

Linear guideways

EG/QE series

3.3 EG/QE series

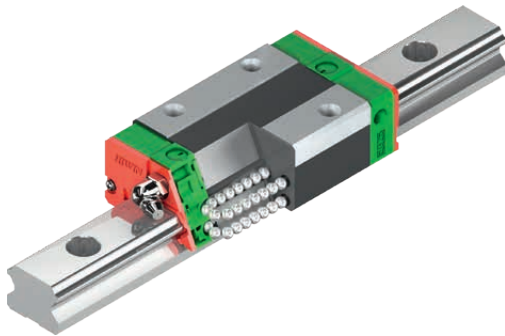
3.3.1 Properties of the EG and QE series linear guideways

Flat type, specially for applications with limited installation space. The HIWIN linear guideways of the EG series with four ball tracks are well-suited for applications with tight installation space due to their low installation height. Nevertheless, the EG series has the same properties as the HG series: high load capacity, low displacement forces and high efficiency. The ball retainers prevent the balls from falling out when pulled from the profile rail during installation of the blocks.

The models of the QE series with SynchMotion™ technology offer all the advantages of the standard EG series. Controlled movement of the balls at a defined distance also results in improved synchronous performance, higher reliable travel speeds, extended lubrication intervals and less running noise. Since the installation dimensions of the QE blocks are identical to those of the EG blocks, they are also mounted on the EGR standard rail and can thus be easily interchanged. For further information, see Page 26.

3.3.2 Layout of EG/QE series

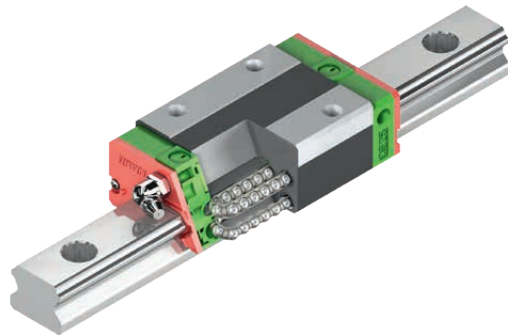
- Four-row recirculating ball bearing guide
- 45° contact angle of the ball tracks
- The ball retainers prevent the balls from falling out when the block is removed
- Different sealing variants, depending on application area
- 6 connection options for lubricating nipples or lubrication adapters
- SynchMotion™ technology (QE series)



Layout of EG series

Advantages:

- Backlash-free
- Exchangeable
- High accuracy
- Highly resilient in all loading directions
- Low friction losses even with preload from optimised ball tracks and 2-point contact



Layout of QE series

Additional advantages of QE series:

- Improved synchronous performance
- Optimised for higher travel speeds
- Extended relubrication intervals
- Reduced running noise
- Higher dynamic load rating

3.3.3 Order codes of EG/QE series

For EG/QE linear guideways, there is a distinction made between assembled and non-assembled models. The dimensions of both models are the same. The main difference is that, in the unassembled models, blocks and profile rails can be freely interchanged. Block and profile rail can be ordered separately and mounted by the customer. Their accuracy reaches class P.

Order code for linear guideway (assembled)

EG	W	25	C	C	2	R	1600	ZA	H	2	DD	E2	CTS
----	---	----	---	---	---	---	------	----	---	---	----	----	-----

Series: _____
 EG
 QE

Type: _____
 W: Flange block
 H: Square block

Size: _____
 EG: 15, 20, 25, 30, 35
 QE: 15, 20, 25, 30, 35

Load class: _____
 S: Average load
 C: Heavy load

Block fastening: _____
 A: From above
 C: From above or below

Number of blocks per profile rail _____

Profile rail mounting: _____
 R: From above
 T: From below
 U: From above with large assembly hole (EG/QE15, EG/QE30)

Coating:
 None: No coating
 CTS, CZS, CCB

None: Standard
 E2: Long-term lubrication unit
 SE: Steel deflector³⁾

Dust protection²⁾:
 None: Standard (SS)
 ZZ, DD, KK

Rails per axis¹⁾

Accuracy class:
 C, H, P, SP, UP

Preload identifier:
 Z0, ZA, ZB

Profile rail length [mm]

Order number of block (not assembled)

EG	W	25	C	C	Z0	H	ZZ	E2
----	---	----	---	---	----	---	----	----

Series: _____
 EG
 QE

Type: _____
 W: Flange block
 H: Square block

Size: _____
 EG: 15, 20, 25, 30, 35
 QE: 15, 20, 25, 30, 35

Load class: _____
 S: Average load
 C: Heavy load

None: Standard
 E2: Long-term lubrication unit

Dust protection²⁾:
 None: Standard (SS)
 ZZ, DD, KK

Accuracy class:
 C, H, P

Preload identifier:
 Z0, ZA, ZB

Block fastening:
 A: From above
 C: From above or below

Order number of profile rail (not assembled)

