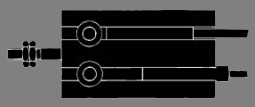


Free Mount Cylinder

Series CU

ø6, ø10, ø16, ø20, ø25, ø32

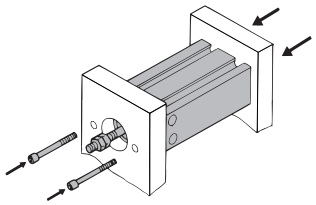
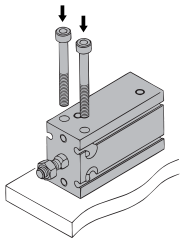
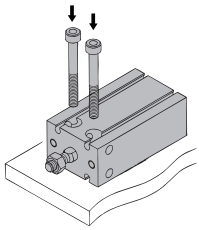
A space-saving air cylinder with multiple surfaces for mounting. The series consist of an array of cylinders.

Space-saving

Having a square shape without a bracket, any of its surfaces can be used for mounting, thus enabling a space saving equipment layout.

Auto switch capable

Mounting

Axial mounting (Body tapped hole)	Vertical mounting (Body through-hole)	Lateral mounting (Body through-hole)
		

Series Variations

Series	Action	Rod	Basic	Standard variations: Built-in magnet	Standard variations: Copper-free	Bore size (mm)	Page
Standard *Series CU* 	Double acting	Single rod	●	●	●	6, 10, 16, 20, 25, 32	7-3-4
		Double rod	●	●	●		7-3-10
	Single acting	Single rod (Spring return/ Spring extend)	●	●	●		7-3-15
Non-rotating Rod *Series CUK* 	Double acting	Single rod	●	●	●		7-3-24
		Double rod	●	●	●		7-3-28
	Single acting	Single rod (Spring return/ Spring extend)	●	●	●		7-3-32
Long Stroke, Standard *Series CU* 	Double acting	Single rod	●	●	●	6, 10, 16, 20, 25, 32	7-3-38
Long Stroke, Non-rotating Rod *Series CUK* 	Double acting	Single rod	●	●	●		7-3-42

Applicable Auto Switch

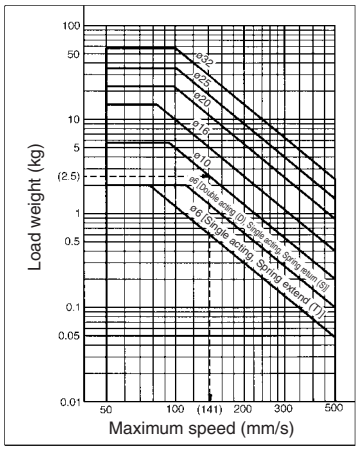
Direct mounting	Reed switch	D-A9□, D-A9□V
	Solid state switch	D-M9□, D-M9□V D-F9□W, D-F9□WV

Precautions on Free Mount

1. Operating speed

Make sure to connect a speed controller to the cylinder and adjust its speed to 500 mm/s or less.
If a load is to be attached to the end of the rod, adjust the speed to the maximum speed shown in Graph (1) or less, in accordance with the added mass.

Graph (1) Load Weight and Maximum Speed



How to read the graph
- Using the CU10 to drive a load weighing 2.5 kg: From the vertical axis in the graph on the left, extend the horizontally from 2.5 kg., and drop down from the point at which it intersects with the tube bore ø10. The maximum speed will be 141 mm/s.

2. Rod end allowable lateral load

Make sure that the lateral load that is applied to the rod end will be no more than the values shown in the tables.
The tables show the value for a single rod. For double rods, please contact SMC.

Standard Double Acting, Single Rod

Without auto switch: CU□-□D (N)

Model	Stroke (mm)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
CU6	0.085	0.075	0.068	0.061	0.056	0.052	0.045	0.039	0.035	—	—	—	—
CU10	0.34	0.30	0.27	0.25	0.23	0.21	0.18	0.16	0.15	—	—	—	—
CU16	0.69	0.61	0.55	0.50	0.46	0.43	0.37	0.33	0.29	—	—	—	—
CU20	2.2	2.0	1.8	1.6	1.5	1.4	1.2	1.1	1.0	0.92	0.85	0.78	0.73
CU25	3.5	3.2	3.0	2.7	2.6	2.4	2.1	1.9	1.7	1.6	1.4	1.3	1.2
CU32	5.4	4.9	4.6	4.3	4.0	3.8	3.3	3.0	2.8	2.5	2.3	2.2	2.0

With auto switch: CDU□-□D (N)

Model	Stroke (mm)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
CDU6	0.085	0.075	0.068	0.061	0.056	0.052	0.045	0.039	0.035	—	—	—	—
CDU10	0.34	0.30	0.27	0.25	0.23	0.21	0.18	0.16	0.15	—	—	—	—
CDU16	0.99	0.89	0.81	0.74	0.69	0.64	0.56	0.50	0.45	—	—	—	—
CDU20	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.6	1.4	1.3	1.2	1.1	1.0
CDU25	4.7	4.3	4.0	3.7	3.5	3.2	2.9	2.6	2.4	2.2	2.0	1.9	1.7
CDU32	7.1	6.6	6.1	5.7	5.4	5.1	4.6	4.1	3.8	3.5	3.2	3.0	2.8

Single Acting, Spring Return (S)

Without auto switch: CU□-□S (N)

Model	Stroke (mm)		
	5	10	15
CU6	0.19	0.17	0.15
CU10	0.66	0.59	0.60
CU16	1.4	1.3	1.3
CU20	4.7	4.2	4.4
CU25	6.8	6.2	6.5
CU32	10	9.8	10

With auto switch: CDU□-□S (N)

Model	Stroke (mm)		
	5	10	15
CDU6	0.17	0.15	0.13
CDU10	0.66	0.59	0.60
CDU16	1.6	1.5	1.5
CDU20	5.3	4.8	4.9
CDU25	7.6	7.0	7.2
CDU32	12	11	11

Single Acting, Spring Extend (T)

Without auto switch: CU□-□T (N)

Model	Stroke (mm)		
	5	10	15
CU6	0.067	0.059	0.052
CU10	0.29	0.26	0.24
CU16	0.99	0.89	0.81
CU20	2.2	2.0	1.8
CU25	3.5	3.2	3.0
CU32	5.4	4.9	4.6

With auto switch: CDU□-□T (N)

Model	Stroke (mm)		
	5	10	15
CDU6	0.062	0.055	0.049
CDU10	0.29	0.26	0.24
CDU16	0.99	0.89	0.81
CDU20	3.0	2.7	2.5
CDU25	4.7	4.3	4.0
CDU32	7.1	6.6	6.1

Non-rotating Rod Type

Without auto switch: CUK□-□D (N)

Model	Stroke (mm)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
CUK6	0.075	0.068	0.061	0.056	0.052	0.048	0.042	0.037	0.033	—	—	—	—
CUK10	0.30	0.27	0.25	0.23	0.21	0.20	0.17	0.15	0.14	—	—	—	—
CUK16	0.55	0.50	0.46	0.43	0.40	0.37	0.33	0.29	0.26	—	—	—	—
CUK20	1.8	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.92	0.85	0.78	0.73	0.68
CUK25	3.0	2.7	2.6	2.4	2.2	2.1	1.9	1.7	1.6	1.4	1.3	1.2	1.2
CUK32	4.3	4.0	3.8	3.5	3.3	3.2	2.9	2.6	2.4	2.2	2.1	2.0	1.8

With auto switch: CDUK□-□D (N)

Model	Stroke (mm)												
	5	10	15	20	25	30	40	50	60	70	80	90	100
CDUK6	0.075	0.068	0.061	0.056	0.052	0.048	0.042	0.037	0.033	—	—	—	—
CDUK10	0.30	0.27	0.25	0.23	0.21	0.20	0.17	0.15	0.14	—	—	—	—
CDUK16	0.81	0.74	0.69	0.64	0.60	0.56	0.50	0.45	0.41	—	—	—	—
CDUK20	2.5	2.3	2.1	2.0	1.9	1.8	1.6	1.4	1.3	1.2	1.1	1.0	1.0
CDUK25	4.0	3.7	3.5	3.2	3.1	2.9	2.6	2.4	2.2	2.0	1.9	1.7	1.6
CDUK32	5.7	5.4	5.1	4.8	4.6	4.4	4.0	3.6	3.4	3.1	2.9	2.7	2.6

Non-rotating Rod Type

Single Acting, Spring Return (S)

Without auto switch: CUK□-□S (N)

Model	Stroke (mm)		
	5	10	15
CUK6	0.17	0.15	0.14
CUK10	0.59	0.54	0.56
CUK16	1.1	1.0	1.1
CUK20	3.9	3.6	3.8
CUK25	5.7	5.3	5.7
CUK32	8.5	7.9	8.6

With auto switch: CDUK□-□S (N)

