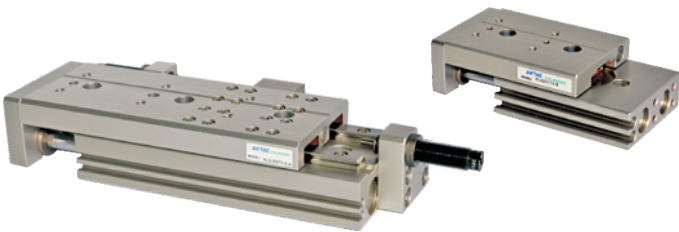




Compact slide cylinder(Recirculating linear ball bearing)——HLQ Series

Product series

Series name		Acting type	Bore size	Collocation of sensor switch	
HLQ		Double acting		DS1-H	
			6		
			8		
			12		
			16		
			20		
			25		
Page	310			397	

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 μm 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



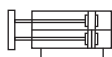
HLQ

Compact slide cylinder(Recirculating linear ball bearing)

HLQ Series



Symbol



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

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 P397~420 for detail of sensor switch.

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.

Ordering code

HLQ 20 × 30 S AS □

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

Bore size
6, 8, 12, 16, 20, 25
Refer to stroke table for details

Stroke
Refer to stroke table for details

Magnet
S: With magnet

Thread type ①
Blank: PT
T: NPT
G: G

Adjuster option ②
Blank: Without adjuster(Basic type)

Adjustable rubber stopper(Both ends)
A: Adjustable rubber stopper(Both ends)

Shock absorber(Both ends)
B: Shock absorber(Both ends)

Adjustable rubber stopper(Extension)
AS: Adjustable rubber stopper(Extension)

Shock absorber(Extension)
BS: Shock absorber(Extension)

Adjustable rubber stopper(Retraction)
AF: Adjustable rubber stopper(Retraction)

Shock absorber(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.



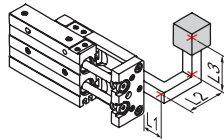
Model Selection Method

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)

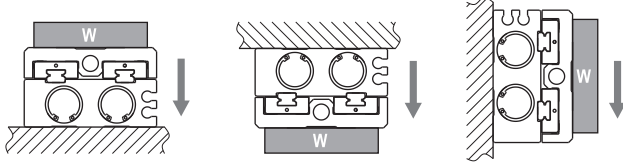
1. Model used(Bore size, Stroke)
2. Type of cushion(Bumper, Shock absorber)
3. Mounting position of work(Top, front)
4. Mounting direction(Axial, Vertical)
5. Average speed V_a (mm/s)
6. Applied load W (N)
7. Overhang L_1, L_2, L_3 (mm)

Fig. 1



Explain: L_1 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, L_1 is negative.

Fig. 1: Applied load



2) Kinetic energy check

Steps

1. Calculate kinetic energy of load E (J)

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

2. Calculate allowable kinetic energy E_a (J)

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

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:

$$E \leq E_a$$

3) Load check

Steps

1. Calculate allowable applied load W_a (N)

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

K : Mounting work coefficient (Fig 2)

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

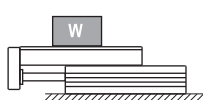
β : Applied load coefficient (Fig 3)

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

$$W \leq W_a$$

Fig 2: Mounting work coefficient (K)

Top



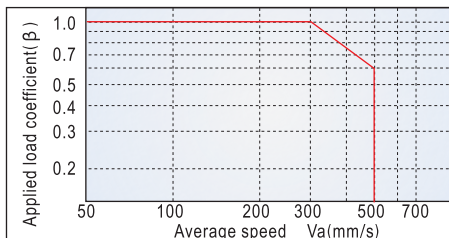
Mounting work coefficient $K=1$

Front



Mounting work coefficient $K=0.6$

Fig 3: Applied load coefficient (β)

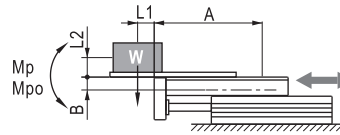


4) Moment check

Steps

Horizontal

1. Calculate actual moment: $M_p, M_{po}, M_y, M_{yo}, M_r, M_{ro}$ (Nm)

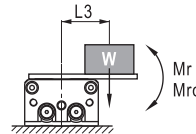


Dynamic moment:

$$M_p = W \times (L_1 + A) / 1000$$

Static moment:

$$M_{po} = \frac{W \times (L_1 + A)}{1000} + \frac{W \times a \times (L_2 + B)}{1000 \times g}$$

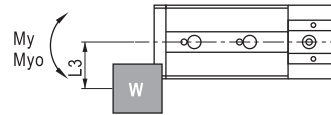


Dynamic moment:

$$M_r = W \times L_3 / 1000$$

Static moment:

$$M_{ro} = (W \times a \times L_3) / 1000g$$



Dynamic moment:

$$M_y = 0$$

Static moment:

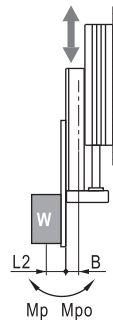
$$M_{yo} = (W \times a \times L_3) / 1000g$$

2. Check

Dynamic moment:	$\frac{M_p}{M_{p_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_r}{M_{r_{max}}} \leq 1$
Static moment:	$\frac{M_{po}}{M_{po_{max}}} + \frac{M_{yo}}{M_{yo_{max}}} + \frac{M_{ro}}{M_{ro_{max}}} \leq 1$

Vertical

1. Calculate actual moment: M_p, M_{po}, M_y, M_{yo} (Nm)

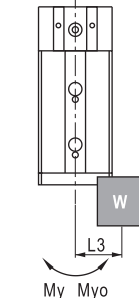


Dynamic moment:

$$M_p = W \times (L_2 + B) / 1000$$

Static moment:

$$M_{po} = \frac{W \times (L_2 + B)}{1000} + \frac{W \times a \times (L_2 + B)}{1000 \times g}$$



Dynamic moment:

$$M_y = W \times L_3 / 1000$$

Static moment:

$$M_{yo} = \frac{W \times a \times L_3}{1000g} + \frac{W \times L_3}{1000}$$

2. Check

Dynamic moment:	$\frac{M_p}{M_{p_{max}}} + \frac{M_y}{M_{y_{max}}} \leq 1$
Static moment:	$\frac{M_{po}}{M_{po_{max}}} + \frac{M_{yo}}{M_{yo_{max}}} \leq 1$

Explain:

L_1, L_2, L_3 : 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).

$M_{p_{max}}, M_{y_{max}}, M_{r_{max}}, M_{po_{max}}, M_{yo_{max}}, M_{ro_{max}}$: Maximum allowable moment (Refer to table 2).

g : Acceleration of gravity ($g=9.81m/s^2$).

a : Acceleration of inertia

(Bumper: $a=1600 \times (V_a/1000)^2$, Shock absorber: $a=400 \times (V_a/1000)^2$)

W : Load weight (Determined by actuality).

Compact slide cylinder(Recirculating linear ball bearing)

HLQ Series

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
E _{max}	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
M _{Pmax} , M _{Ymax} , M _{Rmax}	Maximum allowable dynamic moment(Pitch、Yaw、Roll)	Nm
Mpo, Myo, Mro	Static moment(Pitch、Yaw、Roll)	Nm
M _{po_max} , M _{yo_max} , M _{ro_max}	Maximum allowable static moment(Pitch、Yaw、Roll)	Nm
Va	Average speed	mm/s
W	Applied load	N
W _{max}	Maximum allowable applied load	N
β	Applied load coefficient	—

Table 1: Maximum allowable kinetic energy(E_{max}), Maximum allowable applied load(W_{max})

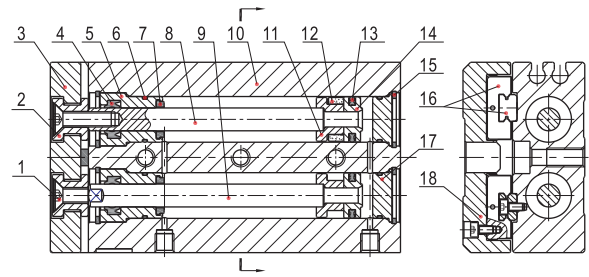
Model	Max. allowable kinetic energy		E _{max} (J)	Max. allowable applied load W _{max} (N)
	Basic type	Rubber stopper type	Shock absorber type	
HLQ6	0.01	0.01	—	4
HLQ8	0.024	0.024	0.048	8
HLQ12	0.05	0.05	0.1	15
HLQ16	0.1	0.1	0.2	30
HLQ20	0.13	0.13	0.26	40
HLQ25	0.22	0.22	0.44	70

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

Bore size	Stroke	Static moment			Dynamic moment			Correction value	
		M _{po_max}	M _{yo_max}	M _{ro_max}	M _{p_max}	M _{y_max}	M _{r_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	
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	
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	
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	
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	

Inner structure

Basic type



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

Compact slide cylinder(Recirculating linear ball bearing)

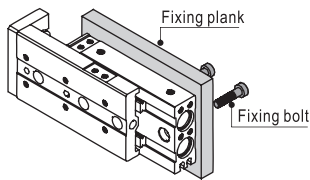
HLQ Series

Installation and application

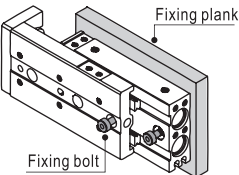
1. How to mount cylinder:

1.1) Cylinder can be mounted from 3 directions

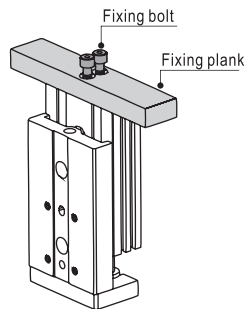
Vertical Mounting(Body thread holes)