EG	R	25	R	1200	H	CTS
----	---	----	---	------	---	-----

EG series _____

Profile rail _____

Size: _____
 15, 20, 25, 30, 35

Coating:
 None: No coating
 CTS, CZS, CCB

Accuracy class:
 C, H, P

Profile rail length [mm]

Profile rail mounting:
 R: From above
 T: From below
 U: From above with large assembly hole (EG/QE15, EG/QE30)

Note:

¹⁾ The number 2 is also a quantity indication, i.e. one piece of the article described above consists of one pair of rails.

No number is given for single profile rails. In the case of multi-part rails, the joint is offset as standard.

²⁾ An overview of the individual sealing systems can be found on Page 24

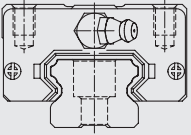
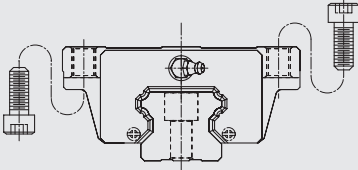
³⁾ Only available for EG 20 and EG 25

Linear guideways

EG/QE series

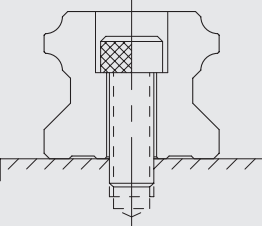
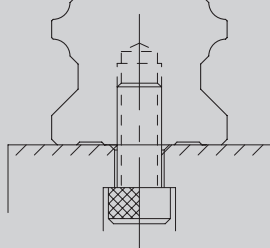
3.3.4 Block types

HIWIN offers block and flange blocks for its linear guideways. Due to the low installation height and the larger mounting surface, flange blocks are better suited for large loads.

Table 3.40 Block types				
Type	Series/size	Layout	Height [mm]	Typical applications
Square type	EGH-SA EGH-CA		24 – 48	– Machining centres – NC lathes – Grinding machines – Precision milling machines – High performance cutting machines – Automation technology – Transport technology – Measuring technology – Machines and devices with high required positioning accuracy
Flange type	EGW-SC EGW-CC			

3.3.5 Profile rail types

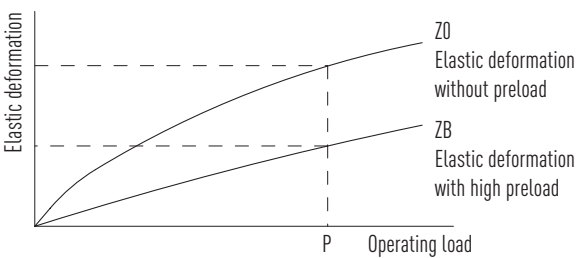
In addition to profile rails with standard fastening from above, HIWIN also offers rails for fastening from below.

Table 3.41 Profile rail types	
Fastening from above	Fastening from below
	
EGR_R	EGR_T

3.3.6 Preload

Definition

Each linear guideway can be preloaded via the ball size. The curve shows that the rigidity doubles at high preload. The EG/QE series of linear guideways offers three standard preloads for different applications and conditions.



Preload identifier

Table 3.42 Preload identifier

Identifier	Preload		Application	Example applications
Z0	Slight preload	$0 - 0.02 C_{dyn}$	Constant load direction, little vibration, less accuracy required	- Transport technology - Automatic packaging machines - X-Y axis in industrial machines - Welding machines
ZA	Medium preload	$0.03 - 0.05 C_{dyn}$	High accuracy required	- Machining centres - Z axes in industrial machines - Eroding machines - NC lathes - Precision X-Y table - Measuring technology
ZB	High preload	$0.06 - 0.08 C_{dyn}$	High rigidity required, vibration and jolting	- Machining centres - Grinding machines - NC lathes - Horizontal and vertical milling machines - Z-axis of machine tools - High performance cutting machines