Model	Stroke (mm)		
	5	10	15
CDUK6	0.15	0.13	0.12
CDUK10	0.59	0.54	0.56
CDUK16	1.3	1.2	1.3
CDUK20	4.4	4.1	4.3
CDUK25	6.5	6.1	6.4
CDUK32	9.7	9.1	9.6

Non-rotating Rod Type

Single Acting, Spring Extend (T)

Without auto switch: CUK□-□T (N)

Model	Stroke (mm)		
	5	10	15
CUK6	0.059	0.052	0.047
CUK10	0.26	0.24	0.22
CUK16	0.81	0.74	0.69
CUK20	1.8	1.6	1.5
CUK25	3.0	2.7	2.6
CUK32	4.3	4.0	3.8

With auto switch: CDUK□-□T (N)

Model	Stroke (mm)		
	5	10	15
CDUK6	0.055	0.049	0.044
CDUK10	0.26	0.24	0.22
CDUK16	0.81	0.74	0.69
CDUK20	2.5	2.3	2.1
CDUK25	4.0	3.7	3.5
CDUK32	5.7	5.4	5.1

Free Mount Cylinder
Double Acting, Single Rod
Series CU
ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CU 6 — 30 D

With auto switch CDU 6 — 30 D — F9BW ☐

Built-in magnet

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

ø6, ø10, ø16	5, 10, 15, 20, 25, 30
ø20, ø25, ø32	5, 10, 15, 20, 25, 30, 40, 50

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m)∗			Pre-wire connector	Applicable load	
					DC		AC	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)			
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.

JIS Symbol

Double acting,
Single rod

Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.12 MPa	0.06 MPa		0.05 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, **10**, **16**	5, 10, 15, 20, 25, 30
20, **25**, **32**	5, 10, 15, 20, 25, 30, 40, 50

For "Long Stroke", refer to page 7-3-38.

Minimum Stroke for Auto Switch Mounting

(mm)

No. of auto switches mounted	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

Theoretical Output

(N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)		
				0.3	0.5	0.7
6	3	OUT	28.3	8.49	14.2	19.8
		IN	21.2	6.36	10.6	14.8
10	4	OUT	78.5	23.6	39.3	55.0
		IN	66.0	19.8	33.0	46.2
16	6	OUT	201	60.3	101	141
		IN	172	51.6	86.0	121
20	8	OUT	314	94.2	157	220
		IN	264	79.2	132	185
25	10	OUT	491	147	246	344
		IN	412	124	206	288
32	12	OUT	804	241	402	563
		IN	691	207	346	454

Weight

/( ): Denotes the values with D-A93.

(g)

Model	Cylinder stroke (mm)							
	5	10	15	20	25	30	40	50
C(D)U6-□D	22 (27)	25 (35)	28 (38)	31 (41)	34 (44)	37 (47)	—	—
C(D)U10-□D	36 (41)	40 (50)	44 (54)	48 (58)	52 (62)	56 (66)	—	—
C(D)U16-□D	50 (75)	56 (86)	62 (92)	68 (98)	74 (104)	80 (110)	—	—
C(D)U20-□D	95 (128)	106 (143)	117 (154)	128 (165)	139 (176)	150 (187)	172 (209)	194 (231)
C(D)U25-□D	176 (230)	193 (252)	210 (269)	227 (286)	244 (303)	261 (320)	295 (354)	329 (388)
C(D)U32-□D	262 (335)	286 (364)	310 (388)	334 (412)	358 (436)	382 (460)	430 (508)	478 (556)

∗ For the auto switch weight, refer to page 7-9-1.

Made to Order Specifications (For details, refer to page 7-10-1.)

Symbol	Specifications
-XB6	Heat resistant cylinder (150°C)
-XB7	Cold resistant cylinder
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC18	NPT finish piping port
-XC19	Intermediate stroke (Compliant for spacer)
-XC22	Fluoro rubber seals

Refer to "Pneumatic Clean Series" catalog for clean room specifications.

Tightening Torque

When mounting Series CU, refer to the below table.

Bore size (mm)	Hexagon socket head cap screw dia. (mm)	Proper tightening torque (N·m)
6, **10**	M3	1.08 ±10%
16	M4	2.45 ±10%
20, **25**	M5	5.10 ±10%
32	M6	8.04 ±10%

Copper-free

20-CU **Bore size** — **Stroke** **D**

•Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Minimum Operating Pressure

(MPa)

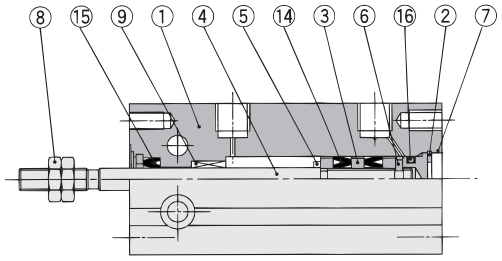
Bore size (mm)	6	10, 16	20, 25, 32
Minimum operating pressure	0.12	0.06	0.05

Specifications

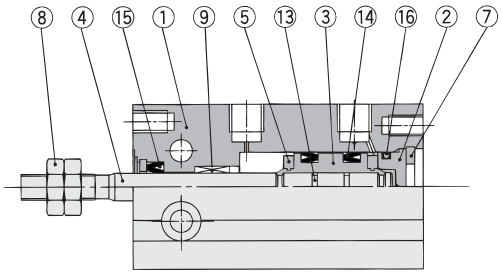
Action	Double acting, Single rod
Bore size (mm)	6, 10, 16, 20, 25, 32
Maximum operating pressure	1.05 MPa
Cushion	Rubber bumper
Stroke	Same as standard model (Refer to page 7-3-4.)
Auto switch	Mountable

Construction

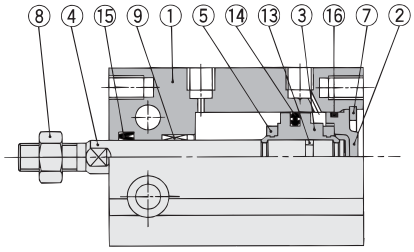
ø6



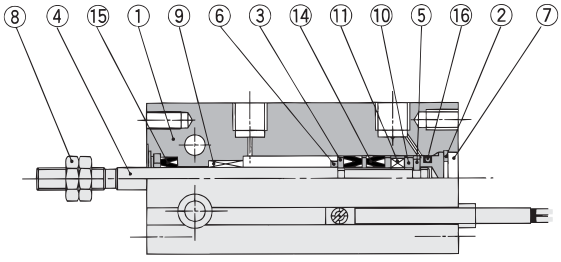
ø10

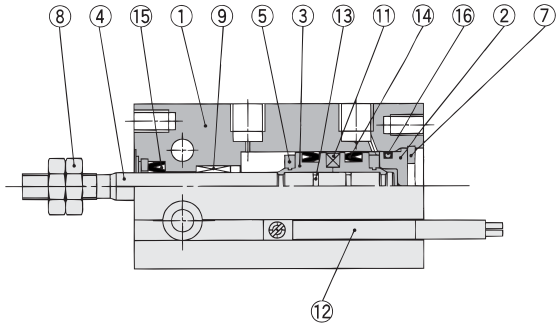


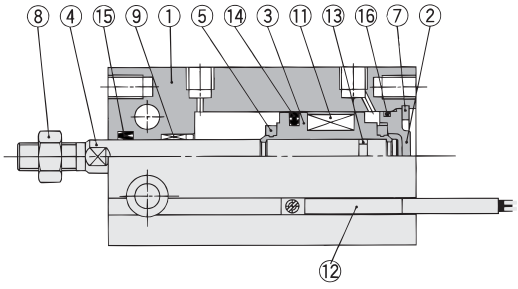
ø16 to ø32



With auto switch







Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
③	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
④	Piston rod	Stainless steel	
⑤	Bumper A	Urethane	
⑥	Bumper B	Urethane	
⑦	Snap ring	Carbon tool steel	Phosphate coated
⑧	Rod end nut	Carbon steel	Nickel plated
⑨	Bushing	Oil-impregnated sintered alloy	
⑩	Magnet holder	Brass	ø6
⑪	Magnet	Magnetic material	
⑫	Auto switch	—	
⑬	Piston gasket	NBR	
⑭*	Piston seal		
⑮*	Rod seal		
⑯*	Gasket		

