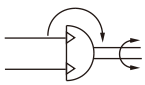
Rotary table cylinder——HRQ Series

Product feature

1. Rack and pinion design, stable functioning.
2. Double cylinder structure, double output could be achieved.
3. The manufacturing precision of working platform is high, and is easy for installation , and is of precise orientation.
4. The center of working platform has a through hole, and pipe can be located and passed through this hole;
5. Guide hole is designed on the both side of the cylinder body (10~200) or undersurface (2~7), which is simply to install.
6. Two modes of buffer could be chosen, adjustment bolt buffer and internal shock absorber, the maximum buffer energy of internal shock absorber is 3-5 times that of adjustment bolt buffer.

Symbol



Specification

Specification		2	3	7	10	20	30	50	70	100	200
Acting type		Double rack and pinion(Double acting)									
Fluid		Air(to be filtered by 40μm filter element)									
Operating pressure	With adjustment bolt	0.15~0.7MPa(22~100psi)(1.5~7.0bar)									
	With internal shock absorber	-			0.15~0.7MPa(22~100psi)(1.5~7.0bar)						
Proof pressure		1.2MPa(175psi)(12.0bar)									
Temperature ℃		-20~70									
Angle adjustment range		0~190°							0~190°		
Repeatable precision	With adjustment bolt	0.2°									
	With internal shock absorber	-			0.05°						
Theoretic moment (Nm)(0.5MPa)		0.2	0.33	0.63	1.1	2.2	2.8	5.0	7.5	11.0	22.0
Cushion type	With adjustment bolt	Rubber bumper									
	With internal shock absorber	–			Shock absorber						
Port size	End ports	M5×0.8					1/8" [Note1]				
	Side ports						M5×0.8				
Weight g		120	175	270	535	940	1260	2060	2890	4100	7650

[Note1] PT thread, G thread and NPT thread are available.

Maximum allowed movement energy and rotation times

Model	Maximal allowed energy (J)		Rotation times (s/90°)	
	With adjustment bolt	With internal shock absorber	With adjustment bolt	With internal shock absorber
HRQ2	0.0015	-	0.2~0.7	-
HRQ3	0.002	-	0.2~0.7	-
HRQ7	0.006	-	0.2~1.0	-
HRQ10	0.01	0.04	0.2~1.0	0.2~0.7
HRQ20	0.025	0.12	0.2~1.0	0.2~0.7
HRQ30	0.05	0.12	0.2~1.0	0.2~0.7
HRQ50	0.08	0.30	0.2~1.0	0.2~0.7
HRQ70	0.24	1.1	0.2~1.5	0.2~1.0
HRQ100	0.32	1.6	0.2~2.0	0.2~1.0
HRQ200	0.56	2.9	0.2~2.5	0.2~1.0

[Note]
1: The movement energy should not exceed the allowed maximum energy, or the inner accessories of product would be damaged;
2: When the rotation times of with shock absorber is larger than the allowed tolerance, the bigger effect will be lost.

Ordering code

HRQ 20 A □

① ② ③ ④

①Model
HRQ: Rotary Table/Rack & Pinion Style

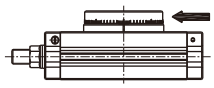
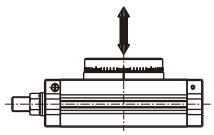
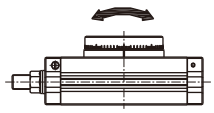
②Specification
2 3 7 10 20 30 50 70 100 200

③Cushion type	Specification
Blank: With adjustment bolt	2 3 7
Blank: With adjustment bolt A: With internal shock absorber	10 20 30 50 70 100 200

④Thread type	Specification
No this code	2 3 7 10 20
Blank: PT G: G T: NPT	30 50 70 100 200

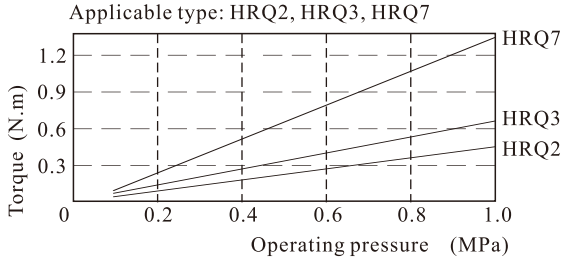
[Note] HRQ series are all atteched with magnet.

Maximum allowed loading

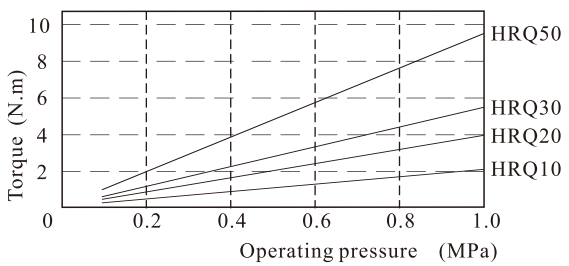
Loading type	Model									
	HRQ2	HRQ3	HRQ7	HRQ10	HRQ20	HRQ30	HRQ50	HRQ70	HRQ100	HRQ200
Maximum allowed radial loading (N) 	18	30	50	80	150	200	300	330	390	540
Maximum allowed axial loading (N) 	35	50	70	80	150	200	300	300	500	740
Maximum allowed bending moment (Nm) 	0.8	1.1	1.5	2.5	4.0	5.5	10.0	12.0	18.0	25.0

Actual torque output

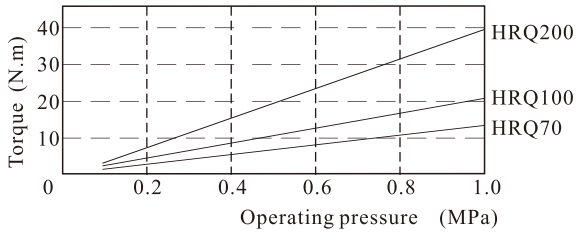
Applicable type: HRQ2, HRQ3, HRQ7



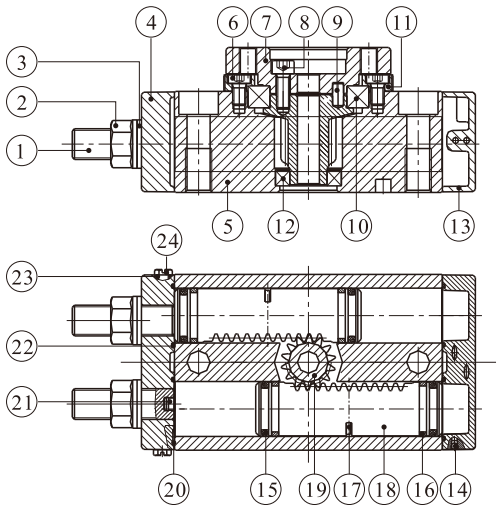
Applicable type: HRQ10, HRQ20, HRQ30, HRQ50



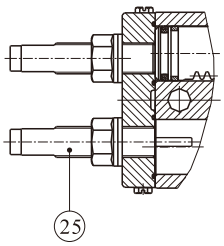
Applicable type: HRQ70, HRQ100, HRQ200



Inner structure and material of major parts



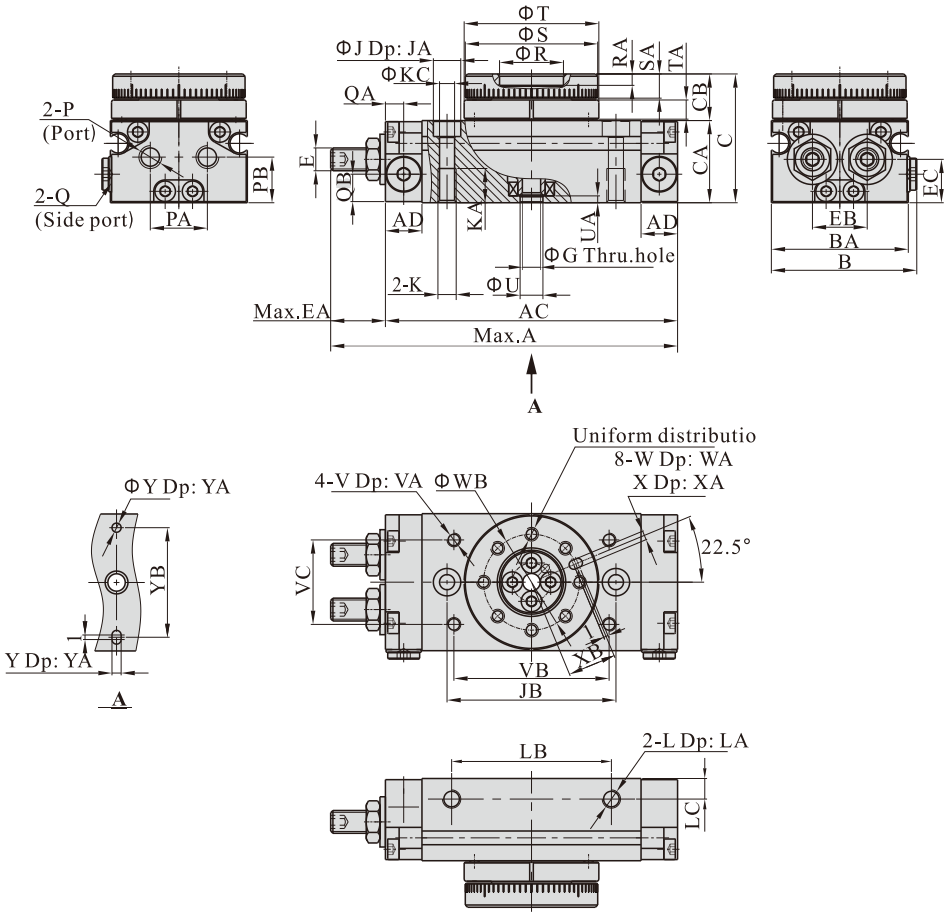
HRQ□-A
(With internal shock absorber)



NO.	Item	Material	NO.	Item	Material
1	Adjustment bole	Carbon steel	14	Steel ball	Stainless steel
2	Hexagon nut	Carbon steel	15	Piston seal	NBR
3	Seal washer	Carbon steel & Rubber	16	Wear ring	Wear resistant material
4	Front cover	Aluminum alloy	17	Magnet	Rare earths
5	Body	Aluminum alloy	18	Rack	Stainless steel/Carbon steel
6	Hexagon socket head set bole	Carbon steel	19	Pinion	Chrome molybdenum steel
7	Table	Aluminum alloy	20	O-ring	NBR
8	Hexagon socket head set bole	Carbon steel	21	Bumper	NBR
9	Guide pin/flat key	Carbon steel	22	O-ring	NBR
10	Deep-groove bearing	Subassembly	23	O-ring	NBR
11	Bearing retainer	Aluminum alloy	24	Hexagon screw	Stainless steel
12	Deep-groove bearing/Needle bearing	Subassembly	25	Shock absorber	Subassembly
13	Back cover	Aluminum alloy			

Dimensions

HRQ2/3/7

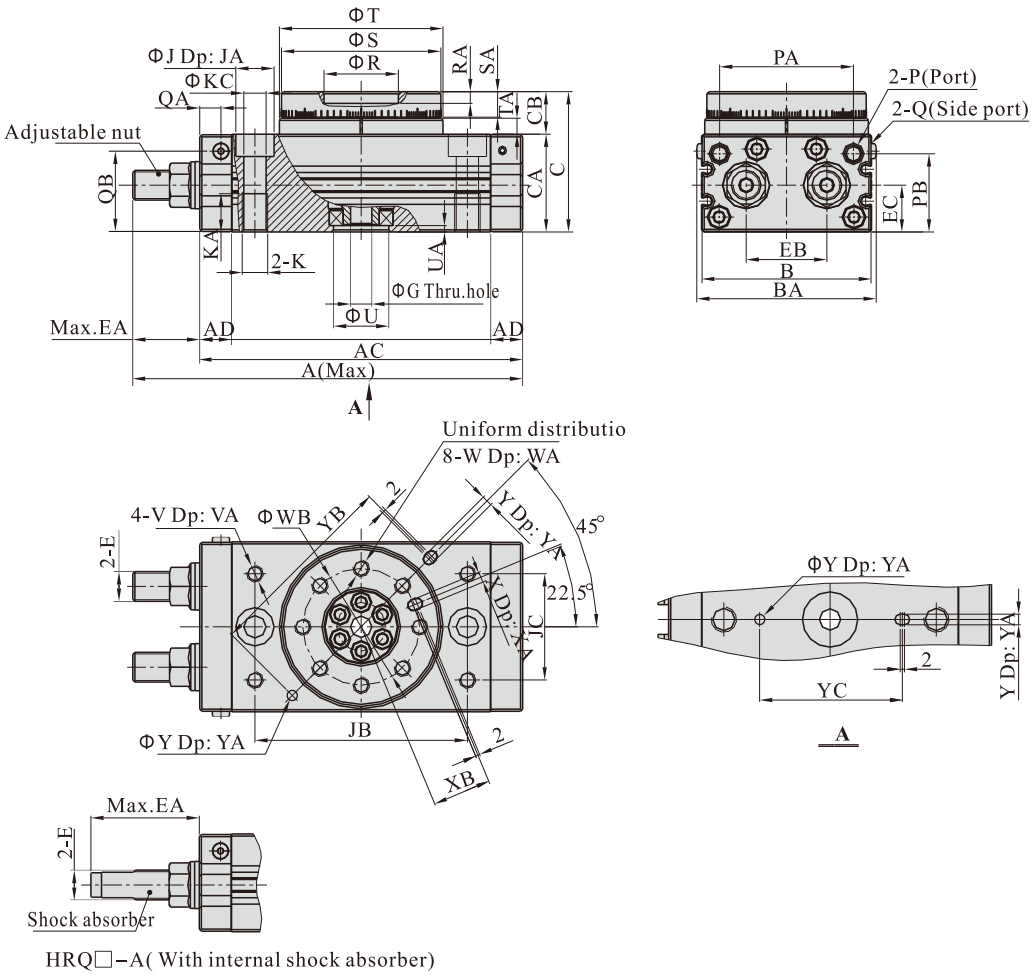


Type\Item	A	AC	AD	B	BA	C	CA	CB	E	EA	EB	EC	G	J	JA	JB	K	KA
2	76	64	8	32	30	28	18	10	M5×0.8	12	12	9.5	4	6	3.5	37	M4×0.7	7.5
3	82	70	8	36.5	34.5	30.5	20.5	10	M5×0.8	12	15.5	10.5	5	7.5	4.5	43	M5×0.8	8.5
7	94.5	79.5	8	43	41	34.5	23	11.5	M6×1.0	15	18.5	12	6	7.5	4.5	50	M5×0.8	8.5

Type\Item	KC	L	LA	LB	LC	P	PA	PB	Q	QA	QB	R	RA	S	SA	T	TA
2	3.5	M4×0.7	4	35	4.5	M5×0.8	12.5	10	M5×0.8	4	6	14(H9)	2.5	29(h9)	5.5	29.5(h9)	4
3	4.5	M4×0.7	4	40	4.5	M5×0.8	15.5	12	M5×0.8	4	7.5	17(H9)	2.5	33(h9)	5.5	34(h9)	4
7	4.5	M5×0.8	5	50	5	M5×0.8	18.5	14	M5×0.8	4	9	20(H9)	3	39(h9)	6.5	40(h9)	4.5

Type\Item	U	UA	V	VA	VB	VC	W	WA	WB	X	XA	XB	Y	YA	YB
2	5(H9)	1.5	M3×0.5	3.5	34	18.5	M3×0.5	5.5	21	2(H9)	2	10.5	2(H9)	2	24
3	6(H9)	1.5	M3×0.5	3.5	38	23	M3×0.5	5.5	25	2(H9)	2	12.5	2(H9)	2	28
7	7(H9)	1.5	M4×0.7	4.5	45	30	M4×0.7	6.5	29	3(H9)	3	14.5	3(H9)	3	32

HRQ10~50



HRQ□–A(With internal shock absorber)

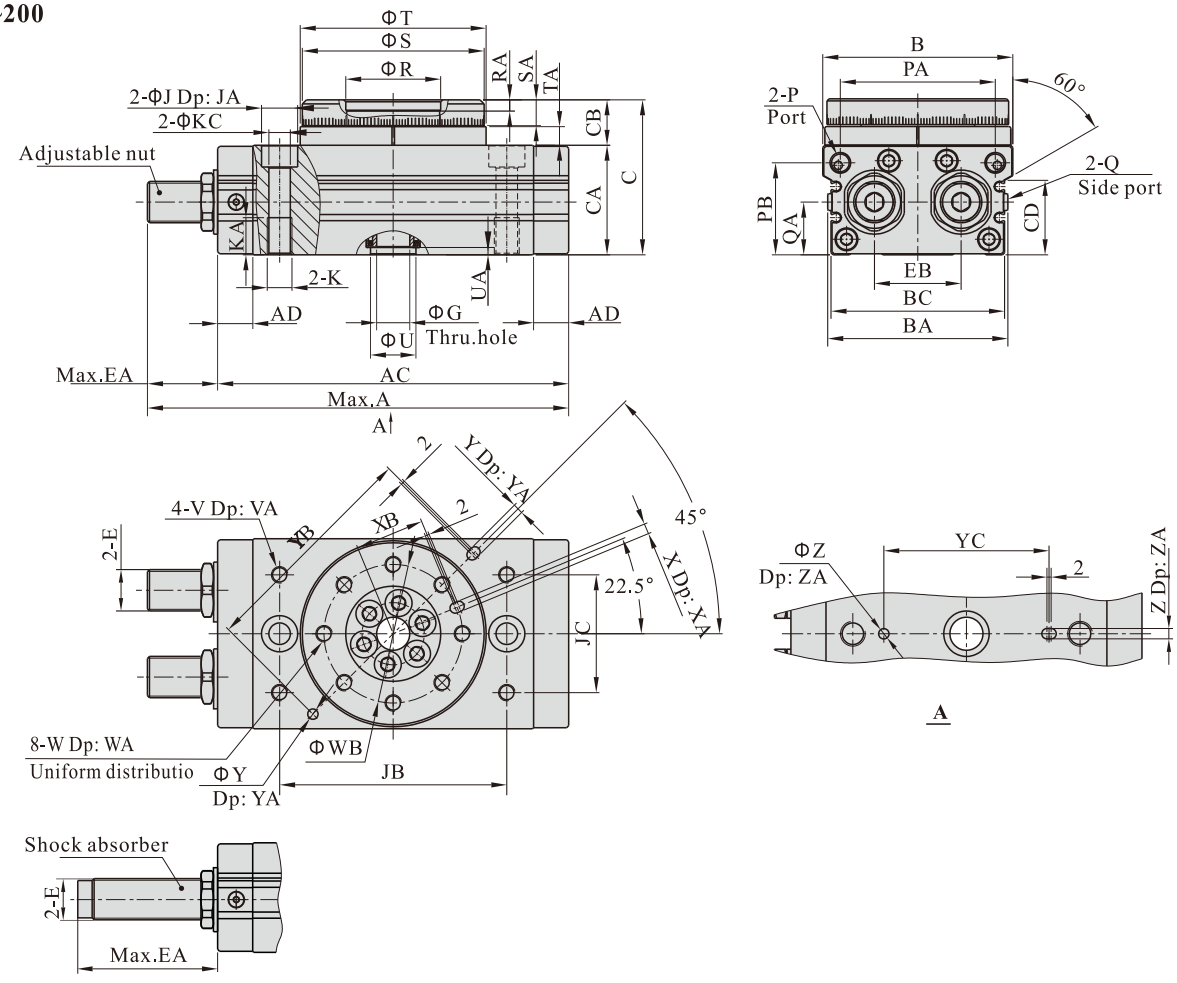
Type\Item	A(With internal shock absorber)	A(With adjustment bolt)	AC	AD	B	BA	C	CA	CB	E
10	123	112	92	9.5	50	54	47	34	13	M10×1.0
20	169	145.3	117	11	65	69	54	37	17	M12×1.0
30	178.5	154.5	127	11.5	70	74	57	40	17	M12×1.0
50	212	185.9	152	15	80	84	66	46	20	M14×1.5

Type\Item	EA(With internal shock absorber)	EA(With adjustment bolt)	EB	EC	G	J	JA	JB	JC
10	31	20	20.5	14	5	11	6.5	60	27
20	52	28.3	27.5	16	9	14	8.5	76	34
30	51.5	27.5	29	18.5	9	14	8.5	84	37
50	60	33.9	38	22	10	17.5	12	100	50

Type\Item	K	KA	KC	P	PA	PB	Q	QA	QB	R	RA	S	SA	T	TA
10	M8×1.25	12	6.5	M5×0.8	34.5	28	M5×0.8	4.5	29	20(H9)	4.5	45(h9)	8	46(h9)	4.5
20	M10×1.5	15	8.5	M5×0.8	47	30	M5×0.8	6	30	28(H9)	6.5	60(h9)	10	61(h9)	6.5
30	M10×1.5	15	8.5	1/8"	50	32	M5×0.8	6.5	34	32(H9)	5	65(h9)	10	67(h9)	6.5
50	M12×1.75	18	10.5	1/8"	63	38	M5×0.8	10	38	35(H9)	5.5	75(h9)	12	77(h9)	7.5

Type\Item	U	UA	V	VA	W	WA	WB	X	XA	XB	Y	YA	YB	YC
10	15(H9)	3	M5×0.8	8	M5×0.8	8	32	3(H9)	3.5	16	3(H9)	3.5	56	40
20	17(H9)	2.5	M6×1.0	8	M6×1.0	10	43	4(H9)	4.5	21.5	4(H9)	4.5	74	50
30	22(H9)	3	M6×1.0	8	M6×1.0	10	48	4(H9)	5	24	4(H9)	4.5	80	58
50	26(H9)	3	M8×1.25	8	M8×1.25	12	55	5(H9)	6	27.5	5(H9)	5.5	92	68

HRQ70~200



HRQ□–A(With internal shock absorber)

Type\Item	A(With adjustment bolt)	A(With internal shock absorber)	AC	AD	B	BA	BC	C	CA	CB	CD
70	206.8	244	170	17	92	88	84	75	53	22	36
100	225.7	263	189	17	102	99	95	86	59	27	42
200	279.5	316.5	240	24	120	117	113	106	74	32	57

Type\Item	E	EA(With adjustment bolt)	EA(With internal shock absorber)	EB	G	J	JA	JB	JC
70	M20×1.5	36.8	74	42	16	17.5	12	110	57
100	M20×1.5	36.7	74	50	19	17.5	12	130	66
200	M27×1.5	39.5	76.5	60	24	20	12.5	150	80

Type\Item	K	KA	KC	P	PA	PB	Q	QA	R	RA	S	SA	T	TA	U	UA
70	M12×1.75	18	10.5	1/8"	75	44.5	M5×0.8	25.5	46(H9)	5	88(h9)	12.5	90(h9)	9	22(H9)	3.5
100	M12×1.75	18	10.5	1/8"	85	50.5	M5×0.8	29.5	56(H9)	6	98(h9)	14.5	100(h9)	12	24(H9)	3.5
200	M16×2.0	25	14	1/8"	103	63	M5×0.8	36.5	64(H9)	9	116(h9)	16.5	118(h9)	15	32(H9)	5.5

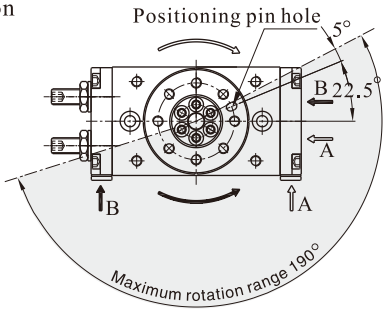
Type\Item	V	VA	W	WA	WB	X	XA	XB	Y	YA	YB	YC	Z	ZA
70	M8×1.25	10	M8×1.25	12.5	67	5(H9)	5.5	33.5	5(H9)	3.5	110	80	5(H9)	3.5
100	M8×1.25	10	M10×1.5	14.5	77	6(H9)	6.5	38.5	6(H9)	4.5	120	100	6(H9)	4.5
200	M12×1.75	13	M12×1.75	16.5	90	8(H9)	8.5	45	8(H9)	4.5	140	110	8(H9)	6.5

Installation and application

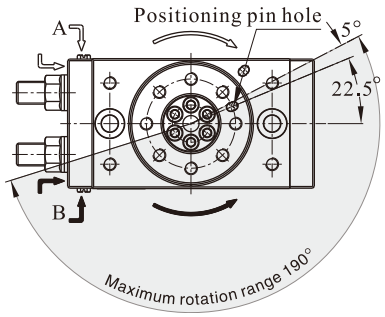
1. Rotation Direction and Rotation Angle

1.1) Rotation Direction

HRQ2/3/7



HRQ10~200



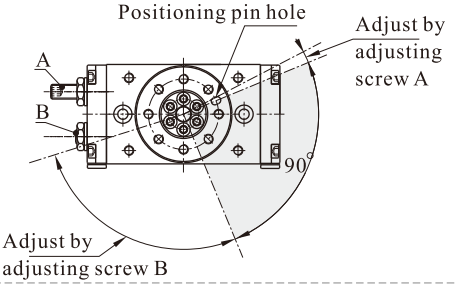
A) By adjusting the adjustment bolt, the rotation end can be set within the range shown in the up drawing: Maximum ratation is 190° ;

B) The rotary table turns in the clockwise direction when the A port is pressurized, and in the counter–clockwise direction when the B port is pressurized.

