Compact slide cylinder(Recirculating linear ball bearing)——HLQ Series

Product series

Series name	Acting type	Bore size	Collocation of sensor switch
			DS1-H
HLQ 	Double acting	6 8 12 16 20 25	
Page 322			403

Installation and application

1. Dirty substances in the pipe must be eliminated before cylinder is connected with pipeline to prevent the entrance of impurities into the cylinder.
2. The medium used by cylinder should be filtered to 40 μ m or below.
3. Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
4. If the cylinder is dismantled and stored for a long time, pay attention to conduct anti-rust treatment to the surface. Anti-dust caps shall be added in air inlet and outlet ports.

Criteria for selection: Cylinder thrust

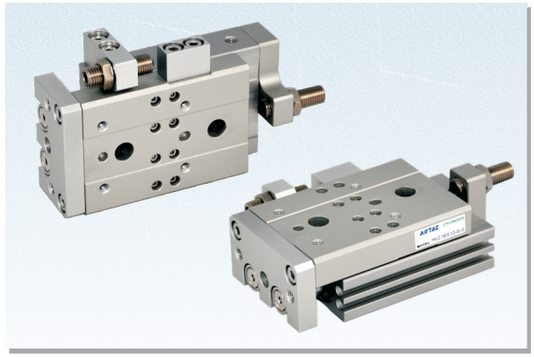
Unit: Newton(N)

Bore size (mm)	Rod size (mm)	Acting type		Pressure area (mm^2)	Operating pressure(MPa)					
					0.2	0.3	0.4	0.5	0.6	0.7
6	3	Double acting	Push side	42	8	13	17	21	25	29
			Pull side	57	11	17	23	29	34	40
8	4	Double acting	Push side	75	15	23	30	38	45	53
			Pull side	101	20	30	40	51	61	71
12	6	Double acting	Push side	170	34	51	68	85	102	119
			Pull side	226	45	68	90	113	136	158
16	8	Double acting	Push side	302	60	91	121	151	181	211
			Pull side	402	80	121	161	201	241	281
20	10	Double acting	Push side	471	94	141	188	236	283	330
			Pull side	628	126	188	251	314	377	440
25	12	Double acting	Push side	756	151	227	302	378	454	529
			Pull side	982	186	295	393	491	589	687

HLQ

Compact slide cylinder(Recirculating linear ball bearing)

HLQ Series

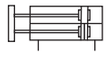


Specification

Bore size(mm)	6	8	12	16	20	25
Guide rail width (mm)	10	10	7	9	9	12
Number of guide rail	Single guide rail		Double guide rail			
Acting type	Double acting					
Fluid	Air(to be filtered by 40 μ m filter element)					
Operating pressure	0.15~0.7MPa(22~100psi)(1.5~7.0bar)					
Proof pressure	1.05MPa(150psi)(10.5bar)					
Temperature ℃	-20~70					
Speed range mm/s	50~500					
Stroke tolerance	$^{+1.0}_{0}$					
Cushion type	Bumper(Both ends), Shock absorber					
Sensor switches ①	DS1-H□N、DS1-H□P					
Port size	M5×0.8				1/8"	

① Sensor switch should be ordered additionally, please refer to P403~426 for detail of sensor switch.

Symbol



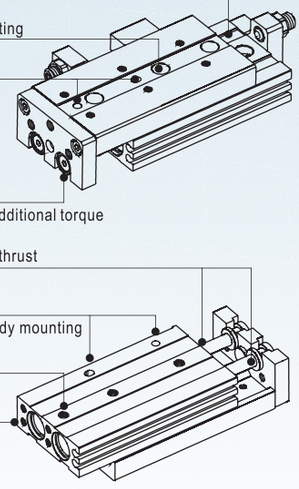
Stroke

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)
6	10 20 30 40 50	50
8	10 20 30 40 50 75	75
12	10 20 30 40 50 75 100	100
16	10 20 30 40 50 75 100 125	125
20	10 20 30 40 50 75 100 125 150	150
25	10 20 30 40 50 75 100 125 150	150

Note) Consult us for non-standard stroke.

Product feature

1. Recirculating linear ball bearing, it achieves high precision, high rigidity, with antirust and dustproof function
2. Through hole for body mounting
3. Pin holes for positioning
   Improved repeatability of work mounting
4. Floating joint design
   Piston rod needn't endure additional torque
5. Dual rod-doubles the output thrust
6. Pin holes for positioning
   Improved repeatability of body mounting
7. Body mounting holes
   provide 3 mounting positions



HLQ

Explain of model

HLQ 20×30-S-AS-P

Model
HLQ: Compact slide cylinder (Double acting type)
(Recirculating linear ball bearing)

Bore size
6, 8, 12, 16, 20, 25

Stroke
Refer to stroke table for details

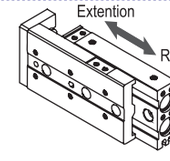
Magnet
S: With magnet

① **Thread type**

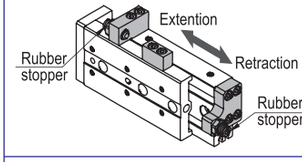
P: PT
T: NPT
G: G

② **Adjuster option**

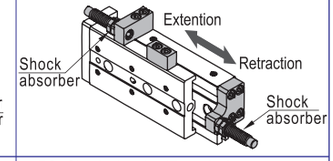
Blank: Without adjuster(Basic type)



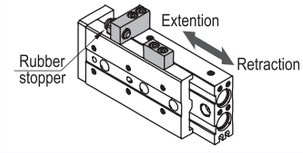
A: Adjustable rubber stopper(Both ends)



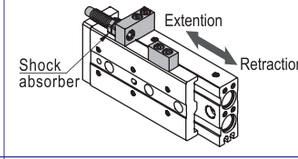
B: Shock absorber(Both ends)



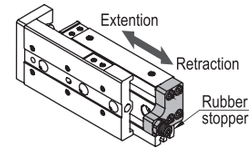
AS: Adjustable rubber stopper(Extention)



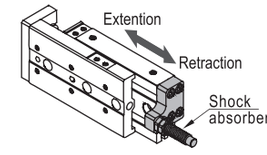
BS: Shock absorber(Extention)



AF: Adjustable rubber stopper(Retraction)



BF: Shock absorber(Retraction)



① When the thread is standard, the code is blank.
② B type, BS type, BF type are unavailable for bore size of Φ6.