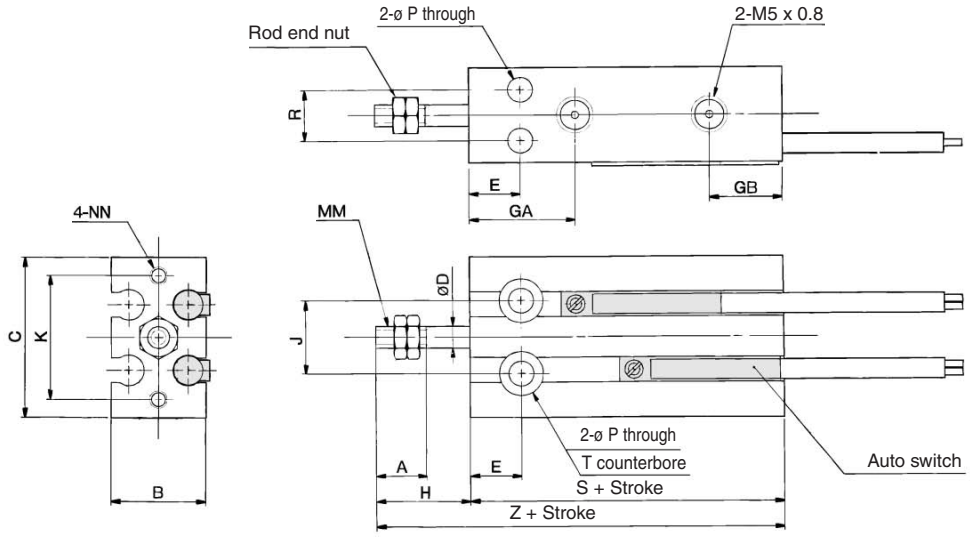
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
10	CU10D-PS	Set of nos. above ⑭, ⑮, ⑯
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

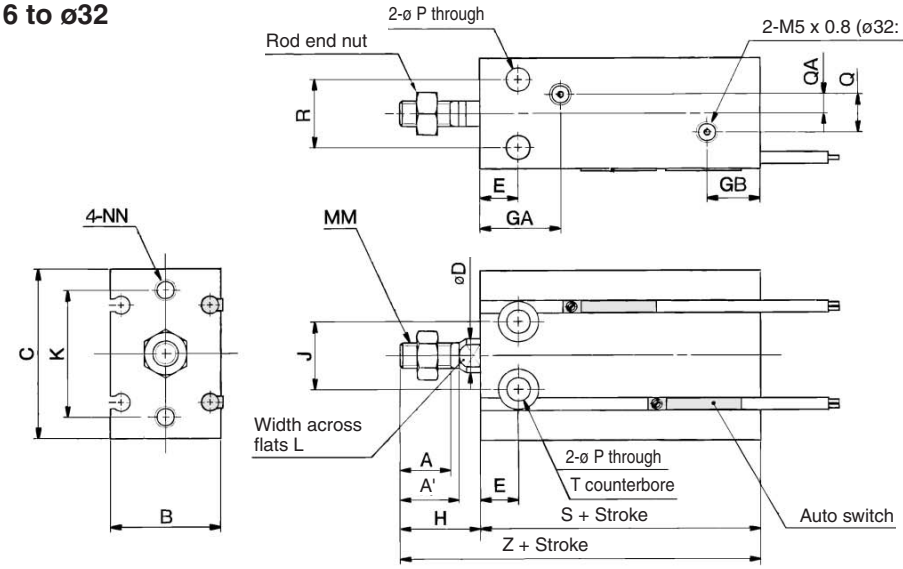
* Seal kit includes ⑭, ⑮, ⑯. Order the seal kit, based on each bore size.

Dimensions: Double Acting, Single Rod

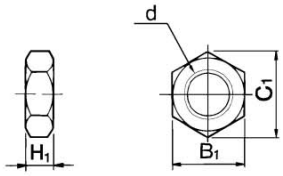
ø6, ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

Part no.	Applicable bore (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

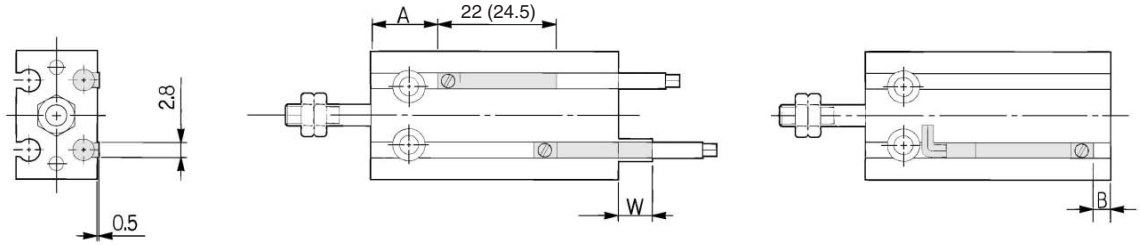
Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA
6	7	—	13	22	3	7	15	10	13	10	17	—	M3 x 0.5	M3 x 0.5 depth 5	3.2	—	—
10	10	—	15	24	4	7	16.5	10	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	—
16	11	12.5	20	32	6	7	16.5[Note]	11.5	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2
20	12	14	26	40	8	9	19	12.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9	4.5
25	15.5	18	32	50	10	10	21.5	13	23	20	38	8	M8 x 1.25	M5 x 0.8 depth 8	5.5	9	4.5
32	19.5	22	40	62	12	11	23	12.5	27	24	48	10	M10 x 1.25	M6 x 1.0 depth 9	6.6	13.5	4.5

Bore size (mm)	R	T	Without auto switch		With auto switch	
			S	Z	S	Z
6	7	6 depth 4.8	33	46	33	46
10	9	6 depth 5	36	52	36	52
16	12	7.6 depth 6.5	30	46	40	56
20	16	9.3 depth 8	36	55	46	65
25	20	9.3 depth 9	40	63	50	73
32	24	11 depth 11.5	42	69	52	79

Note) 5 stroke (CU16-5D): 14.5 mm

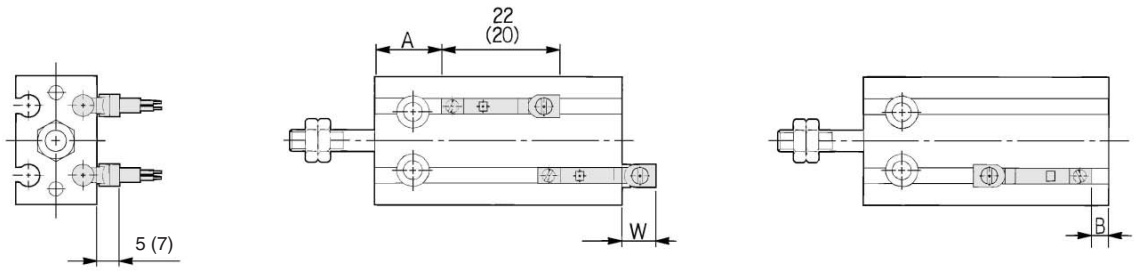
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A9□
D-M9□
D-F9□W



( ): Denotes the values of D-A93.

D-A9□V
D-M9□V
D-F9□WV



( ): Denotes the values of D-M9□V, D-F9□WV.

CDU Double Acting, Single Rod

Bore size (mm)	D-A9□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
	A	B	W	A	B	W	A	B	W
6	13.5	–0.5	2.5(5)	17.5	3.5	6.5	17.5	3.5	4.5
10	12.5	3.5	–1.5(1)	16.5	7.5	2.5	16.5	7.5	0.5
16	16	4	–2(0.5)	20	8	1.5	20	8	–0.5
20	20	6	–4(–1.5)	24	10	0	24	10	–2
25	22.5	7	–5.5(–3)	26.5	11	–1.5	26.5	11	–3.5
32	23.5	8.5	–6.5(–4)	27.5	12.5	–2.5	27.5	12.5	–4.5

Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 2) In the case of the 5 stroke or the 10 stroke, there are times in which the switch will not turn OFF or 2 switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).

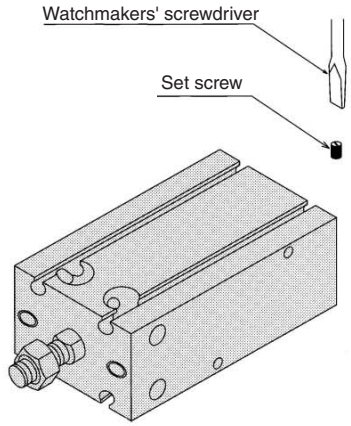
Operating Range

Auto switch model	Bore size (mm)					
	6	10	16	20	25	32
D-A9□/A9□V	5	6	9	11	12.5	14
D-M9□/M9□V	2.5	2.5	3.5	5	5	5
D-F9□W/F9□WV	3	3.5	5.5	6.5	7	7

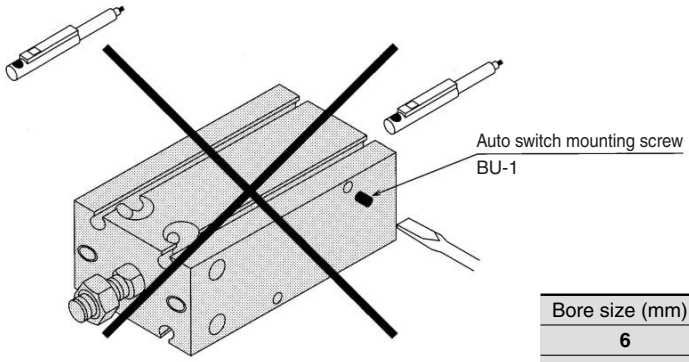
∗ Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.