3.3.7 Load ratings and torques

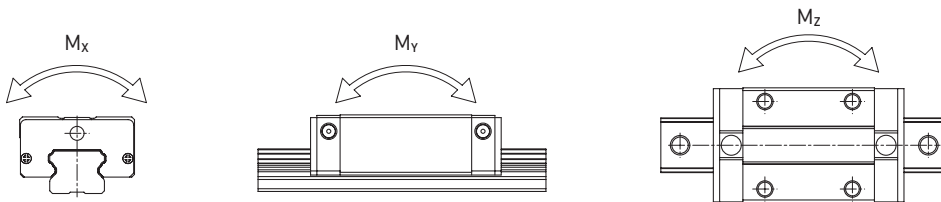


Table 3.43 Load ratings and torques for EG/QE series

Series/Size	Dynamic load rating C_{dyn} [N] ¹⁾	Static load rating C_0 [N]	Static moment [Nm]		
			M_{0x}	M_{0y}	M_{0z}
EG_15S	5,350	9,400	80	40	40
QE_15S	8,560	8,790	70	30	30
EG_15C	7,830	16,190	130	100	100
QE_15C	12,530	15,280	120	90	90
EG_20S	7,230	12,740	130	60	60
QE_20S	11,570	12,180	130	50	50
EG_20C	10,310	21,130	220	160	160
QE_20C	16,500	20,210	210	150	150
EG_25S	11,400	19,500	230	120	120
QE_25S	18,240	18,900	220	100	100
EG_25C	16,270	32,400	380	320	320
QE_25C	26,030	31,490	370	290	290
EG_30S	16,420	28,100	400	210	210
QE_30S	26,270	27,820	400	180	180
EG_30C	23,700	47,460	680	550	550
QE_30C	37,920	46,630	670	510	510
EG_35S	22,660	37,380	560	310	310
QE_35S	36,390	36,430	610	330	330
EG_35C	33,350	64,840	980	690	690
QE_35C	51,180	59,280	1,000	750	750

¹⁾ Dynamic load rating for 50,000 m travel path

Linear guideways

EG/QE series

3.3.8 Rigidity

The rigidity depends on the preload. With the formula F 3.9, the deformation can be calculated depending on the rigidity.

F 3.9

$$\delta = \frac{P}{k}$$

δ Deformation [μm]
 P Operating load [N]
 k Rigidity value [N/ μm]

Table 3.44 Radial rigidity of EG/QE series				
Load type	Series/size	Rigidity depending on the preload		
		Z0	ZA	ZB
Average load	EG_15S	105	126	141
	QE_15S	96	115	128
	EG_20S	126	151	168
	QE_20S	116	139	153
	EG_25S	156	187	209
	QE_25S	137	165	184
	EG_30S	184	221	246
	QE_30S	169	203	226
	EG_35S	221	265	295
	QE_35S	214	257	287
Heavy load	EG_15C	172	206	230
	QE_15C	157	187	209
	EG_20C	199	238	266
	QE_20C	183	219	245
	EG_25C	246	296	329
	QE_25C	219	263	293
	EG_30C	295	354	395
	QE_30C	271	326	363
	EG_35C	354	425	474
	QE_35C	333	399	445

Unit: N/ μm

3.3.9 Dimensions of the EG/QE blocks

3.3.9.1 EGH/QEH

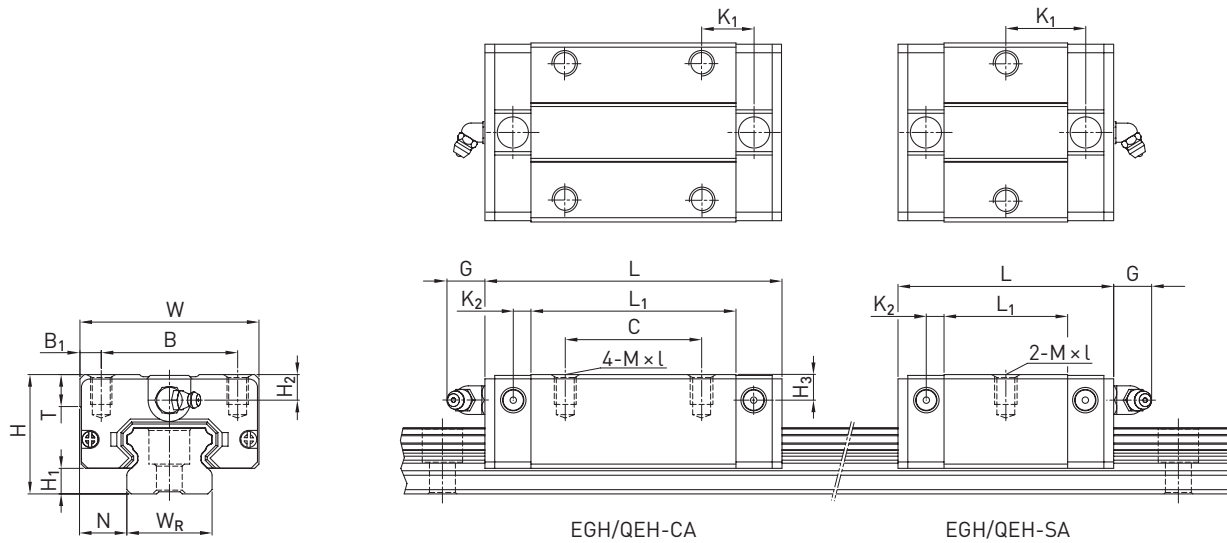


Table 3.45 Dimensions of the block

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

For dimensions of the rail, see Page 77, for standard as well as optional lubrication adapter, see Page 152.

