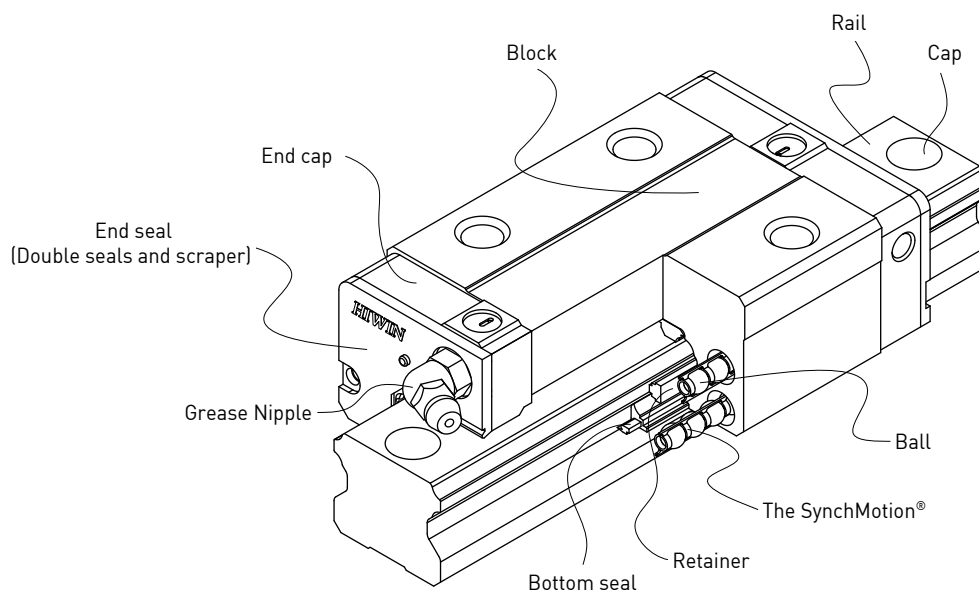


2-6 QE Series – Low Profile Linear Guideway, with SynchMotion® Technology

The development of QE linear guideway is based on a four-row circular-arc contact. The QE series linear guideway with SynchMotion® Technology offers smooth movement, superior lubrication, quieter operation and longer running life. Therefore the QE linear guideway has broad industrial applicability. In the high-tech industry where high speed, low noise, and reduced dust generation is required, the QE series is interchangeable with the EG series.

2-6-1 Construction



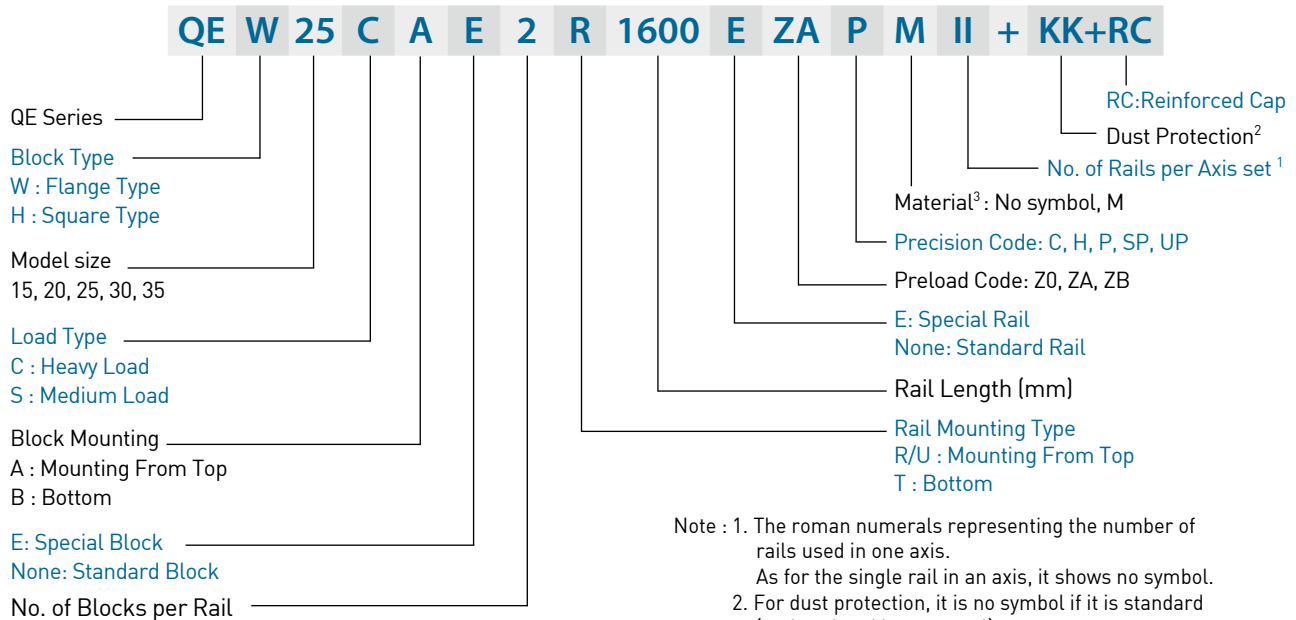
2-6-2 Model Number of QE Series

QE series guideway can be classified into non-interchangeable and interchangeable types. The sizes are identical. The main difference is that the interchangeable blocks and rails can be freely exchanged. Because of dimensional control, the interchangeable type linear guideway is a perfect choice for the client when rails do not need to be paired for an axis. And since the QE and EG share the identical rails, the customer does not need to redesign when choosing the QE series. Therefore the QE linear guideway has increased applicability.

