Compact slide cylinder(Recirculating linear ball bearing)

HLQ、HLQL Series

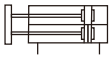
Specification

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 40μm filter element)					
Operating pressure	0.15~0.7MPa(22~100psi)(1.5~7.0bar)					
Proof pressure	1.2MPa(175psi)(12.0bar)					
Temperature ℃	-20~70					
Speed range mm/s	50~500					
Stroke tolerance	Stroke≤100 $^{+1.0}_{0}$		Stroke>100 $^{+1.5}_{0}$			
Cushion type	Bumper(Both ends)、Shock absorber					
Sensor switches	CMSH、DMSH(S)					
Port size [Note1]	M5×0.8				1/8"	

[Note1] G thread is available.

Refer to P451 for detail of sensor switch.

Symbol



Stroke

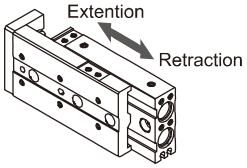
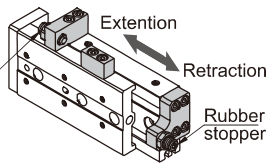
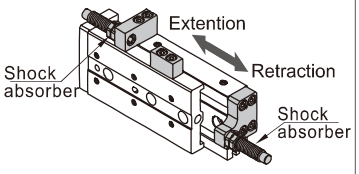
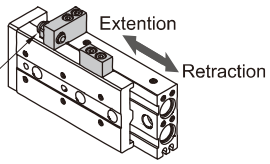
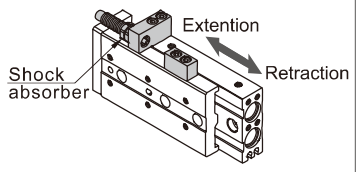
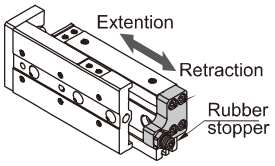
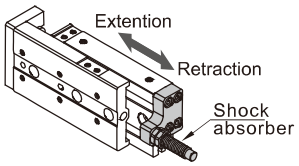
Bore size (mm)	Standard stroke (mm)	Max.std stroke
6	10 20 30 40 50	50
8	10 20 30 40 50 75	75
12	10 20 30 40 50 75 100	100
16	10 20 30 40 50 75 100 125	125
20	10 20 30 40 50 75 100 125 150	150
25	10 20 30 40 50 75 100 125 150	150

[Note] Consult us for non-standard stroke.

Ordering code

HLQ 20 × 30 S AS G

① ② ③ ④ ⑤ ⑥

①Model	②Bore Size	③Stroke	④Magnet	⑤Adjuster option [Note1]	⑥Thread type [Note2]
HLQ: Compact slide cylinder (Double acting type) (Recirculating linear ball bearing) HLQL: Symmetrical Compact slide cylinder (Double acting type) (Recirculating linear ball bearing)	6 8 12 16 20 25	Refer to stroke table for details	S: With magnet	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) 	G: G

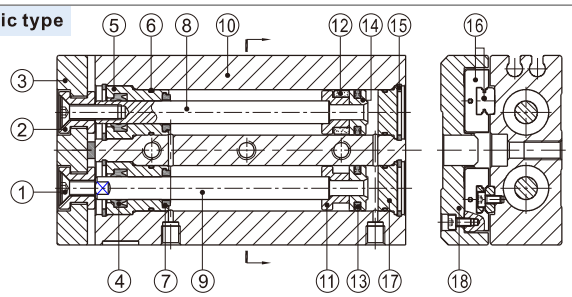
[Note1] B type, BS type, BF type are unavailable for bore size of Φ6. [Note2]When the thread is standard, the code is blank.

Compact slide cylinder(Recirculating linear ball bearing)

HLQ、HLQL Series

Inner structure and material of major parts

Basic type



NO.	Item	Material	NO.	Item	Material
1	Screw	Carbon steel	11	Magnet holder	Brass
2	Floating joint	Carbon steel	12	Magnet	Sintered metal (Neodymium-iron-boron)
3	Fixing plate	Aluminum alloy			
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			
9	Piston rod B	Carbon steel	17	Back cover	Brass
10	Body	Aluminum alloy	18	Slide table	Aluminum alloy

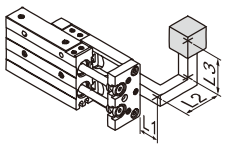
Model Selection Method

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

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

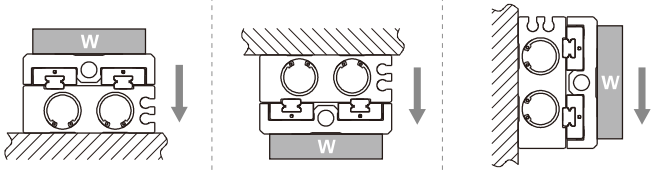
1. Model used(Bore size, Stroke)
2. Type of cushion(Bumper, Shock absrober)
3. Mounting position of work(Top, front)
4. Mounting direction(Axial, Vertical)
5. Average speed Va(mm/s)
6. Applied load W(N)
7. Overhang L1, L2, L3(mm)

Fig. 1



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



B) Kinetic energy check

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≤Ea

C) Load check

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≤Wa

Fig 2: Mounting work coefficient (K)

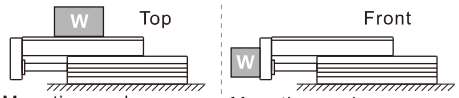
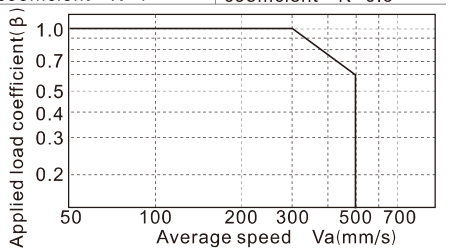


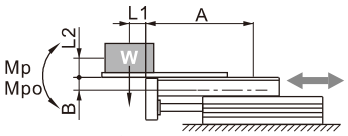
Fig 3: Applied load coefficient (β)



D) Moment check

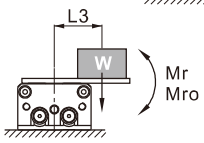
Horizontal

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



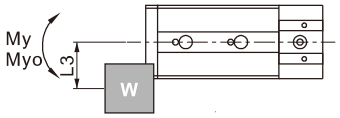
Dynamic moment: $Mp=W\times(L1+A)/1000$

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: $My=0$

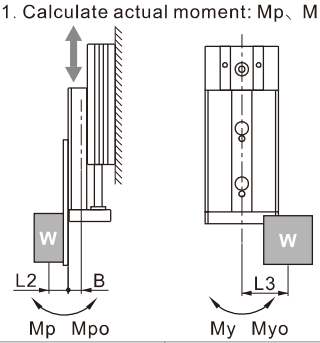
Static moment: $Myo=(W\times a\times L3)/1000g$

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、HLQL Series

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	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