Mounting of Auto Switch

D-A9□/M9□/A9□V/M9□V/F9□W/F9□WV

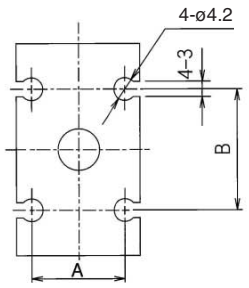


- When tightening an auto switch mounting screw, use a watchmakers' screwdriver with a grip diameter of 5 to 6 mm.
- Use a tightening torque of approximately 0.10 to 0.20 N·m.



- Never use BU-1 (Mounting screw for D-9□ auto switch).
(Auto switch may be damaged.)

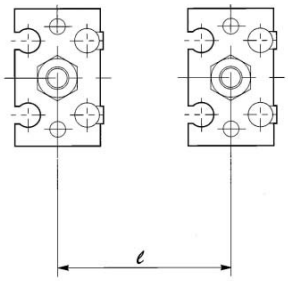
Auto Switch Groove



Bore size (mm)	A	B
6	8.2	9
10	10.3	13
16	15	18
20	21	23
25	27	25
32	35	27

Caution on Proximity Installation

When universal mounting cylinders equipped with D-A9□ or D-M9□ auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimensions shown in the table. Therefore, make sure to provide a greater clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shield plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.)



Bore size (mm)	Mounting pitch ℓ (mm)
6	18
10	20
16	33
20	40
25	46
32	56

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 7-9-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A90	Grommet (In-line)	Without indicator light
	D-A90V	Grommet (Perpendicular)	

∗ Normally closed (NC = b contact), solid state switch (D-F9G/F9H type) are also available. For details, refer to page 7-9-23.

Free Mount Cylinder
Double Acting, Double Rod
Series CUW
ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CUW **6** — **30** **D**

With auto switch CDUW **6** — **30** **D** — **F9BW** ☐

Built-in magnet

Double rod

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

ø6, ø10, ø16	5, 10, 15, 20, 25, 30
ø20, ø25, ø32	5, 10, 15, 20, 25, 30, 40, 50

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

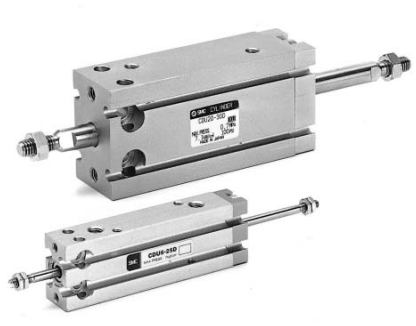
Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.



JIS Symbol
Double acting,
Double rod

Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.15 MPa	0.10 MPa		0.08 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, **10**, **16**	5, 10, 15, 20, 25, 30
20, **25**, **32**	5, 10, 15, 20, 25, 30, 40, 50

Minimum Stroke for Auto Switch Mounting (mm)

No. of auto switches mounted	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

Theoretical Output (N)

Bore size (mm)	Rod size (mm)	Piston area (mm^2)	Operating pressure (MPa)		
			0.3	0.5	0.7
6	3	21.2	6.36	10.6	14.8
10	4	66.0	19.8	33.0	46.2
16	6	172	51.6	86.0	121
20	8	264	79.2	132	185
25	10	412	124	206	288
32	12	691	207	346	484

Weight (g)

/( ): Denotes the values with D-A93.

Model	Stroke (mm)							
	5	10	15	20	25	30	40	50
C(D)UW6-□D	27 (32)	30 (40)	34 (44)	37 (47)	40 (50)	44 (54)	—	—
C(D)UW10-□D	44 (49)	49 (59)	53 (63)	58 (68)	62 (72)	67 (77)	—	—
C(D)UW16-□D	74 (99)	81 (111)	88 (118)	95 (125)	102 (132)	109 (139)	—	—
C(D)UW20-□D	132 (165)	145 (182)	158 (195)	171 (208)	184 (221)	197 (234)	223 (260)	250 (287)
C(D)UW25-□D	240 (294)	260 (319)	280 (339)	300 (359)	321 (380)	341 (400)	381 (440)	421 (480)
C(D)UW32-□D	365 (438)	394 (472)	422 (500)	451 (529)	479 (557)	508 (586)	586 (664)	622 (700)

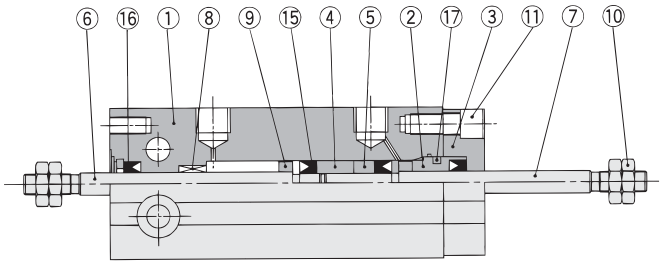
∗ For the auto switch weight, refer to page 7-9-1.

Tightening Torque

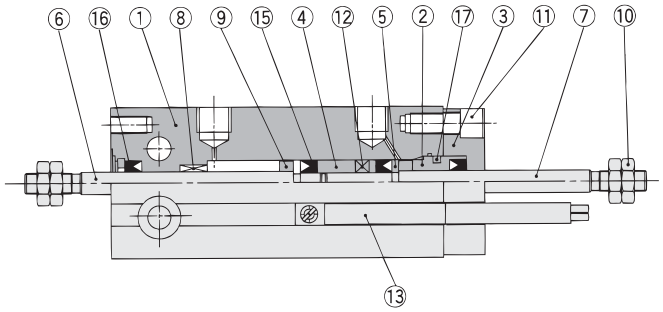
When mounting Series CUW, refer to page 7-3-5.

Construction

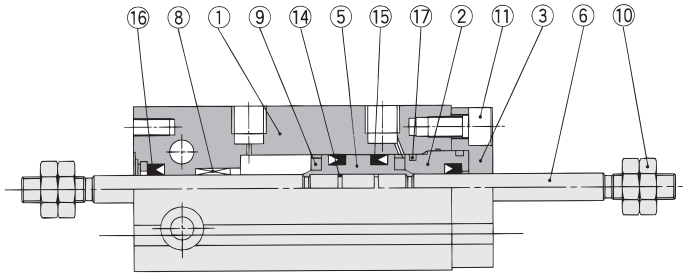
ø6

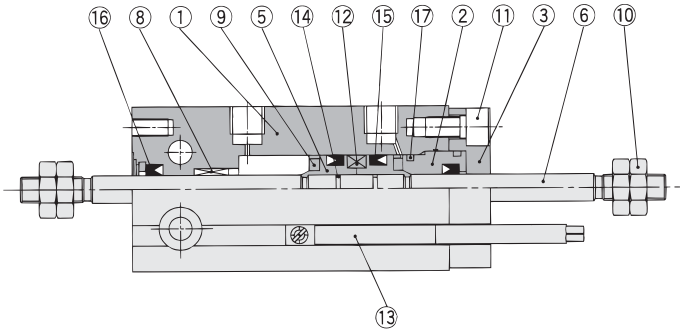


With auto switch

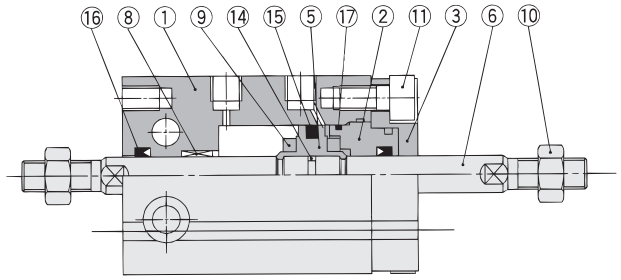


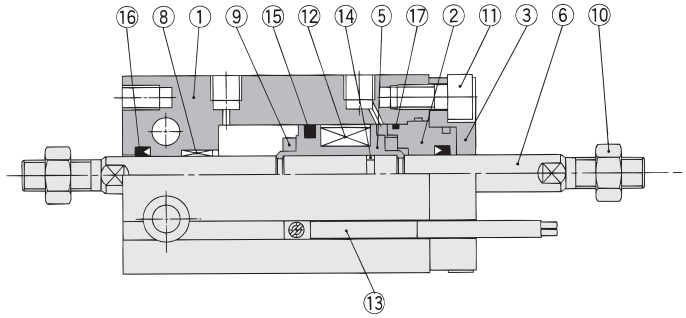
ø10





ø16 to 32





Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover	Aluminum bearing alloy	Chromated
③	Rod cover retainer	Aluminum alloy	Hard anodized
④	Piston	Brass	ø6
⑤	Piston	Brass	ø6, ø10
		Aluminum alloy	ø16 to ø32, Chromated
⑥	Piston rod	Stainless steel	
⑦	Piston rod	Stainless steel	ø6
⑧	Bushing	Oil-impregnated sintered alloy	

