	Z0	Z1
MG_05	20	20	2
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_05	0.015/200
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 RG and QR series

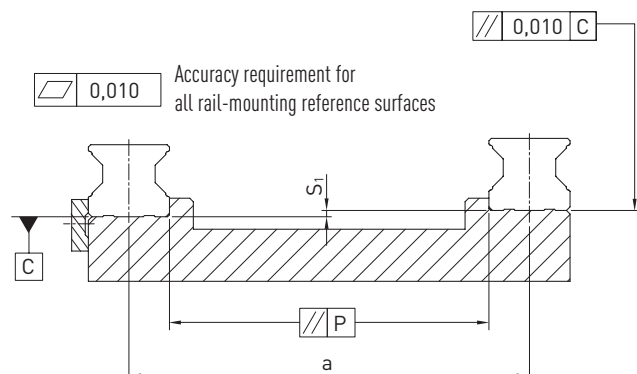


Fig. 4.18 Parallelism of the reference surface P – RG/QR series

○ Tolerances for the parallelism of the reference surface (P)

Table 4.12 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:  $\mu\text{m}$

○ Tolerances for the height of the reference surface ( $S_1$ )

$$S_1 = a \times K$$

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

Table 4.13 Coefficient of the height tolerance (K) – RG/QR series

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

### 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 [mm]  
 $b$  Distance between blocks [mm]

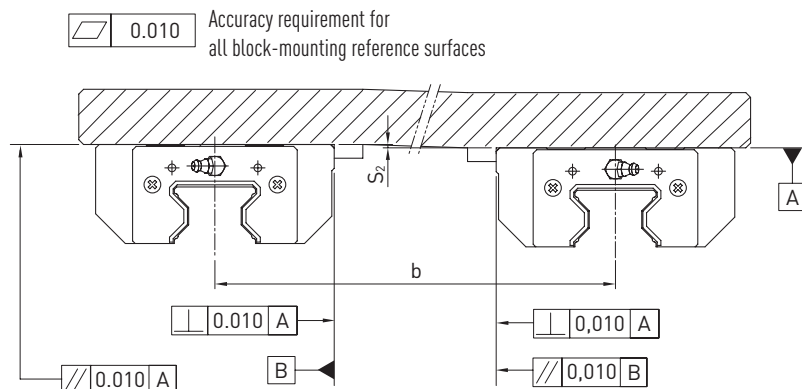


Fig. 4.19 Maximum height tolerance  $S_2$

- 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 [mm]  
 $c$  Distance between blocks [mm]

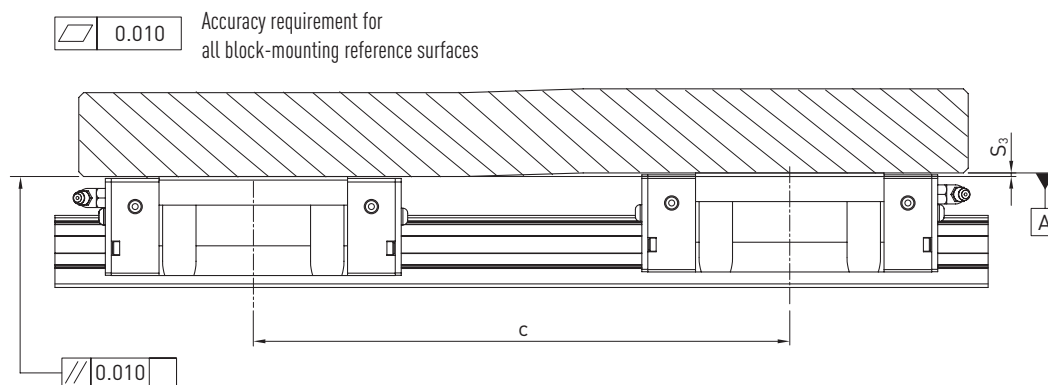


Fig. 4.20 Maximum height tolerance  $S_3$

Assembly

**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**

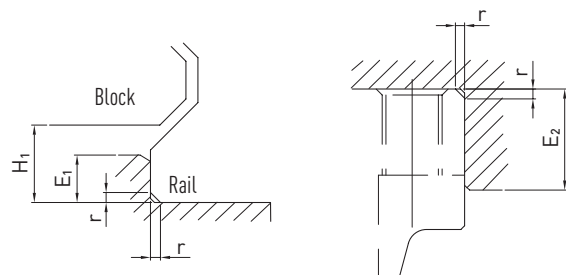


Fig. 4.21 Shoulder heights and fillets – HG/QH series

Table 4.14 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**

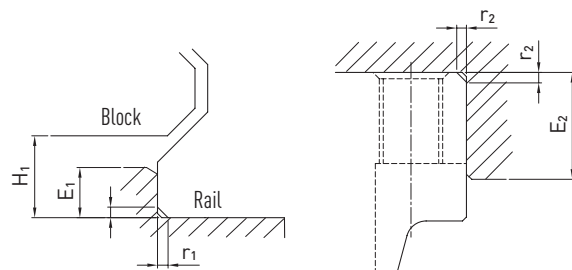


Fig. 4.22 Shoulder heights and fillets – EG/QE series

Table 4.15 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

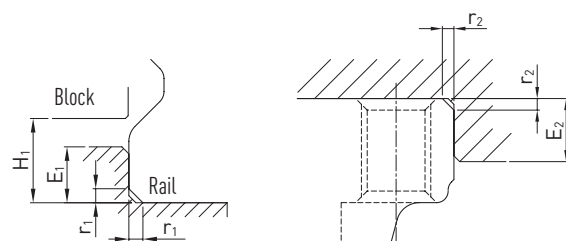


Fig. 4.23 Shoulder heights and fillets – WE series

Table 4.16 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 MG-0 series

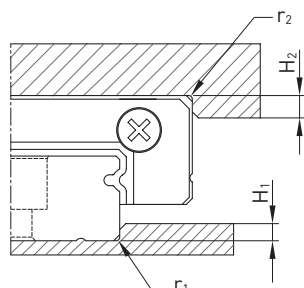


Fig. 4.24 Shoulder heights and fillets – MG and MG-0 series

Table 4.17 Shoulder heights and fillets – MG and MG-0 series

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

Unit: mm

#### 4.4.2.5 RG and QR series

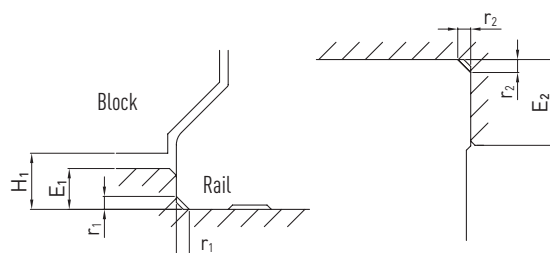


Fig. 4.25 Shoulder heights and fillets – RG/QR series

Table 4.18 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 $H_1$
<b>RG_15</b>	0.5	0.5	4.0	4.0	4.0
<b>RG_20</b>	0.5	0.5	5.0	5.0	5.0
<b>RG/QR_25</b>	1.0	1.0	5.0	5.0	5.5
<b>RG/QR_30</b>	1.0	1.0	5.0	5.0	6.0
<b>RG/QR_35</b>	1.0	1.0	6.0	6.0	6.5
<b>RG/QR_45</b>	1.0	1.0	7.0	8.0	8.0
<b>RG_55</b>	1.5	1.5	9.0	10.0	10.0
<b>RG_65</b>	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 4.19 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

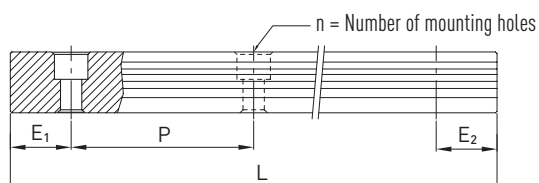
#### Please note:

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

**NOTE**

### 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.



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

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

Values for the maximum lengths of rails are to be found in the dimension charts in the appendix from page 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. 4.26). Therefore, it is important that the screws used do not exceed the maximum lengths shown in Table 4.20. **Non-observance may result in damage to the rolling elements and thus to a failure of the profile rail.**

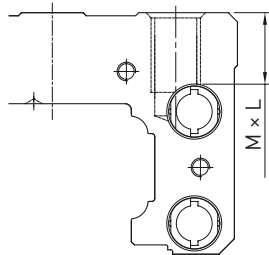


Fig. 4.26 Depiction of bore hole and recirculation channel

Table 4.20 Maximum lengths for fixing screws – QH, QE and QW blocks

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

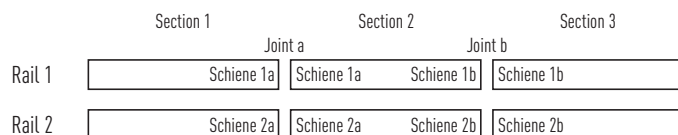


Fig. 4.27 Identification of jointed multi-part rails\*

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.

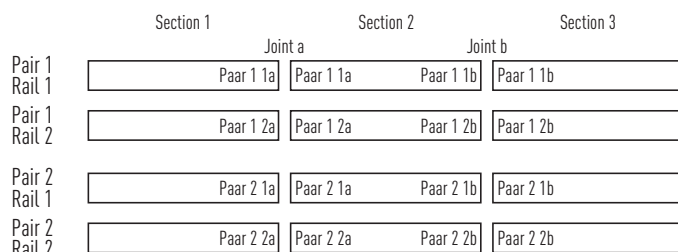


Fig. 4.28 Identification of jointed multi-part paired rails\*

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

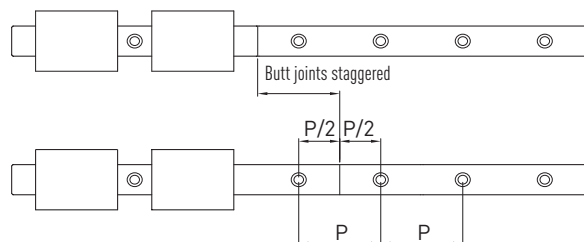


Fig. 4.29 Configuration of jointed multi-part rails

\* 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 section 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 section 6.9.

Table 6.1 **Lubrication condition at delivery**

Lubrication condition preserved	Basic lubrication
RG, MG, MG-0	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 <sup>2</sup> /s at 40 °C]
QR	100
HG, QH, EG, QE, WE, QW	200

**NOTE**

**Please note:**

Lubricants containing MoS<sub>2</sub> or graphite must not be used.

**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.

Table 6.3 **Miscibility of HIWIN greases**

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

Table 6.4 **Compatibility of basically lubricated products with HIWIN greases**

	G01	G02	G03	G04	G05
HG, QH, EG, QE, WE, QW, QR	○	●	●	●	●
MG, MG-O, RG	●	●	●	●	●

- miscible
- partly miscible

**Recommendation:**

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

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

**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.

#### 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.

**NOTE**

### 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.

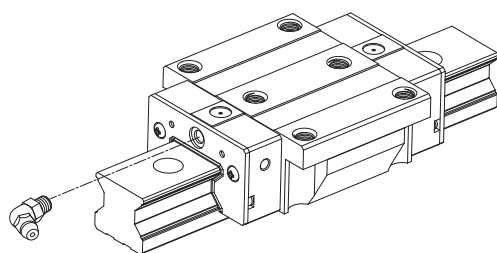


Fig. 6.1 Lubrication connection on the front side

#### 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.

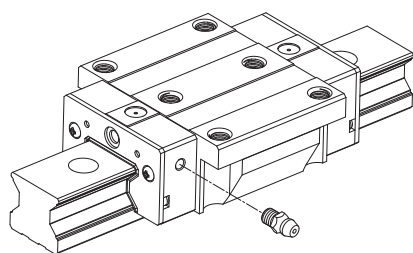


Fig. 6.2 Lubrication connection on the side

#### 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 6.5 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**

Lubrication

**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 6.5](#)), because of the reduced distance between flange and grease nipple.