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	-

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

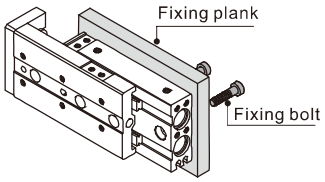
Bore size	Stroke	Static moment			Dynamic moment			Correction value	
		Mpo_{max}	Myo_{max}	Mro_{max}	Mp_{max}	My_{max}	Mr_{max}	A	B
6	10	3.3	3.8	2.6	0.7	0.7	0.6	30	7
	20	3.3	3.8	2.6	0.7	0.8	0.6	40	
	30	3.3	3.8	2.6	0.7	0.8	0.6	50	
	40	7.2	7.9	3.6	1.3	1.3	0.6	60	
	50	12.4	12.7	4.7	1.8	1.8	0.6	70	
8	10	10.1	9.1	8.8	2.5	2.5	2.0	30	7
	20	10.1	9.1	8.8	2.6	2.6	2.0	40	
	30	10.1	9.1	8.8	2.8	2.8	2.0	50	
	40	12.4	10.8	10.1	3.4	3.4	2.3	60	
	50	23.6	24.8	13.9	4.4	4.4	2.1	70	
	75	32.8	35.3	16.4	4.6	4.6	1.8	95	
12	10	8.5	8.5	13.6	2.5	2.5	4	32	11
	20	8.5	8.5	13.6	2.5	2.5	4	44	
	30	8.5	8.5	13.6	2.5	2.5	4	54	
	40	8.5	8.5	13.6	2.5	2.5	4	62	
	50	8.5	8.5	13.6	2.5	2.5	4	72	
	75	52.3	52.3	85.6	18.9	18.9	13	115	
	100	53.9	53.9	86.9	19.5	19.5	13	142	
16	10	33.6	33.6	35.2	8.4	8.4	8.8	49	12
	20	33.6	33.6	35.2	8.4	8.4	8.8	49	
	30	33.6	33.6	35.2	8.4	8.4	8.8	59	
	40	33.6	33.6	35.2	8.4	8.4	8.8	69	
	50	33.6	33.6	35.2	8.4	8.4	8.8	79	
	75	70.2	70.2	62.5	28.1	28.1	25	120	
	100	76.6	76.6	62.5	38.3	38.3	25	150	
	125	78	78	62.5	39	39	25	175	
20	10	34.8	34.8	36.8	8.7	8.7	9.2	53	14
	20	34.8	34.8	36.8	8.7	8.7	9.2	53	
	30	34.8	34.8	36.8	8.7	8.7	9.2	63	
	40	34.8	34.8	36.8	8.7	8.7	9.2	73	
	50	34.8	34.8	36.8	8.7	8.7	9.2	83	
	75	70.2	70.2	74.5	28.1	28.1	29.7	123	
	100	76.6	76.6	74.5	38.3	38.3	29.7	157	
	125	78	78	74.5	39	39	29.7	178	
	150	98.4	98.4	74.5	49.2	49.2	29.7	210	
25	10	56.7	56.7	51	16.2	16.2	17	60	17
	20	56.7	56.7	51	16.2	16.2	17	60	
	30	56.7	56.7	51	16.2	16.2	17	70	
	40	56.7	56.7	51	16.2	16.2	17	80	
	50	56.7	56.7	51	16.2	16.2	17	90	
	75	122.5	122.5	138.5	49	49	55.4	130	
	100	173.8	173.8	138.5	79	79	55.4	168	
	125	217	217	138.5	108.6	108.6	55.4	205	
	150	221.8	221.8	138.5	110.9	110.9	55.4	230	

Installation and application

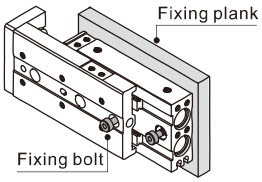
1. How to mount cylinder:

1.1) Cylinder can to be mounted from 3 directions

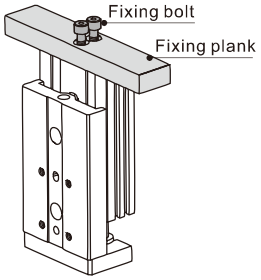
Vertical Mounting(Body thread holes)



Vertical Mounting(Body through holes)

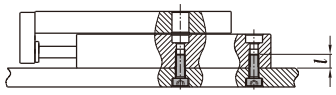


Axial Mounting (Body thread holes)



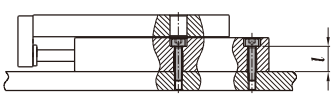
1.2) When mounting an compact slide cylinder, screws of appropriate length should be used and tightened properly within the maximum tightening torque. If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding of falling off from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

Vertical Mounting(Body thread holes)



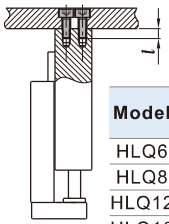
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M4×0.7	2.1	8
HLQ8	M4×0.7	2.1	8
HLQ12	M5×0.8	4.4	10
HLQ16	M6×1.0	4.4	10
HLQ20	M6×1.0	7.4	12
HLQ25	M8×1.25	18.0	16

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

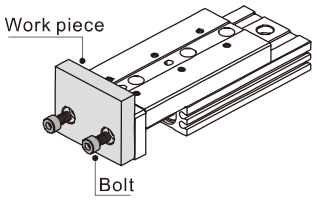
Axial Mounting(Body thread holes)



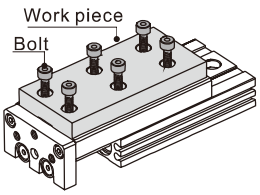
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M2.5×0.45	0.5	3.5
HLQ8	M3×0.5	0.9	4.0
HLQ12	M4×0.7	2.1	6.0
HLQ16	M5×0.8	4.4	7.0
HLQ20	M5×0.8	4.4	8.0
HLQ25	M6×1.0	7.4	10.0

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

Front Mounting

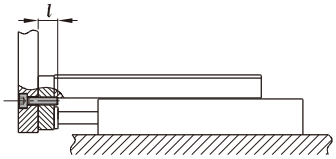


Top Mounting



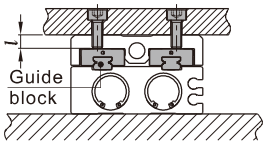
2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use blots at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

Front Mounting



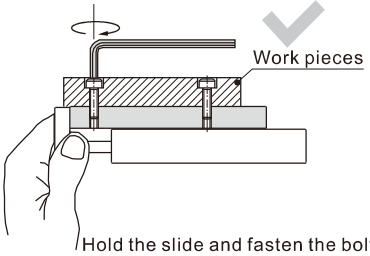
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M3×0.4	0.9	5
HLQ8	M4×0.7	2.1	6
HLQ12	M5×0.8	4.4	8
HLQ16	M6×1.0	7.4	10
HLQ20	M6×1.0	7.4	13
HLQ25	M8×1.25	18.0	15

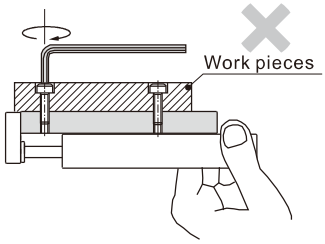
Top Mounting



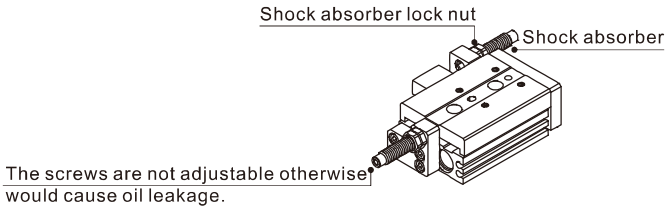
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M3×0.5	0.9	4.7
HLQ8	M3×0.5	0.9	4.7
HLQ12	M4×0.7	2.1	5.0
HLQ16	M5×0.8	4.4	5.0
HLQ20	M5×0.8	4.4	8.0
HLQ25	M6×1.0	7.4	9.0

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.



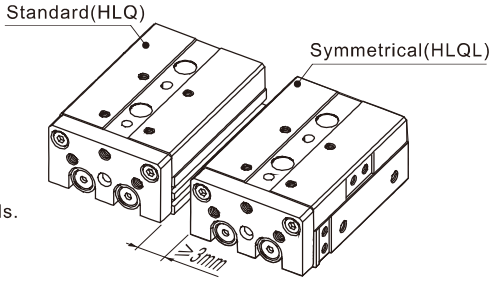


3. About shock absorber:
3.1) Shock absorbers are expendable. Promptly replace them when energy absorbing capacity decreases.
3.2) Never turn or adjust the screws on bottom of the shock absorber body. The screws are not for adjusting. Otherwise would cause oil leakage.
3.3) Follow the table for tightening 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)

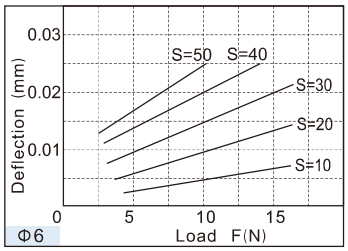
4. How to mount sensor switch:
4.1) HLQ Series are all with magnet. The matching sensor switches are CMSH, DMSH(S) series.
4.2) Maintain a minimum spacing of at least 3mm if two compact cylinders are used side by side in order to avoid malfunction.

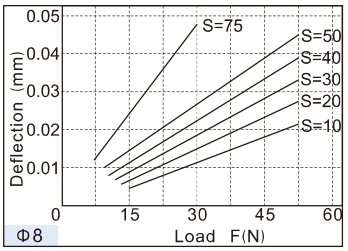


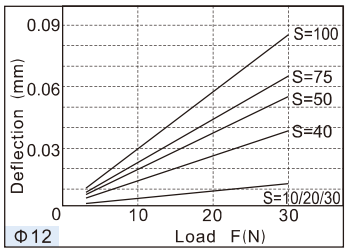
5. Make sure to connect the compact cylinder to speed controller at the meter-out side, and the speed of compact cylinder must below 500mm/s.
6. Don't apply a load beyond the range of the operation limits. Different load or torque will cause different deflection to table, please see below for details.