Ordering code

Model can to be changed Ordering code. Example:
Production type: HLQ
Bore size: 16mm
Stroke: 50mm
Magnet: With magnet
Adjuster option: Extention rubber stopper
Model:HLQ16×50-S-AS
Ordering code: HLQ 16 S 0050 AS

Model

Bore size

06: Φ6mm
08: Φ8mm
12: Φ12mm
16: Φ16mm
20: Φ20mm
25: Φ25mm

Magnet
S: With magnet

Stroke
In 4 digits

Adjuster option

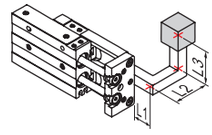
Blank: Without adjuster
A: Robber stopper(Both ends)
AS: Robber stopper(Extention)
AF: Robber stopper(Retraction)
B: Shock absorber(Both ends)
BS: Shock absorber(Extention)
BF: Shock absorber(Retraction)

Model Selection Method

Please select compact cylinder's type according to following procedure, and cross reference with data sheets.

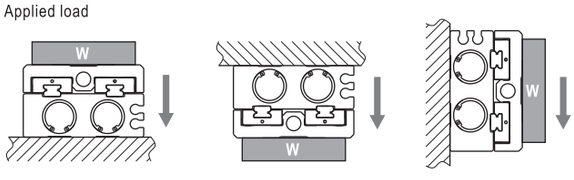
1) Operating conditions(According to mounting position and work form)

1. Model used(Bore size, Stroke)
2. Type of cushion(Bumper, Shock absrober)
3. Mounting position of work(Top, front)
4. Mounting direction(Axial, Vertical)
5. Average speed Va(mm/s)
6. Applied load W(N) **Fig. 1**
7. Overhang L1, L2, L3(mm)



Explain: L1 is the distance of load's center beyond the end plank's plane. If load's center is not beyond the end plank's plane, L1 is negative.

Fig. 1: Applied load



2) Kinetic energy check

Steps

1. Calculate kinetic energy of load E(J)

$$E=\frac{1}{2}\times\frac{W}{g}\times\left(\frac{1.4\times Va}{1000}\right)^2$$

2. Calculate allowable kinetic energy Ea(J)

$$Ea = K \times E_{max}$$

K:Mounting work coefficient (**Fig 2**)

E_{max}:Maximum allowable kinetic energy (**Table 1**)

3. Check that kinetic energy of load doesn't exceed allowable kinetic energy:

$$E \leqslant Ea$$

3) Load check

Steps

1. Calculate allowable applied load Wa (N)

$$Wa = K \times \beta \times W_{max}$$

K:Mounting work coefficient (**Fig 2**)

W_{max}:Maximum allowable applied load(**Table 1**)

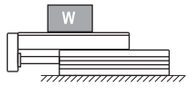
β :Applied load coefficient (**Fig 3**)

2. Check that load(W) doesn't exceed allowable applied load(Wa):

$$W \leqslant Wa$$

Fig 2: Mounting work coefficient (K)

Top

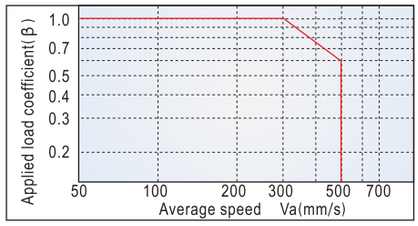


Mounting work coefficient K=1

Front

Mounting work coefficient K=0.6

Fig 3: Applied load coefficient (β)

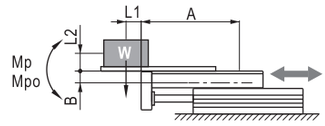


4) Moment check

Steps

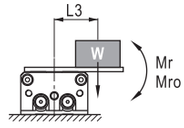
Horizontal

1. Calculate actual moment: Mp、Mpo、My、Myo、Mr、Mro (Nm)



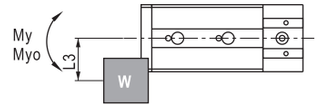
Dynamic moment:
$Mp=W\times(L1+A)/1000$

Static moment:
$Mpo=\frac{W\times(L1+A)}{1000}+\frac{W\times a\times(L2+B)}{1000\times g}$



Dynamic moment:
$Mr=W\times L3/1000$

Static moment:
$Mro=(W\times a\times L3)/1000g$



Dynamic moment:
$My=0$

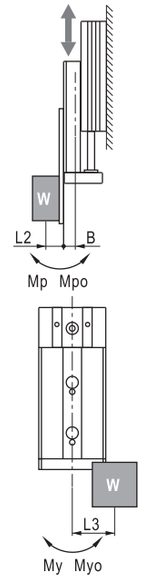
Static moment:
$Myo=(W\times a\times L3)/1000g$

2. Check

Dynamic moment:	$\frac{Mp}{Mp_{max}}+\frac{My}{My_{max}}+\frac{Mr}{Mr_{max}}\leqslant 1$
Static moment:	$\frac{Mpo}{Mpo_{max}}+\frac{Myo}{Myo_{max}}+\frac{Mro}{Mro_{max}}\leqslant 1$

Vertical

1. Calculate actual moment: Mp、Mpo、My、Myo(Nm)



Dynamic moment:
$Mp=W\times(L2+B)/1000$

Static moment:
$Mpo=\frac{W\times(L2+B)}{1000}+\frac{W\times a\times(L2+B)}{1000\times g}$

Dynamic moment:
$My=W\times L3/1000$

Static moment:
$Myo=\frac{W\times a\times L3}{1000g}+\frac{W\times L3}{1000}$

2. Check

Dynamic moment:	$\frac{Mp}{Mp_{max}}+\frac{My}{My_{max}}\leqslant 1$
Static moment:	$\frac{Mpo}{Mpo_{max}}+\frac{Myo}{Myo_{max}}\leqslant 1$

Explain:
L1, L2, L3: The distance of load center to mount plane(Determined by actuality).
A, B: Correction value for center position distance of moment(Refer to table 2).
Mp_{max}, My_{max}, Mr_{max}, Mpo_{max}, Myo_{max}, Mro_{max}: Maximum allowable moment(Refer to table 2).
g: Acceleration of gravity($g=9.81m/s^2$).
a: Acceleration of inertia
(Bumper: $a=1600\times(Va/1000)^2$, Shock absorber: $a=400\times(Va/1000)^2$)
W: Load weight(Determined by actuality).