Table 6.5 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 PT  
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 P  
Article number 20-000283



Fig. 6.9 Funnel type grease nipple M3 × 0.5 P  
Article number 20-000370

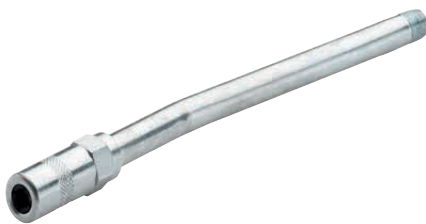


Fig. 6.10 A1 – Hydraulic coupling

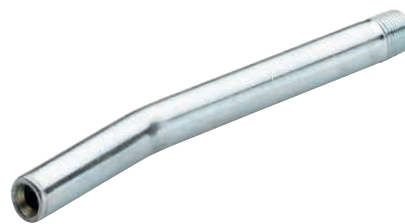


Fig. 6.11 A2 – Hollow mouthpiece 10 mm



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.

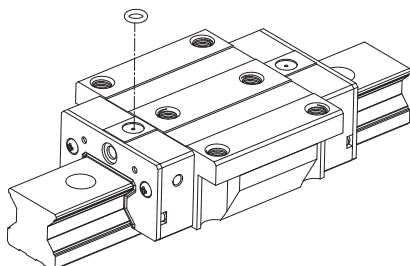


Fig. 6.14 Lubrication connection on the top

Alternatively, lubrication of the block can also be carried out from above. In doing so, an O-ring is used as a seal. The size of the O-ring is to be found in Table 6.6. The O-ring is not included in the standard shipment.



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

A further recess is located in the counterbore that receives the O-ring. This is pierced using a hot metal spike with diameter 0.8 mm to a maximum depth of  $T_{max}$  according to Table 6.6.

**NOTE**

**Please note:**

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

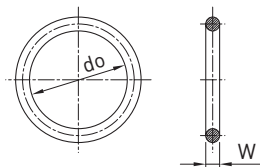


Fig. 6.15 O-ring to cover the lubrication connection on the top

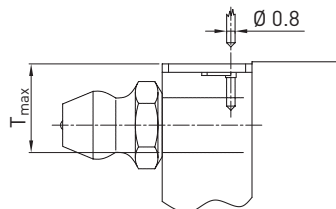


Fig. 6.16 Maximum piercing depth  $D_{max}$

Table 6.6 O-ring specifications for lubrication connection on the top

Series/size	O-ring			Lubrication hole on the top
	Article number	do [mm]	W [mm]	max. depth $T_{max}$ [mm]
HG/QH_15	20-000386	2.5 ± 0.15	1.5 ± 0.15	3.75
HG/QH_20	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.70
HG/QH_25	20-000387	4.5 ± 0.15	1.5 ± 0.15	5.80
HG/QH_30	20-000387	4.5 ± 0.15	1.5 ± 0.15	6.30
HG/QH_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.80
HG/QH_45	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.20
HG_55	20-000387	4.5 ± 0.15	1.5 ± 0.15	11.80
HG_65	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.80
EG/QE_15	20-000386	2.5 ± 0.15	1.5 ± 0.15	6.90
EG/QE_20	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.40
EG/QE_25	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.40
EG/QE_30	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.40
EG/QE_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.80

The HIWIN lubrication adapter can be used for lubrication connections.



Table 6.6 O-ring specifications for lubrication connection on the top (continuation)

Series/size	O-ring			Lubrication hole on the top
	Article number	do [mm]	W [mm]	max. depth $T_{max}$ [mm]
WE/QW_21	20-000387	4.5 ± 0.15	1.5 ± 0.15	6.80
WE/QW_27	20-000387	4.5 ± 0.15	1.5 ± 0.15	8.40
WE/QW_35	20-000387	4.5 ± 0.15	1.5 ± 0.15	10.20
RG_15	20-000386	2.5 ± 0.15	1.5 ± 0.15	3.45
RG_20	20-000386	2.5 ± 0.15	1.5 ± 0.15	4.00
RG/QR_25	20-000376	7.5 ± 0.15	1.5 ± 0.15	5.80
RG/QR_30	20-000376	7.5 ± 0.15	1.5 ± 0.15	6.20
RG/QR_35	20-000376	7.5 ± 0.15	1.5 ± 0.15	8.65
RG/QR_45	20-000376	7.5 ± 0.15	1.5 ± 0.15	9.50
RG_55	20-000376	7.5 ± 0.15	1.5 ± 0.15	11.60
RG_65	20-000376	7.5 ± 0.15	1.5 ± 0.15	14.50

The HIWIN lubrication adapter can be used for lubrication connections.

### 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 6.7 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	

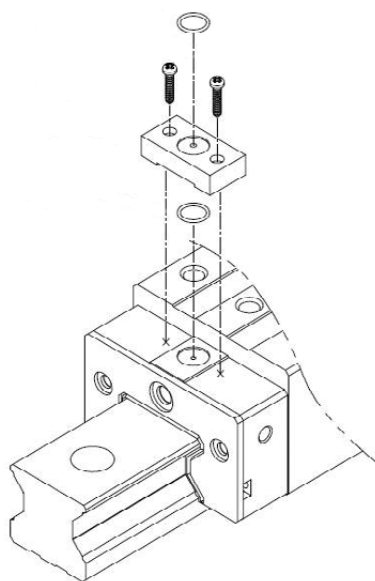


Fig. 6.17 Structure of the lubrication adapter

### 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 section 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 section 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 %.

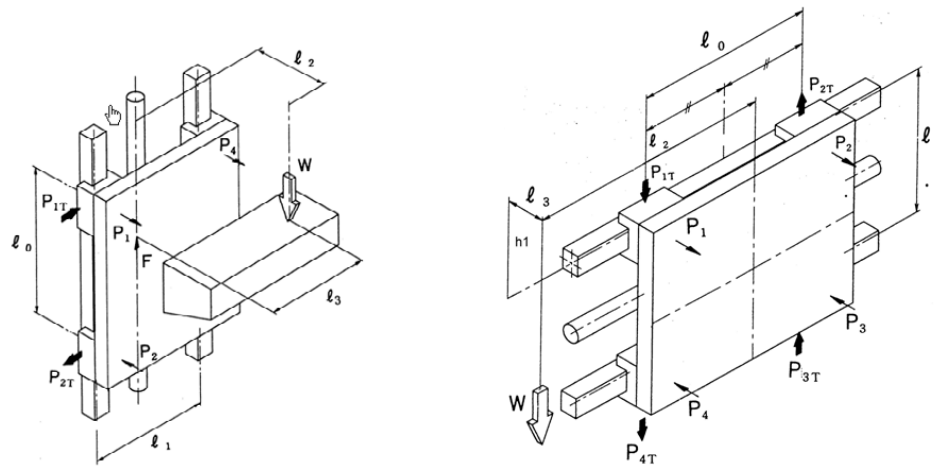


Fig. 6.18 Mounting positions of profile rails

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

#### Initial lubrication for short-stroke applications

- |                                     |   |
|-------------------------------------|---|
| Stroke $< 2 \times$ 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 $< 0.5 \times$ 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  $< 2 \times$  block length), the relubrication is to be carried out as described in section 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  $\text{MOS}_2$  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:  $-10\text{ °C}$  to  $+80\text{ °C}$

Speed:  $< 1\text{ m/s}$

Table 6.8 Recommended greases for standard applications

<b>HIWIN</b>	G05
<b>Klüber</b>	MICROLUBE GL-261
<b>Mobil</b>	Mobilux EP1
<b>Fuchs Lubritech</b>	Lagermeister BF2
<b>Lubcon</b>	TURMOGREASE CAK 2502

##### 6.11.1.2 Heavy-duty applications

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

Temperature range:  $0\text{ °C}$  to  $+80\text{ °C}$

Speed:  $< 1\text{ m/s}$

Table 6.9 Recommended greases for heavy-duty applications

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

Lubrication

**6.11.1.3 Clean room applications**

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 clean room applications

<b>HIWIN</b>	G02
<b>Klüber</b>	Isoflex Topas NCA52
<b>Fuchs Lubritech</b>	gleitmo 591

**6.11.1.4 Clean room applications at high speeds**

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

Table 6.11 Recommended greases for clean room applications at high speeds

<b>HIWIN</b>	G03
<b>Klüber</b>	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 6.12 Recommended greases for applications with high speeds

<b>HIWIN</b>	G04
<b>Klüber</b>	Isoflex NCA15
<b>Lubcon</b>	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 6.13 Recommended greases for applications in the foodstuffs industry in acc. with USDA H1

<b>Klüber</b>	Klübersynth UH1 14-151
<b>Mobil</b>	Mobilgrease FM102
<b>Fuchs Lubritech</b>	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 6.14 Recommended low-viscosity greases for standard applications

<b>Klüber</b>	MICROLUBE GB 00
<b>Mobil</b>	Mobilux EP004
<b>Fuchs Lubritech</b>	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 applications

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

Temperature range: -10 °C to + 80 °C

Speed: < 1 m/s

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

##### Please note:

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

**NOTE**

Lubrication

**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 6.15 **Recommended low-viscosity greases for applications with high speeds**

<b>Klüber</b>	Isoflex Topas NCA5051
<b>Mobil</b>	Mobilux EP004
<b>Fuchs Lubritech</b>	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 6.16 **Recommended low-viscosity greases for applications in the foodstuffs industry in acc. with USDA H1**

<b>Klüber</b>	Klübersynth UH1 14-1600
<b>Mobil</b>	Mobilgrese FM 003
<b>Fuchs Lubritech</b>	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 6.17 **Recommended oils for standard applications**

<b>Klüber</b>	Klüberoil GEM 1-150 N
<b>Mobil</b>	Mobilgear 630
<b>Fuchs Lubritech</b>	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 applications

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

Table 6.18 Recommended oils for clean room applications

<b>Klüber</b>	Tyreno Fluid E-95 V
<b>Mobil</b>	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 6.19 Recommended oils for applications with high speeds

<b>Klüber</b>	Klüberoil GEM 1-46 N
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### 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 6.20 Recommended oils for applications in the foodstuffs industry in acc. with USDA H1

<b>Klüber</b>	Klüberoil 4 UH1-68 N
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### 6.11.4 HIWIN lubricants

#### 6.11.4.1 HIWIN greases

Table 6.21 Overview HIWIN greases




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

Table 6.22 HIWIN grease guns

Article number	Grease gun	Lubrication adapter and set of nozzles	Direct filling	Cartridge
20-000325	●	—	●	70 g
20-000332	●	●	●	70 g
20-000353	●	—	●	400 g
20-000333	●	●	●	400 g
20-000358	—	●	—	—

**Scope of delivery for grease gun GN-80M (see Fig. 6.19):**

- 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

**Scope of delivery for grease gun GN-400C (see Fig. 6.20):**

- 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

**Scope of delivery for set of lubrication adapter and nozzles (see Fig. 6.21):**

- 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

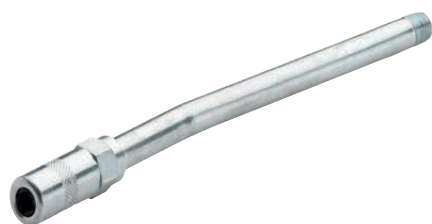


Fig. 6.22 A1 - Hydraulic coupling

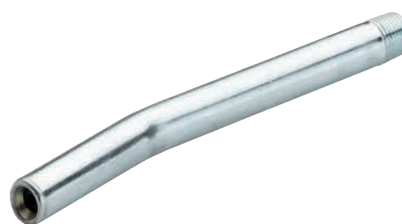


Fig. 6.23 A2 - Hollow mouthpiece 10 mm






Fig. 6.24 A3 - Hollow mouthpiece 6 mm



Fig. 6.25 A4 - Ball type mouthpiece 6 mm

Table 6.23 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 <sup>1)</sup>
	M4 × 0.7 P	A2, A3 <sup>1)</sup>
	Conical grease nipple	
	M6 × 0.75 P	A1, A2 <sup>1)</sup>
	1/8 PT	A1, A2 <sup>1)</sup>
	Funnel-type grease nipple	
	M3 × 0.5 P	A4
	M4 × 0.7 P	A4
	M6 × 0.75 P	A4