QE Series

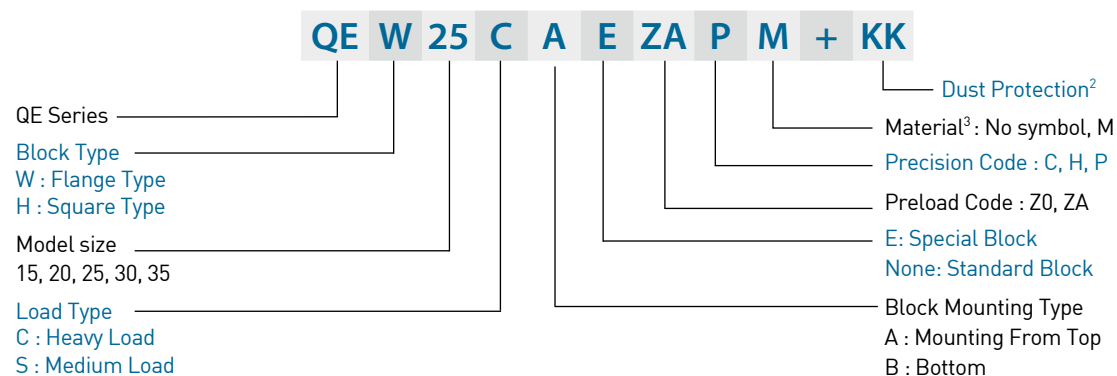
Low Profile

(1) Non-interchangeable type

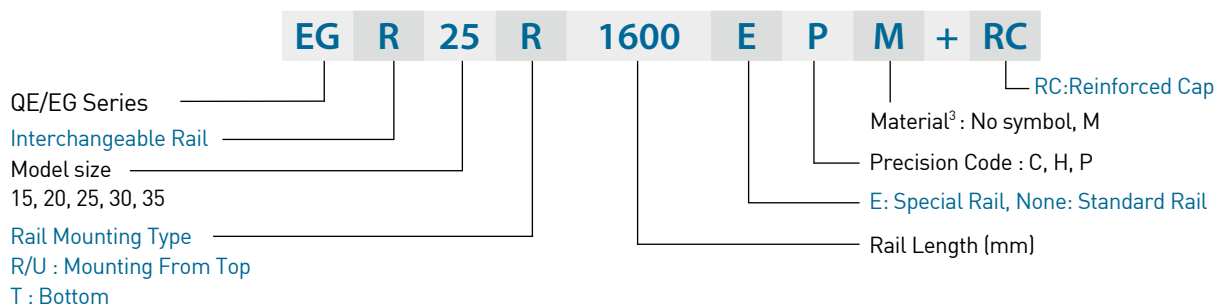


(2) Interchangeable type

Model Number of QE Block



Model Number of QE Rail (QE and EG share the identical rails)

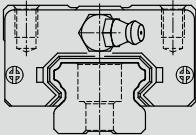
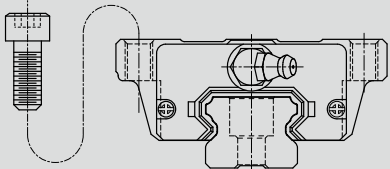
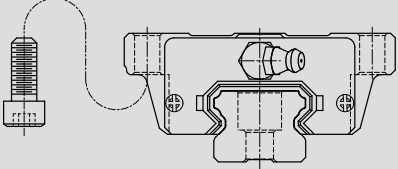


2-6-3 Types

(1) Block types

HIWIN offers two types of linear guideways, flange and square types.

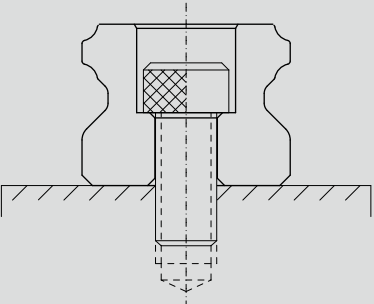
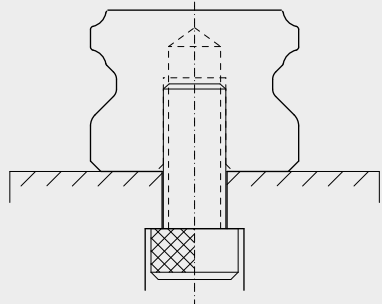
Table 2-6-1 Block Type

Type	Model	Shape	Height (mm)	Rail Length (mm)	Main Applications
Square	QEH-SA QEH-CA		24	100	- Automation devices - High-speed transportation equipment - Precision measuring equipment - Semiconductor manufacturing equipment
			↓	↓	
Flange	QEW-SA QEW-CA		24	100	
			↓	↓	
	QEW-SB QEW-CB		24	100	
			↓	↓	
			48	4000	

(2) Rail types

Besides the standard top mounting type, the bottom mounting type is also available.

Table 2-6-2 Rail Types

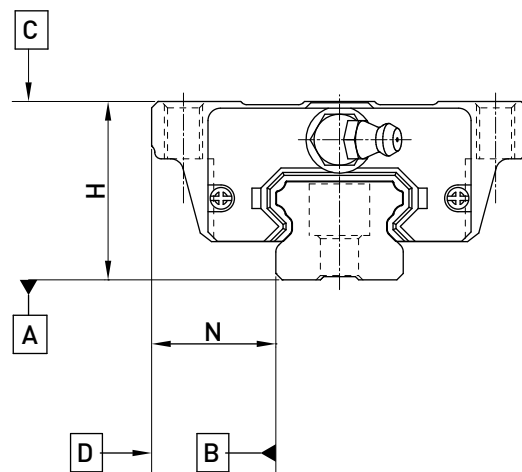
Mounting from Top	Mounting from bottom
	

QE Series

Low Profile

2-6-4 Accuracy

The accuracy of the QE series can be classified into 5 classes: normal(C), high(H), precision(P), super precision(SP), and ultra precision(UP). Choose the class by referencing the accuracy of selected equipment.