Linear guideways

EG/QE series

3.3.9.2 EGW/QEW

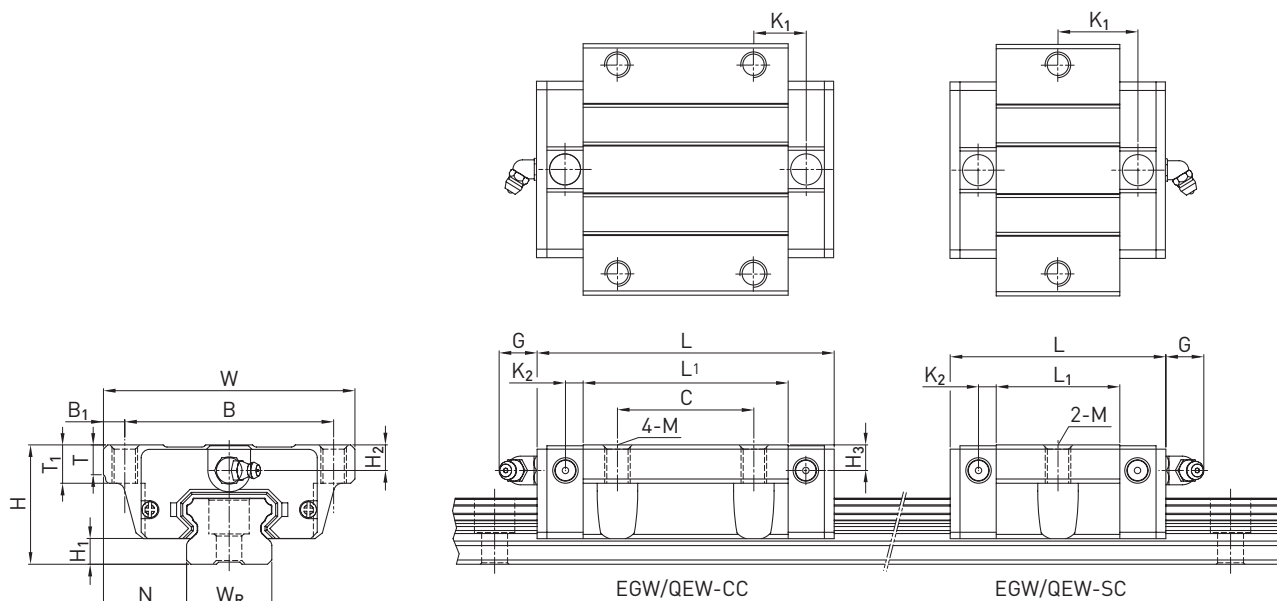


Table 3.46 Dimensions of the block

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

For dimensions of the rail, see Page 77, for standard as well as optional lubrication adapter, see Page 152.

3.3.10 Dimensions of the EG rail

The EG profile rail is used for both the EG and QE blocks.

3.3.10.1 Dimensions EGR_R

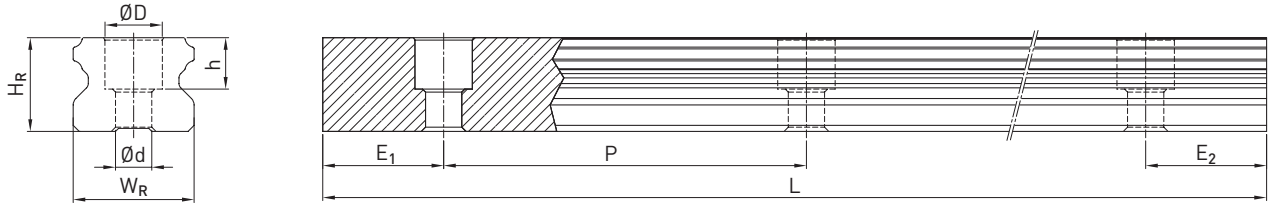


Table 3.47 Dimensions of profile rail EGR_R

Series/size	Assembly screw for rail [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		W_R	H_R	D	h	d	P						
EGR15R	M3 × 16	15	12.5	6.0	4.5	3.5	60	4,000	3,900	70	5	54	1.25
EGR20R	M5 × 20	20	15.5	9.5	8.5	6.0	60	4,000	3,900	74	7	53	2.08
EGR25R	M6 × 25	23	18.0	11.0	9.0	7.0	60	4,000/5,600	3,900/5,520 ¹⁾	76	8	52	2.67
EGR30R	M6 × 30	28	23.0	11.0	9.0	7.0	80	4,000/5,600	3,900/5,520 ¹⁾	96	8	71	4.35
EGR35R	M8 × 35	34	27.5	14.0	12.0	9.0	80	4,000	3,920	98	9	71	6.14