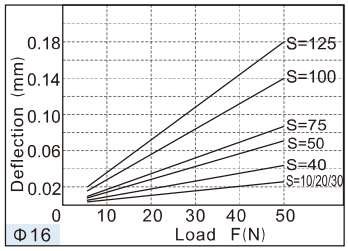
6.1) Table deflection due to pitch moment:

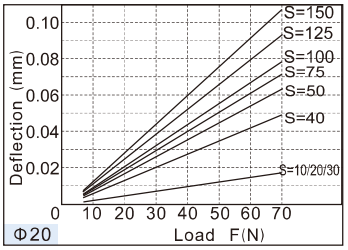
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

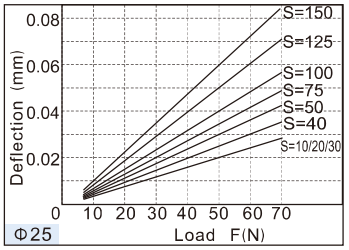






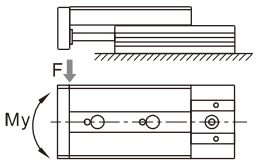


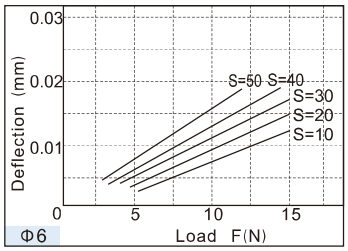


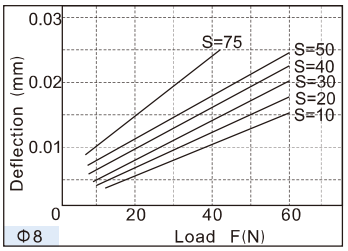


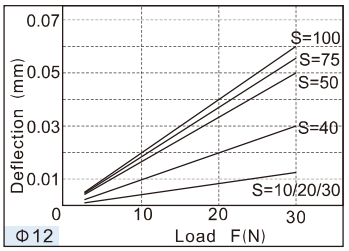
6.2) Table deflection due to yaw moment:

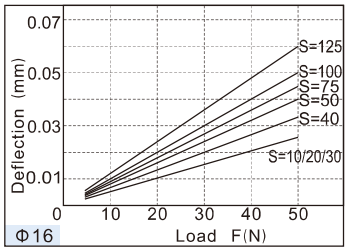
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

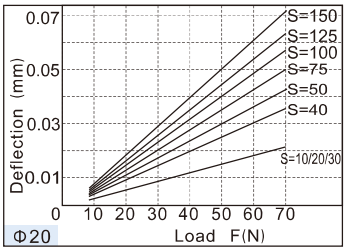


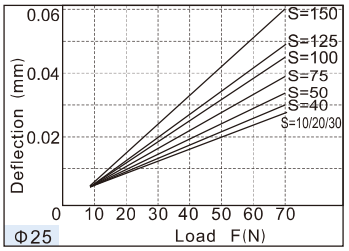






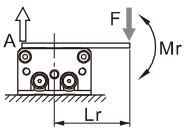


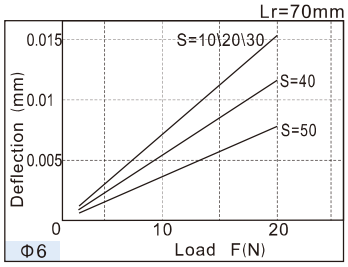


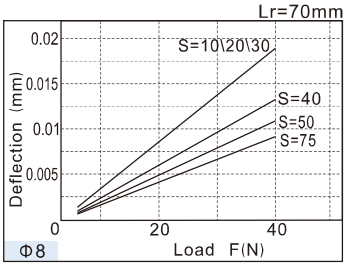


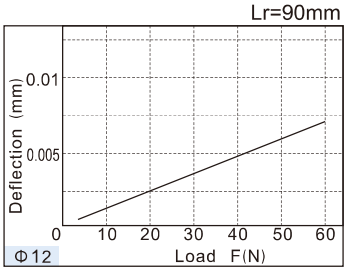
6.3) Table deflection due to roll moment:

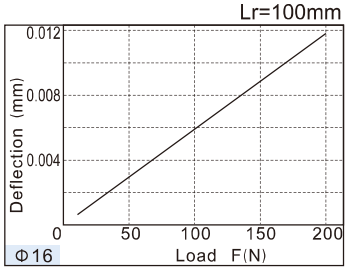
Table deflects (A) when a load acts upon section F at the full stroke of the compact slide.