HLQ

Note: Symbol and unit

Symbol	Item	Unit
A, B	Correction value for center position distance of moment	mm
a	Acceleration of inertia	–
E	Kinetic energy	J
Ea	Allowable kinetic energy	J
Emax	Maximum allowable kinetic energy	J
g	Acceleration of gravity g=9.81	m/s^2
K	Mounting work coefficient	–
L1, L2, L3	Overhang	mm
Mp, My, Mr	Dynamic moment(Pitch、Yaw、Roll)	Nm
Mp_{max}, My_{max}, Mr_{max}	Maximum allowable dynamic moment(Pitch、Yaw、Roll)	Nm
Mpo, Myo, Mro	Static moment(Pitch、Yaw、Roll)	Nm
Mpo_{max}, Myo_{max}, Mro_{max}	Maximum allowable static moment(Pitch、Yaw、Roll)	Nm
Va	Average speed	mm/s
W	Applied load	N
Wmax	Maximum allowable applied load	N
β	Applied load coefficient	-

HLQ

Table 1: Maximum allowable kinetic energy(Emax), Maximum allowable applied load(Wmax)

Model	Max. allowable kinetic energy Emax(J)			Max. allowable applied load Wmax(N)
	Basic type	Robber stopper type	Shock absorber type	
HLQ6	0.01	0.01	–	4
HLQ8	0.024	0.024	0.048	8
HLQ12	0.05	0.05	0.1	15
HLQ16	0.1	0.1	0.2	30
HLQ20	0.13	0.13	0.26	40
HLQ25	0.22	0.22	0.44	70

Table 2: Maximum allowable moment(Nm), Correction value for center position distance of moment(mm)

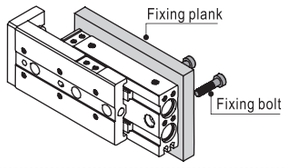
Bore size	Stroke	Static moment			Dynamic moment			Correction value	
		Mpo_{max}	Myo_{max}	Mro_{max}	Mp_{max}	My_{max}	Mr_{max}	A	B
6	10	3.4	3.4	5.4	0.7	0.7	1.2	30	7
	20	3.4	3.4	5.4	0.7	0.7	1.2	40	
	30	3.4	3.4	5.4	0.7	0.7	1.2	50	
	40	3.4	3.4	5.4	0.7	0.7	1.2	60	
	50	3.4	3.4	5.4	0.7	0.7	1.2	70	
8	10	3.4	3.4	5.4	0.7	0.7	1.2	30	7
	20	3.4	3.4	5.4	0.7	0.7	1.2	40	
	30	3.4	3.4	5.4	0.7	0.7	1.2	50	
	40	3.4	3.4	5.4	0.7	0.7	1.2	60	
	50	3.4	3.4	5.4	0.7	0.7	1.2	70	
	75	3.4	3.4	5.4	0.7	0.7	1.2	95	
12	10	5.5	5.5	8.5	1.5	1.5	2.5	32	11
	20	5.5	5.5	8.5	1.5	1.5	2.5	44	
	30	5.5	5.5	8.5	1.5	1.5	2.5	54	
	40	5.5	5.5	8.5	1.5	1.5	2.5	62	
	50	5.5	5.5	8.5	1.5	1.5	2.5	72	
	75	36	36	58	13	13	21	115	
	100	37	37	58	13	13	21	142	
16	10	15	15	23	3	3	5.4	49	12
	20	15	15	23	3	3	5.4	49	
	30	15	15	23	3	3	5.4	59	
	40	15	15	23	3	3	5.4	69	
	50	15	15	23	3	3	5.4	79	
	75	62	62	103	21	21	38	120	
	100	74	74	103	29	29	38	150	
	125	65	65	103	29	29	38	175	
20	10	15	15	23	3	3	5.4	53	14
	20	15	15	23	3	3	5.4	53	
	30	15	15	23	3	3	5.4	63	
	40	15	15	23	3	3	5.4	73	
	50	15	15	23	3	3	5.4	83	
	75	62	62	103	21	21	38	123	
	100	74	74	103	29	29	38	157	
	125	65	65	103	29	29	38	178	
	150	99	99	103	37	37	38	210	
25	10	25	25	36	6.3	6.3	10.7	60	17
	20	25	25	36	6.3	6.3	10.7	60	
	30	25	25	36	6.3	6.3	10.7	70	
	40	25	25	36	6.3	6.3	10.7	80	
	50	25	25	36	6.3	6.3	10.7	90	
	75	110	110	190	36	36	70	130	
	100	165	165	190	68	68	70	168	
	125	195	195	190	77	77	70	205	
	150	200	200	190	77	77	70	230	

Installation and application

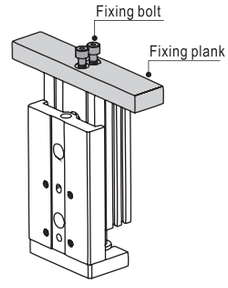
1. How to mount cylinder:

1.1) Cylinder can to be mounted from 3 directions

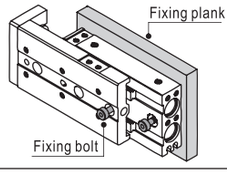
Vertical Mounting(Body thread holes)



Axial Mounting(Body thread holes)

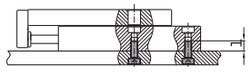


Vertical Mounting(Body through holes)



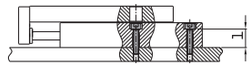
1.2) When mounting an compact slide cylinder, screws of appropriate length should be used and tightened properly within the maximum tightening torque. If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding of falling off from its position.