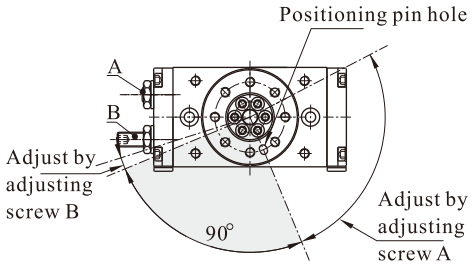
1.2) Rotation Range Example(90° Rotation)

HRQ2/3/7

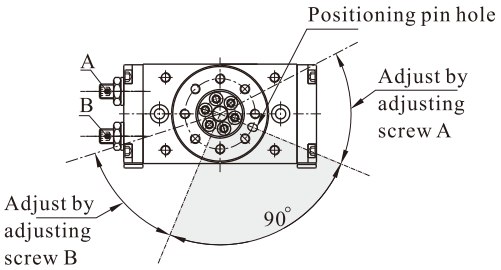
Adjustment amount by adjustment bolt B



Adjustment amount by adjustment bolt A

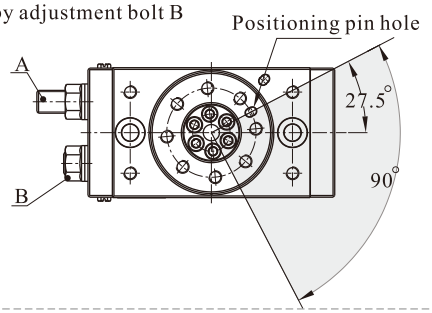


Adjustment amount by adjustment bolt A, B

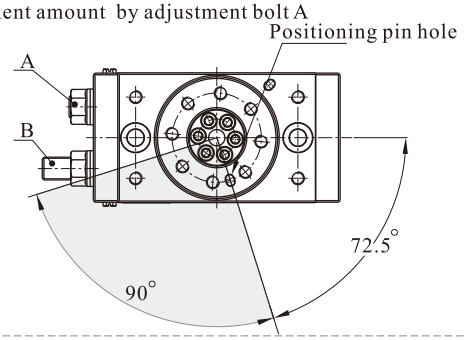


HRQ10~200

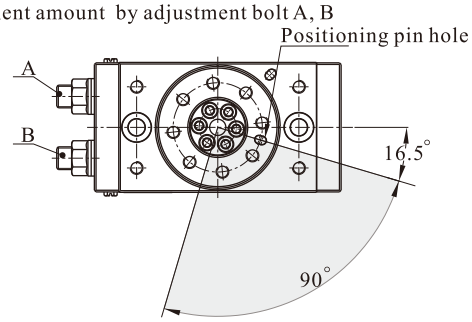
Adjustment amount by adjustment bolt B



Adjustment amount by adjustment bolt A



Adjustment amount by adjustment bolt A, B



Model	Adjustment angle per rotation of angle(adjustment screw)
HRQ2	11.5°
HRQ3	10.9°
HRQ7	10.2°

Model	Adjustment angle per rotation of angle(adjustment screw or shock absorber)
HRQ10	10.2°
HRQ20	6.5°
HRQ30	6.5°
HRQ50	8.2°
HRQ70	7.0°
HRQ100	6.1°
HRQ200	4.9°

1.3) The rotation angle can also be set on a type with internal absorber.

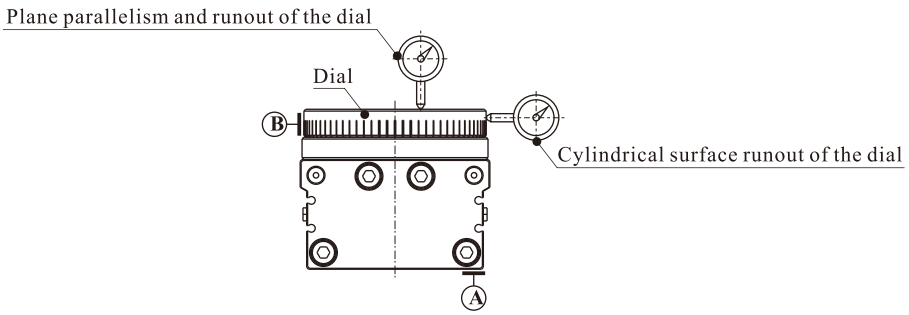
2. The range of rotation angle has been adjusted to the maximum in the factory, please do not enlarge the rotation angle any more.
3. The movement energy should not exceed the allowed maximum energy, or the inner parts will be damaged.
4. The rotary parts need no lubrication.
5. Series HRQ is equipped with a rubber bumper or shock absorber. Therefore, perform rotation adjustment in the pressurized condition(minimum operation pressure: 0.1 Mpa or more for adjustment bolt and internal shock absorber types, and 0.2 MPa or more for external shock absorber type.)
6. Refer to the table below for tightening torques of the shock absorber setting nut.

Shock absorber size	Max. tightening torque(Nm)
M10	3.5
M12	8.0
M14	11.0
M20	24.0
M27	63.0

7. Never loosen the bottom screw of the shock absorber. (It is not an adjustment screw.) That may cause oil leakage.
8. Shock absorbers are consumable parts.
When a decrease in energy absorption capacity is noticed, it must be replaced.

Rotary table cylinder	Shock absorber
HRQ10	ACA1006-A
HRQ20\HRQ30	ACA1215-A
HRQ50	ACA1416-A
HRQ70\HRQ100	ACA2020-A
HRQ200	ACA2725-A

9.Strictly control run out and parallelism of the dial according to the requirements of the following table.

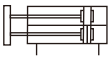


Items	Specific requirements	Relative datum
Plane parallelism of the dial	0.1	A
Plane runout of the dial	0.1	A
Cylindrical surface runout of the dial	0.1	B

Slide table cylinder(Cross roller type)

HLS、HLSL Series

Symbol



Specification

Bore size(mm)	6	8	12	16	20	25
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	1.2MPa(175psi)(12.0bar)					
Temperature ℃	-20~70					
Speed range mm/s	50~500					
Stroke tolerance	Stroke≤100 Stroke>100					
Cushion type	Bumper(Both ends)、Shock absorber					
Sensor switches	CMSH、DMSH(S)					
Port size【Note1】	M5×0.8				1/8"	

【Note1】PT thread, G thread, NPT thread are available.

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.

Criteria for selection: Cylinder thrust

Unit: Newton(N)

Bore size	Rod size	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

Slide table cylinder(Cross roller type)

HLS、HLSL Series

Ordering code

HLS 20 × 30 S AS □

① ② ③ ④ ⑤ ⑥

①Model

HLS: Slide table cylinder (Double acting type) (Cross roller type)

HLSL: Symmetrical slide table cylinder (Double acting type) (Cross roller type)

②Bore Size

6 8 12
16 20 25

③Stroke

Refer to stroke table for details

④Magnet

S: With magnet

⑤Adjuster option [Note1]

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)

⑥Thread type [Note2]

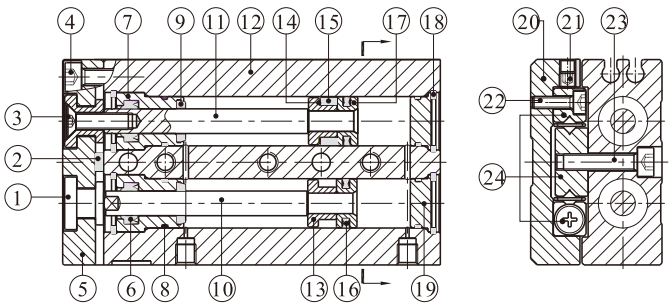
Blank: PT
G: G
T: NPT

[Note1] B type, BS type, BF type are unavailable for bore size of Φ6.

[Note2]When the thread is standard, the code is blank.

Inner structure and material of major parts

Basic type



NO.	Item	Material	NO.	Item	Material
1	Floating joint	Carbon steel	13	Magnet holder	Brass
2	Bumper	TPU	14	Magnet washer	NBR
3	Screw	Carbon steel	15	Magnet	Sintered metal(Neodymium-iron-boron)
4	Screw	Carbon steel	16	Piston seal	NBR
5	Fixing plate	Aluminum alloy	17	Piston	Brass
6	Rod seal	NBR	18	C clip	Spring steel
7	Front cover	Aluminum alloy	19	Back cover	Aluminum alloy
8	O-ring	NBR	20	Slide table	Aluminum alloy
9	Bumper	TPU	21	Nut	Carbon steel
10	Piston rod A	Carbon steel	22	Screw	Carbon steel
11	Piston rod B	Stainless steel	23	Screw	Carbon steel
12	Body	Aluminum alloy	24	Slide guidecombination	Subassembly

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 absorber)
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)

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

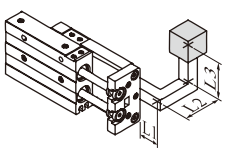
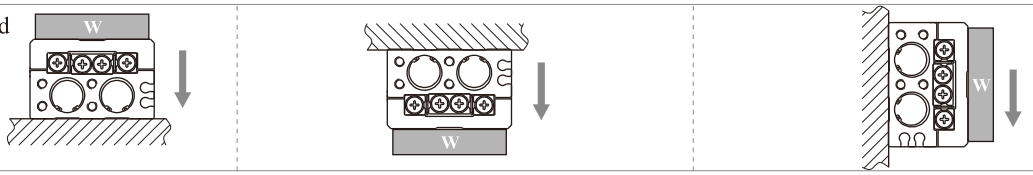


Fig. 1: Applied load



B) Kinetic energy check

1. Calculate kinetic energy of load E(J)	$E=\frac{1}{2}\times\frac{W}{g}\times(\frac{1.4\times Va}{1000})^2$	
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

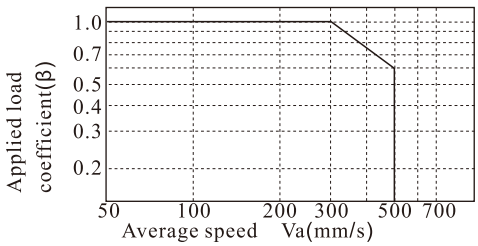
1. Calculate allowable applied load Wa (N)	$Wa = K \times \beta \times W_{max}$	K:Mounting work coefficient (**Fig 2**) W_{max}:Maximum allowable applied load(**Table 1**) β:Applied load coefficient (**Fig 3**)
2. Check that load(W) doesn't exceed allowable applied load(Wa): W≤Wa		

Fig 2: Mounting work coefficient (K)

Mounting work coefficient K=1

Mounting work coefficient K=0.6

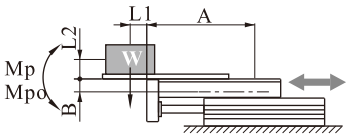
Fig 3: Applied load coefficient (β)



D) Moment check

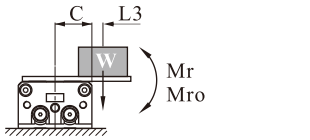
Horizontal

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



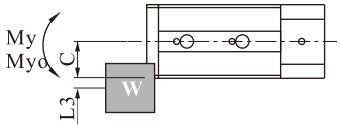
Dynamic moment:
$Mp=W\times(L1+A)/1000$

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



Dynamic moment:
$Mr=W\times(C+L3)/1000$

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



Dynamic moment:
$My=0$

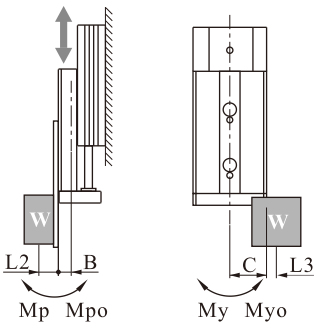
Static moment:
$Myo=(W\times a\times(C+L3))/1000g$

2. Check

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

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:
$My=W\times(C+L3)/1000$

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

2. Check

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

Explain:
L1/L2/L3: The distance of load center to mount plane (Determined by actuality).
A/B/C: 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).

Slide table cylinder(Cross roller type)

HLS、HLSL 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	
HLS6	0.01	0.01	–	4
HLS8	0.024	0.024	0.048	8
HLS12	0.05	0.05	0.1	15
HLS16	0.1	0.1	0.2	30
HLS20	0.13	0.13	0.26	40
HLS25	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	C
6	10	3.3	3.8	2.6	0.7	0.7	0.6	27	7.3	16
	20	3.3	3.8	2.6	0.7	0.8	0.6	42		
	30	3.3	3.8	2.6	0.7	0.8	0.6	52		
	40	7.2	7.9	3.6	1.3	1.3	0.6	72		
	50	12.4	12.7	4.7	1.8	1.8	0.6	87		
8	10	10.1	9.1	8.8	2.5	2.5	2.0	32	8.5	20
	20	10.1	9.1	8.8	2.6	2.6	2.0	42		
	30	10.1	9.1	8.8	2.8	2.8	2.0	57		
	40	12.4	10.8	10.1	3.4	3.4	2.3	72		
	50	23.6	24.8	13.9	4.4	4.4	2.1	92		
	75	32.8	35.3	16.4	4.6	4.6	1.8	132		
12	10	33.0	34.3	30.9	7.3	7.3	5.8	48	10	25
	20	33.0	34.3	30.9	7.6	7.6	5.8	58		
	30	33.0	34.3	30.9	7.8	7.8	5.8	68		
	40	33.0	34.3	30.9	8.0	8.0	5.8	78		
	50	53.4	49.6	39.7	9.8	9.8	5.8	88		
	75	78.8	71.9	48.6	14.2	14.2	6.8	125		
	100	78.8	71.9	48.6	14.7	14.7	6.8	160		
16	10	33.0	34.3	30.9	8.8	8.8	7.6	43	11	30
	20	33.0	34.3	30.9	9.2	9.2	7.6	53		
	30	33.0	34.3	30.9	9.5	9.5	7.6	63		
	40	33.0	34.3	30.9	10.0	10.0	7.6	78		
	50	53.4	49.6	39.7	12.2	12.2	7.6	93		
	75	78.8	71.9	48.6	17.6	17.6	8.9	130		
	100	78.8	71.9	48.6	18.2	18.2	8.9	165		
	125	143.7	144.5	53.3	24.8	24.8	7.8	204		
20	10	60.1	50.5	72.8	14.5	14.5	15.2	47	16.5	35
	20	60.1	50.5	72.8	15.2	15.2	15.2	57		
	30	60.1	50.5	72.8	15.7	15.7	15.2	67		
	40	60.1	50.5	72.8	16.3	16.3	15.2	82		
	50	60.1	50.5	72.8	16.6	16.6	15.2	92		
	75	169.3	154.3	114.4	41.2	41.2	22.0	136		
	100	169.3	154.3	114.4	42.8	42.8	22.0	176		
	125	169.3	154.3	114.4	43.6	43.6	22.0	205		
	150	267.5	286.6	145.6	49.0	49.0	20.5	249		
25	10	60.1	50.5	72.8	16.3	16.3	17.6	52	20.3	42
	20	60.1	50.5	72.8	17.0	17.0	17.6	62		
	30	60.1	50.5	72.8	17.4	17.4	17.6	72		
	40	60.1	50.5	72.8	17.8	17.8	17.6	82		
	50	60.1	50.5	72.8	18.2	18.2	17.6	96		
	75	169.3	154.3	114.4	45.2	45.2	25.3	141		
	100	169.3	154.3	114.4	46.2	46.2	25.3	165		
	125	169.3	154.3	114.4	48.0	48.0	25.3	210		
	150	267.5	286.6	145.6	65.0	65.0	28.3	254		

Note: Symbol and unit

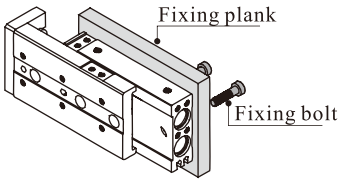
Symbol	Item	Unit
A, B, C	Correction value for center position distance of moment	mm
a	Acceleration of inertia	–
E	Kinetic energy	J
Ea	Allowable kinetic energy	J
Emax	Maximum allowable kinetic energy	J
g	Acceleration of gravity g=9.81	m/s^2
K	Mounting work coefficient	–
L1, L2, L3	Overhang	mm
Mp, My,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

Installation and application

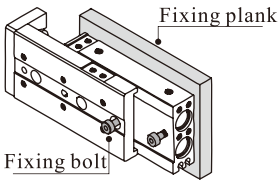
1. How to mount cylinder:

1.1) Cylinder can to be mounted from 3 directions

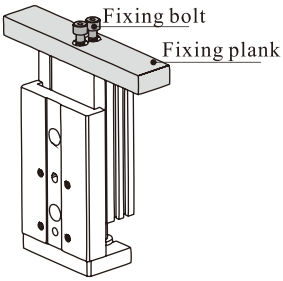
Vertical Mounting(Body thread holes)



Vertical Mounting(Body through holes)

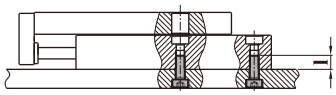


Axial Mounting (Body thread holes)



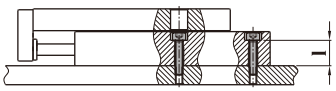
1.2) When mounting an compact slide cylinder, screws of appropriate length should be used and tightened properly within the maximum tightening torque. If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding of falling off from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

Vertical Mounting(Body thread holes)



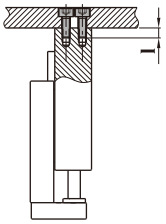
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLS6	M4×0.7	2.1	8
HLS8	M4×0.7	2.1	8
HLS12	M5×0.8	4.4	10
HLS16	M6×1.0	4.4	10
HLS20	M6×1.0	7.4	12
HLS25	M8×1.25	18.0	16

Vertical Mounting(Body through holes)



Model	Bolt used	Max. tightening torque (Nm)	Body depth(mm)
HLS6	M3×0.5	1.2	11.0
HLS8	M3×0.5	1.2	12.5
HLS12	M4×0.7	2.8	18.0
HLS16	M5×0.8	5.7	25.0
HLS20	M5×0.8	5.7	28.0
HLS25	M6×1.0	10.0	36.2

Axial Mounting(Body thread holes)

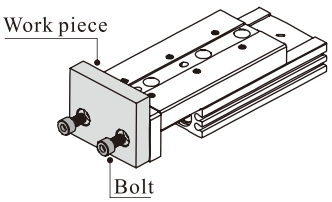


Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLS6	M2.5×0.45	0.5	3.5
HLS8	M3×0.5	0.9	4.0
HLS12	M4×0.7	2.1	6.0
HLS16	M5×0.8	4.4	7.0
HLS20	M5×0.8	4.4	8.0
HLS25	M6×1.0	7.4	10.0

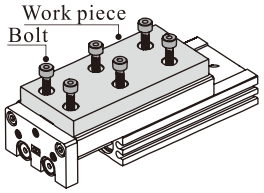
2. Work Piece Mounting:

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

Front Mounting

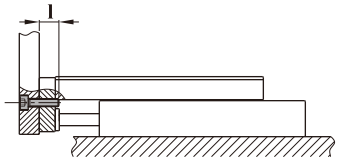


Top Mounting



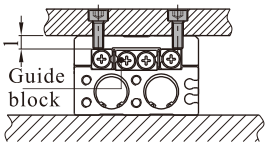
2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use blots at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

Front Mounting



Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLS6	M3×0.4	0.9	5
HLS8	M4×0.7	2.1	6
HLS12	M5×0.8	4.4	8
HLS16	M6×1.0	7.4	10
HLS20	M6×1.0	7.4	13
HLS25	M8×1.25	18.0	15

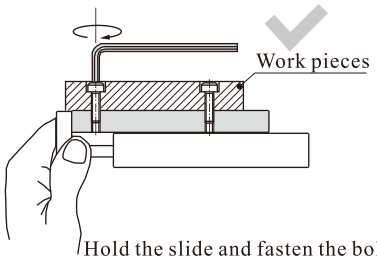
Top Mounting



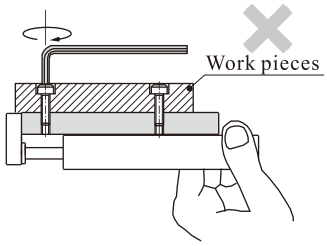
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLS6	M3×0.5	0.9	4.0
HLS8	M3×0.5	0.9	5.0
HLS12	M4×0.7	2.1	5.5
HLS16	M5×0.8	4.4	6.0
HLS20	M5×0.8	4.4	10.0
HLS25	M6×1.0	7.4	13.0

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.



Hold the slide and fasten the bolt



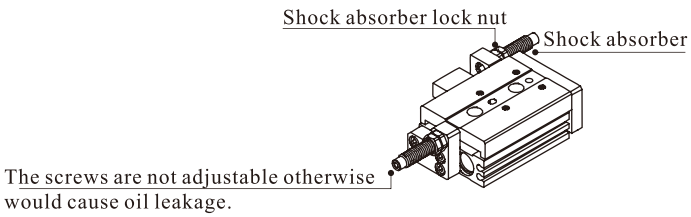
Hold the body and fasten the bolt

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.

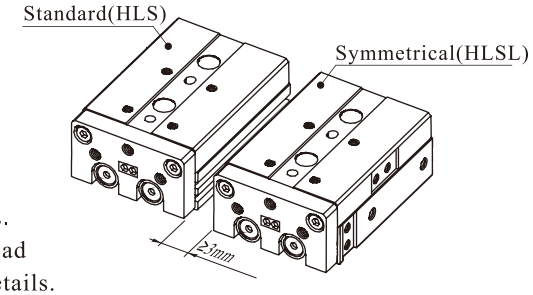


Model	Shock absorber	Tightening torque
HLS6	Without shock absorber	
HLS8	ACA0806-1N	1.67(Nm)
HLS12	ACA0806-1N	1.67(Nm)
HLS16	ACA1007-1N	3.14(Nm)
HLS20	ACA1210-1N	3.14(Nm)
HLS25	ACA1412-1N	10.8(Nm)

4. How to mount sensor switch:

4.1) HLS 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.

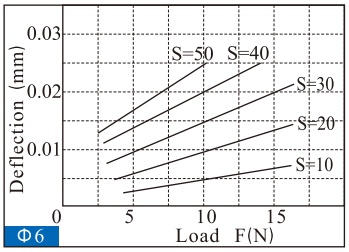


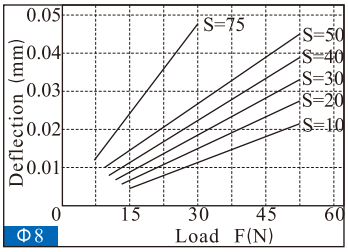
5. Make sure to connect the compact cylinder to speed controller at the meter-out side, and the speed of compact cylinder must below 500mm/s.

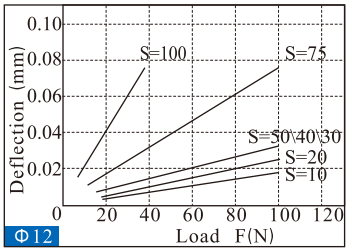
6. Don't apply a load beyond the range of the operation limits. Different load or torque will cause different deflection to table, please see below for details.

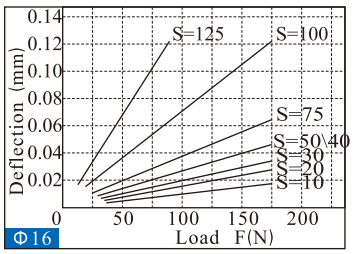
6.1) Table deflection due to pitch moment:

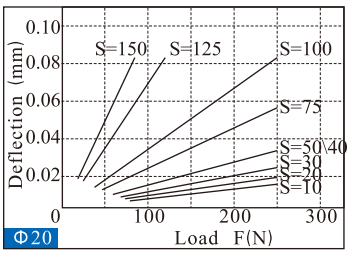
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

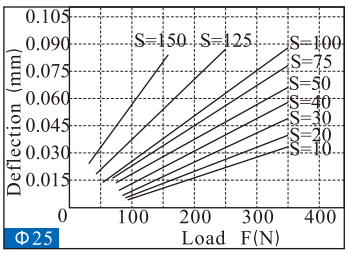






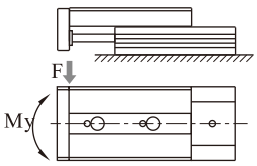


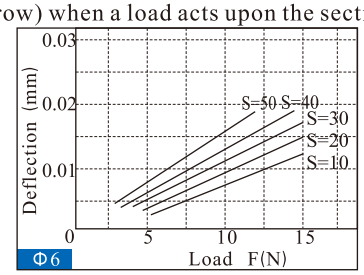


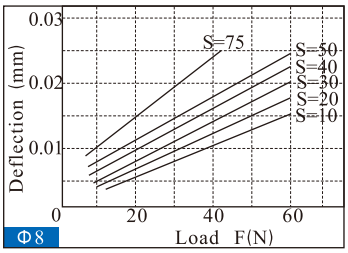


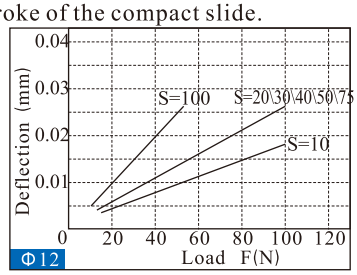
6.2) Table deflection due to yaw moment:

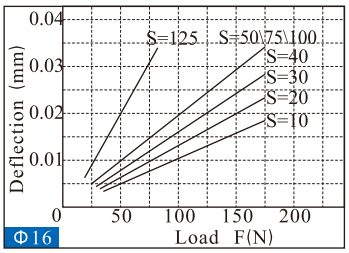
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

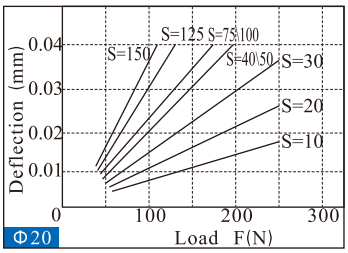


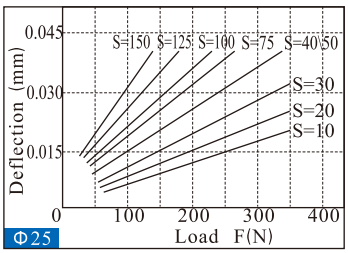






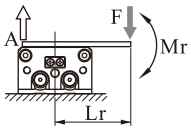


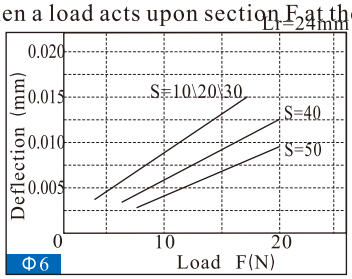


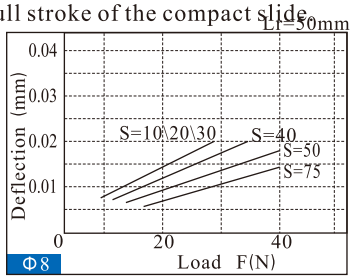


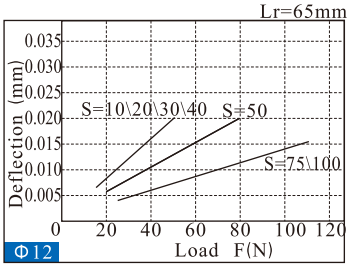
6.3) Table deflection due to roll moment:

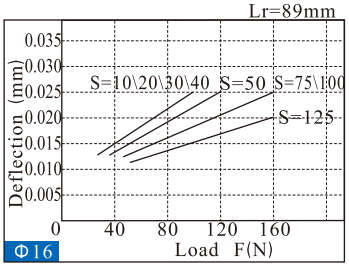
Table deflects (A) when a load acts upon section F at the full stroke of the compact slide.