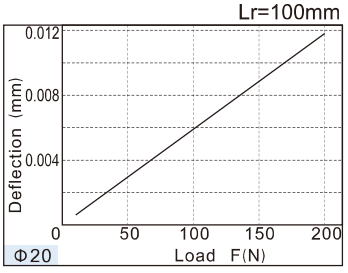


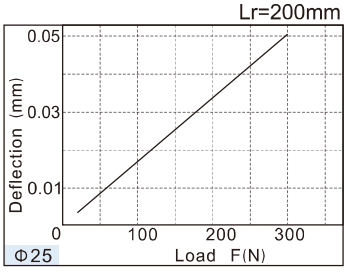






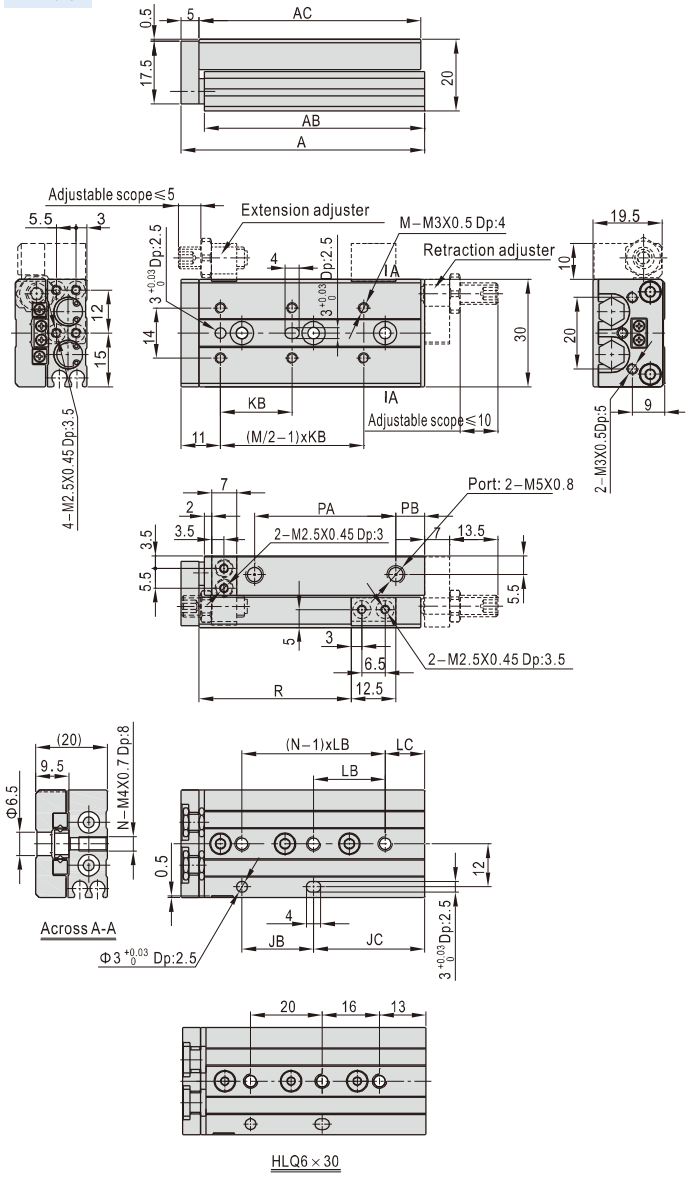






Dimensions

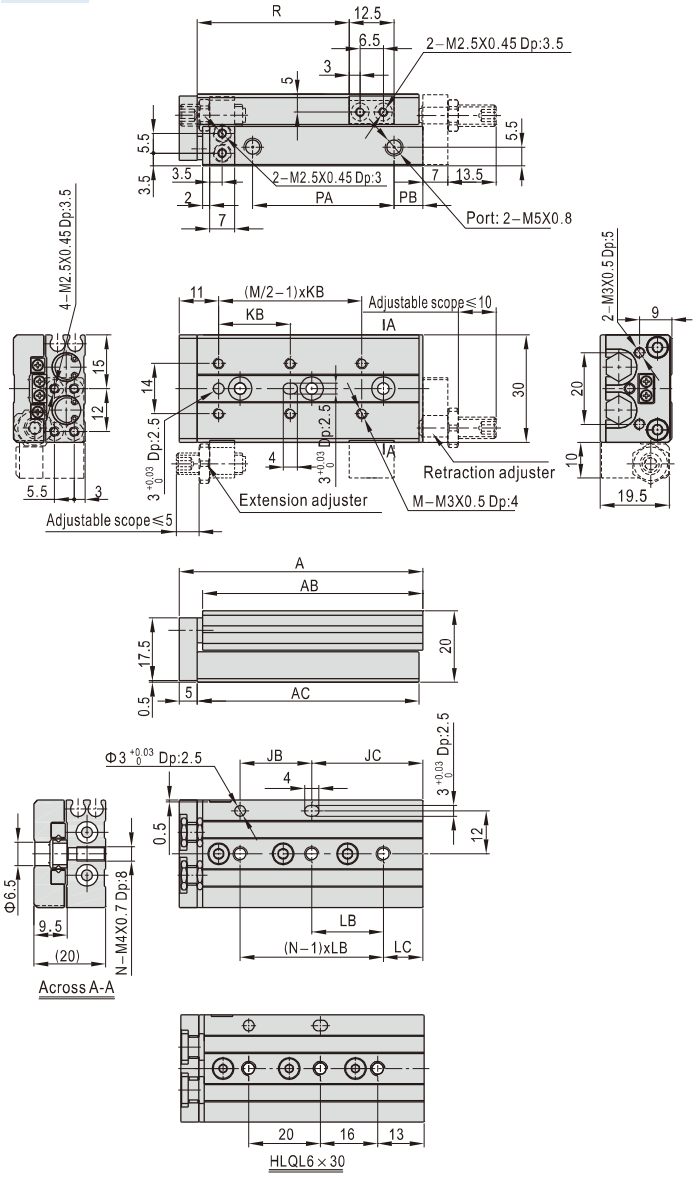
HLQ6



HLQ6×30

Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	48	41.5	42	16	13	22	23	6	4	2	16	9	21.5
20	58	51.5	52	26	13	25	26	13	4	2	26	9	31.5
30	68	61.5	62	20	29	21	–	–	6	3	36	9	41.5
40	86	79.5	80	28	39	26	28	11	6	3	47	16	51.5
50	96	89.5	90	28	49	27	28	21	6	3	64	9	61.5

HLQL6

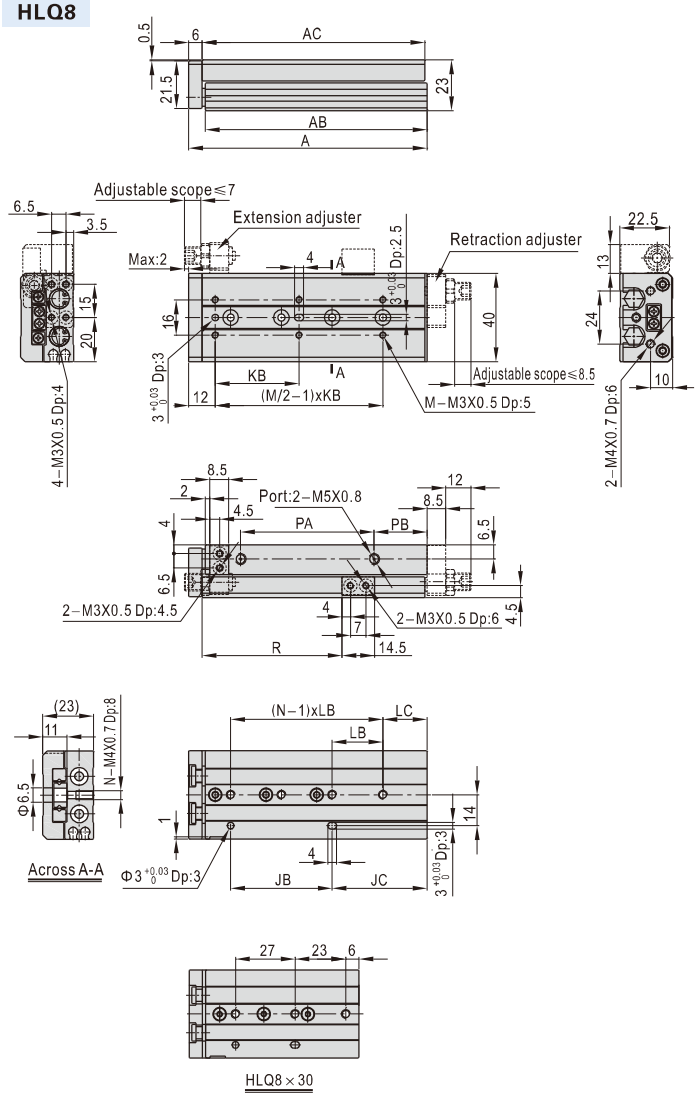


HLQL6×30

Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	48	41.5	42	16	13	22	23	6	4	2	16	9	21.5
20	58	51.5	52	26	13	25	26	13	4	2	26	9	31.5
30	68	61.5	62	20	29	21	–	–	6	3	36	9	41.5
40	86	79.5	80	28	39	26	28	11	6	3	47	16	51.5
50	96	89.5	90	28	49	27	28	21	6	3	64	9	61.5

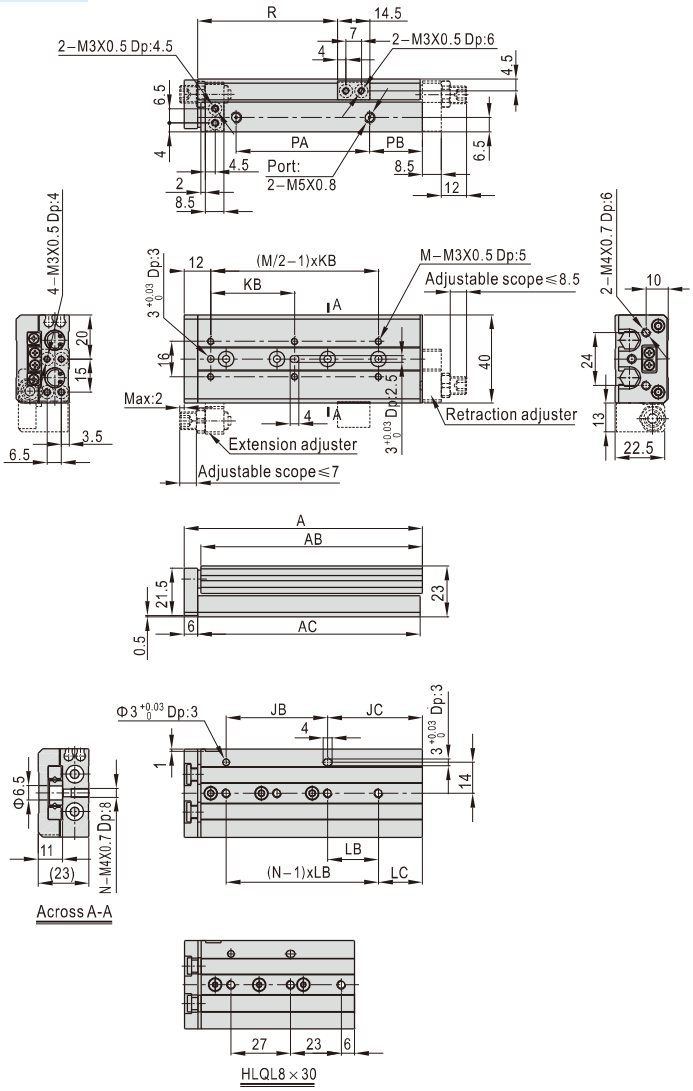
HLQ、HLQL Series

HLQ8



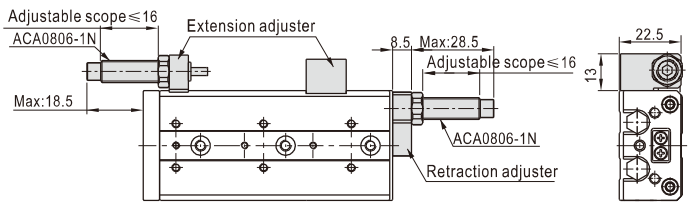
Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	53	45.5	46	19	13	25	25	7	4	2	18	10	23.5
20	63	55.5	56	28	14	25	28	14	4	2	28	10	33.5
30	77	69.5	70	27	29	26	–	–	6	3	42	10	43.5
40	91	83.5	84	31	39	32	31	8	6	3	54	12	53.5
50	116	108.5	109	58	37	46	29	8	6	4	79	12	63.5
75	144	136.5	137	60	61	50	30	31	6	4	107	10	88.5