No.	Description	Material	Note
⑨	Bumper	Urethane	
⑩	Rod end nut	Carbon steel	Nickel plated
⑪	Hexagon socket head cap screw	Carbon steel	Nickel plated
⑫	Magnet	Magnetic material	
⑬	Auto switch	——	
⑭	Piston gasket	NBR	
⑮*	Piston seal		
⑯*	Rod seal		
⑰*	Gasket		

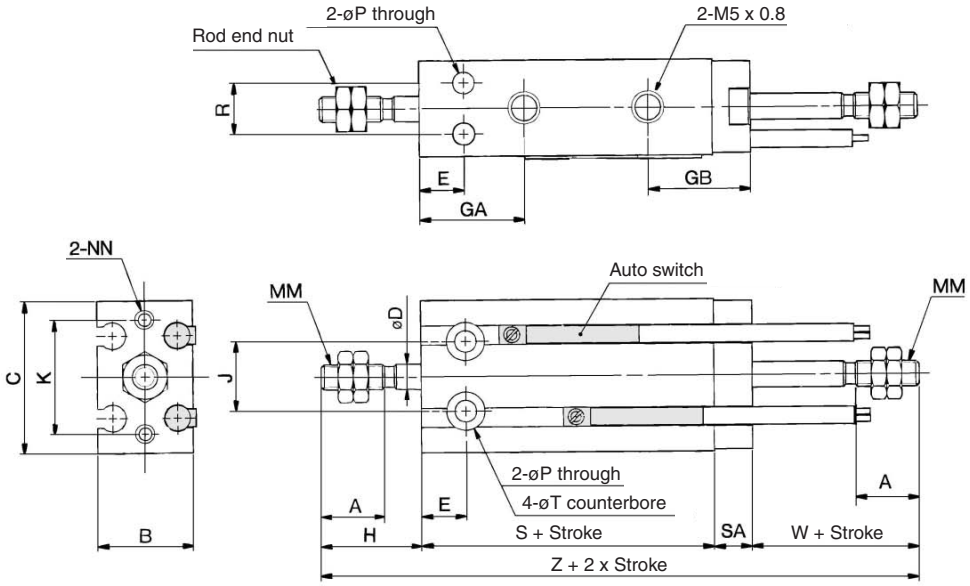
Replacement Parts: Seal Kit

	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
Kit no.	CUW10D-PS	CUW16D-PS	CUW20D-PS	CUW25D-PS	CUW32D-PS

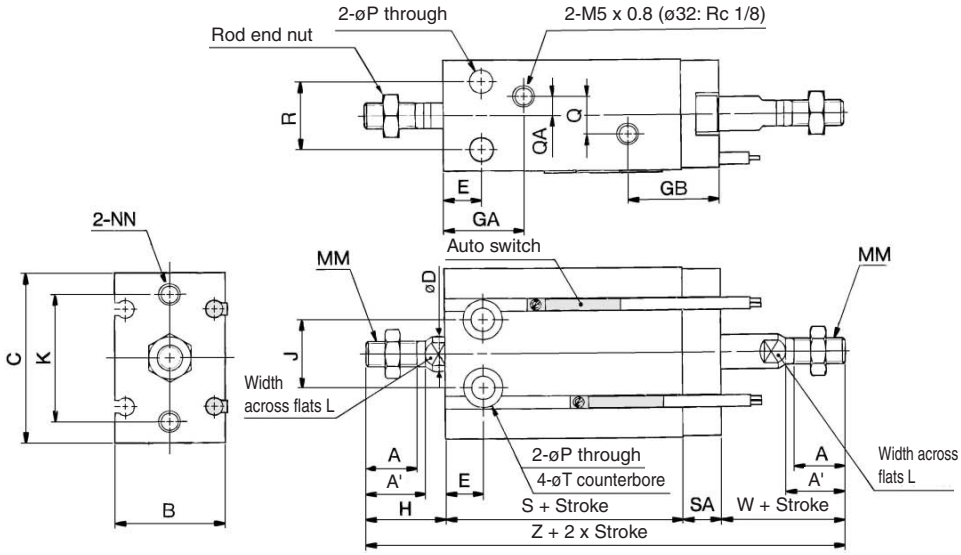
* Seal kit includes ⑮, ⑯, ⑰. Order the seal kit, based on each bore size.

Dimensions: Double Acting, Double Rod

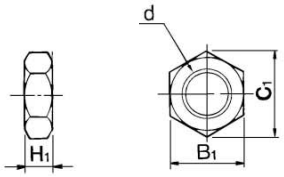
ø6, ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

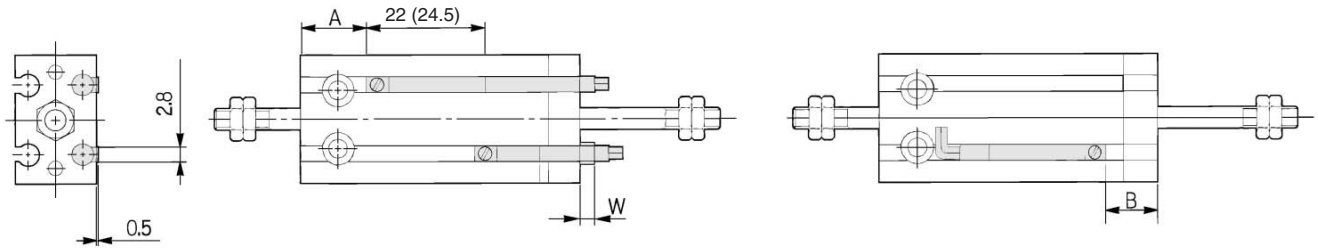
Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA
6	7	—	13	22	3	7	15	16	13	10	17	—	M3 x 0.5	M3 x 0.5 depth 5	3.2	—	—
10	10	—	15	24	4	7	16.5	16	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	—
16	11	12.5	20	32	6	7	16.5 Note)	19	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2
20	12	14	26	40	8	9	19	21.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9	4.5
25	15.5	18	32	50	10	10	21.5	22	23	20	38	8	M8 x 1.25	M5 x 0.8 depth 8	5.5	9	4.5
32	19.5	22	40	62	12	11	23	22.5	27	24	48	10	M10 x 1.25	M6 x 1.0 depth 9	6.6	13.5	4.5

Note) 5 stroke (CUW16-5D): GA = 14.5

Bore size (mm)	R	SA	T	W	Without auto switch		With auto switch	
					S	Z	S	Z
6	7	6	6 depth 4.8	13	38	70	38	70
10	9	6	6 depth 5	16	36	74	36	74
16	12	7.5	7.6 depth 6.5	16	30	69.5	40	79.5
20	16	9	9.3 depth 8	19	36	83	46	93
25	20	9	9.3 depth 9	23	40	95	50	105
32	24	10	11 depth 11.5	27	42	106	52	116

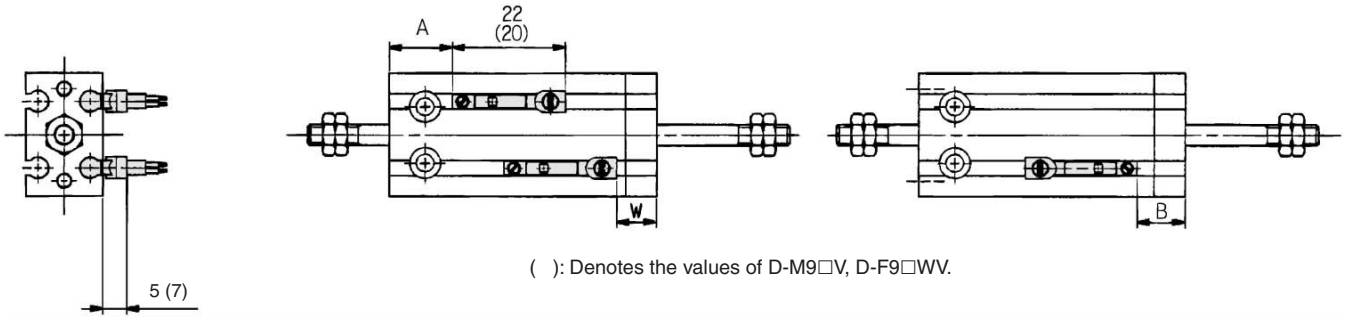
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A9□
D-M9□
D-F9□W



( ): Denotes the values of D-A93.

D-A9□V
D-M9□V
D-F9□WV



( ): Denotes the values of D-M9□V, D-F9□WV.