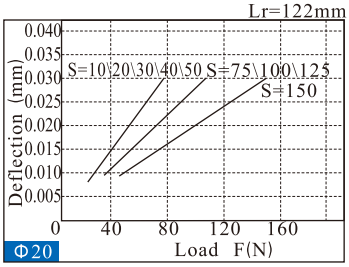


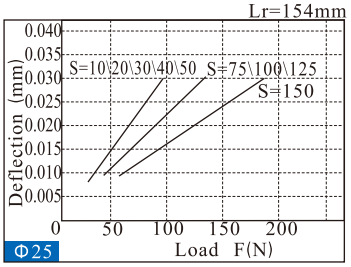






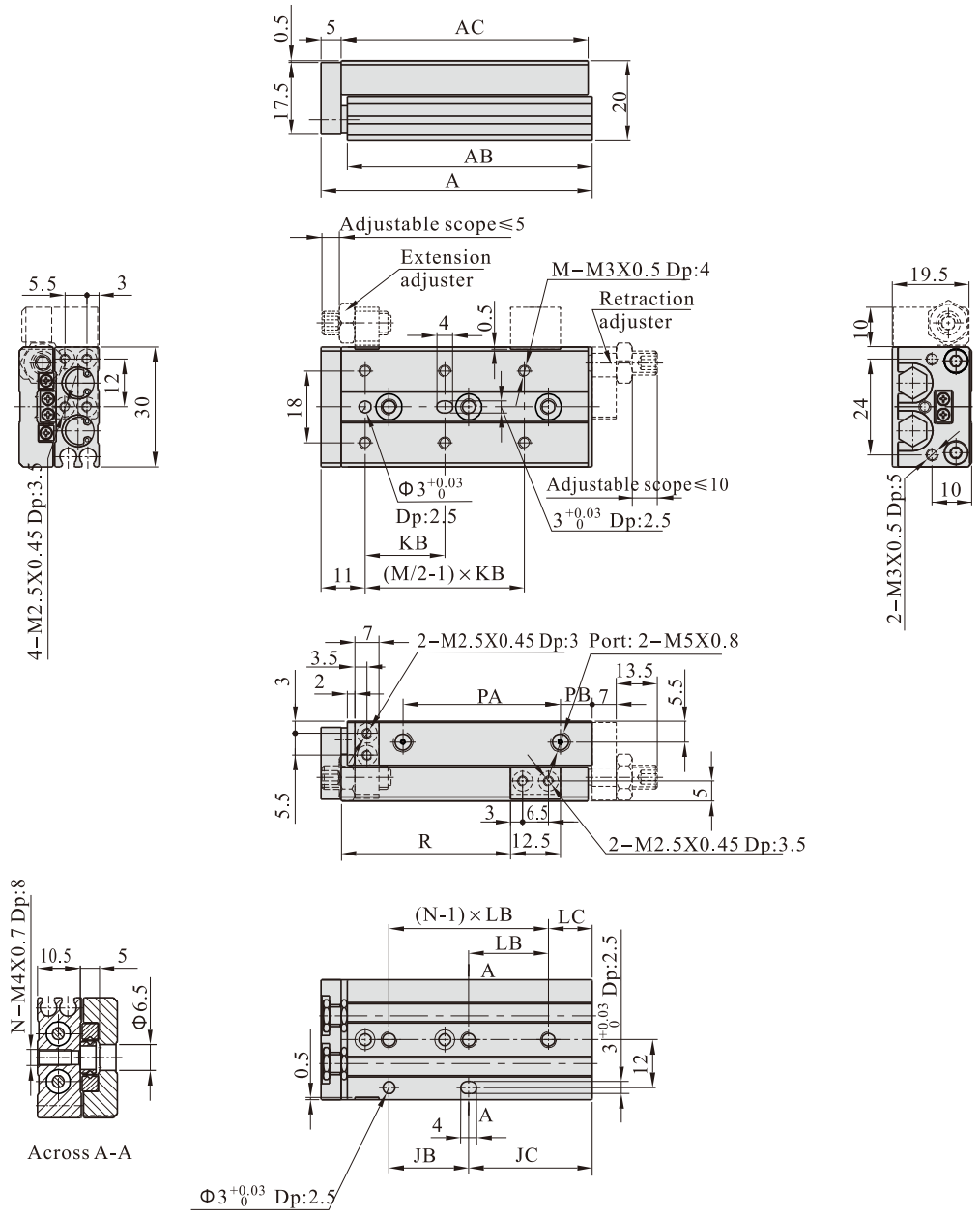






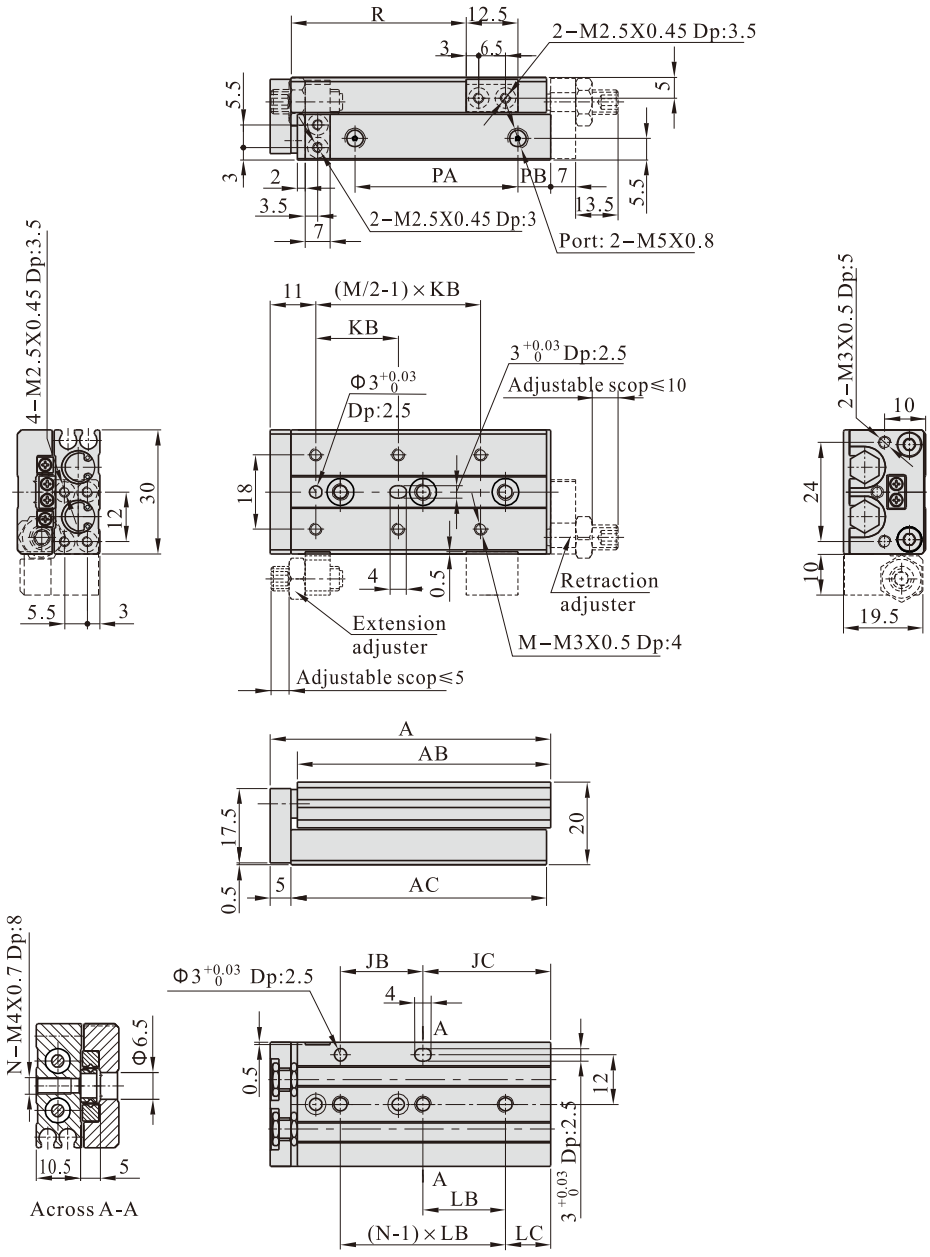
Dimensions

HLS6



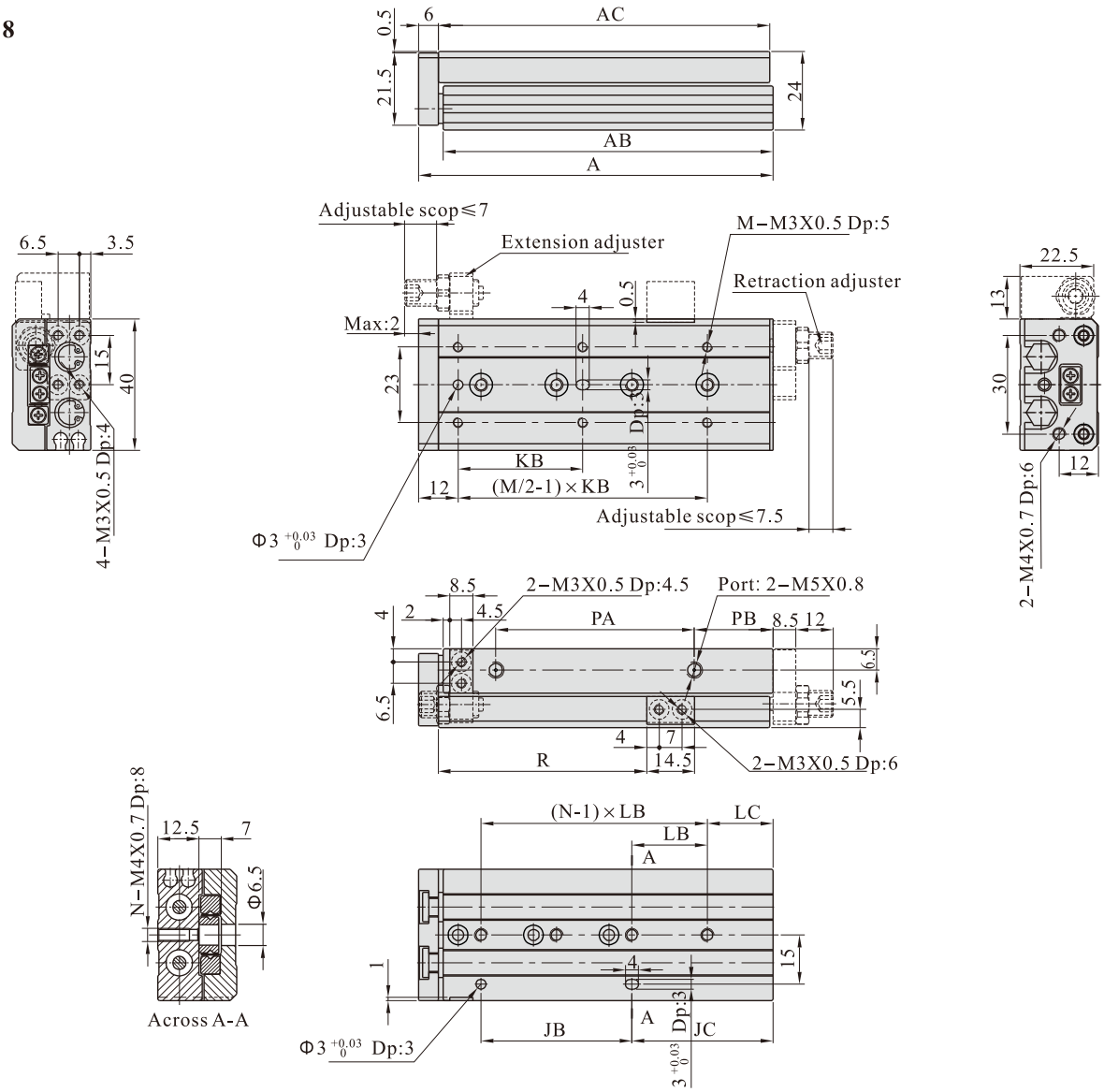
Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	48	41.5	42	20	11	20	25	6	4	2	19	8	21.5
20	58	51.5	52	20	21	30	35	6	4	2	28	9	31.5
30	68	61.5	62	20	31	20	20	11	6	3	39	8	41.5
40	90	83.5	84	30	43	28	30	13	6	3	51	18	51.5
50	106	99.5	100	48	41	38	24	17	6	4	61	24	61.5

HLSL6



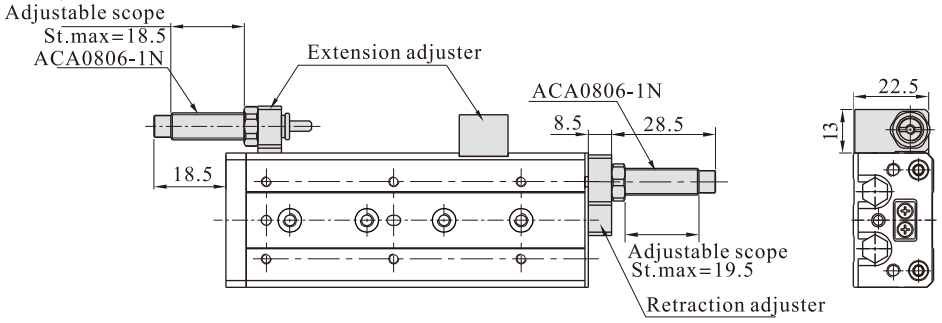
Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	48	41.5	42	20	11	20	25	6	4	2	19	8	21.5
20	58	51.5	52	20	21	30	35	6	4	2	28	9	31.5
30	68	61.5	62	20	31	20	20	11	6	3	39	8	41.5
40	90	83.5	84	30	43	28	30	13	6	3	51	18	51.5
50	106	99.5	100	48	41	38	24	17	6	4	61	24	61.5

HLS8



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	56	48.5	49	20	17	25	28	9	4	2	19.5	12.5	23.5
20	61	53.5	54	30	12	25	30	12	4	2	30	7	33.5
30	72	64.5	65	20	33	40	20	13	4	3	41	7	43.5
40	90	82.5	83	28	43	50	28	15	4	3	56	10	53.5
50	108	100.5	101	46	43	38	23	20	6	4	68	16	63.5
75	158	150.5	151	56	83	50	28	27	6	5	94	40	88.5

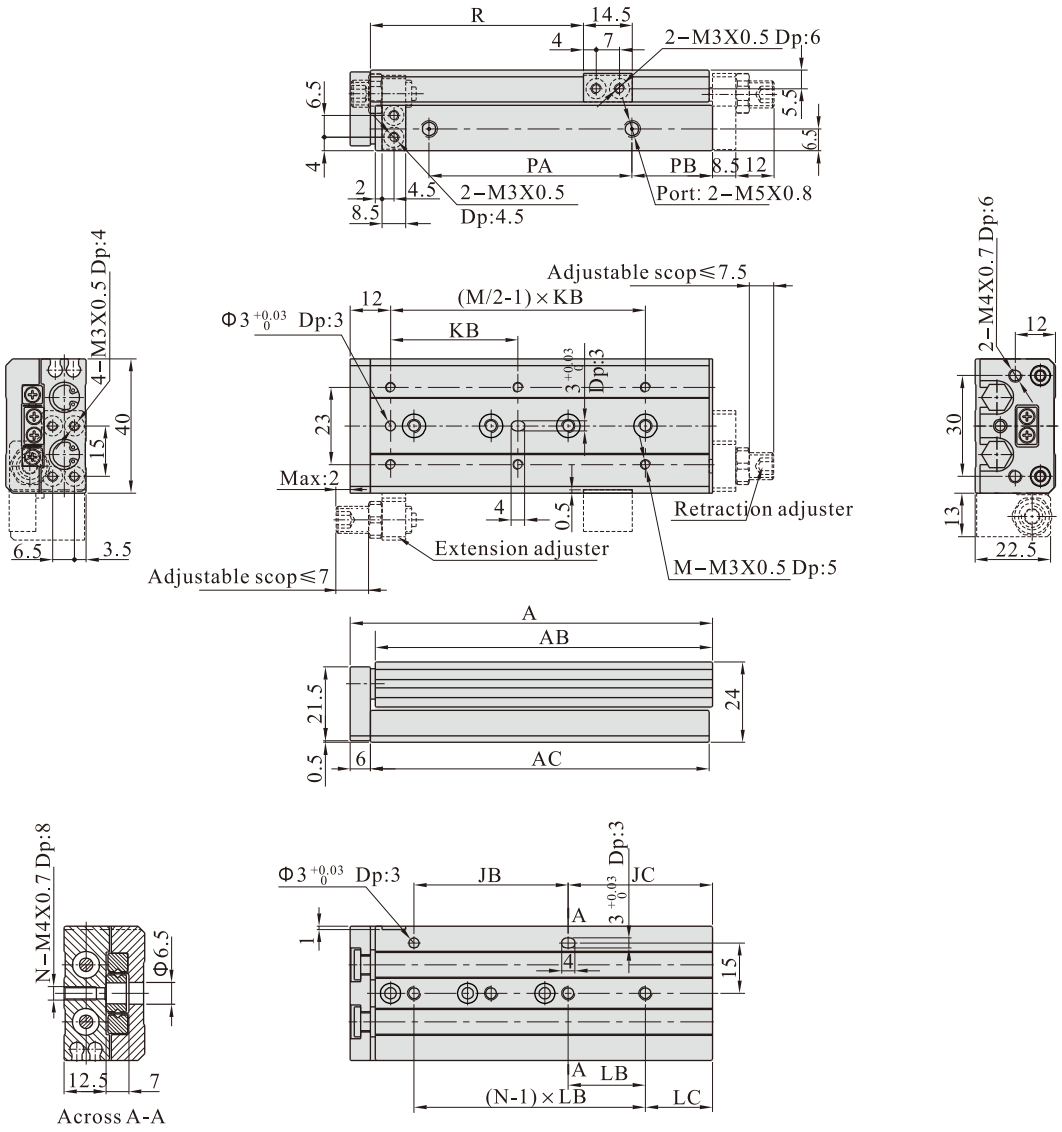
HLS8(With shock absorber)



Slide table cylinder(Cross roller type)

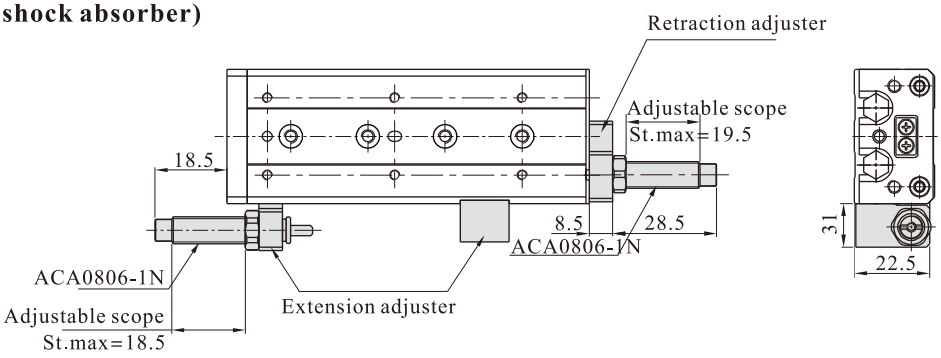
HLS、HLSL Series

HLSL8



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	56	48.5	49	20	17	25	28	9	4	2	19.5	12.5	23.5
20	61	53.5	54	30	12	25	30	12	4	2	30	7	33.5
30	72	64.5	65	20	33	40	20	13	4	3	41	7	43.5
40	90	82.5	83	28	43	50	28	15	4	3	56	10	53.5
50	108	100.5	101	46	43	38	23	20	6	4	68	16	63.5
75	158	150.5	151	56	83	50	28	27	6	5	94	40	88.5

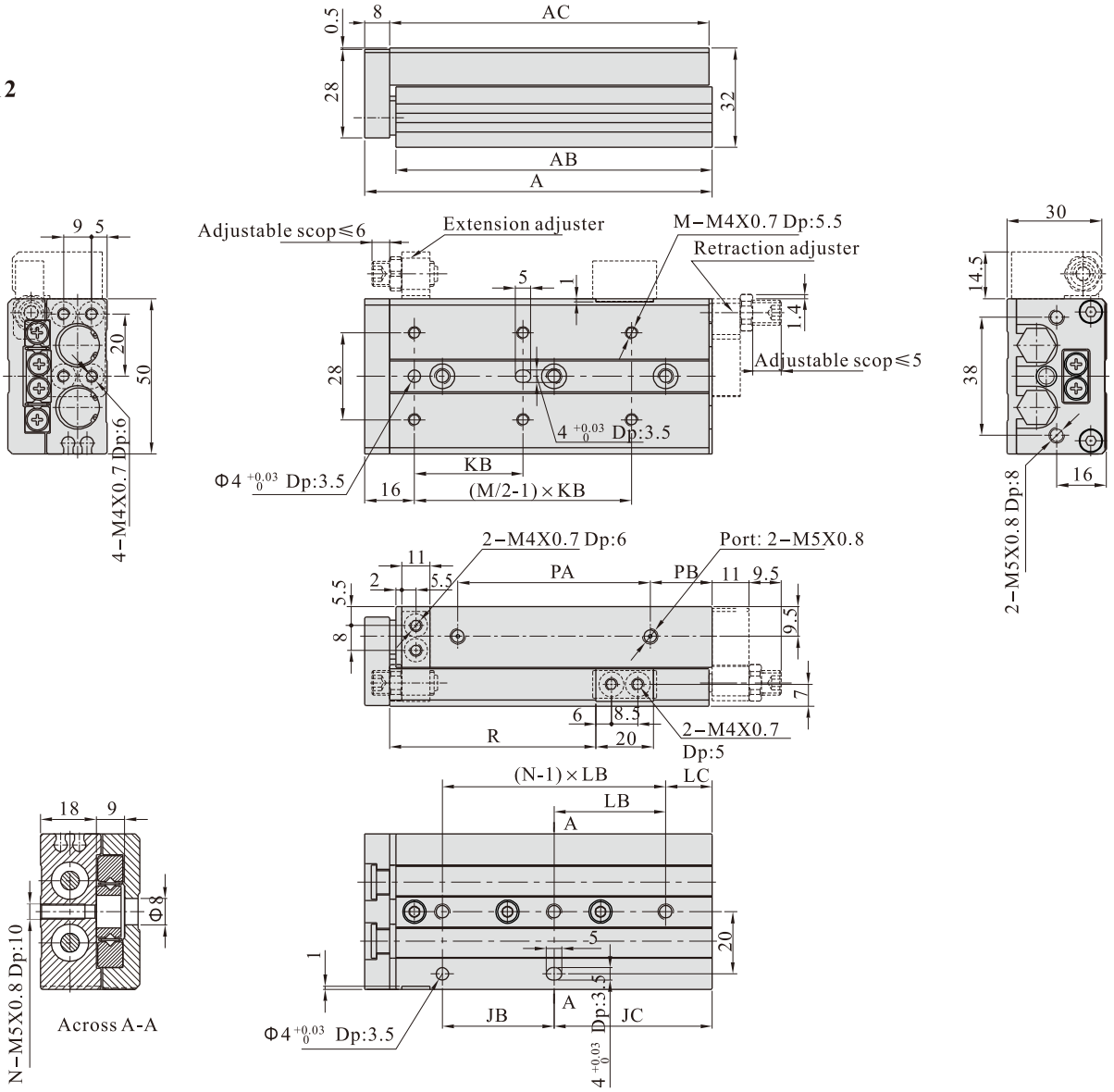
HLSL8(With shock absorber)



Slide table cylinder(Cross roller type)

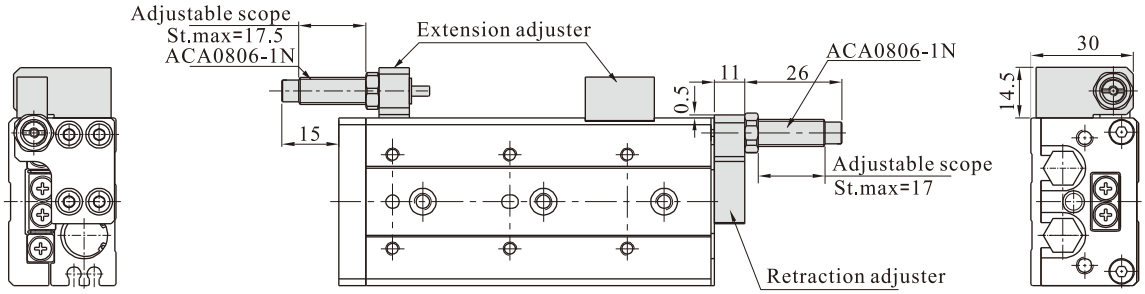
HLS、HLSL Series

HLS12



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	80	70	71	40	15	35	40	15	4	2	39.5	10	25
20	80	70	71	40	15	35	40	15	4	2	39.5	10	35
30	80	70	71	40	15	35	40	15	4	2	39.5	10	45
40	92	82	83	25	42	50	25	17	4	3	51.5	10	55
50	112	102	103	36	51	35	36	15	6	3	61.5	20	65
75	158	148	149	72	61	55	36	25	6	4	87.5	40	90
100	212	202	203	76	111	65	38	35	6	5	131.5	50	115