HLQL8

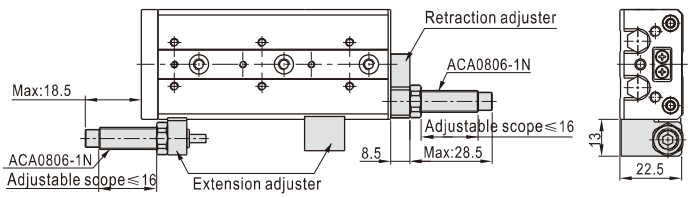


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	53	45.5	46	19	13	25	25	7	4	2	18	10	23.5
20	63	55.5	56	28	14	25	28	14	4	2	28	10	33.5
30	77	69.5	70	27	29	26	–	–	6	3	42	10	43.5
40	91	83.5	84	31	39	32	31	8	6	3	54	12	53.5
50	116	108.5	109	58	37	46	29	8	6	4	79	12	63.5
75	144	136.5	137	60	61	50	30	31	6	4	107	10	88.5

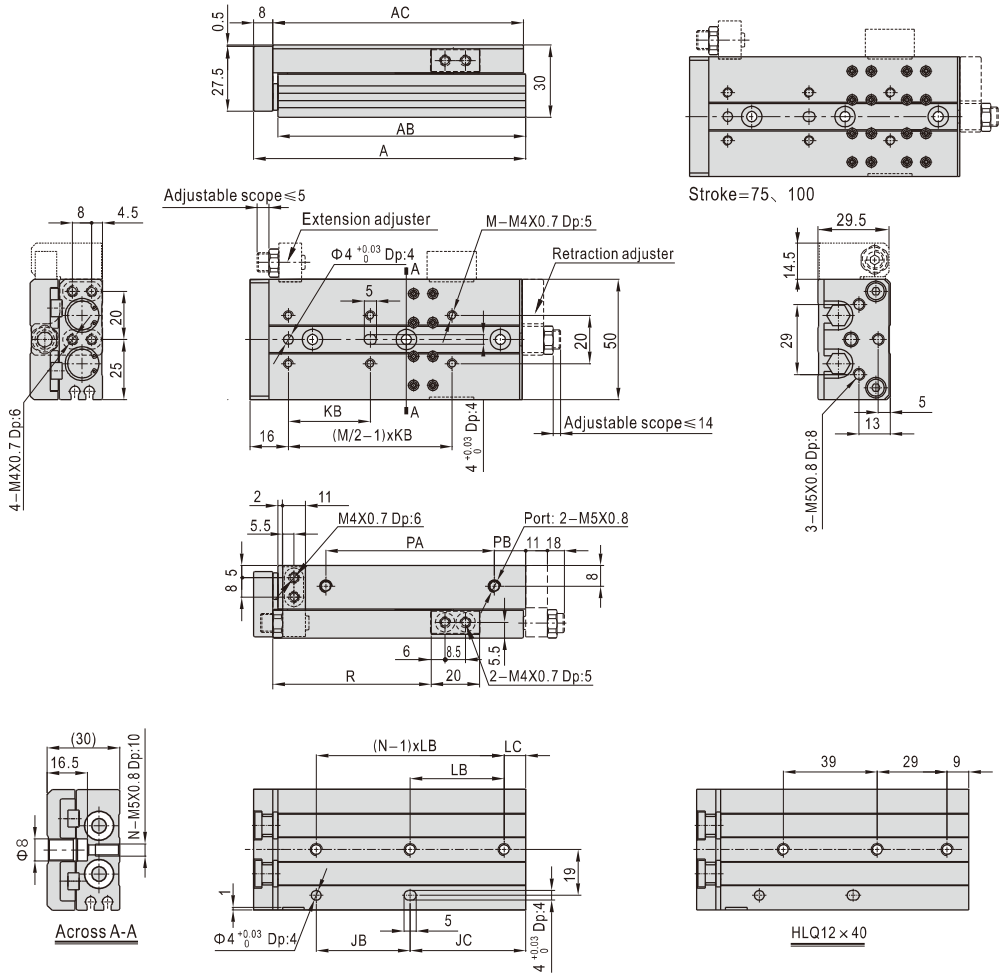
HLQ8(With shock absorber)



HLQL8(With shock absorber)

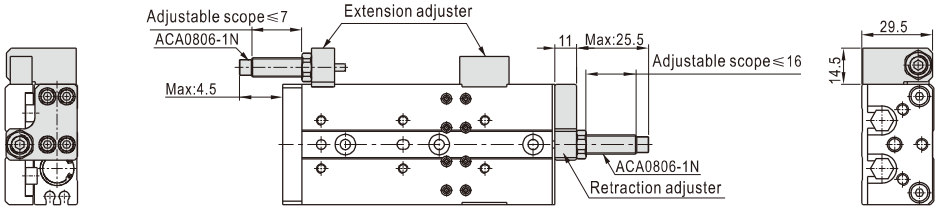


HLQ12



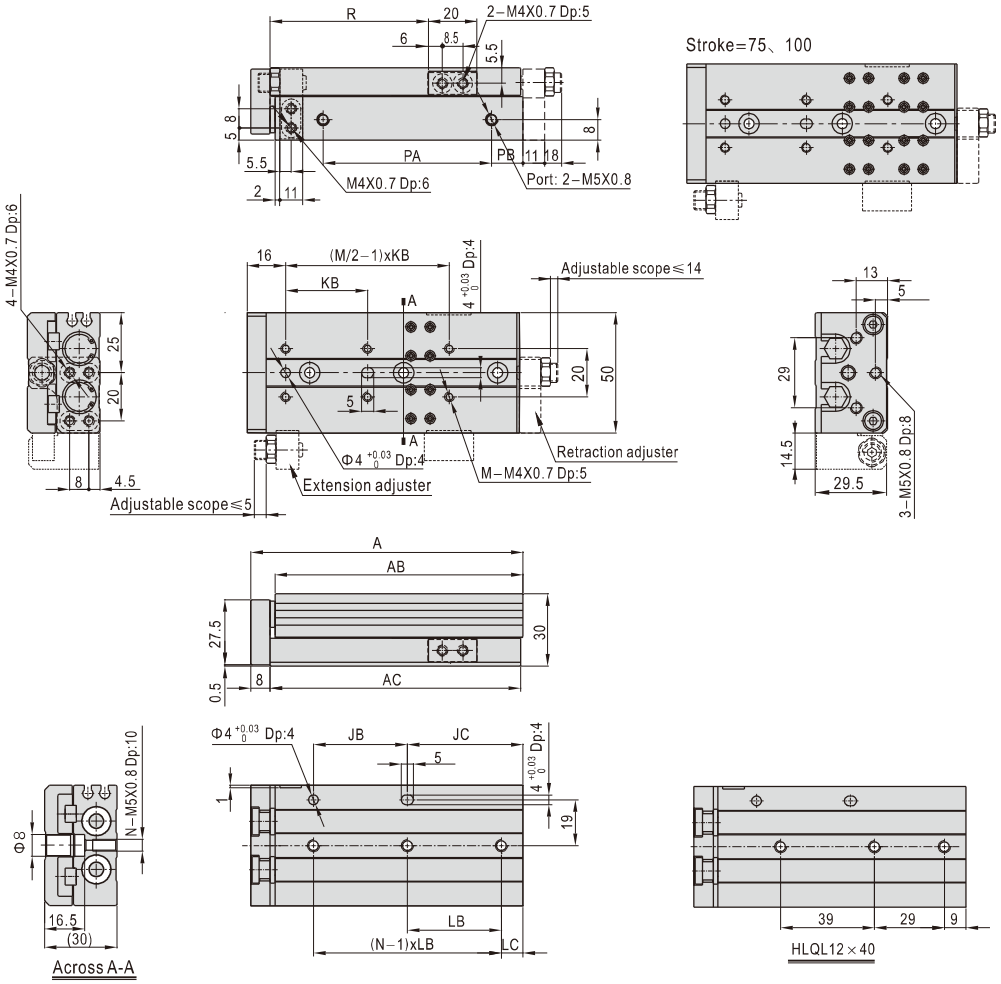
Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	76	66	67	32	18	28	32	18	4	2	32.5	13	35
20	76	66	67	32	18	28	32	18	4	2	32.5	13	45
30	86	76	77	40	20	38	40	20	4	2	42.5	13	55
40	103	93	94	39	38	34	–	–	6	3	59.5	13	65
50	113	103	104	39	48	34	39	9	6	3	69.5	13	75
75	157	147	148	72	59	36	36	23	8	4	113.5	13	99
100	182	172	173	72	84	36	36	12	10	5	134.5	17	124

HLQ12(With shock absorber)