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

Lubrication

**6.11.4.2 HIWIN oils**

Table 6.24 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 6.25 Lubricant quantities for grease lubrication of the HG series

Series/ size	Initial lubrication partial quantity [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	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 6.26 Lubricant quantities for grease lubrication of the QH series

Series/ size	Initial lubrication partial quantity [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	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

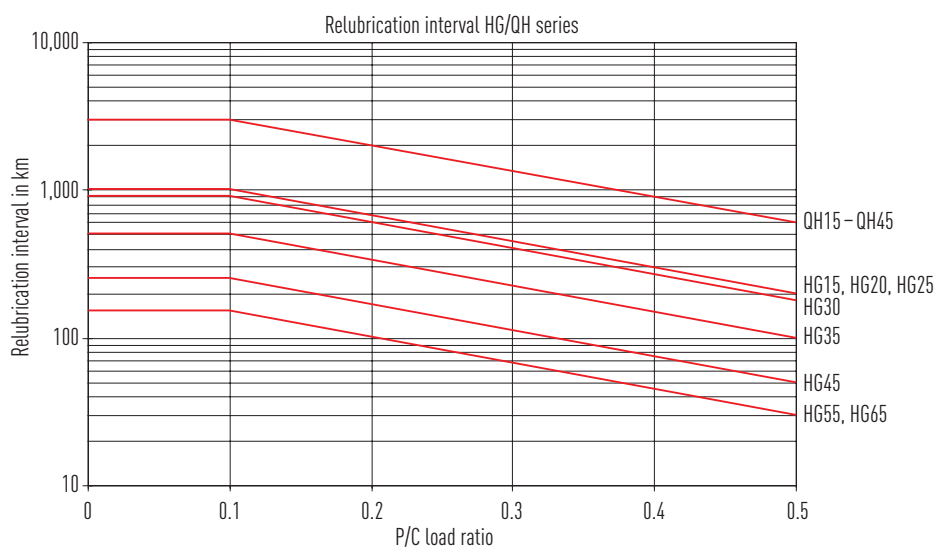


Fig. 6.26 Load-dependent relubrication intervals for grease lubrication – HG/QH series

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

Table 6.27 Lubricant quantities for grease lubrication of the EG series

Series/ size	Initial lubrication partial quantity [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	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 6.28 Lubricant quantities for grease lubrication of the QE series

Series/ size	Initial lubrication partial quantity [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	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

Lubrication

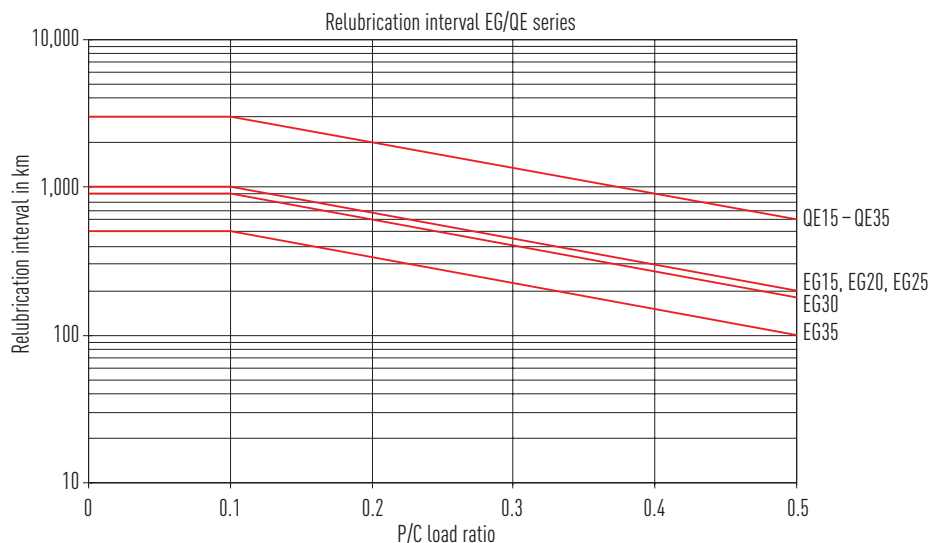


Fig. 6.27 Load-dependent relubrication intervals for grease lubrication – EG series

6.12.1.3 Lubricant quantities for grease lubrication of the WE series

Table 6.29 Lubricant quantities for grease lubrication of the WE series

Series/ size	Initial lubrication partial quantity [cm <sup>3</sup> ]	Relubrication quantity [cm <sup>3</sup> ]
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

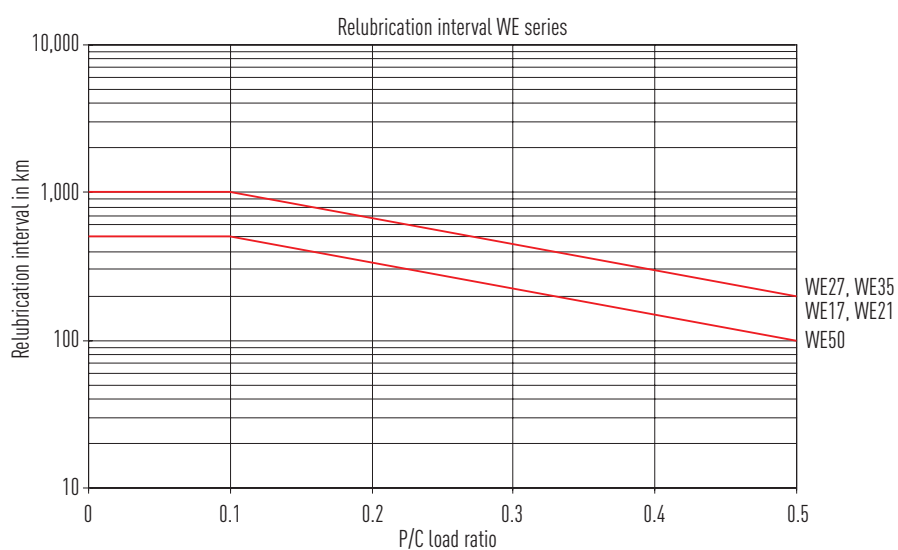


Fig. 6.28 Load-dependent relubrication intervals for grease lubrication – WE series

### 6.12.1.4 Lubricant quantities for grease lubrication of the MG series

Table 6.30 Lubricant quantities for grease lubrication of the MG series

Series/ size	Initial lubrication partial quantity [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	Heavy duty (C)	Super heavy duty (H)	Heavy duty (C)	Super heavy duty (H)
<b>MGN05</b>	0.002 (3 ×)	0.003 (3 ×)	0.002	0.003
<b>MGN07</b>	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
<b>MGN09</b>	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
<b>MGN12</b>	0.03 (3 ×)	0.03 (3 ×)	0.04	0.07
<b>MGN15</b>	0.04 (3 ×)	0.06 (3 ×)	0.07	0.09
<b>MGW07</b>	0.01 (3 ×)	0.02 (3 ×)	0.01	0.02
<b>MGW09</b>	0.02 (3 ×)	0.03 (3 ×)	0.02	0.03
<b>MGW12</b>	0.04 (3 ×)	0.07 (3 ×)	0.04	0.07
<b>MGW15</b>	0.07 (3 ×)	0.09 (3 ×)	0.07	0.09

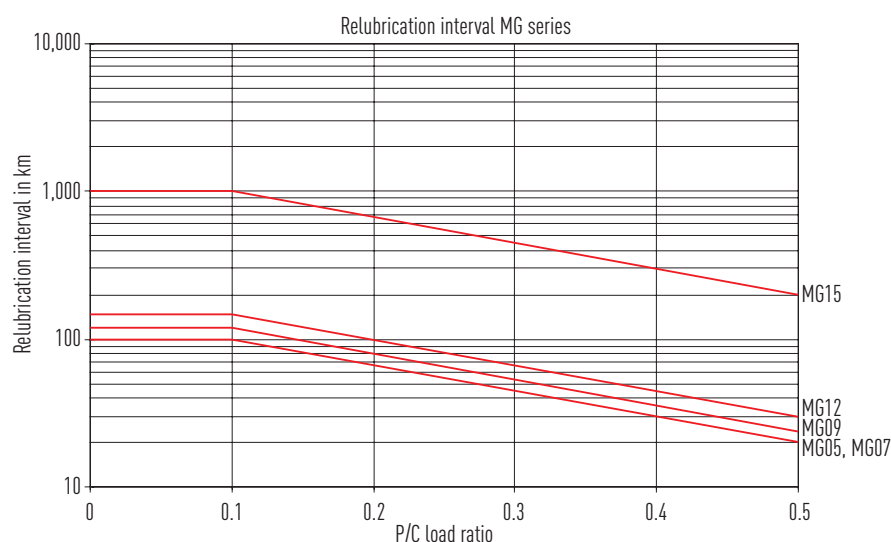


Fig. 6.29 Load-dependent relubrication intervals for grease lubrication – MG series

### 6.12.1.5 Lubricant quantities for grease lubrication of the RG/QR series

Table 6.31 Lubricant quantities for grease lubrication of the RG series

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

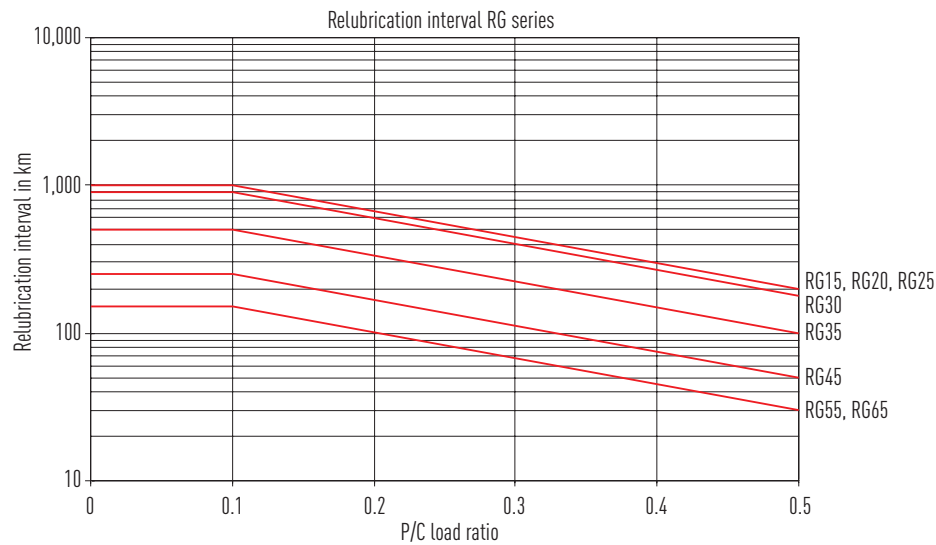


Fig. 6.30 Load-dependent relubrication intervals for grease lubrication – RG series