3.3.10.2 Dimensions EGR_U (large mounting holes)

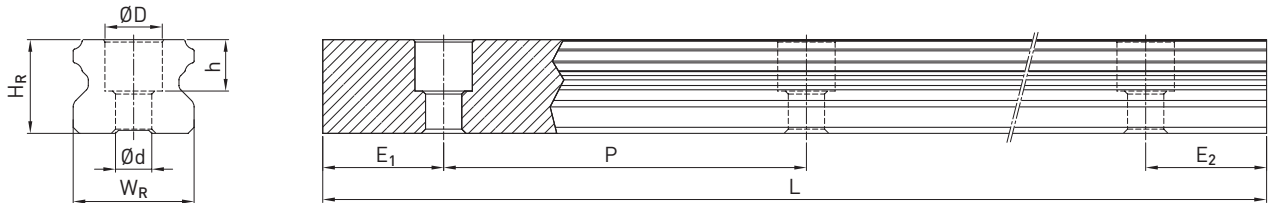


Table 3.48 Dimensions of profile rail EGR_U

Series/size	Assembly screw for rail [mm]	Dimensions of the rail [mm]						Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
		W_R	H_R	D	h	d	P						
EGR15U	M4 × 16	15	12.5	7.5	5.3	4.5	60	4,000	3,900	72	6	54	1.23
EGR30U	M8 × 30	28	23.0	14.0	12.0	9.0	80	4,000	3,920	98	9	71	4.23

Note:

1. The tolerance for E is +0.5 to -1 mm for standard, for joint connections 0 to -0.3 mm.
2. If no information is provided on the $E_{1/2}$ dimensions, the maximum number of mounting holes is determined taking into account $E_{1/2}$ min.
3. The rails are shortened to the desired length. If no information on the $E_{1/2}$ dimensions is provided, then the rails are manufactured symmetrically.

Linear guideways

EG/QE series

3.3.10.3 Dimensions EGR_T (profile rail fastening from below)

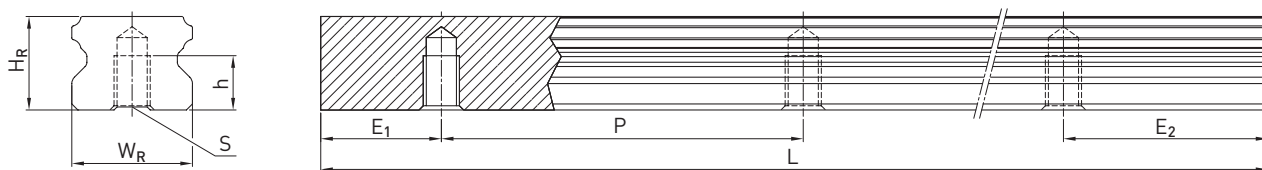


Table 3.49 Dimensions of profile rail EGR_T

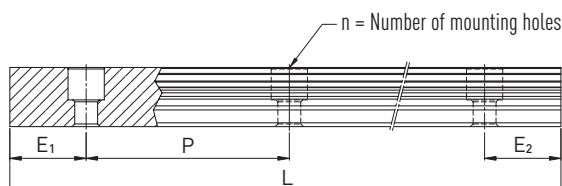
Series/size	Dimensions of the rail [mm]					Max. length [mm]	Max. length $E_1 = E_2$ [mm]	Min. length [mm]	$E_{1/2}$ min [mm]	$E_{1/2}$ max [mm]	Weight [kg/m]
	W_R	H_R	S	h	P						
EGR15T	15	12.5	M5	7	60	4,000	3,900	70	5	54	1.26
EGR20T	20	15.5	M6	9	60	4,000	3,900	74	7	53	2.15
EGR25T	23	18.0	M6	10	60	4,000	3,900	76	8	52	2.79
EGR30T	28	23.0	M8	14	80	4,000	3,920	96	8	71	4.42
EGR35T	34	27.5	M8	17	80	4,000	3,920	98	9	71	6.34

Note:

1. The tolerance for E is +0.5 to -1 mm for standard, for joint connections 0 to -0.3 mm.
2. If no information is provided on the $E_{1/2}$ dimensions, the maximum number of mounting holes is determined taking into account $E_{1/2}$ min.
3. The rails are shortened to the desired length. If no information on the $E_{1/2}$ dimensions is provided, then the rails are manufactured symmetrically.