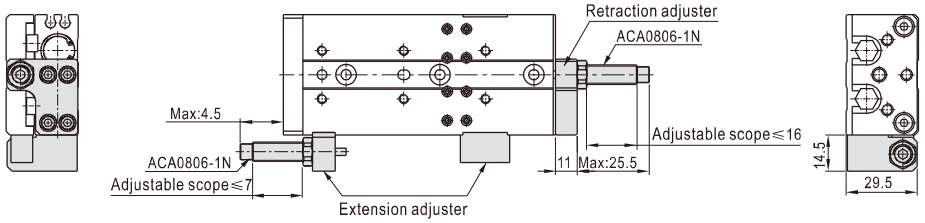
HLQ、HLQL Series

HLQL12

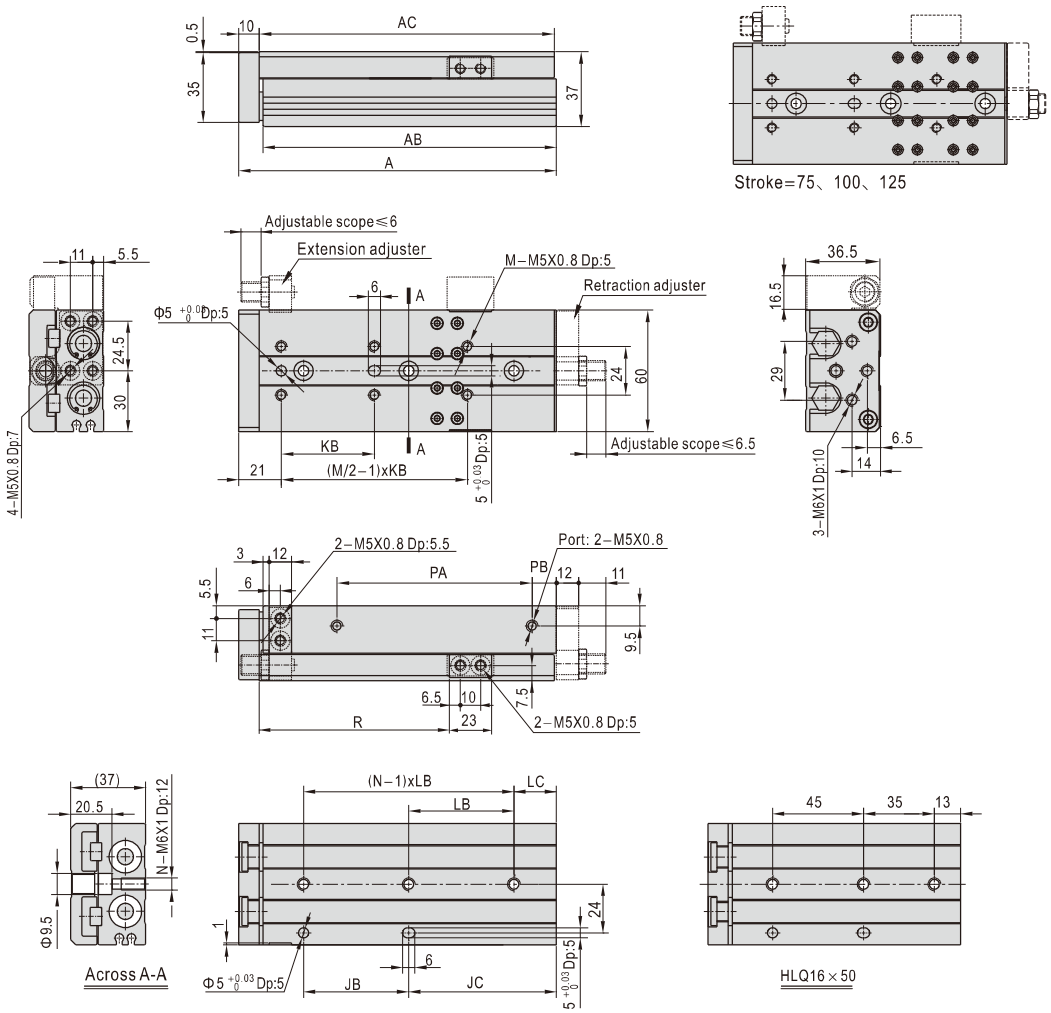


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	76	66	67	32	18	28	32	18	4	2	32.5	13	35
20	76	66	67	32	18	28	32	18	4	2	32.5	13	45
30	86	76	77	40	20	38	40	20	4	2	42.5	13	55
40	103	93	94	39	38	34	–	–	6	3	59.5	13	65
50	113	103	104	39	48	34	39	9	6	3	69.5	13	75
75	157	147	148	72	59	36	36	23	8	4	113.5	13	99
100	182	172	173	72	84	36	36	12	10	5	134.5	17	124

HLQL12(With shock absorber)

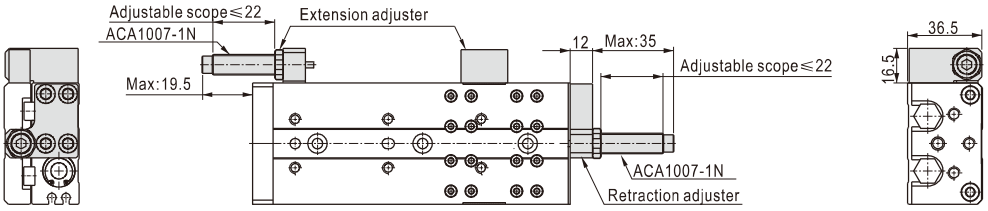


HLQ16

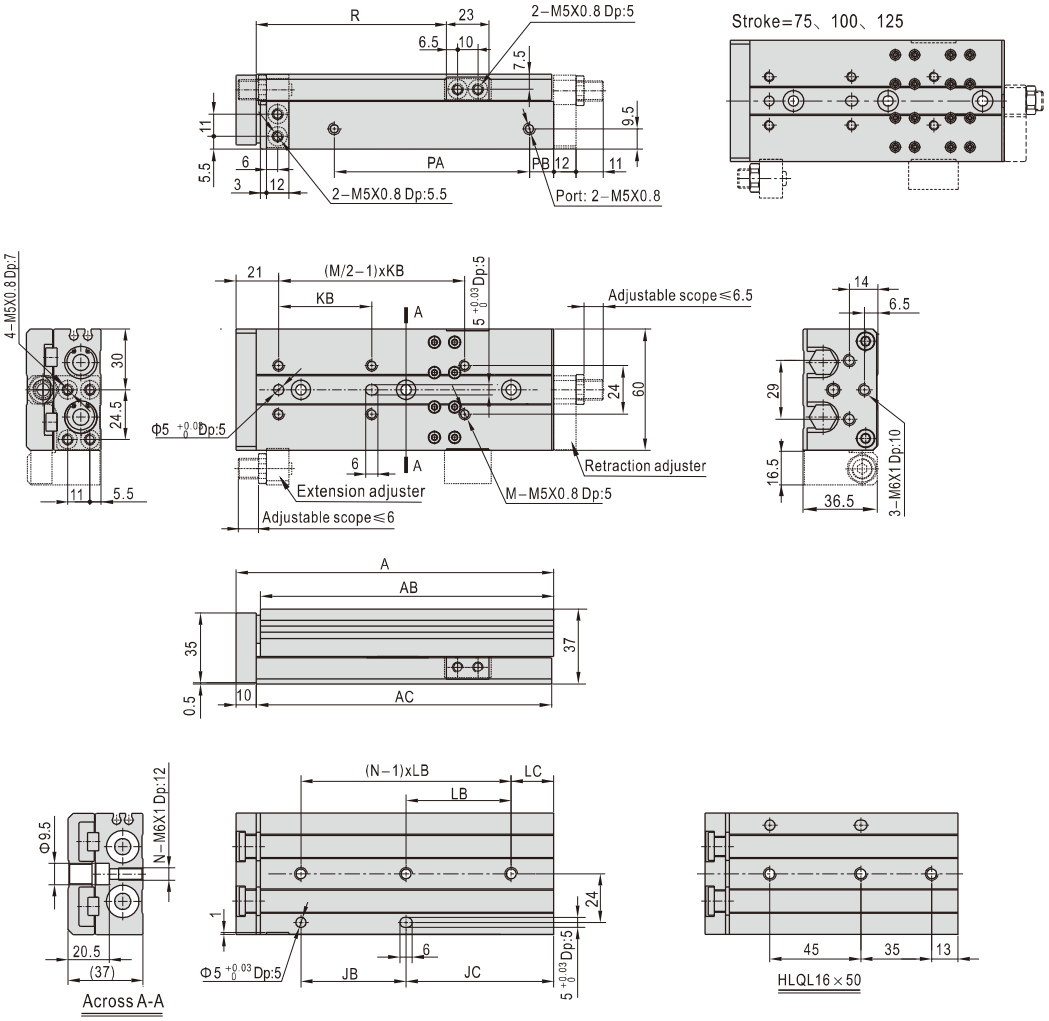


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	89	77	78	39	18	38	39	18	4	2	40.5	12	28.5
20	89	77	78	39	18	38	39	18	4	2	40.5	12	38.5
30	99	87	88	48	19	48	48	19	4	2	50.5	12	48.5
40	109	97	98	58	19	58	58	19	4	2	60.5	12	58.5
50	125	113	114	45	48	40	–	–	6	3	70.5	18	68.5
75	157	145	146	52	73	46	52	21	6	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)