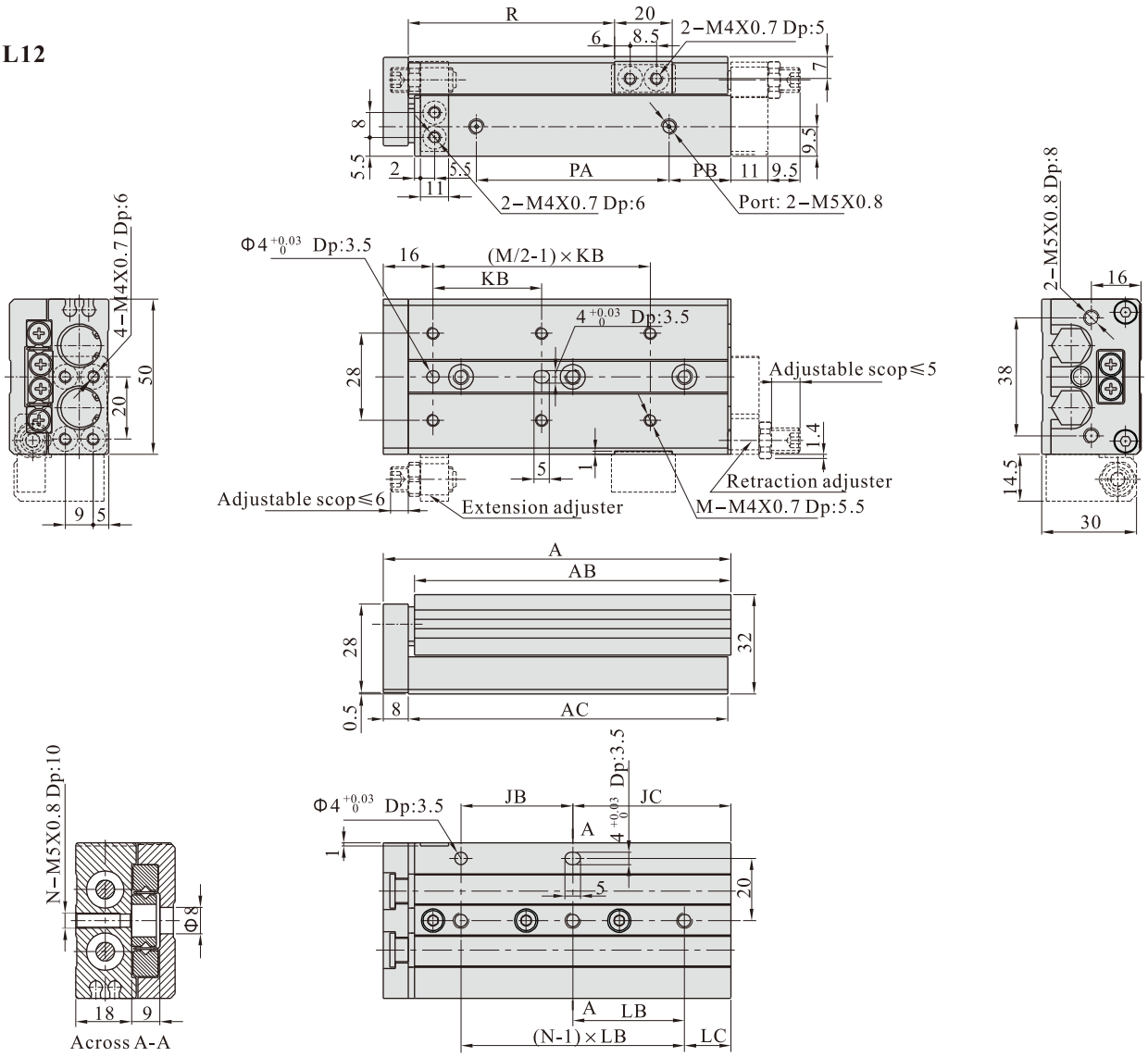
HLS12(With shock absorber)



Slide table cylinder(Cross roller type)

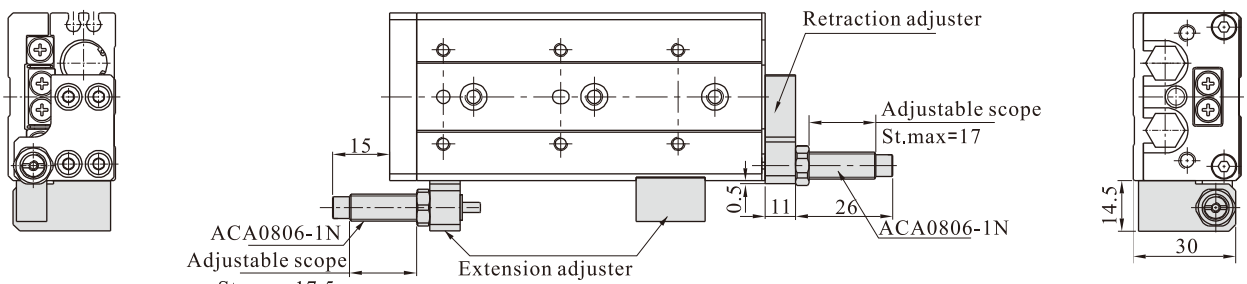
HLS、HLSL Series

HLSL12



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	80	70	71	40	15	35	40	15	4	2	39.5	10	25
20	80	70	71	40	15	35	40	15	4	2	39.5	10	35
30	80	70	71	40	15	35	40	15	4	2	39.5	10	45
40	92	82	83	25	42	50	25	17	4	3	51.5	10	55
50	112	102	103	36	51	35	36	15	6	3	61.5	20	65
75	158	148	149	72	61	55	36	25	6	4	87.5	40	90
100	212	202	203	76	111	65	38	35	6	5	131.5	50	115

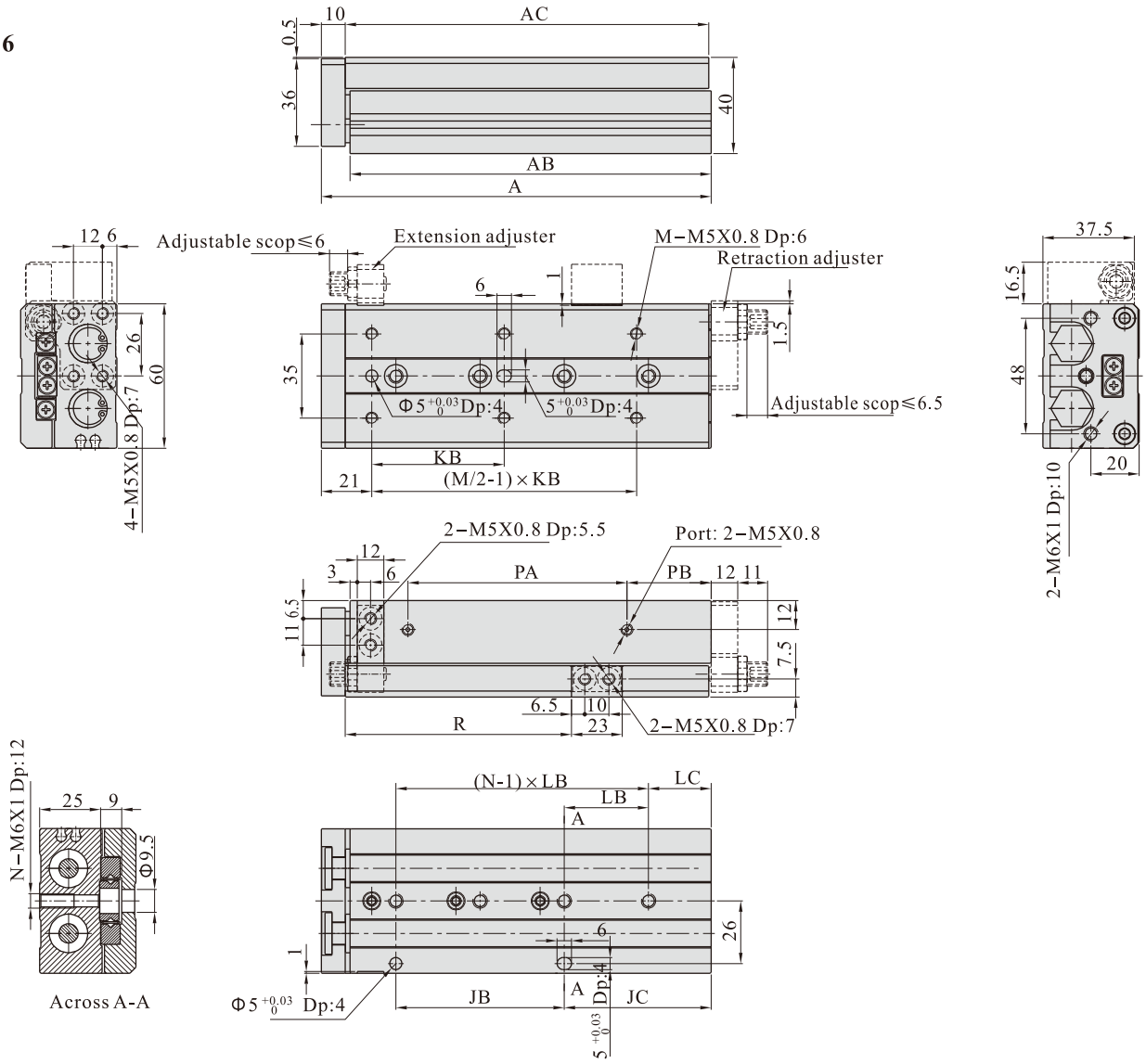
HLSL12(With shock absorber)



Slide table cylinder(Cross roller type)

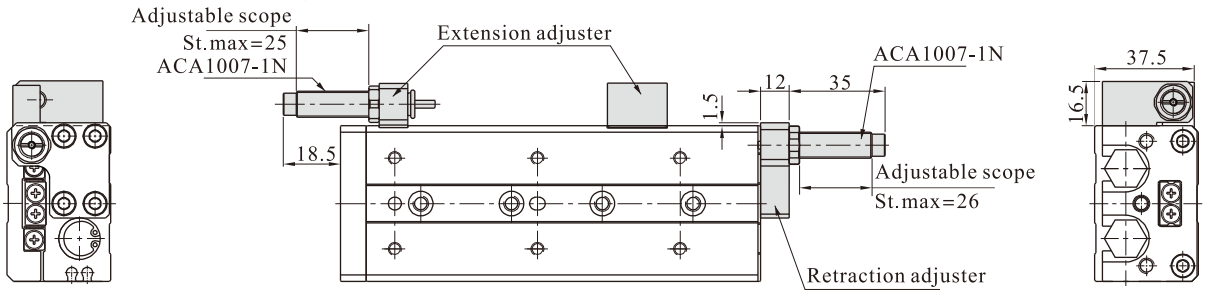
HLS、HLSL Series

HLS16



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	87	75	76	40	16	35	40	16	4	2	42.5	8	28.5
20	87	75	76	40	16	35	40	16	4	2	42.5	8	38.5
30	87	75	76	40	16	35	40	16	4	2	42.5	8	48.5
40	97	85	86	50	16	40	50	16	4	2	52.5	8	58.5
50	112	100	101	30	51	30	30	21	6	3	63.5	12	68.5
75	162	150	151	70	61	55	35	26	6	4	90.5	35	93.5
100	210	198	199	70	109	65	35	39	6	5	118.5	55	118.8
125	260	248	249	70	159	70	35	19	8	7	153.5	70	143.5

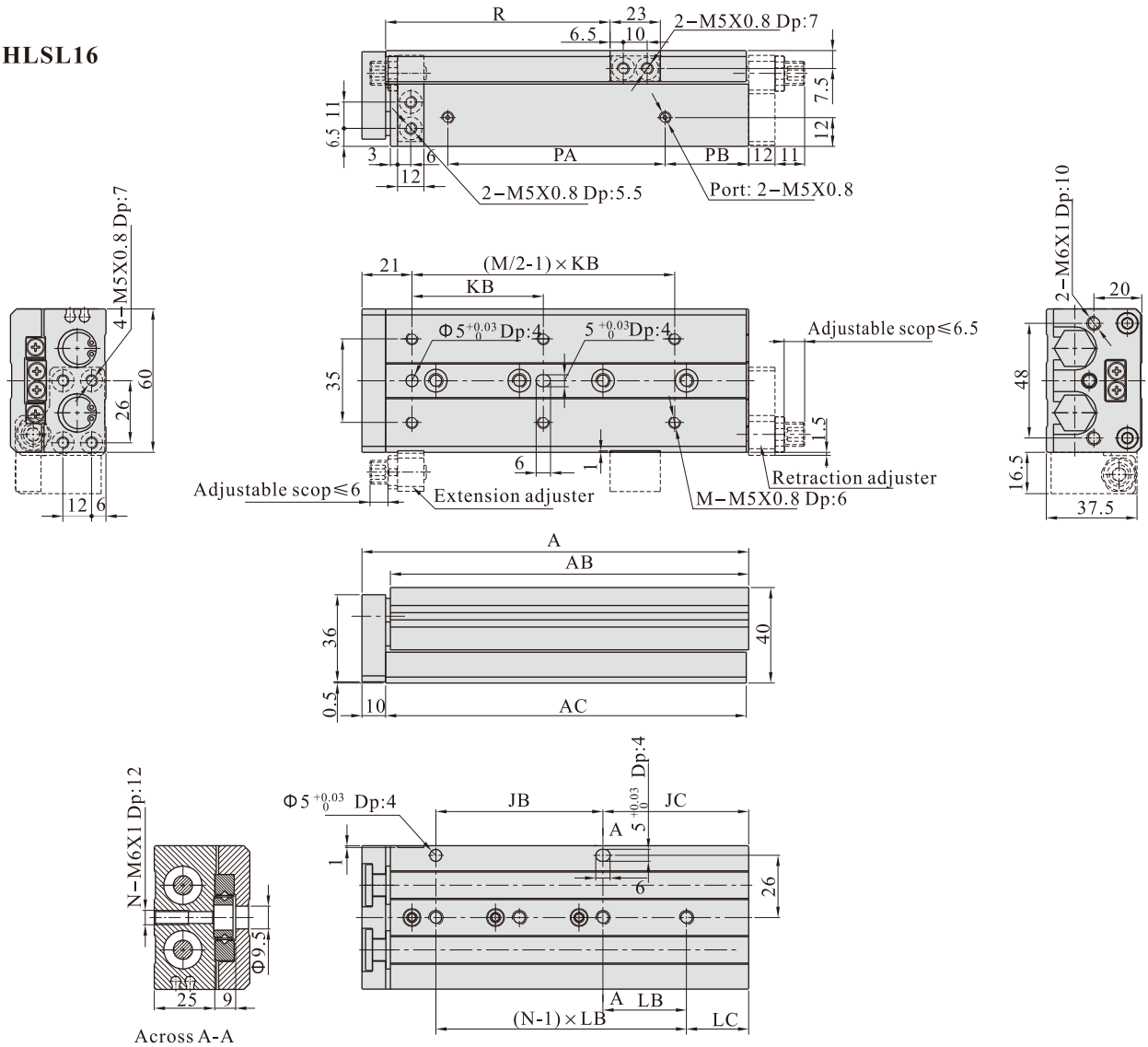
HLS16(With shock absorber)



Slide table cylinder(Cross roller type)

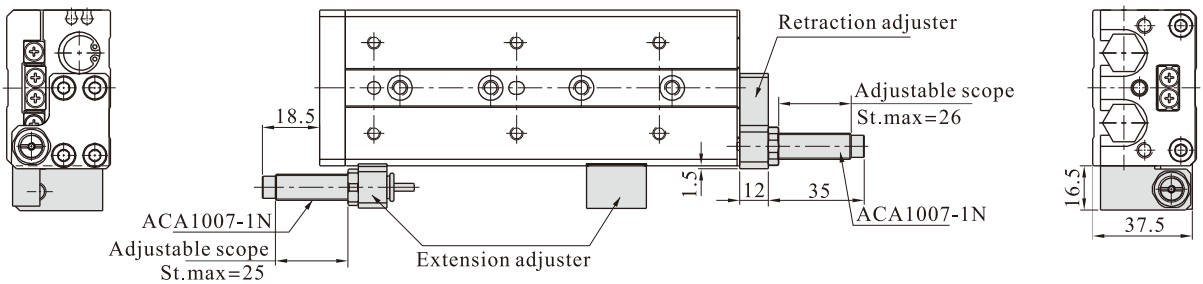
HLS、HLSL Series

HLSL16



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	87	75	76	40	16	35	40	16	4	2	42.5	8	28.5
20	87	75	76	40	16	35	40	16	4	2	42.5	8	38.5
30	87	75	76	40	16	35	40	16	4	2	42.5	8	48.5
40	97	85	86	50	16	40	50	16	4	2	52.5	8	58.5
50	112	100	101	30	51	30	30	21	6	3	63.5	12	68.5
75	162	150	151	70	61	55	35	26	6	4	90.5	35	93.5
100	210	198	199	70	109	65	35	39	6	5	118.5	55	118.8
125	260	248	249	70	159	70	35	19	8	7	153.5	70	143.5

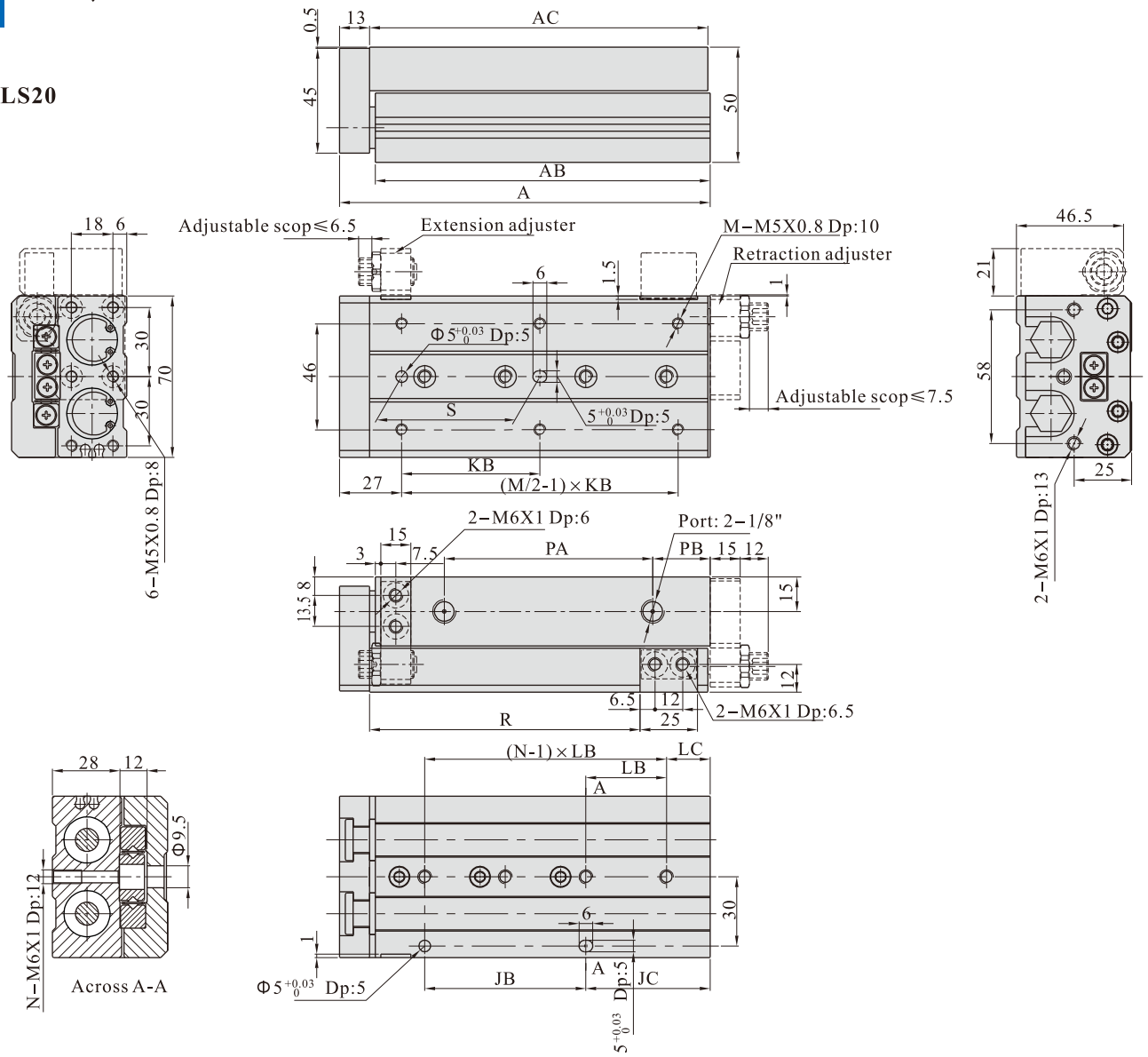
HLSL16(With shock absorber)



Slide table cylinder(Cross roller type)

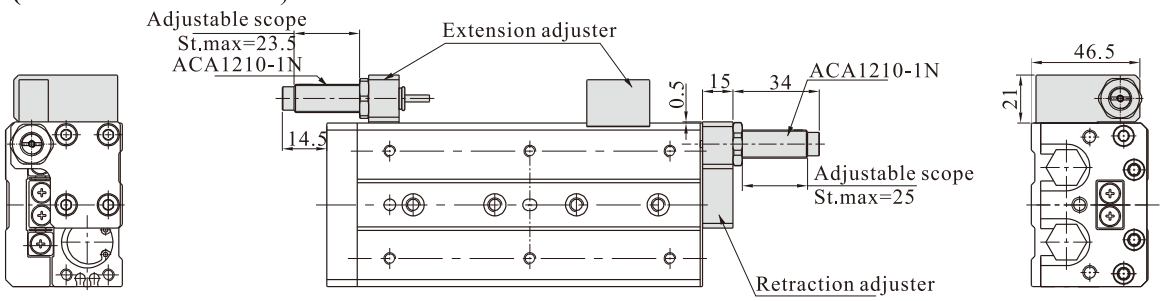
HLS、HLSL Series

HLS20



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	S	PA	PB	R
10	97	81.5	83	35	25	50	45	15	4	2	40	43.5	10	32.5
20	97	81.5	83	35	25	50	45	15	4	2	40	43.5	10	42.5
30	97	81.5	83	35	25	50	45	15	4	2	40	43.5	10	52.5
40	107	91.5	93	35	35	60	55	15	4	2	50	53.5	10	62.5
50	122	106.5	108	35	50	35	35	15	6	3	35	68.5	10	72.5
75	161	145.5	147	70	54	60	35	19	6	4	60	107.5	10	97.5
100	214	198.5	200	70	107	70	35	37	6	5	70	115.5	55	122.5
125	268	252.5	254	76	155	70	38	41	8	6	70	154.5	70	147.5
150	320	304.5	306	88	195	80	44	19	8	7	80	186.5	90	172.5

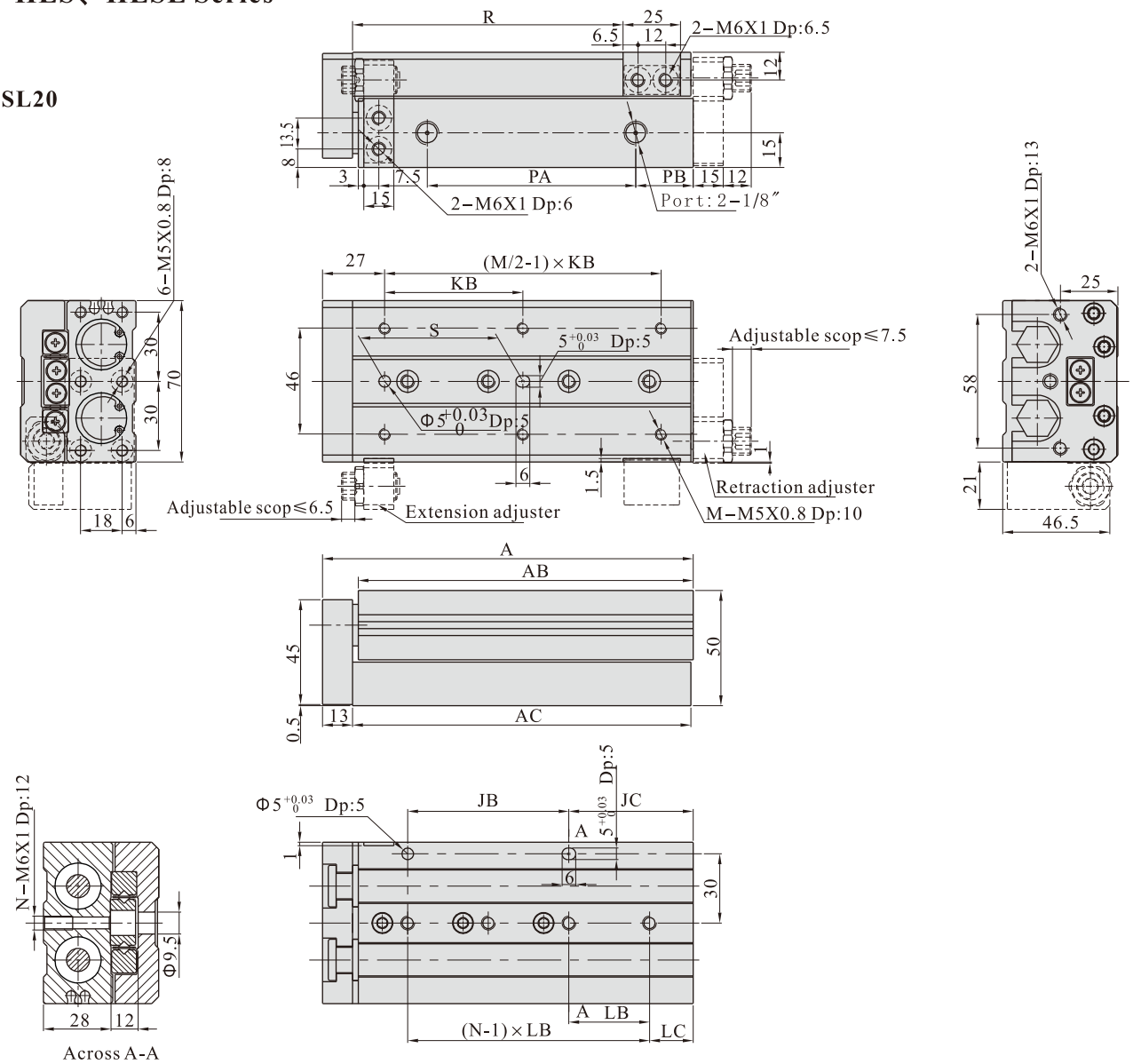
HLS20(With shock absorber)