Vertical Mounting(Body thread holes)



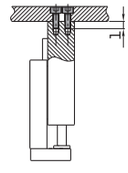
Model	Bolt used	Max. tightening torque (Nm)	Max. screw–in depth(mm)
HLQ6	M4 × 0.7	2.1	8
HLQ8	M4 × 0.7	2.1	8
HLQ12	M5 × 0.8	4.4	10
HLQ16	M6 × 1.0	4.4	10
HLQ20	M6 × 1.0	7.4	12
HLQ25	M8 × 1.25	18.0	16

Vertical Mounting(Body through holes)



Model	Bolt used	Max. tightening torque (Nm)	Max. screw–in depth(mm)
HLQ6	M3 × 0.5	1.2	8.0
HLQ8	M3 × 0.5	1.2	9.6
HLQ12	M4 × 0.7	2.8	13.4
HLQ16	M5 × 0.8	5.7	16.7
HLQ20	M5 × 0.8	5.7	22.0
HLQ25	M6 × 1.0	10.0	27.0

Axial Mounting(Body thread holes)

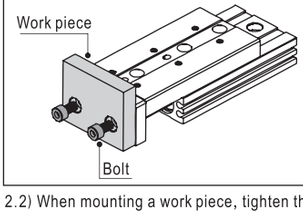


Model	Bolt used	Max. tightening torque (Nm)	Max. screw–in depth(mm)
HLQ6	M2.5 × 0.45	0.5	3.5
HLQ8	M3 × 0.5	0.9	4.0
HLQ12	M4 × 0.7	2.1	6.0
HLQ16	M5 × 0.8	4.4	7.0
HLQ20	M5 × 0.8	4.4	8.0
HLQ25	M6 × 1.0	7.4	10.0

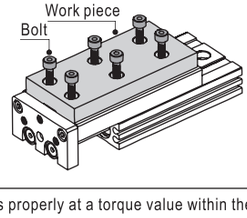
2. Work Piece Mounting:

2.1) Work pieces can be mounted on 2 surfaces of the compact slide.

Front Mounting

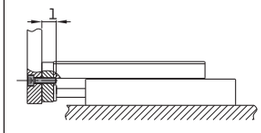


Top Mounting



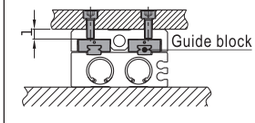
2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use blots at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

Front Mounting



Model	Bolt used	Max. tightening torque (Nm)	Max. screw–in depth(mm)
HLQ6	M3 × 0.4	0.9	5
HLQ8	M4 × 0.7	2.1	6
HLQ12	M5 × 0.8	4.4	8
HLQ16	M6 × 1.0	7.4	10
HLQ20	M6 × 1.0	7.4	13
HLQ25	M8 × 1.25	18.0	15

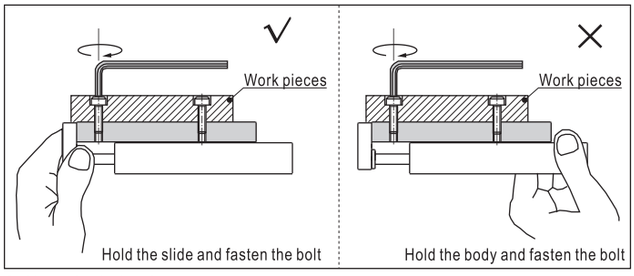
Top Mounting



Model	Bolt used	Max. tightening torque (Nm)	Max. screw–in depth(mm)
HLQ6	M3 × 0.5	0.9	4.7
HLQ8	M3 × 0.5	0.9	4.7
HLQ12	M4 × 0.7	2.1	5.0
HLQ16	M5 × 0.8	4.4	5.0
HLQ20	M5 × 0.8	4.4	8.0
HLQ25	M6 × 1.0	7.4	9.0

2.3) Since the table is supported by the linear guide, take care not to apply strong impact or large moment to the guide section.

2.4) Hold the slide when fastening work pieces to it with bolts, If the body is held while tightening bolts, excessive moment may damage guide section.

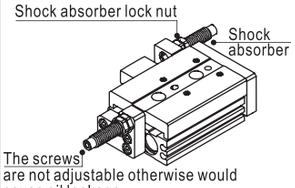


3. About shock absorber:

3.1) Shock absorbers are expendable. Promptly replace them when energy absorbing capacity decreases.

3.2) Never turn or adjust the screws on bottom of the shock absorber body. The screws are not for adjusting. Otherwise would cause oil leakage.

3.3) Follow the table for tightening torque of shock absorber to lock nuts.

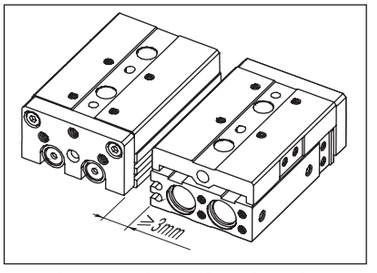


Model	Shock absorber	Tightening torque
HLQ6	Without shock absorber	
HLQ8	ACA0806-1N	1.67(Nm)
HLQ12	ACA0806-1N	1.67(Nm)
HLQ16	ACA1007-1N	3.14(Nm)
HLQ20	ACA1210-1N	3.14(Nm)
HLQ25	ACA1412-1N	10.8(Nm)

4. How to mount sensor switch:

4.1) HLQ Series are all with magnet. The matching sensor switches are DS1–H, DS1–HL series. Please refer to page 401~424 for details.

4.2) Maintain a minimum spacing of at least 3mm if two compact cylinders are used side by side in order to avoid malfunction.

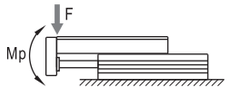


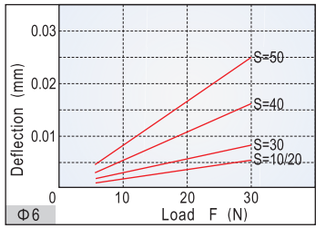
5. Make sure to connect the compact cylinder to speed controller at the meter–out side, and the speed of compact cylinder must below 500mm/s.

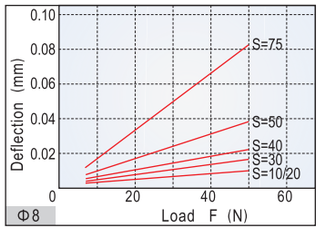
6. Don't apply a load beyond the range of the operation limits. Different load or torque will cause different deflection to table, please see below for details.