3.3.10.4 Calculation of the length of profile rails

HIWIN offers profile rails in customised lengths. To make sure the end of the profile rail does not become unstable, the value E should not exceed half the distance between the mounting holes (P). At the same time, the value $E_{1/2}$ should be between $E_{1/2}$ min and $E_{1/2}$ max so that the mounting hole does not break out.



F 3.10

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

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

3.3.10.5 Cover caps for mounting holes of profile rails

The cover caps are used to keep the mounting holes free of chips and dirt. The standard plastic cover caps accompany each profile rail. Optional cover caps have to be ordered separately.



Table 3.50 Cover caps for mounting holes of profile rails

Rail	Screw	Article number			Ø D [mm]	Height H [mm]
		Plastic (200 units)	Brass ¹⁾	Steel ¹⁾		
EGR15R	M3	5-002217	5-001340	—	6.0	1.2
EGR20R	M5	5-002220	5-001350	5-001352	9.5	2.5
EGR25R	M6	5-002221	5-001355	5-001357	11.0	2.8
EGR30R	M6	5-002221	5-001355	5-001357	11.0	2.8
EGR35R	M8	5-002222	5-001360	5-001362	14.0	3.5
EGR15U	M4	5-002218	5-001344	—	7.5	1.2
EGR30U	M8	5-002222	5-001360	5-001362	14.0	3.5

¹⁾ Not recommended for coated rails.

3.3.11 Sealing systems

Different sealing systems are available for HIWIN blocks. You can find an overview on Page 24. The following table shows the total length of the blocks with different sealing systems. Appropriate sealing systems are available for these sizes.

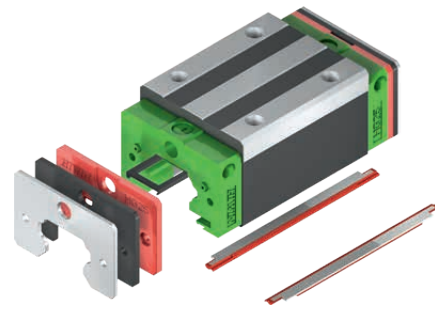


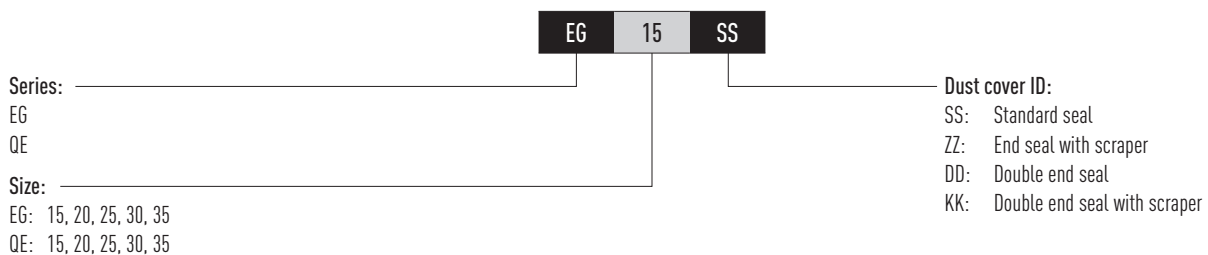
Table 3.51 Total length of block with different sealing systems

Series/size	Total length L (including screws)			
	SS	DD	ZZ	KK
EG_15S	40.1	44.1	41.7	45.7
QE_15S	40.1	44.1	42.1	46.1
EG_15C	56.8	60.8	58.4	62.4
QE_15C	56.8	60.8	58.8	62.8
EG_20S	50.0	54.0	51.6	55.6
QE_20S	50.0	54.0	52.0	56.0
EG_20C	69.1	73.1	70.7	74.7
QE_20C	69.1	73.1	71.1	75.1
EG_25S	59.1	63.1	61.1	65.1
QE_25S	60.1	65.1	62.1	67.1
EG_25C	82.6	86.6	84.6	88.6
QE_25C	83.6	88.6	85.6	90.6
EG_30S	69.5	73.5	71.5	75.5
QE_30S	67.5	72.5	69.5	74.5
EG_30C	98.1	102.1	100.1	104.1
QE_30C	96.1	101.1	98.1	103.1
EG_35S	75.0	79.0	78.0	82.0
QE_35S	76.0	80.0	79.0	83.0
EG_35C	108.0	112.0	111.0	115.0
QE_35C	108.0	112.0	111.0	115.0

Unit: mm

3.3.11.1 Designation of the seal sets

The seal sets are always shipped complete with the installation materials and include the supplemental parts for the standard seal.