Vertical Mounting(Body through holes)

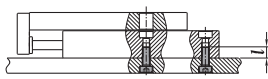


Axial Mounting(Body thread holes)



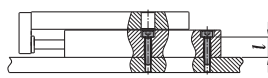
1.2) When mounting a compact slide cylinder, screws of appropriate length should be used and tightened properly within the maximum tightening torque. If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding or falling off from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

Vertical Mounting(Body thread holes)



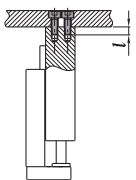
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M4 × 0.7	2.1	8
HLQ8	M4 × 0.7	2.1	8
HLQ12	M5 × 0.8	4.4	10
HLQ16	M6 × 1.0	4.4	10
HLQ20	M6 × 1.0	7.4	12
HLQ25	M8 × 1.25	18.0	16

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)

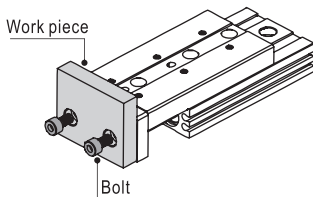


Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M2.5 × 0.45	0.5	3.5
HLQ8	M3 × 0.5	0.9	4.0
HLQ12	M4 × 0.7	2.1	6.0
HLQ16	M5 × 0.8	4.4	7.0
HLQ20	M5 × 0.8	4.4	8.0
HLQ25	M6 × 1.0	7.4	10.0

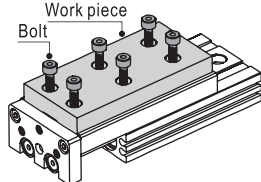
2. Work Piece Mounting:

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

Front Mounting

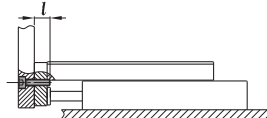


Top Mounting



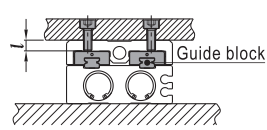
2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use bolts at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

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

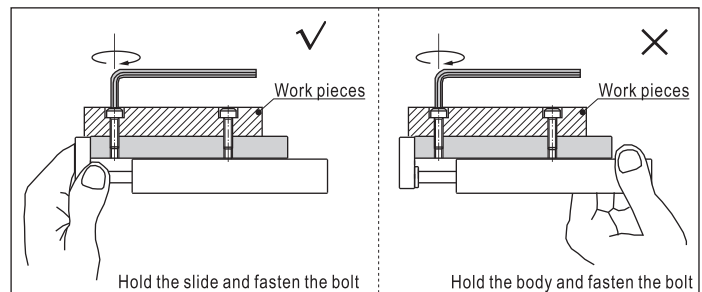
Top Mounting



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.



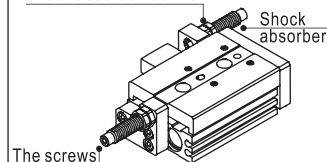
3. About shock absorber:

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.

Shock absorber lock nut



The screws are not adjustable otherwise would cause oil leakage.

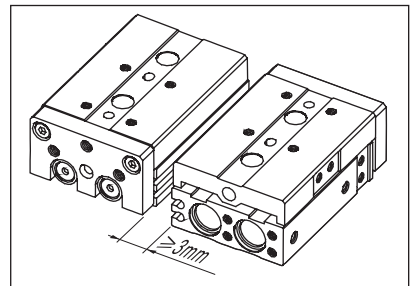
Model	Shock absorber	Tightening torque
HLQ6	Without shock absorber	
HLQ8	ACA0806-1N	1.67(Nm)
HLQ12	ACA0806-1N	1.67(Nm)
HLQ16	ACA1007-1N	3.14(Nm)
HLQ20	ACA1210-1N	3.14(Nm)
HLQ25	ACA1412-1N	10.8(Nm)

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 397~420 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.