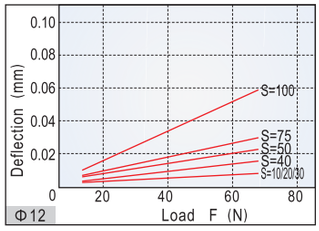
HLQ

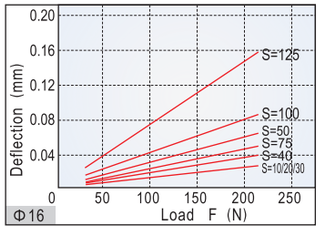
6.1) Table deflection due to pitch moment:
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

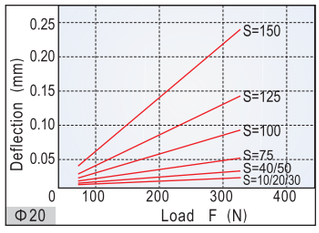


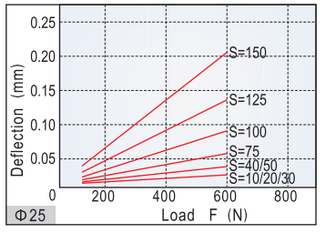




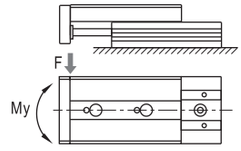


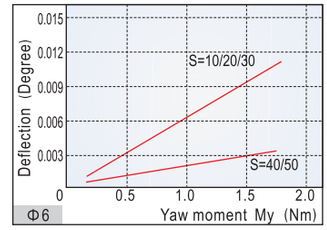


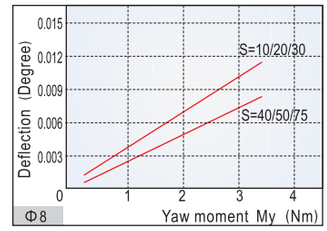


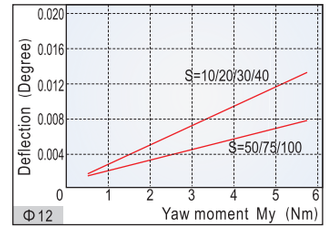


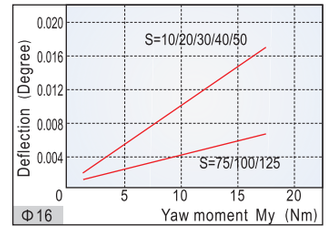
6.2) Table deflection due to yaw moment:
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

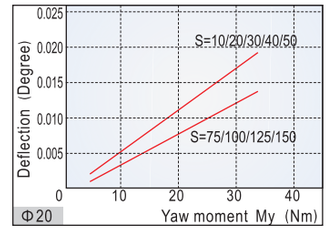


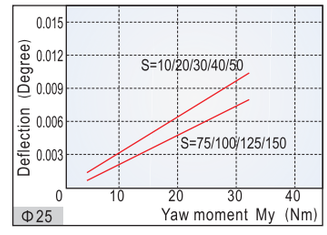




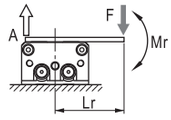


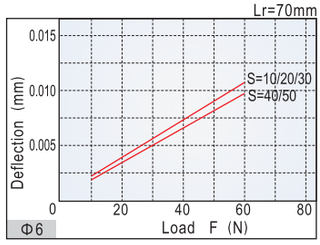


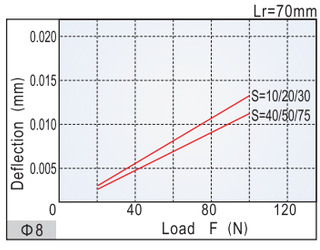


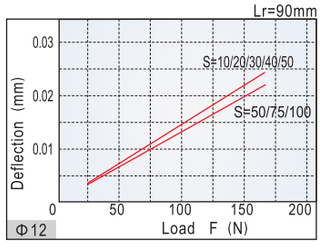


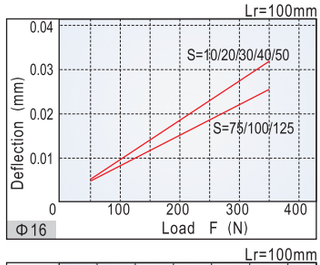
6.3) Table deflection due to roll moment:
Table deflects (A) when a load acts upon section F at the full stroke of the compact slide.