Slide table cylinder(Cross roller type)

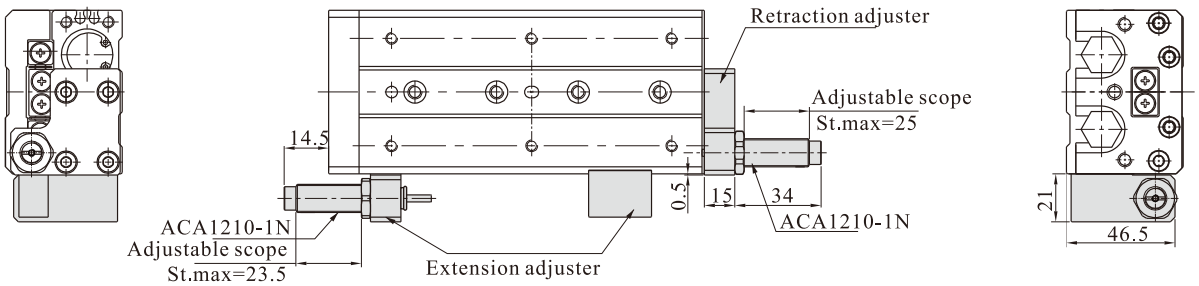
HLS、HLSL Series

HLSL20



	A	AB	AC	JB	JC	KB	LB	LC	M	N	S	PA	PB	R
10	97	81.5	83	35	25	50	45	15	4	2	40	43.5	10	32.5
20	97	81.5	83	35	25	50	45	15	4	2	40	43.5	10	42.5
30	97	81.5	83	35	25	50	45	15	4	2	40	43.5	10	52.5
40	107	91.5	93	35	35	60	55	15	4	2	50	53.5	10	62.5
50	122	106.5	108	35	50	35	35	15	6	3	35	68.5	10	72.5
75	161	145.5	147	70	54	60	35	19	6	4	60	107.5	10	97.5
100	214	198.5	200	70	107	70	35	37	6	5	70	115.5	55	122.5
125	268	252.5	254	76	155	70	38	41	8	6	70	154.5	70	147.5
150	320	304.5	306	88	195	80	44	19	8	7	80	186.5	90	172.5

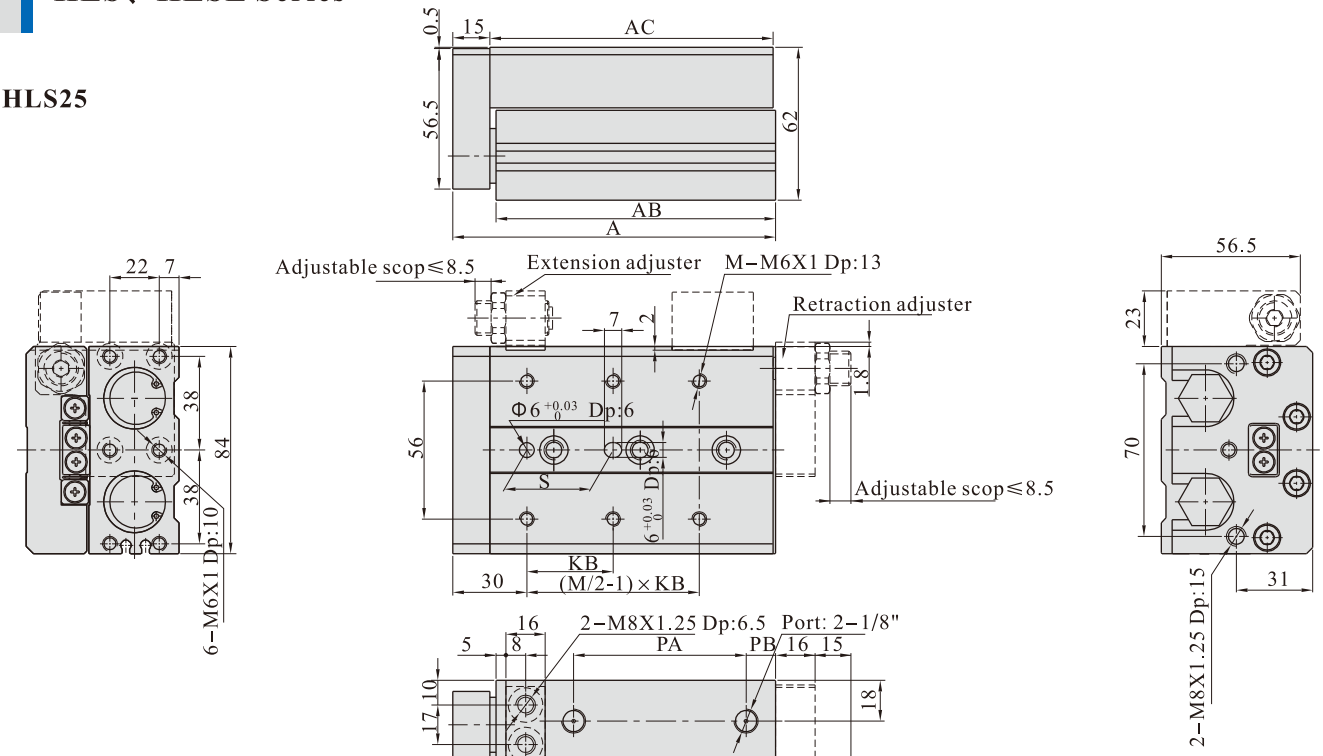
HLSL20(With shock absorber)



Slide table cylinder(Cross roller type)

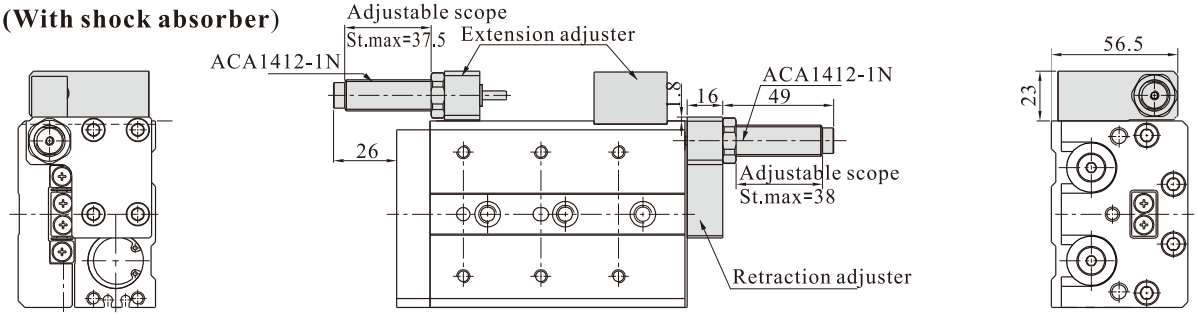
HLS、HLSL Series

HLS25



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	S	PA	PB	R
10	108	90.5	92	45	22	50	45	22	4	2	40	47	12	35
20	108	90.5	92	45	22	50	45	22	4	2	40	47	12	45
30	108	90.5	92	45	22	50	45	22	4	2	40	47	12	55
40	118	100.5	102	55	22	60	55	22	4	2	50	57	12	65
50	131	113.5	115	35	55	35	35	20	6	3	35	70	12	75
75	172	154.5	156	70	61	60	35	26	6	4	60	90	33	100
100	213	195.5	197	70	102	70	35	32	6	5	70	119	45	125
125	271	253.5	255	76	154	75	38	40	8	6	75	155	67	150
150	311	293.5	295	80	190	80	40	30	8	7	80	180	82	175

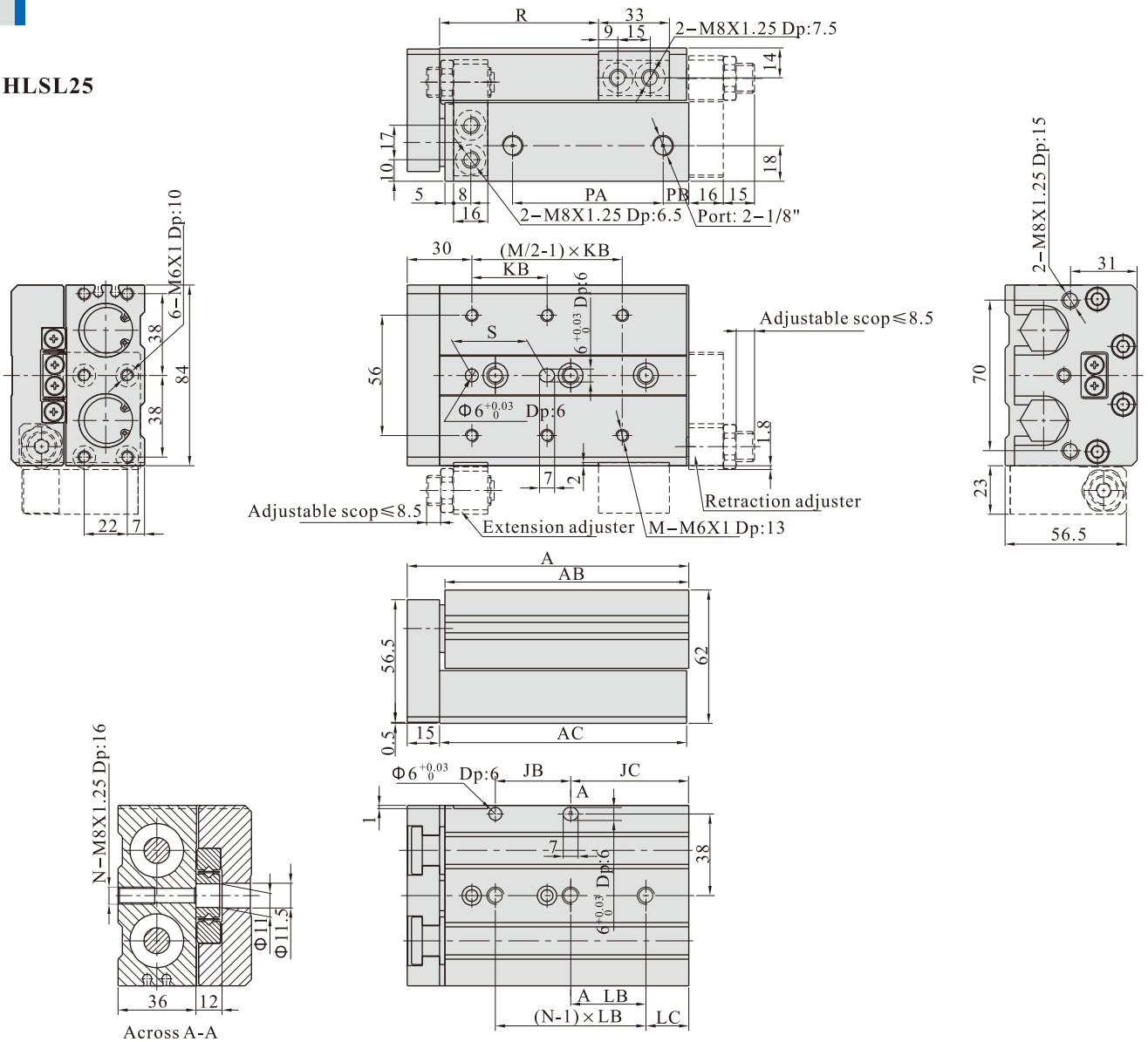
HLS25(With shock absorber)



Slide table cylinder(Cross roller type)

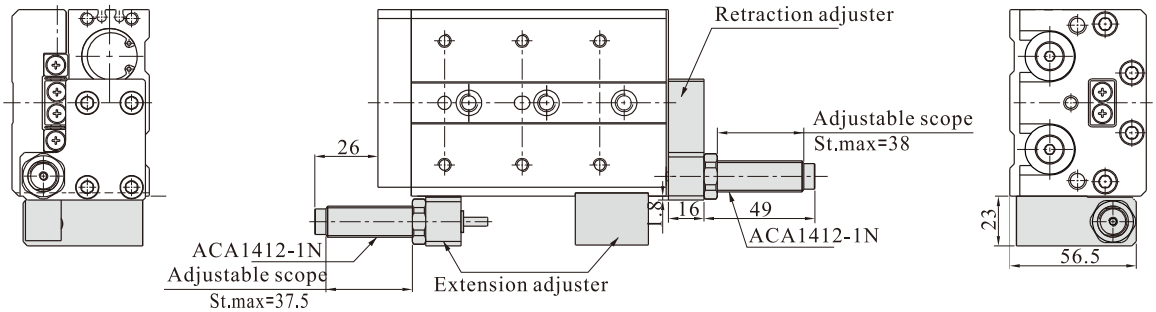
HLS、HLSL Series

HLSL25



Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	S	PA	PB	R
10	108	90.5	92	45	22	50	45	22	4	2	40	47	12	35
20	108	90.5	92	45	22	50	45	22	4	2	40	47	12	45
30	108	90.5	92	45	22	50	45	22	4	2	40	47	12	55
40	118	100.5	102	55	22	60	55	22	4	2	50	57	12	65
50	131	113.5	115	35	55	35	35	20	6	3	35	70	12	75
75	172	154.5	156	70	61	60	35	26	6	4	60	90	33	100
100	213	195.5	197	70	102	70	35	32	6	5	70	119	45	125
125	271	253.5	255	76	154	75	38	40	8	6	75	155	67	150
150	311	293.5	295	80	190	80	40	30	8	7	80	180	82	175

HLSL25(With shock absorber)



Accessory selection

	Accessories\Bore size		6	8	12
Standard (HLS)	Both ends	A(Adjustable rubber stopper)	F-HLQ6A	F-HLS8A	F-HLS12A
		B(Shock absorber)	×	F-HLS8B	F-HLS12B
	Extention	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-HLS8AF	F-HLS12AF
		BF(Shock absorber)	×	F-HLS8BF	F-HLS12BF

	Accessories\Bore size		16	20	25
Standard (HLS)	Both ends	A(Adjustable rubber stopper)	F-HLS16A	F-HLS20A	F-HLS25A
		B(Shock absorber)	F-HLS16B	F-HLS20B	F-HLS25B
	Extention	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-HLS16AF	F-HLS20AF	F-HLS25AF
		BF(Shock absorber)	F-HLS16BF	F-HLS20BF	F-HLS25BF

	Accessories\Bore size		6	8	12
Symmetrical (HLSL)	Both ends	A(Adjustable rubber stopper)	F-HLQL6A	F-HLSL8A	F-HLSL12A
		B(Shock absorber)	×	F-HLSL8B	F-HLSL12B
	Extention	AS(Adjustable rubber stopper)	F-HLQ6AS	F-HLQ8AS	F-HLQ12AS
		BS(Shock absorber)	×	F-HLQ8BS	F-HLQ12BS
	Retraction	AF(Adjustable rubber stopper)	F-HLQL6AF	F-HLSL8AF	F-HLSL12AF
		BF(Shock absorber)	×	F-HLSL8BF	F-HLSL12BF

	Accessories\Bore size		16	20	25
Symmetrical (HLSL)	Both ends	A(Adjustable rubber stopper)	F-HLSL16A	F-HLSL20A	F-HLSL25A
		B(Shock absorber)	F-HLSL16B	F-HLSL20B	F-HLSL25B
	Extention	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-HLSL16AF	F-HLSL20AF	F-HLSL25AF
		BF(Shock absorber)	F-HLSL16BF	F-HLSL20BF	F-HLSL25BF

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

F – HLS 20 AF

① ② ③ ④

①Accessory

②Cylindeer model

HLS: Standard
HLSL: Symmetrical

③Bore size

6 8 12
16 20 25

④Accessory type[Note]

A: Adjustable rubber stopper(Both ends)
AF: Adjustable rubber stopper(Retraction)
B: Shock absorber(Both ends)
BF: Shock absorber(Retraction)

[Note]The list accessories are for HLS cylinder. Accessories that are adaptable to other cylinder are not shown. Please refer to accessorylist for selection and ordering information.

Dimensions

AS: Adjustable rubber stopper(Extention)

Body Mounting

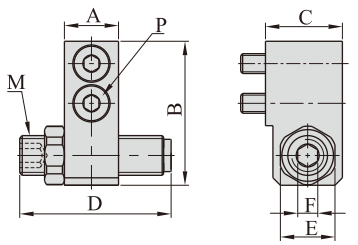
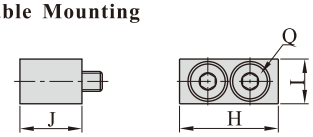


Table Mounting



Bore size\Item	Adjusting stroke range	A	B	C	D	E	F	M	P	H	I	J	Q
6	5	7	19	10.5	16.5	8	3	M6×1.0	M2.5 Length:10	12.5	6.5	10.5	M2.5 Length:10
8	5	8.5	21.5	14	21.5	11	4	M8×1.0	M3 Length:14	14.5	8	12	M3 Length:14
12	5	11	29	15.5	31.5	11	4	M8×1.0	M4 Length:16	20	9	13.5	M4 Length:12
16	5	12	36	17.5	24	14	5	M10×1.0	M5 Length:16	23	10.5	17	M5 Length:16
20	5	15	44.5	22	28	17	6	M12×1.0	M6 Length:20	25	12.5	21	M6 Length:20
25	5	16	53.5	24	32	19	6	M14×1.5	M8 Length:20	33	16.5	23	M8 Length:20

Slide table cylinder(Cross roller type)

HLS、HLSL Series——Accessories

BS: Shock absorber(Extention)

Body Mounting

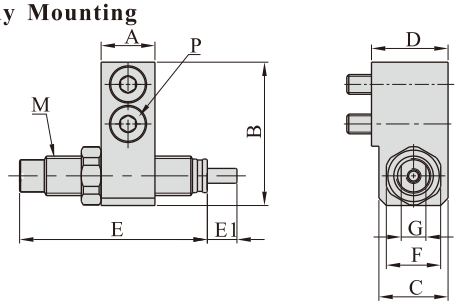
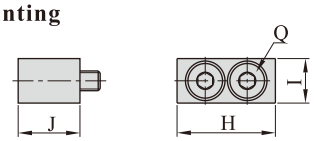


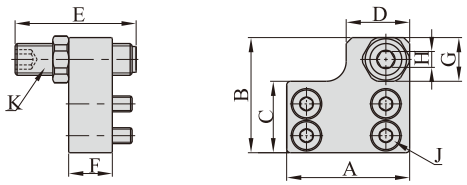
Table Mounting



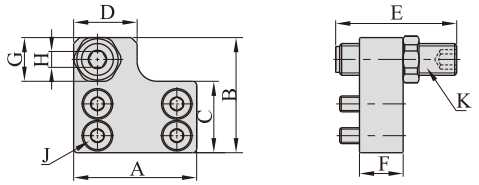
Bore size\Item	A	B	C	D	E	E1	F	G	M	P	H	I	J	Q
8	8.5	21.5	12.5	14	40	6	11	7	M8×1.0	M3 Length:14	14.5	8	12	M3 Length:14
12	11	29	14	15.5	40	6	11	7	M8×1.0	M4 Length:16	20	9	13.5	M4 Length:12
16	12	36	16	17.5	49	7	14	9	M10×1.0	M5 Length:16	23	10.5	17	M5 Length:16
20	15	44.5	20	22	53.5	10	17	11	M12×1.0	M6 Length:20	25	12.5	21	M6 Length:20
25	16	53.5	22	24	68.5	12	19	12	M14×1.5	M8 Length:20	33	16.5	23	M8 Length:20

AF: Adjustable rubber stopper(Retraction)

For standard type



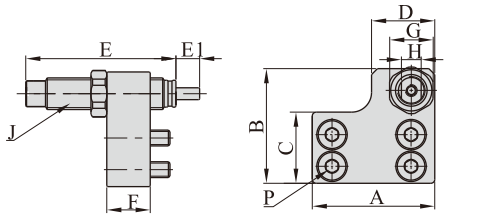
For symmetrical type



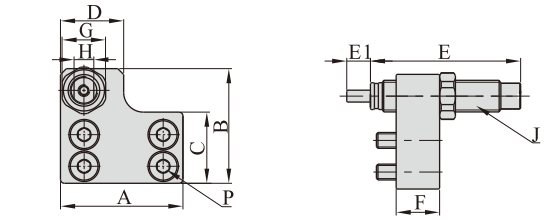
Bore size\Item	Adjusting stroke range	A	B	C	D	E	F	G	H	J	K
6	5	18	19	11	8	21.5	7	8	3	M2.5 Length:6	M6×1.0
8	5	24	22.5	13	14	21.5	8.5	11	4	M3 Length:8	M8×1.0
12	5	31	29	18	16	21.5	11	11	4	M4 Length:12	M8×1.0
16	5	37	37.5	23	18	24	12	14	5	M5 Length:12	M10×1.0
20	5	45.5	47	28.5	23	28	15	17	6	M5 Length:16	M12×1.0
25	5	54	56	34	28	32	16	19	6	M6 Length:18	M14×1.5

BF: Shock absorber(Retraction)

For standard type



For symmetrical type

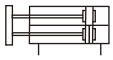


Bore size\Item	A	B	C	D	E	E1	F	G	H	J	P
8	24	22.5	13	14	40	6	8.5	11	7	M8×1.0	M3 Length:8
12	31	29	18	16	40	6	11	11	7	M8×1.0	M4 Length:12
16	37	37.5	23	18	49	7	12	14	9	M10×1.0	M5 Length:12
20	45.5	47	28.5	23	53.5	10	15	17	11	M12×1.0	M5 Length:16
25	54	56	34	28	68.5	12	16	19	12	M14×1.5	M6 Length:18

Slide table cylinder(ball bearing type)

HLQ、HLQL Series

Symbol



Specification

Bore size(mm)	6	8	12	16	20	25
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】PT thread, G thread, NPT thread are available.

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.

Criteria for selection: Cylinder thrust

Unit: Newton(N)

Bore size	Rod size	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

Slide table cylinder(ball bearing type)

HLQ、HLQL Series

Ordering code

HLQ 20 × 30 S AS □

① ② ③ ④ ⑤ ⑥

①Model

HLQ: Slide table cylinder (Double acting type) (ball bearing type)

HLQL: Symmetrical Slide table cylinder (Double acting type) (ball bearing type)

②Bore Size

6 8 12
16 20 25

③Stroke

Refer to stroke table for details

④Magnet

S: With magnet

⑤Adjuster option [Note1]

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)

⑥Thread type [Note2]

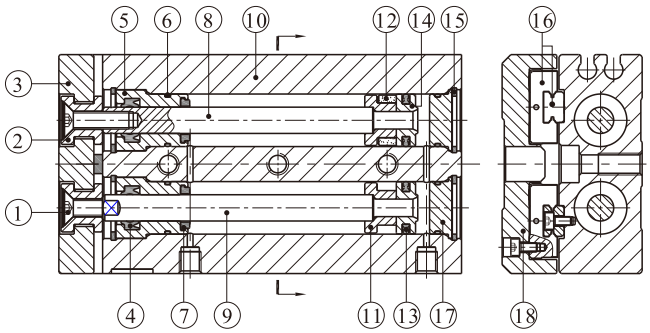
Blank: PT
G: G
T: NPT

[Note1] B type, BS type, BF type are unavailable for bore size of Φ6.

[Note2]When the thread is standard, the code is blank.

Inner structure and material of major parts

Basic type



NO.	Item	Material	NO.	Item	Material
1	Screw	Carbon steel	10	Body	Aluminum alloy
2	Floating joint	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

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 absorber)
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)

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

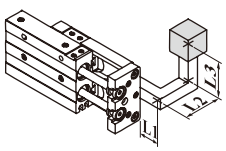
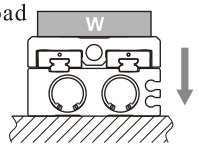
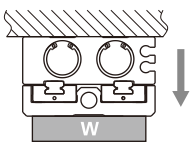
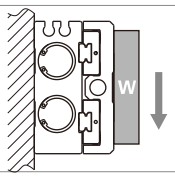


Fig. 1: Applied load







B) Kinetic energy check

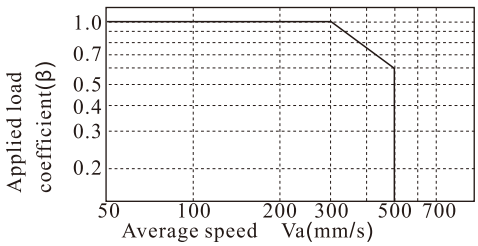
1. Calculate kinetic energy of load E(J)	$E=\frac{1}{2}\times\frac{W}{g}\times(\frac{1.4\times Va}{1000})^2$	
2. Calculate allowable kinetic energy Ea(J)	$Ea = K \times E_{max}$	K:Mounting work coefficient (**Fig 2**) E_{max}:Maximum allowable kinetic energy (**Table 1**)
3. Check that kinetic energy 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)

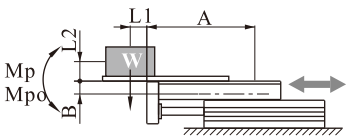
Fig 3 Applied load coefficient (β)



D) Moment check

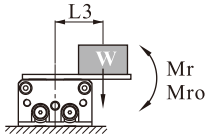
Horizontal

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



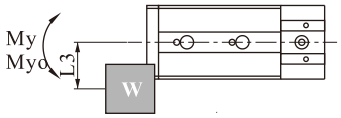
Dynamic moment: $Mp=W\times(L1+A)/1000$

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



Dynamic moment: $Mr=W\times(C+L3)/1000$

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



Dynamic moment: $My=0$

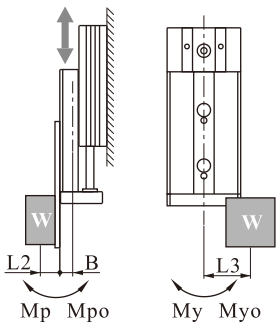
Static moment: $Myo=(W\times a\times(C+L3))/1000g$

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: $My=W\times(C+L3)/1000$

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

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/C: 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).