### 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 section 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:

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

### 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 [cm <sup>3</sup> ]			Relubrication quantity [cm <sup>3</sup> ]		
	Average load (S)	Heavy duty (C)	Super heavy duty (H)	Average load (S)	Heavy duty (C)	Super heavy duty (H)
15	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 [cm <sup>3</sup> ]	Relubrication quantity [cm <sup>3</sup> ]
	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 [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	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 [cm <sup>3</sup> ]		Relubrication quantity [cm <sup>3</sup> ]	
	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

Lubrication

**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).

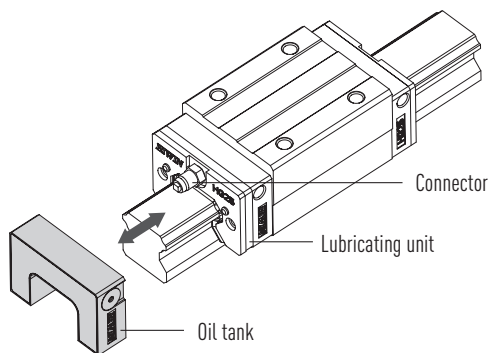
**Piston distributor sizes for feed units (single-line systems) for semi-fluid grease lubrication**

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:

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

**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 [cm <sup>3</sup> ]	Mileage [km]
HG15E2	1.6	2,000
HG20E2	3.9	4,000
HG25E2	5.1	6,000
HG30E2	7.8	8,000
HG35E2	9.8	10,000
HG45E2	18.5	20,000
HG55E2	25.9	30,000
HG65E2	50.8	40,000
EG15E2	1.7	2,000
EG20E2	2.9	3,000
EG25E2	4.8	5,000
EG30E2	8.9	9,000



Table 6.36 Oil quantities in the oil tank

Model	Oil quantity [cm <sup>3</sup> ]	Mileage [km]
RG25E2	5.0	6,000
RG30E2	7.5	8,000
RG35E2	10.7	10,000
RG45E2	18.5	20,000
RG55E2	26.5	30,000
RG65E2	50.5	40,000

Standard oil:

Mobil SHC 636

Fully synthetic with a hydrocarbon base (PAO)

Viscosity grade: ISO VG 680

Alternatively, oils of the same classification and viscosity may be used.

## 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

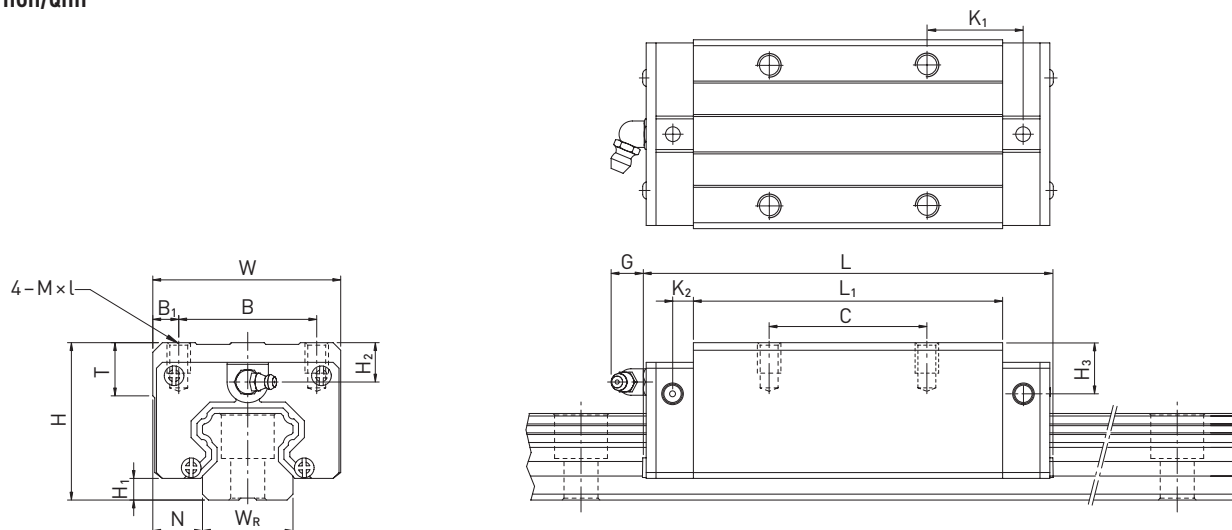
Model	Max. speed $v_{max}$ [m/s]	Max. acceleration $a_{max}$ [m/s <sup>2</sup> ]
<b>QH, QE, QW</b>	5	50
<b>HG, EG, WE, QR</b>	4	40
<b>RG</b>	3	30
<b>MG</b>	2	30

\* 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



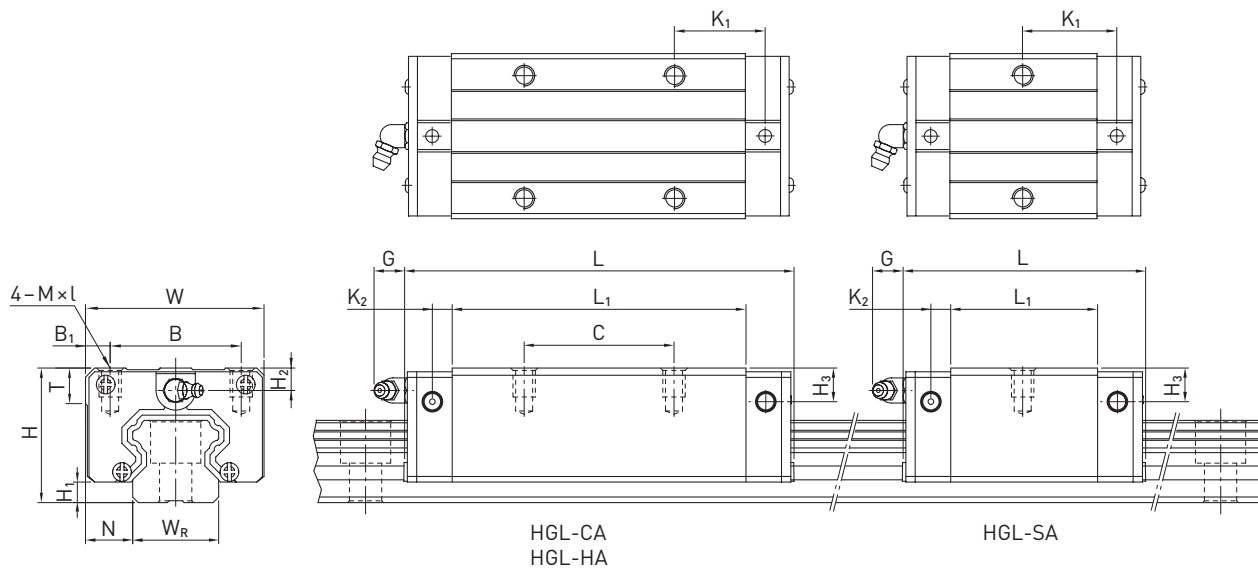
Dimensions of the block

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

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

Appendix

HGL

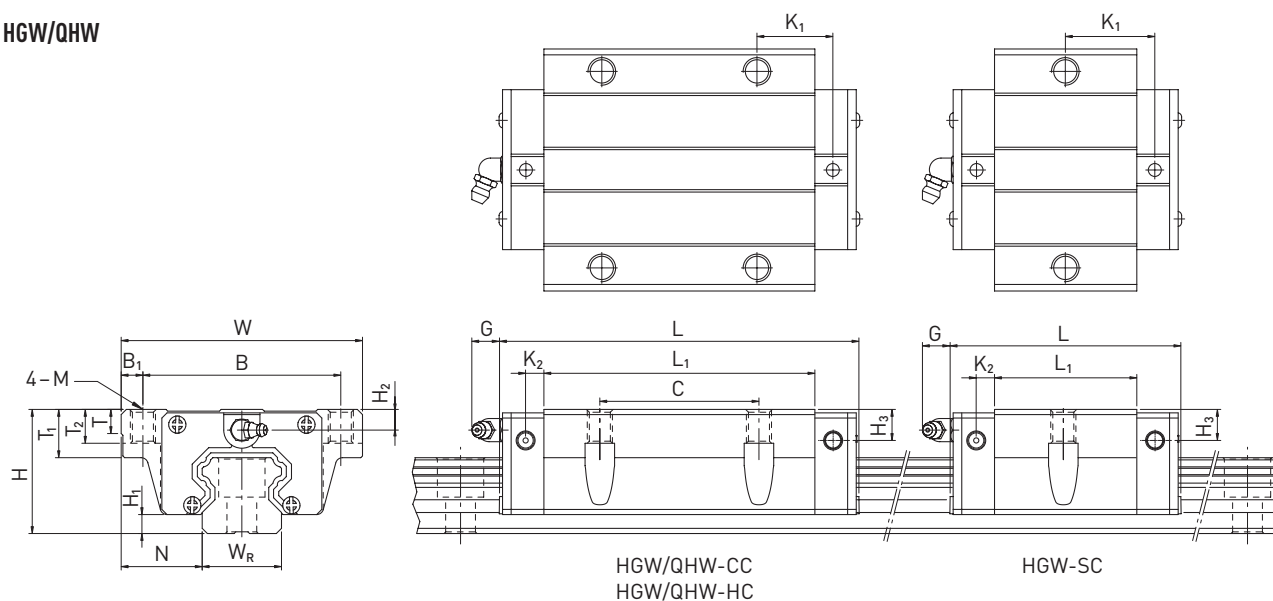


Dimensions of the block																				
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>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

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

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

### HGW/QHW



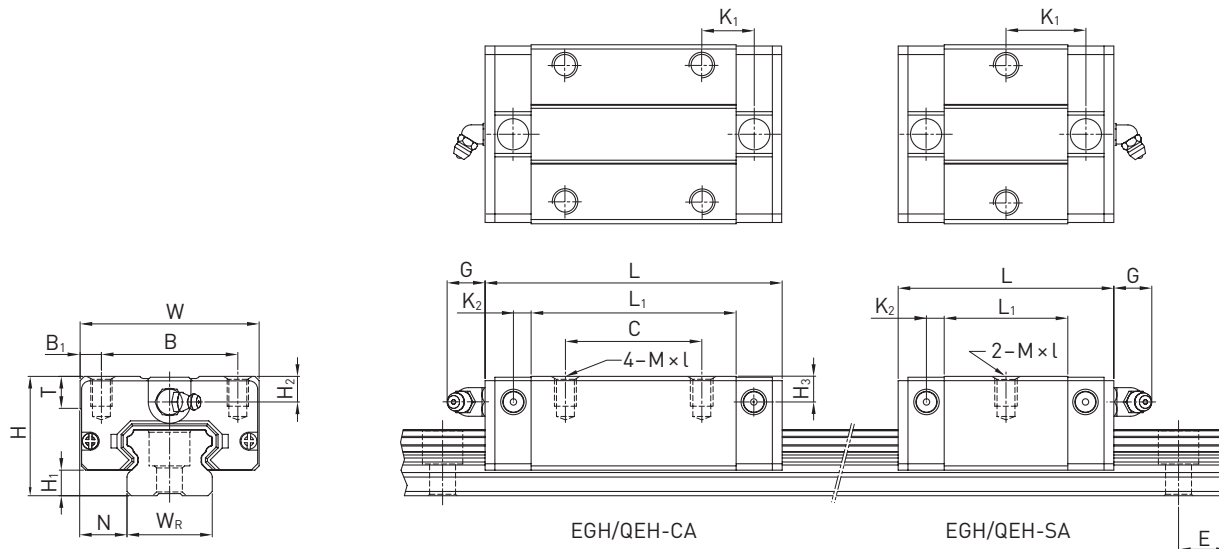
Dimensions of the block																					
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]															Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	M	G	T	T <sub>1</sub>	T <sub>2</sub>	H <sub>2</sub>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