Unit: mm

Table 2-6-3 Accuracy Standards

Item	QE - 15, 20				
Accuracy Classes	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.03	0 - 0.03	0 - 0.015	0 - 0.008
Dimensional tolerance of width N	± 0.1	± 0.03	0 - 0.03	0 - 0.015	0 - 0.008
Variation of height H	0.02	0.01	0.006	0.004	0.003
Variation of width N	0.02	0.01	0.006	0.004	0.003
Running parallelism of block surface C to surface A	See Table 2-6-7				
Running parallelism of block surface D to surface B	See Table 2-6-7				

Table 2-6-4 Accuracy Standards

Unit: mm

Item	QE - 25, 30, 35				
Accuracy Classes	Normal (C)	High (H)	Precision (P)	Super Precision (SP)	Ultra Precision (UP)
Dimensional tolerance of height H	± 0.1	± 0.04	0 - 0.04	0 - 0.02	0 - 0.01
Dimensional tolerance of width N	± 0.1	± 0.04	0 - 0.04	0 - 0.02	0 - 0.01
Variation of height H	0.02	0.015	0.007	0.005	0.003
Variation of width N	0.03	0.015	0.007	0.005	0.003
Running parallelism of block surface C to surface A	See Table 2-6-7				
Running parallelism of block surface D to surface B	See Table 2-6-7				

(2) Accuracy of interchangeable guideways

Table 2-6-5 Accuracy Standards

Unit: mm

Item	QE - 15, 20		
Accuracy Classes	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.03	± 0.015
Dimensional tolerance of width N	± 0.1	± 0.03	± 0.015
Variation of height H	0.02	0.01	0.006
Variation of width N	0.02	0.01	0.006
Running parallelism of block surface C to surface A	See Table 2-6-7		
Running parallelism of block surface D to surface B	See Table 2-6-7		

Table 2-6-6 Accuracy Standards

Unit: mm

Item	QE - 25, 30, 35		
Accuracy Classes	Normal (C)	High (H)	Precision (P)
Dimensional tolerance of height H	± 0.1	± 0.04	± 0.02
Dimensional tolerance of width N	± 0.1	± 0.04	± 0.02
Variation of height H	0.02	0.015	0.007
Variation of width N	0.03	0.015	0.007
Running parallelism of block surface C to surface A	See Table 2-6-7		
Running parallelism of block surface D to surface B	See Table 2-6-7		

(3) Accuracy of running parallelism

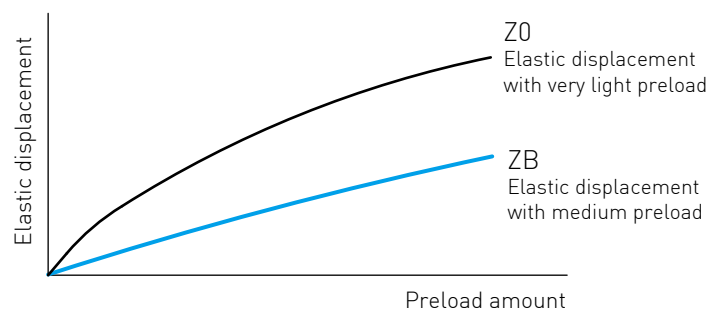
Table 2-6-7 Accuracy of Running Parallelism

Rail Length (mm)	Accuracy (μm)				
	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 ~ 1,100	24	16	9	6	3
1,100 ~ 1,500	26	18	11	7	4
1,500 ~ 1,900	28	20	13	8	4
1,900 ~ 2,500	31	22	15	10	5
2,500 ~ 3,100	33	25	18	11	6
3,100 ~ 3,600	36	27	20	14	7
3,600 ~ 4,000	37	28	21	15	7

2-6-5 Preload

(1) Definition

A preload can be applied to each guideway. Generally, a linear motion guideway has a negative clearance between the groove and balls in order to improve stiffness and maintain high precision. The figure shows that adding a preload can improve stiffness of the linear guideway. A preload no greater than ZA would be recommended for model sizes smaller than QE20. This will avoid an over-loaded condition that would affect guideway life.



(2) Preload classes

HIWIN offers three standard preloads for various applications and conditions.

Table 2-6-8 Preload Classes

Class	Code	Preload	Condition
Very Light Preload	Z0	0~ 0.02C	Certain load direction, low impact, low precision required
Light Preload	ZA	0.03C~0.05C	low load and high precision required
Medium Preload	ZB	0.06C~ 0.08C	High rigidity required, with vibration and impact

Class	Interchangeable Guideway	Non-Interchangeable Guideway
Preload classes	Z0, ZA	Z0, ZA, ZB

Note: The "C" in the preload column denotes basic dynamic load rating.

QE Series

Low Profile

(3) Stiffness performance

Stiffness depends on preload. The following table shows stiffness value of each size.

Table 2-6-9 Radial stiffness for QE Series

Load type	Series / Size	Stiffness for different preload level (N/μm)		
		Z0	ZA	ZB
Heavy load	QE 15S	87	165	210
	QE 20S	112	238	324
	QE 25S	135	266	368
	QE 30S	160	298	387
	QE 35S	194	352	481
Super heavy load	QE 15C	151	305	387
	QE 20C	183	415	564
	QE 25C	222	463	640
	QE 30C	266	519	671
	QE 35C	298	548	746

2-6-6 Mounting location

- (1) The standard location of the grease fitting is at either end of the block.
- (2) Alternatively, the nipple may be mounted on the side of the block. For side installation, contact HIWIN to pre-drill the block at the desired location.
- (3) Mounting the nipple on the top of the block requires an adaptor or o-ring depending on different series. HIWIN will pre-drill the holes to accommodate the application's requirement. For non-standard location, please contact HIWIN.
- (4) Oil piping joints may also be used at these locations for lubrication. For customers who need to lubricate from the top on a standard block, HIWIN will pre-tap the block and add a recessed o-ring. Please contact HIWIN for more information.