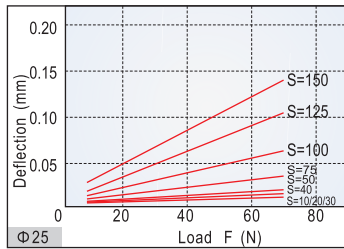
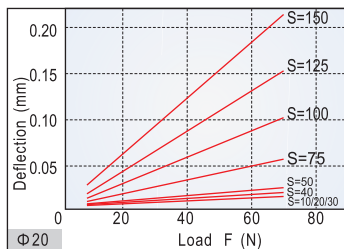
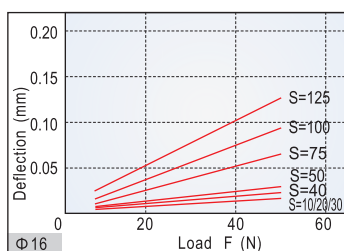
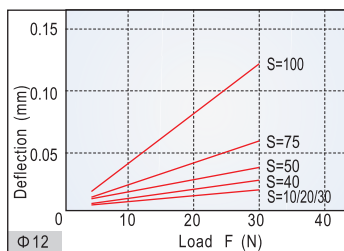
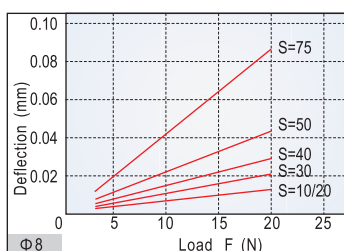
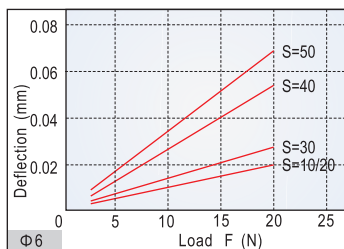


5. Make sure to connect the compact cylinder to speed controller at the meter-out side, and the speed of compact cylinder must below 500mm/s.

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.

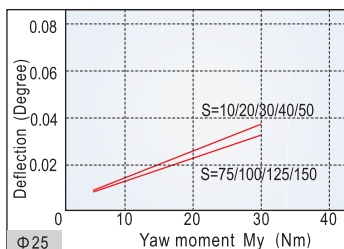
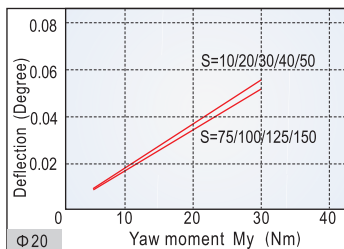
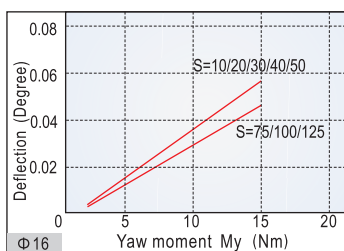
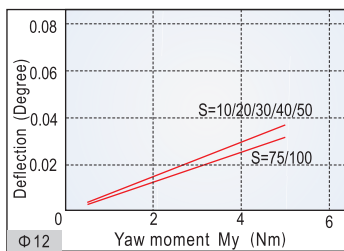
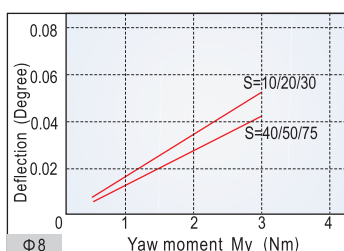
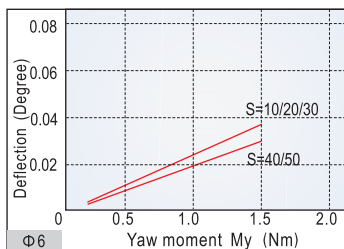
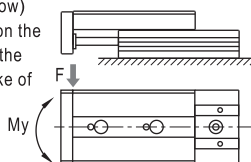
6.1) Table deflection due to pitch moment:

Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.



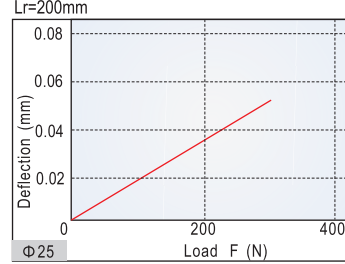
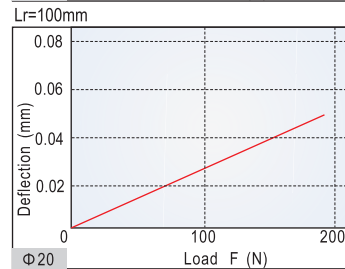
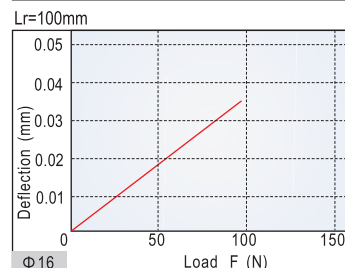
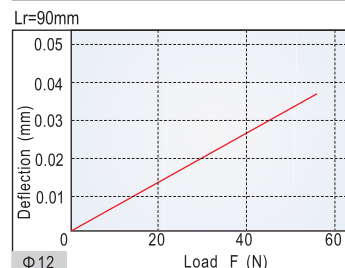
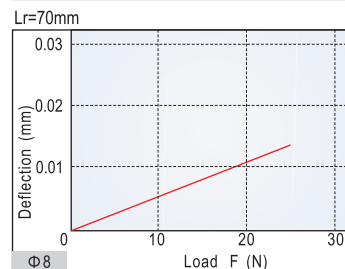
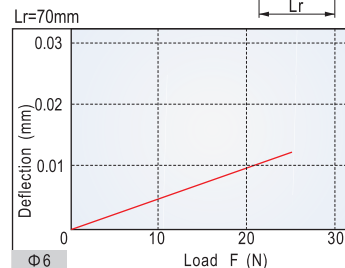
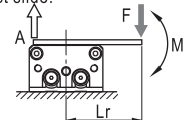
6.2) Table deflection due to yaw moment:

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:

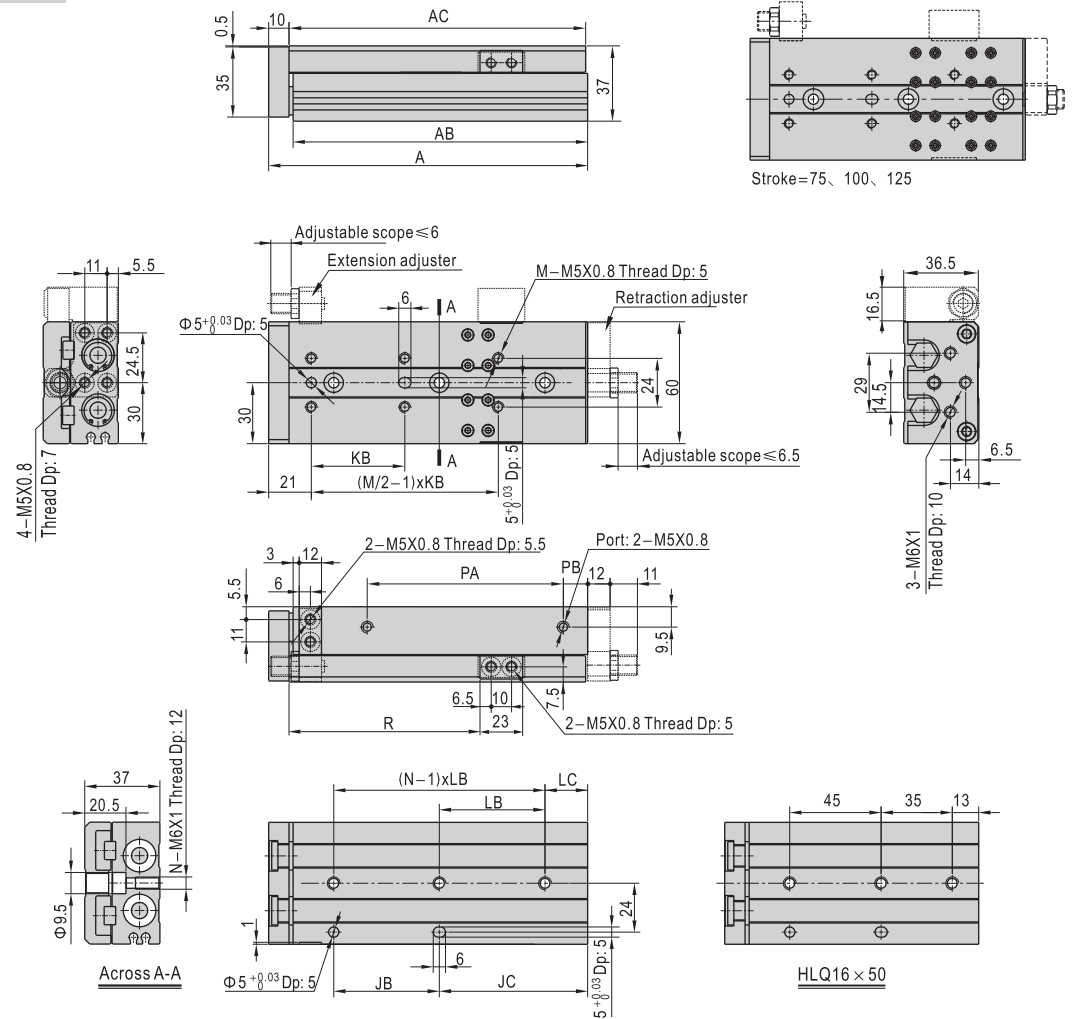
Table deflects (A) when a load acts upon section F at the full stroke of the compact slide.



AirTAC

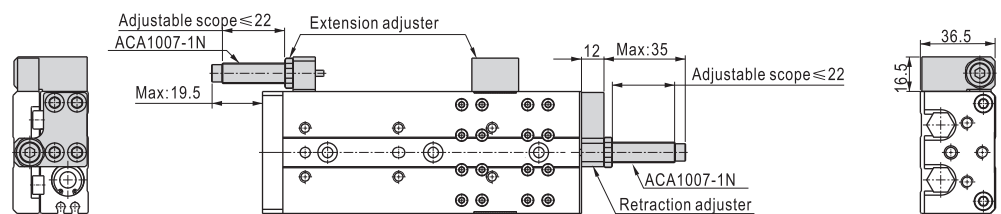
HLQ Series

HLQ16



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	89	77	78	39	18	38	39	18	4	2	40.5	12	28.5
20	89	77	78	39	18	38	39	18	4	2	40.5	12	38.5
30	99	87	88	48	19	48	48	19	4	2	50.5	12	48.5
40	109	97	98	58	19	58	58	19	4	2	60.5	12	58.5
50	125	113	114	45	48	40	—	—	6	3	70.5	18	68.5
75	157	145	146	52	73	46	52	21	6	3	108.5	12	93.5
100	200	188	189	88	80	44	44	36	8	4	151.5	12	118.5
125	225	213	214	88	105	44	44	17	10	5	176.5	12	143.5