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

Appendix

9.2.2 Dimensions of the EG/QE blocks

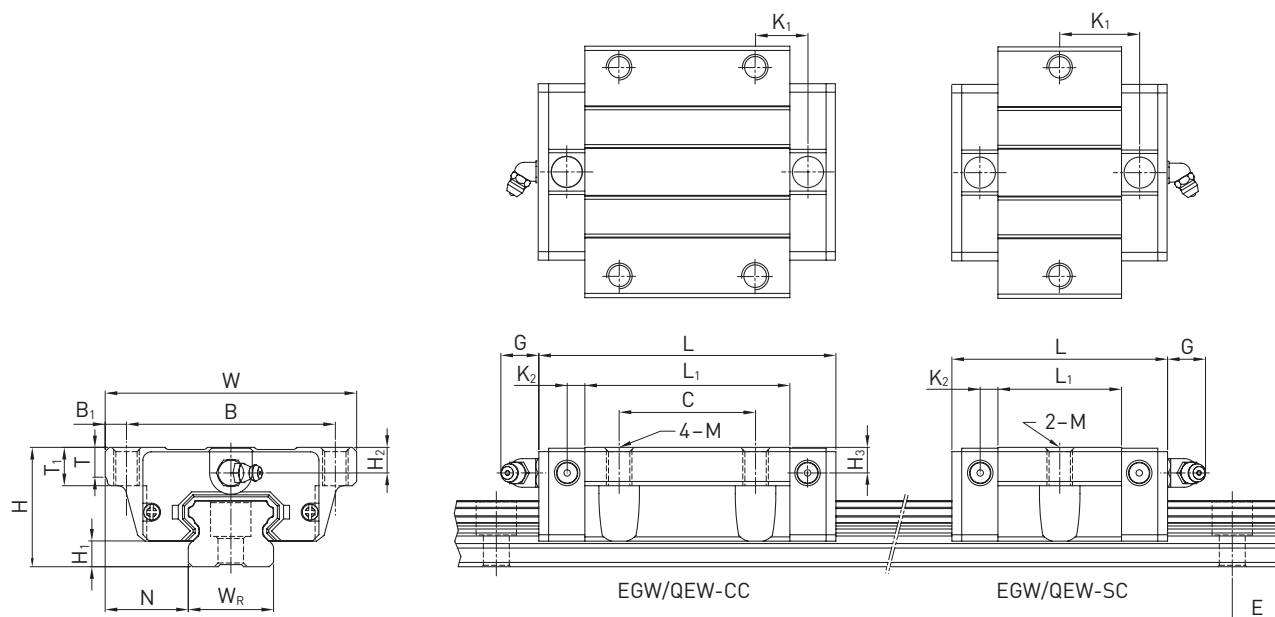
EGH/QEH



Dimensions of the block																			
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
EGH15SA	24	4.5	9.5	34	26	4.0	—	23.1	40.1	14.80	3.50	5.7	M4 × 6	6.0	5.5	6.0	5,350	9,400	0.09
EGH15CA							26	39.8	56.8	10.15							7,830	16,190	0.15
QEH15SA	24	4.0	9.5	34	26	4.0	—	23.1	40.1	14.80	3.50	5.7	M4 × 6	6.0	5.5	6.0	8,560	8,790	0.09
QEH15CA							26	39.8	56.8	10.15							12,530	15,280	0.15
EGH20SA	28	6.0	11.0	42	32	5.0	—	29.0	50.0	18.75	4.15	12.0	M5 × 7	7.5	6.0	6.0	7,230	12,740	0.15
EGH20CA							32	48.1	69.1	12.30							10,310	21,130	0.24
QEH20SA	28	6.0	11.0	42	32	5.0	—	29.0	50.0	18.75	4.15	12.0	M5 × 7	7.5	6.0	6.5	11,570	12,180	0.15
QEH20CA							32	48.1	69.1	12.30							16,500	20,210	0.23
EGH25SA	33	7.0	12.5	48	35	6.5	—	35.5	59.1	21.90	4.55	12.0	M6 × 9	8.0	8.0	8.0	11,400	19,500	0.25
EGH25CA							35	59.0	82.6	16.15							16,270	32,400	0.41
QEH25SA	33	6.2	12.5	48	35	6.5	—	35.5	60.1	21.90	5.00	12.0	M6 × 9	8.0	8.0	8.0	18,240	18,900	0.24
QEH25CA							35	59.0	83.6	16.15							26,030	31,490	0.40
EGH30SA	42	10.0	16.0	60	40	10.0	—	41.5	69.5	26.75	6.00	12.0	M8 × 12	9.0	8.0	9.0	16,420	28,100	0.45
EGH30CA							40	70.1	98.1	21.05							23,700	47,460	0.76
QEH30SA	42	10.0	16.0	60	40	10.0	—	41.5	67.5	25.75	6.00	12.0	M8 × 12	9.0	8.0	9.0	26,270	27,820	0.44
QEH30CA							40	70.1	96.1	20.05							37,920	46,630	0.75
EGH35SA	48	11.0	18.0	70	50	10.0	—	45.0	75.0	28.50	7.00	12.0	M8 × 12	10.0	8.5	8.5	22,660	37,380	0.74
EGH35CA							50	78.0	108.0	20.00							33,350	64,840	1.10
QEH35SA	48	11.0	18.0	70	50	10.0	—	51.0	76.0	30.30	6.25	12.0	M8 × 12	10.0	8.5	8.5	36,390	36,430	0.58
QEH35CA							50	83.0	108.0	21.30							51,180	59,280	0.90



### EGW/QEW

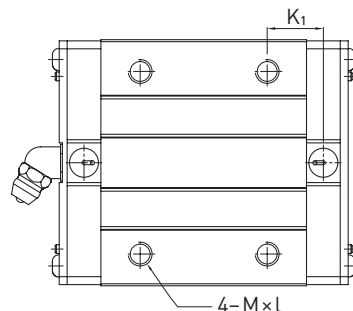


Dimensions of the block																					
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Weight [kg]	
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M	T	T <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>		
EGW15SC	24	4.5	18.5	52	41	5.5	—	23.1	40.1	14.80	3.50	5.7	M5	5.0	7	5.5	6.0	5,350	9,400	0.12	
EGW15CC							26	39.8	56.8	10.15								7,830	16,190	0.21	
QEW15SC	24	4.0	18.5	52	41	5.5	—	23.1	40.1	14.80	3.50	5.7	M5	5.0	—	5.5	6.0	8,560	8,790	0.12	
QEW15CC							26	39.8	56.8	10.15								12,530	15,280	0.21	
EGW20SC	28	6.0	19.5	59	49	5.0	—	29.0	50.0	18.75	4.15	12.0	M6	7.0	9	6.0	6.0	7,230	12,740	0.19	
EGW20CC							32	48.1	69.1	12.30								10,310	21,130	0.32	
QEW20SC	28	6.0	19.5	59	49	5.0	—	29.0	50.0	18.75	4.15	12.0	M6	7.0	—	6.0	6.5	11,570	12,180	0.19	
QEW20CC							32	48.1	69.1	12.30								16,500	20,210	0.31	
EGW25SC	33	7.0	25.0	73	60	6.5	—	35.5	59.1	21.90	4.55	12.0	M8	7.5	10	8.0	8.0	11,400	19,500	0.35	
EGW25CC							35	59.0	82.6	16.15								16,270	32,400	0.59	
QEW25SC	33	6.2	25.0	73	60	6.5	—	35.5	60.1	21.90	5.00	12.0	M8	7.5	—	8.0	8.0	18,240	18,900	0.34	
QEW25CC							35	59.0	83.6	16.15								26,030	31,490	0.58	
EGW30SC	42	10.0	31.0	90	72	9.0	—	41.5	69.5	26.75	6.00	12.0	M10	7.0	10	8.0	9.0	16,420	28,100	0.62	
EGW30CC							40	70.1	98.1	21.05								23,700	47,460	1.04	
QEW30SC	42	10.0	31.0	90	72	9.0	—	41.5	67.5	25.75	6.00	12.0	M10	7.0	—	8.0	9.0	26,270	27,820	0.61	
QEW30CC							40	70.1	96.1	20.05								37,920	46,630	1.03	
EGW35SC	48	11.0	33.0	100	82	9.0	—	45.0	75.0	28.50	7.00	12.0	M10	10.0	13	8.5	8.5	22,660	37,380	0.91	
EGW35CC							50	78.0	108.0	20.00								33,350	64,840	1.40	
QEW35SC	48	11.0	33.0	100	82	9.0	—	51.0	76.0	30.30	6.25	12.0	M10	10.0	13	8.5	8.5	36,390	36,430	0.77	
QEW35CC							50	83.0	108.0	21.30								51,180	59,280	1.19	

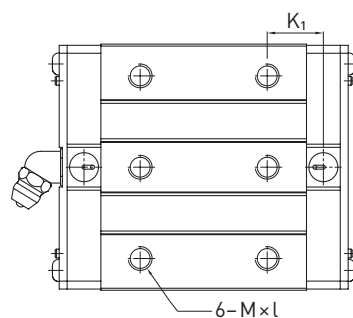
Appendix

9.2.3 Dimensions of the WE blocks

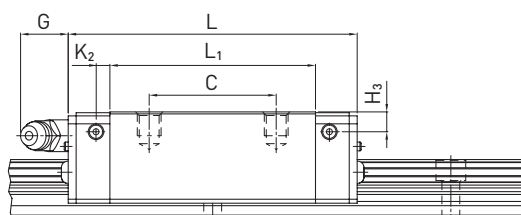
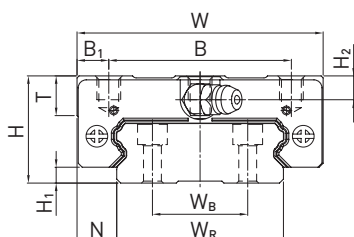
WEH



WE\_17  
WE\_21



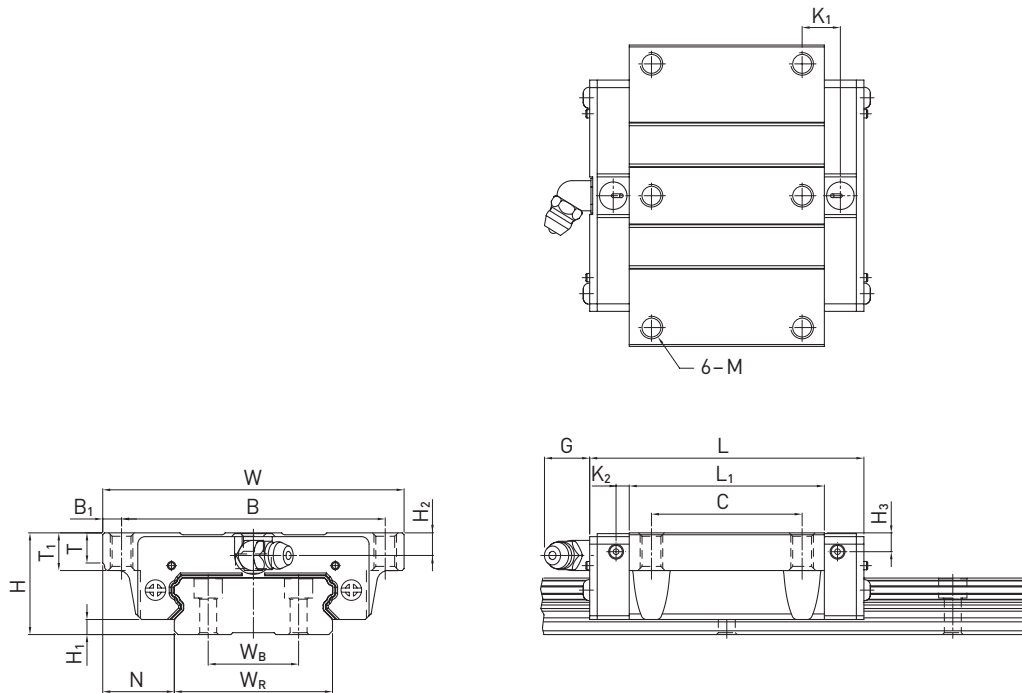
WE\_27  
WE\_35  
WE\_50



Dimensions of the block

Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
WEH17CA	17	2.5	8.5	50	29	10.5	15	35.0	50.6	—	3.10	4.9	M4 × 5	6.0	4.0	3.0	5,230	9,640	0.12
WEH21CA	21	3.0	8.5	54	31	11.5	19	41.7	59.0	14.68	3.65	12.0	M5 × 6	8.0	4.5	4.2	7,210	13,700	0.20
WEH27CA	27	4.0	10.0	62	46	8.0	32	51.8	72.8	14.15	3.50	12.0	M6 × 6	10.0	6.0	5.0	12,400	21,600	0.35
WEH35CA	35	4.0	15.5	100	76	12.0	50	77.6	102.6	18.35	5.25	12.0	M8 × 8	13.0	8.0	6.5	29,800	49,400	1.10
WEH50CA	50	7.5	20.0	130	100	15.0	65	112.0	140.0	28.05	6.00	12.9	M10 × 15	19.5	12.0	10.5	61,520	97,000	3.16