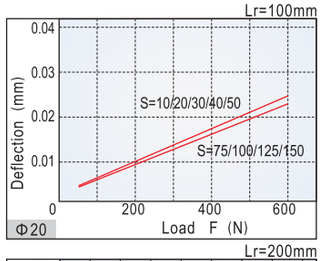


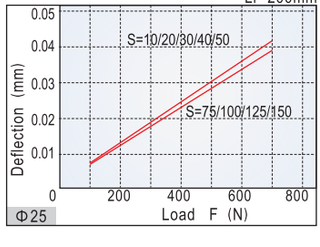






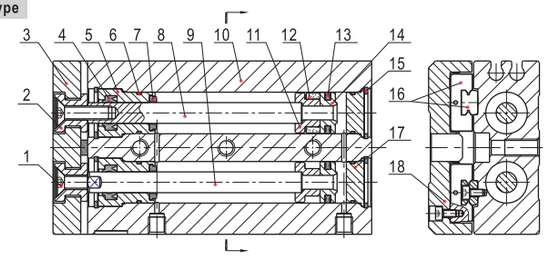






Inner structure

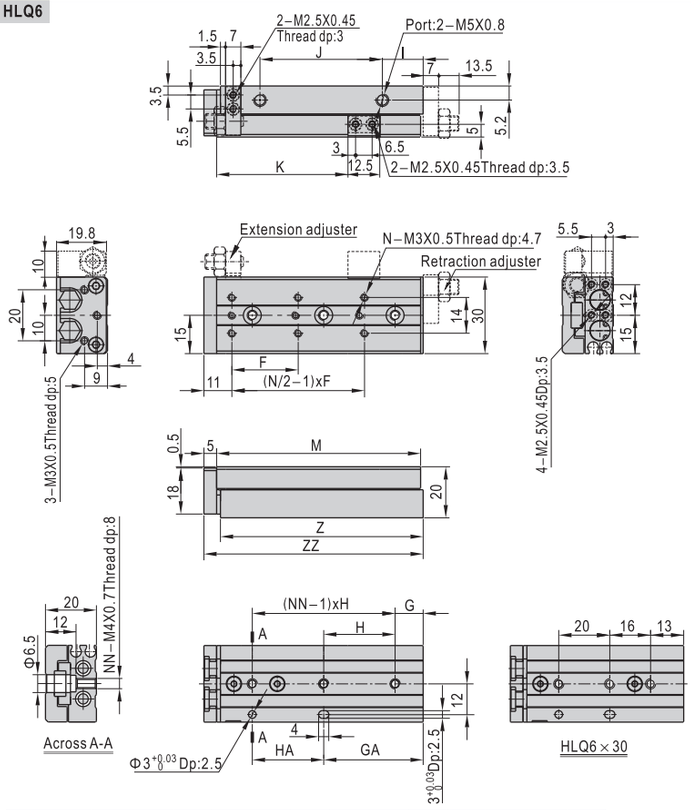
Basic type



NO.	Item	Material	NO.	Item	Material
1	Screw	Carbon steel	10	Body	Aluminum alloy
2	Floating jointer	Carbon steel	11	Magnet holder	Brass
3	Fixing plate	Aluminum alloy	12	Magnet	Sintered metal(Neodymium-iron-boron)
4	Rod seal	NBR	13	Piston seal	NBR
5	Front cover	Aluminum alloy	14	Piston	Brass
6	O–ring	NBR	15	C clip	Spring steel
7	Bumper	TPU	16	Linear guide combination	
8	Piston rod A	Stainless steel	17	Back cover	Brass
9	Piston rod B	Carbon steel	18	Slide table	Aluminum alloy

Dimensions

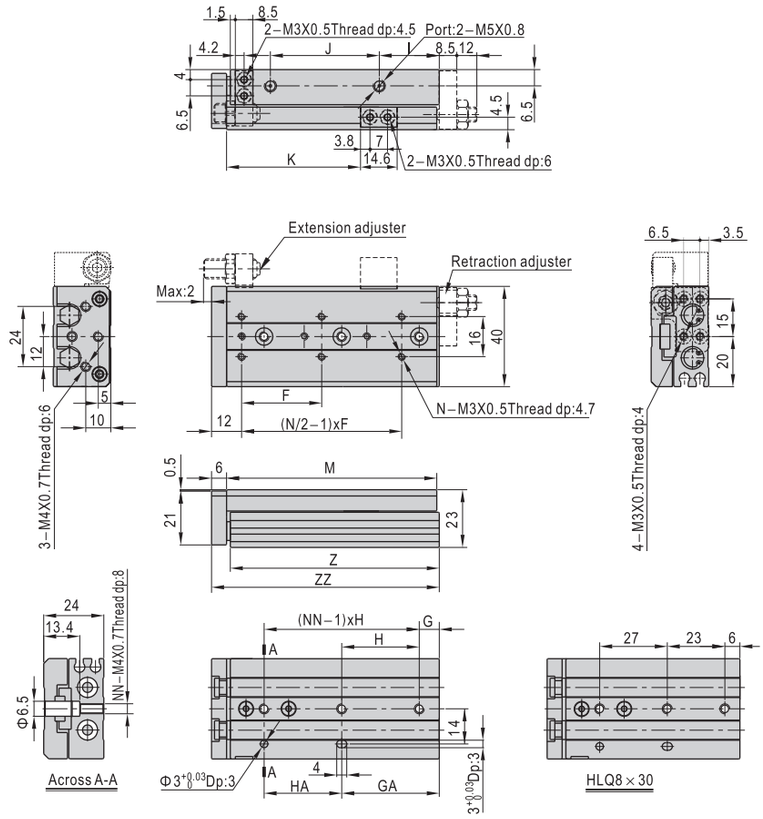
HLQ6



Stroke\Item	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	22	6	13	23	16	9	16.3	21.5	42	4	2	41.5	48
20	25	13	13	26	26	9	26.3	31.5	52	4	2	51.5	58
30	21	–	29	–	20	9	36.3	41.5	62	6	3	61.5	68
40	26	11	39	28	28	16	47.3	51.5	80	6	3	79.5	86
50	27	21	49	28	28	9	64.3	61.5	90	6	3	89.5	96

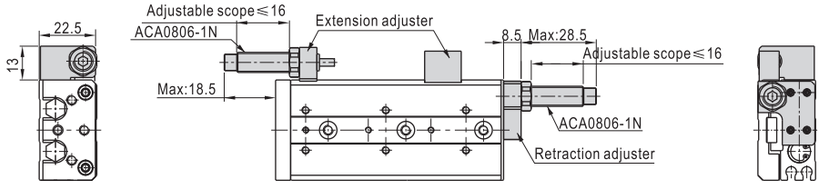
HLQ

HLQ8

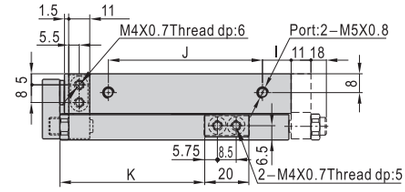


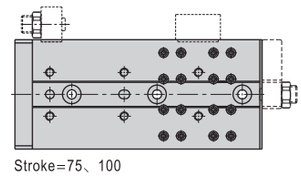
Stroke\Item	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	25	7	13	25	19	10	18	23.5	46	4	2	45.5	53
20	25	14	14	28	28	10	28	33.5	56	4	2	55.5	63
30	26	–	29	–	27	10	42	43.5	70	6	3	69.5	77
40	32	8	39	31	31	12	54	53.5	84	6	3	83.5	91
50	46	8	37	29	58	12	79	63.5	109	6	4	108.5	116
75	50	31	61	30	60	10	107	88.5	135	6	4	134.5	142

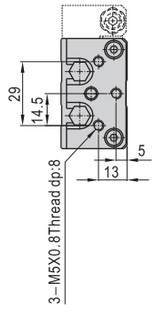
HLQ8(With shock absorber)