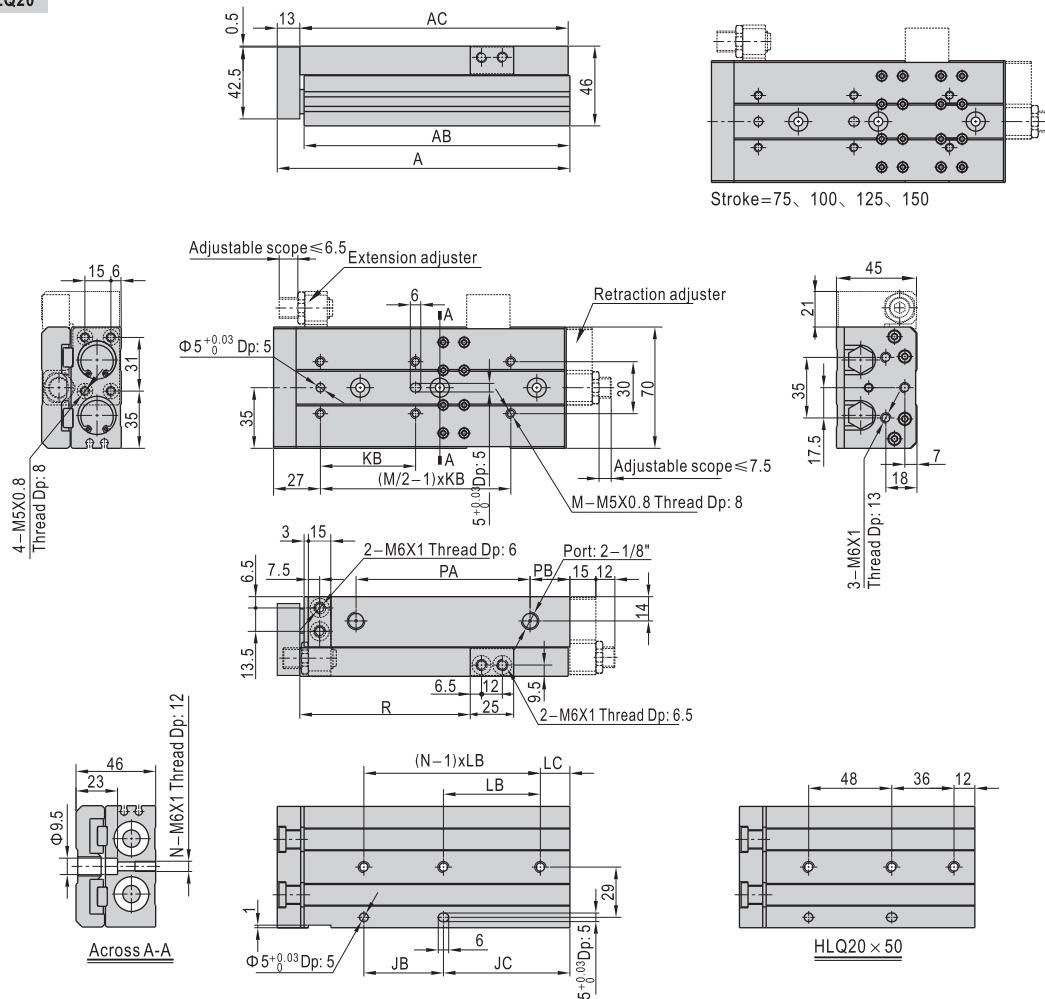
HLQ16(With shock absorber)



Compact slide cylinder(Recirculating linear ball bearing)