Linear guideways

EG/QE series

3.3.12 Long-term lubrication unit

Further information on the lubrication unit can be found in the general information In section "2.6.3 Long-term lubrication unit" on Page 17.

The following drawing shows the dimension (L) for a single-sided lubrication unit. (standard) The dimension for a double-sided lubrication unit results from the dimension $L + V + T$. The E2 long-term lubrication unit is available with the sealing systems named in the table.

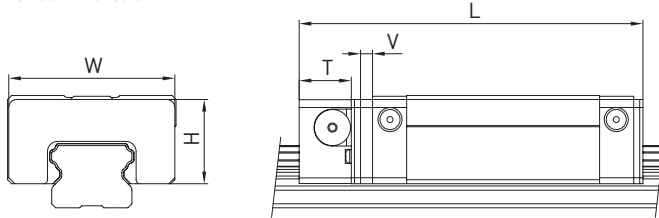


Table 3.52 Dimensions of the block with lubrication unit E2

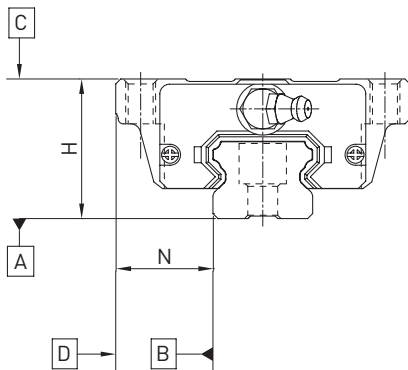
Model	Dimensions of the block [mm]								Max. running performance ²⁾ [km] E2 single-sided	Max. running performance ²⁾ [km] E2 double-sided
	W	H	T	V	L _{SS} ¹⁾	L _{ZZ} ¹⁾	L _{DD} ¹⁾	L _{KK} ¹⁾		
EG_15S	33.3	18.7	11.5	3.0	54.6	56.2	58.6	60.2	10,000	20,000
QE_15S	33.3	19.2	11.5	3	54.6	–	–	–	20,000	30,000
EG_15C	33.3	18.7	11.5	3.0	71.3	72.9	75.3	76.9	10,000	20,000
QE_15C	33.3	19.2	11.5	3	71.3	–	–	–	20,000	30,000
EG_20S	41.3	20.9	13.0	3.0	66.0	67.6	70.0	71.6	10,000	20,000
QE_20S	41.3	20.9	13	3	66.0	–	–	–	20,000	30,000
EG_20C	41.3	20.9	13.0	3.0	85.1	86.7	89.1	90.7	10,000	20,000
QE_20C	41.3	20.9	13	3	85.1	–	–	–	20,000	30,000
EG_25S	47.3	24.9	13.0	3.0	75.1	77.1	79.1	81.1	10,000	20,000
QE_25S	47.3	24.9	13	3	76.1	–	–	–	20,000	30,000
EG_25C	47.3	24.9	13.0	3.0	98.6	100.6	102.6	104.6	10,000	20,000
QE_25C	47.3	24.9	13	3	99.6	–	–	–	20,000	30,000
EG_30S	59.3	31.0	13.0	3.0	85.5	87.5	89.5	91.5	10,000	20,000
QE_30S	59.3	31	13	3	83.5	–	–	–	20,000	30,000
EG_30C	59.3	31.0	13.0	3.0	114.1	116.1	118.1	120.1	10,000	20,000
QE_30C	59.3	31	13	3	112.1	–	–	–	20,000	30,000
QE_35S	68	35.5	13	3	92.0	–	–	–	20,000	30,000
QE_35C	68	35.5	13	3	124.0	–	–	–	20,000	30,000

¹⁾ Total length depending on the selected dust protection. SS = Standard dust protection

²⁾ Further details can be found in the assembly instructions in the "Lubrication" chapter

3.3.13 Tolerances depending on the accuracy class

The EG and QE series are available in five accuracy classes according to the parallelism between block and rail, height accuracy H and width accuracy N. The selection of the accuracy class is determined by the requirements of the machine.



3.3.13.1 Parallelism

Parallelism of locating surfaces D and B of the block and rail and of top block surface C to mounting surface A of the rail. Ideal installation of the linear guideway and the measurement in the centre of the block are prerequisites.