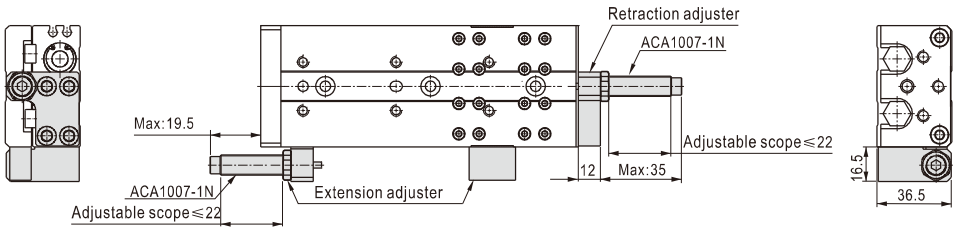


HLQL16

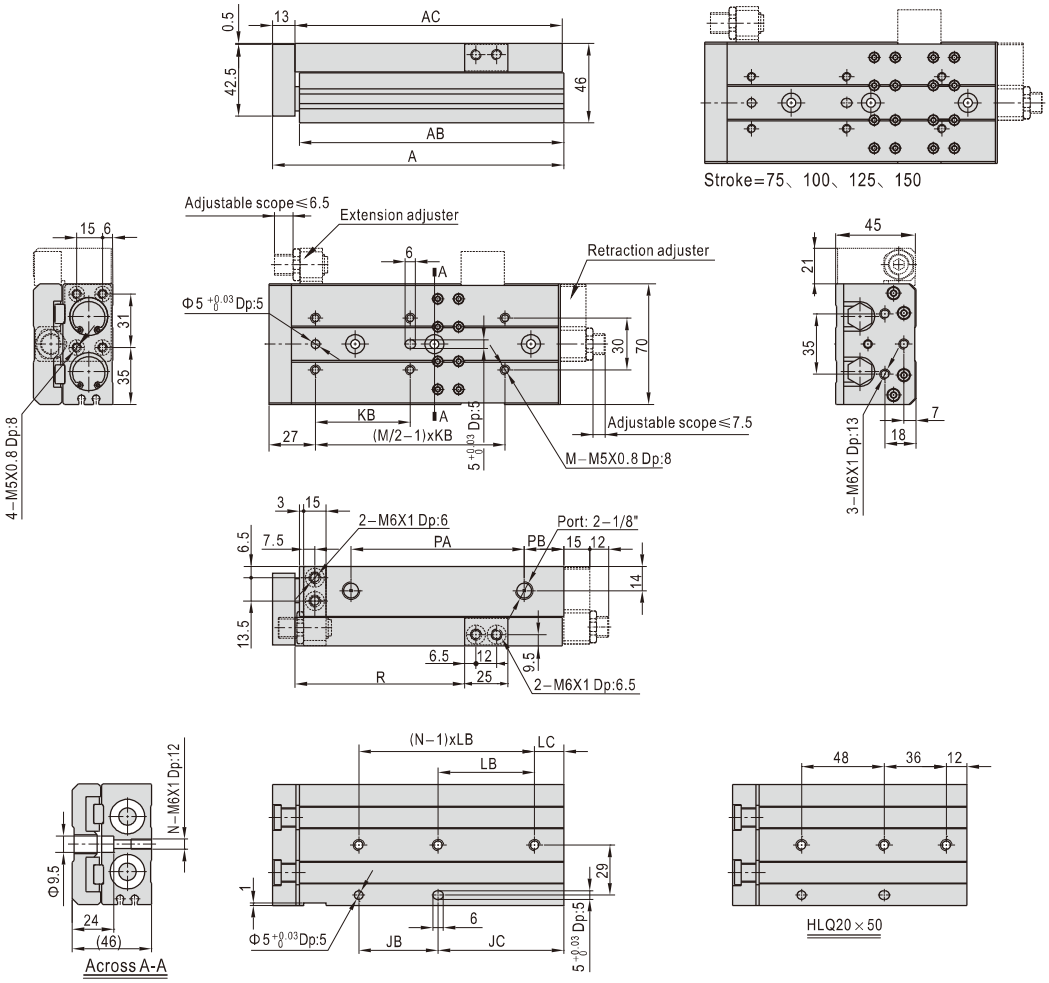


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	89	77	78	39	18	38	39	18	4	2	40.5	12	28.5
20	89	77	78	39	18	38	39	18	4	2	40.5	12	38.5
30	99	87	88	48	19	48	48	19	4	2	50.5	12	48.5
40	109	97	98	58	19	58	58	19	4	2	60.5	12	58.5
50	125	113	114	45	48	40	–	–	6	3	70.5	18	68.5
75	157	145	146	52	73	46	52	21	6	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

HLQL16(With shock absorber)

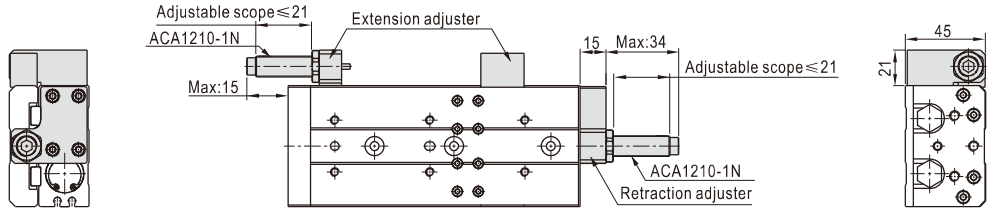


HLQ20



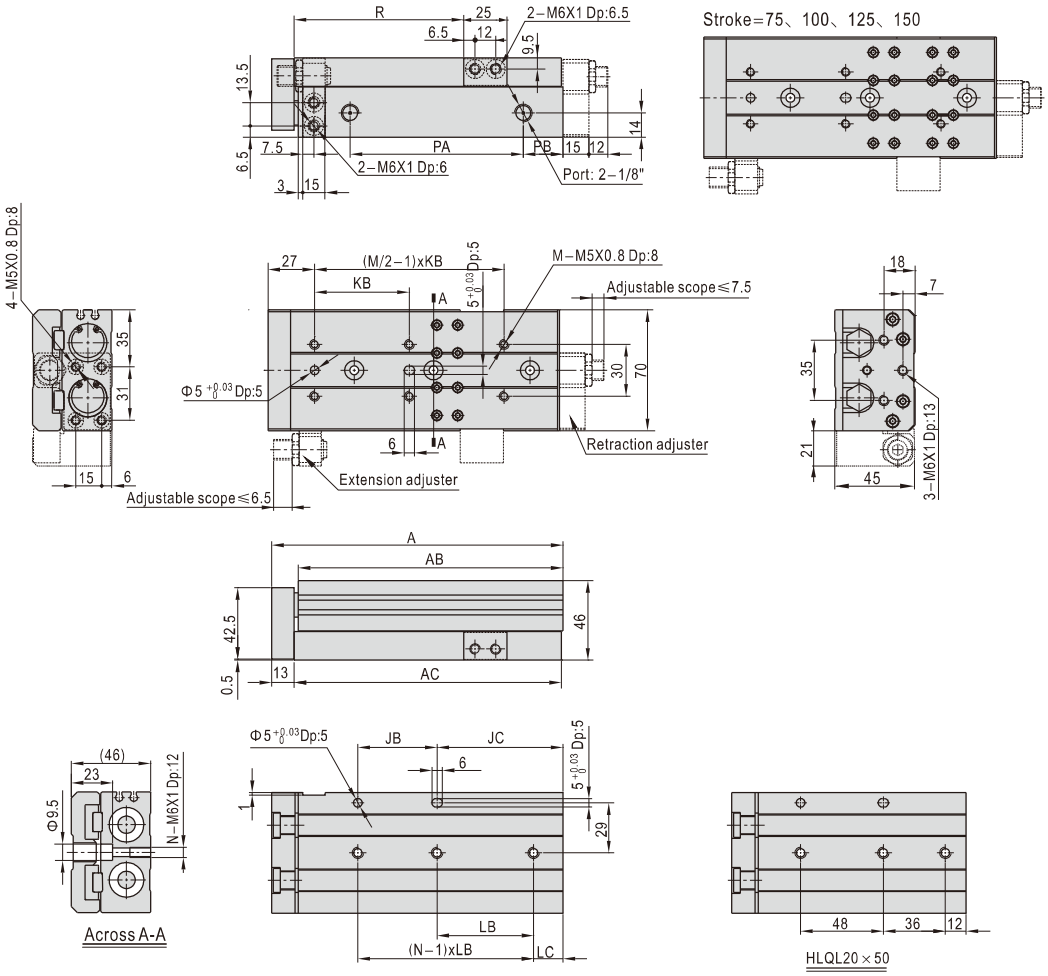
Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	108	92.5	94	50	18	45	46	22	4	2	46.5	16	32.5
20	108	92.5	94	50	18	40	46	22	4	2	46.5	16	42.5
30	108	92.5	94	50	18	48	46	22	4	2	46.5	16	52.5
40	118	102.5	104	56	22	58	56	22	4	2	56.5	16	62.5
50	136	120.5	122	48	48	42	–	–	6	3	72.5	18	72.5
75	169	153.5	155	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)