### WEW



Dimensions of the block

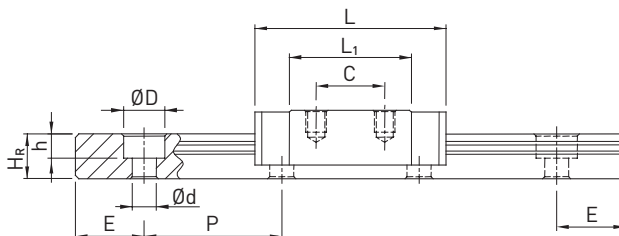
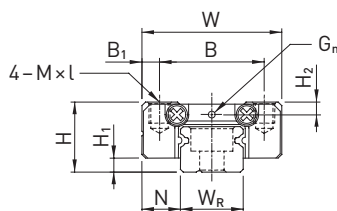
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]														Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M	T	T <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
<b>WEW17CC</b>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

Appendix

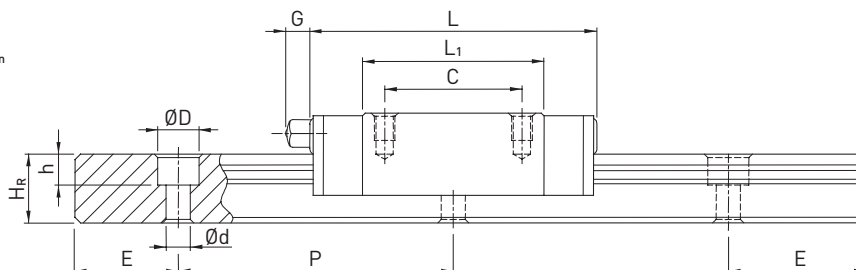
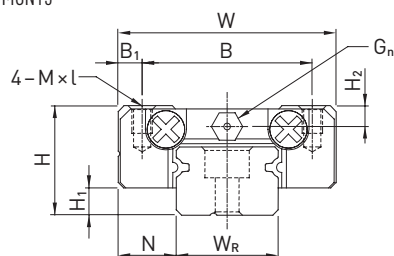
9.2.4 Dimensions of the MG blocks

**MGN**

MGN07, MGN09, MGN12



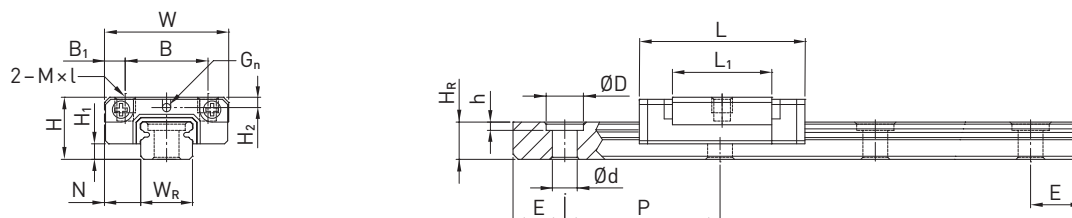
MGN15



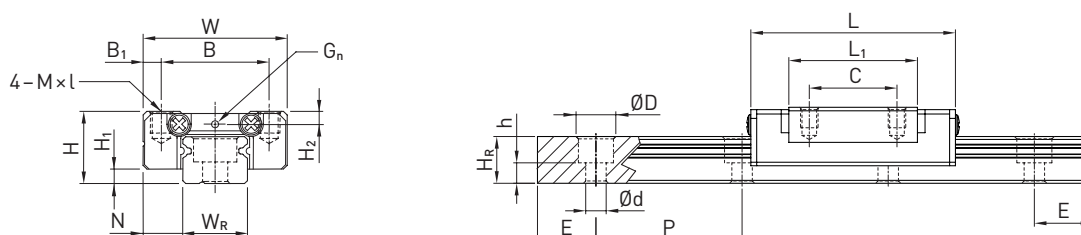
Dimensions of the block																
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	G	G <sub>n</sub>	M × l	H <sub>2</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
MGN07C	8	1.5	5.0	17	12	2.5	8	13.5	22.5	—	Ø1.2	M2 × 2.5	1.5	980	1,245	0.01
MGN07H							13	21.8	30.8					1,372	1,960	0.02
MGN09C	10	2.0	5.5	20	15	2.5	10	18.9	28.9	—	Ø1.4	M3 × 3	1.8	1,860	2,550	0.02
MGN09H							16	29.9	39.9					2,550	4,020	0.03
MGN12C	13	3.0	7.5	27	20	3.5	15	21.7	34.7	—	Ø2	M3 × 3.5	2.5	2,840	3,920	0.03
MGN12H							20	32.4	45.4					3,720	5,880	0.05
MGN15C	16	4.0	8.5	32	25	3.5	20	26.7	42.1	4.5	M3	M3 × 4	3.0	4,610	5,590	0.06
MGN15H							25	43.4	58.8					6,370	9,110	0.09

### MGW

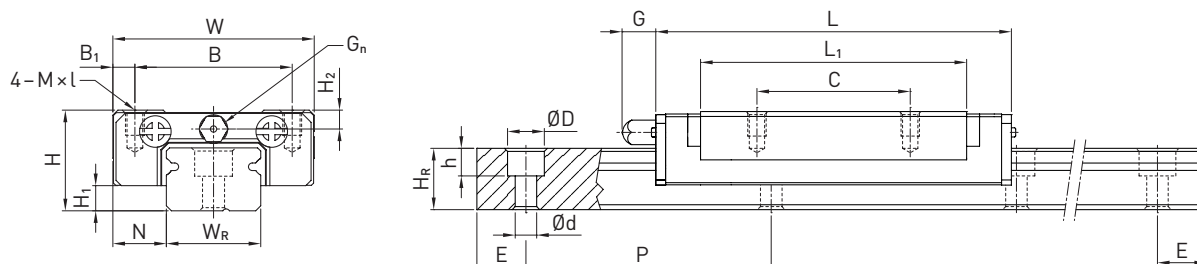
MGN05-0



MGN09-0, MGN12-0



MGN15-0



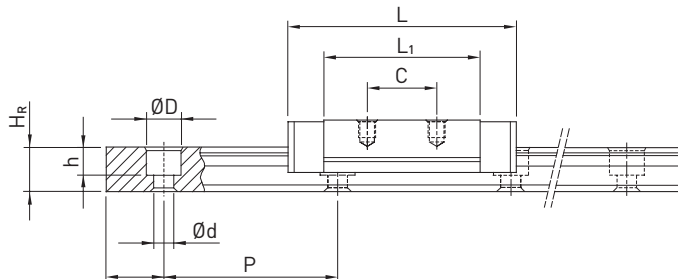
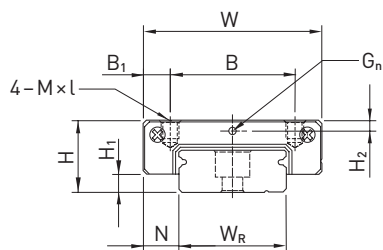
Dimensions of the block																
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	G	G <sub>n</sub>	M × l	H <sub>2</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
MGN05C-0	6	1.5	3.5	12	8	2.0	—	9.6	16.0	—	Ø 0.8	M2 × 1.5	1.0	540	840	0.008
MGN05H-0	6	1.5	3.5	12	8	2.0	—	12.6	19.0	—	Ø 0.8	M2 × 1.5	1.0	670	1,080	0.010
MGN09C-0	10	2.2	5.5	20	15	2.5	10	19.4	30.0	—	Ø 1.4	M3 × 3.0	1.8	2,010	2,840	0.012
MGN09H-0	10	2.2	5.5	20	15	2.5	16	29.3	39.9	—	Ø 1.4	M3 × 3.0	1.8	2,500	3,930	0.020
MGN12C-0	13	3.0	7.5	27	20	3.5	15	22.0	35.0	—	Ø 2.0	M3 × 3.5	2.5	2,840	3,920	0.025
MGN12H-0	13	3.0	7.5	27	20	3.5	20	34.6	47.6	—	Ø 2.0	M3 × 3.5	2.5	4,270	5,900	0.047
MGN15C-0	16	4.0	8.5	32	25	3.5	20	26.7	41.3	4.5	M3	M3 × 4.0	3.0	4,610	5,590	0.057
MGN15H-0	16	4.0	8.5	32	25	3.5	25	43.4	58.0	4.5	M3	M3 × 4.0	3.0	6,370	9,110	0.088

Appendix

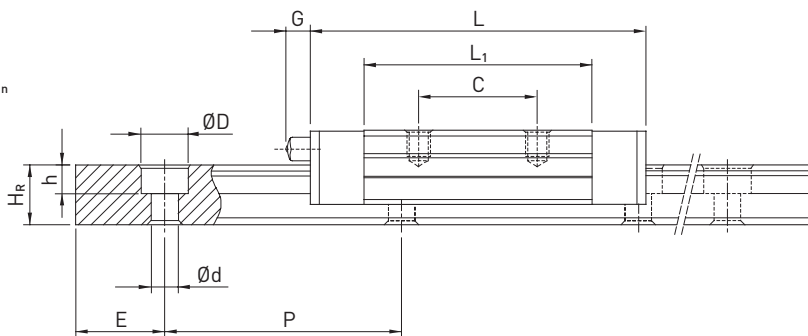
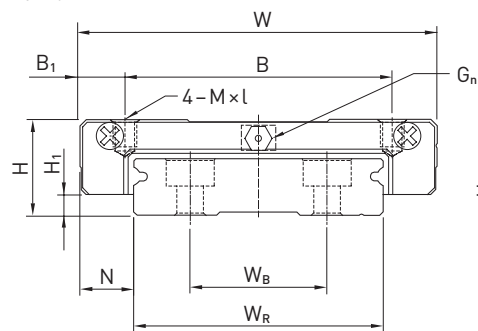
9.2.5 Dimensions of the MG-0 blocks