Slide table cylinder(ball bearing type)

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

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	

Note: Symbol and unit

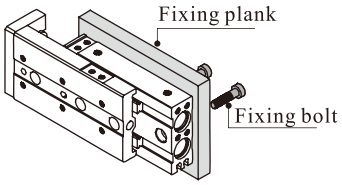
Symbol	Item	Unit
A, B, C	Correction value for center position distance of moment	mm
a	Acceleration of inertia	–
E	Kinetic energy	J
Ea	Allowable kinetic energy	J
Emax	Maximum allowable kinetic energy	J
g	Acceleration of gravity g=9.81	m/s^2
K	Mounting work coefficient	–
L1, L2, L3	Overhang	mm
Mp, My,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

Installation and application

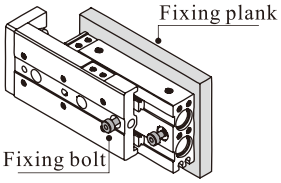
1. How to mount cylinder:

1.1) Cylinder can to be mounted from 3 directions

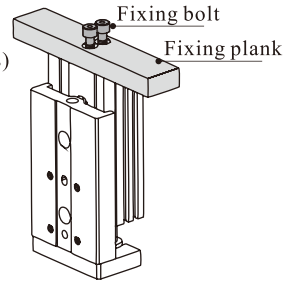
Vertical Mounting(Body thread holes)



Vertical Mounting(Body through holes)

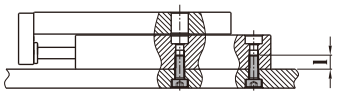


Axial Mounting (Body thread holes)



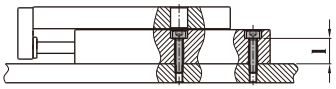
1.2) When mounting an compact slide cylinder, screws of appropriate length should be used and tightened properly within the maximum tightening torque. If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding of falling off from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

Vertical Mounting(Body thread holes)



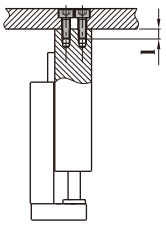
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M4×0.7	2.1	8
HLQ8	M4×0.7	2.1	8
HLQ12	M5×0.8	4.4	10
HLQ16	M6×1.0	4.4	10
HLQ20	M6×1.0	7.4	12
HLQ25	M8×1.25	18.0	16

Vertical Mounting(Body through holes)



Model	Bolt used	Max. tightening torque (Nm)	Body 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)

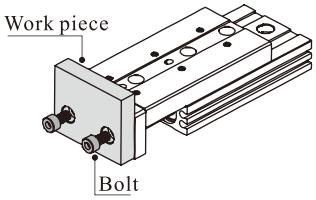


Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M2.5×0.45	0.5	3.5
HLQ8	M3×0.5	0.9	4.0
HLQ12	M4×0.7	2.1	6.0
HLQ16	M5×0.8	4.4	7.0
HLQ20	M5×0.8	4.4	8.0
HLQ25	M6×1.0	7.4	10.0

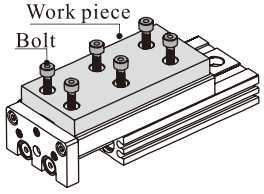
2. Work Piece Mounting:

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

Front Mounting

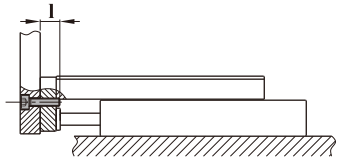


Top Mounting



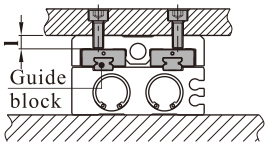
2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use blots at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

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

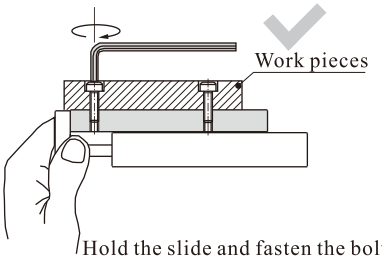
Top Mounting



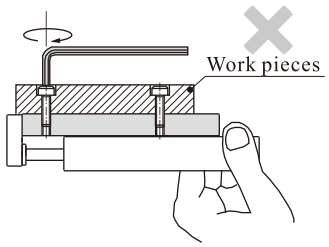
Model	Bolt used	Max. tightening torque (Nm)	Max. screw-in depth(mm)
HLQ6	M3×0.5	0.9	4.7
HLQ8	M3×0.5	0.9	4.7
HLQ12	M4×0.7	2.1	5.0
HLQ16	M5×0.8	4.4	5.0
HLQ20	M5×0.8	4.4	8.0
HLQ25	M6×1.0	7.4	9.0

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.



Hold the slide and fasten the bolt



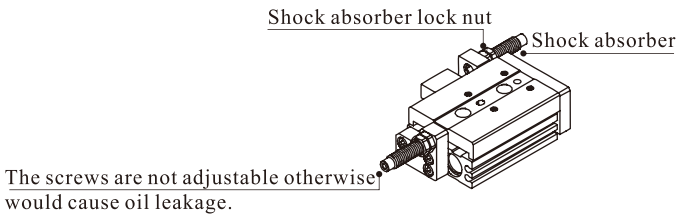
Hold the body and fasten the bolt

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.

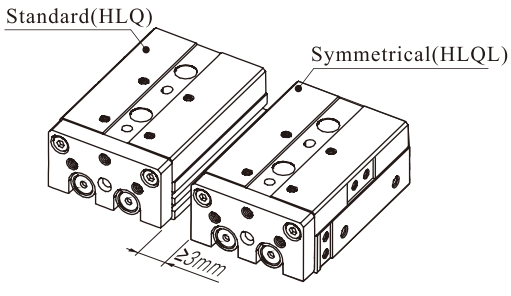


Model	Shock absorber	Tightening torque
HLQ6	Without shock absorber	
HLQ8	ACA0806-1N	1.67(Nm)
HLQ12	ACA0806-1N	1.67(Nm)
HLQ16	ACA1007-1N	3.14(Nm)
HLQ20	ACA1210-1N	3.14(Nm)
HLQ25	ACA1412-1N	10.8(Nm)

4. How to mount sensor switch:

4.1) HLS 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.

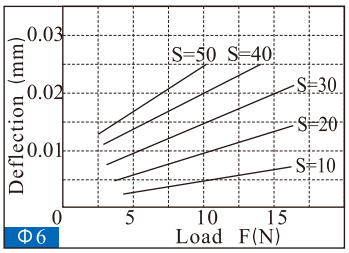


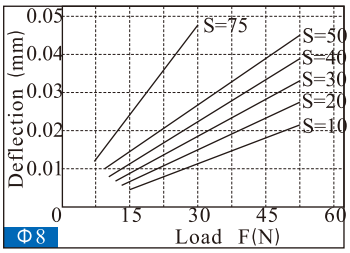
5. Make sure to connect the compact cylinder to speed controller at the meter-out side, and the speed of compact cylinder must below 500mm/s.

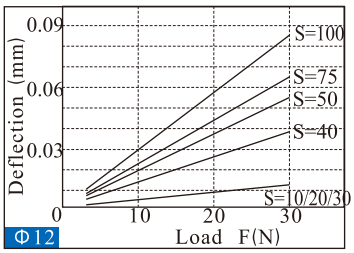
6. Don't apply a load beyond the range of the operation limits. Different load or torque will cause different deflection to table, please see below for details.

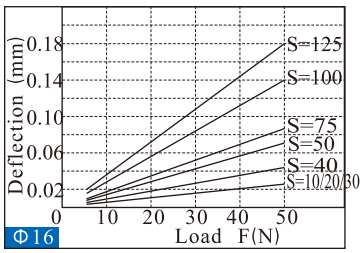
6.1) Table deflection due to pitch moment:

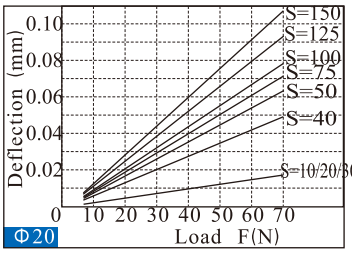
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

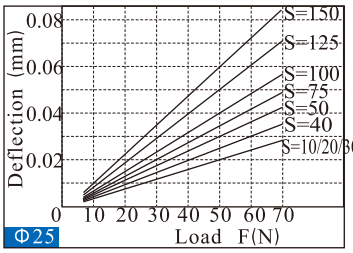






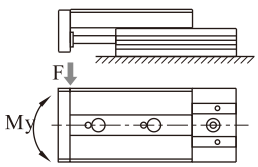


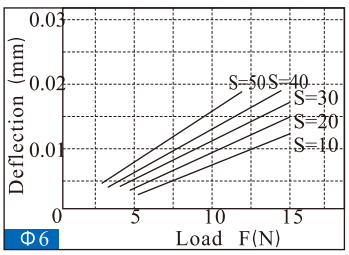


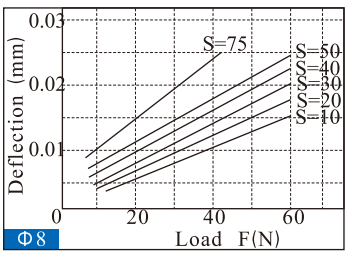


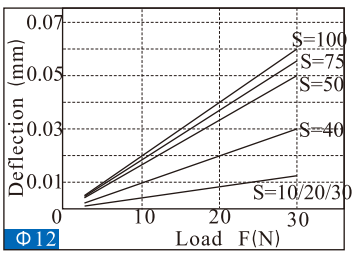
6.2) Table deflection due to yaw moment:

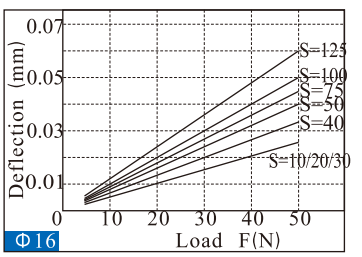
Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.

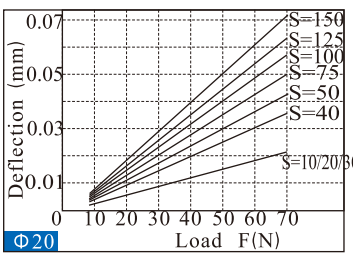


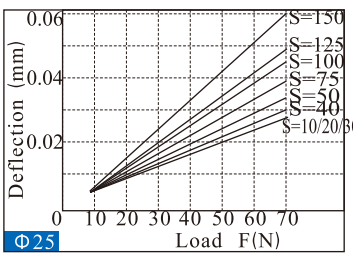






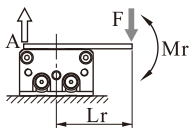


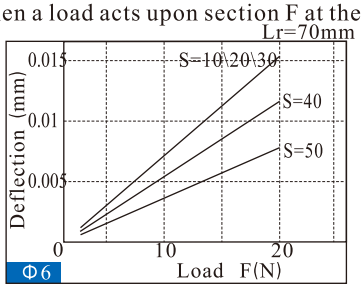


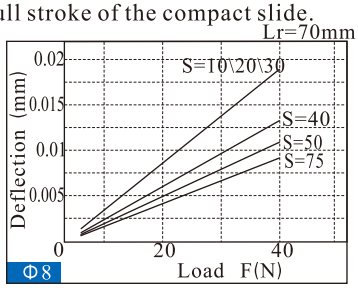


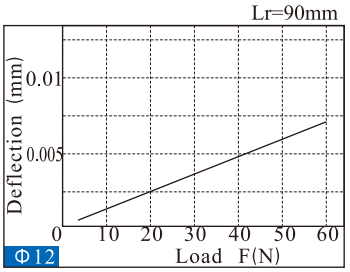
6.3) Table deflection due to roll moment:

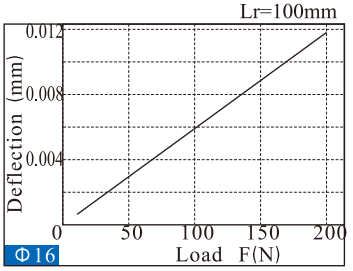
Table deflects (A) when a load acts upon section F at the full stroke of the compact slide.

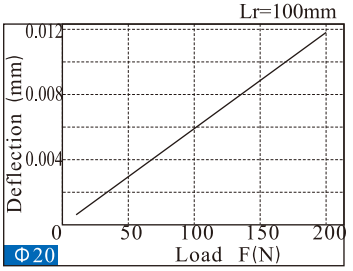


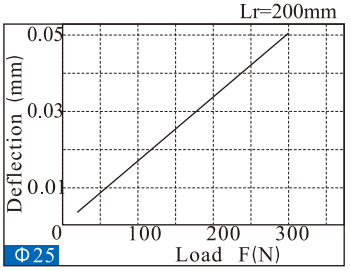






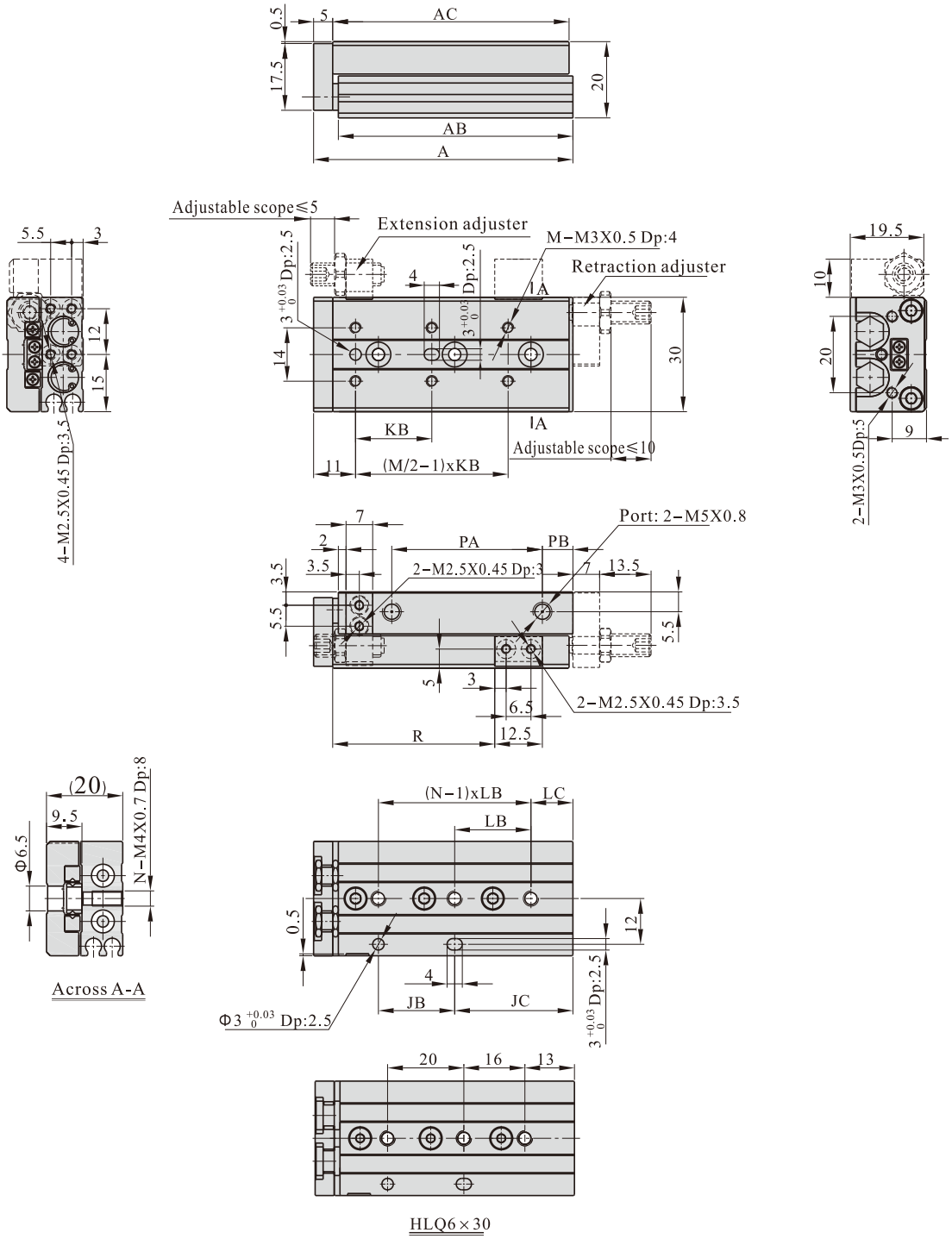






Dimensions

HLQ6

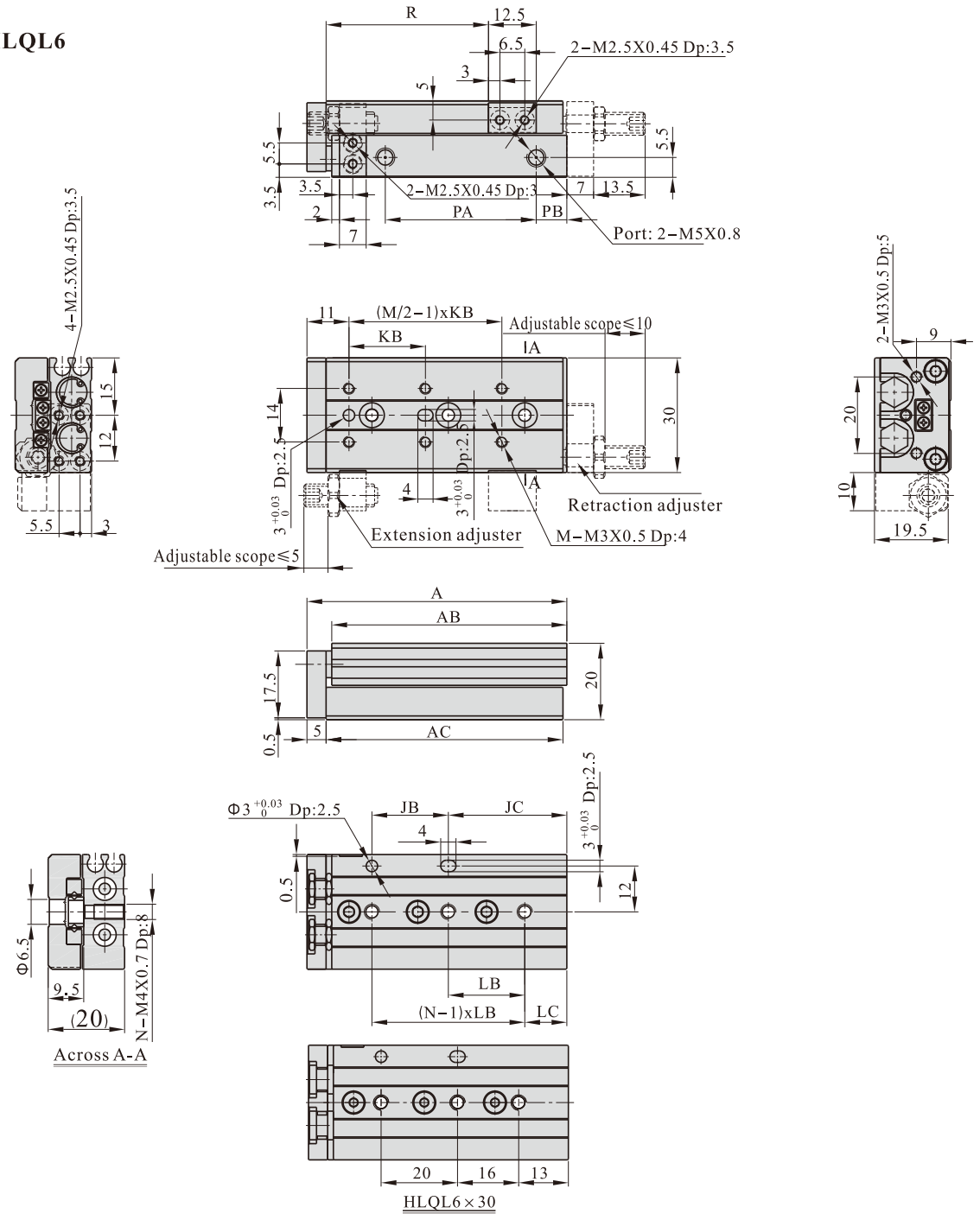


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	48	41.5	42	16	13	22	23	6	4	2	16	9	21.5
20	58	51.5	52	26	13	25	26	13	4	2	26	9	31.5
30	68	61.5	62	20	29	21	–	–	6	3	36	9	41.5
40	86	79.5	80	28	39	26	28	11	6	3	47	16	51.5
50	96	89.5	90	28	49	27	28	21	6	3	64	9	61.5

Slide table cylinder(ball bearing type)

HLQ、HLQL Series

HLQL6

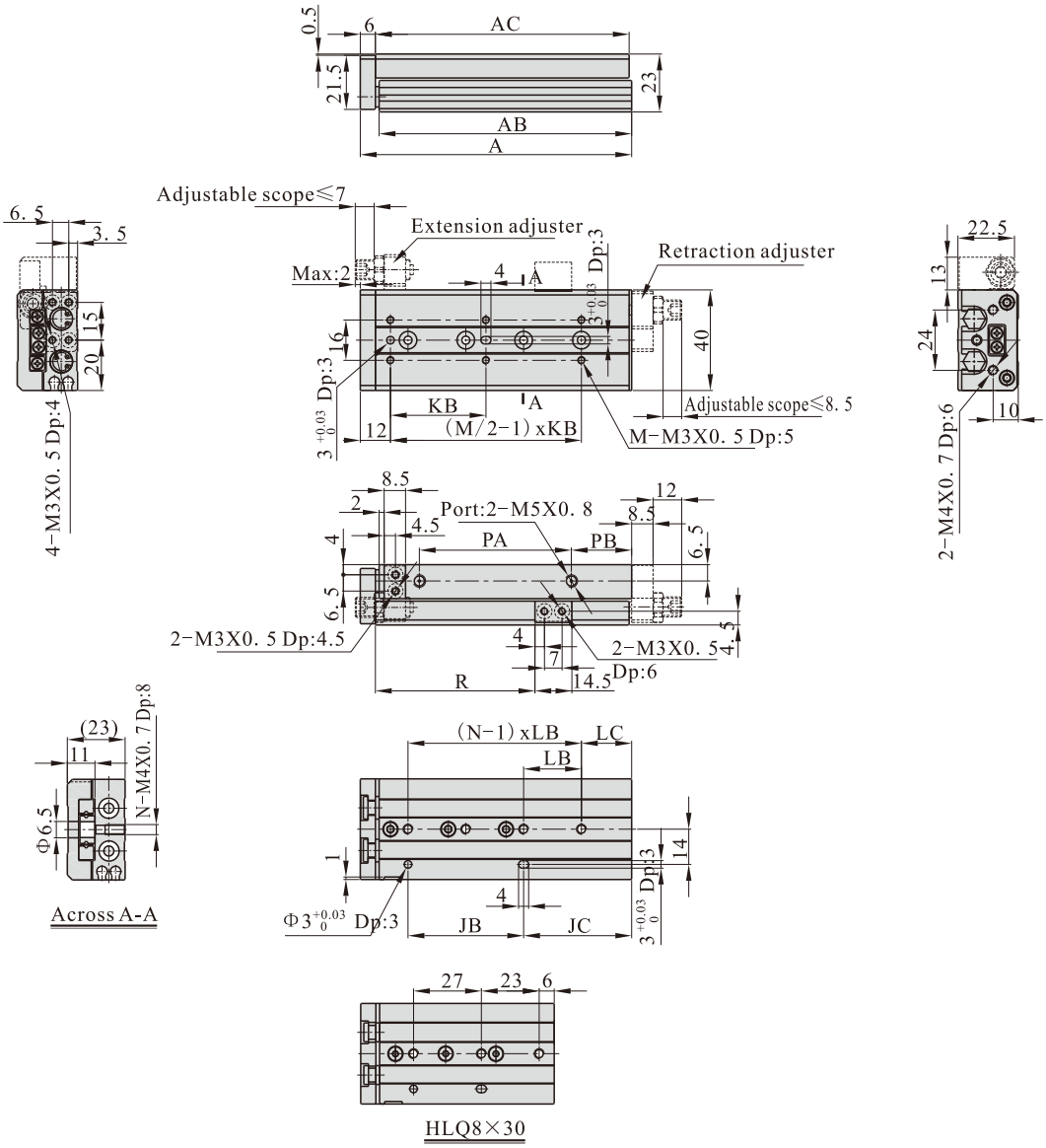


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	48	41.5	42	16	13	22	23	6	4	2	16	9	21.5
20	58	51.5	52	26	13	25	26	13	4	2	26	9	31.5
30	68	61.5	62	20	29	21	–	–	6	3	36	9	41.5
40	86	79.5	80	28	39	26	28	11	6	3	47	16	51.5
50	96	89.5	90	28	49	27	28	21	6	3	64	9	61.5

Slide table cylinder(ball bearing type)

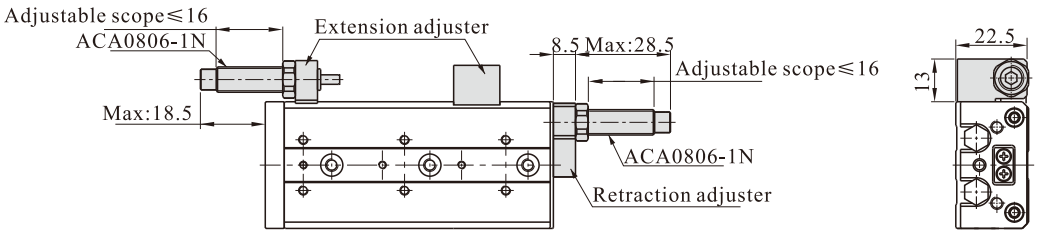
HLQ、HLQL Series

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	17.5	10.5	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	63	50	30	33	6	4	109	10	88.5