Bore size (mm)	D-A9□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
	A	B	W	A	B	W	A	B	W
6	13.5	5.5	–3.5(–1)	17.5	9.5	0.5	17.5	9.5	–1.5
10	12.5	9.5	–7.5(–5)	16.5	13.5	–3.5	16.5	13.5	–5.5
16	16	11.5	–9.5(–7)	20	15.5	5.5	20	15.5	–7.5
20	20	15	–13(–10.5)	24	19	–9	24	19	–11
25	22.5	16	–14.5(–12)	26.5	20	–10.5	26.5	20	–12.5
32	23.5	18.5	–16.5(–14)	27.5	22.5	–12.5	27.5	22.5	–14.5

Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 2) In the case of the 5 stroke or the 10 stroke, there are times in which the switch will not turn OFF or 2 switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).
Note 3) ( ) in column W is the dimensions of D-A93.

Free Mount Cylinder
Single Acting, Single Rod, Spring Return/Extend
Series CU
ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CU 10 — 15 S

With auto switch CDU 10 — 15 S — F9BW ☐

Built-in magnet

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

ø6, ø10, ø16 ø20, ø25, ø32	5, 10, 15

Action

S	Single acting, Spring return
T	Single acting, Spring extend

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

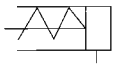
∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

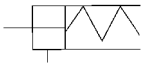
• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.

JIS Symbol

Single acting, Spring return



Single acting, Spring extend



Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.2 MPa	0.15 MPa		0.13 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread Note)					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					

Note) ø6 with auto switch type: One side rubber bumper

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, **10**, **16**, **20**, **25**, **32**	5, 10, 15

Minimum Stroke for Auto Switch Mounting (mm)

No. of auto switches mounted	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

Made to Order Specifications (For details, refer to page 7-10-1.)

Symbol	Specifications
-XC18	NPT finish piping port
-XC22	Fluoro rubber seals

Theoretical Output (N)

Action	Bore size (mm)	Operating pressure (MPa)		
		0.3	0.5	0.7
Spring return (S)	6	4.99	10.7	16.3
	10	16.7	32.4	48.1
	16	45.6	86.3	126
	20	73	136	199
	25	119	218	316
	32	207	368	529
Spring extend (T)	6	2.86	7.10	11.3
	10	12.9	26.1	39.3
	16	37.2	71.8	106
	20	58	111	164
	25	95	178	260
	32	173	312	450

For the reactive force of spring return, refer to page 7-12-3.

Weight/( ): Denotes the values with D-A93. (g)

Model	Stroke (mm)		
	5	10	15
C(D)U6-□S,T	22(27)	25(35)	28(38)
C(D)U10-□S,T	36(41)	40(50)	48(58)
C(D)U16-□S,T	50(75)	56(86)	71(101)
C(D)U20-□S,T	95(128)	106(143)	133(170)
C(D)U25-□S,T	176(230)	193(252)	235(294)
C(D)U32-□S,T	262(335)	286(364)	347(425)

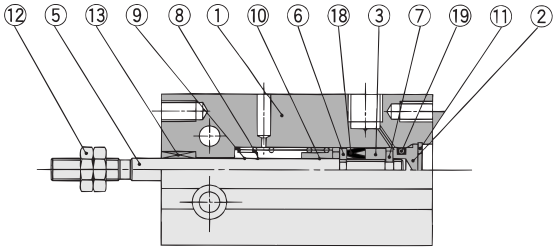
∗ For the weight of auto switch, refer to page 7-9-1.

Tightening Torque

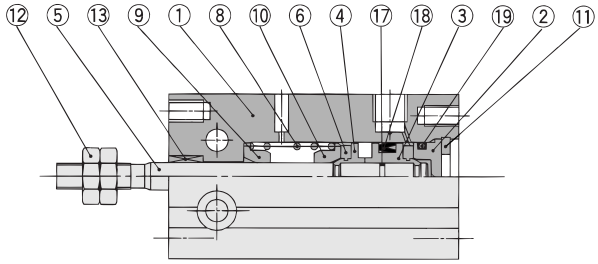
When mounting a CU single acting series, refer to page 7-3-5.

Construction

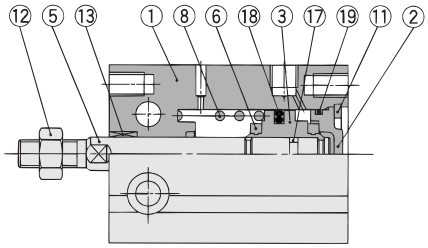
Single acting, Spring return



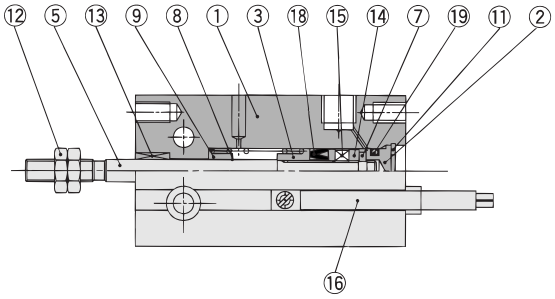
ø10

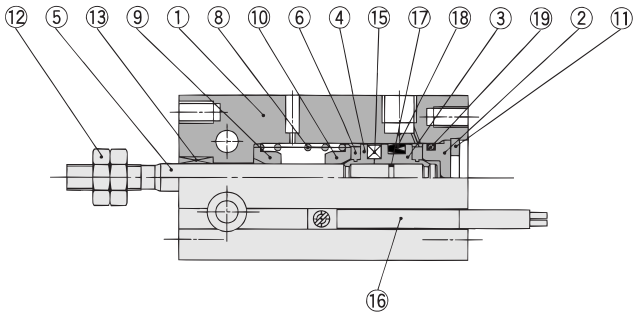


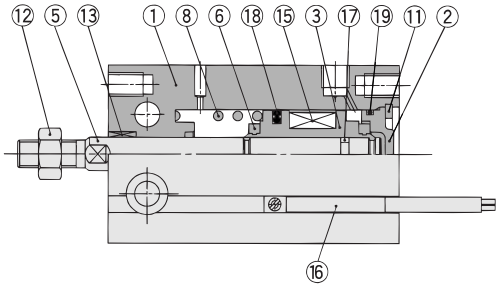
ø16 to ø32



With auto switch







Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
③	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
④	Piston	Brass	ø10
⑤	Piston rod	Stainless steel	
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	
⑧	Return spring	Piano wire	Zinc chromated

No.	Description	Material	Note
⑨	Spring seat	Brass	
⑩	Spring seat	Brass	
⑪	Snap ring	Carbon tool steel	Phosphate coated
⑫	Rod end nut	Carbon steel	Nickel plated
⑬	Bushing	Oil-impregnated sintered alloy	
⑭	Magnet holder	Brass	ø6
⑮	Magnet	Magnetic material	
⑯	Auto switch	—	
⑰	Piston gasket	NBR	
⑱ *	Piston seal		
⑲ *	Gasket		

Replacement Parts: Seal Kit

	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
Kit no.	CU10S-PS	CU16S-PS	CU20S-PS	CU25S-PS	CU32S-PS

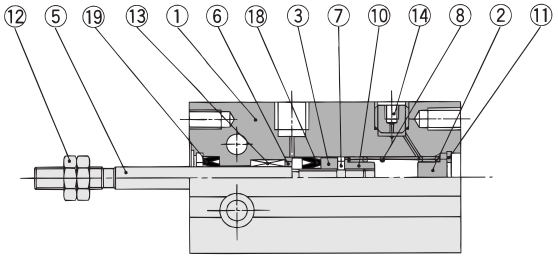
* Seal kit includes ⑱, ⑲. Order the seal kit, based on each bore size.