**MGN-0**

MGW07, MGW09, MGW12



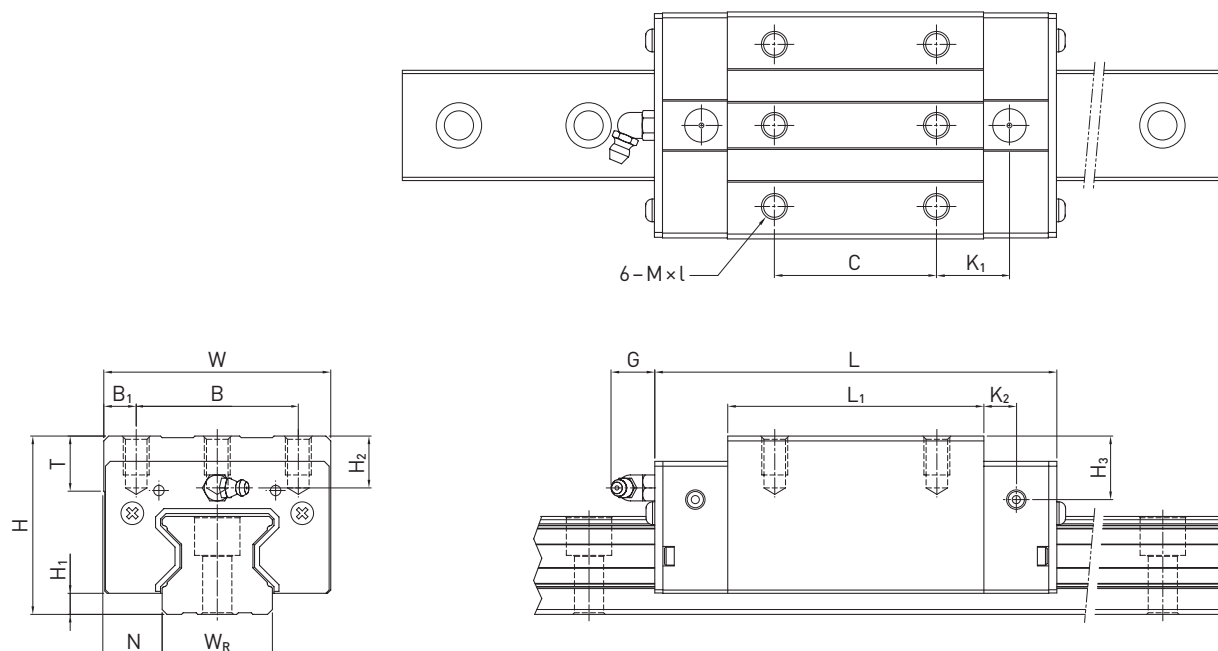
MGW15



Dimensions of the block																
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]										Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	G	G <sub>n</sub>	M × l	H <sub>2</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
MGW07C	9	1.9	5.5	25	19	3.0	10	21.0	31.2	—	Ø 1.2	M3 × 3	1.85	1,370	2,060	0.02
MGW07H							19	30.8	41.0					1,770	3,140	0.03
MGW09C	12	2.9	6.0	30	21	4.5	12	27.5	39.3	—	Ø 1.4	M3 × 3	2.40	2,750	4,120	0.04
MGW09H					23	3.5	24	38.5	50.7					3,430	5,890	0.06
MGW12C	14	3.4	8.0	40	28	6.0	15	31.3	46.1	—	Ø 2	M3 × 3.6	2.80	3,920	5,590	0.07
MGW12H							28	45.6	60.4					5,100	8,240	0.10
MGW15C	16	3.4	9.0	60	45	7.5	20	38.0	54.8	5.2	M3	M4 × 4.2	3.20	6,770	9,220	0.14
MGW15H							35	57.0	73.8					8,930	13,380	0.22

### 9.2.6 Dimensions of the RG/QR blocks

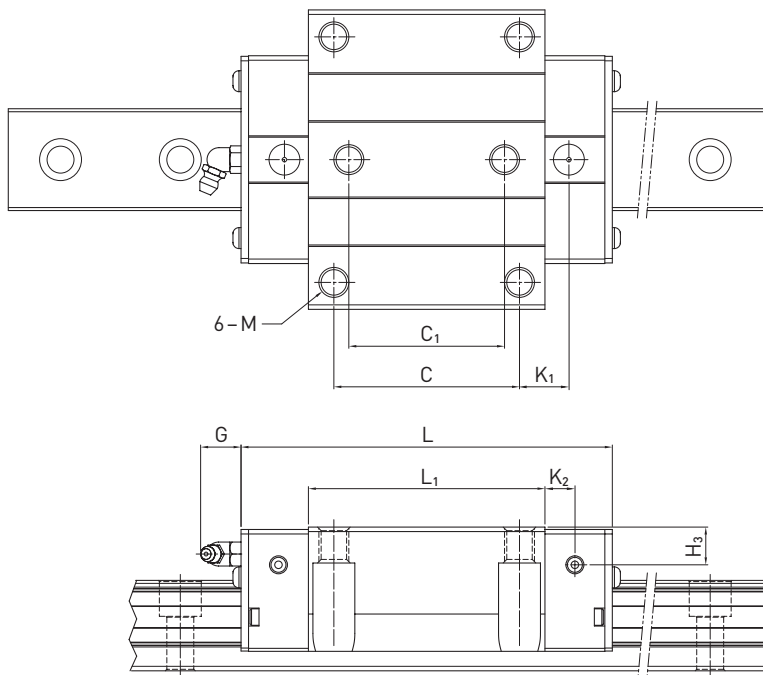
#### RGH/QRH



Dimensions of the block																			
Series/ size	Installation dimensions [mm]			Dimensions of the block [mm]													Load ratings [N]		Weight [kg]
	H	H <sub>1</sub>	N	W	B	B <sub>1</sub>	C	L <sub>1</sub>	L	K <sub>1</sub>	K <sub>2</sub>	G	M × l	T	H <sub>2</sub>	H <sub>3</sub>	C <sub>dyn</sub>	C <sub>0</sub>	
RGH15CA	28	4.0	9.5	34	26	4.0	26	45.0	68.0	13.40	4.70	5.3	M4 × 8	6.0	7.6	10.1	11,300	24,000	0.20
RGH20CA	34	5.0	12.0	44	32	6.0	36	57.5	86.0	15.80	6.00	5.3	M5 × 8	8.0	8.3	8.3	21,300	46,700	0.40
RGH20HA							50	77.5	106.0	18.80							26,900	63,000	0.53
RGH25CA	40	5.5	12.5	48	35	6.5	35	64.5	97.9	20.75	7.25	12.0	M6 × 8	9.5	10.2	10.0	27,700	57,100	0.61
RGH25HA							50	81.0	114.4	21.50							33,900	73,400	0.75
QRH25CA	40	5.5	12.5	48	35	6.5	35	66.0	9.9	20.75	7.25	12.0	M6 × 8	9.5	10.2	10.0	38,500	54,400	0.60
QRH25HA							50	81.0	112.9	21.50							44,700	65,300	0.74
RGH30CA	45	6.0	16.0	60	40	10.0	40	71.0	109.8	23.50	8.00	12.0	M8 × 10	9.5	9.5	10.3	39,100	82,100	0.90
RGH30HA							60	93.0	131.8	24.50							48,100	105,000	1.16
QRH30CA	45	6.0	16.0	60	40	10.0	40	71.0	109.8	23.50	8.00	12.0	M8 × 10	9.5	9.5	10.3	51,500	73,000	0.89
QRH30HA							60	93.0	131.8	24.50							64,700	95,800	1.15
RGH35CA	55	6.5	18.0	70	50	10.0	50	79.0	124.0	22.50	10.00	12.0	M8 × 12	12.0	16.0	19.6	57,900	105,200	1.57
RGH35HA							72	106.5	151.5	25.25							73,100	142,000	2.06
QRH35CA	55	6.5	18.0	70	50	10.0	50	79.0	124.0	22.50	10.00	12.0	M8 × 12	12.0	16.0	19.6	77,000	94,700	1.56
QRH35HA							72	106.5	151.5	25.25							95,700	126,300	2.04
RGH45CA	70	8.0	20.5	86	60	13.0	60	106.0	153.2	31.00	10.00	12.9	M10 × 17	16.0	20.0	24.0	92,600	178,800	3.18
RGH45HA							80	139.8	187.0	37.90							116,000	230,900	4.13
QRH45CA	70	8.0	20.5	86	60	13.0	60	106.0	153.2	31.00	10.00	12.9	M10 × 17	16.0	20.0	24.0	123,200	156,400	3.16
QRH45HA							80	139.8	187.0	37.90							150,800	208,600	4.10
RGH55CA	80	10.0	23.5	100	75	12.5	75	125.5	183.7	37.75	12.50	12.9	M12 × 18	17.5	22.0	27.5	130,500	252,000	4.89
RGH55HA							95	173.8	232.0	51.90							167,800	348,000	6.68
RGH65CA	90	12.0	31.5	126	76	25.0	70	160.0	232.0	60.80	15.80	12.9	M16 × 20	25.0	15.0	15.0	213,000	411,600	8.89
RGH65HA							120	223.0	295.0	67.30							275,300	572,700	12.13

Appendix

RGW/QRW



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

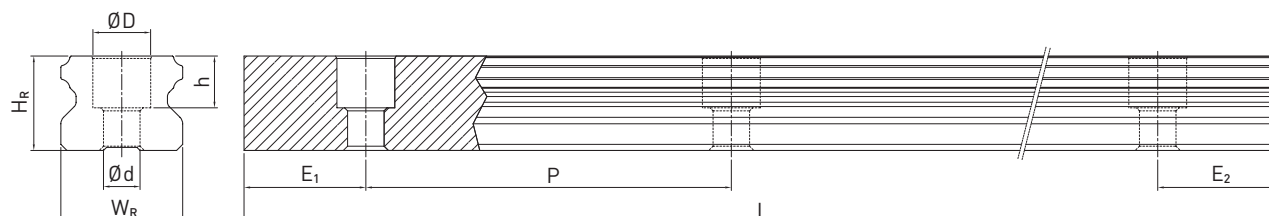


### 9.3 Technical data for rails

#### 9.3.1 Dimensions of the HG rails

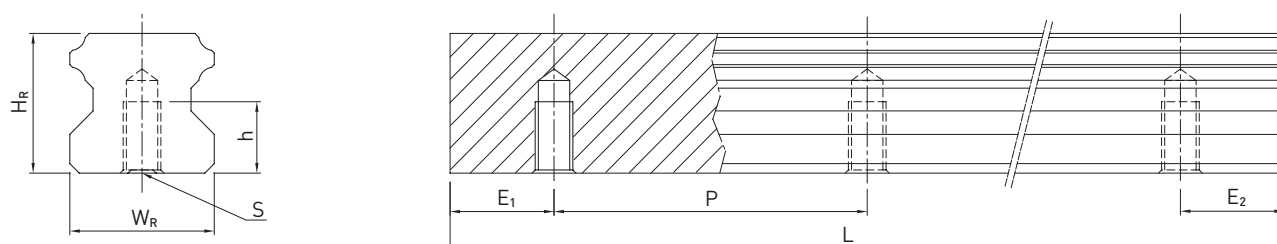
The HG rails are used for both the HG and QH blocks.