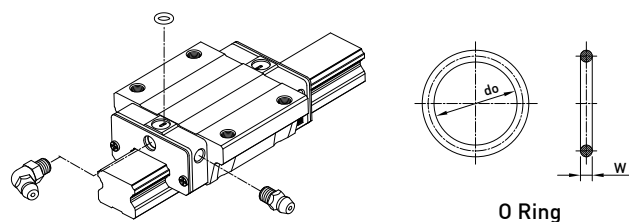
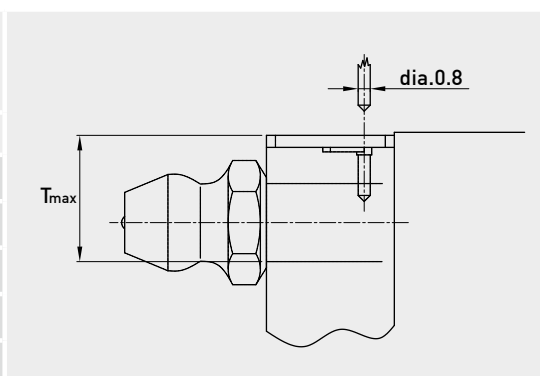


Table 2-6-10 O-Ring size and max. permissible depth for piercing

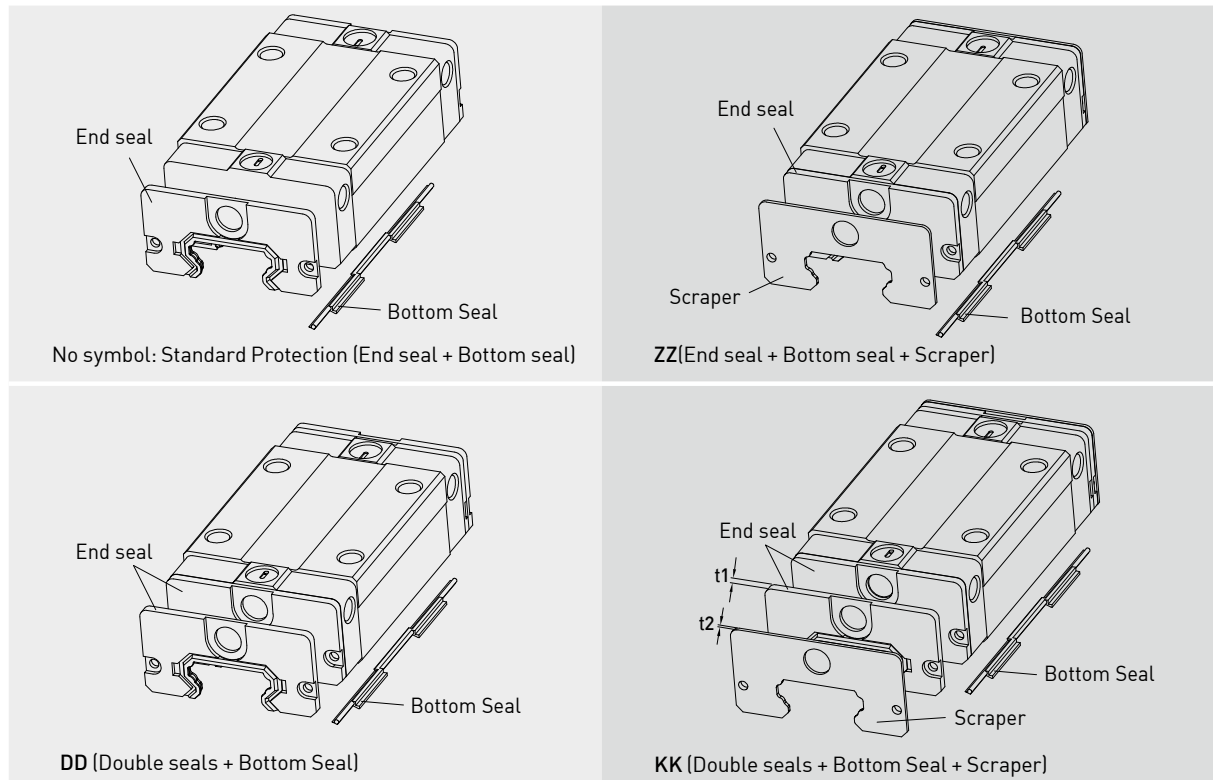
Size	O-Ring		Lube hole at top: max. permissible depth for piercing
	do (mm)	W (mm)	T _{max} (mm)
QE 15	2.5±0.15	1.5±0.15	5.3
QE 20	4.5±0.15	1.5±0.15	5.8
QE 25	3±0.15	2.5±0.15	7
QE 30	4.5±0.15	1.5±0.15	7.8
QE 35	4.5±0.15	1.5±0.15	8.3



2-6-7 Dust Protection Equipment

(1) Codes of equipment

If the following equipment is needed, please indicate the code followed by the model number.



(2) End seal and bottom seal

To prevent life reduction caused by iron chips or dust entering the block.

(3) Double seals

Removes foreign matter from the rail preventing contaminants from entering the block.

Table 2-6-11 Dimensions of end seal

Size	Thickness [t1] (mm)	Size	Thickness [t1] (mm)
QE15 ES	2	QE30 ES	2.5
QE20 ES	2	QE35 ES	2
QE25 ES	2.5		

(4) Scraper

Clears larger contaminants, such as weld spatter and metal cuttings, from the rail. Metal scraper protects end seals from excessive damage.