Table 3.53 Tolerance of parallelism between block and profile rail

Rail length [mm]	Accuracy class				
	C	H	P	SP	UP
– 100	12	7	3	2	2
100 – 200	14	9	4	2	2
200 – 300	15	10	5	3	2
300 – 500	17	12	6	3	2
500 – 700	20	13	7	4	2
700 – 900	22	15	8	5	3
900 – 1100	24	16	9	6	3
1100 – 1500	26	18	11	7	4
1500 – 1900	28	20	13	8	4
1900 – 2500	31	22	15	10	5
2500 – 3100	33	25	18	11	6
3100 – 3600	36	27	20	14	7
3600 – 4000	37	28	21	15	7

Unit: μm

Linear guideways

EG/QE series

3.3.13.2 Accuracy – height and width

Height tolerance of H

Permissible absolute dimension deviation of height H, measured between the centre of bolting surface C and rail underside A, with any position of the block on the rail.

Height variance of H

Permissible deviation of height H between several blocks on one rail, measured at the same position of the rail.

Width tolerance of N

Permissible absolute dimension deviation of width N, measured between the centre of bolting surfaces D and B, with any position of the block on the rail.

Width variance of N

Permissible deviation of width N between several blocks on one rail, measured at the same position of the rail.

Table 3.54 Tolerances of width and height

Series/size	Accuracy class	Height tolerance of H	Width tolerance of N	Height variance of H	Width variance of N
EG_15, 20 QE_15, 20	C (Normal)	± 0.1	± 0.1	0.02	0.02
	H (high)	± 0.03	± 0.03	0.01	0.01
	P (precision)	$0/-0.03^{1)}$ $\pm 0.015^{2)}$	$0/-0.03^{1)}$ $\pm 0.015^{2)}$	0.006	0.006
	SP (super precision)	$0/-0.015$	$0/-0.015$	0.004	0.004
	UP (ultra precision)	$0/-0.008$	$0/-0.008$	0.003	0.003
EG_25, 30, 35 QE_25, 30, 35	C (Normal)	± 0.1	± 0.1	0.02	0.03
	H (high)	± 0.04	± 0.04	0.015	0.015
	P (precision)	$0/-0.04^{1)}$ $\pm 0.02^{2)}$	$0/-0.04^{1)}$ $\pm 0.02^{2)}$	0.007	0.007
	SP (super precision)	$0/-0.02$	$0/-0.02$	0.005	0.005
	UP (ultra precision)	$0/-0.01$	$0/-0.01$	0.003	0.003

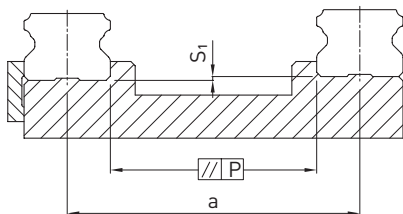
Unit: mm

¹⁾ Assembled linear guideway

²⁾ Unassembled linear guideway

3.3.13.3 Permissible tolerances of the mounting surface

Once the requirements for the accuracy of the mounting surfaces are met, the high accuracy, rigidity and service life of the EG and QE series linear guideways are achieved.



Tolerance of parallelism of reference surface (P):

Table 3.55 Maximum tolerance for parallelism (P)

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

 Unit: μm
Tolerance of height of reference surface (S_1):

F 3.11 $S_1 = a \times K$

 S_1 Maximum height tolerance [mm]

 a Distance between rails [mm]

 K Coefficient of height tolerance

Table 3.56 Coefficient of height tolerance (K)

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

3.3.14 Shoulder heights and edge roundings

Inaccurate shoulder heights and edge roundings of mounting surfaces impair accuracy and may conflict with the block or rail profile. The following shoulder heights and edge profiles must be observed to avoid assembly problems.

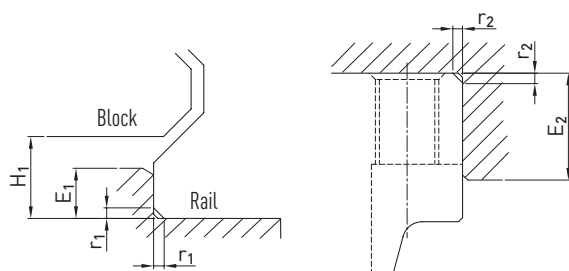


Table 3.57 Shoulder heights and edge roundings

Series/Size	Max. radius of edges r_1	Max. radius of edges r_2	Shoulder height of the reference edge of rail E_1	Shoulder height of the reference edge of block E_2	Clearance height 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