##### HGR\_R



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

##### HGR\_T



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

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

Note:

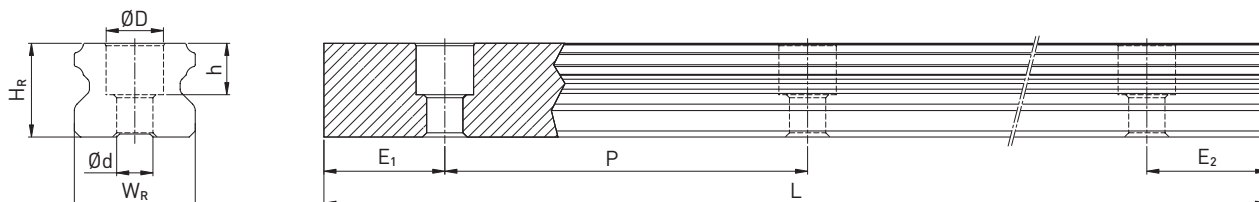
1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the E<sub>1/2</sub> dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the E<sub>1/2</sub> min.
3. The rails are shortened to the required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

Appendix

**9.3.2 Dimensions of the EG rails**

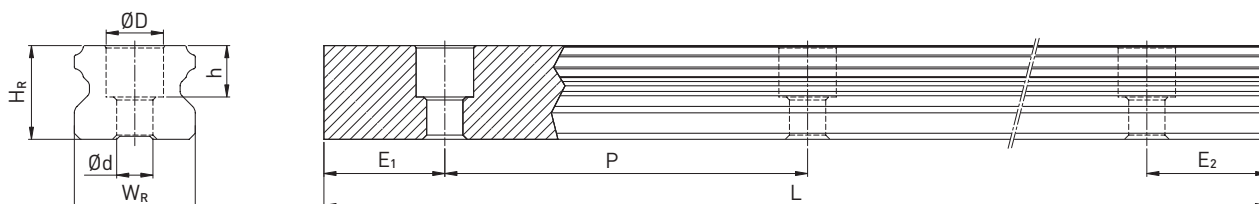
The EG rails are used for both the EG and QE blocks.

**EGR\_R**



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

**EGR\_U**

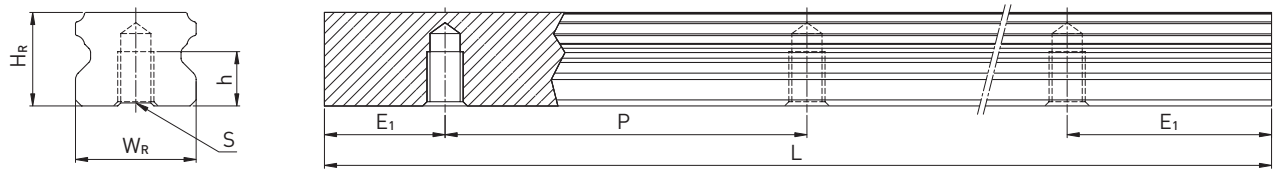


Dimensions of rail EGR_U												
Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		$W_R$	$H_R$	D	h	d	P					
EGR15U	M4 × 16	15	12.5	7.5	5.3	4.5	60	4,000	3,900	6	54	1.23
EGR30U	M8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

Note:

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

### EGR\_T



Dimensions of rail EGR\_T

Series/ size	Dimensions of rail [mm]					Max. length [mm]	Max. length E <sub>1</sub> = E <sub>2</sub> [mm]	E <sub>1/2</sub> min [mm]	E <sub>1/2</sub> max [mm]	Weight [kg/m]
	W <sub>R</sub>	H <sub>R</sub>	S	h	P					
<b>EGR15T</b>	15	12.5	M5	7	60	4,000	3,900	6	54	1.26
<b>EGR20T</b>	20	15.5	M6	9	60	4,000	3,900	7	53	2.15
<b>EGR25T</b>	23	18.0	M6	10	60	4,000	3,900	8	52	2.79
<b>EGR30T</b>	28	23.0	M8	14	80	4,000	3,920	9	71	4.42
<b>EGR35T</b>	34	27.5	M8	17	80	4,000	3,920	9	71	6.34

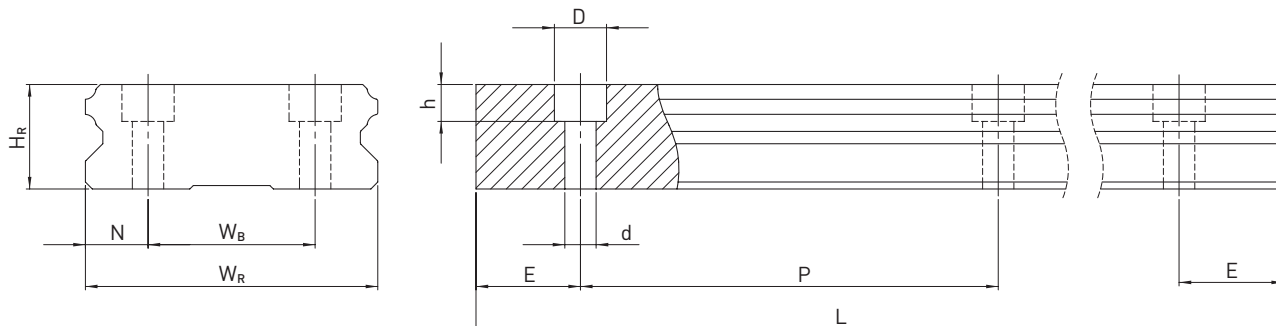
Note:

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

Appendix

9.3.3 Dimensions of the WE rails

WER\_R



Dimensions of rail WER\_R

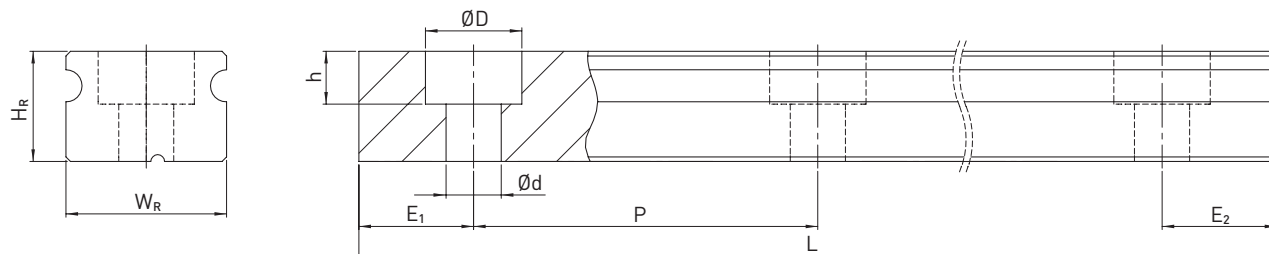
Series/ size	Assembly screw for rail [mm]	Dimensions of the rail [mm]							Max. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		$W_R$	$W_B$	$H_R$	$D$	$h$	$d$	$P$				
WER17R	M4 × 12	33	18	9.3	7.5	5.3	4.5	40	4,000	6	34	2.2
WER21R	M4 × 12	37	22	11.0	7.5	5.3	4.5	50	4,000	6	44	3.0
WER27R	M4 × 16	42	24	15.0	7.5	5.3	4.5	60	4,000	6	54	4.7
WER35R	M6 × 20	69	40	19.0	11.0	9.0	7.0	80	4,000	8	72	9.7
WER50R	M8 × 25	90	60	24.0	14.0	12.0	9.0	80	4,000	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

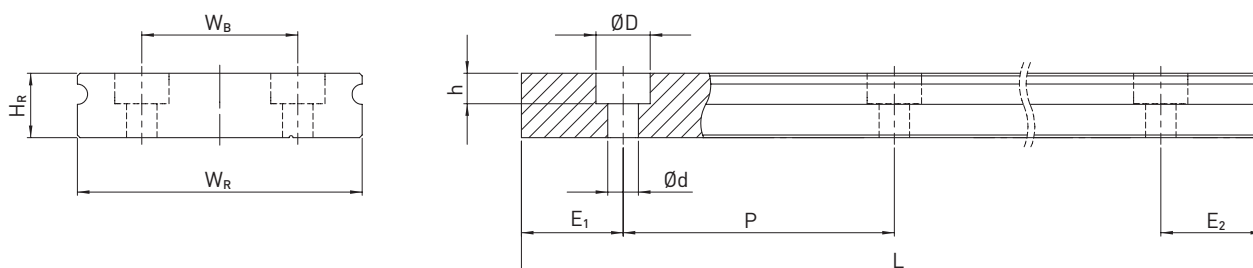
#### MGN\_R



Dimensions of rail MGN\_R

Series/ size	Assembly screw for rail [mm]	Dimensions of rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [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	12	0.22
MGNR09R	M3 × 8	9	6.5	6.0	3.5	3.5	20	1,200	1,180	5	15	0.38
MGNR12R	M3 × 8	12	8.0	6.0	4.5	3.5	25	2,000	1,975	5	20	0.65
MGNR15R	M3 × 10	15	10.0	6.0	4.5	3.5	40	2,000	1,960	6	34	1.06

#### MGW\_R



Dimensions of rail 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]	Weight [kg/m]
		$W_R$	$H_R$	$W_B$	D	h	d	P					
MGWR07R	M3 × 6	14	5.2	—	6.0	3.2	3.5	30	600	570	6	24	0.51
MGWR09R	M3 × 8	18	7.0	—	6.0	4.5	3.5	30	1,200	1,170	6	24	0.91
MGWR12R	M4 × 8	24	8.5	—	8.0	4.5	4.5	40	2,000	1,960	8	32	1.49
MGWR15R	M4 × 10	42	9.5	23	8.0	4.5	4.5	40	2,000	1,960	8	32	2.86

Note:

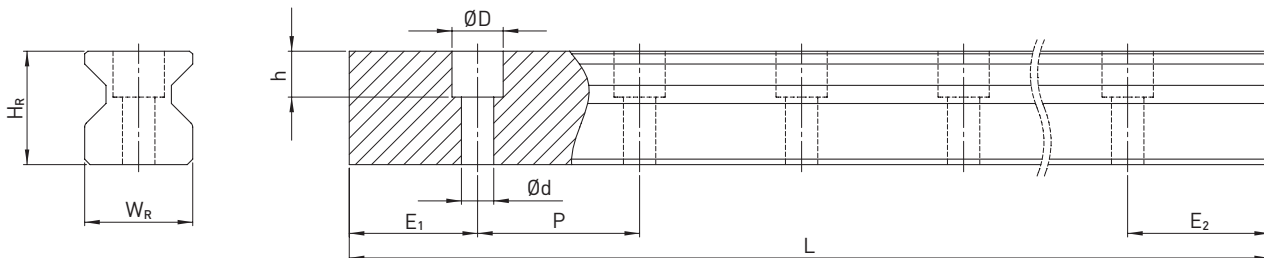
1. The tolerance for E is +0.5 to -1 mm for standard rails and 0 to -0.3 mm for joint connections.
2. If the  $E_{1/2}$  dimensions are not indicated, the maximum possible amount of fixing holes will be determined with regard to the  $E_{1/2}$  min.
3. The rails are shortened to the required length.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

Appendix

**9.3.5 Dimensions of the RG rails**

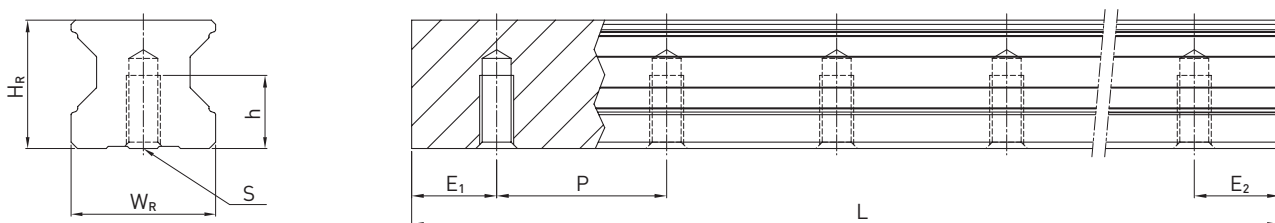
The RG rails are used for both the RG and QR blocks.

**RGR\_R**



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

**RGR\_T**



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

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

Note:

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

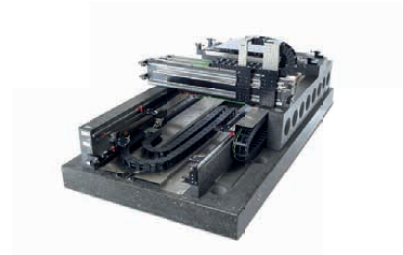




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