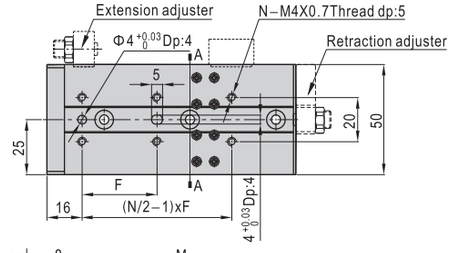


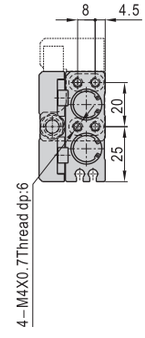
HLQ12

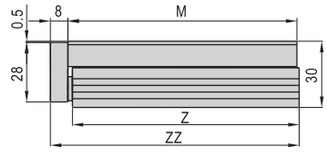


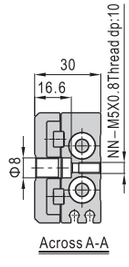


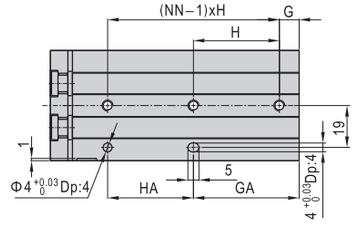


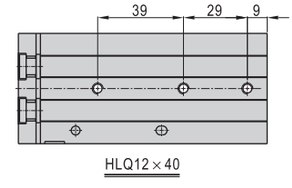






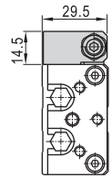


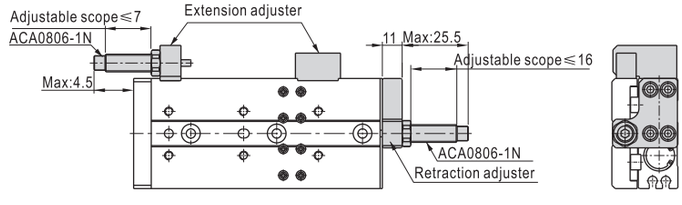




Stroke\Item	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	28	18	18	32	32	13	33	35	67	4	2	66	76
20	28	18	18	32	32	13	33	45	67	4	2	66	76
30	38	20	20	40	40	13	43	55	77	4	2	76	86
40	34	–	38	–	39	13	60	65	94	6	3	93	103
50	34	9	48	39	39	13	70	75	104	6	3	103	113
75	36	23	59	36	72	13	114	99	148	8	4	147	157
100	36	12	84	36	72	17	135	124	173	10	5	172	182

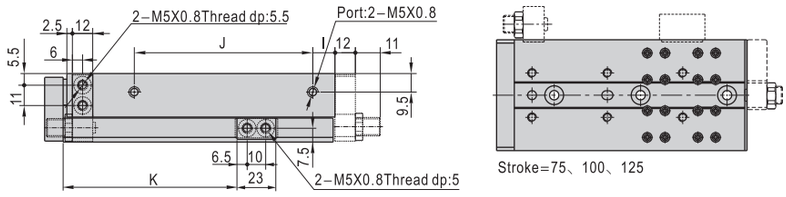
HLQ12(With shock absorber)