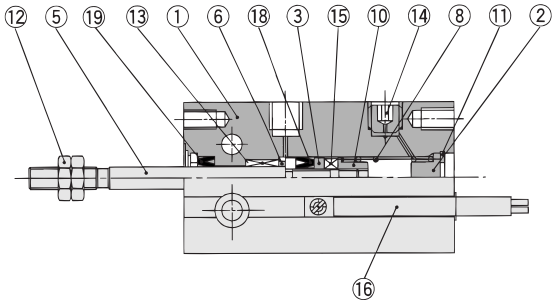
Construction

Single acting, Spring extend

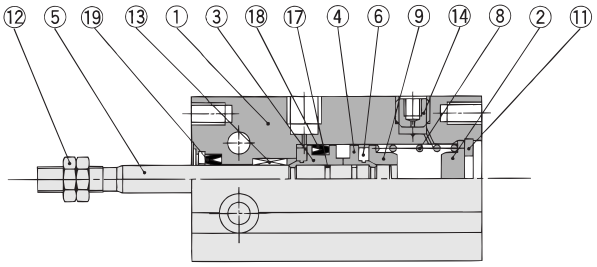
With auto switch

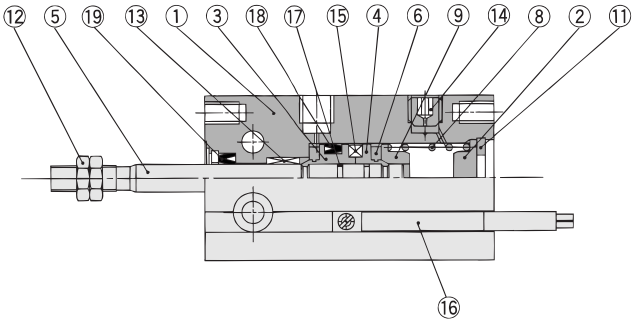
ø6



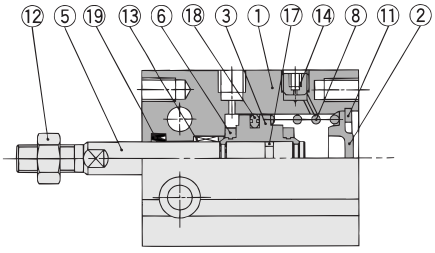


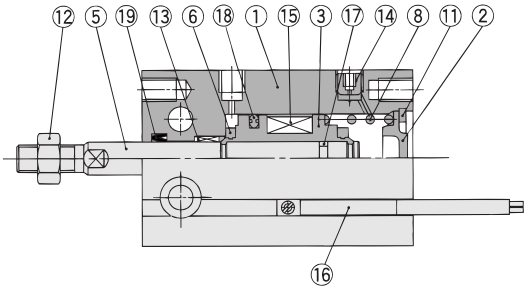
ø10





ø16 to ø32





Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
③	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
④	Piston	Brass	ø10
⑤	Piston rod	Stainless steel	
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	
⑧	Return spring	Piano wire	Zinc chromated

No.	Description	Material	Note
⑨	Spring seat	Brass	
⑩	Stopper	Brass	ø6
⑪	Snap ring	Carbon tool steel	Phosphate coated
⑫	Rod end nut	Carbon steel	Nickel plated
⑬	Bushing	Oil-impregnated sintered alloy	
⑭	Plug with fixed orifice	Alloy steel	Black zinc chromated
⑮	Magnet	Magnetic material	
⑯	Auto switch	—	
⑰	Piston gasket	NBR	
⑱*	Piston seal		
⑲*	Rod seal		

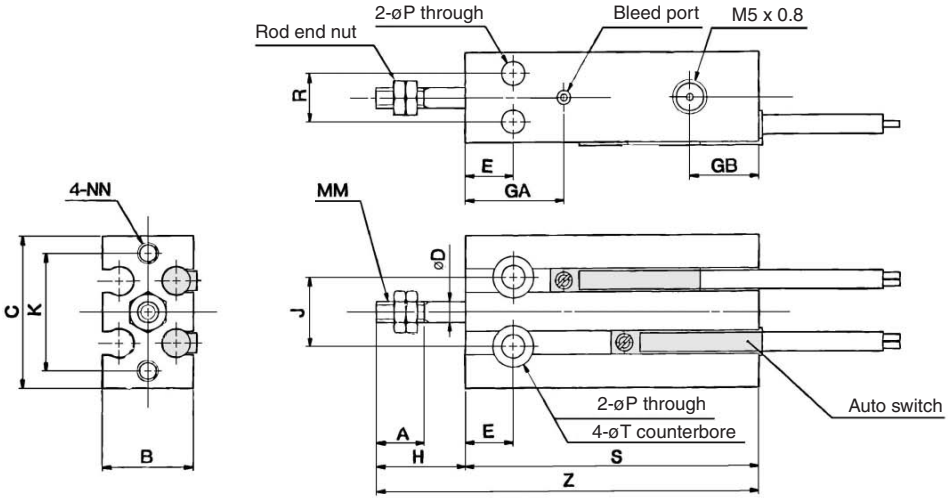
Replacement Parts: Seal Kit

	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
Kit no.	CU10T-PS	CU16T-PS	CU20T-PS	CU25T-PS	CU32T-PS

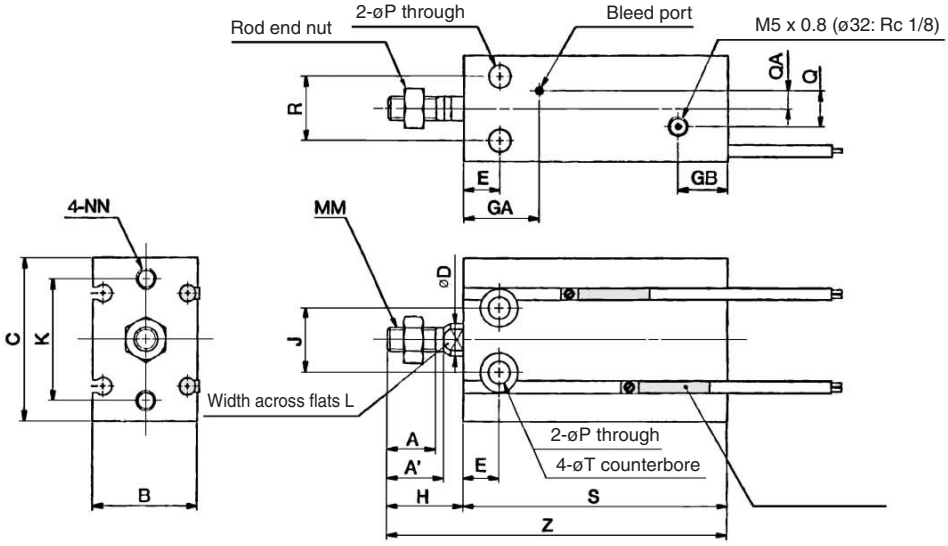
* Seal kit includes ⑱, ⑲. Order the seal kit, based on each bore size.

Dimensions: Single Acting, Spring Return

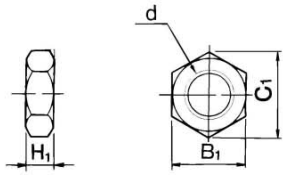
ø6, ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

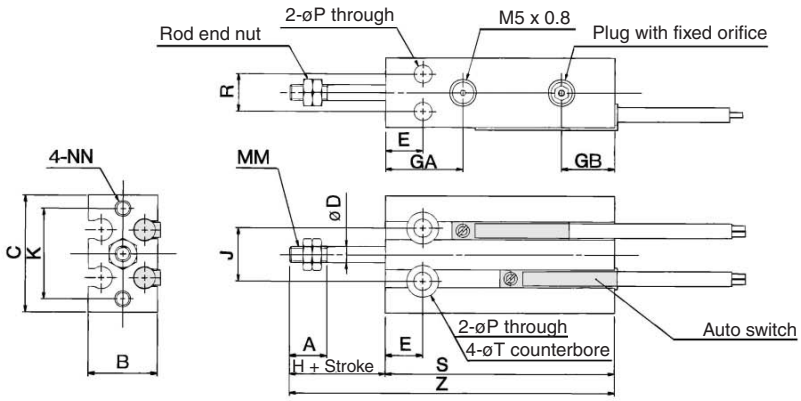
Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA	R	T
6	7	—	13	22	3	7	15	10	13	10	17	—	M3 x 0.5	M3 x 0.5 depth 5	3.2	—	—	7	6 depth 4.8
10	10	—	15	24	4	7	16.5	10	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	—	9	6 depth 5
16	11	12.5	20	32	6	7	16.5	11.5	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2	12	7.6 depth 6.5
20	12	14	26	40	8	9	19	12.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9	4.5	16	9.3 depth 8
25	15.5	18	32	50	10	10	21.5	13	23	20	38	8	M8 x 1.25	M5 x 0.8 depth 8	5.5	9	4.5	20	9.3 depth 9
32	19.5	22	40	62	12	11	23	12.5	27	24	48	10	M10 x 1.25	M6 x 1.0 depth 9	6.6	13.5	4.5	24	11 depth 11.5

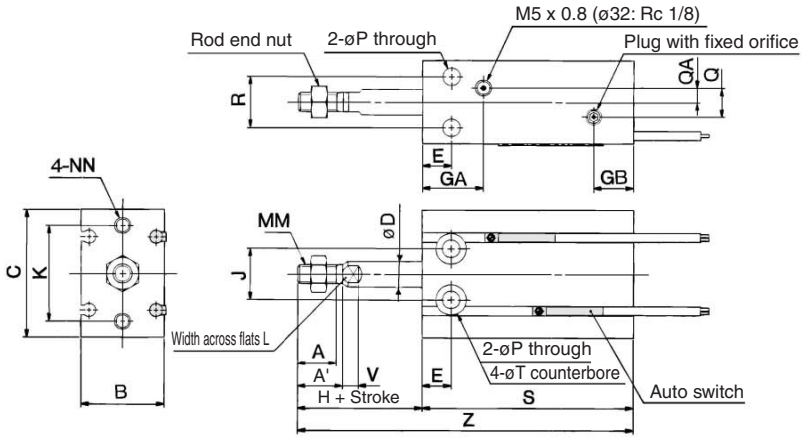
Bore size (mm)	Without auto switch						With auto switch					
	S			Z			S			Z		
	5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st
6	38	43	48	51	56	61	38	43	48	51	56	61
10	41	46	56	57	62	72	41	46	56	57	62	72
16	35	40	50	51	56	66	45	50	60	61	66	76
20	41	46	56	60	65	75	51	56	66	70	75	85
25	45	50	60	68	73	83	55	60	70	78	83	93
32	47	52	62	74	79	89	57	62	72	84	89	99