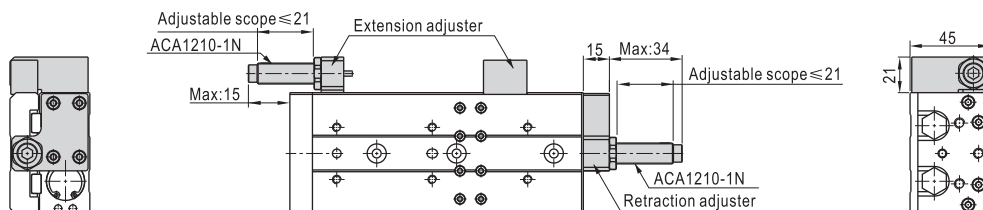
HLQ Series

HLQ20



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	108	92.5	94	50	18	45	46	22	4	2	46.5	16	32.5
20	108	92.5	94	50	18	40	46	22	4	2	46.5	16	42.5
30	108	92.5	94	50	18	48	46	22	4	2	46.5	16	52.5
40	118	102.5	104	56	22	58	56	22	4	2	56.5	16	62.5
50	136	120.5	122	48	48	42	-	-	6	3	72.5	18	72.5
75	169	153.5	155	56	73	55	56	17	6	3	98.5	25	97.5
100	226	210.5	212	112	74	50	56	18	8	4	155.5	25	122.5
125	254	238.5	240	118	96	55	59	37	8	4	183.5	25	147.5
150	282	266.5	268	124	118	62	62	56	8	4	211.5	25	172.5

HLQ20(With shock absorber)



AirTAC

HLQ25



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	123	105.5	107	55	23	55	55	23	4	2	58	12	35
20	123	105.5	107	55	23	46	55	23	4	2	58	12	45
30	123	105.5	107	55	23	55	55	23	4	2	58	12	55
40	133	115.5	117	65	23	65	65	23	4	2	68	12	65
50	157	139.5	141	80	32	75	80	32	4	2	92	14	75
75	182	164.5	166	65	72	60	—	—	6	3	117	12	100
100	221	203.5	205	88	88	48	44	44	8	4	156	12	125
125	274	256.5	258	132	97	60	66	31	8	4	209	12	150
150	299	281.5	283	132	122	65	66	56	8	4	234	12	175

Adjustable scope ≤ 35
ACA1412-1N
Max: 26
16
Max: 49
Adjustable scope ≤ 35
ACA1412-1N
Retraction adjuster
54.5
23

Compact slide cylinder(Recirculating linear ball bearing)

HLQ Series—Accessories

Ordering code

F-HLQ 20 AS	
Accessory	Accessory type
Model	
Bore size	
A: Adjustable rubber stopper(Both ends) AS: Adjustable rubber stopper(Extension) AF: Adjustable rubber stopper(Retraction) B: Shock absorber(Both ends) BS: Shock absorber(Extension) BF: Shock absorber(Retraction)	

Accessory selection

Accessories\Bore size	6	8	12
Both ends			
A(Adjustable rubber stopper)	F-HLQ6A	F-HLQ8A	F-HLQ12A
B(Shock absorber)	×	F-HLQ8B	F-HLQ12B
Extension			
AS(Adjustable rubber stopper)	F-HLQ6AS	F-HLQ8AS	F-HLQ12AS
BS(Shock absorber)	×	F-HLQ8BS	F-HLQ12BS
Retraction			
AF(Adjustable rubber stopper)	F-HLQ6AF	F-HLQ8AF	F-HLQ12AF
BF(Shock absorber)	×	F-HLQ8BF	F-HLQ12BF

Accessories\Bore size	16	20	25
Both ends			
A(Adjustable rubber stopper)	F-HLQ16A	F-HLQ20A	F-HLQ25A
B(Shock absorber)	F-HLQ16B	F-HLQ20B	F-HLQ25B
Extension			
AS(Adjustable rubber stopper)	F-HLQ16AS	F-HLQ20AS	F-HLQ25AS
BS(Shock absorber)	F-HLQ16BS	F-HLQ20BS	F-HLQ25BS
Retraction			
AF(Adjustable rubber stopper)	F-HLQ16AF	F-HLQ20AF	F-HLQ25AF
BF(Shock absorber)	F-HLQ16BF	F-HLQ20BF	F-HLQ25BF

Note): A=AS+AF; B=BS+BF.

Dimensions

AS: Adjustable rubber stopper(Extension)

Body Mounting

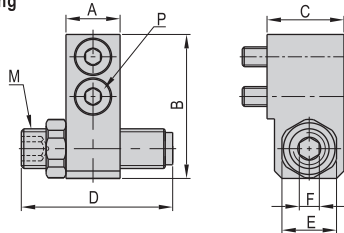
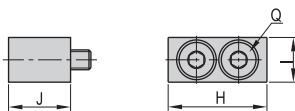


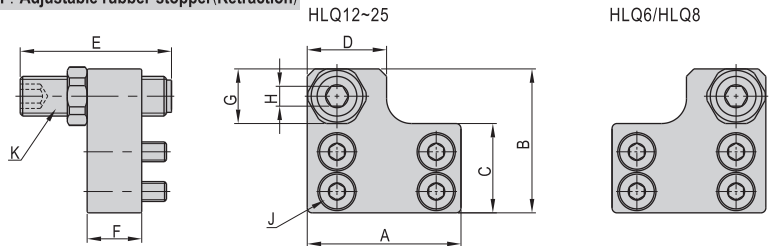
Table Mounting



Bore size\Item	Adjusting stroke range	A	B	C	D	E	F
6	5	7	19	10.5	16.5	8	3
8	5	8.5	22	14	21.5	11	4
12	5	11	29	15.5	30.5	11	4
16	5	12	36	17.5	24	14	5
20	5	15	44.5	22	28	17	6
25	5	16	54	24	32	19	6