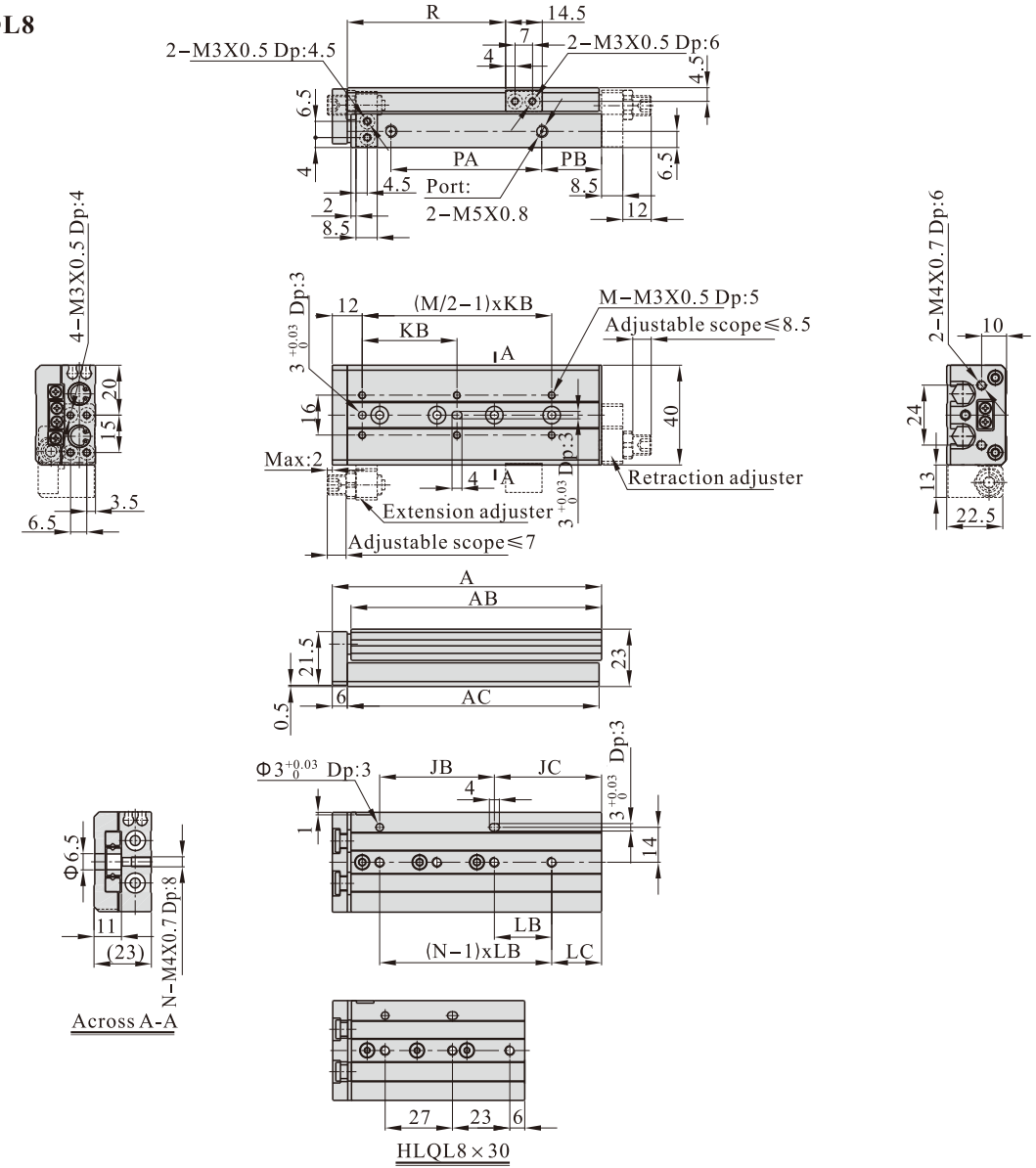
HLQ8(With shock absorber)



Slide table cylinder(ball bearing type)

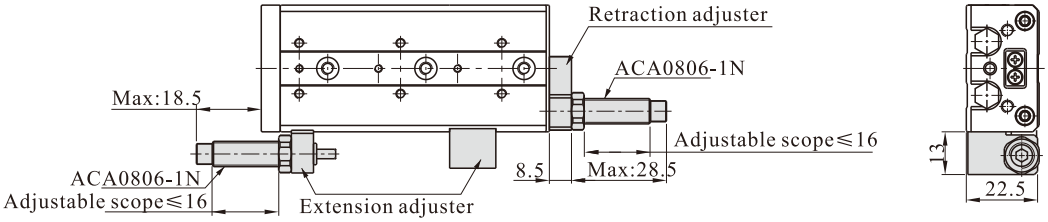
HLQ、HLQL Series

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	17.5	10.5	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	63	50	30	33	6	4	109	10	88.5

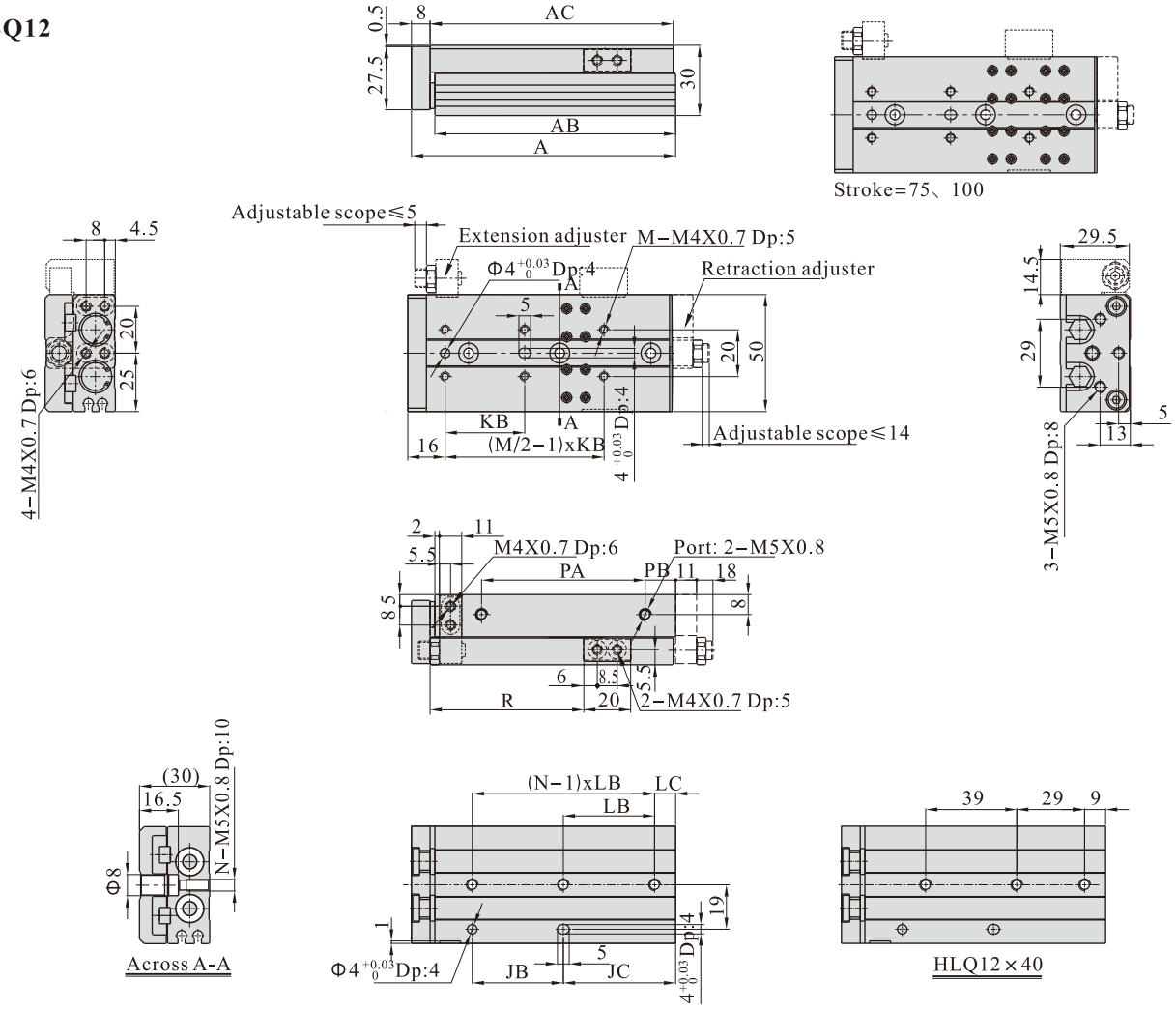
HLQL8(With shock absorber)



Slide table cylinder(ball bearing type)

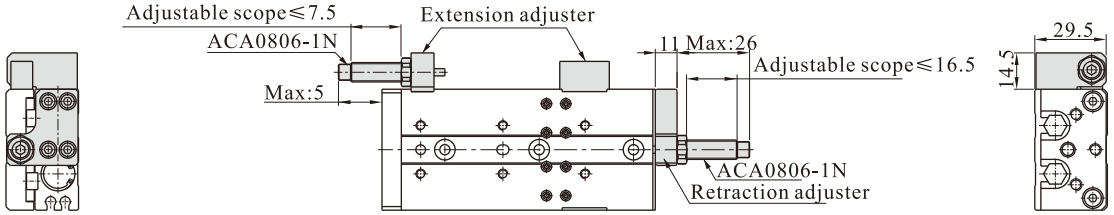
HLQ、HLQL Series

HLQ12

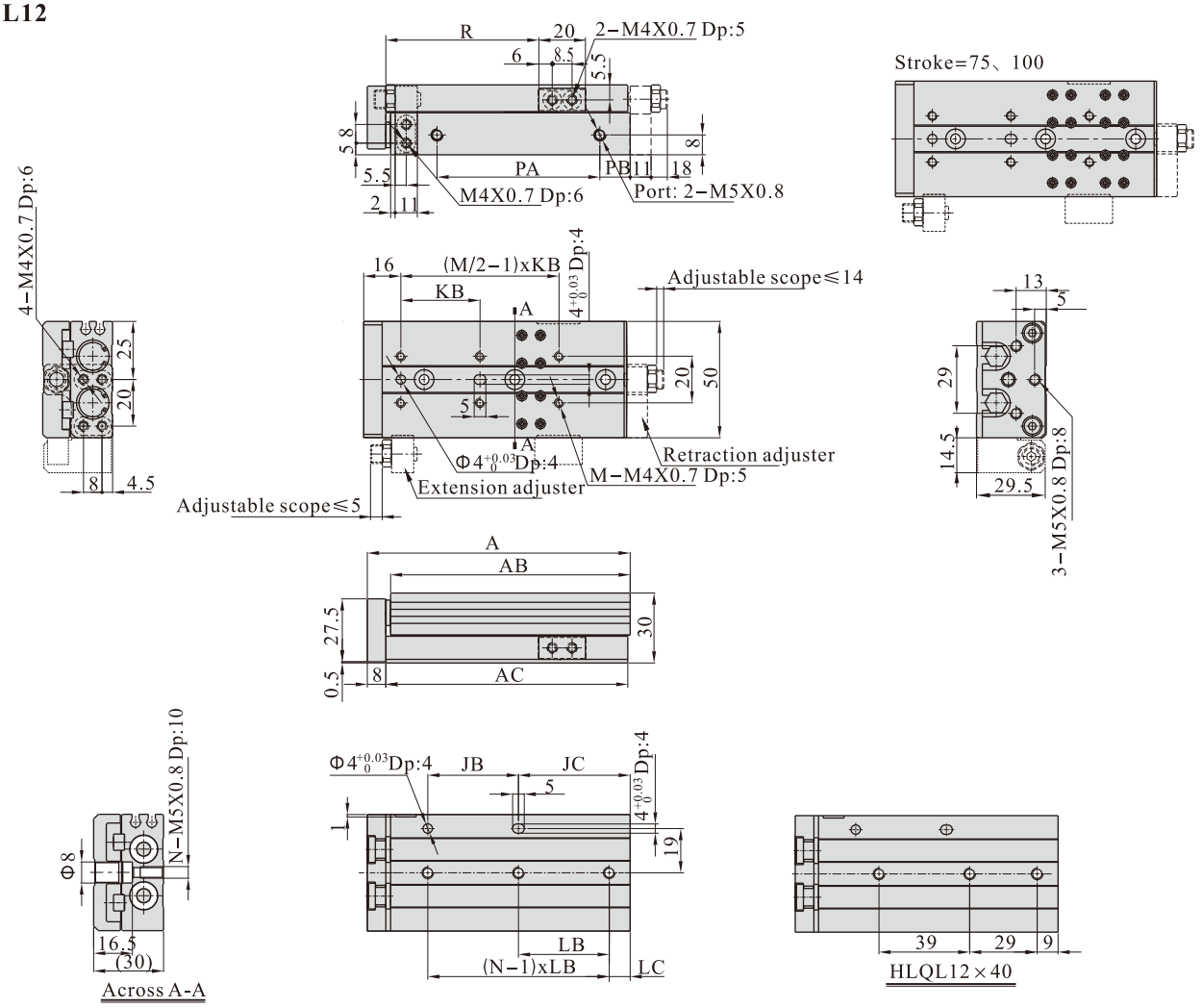


Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	76	66	67	32	18	28	32	18	4	2	32.5	13	35
20	76	66	67	32	18	28	32	18	4	2	32.5	13	45
30	86	76	77	40	20	38	40	20	4	2	42.5	13	55
40	103	93	94	39	38	34	–	–	6	3	59.5	13	65
50	113	103	104	39	48	34	39	9	6	3	69.5	13	75
75	157	147	148	72	59	36	36	23	8	4	113.5	13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

HLQ12(With shock absorber)

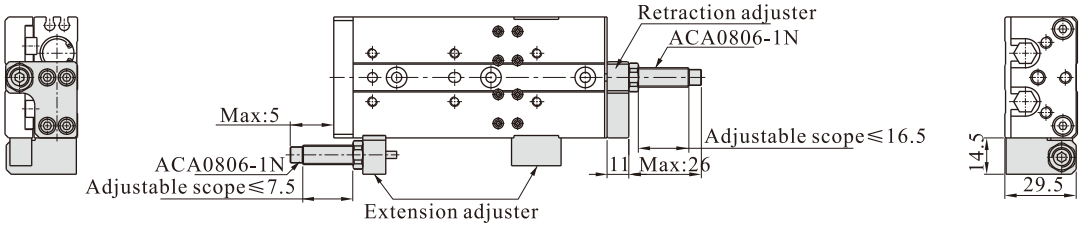


HLQL12



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

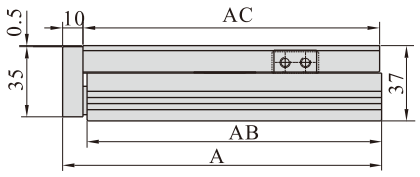
HLQL12(With shock absorber)

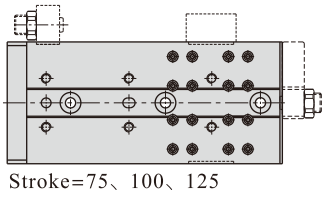


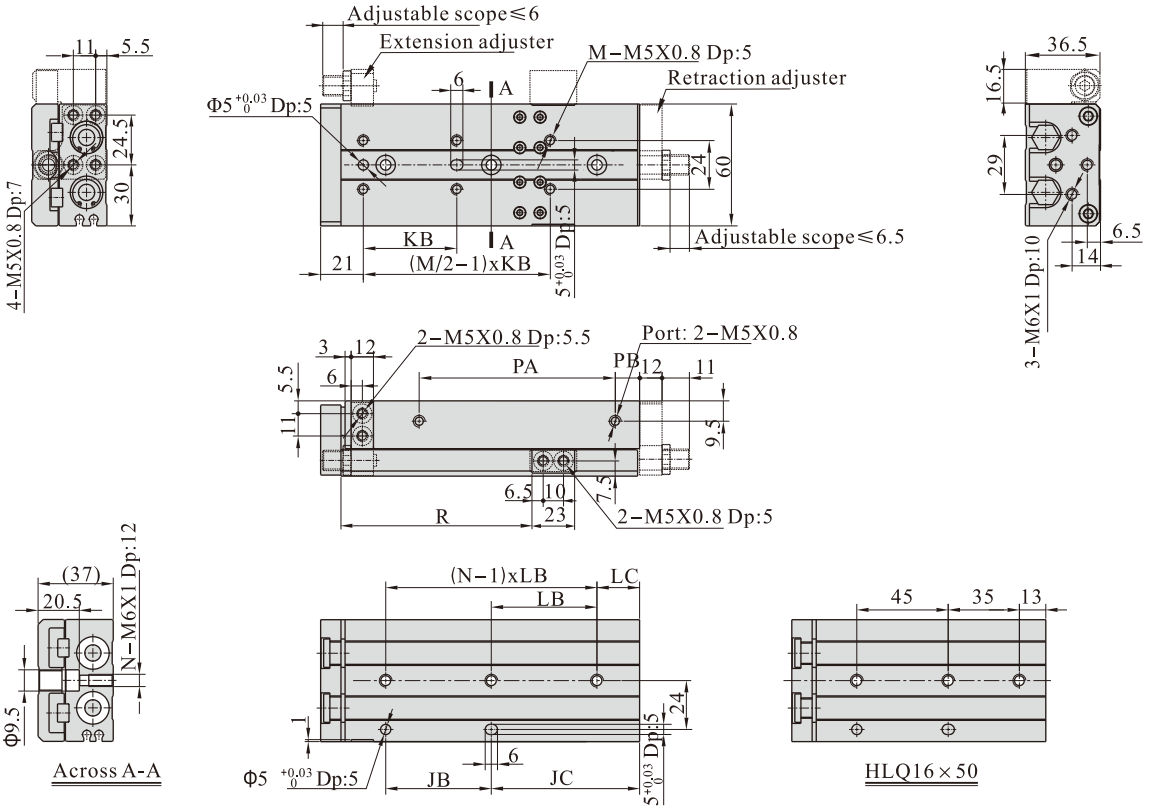
Slide table cylinder(ball bearing type)

HLQ、HLQL Series

HLQ16

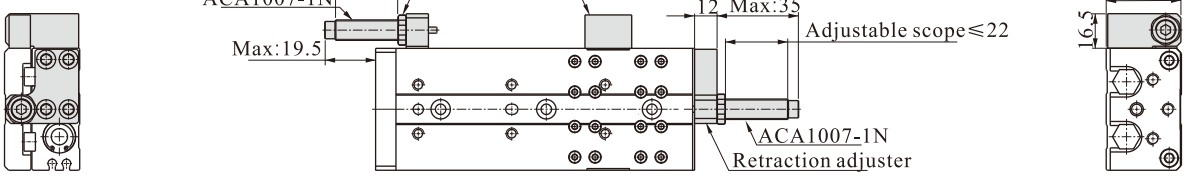






Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	89	77	78	39	18	38	39	18	4	2	40.5	12	28.5
20	89	77	78	39	18	38	39	18	4	2	40.5	12	38.5
30	99	87	88	48	19	48	48	19	4	2	50.5	12	48.5
40	109	97	98	58	19	58	58	19	4	2	60.5	12	58.5
50	125	113	114	45	48	40	–	–	6	3	70.5	18	68.5
75	157	145	146	52	73	46	52	21	6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

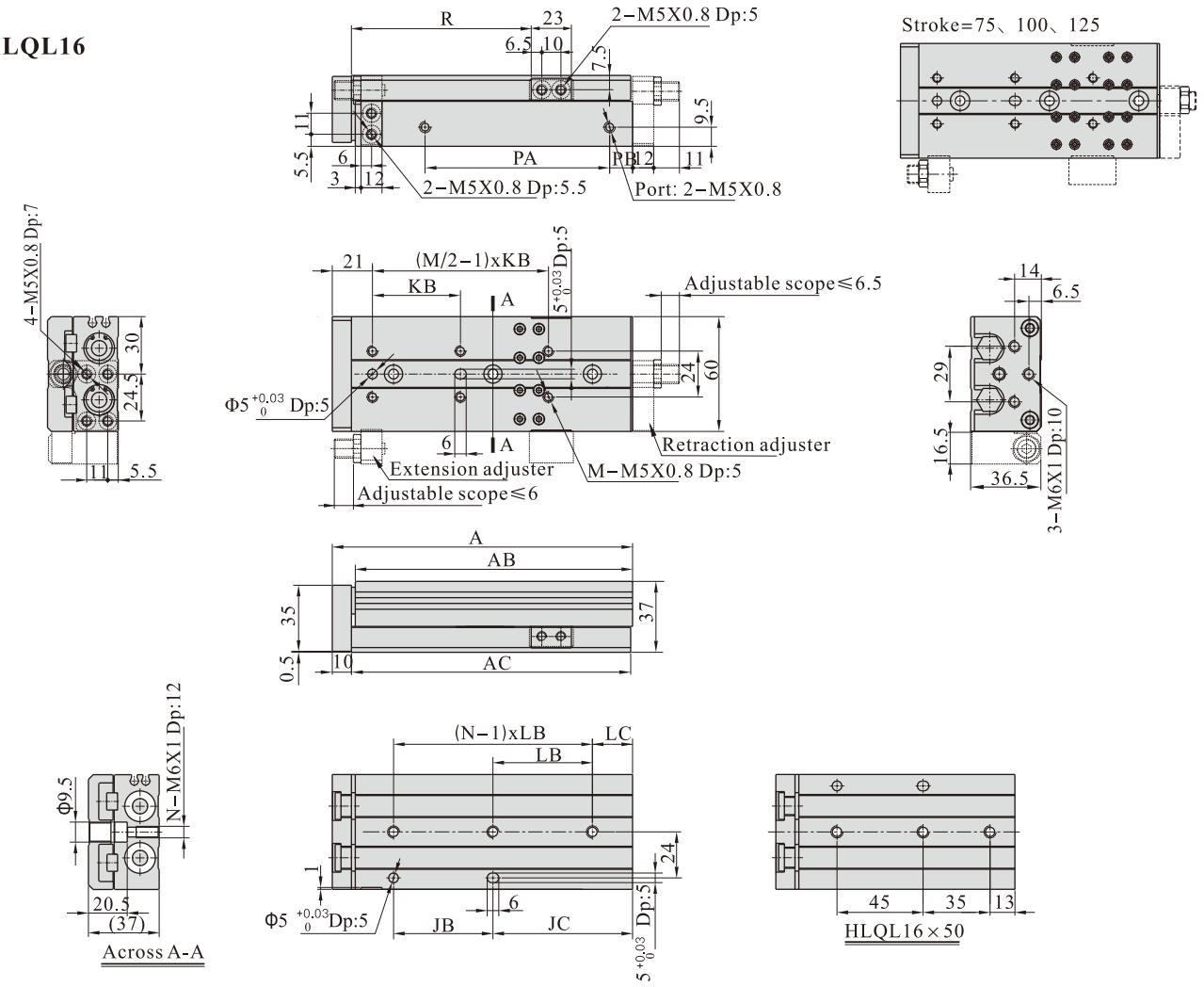
HLQ16(With shock absorber)



Slide table cylinder(ball bearing type)

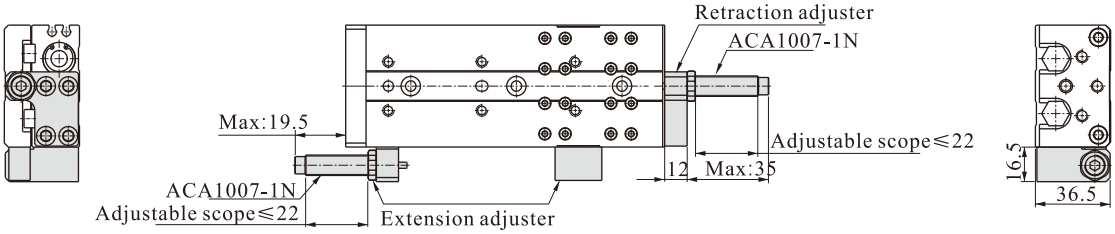
HLQ、HLQL Series

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

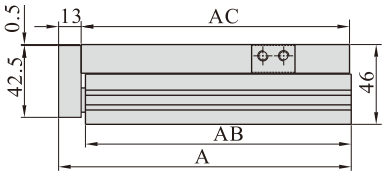
HLQL16(With shock absorber)

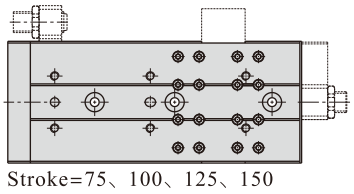


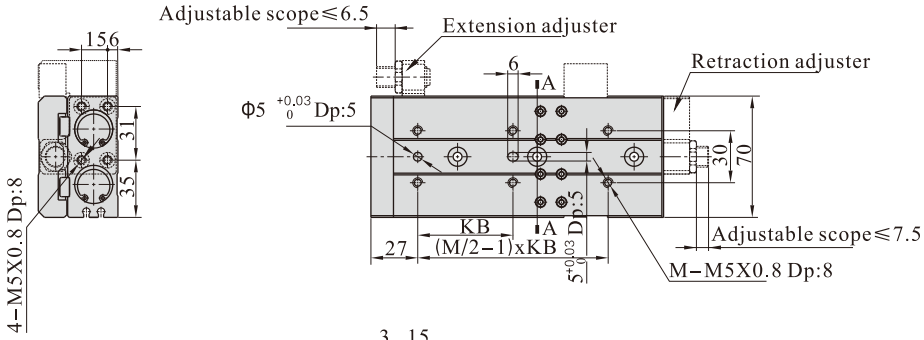
Slide table cylinder(ball bearing type)