Table 2-6-12 Dimensions of Scraper

Size	Thickness [t2] (mm)	Size	Thickness [t2] (mm)
QE15 SC	1	QE30 SC	1
QE20 SC	1	QE35 SC	1.5
QE25 SC	1		

(5) Dimensions of block equipped with the dustproof parts

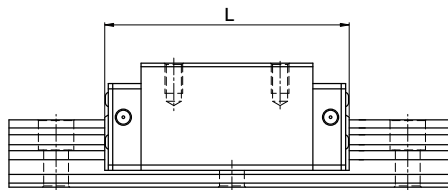


Table 2-6-13 Overall block length

unit: mm

Size	Overall block length (L)			
	SS	ZZ	DD	KK
QE15S	40.1 (42.9)	42.1 (46.5)	44.1 (46.9)	46.1 (50.5)
QE15C	56.8 (59.6)	58.8 (63.2)	60.8 (63.6)	62.8 (67.2)
QE20S	50.0 (54.0)	52.0 (58.0)	54.0 (58.0)	56.0 (62.0)
QE20C	69.1 (73.1)	71.1 (77.1)	73.1 (77.1)	75.1 (81.1)
QE25S	60.1 (63.5)	62.1 (68.1)	65.1 (68.5)	67.1 (73.1)
QE25C	83.6 (87.0)	85.6 (91.6)	88.6 (92.0)	90.6 (96.6)
QE30S	67.5 (71.3)	69.5 (75.5)	72.5 (76.3)	74.5 (80.5)
QE30C	96.1 (99.9)	98.1 (104.1)	101.1 (104.9)	103.1 (109.1)
QE35S	76.0 (80.0)	79.0 (85.0)	80.0 (84.0)	83.0 (89.0)
QE35C	108.0 (112)	111.0 (117.0)	112.0 (116.0)	115.0 (121.0)

Note : The marking of "()" denotes the maximum block length with screws, lips of end seals, etc.

2-6-8 Friction

The maximum value of resistance per end seal are as shown in the table.

Table 2-6-14 Seal Resistance

Size	Resistance N (kgf)	Size	Resistance N (kgf)
QE15	1.08 [0.11]	QE30	2.06 [0.21]
QE20	1.37 [0.14]	QE35	2.26 [0.23]
QE25	1.67 [0.17]		

Note: 1kgf=9.81N

2-6-9 Mounting Surface Accuracy Tolerance

Because of the circular-arc contact design, the QE linear guideway can withstand surface-error installation and deliver smooth linear motion. When the mounting surface meets the accuracy requirements of the installation, the high accuracy and rigidity of the guideway will be obtained without any difficulty. For faster installation and smoother movement, HIWIN offers a preload with normal clearance because of its ability to absorb higher deviations in mounting surface inaccuracies.

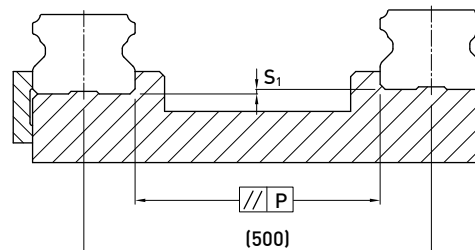


Table 2-6-15 Max. Parallelism Tolerance (P)

unit: μm

Size	Preload classes			Size	Preload classes		
	Z0	ZA	ZB		Z0	ZA	ZB
QE15	25	18	-	QE30	40	30	27
QE20	25	20	18	QE35	50	35	30
QE25	30	22	20				

Table 2-6-16 Max. Tolerance of Reference Surface Height (S_1)

unit: μm

Size	Preload classes			Size	Preload classes		
	Z0	ZA	ZB		Z0	ZA	ZB
QE15	130	85	-	QE30	170	110	90
QE20	130	85	50	QE35	210	150	120
QE25	130	85	70				

Note: The allowable value is proportional to the distance between the axes.

2-6-10 Cautions for Installation

(1) Shoulder heights and chamfers

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

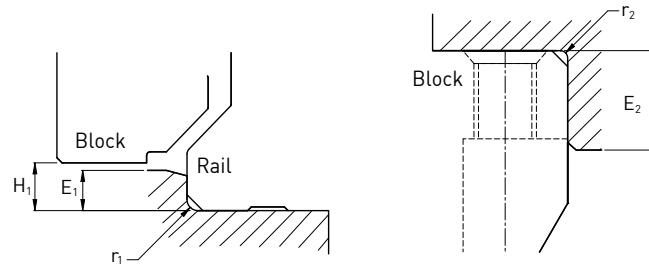


Table 2-6-17 Shoulder Heights and Chamfers

unit: mm

Size	Max. radius of fillets r_1 (mm)	Max. radius of fillets r_2 (mm)	Shoulder height beside the rail E_1 (mm)	Shoulder height beside the block E_2 (mm)	Clearance under block H_1 (mm)
QE15	0.5	0.5	2.7	5.0	4.0
QE20	0.5	0.5	5.0	7.0	6.0
QE25	1.0	1.0	5.0	7.5	6.2
QE30	1.0	1.0	7.0	7.0	10.0
QE35	1.0	1.5	7.5	9.5	11.0

(2) Tightening Torque of Bolts for Installation

Improperly tightened mounting bolts will seriously affect the accuracy of linear guide installations. The following tightening torques for different sizes of bolts are recommended.