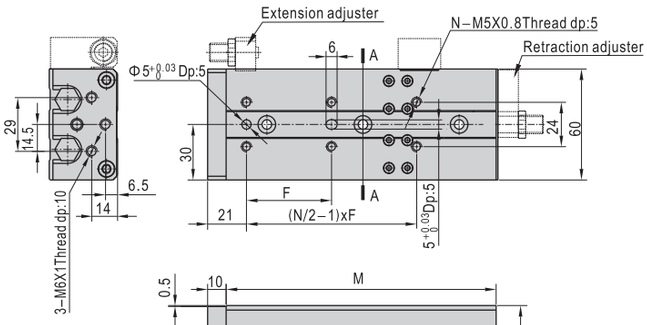


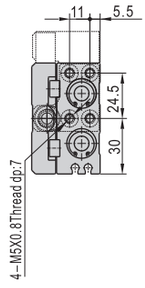


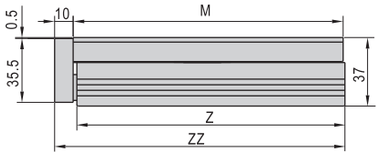
HLQ

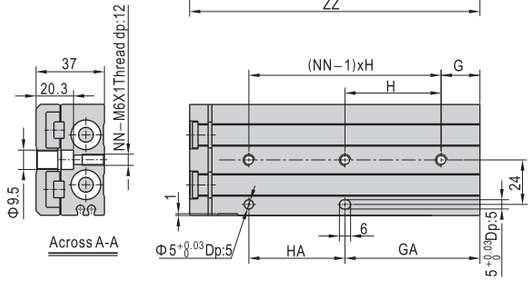
HLQ16

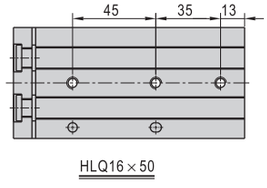






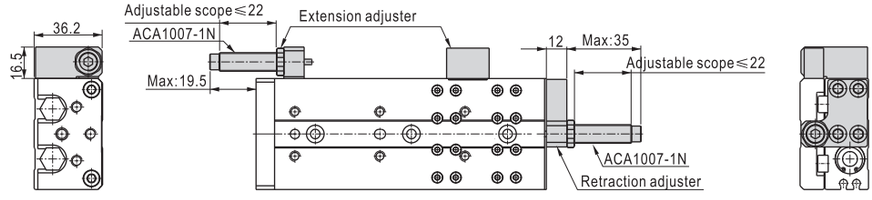




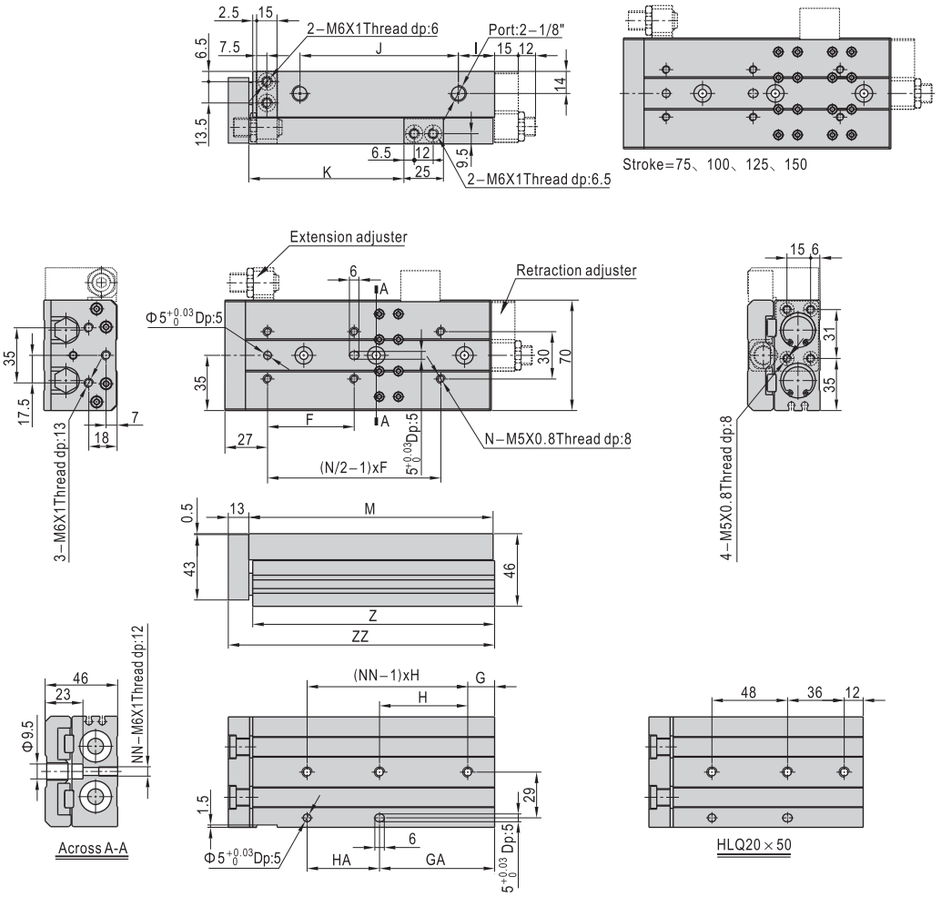


Stroke\Item	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	38	18	18	39	39	12	41	28.5	78	4	2	77	89
20	38	18	18	39	39	12	41	38.5	78	4	2	77	89
30	48	19	19	48	48	12	51	48.5	88	4	2	87	99
40	58	19	19	58	58	12	61	58.5	98	4	2	97	109
50	40	–	48	–	45	18	71	68.5	114	6	3	113	125
75	46	21	73	52	52	12	109	93.5	146	6	3	145	157
100	44	36	80	44	88	12	152	118.5	189	8	4	188	200
125	44	17	105	44	88	12	177	143.5	214	10	5	213	225

HLQ16(With shock absorber)

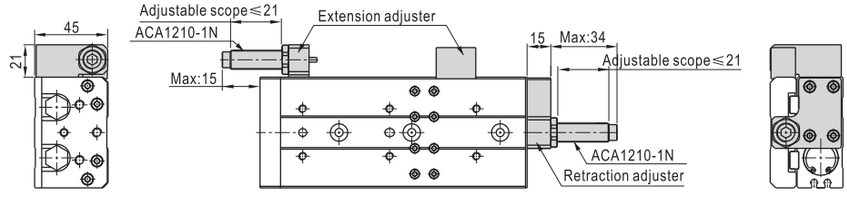


HLQ20



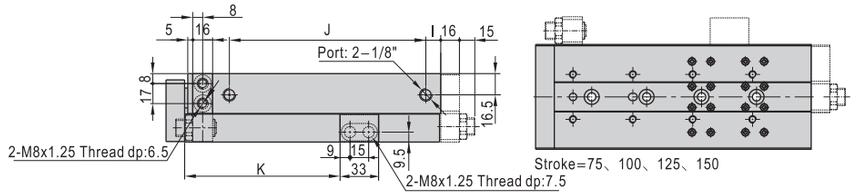
Stroke\Item	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	45	22	18	46	50	16	46.5	32.5	94	4	2	92.5	108
20	40	22	18	46	50	16	46.5	42.5	94	4	2	92.5	108
30	48	22	18	46	50	16	46.5	52.5	94	4	2	92.5	108
40	58	22	22	56	56	16	56.5	62.5	104	4	2	102.5	118
50	42	–	48	–	48	18	72.5	72.5	122	6	3	120.5	136
75	55	17	73	56	56	25	98.5	97.5	155	6	3	153.5	169
100	50	18	74	56	112	25	155.5	122.5	212	8	4	210.5	226
125	55	37	96	59	118	25	183.5	147.5	240	8	4	238.5	254
150	62	56	118	62	124	25	211.5	172.5	268	8	4	266.5	282

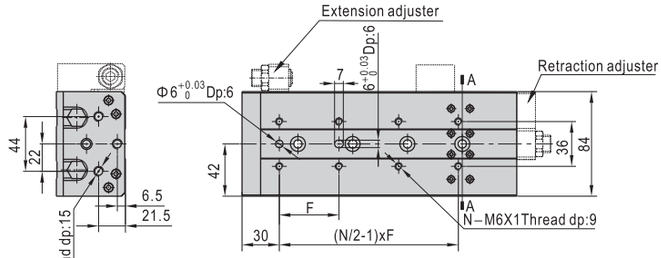
HLQ20(With shock absorber)

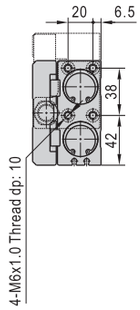


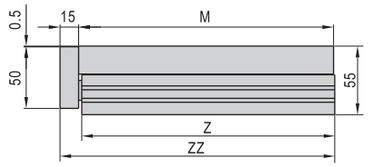
HLQ

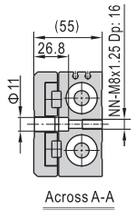
HLQ25

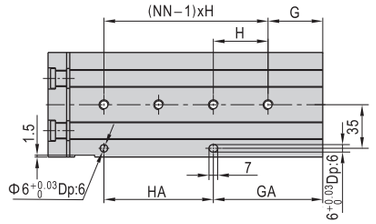


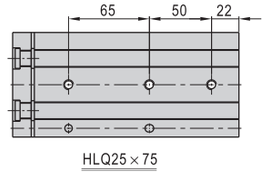












Stroke\Item	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	55	23	23	55	55	12	58	35	107	4	2	105.5	123
20	46	23	23	55	55	12	58	45	107	4	2	105.5	123
30	55	23	23	55	55	12	58	55	107	4	2	105.5	123
40	65	23	23	65	65	12	68	65	117	4	2	115.5	133
50	75	32	32	80	80	14	92	75	141	4	2	139.5	157
75	60	–	72	–	65	12	117	100	166	6	3	164.5	182
100	48	44	88	44	88	12	156	125	205	8	4	203.5	221
125	60	31	97	66	132	12	209	150	258	8	4	256.5	274
150	65	56	122	66	132	12	234	175	283	8	4	281.5	299

HLQ25(With shock absorber)