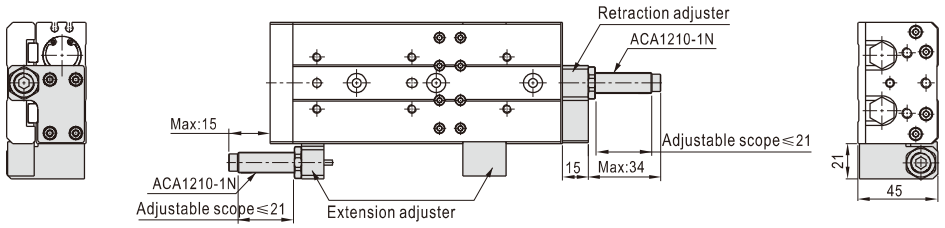
HLQ、HLQL Series

HLQL20

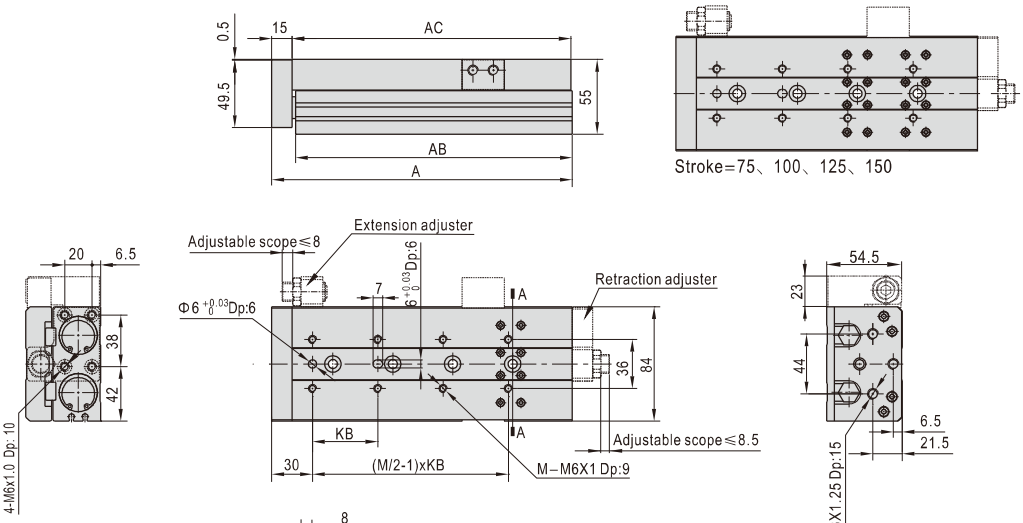


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	108	92.5	94	50	18	45	46	22	4	2	46.5	16	32.5
20	108	92.5	94	50	18	40	46	22	4	2	46.5	16	42.5
30	108	92.5	94	50	18	48	46	22	4	2	46.5	16	52.5
40	118	102.5	104	56	22	58	56	22	4	2	56.5	16	62.5
50	136	120.5	122	48	48	42	–	–	6	3	72.5	18	72.5
75	169	153.5	155	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

HLQL20(With shock absorber)

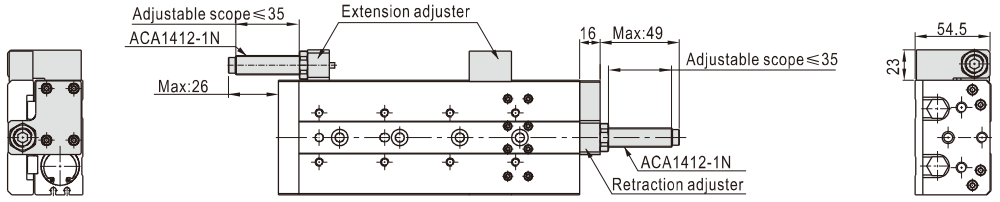


HLQ25



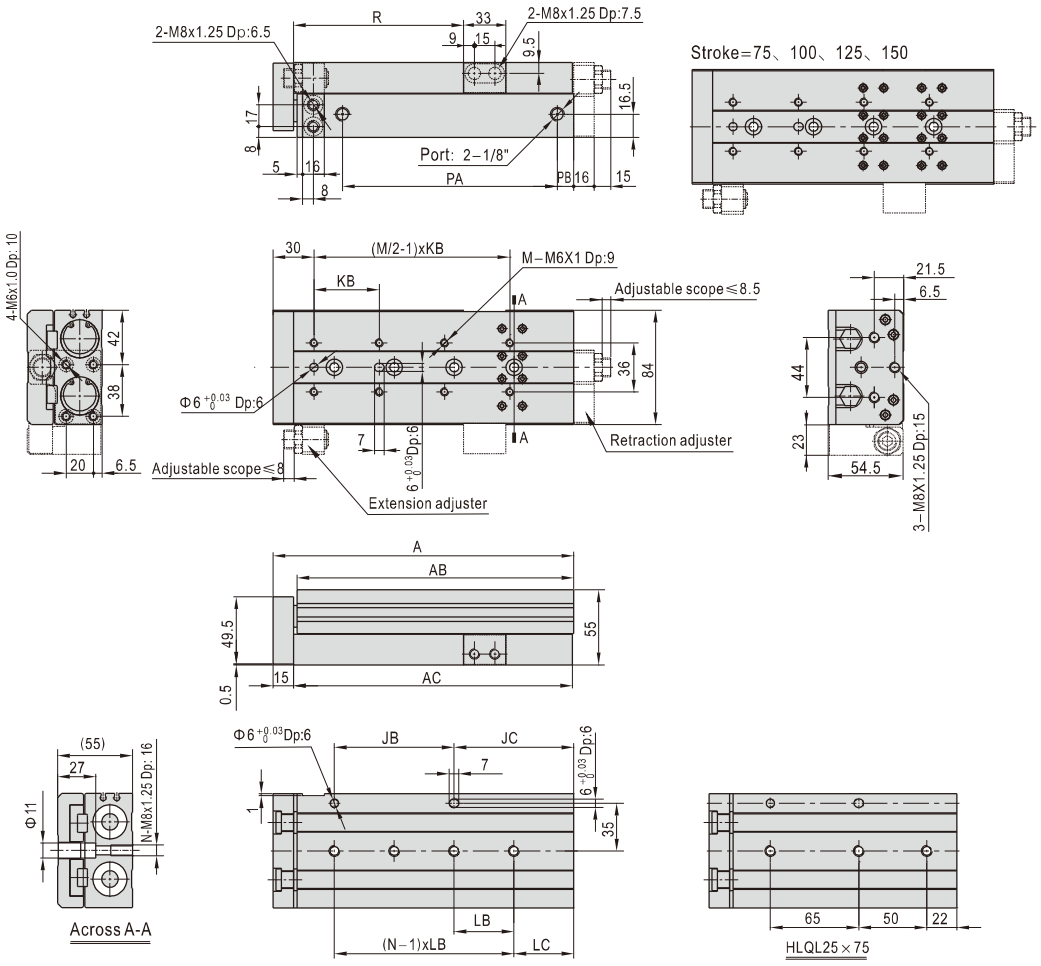
Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	123	105.5	107	55	23	55	55	23	4	2	58	12	35
20	123	105.5	107	55	23	46	55	23	4	2	58	12	45
30	123	105.5	107	55	23	55	55	23	4	2	58	12	55
40	133	115.5	117	65	23	65	65	23	4	2	68	12	65
50	157	139.5	141	80	32	75	80	32	4	2	92	14	75
75	182	164.5	166	65	72	60	–	–	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

HLQ25(With shock absorber)



HLQ、HLQL Series

HLQL25



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

HLQL25(With shock absorber)