Table 2-6-18 Tightening Torque

Size	Bolt size	Torque N-cm(kgf-cm)		
		Iron	Casting	Aluminum
QE15	M3×0.5P×16L	186 (19)	127 (13)	98(10)
QE20	M5×0.8P×16L	883 (90)	588 (60)	441 (45)
QE25	M6×1P×20L	1373 (140)	921 (94)	686 (70)
QE30	M6×1P×25L	1373 (140)	921 (94)	686 (70)
QE35	M8×1.25P×25L	3041 (310)	2010 (205)	1470 (150)

Note: 1 kgf = 9.81 N

Table 2-6-19 Tightening Torque of Mounting Bolts for Block Installation

Size	Bolt size	Torque N-cm(kgf-cm)	Size	Bolt size	Torque N-cm(kgf-cm)
		Iron			Iron
QEH15	M4x0.7P	392 [40]	QEW25	M8x1.25P	3041 [310]
QEW15	M5x0.8P	883 [90]	QEH30	M8x1.25P	3041 [310]
QEH20	M5x0.8P	883 [90]	QEW30	M10x1.5P	6760 [689]
QEW20	M6x1P	1373 [140]	QEH35	M8x1.25P	3041 [310]
QEH25	M6x1P	1373 [140]	QEW35	M10x1.5P	6760 [689]