Bore size\Item	M	P	H	I	J	Q
6	M6 × 1.0	M2.5 length :10	12.5	6.5	10.5	M2.5 length :10
8	M8 × 1.0	M3 length :14	14.5	8	12	M3 length :14
12	M8 × 1.0	M4 length :16	20	9	12.5	M4 length :12
16	M10 × 1.0	M5 length :16	23	10.5	17	M5 length :16
20	M12 × 1.0	M6 length :20	25	12.5	21	M6 length :20
25	M14 × 1.5	M8 length :20	33	16.5	23	M8 length :20

AF: Adjustable rubber stopper(Retraction)



Bore size\Item	Adjusting stroke range	A	B	C	D	E	F	G	H	J	K
6	5	18	19	11	8	21.5	7	8	3	M2.5 length :6	M6 × 1.0
8	5	24	22.2	13	14	21.5	8.5	8	3	M3 length :8	M6 × 1.0
12	5	31	29	18	16	30.5	11	11	4	M4 length :12	M8 × 1.0
16	5	37	36	21.5	18	24	12	14	5	M5 length :12	M10 × 1.0
20	5	45.5	44	25.5	23	28	15	17	6	M5 length :16	M12 × 1.0
25	5	54	53.6	31.6	28	32	16	19	6	M6 length :18	M14 × 1.5

BS: Shock absorber(Extension)

Body Mounting

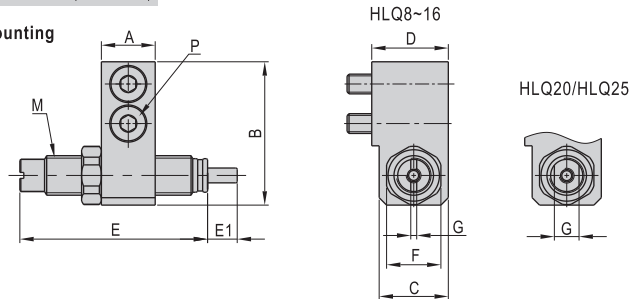
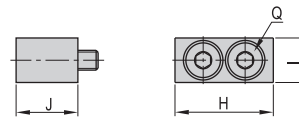
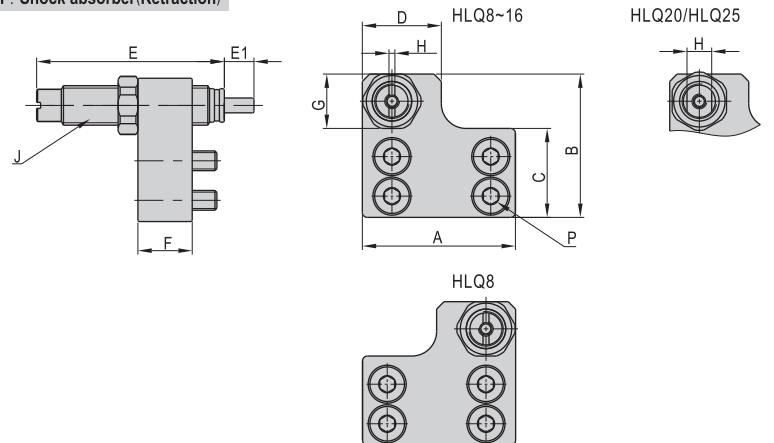


Table Mounting



Bore size\Item	A	B	C	D	E	E1	F	G	M	P	H	I	J	Q
8	8.5	22	12.5	14	38	6	11	1.2	M8 × 1.0	M3 length :14	14.5	8	12	M3 length :14
12	11	29	14	15.5	38	6	11	1.2	M8 × 1.0	M4 length :16	20	9	12.5	M4 length :12
16	12	36	16	17.5	48	7	14	1.2	M10 × 1.0	M5 length :16	23	10.5	17	M5 length :16
20	15	44.5	20	22	50	10	17	11	M12 × 1.0	M6 length :20	25	12.5	21	M6 length :20
25	16	54	22	24	66	12	19	12	M14 × 1.5	M8 length :20	33	16.5	23	M8 length :20

BF: Shock absorber(Retraction)



Bore size\Item	A	B	C	D	E	E1	F	G	H	J	P
8	24	23.5	13	14	38	6	8.5	11	1.2	M8 × 1.0	M3 length :8
12	31	29	18	16	38	6	11	11	1.2	M8 × 1.0	M4 length :12
16	37	36	21.5	18	48	7	12	14	1.2	M10 × 1.0	M5 length :12
20	45.5	44	25.5	23	50	10	15	17	11	M12 × 1.0	M5 length :16
25	54	53.6	31.6	28	66	12	16	19	12	M14 × 1.5	M6 length :18