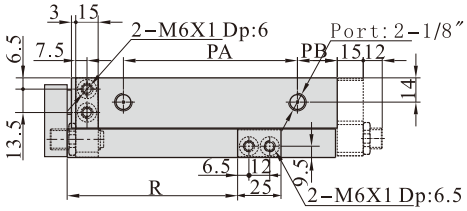
HLQ、HLQL Series

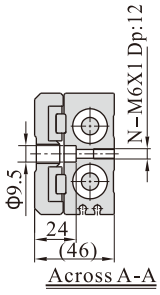
HLQ20

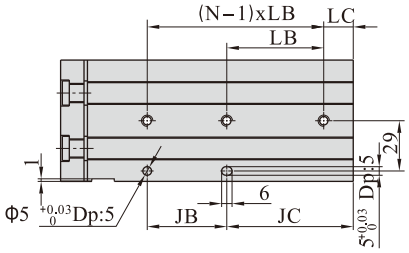


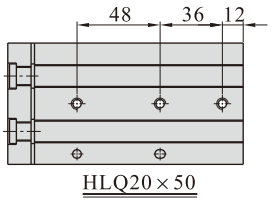






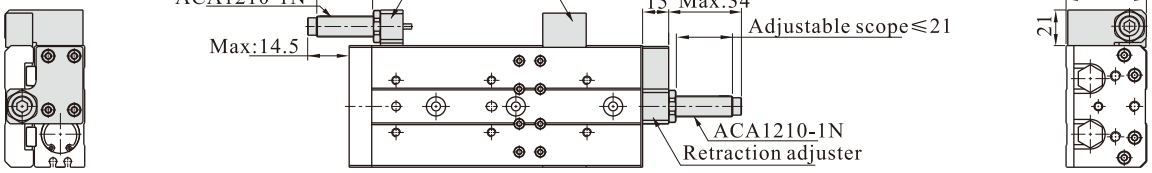






Stroke\Item	A	AB	AC	JB	JC	KB	LB	LC	M	N	PA	PB	R
10	108	92.5	94	50	18	45	46	22	4	2	46.5	16	32.5
20	108	92.5	94	50	18	40	46	22	4	2	46.5	16	42.5
30	108	92.5	94	50	18	48	46	22	4	2	46.5	16	52.5
40	118	102.5	104	56	22	58	56	22	4	2	56.5	16	62.5
50	136	120.5	122	48	48	42	–	–	6	3	72.5	18	72.5
75	169	153.5	155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

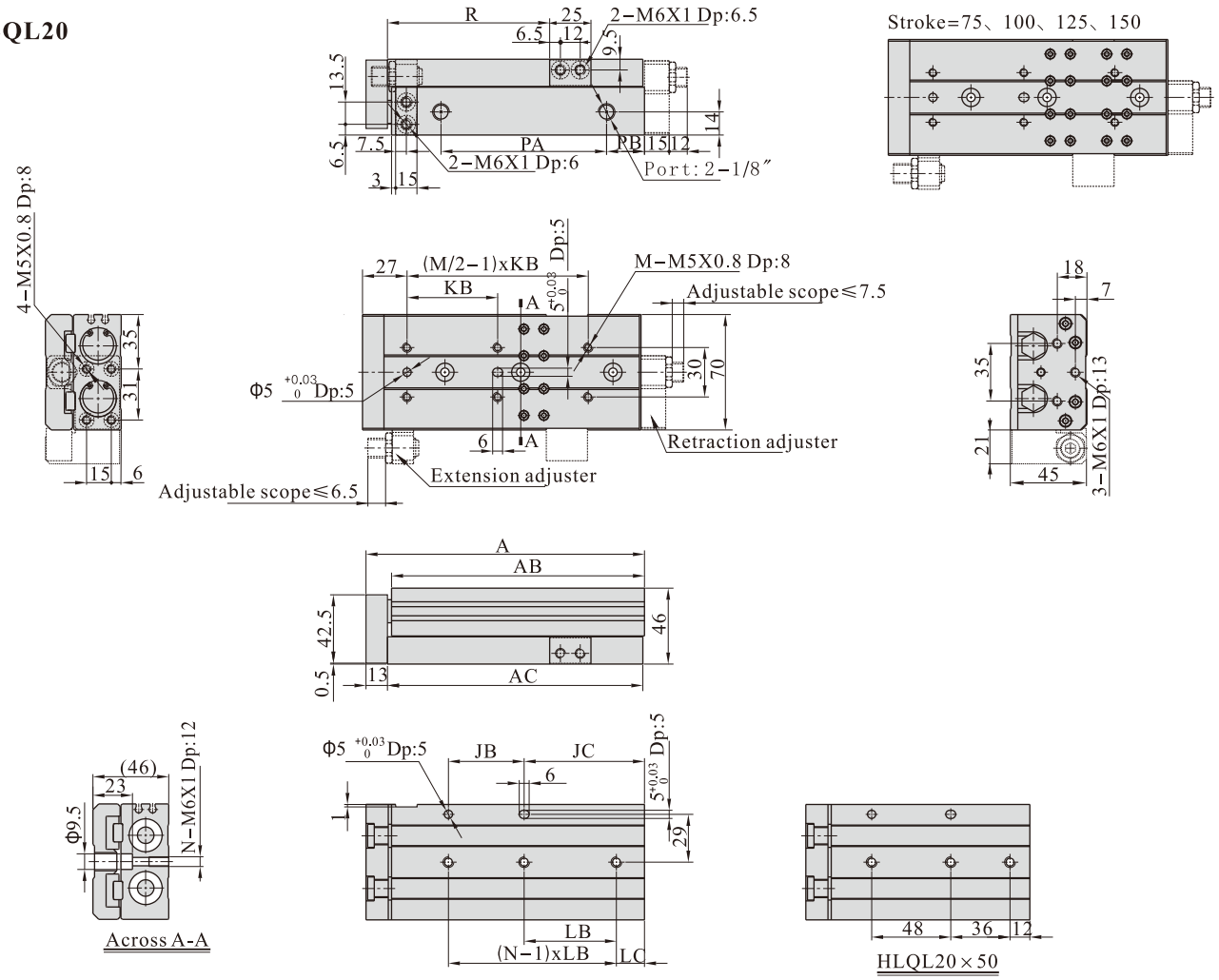
HLQ20(With shock absorber)



Slide table cylinder(ball bearing type)

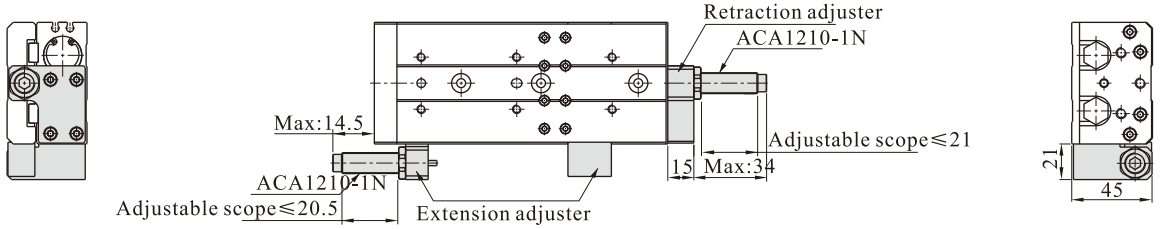
HLQ、HLQL Series

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

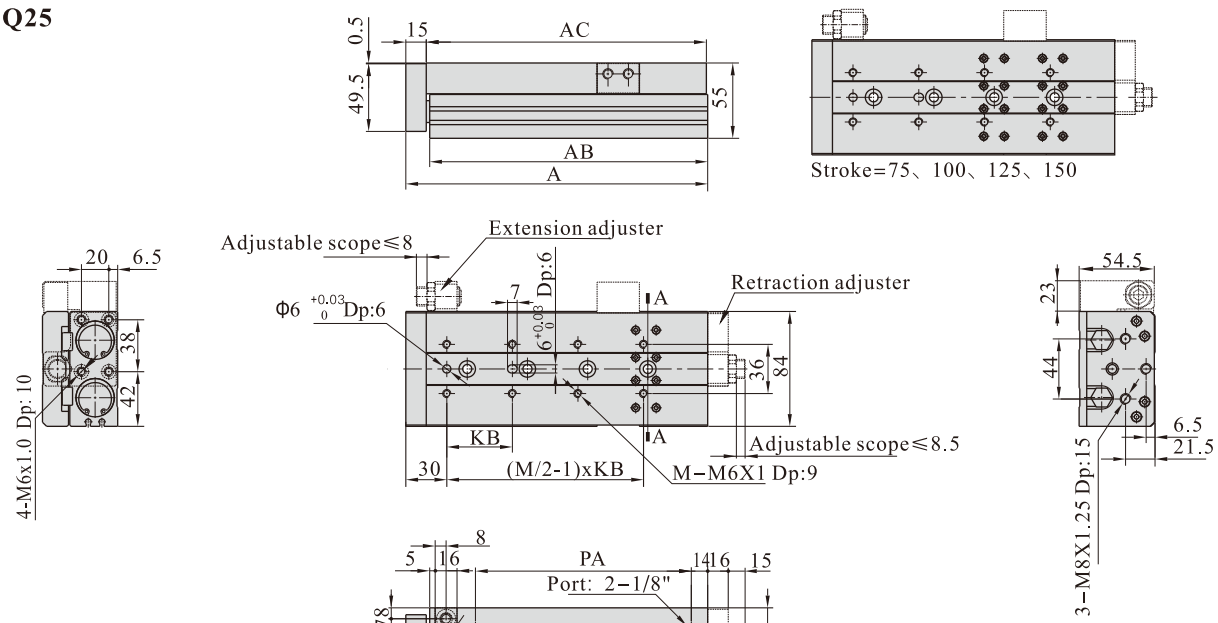
HLQL20(With shock absorber)



Slide table cylinder(ball bearing type)

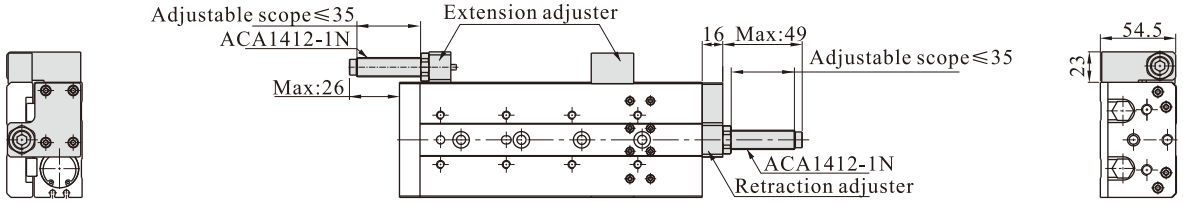
HLQ、HLQL Series

HLQ25



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

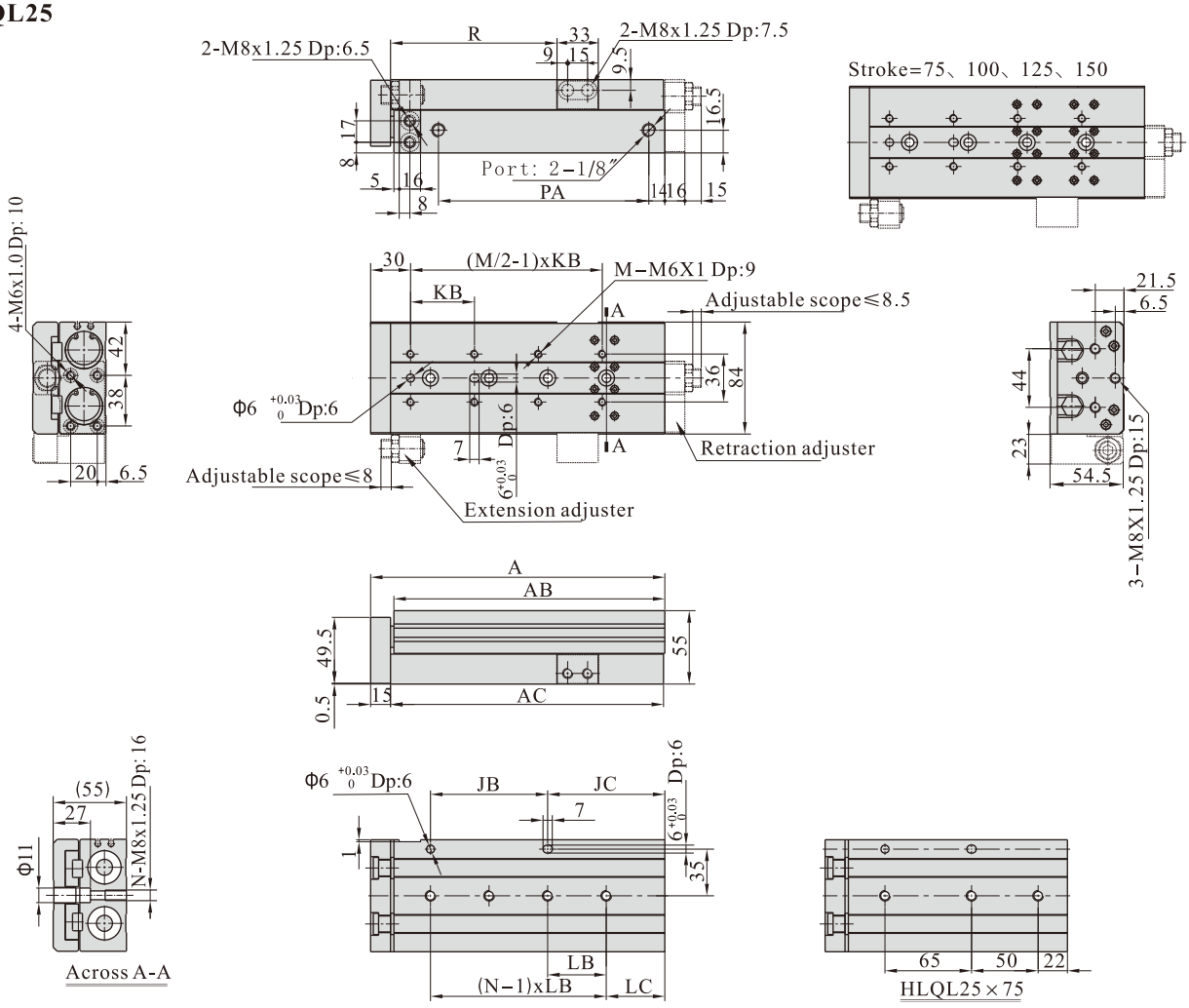
HLQ25(With shock absorber)



Slide table cylinder(ball bearing type)

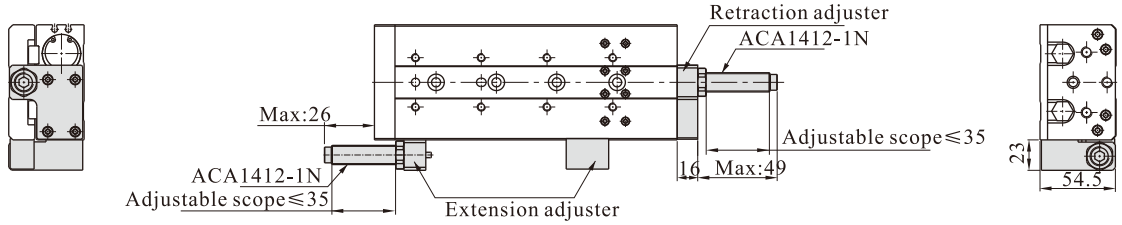
HLQ、HLQL Series

HLQL25



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

HLQL25(With shock absorber)



Slide table cylinder(ball bearing type)

HLQ、HLQL Series——Accessories

Accessory selection

	Accessories\Bore size		6	8	12
Standard (HLQ)	Both ends	A(Adjustable rubber stopper)	F-HLQ6A	F-HLQ8A	F-HLQ12A
		B(Shock absorber)	×	F-HLQ8B	F-HLQ12B
	Extention	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
Standard (HLQ)	Both ends	A(Adjustable rubber stopper)	F-HLQ16A	F-HLQ20A	F-HLQ25A
		B(Shock absorber)	F-HLQ16B	F-HLQ20B	F-HLQ25B
	Extention	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

	Accessories\Bore size		6	8	12
Symmetrical (HLQL)	Both ends	A(Adjustable rubber stopper)	F-HLQL6A	F-HLQL8A	F-HLQL12A
		B(Shock absorber)	×	F-HLQL8B	F-HLQL12B
	Extention	AS(Adjustable rubber stopper)	F-HLQ6AS	F-HLQ8AS	F-HLQ12AS
		BS(Shock absorber)	×	F-HLQ8BS	F-HLQ12BS
	Retraction	AF(Adjustable rubber stopper)	F-HLQL6AF	F-HLQL8AF	F-HLQL12AF
		BF(Shock absorber)	×	F-HLQL8BF	F-HLQL12BF

	Accessories\Bore size		16	20	25
Symmetrical (HLQL)	Both ends	A(Adjustable rubber stopper)	F-HLQL16A	F-HLQL20A	F-HLQL25A
		B(Shock absorber)	F-HLQL16B	F-HLQL20B	F-HLQL25B
	Extention	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-HLQL16AF	F-HLQL20AF	F-HLQL25AF
		BF(Shock absorber)	F-HLQL16BF	F-HLQL20BF	F-HLQL25BF

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

F – HLQ 20 AF

① ② ③ ④

①Accessory

②Cylindeer model

HLQ: Standard
HLQL: Symmetrical

③Bore size

6 8 12
16 20 25

④Accessory type[Note]

A: Adjustable rubber stopper(Both ends)
AF: Adjustable rubber stopper(Retraction)
B: Shock absorber(Both ends)
BF: Shock absorber(Retraction)

[Note]The list accessories are for HLS cylinder. Accessories that are adaptable to other cylinder are not shown. Please refer to accessorylist for selection and ordering information.

Dimensions

AS: Adjustable rubber stopper(Extention)

Body Mounting

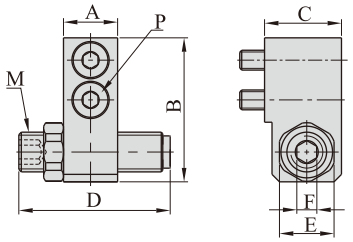
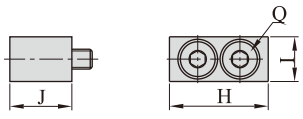


Table Mounting



Bore size\Item	Adjusting stroke range	A	B	C	D	E	F	M	P	H	I	J	Q
6	5	7	19	10.5	16.5	8	3	M6×1.0	M2.5Length:10	12.5	6.5	10.5	M2.5Length:10
8	5	8.5	21.5	14	21.5	11	4	M8×1.0	M3Length:14	14.5	8	12	M3Length:14
12	5	11	29	15.5	31.5	11	4	M8×1.0	M4Length:16	20	9	13.5	M4Length:12
16	5	12	36	17.5	24	14	5	M10×1.0	M5Length:16	23	10.5	17	M5Length:16
20	5	15	44.5	22	28	17	6	M12×1.0	M6Length:20	25	12.5	21	M6Length:20
25	5	16	53.5	24	32	19	6	M14×1.5	M8Length:20	33	16.5	23	M8Length:20

BS: Shock absorber(Extention)

Body Mounting

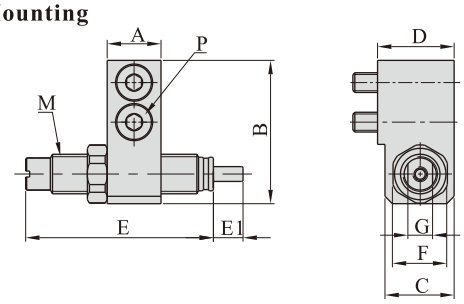
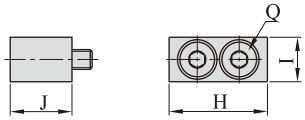


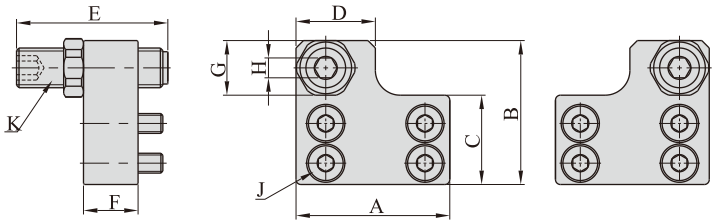
Table Mounting



Bore size\Item	A	B	C	D	E	E1	F	G	M	P	H	I	J	Q
8	8.5	21.5	12.5	14	40	6	11	7	M8×1.0	M3Length:14	14.5	8	12	M3Length:14
12	11	29	14	15.5	40	6	11	7	M8×1.0	M4Length:16	20	9	13.5	M4Length:12
16	12	36	16	17.5	49	7	14	9	M10×1.0	M5Length:16	23	10.5	17	M5Length:16
20	15	44.5	20	22	53.5	10	17	11	M12×1.0	M6Length:20	25	12.5	21	M6Length:20
25	16	53.5	22	24	68.5	12	19	12	M14×1.5	M8Length:20	33	16.5	23	M8Length:20

AF: Adjustable rubber stopper(Retraction, for standard)

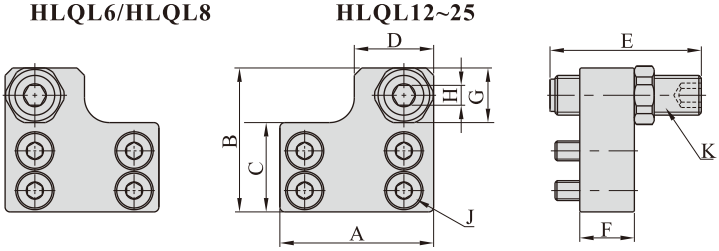
HLQ12~25 **HLQ6/HLQ8**



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	M2.5Length:6	M6×1.0
8	5	24	22	13	14	21.5	8.5	11	4	M3Length:8	M8×1.0
12	5	31	29	18	16	31.5	11	11	4	M4Length:12	M8×1.0
16	5	37	36	21.5	18	24	12	14	5	M5Length:12	M10×1.0
20	5	45.5	44	25.5	23	28	15	17	6	M5Length:16	M12×1.0
25	5	54	53.5	31.6	28	32	16	19	6	M6Length:18	M14×1.5

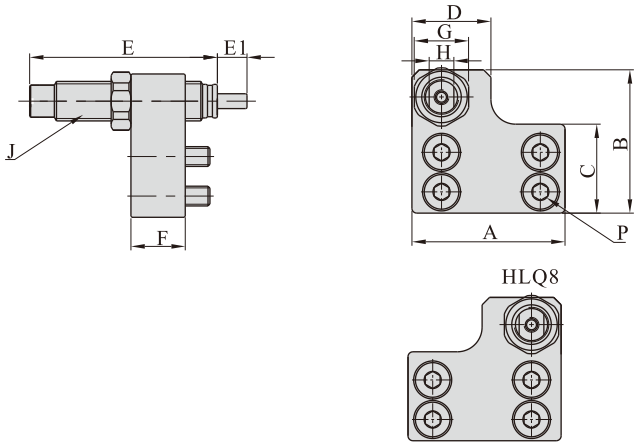
AF: Adjustable rubber stopper(Retraction, for symmetrical)

HLQL6/HLQL8 **HLQL12~25**



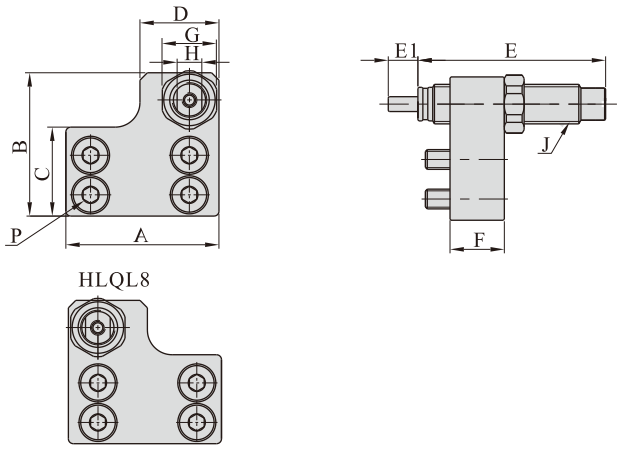
Bore size\Item	Adjusting stroke range	A	B	C	D	E	F	G	H	J	K
6	5	18	19	11	8	21.5	7	8	3	M2.5Length:6	M6×1.0
8	5	24	22	13	14	21.5	8.5	11	4	M3Length:8	M8×1.0
12	5	31	29	18	16	31.5	11	11	4	M4Length:12	M8×1.0
16	5	37	36	21.5	18	24	12	14	5	M5Length:12	M10×1.0
20	5	45.5	44	25.5	23	28	15	17	6	M5Length:16	M12×1.0
25	5	54	53.5	31.6	28	32	16	19	6	M6Length:18	M14×1.5

BF: Shock absorber(Retraction, for standard)



Bore size\Item	A	B	C	D	E	E1	F	G	H	J	P
8	24	22	13	14	40	6	8.5	11	7	M8×1.0	M3Length:8
12	31	29	18	16	40	6	11	11	7	M8×1.0	M4Length:12
16	37	36	21.5	18	49	7	12	14	9	M10×1.0	M5Length:12
20	45.5	44	25.5	23	53.5	10	15	17	11	M12×1.0	M5Length:16
25	54	53.5	31.6	28	68.5	12	16	19	12	M14×1.5	M6Length:18

BF: Shock absorber(Retraction, for symmetrical)



Bore size\Item	A	B	C	D	E	E1	F	G	H	J	P
8	24	22	13	14	40	6	8.5	11	7	M8×1.0	M3Length:8
12	31	29	18	16	40	6	11	11	7	M8×1.0	M4Length:12
16	37	36	21.5	18	49	7	12	14	9	M10×1.0	M5Length:12
20	45.5	44	25.5	23	53.5	10	15	17	11	M12×1.0	M5Length:16
25	54	53.5	31.6	28	68.5	12	16	19	12	M14×1.5	M6Length:18