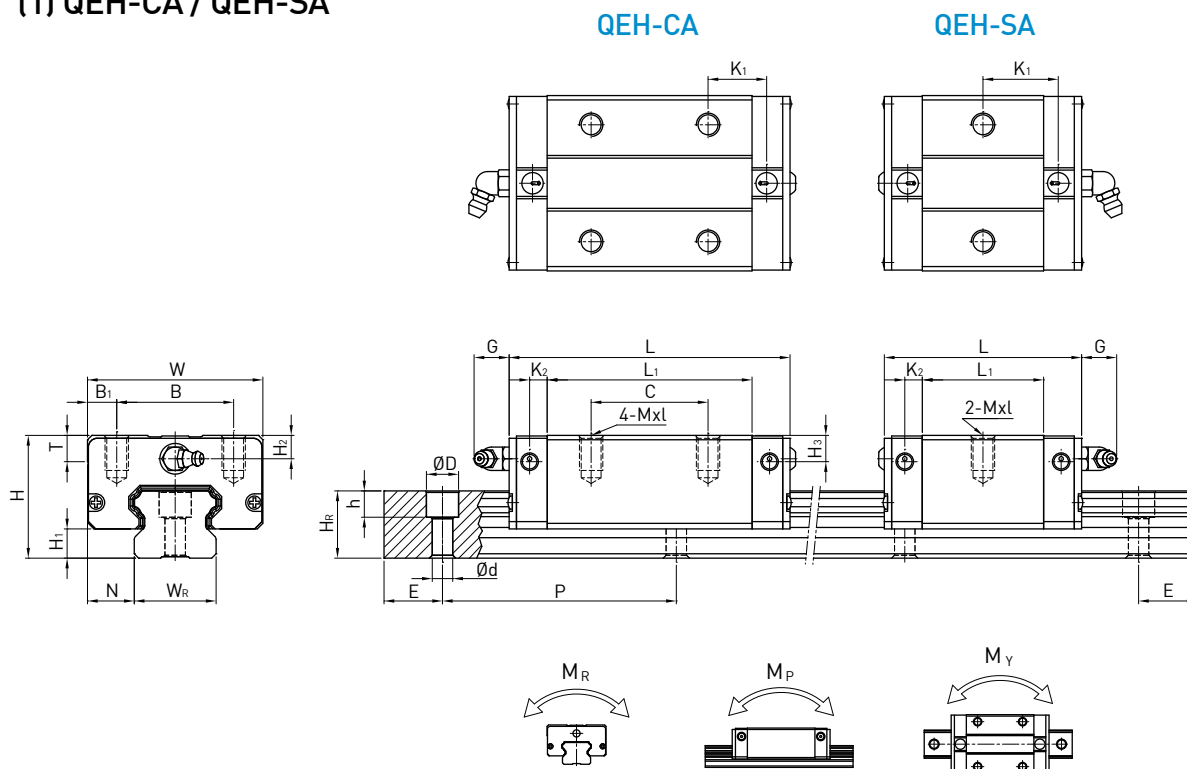
Note: 1 kgf = 9.81 N

QE Series

Low Profile

2-6-11 Dimensions for HIWIN QE Series

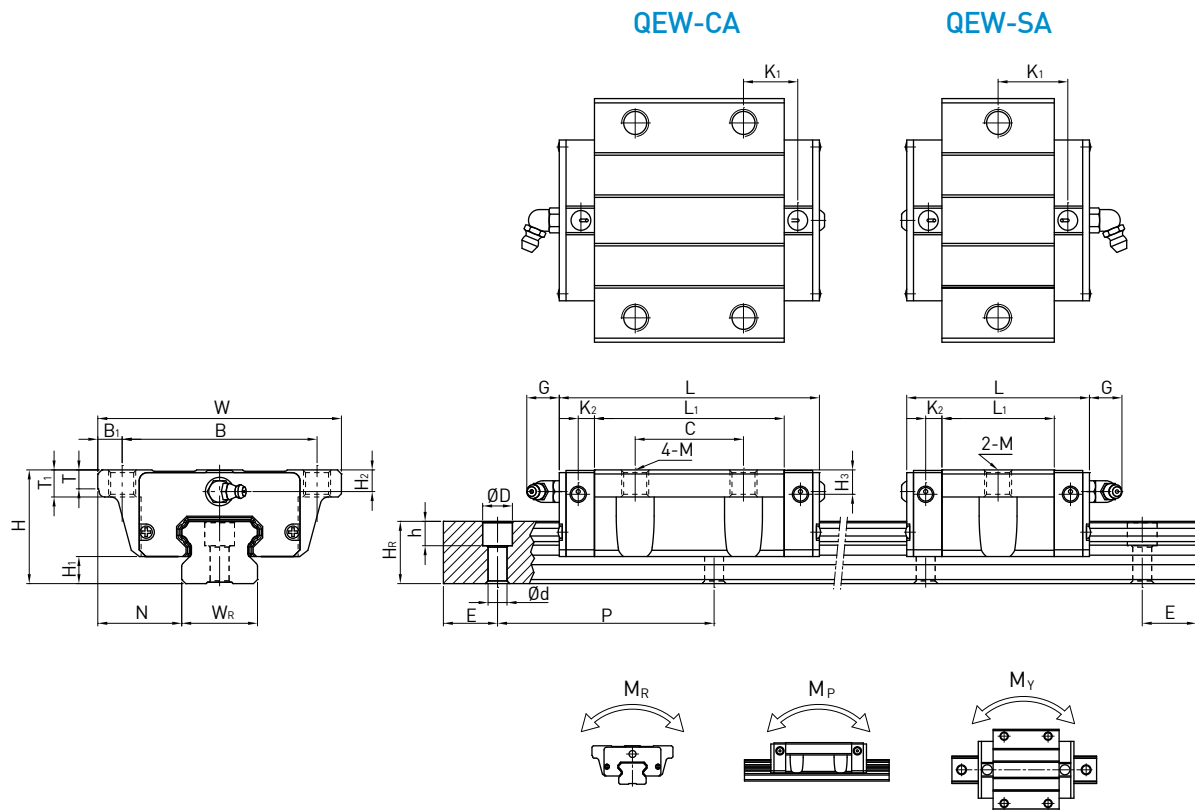
(1) QEH-CA / QEH-SA



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)															Dimensions of Rail (mm)								Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
																														M _R	M _P	M _V	Block	Rail
	H	H ₁	N	W	B	B ₁	C	L ₁	L	K ₁	K ₂	G	MxL	T	H ₂	H ₃	W _R	H _R	D	h	d	P	E	(mm)	C(kN)	C ₀ (kN)	kN-m	kN-m	kN-m	kg	kg/m			
QEH15SA	24	4	9.5	34	26	4	-	23.1	40.1	14.8	3.5	5.7	M4x6	6	5.5	6	15	12.5	6	4.5	3.5	60	20	M3x16	8.56	8.79	0.07	0.03	0.03	0.09	1.25			
QEH15CA							26	39.8	56.8	10.15															26	39.8	56.8	10.15	12.53	15.28		0.12	0.09	0.09
QEH20SA	28	6	11	42	32	5	-	29	50	18.75	4.15	12	M5x7	7.5	6	6.5	20	15.5	9.5	8.5	6	60	20	M5x16	11.57	12.18	0.13	0.05	0.05	0.15	2.08			
QEH20CA							32	48.1	69.1	12.3															16.50	20.21	0.21	0.15	0.15	0.23				
QEH25SA	33	6.2	12.5	48	35	6.5	-	35.5	60.1	21.9	5	12	M6x9	8	8	8	23	18	11	9	7	60	20	M6x20	18.24	18.90	0.22	0.10	0.10	0.24	2.67			
QEH25CA							35	59	83.6	16.15															26.03	31.49	0.37	0.29	0.29	0.40				
QEH30SA	42	10	16	60	40	10	-	41.5	67.5	25.75	6	12	M8x12	9	8	9	28	23	11	9	7	80	20	M6x25	26.27	27.82	0.40	0.18	0.18	0.44	4.35			
QEH30CA							40	70.1	96.1	20.05															37.92	46.63	0.67	0.51	0.51	0.75				
QEH35SA	48	11	18	70	50	10	-	51	76	30.3	6.25	12	M8x12	10	8.5	8.5	34	27.5	14	12	9	80	20	M8x25	36.39	36.43	0.61	0.33	0.33	0.77	6.14			
QEH35CA							50	83	108	21.3															51.18	59.28	1.00	0.75	0.75	1.19				

Note : 1 kgf = 9.81 N

(2) QEW-CA / QEW-SA



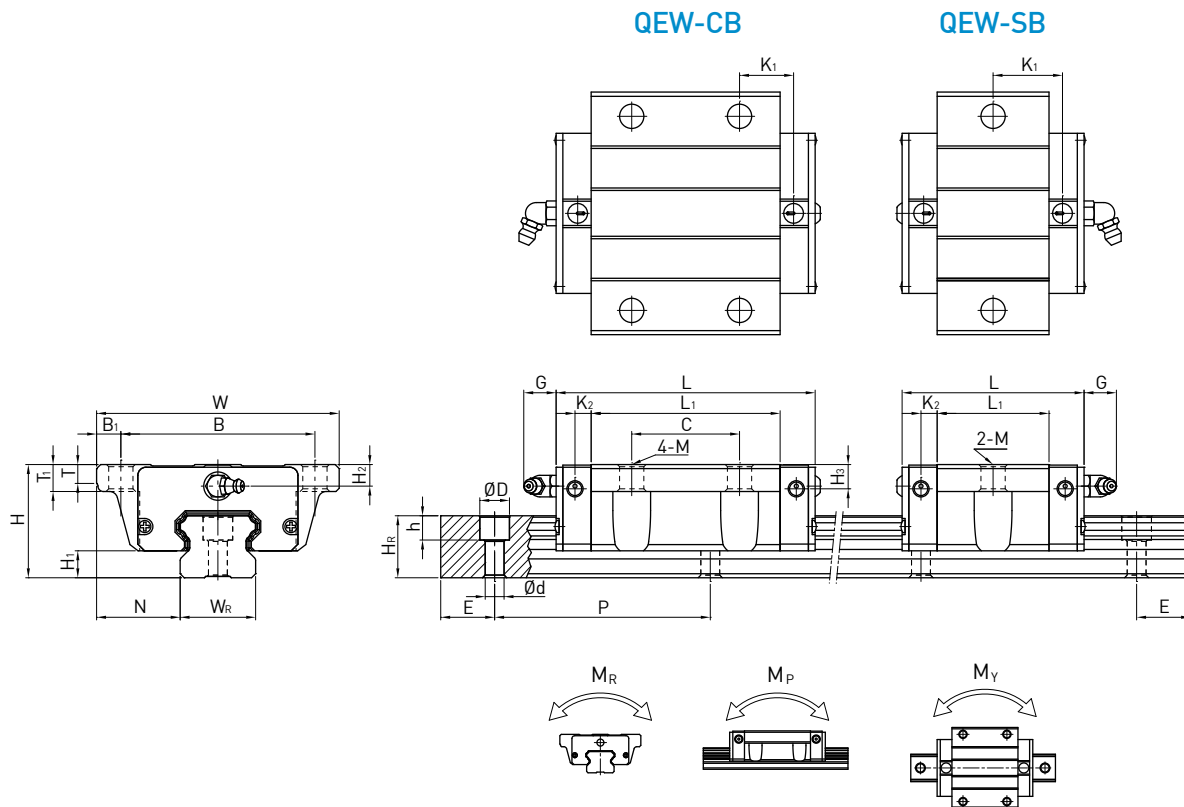
Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)														Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	H	H ₁	N	W	B	B ₁	C	L ₁	L	K ₁	K ₂	G	M	T	T ₁	H ₂	H ₃	W _R	H _R	D	h	d	P	E	(mm)	C(kN)	C ₀ (kN)	M _R	M _P	M _Y	Block	Rail
QEW15SA	24	4	18.5	52	41	5.5	-	23.1	40.1	14.8	3.5	5.7	M5	5	7	5.5	6	15	12.5	6	4.5	3.5	60	20	M3×16	8.56	8.79	0.07	0.03	0.03	0.12	1.25
QEW15CA							26	39.8	56.8	10.15																12.53	15.28	0.12	0.09	0.09	0.21	
QEW20SA	28	6	19.5	59	49	5	-	29	50	18.75	4.15	12	M6	7	9	6	6.5	20	15.5	9.5	8.5	6	60	20	M5×16	11.57	12.18	0.13	0.05	0.05	0.19	2.08
QEW20CA							32	48.1	69.1	12.3																16.50	20.21	0.21	0.15	0.15	0.31	
QEW25SA	33	6.2	25	73	60	6.5	-	35.5	60.1	21.9	5	12	M8	7.5	10	8	8	23	18	11	9	7	60	20	M6×20	18.24	18.90	0.22	0.10	0.10	0.34	2.67
QEW25CA							35	59	83.6	16.15																26.03	31.49	0.37	0.29	0.29	0.58	
QEW30SA	42	10	31	90	72	9	-	41.5	67.5	25.75	6	12	M10	7	10	8	9	28	23	11	9	7	80	20	M6×25	26.27	27.82	0.40	0.18	0.18	0.61	4.35
QEW30CA							40	70.1	96.1	20.05																37.92	46.63	0.67	0.51	0.51	1.03	
QEW35SA	48	11	33	100	82	9	-	51	76	30.3	6.25	12	M10	10	13	8.5	8.5	34	27.5	14	12	9	80	20	M8×25	36.39	36.43	0.61	0.33	0.33	0.77	6.14
QEW35CA							50	83	108	21.3																51.18	59.28	1.00	0.75	0.75	1.19	

Note : 1 kgf = 9.81 N

QE Series

Low Profile

(3) QEW-CB / QEW-SB



Model No.	Dimensions of Assembly (mm)			Dimensions of Block (mm)															Dimensions of Rail (mm)							Mounting Bolt for Rail	Basic Dynamic Load Rating	Basic Static Load Rating	Static Rated Moment			Weight	
	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	W _R	H _R	D	h	d	P	E	(mm)	C(kN)	C ₀ (kN)	M _R kN-m	M _P kN-m	M _Y kN-m	Block kg	Rail kg/m	
QEW15SB	24	4	18.5	52	41	5.5	-	23.1	40.1	14.8	3.5	5.7	Ø 4.5	5	7	5.5	6	15	12.5	6	4.5	3.5	60	20	M3x16	8.56	8.79	0.07	0.03	0.03	0.12	1.25	
QEW15CB							26	39.8	56.8	10.15																	12.53	15.28	0.12	0.09	0.09	0.21	
QEW20SB	28	6	19.5	59	49	5	-	29	50	18.75	4.15	12	Ø 5.5	7	9	6	6.5	20	15.5	9.5	8.5	6	60	20	M5x16	11.57	12.18	0.13	0.05	0.05	0.19	2.08	
QEW20CB							32	48.1	69.1	12.3																	16.50	20.21	0.21	0.15	0.15	0.31	
QEW25SB	33	6.2	25	73	60	6.5	-	35.5	60.1	21.9	5	12	Ø 7	7.5	10	8	8	23	18	11	9	7	60	20	M6x20	18.24	18.90	0.22	0.10	0.10	0.34	2.67	
QEW25CB							35	59	83.6	16.15																	26.03	31.49	0.37	0.29	0.29	0.58	
QEW30SB	42	10	31	90	72	9	-	41.5	67.5	25.75	6	12	Ø 9	7	10	8	9	28	23	11	9	7	80	20	M6x25	26.27	27.82	0.40	0.18	0.18	0.61	4.35	
QEW30CB							40	70.1	96.1	20.05																	37.92	46.63	0.67	0.51	0.51	1.03	
QEW35SB	48	11	33	100	82	9	-	51	76	30.3	6.25	12	Ø 9	10	13	8.5	8.5	34	27.5	14	12	9	80	20	M8x25	36.39	36.43	0.61	0.33	0.33	0.77	6.14	
QEW35CB							50	83	108	21.3																	51.18	59.28	1.00	0.75	0.75	1.19	

Note : 1 kgf = 9.81 N