Dimensions: Single Acting, Spring Extend

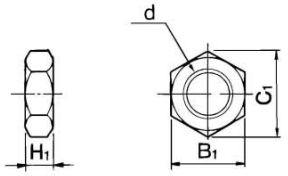
ø6, ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

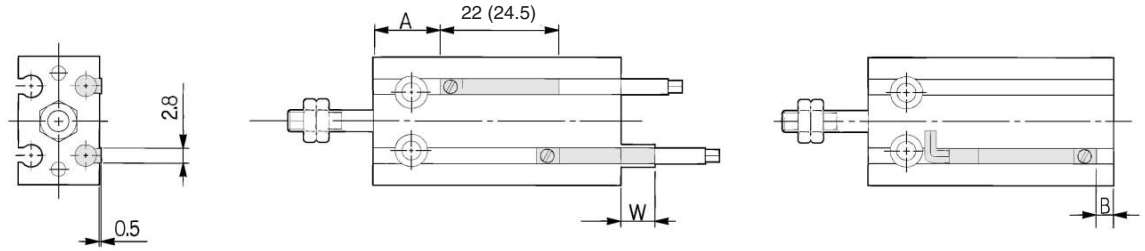
Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA	R	T	V
6	7	—	13	22	3	7	15	10	13	10	17	—	M3 x 0.5	M3 x 0.5 depth 5	3.2	—	—	7	6 depth 4.8	—
10	10	—	15	24	4	7	16.5	10	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	—	9	6 depth 5	—
16	11	12.5	20	32	6	7	16.5	11.5	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2	12	7.6 depth 6.5	3.5
20	12	14	26	40	8	9	19	12.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9	4.5	16	9.3 depth 8	5
25	15.5	18	32	50	10	10	21.5	13	23	20	38	8	M8 x 1.25	M5 x 0.8 depth 8	5.5	9	4.5	20	9.3 depth 9	5
32	19.5	22	40	62	12	11	23	12.5	27	24	48	10	M10 x 1.25	M6 x 1.0 depth 9	6.6	13.5	4.5	24	11 depth 11.5	5

Bore size (mm)	Without auto switch						With auto switch					
	S			Z			S			Z		
	5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st
6	38	43	48	56	66	76	38	43	48	56	66	76
10	41	46	56	62	72	87	41	46	56	62	72	87
16	45	50	60	66	76	91	45	50	60	66	76	91
20	41	46	56	65	75	90	51	56	66	75	85	100
25	45	50	60	73	83	98	55	60	70	83	93	108
32	47	52	62	79	89	104	57	62	72	89	99	114

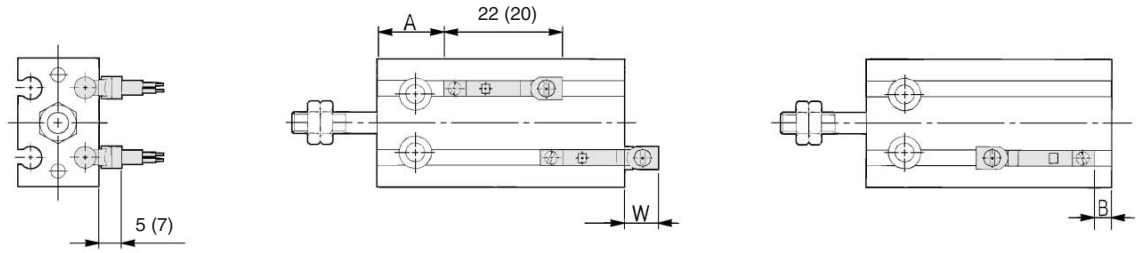
Proper Auto Switch Mounting Position and Its Mounting Height: Single Acting, Spring Return

D-A9□
D-M9□
D-M9□W



( ): Denotes the values of D-A93.

D-A9□V
D-M9□V
D-F9□WV



( ): Denotes the values of D-M9□V, D-F9□WV.

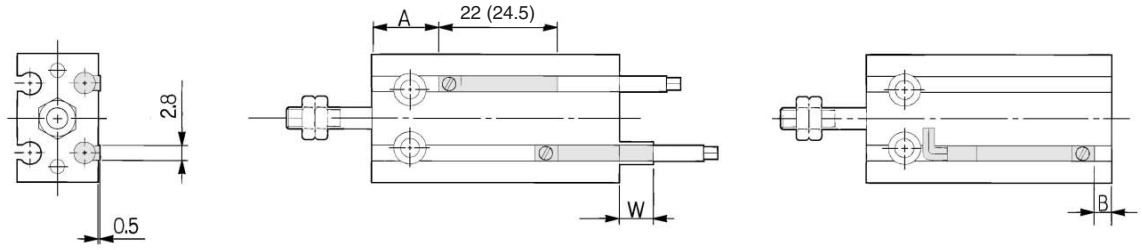
Single Acting, Spring Return

Bore size (mm)	Stroke	D-A9□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
		A	B	W	A	B	W	A	B	W
6	All stroke	13.5	0	2.5(5)	17.5	4	6.5	17.5	4	4.5
10	5, 10	12.5	3.5	–1.5(1)	16.5	7.5	2.5	16.5	7.5	0.5
	15	17.5			21.5			21.5		
16	5, 10	16	4	–2(0.5)	20	8	2	20	8	–0.5
	15	21			25			25		
20	5, 10	20	6	–4(–1.5)	24	10	0	24	10	–2
	15	25			29			29		
25	5, 10	22.5	7	–5.5(–3)	26.5	11	–1.5	26.5	11	–3.5
	15	27.5			31.5			31.5		
32	5, 10	23.5	8.5	–6.5(–4)	27.5	12.5	–2.5	27.5	12.5	–4.5
	15	28.5			32.5			32.5		

Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 2) In the case of the 5 stroke or the 10 stroke, there are times in which the switch will not turn OFF or 2 switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).
Note 3) ( ) in column W is the dimensions of D-A93.

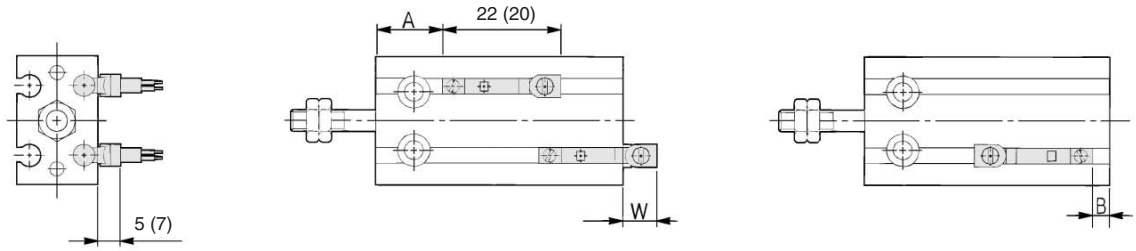
Proper Auto Switch Mounting Position and Its Mounting Height: Single Acting, Spring Extend

D-A9□
D-M9□
D-F9□W



( ): Denotes the values of D-A93.

D-A9□V
D-M9□V
D-F9□WV



( ): Denotes the values of D-M9□V, D-F9□WV.

Single Acting, Spring Extend

Bore size (mm)	Stroke	D-A9□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
		A	B	W	A	B	W	A	B	W
6	All stroke	10.5	1.5	0.5(3)	14.5	5.5	4.5	14.5	5.5	2.5
10	5, 10	12.5	3.5	–1.5(1)	16.5	7.5	2.5	16.5	7.5	0.5
	15		8.5	–6.5(–4)		12.5	–2.5		12.5	–4.5
16	5, 10	16	4	–2(0.5)	20	8	2	20	8	0
	15		9	–7(–4.5)		13	–3		13	–5
20	5, 10	20	6	–4(–1.5)	24	10	0	24	10	–2
	15		11	–9(–6.5)		15	–5		15	–7
25	5, 10	22.5	7	–5.5(–3)	26.5	11	–1.5	26.5	11	–3.5
	15		12	–10.5(–8)		16	–6.5		16	–8.5
32	5, 10	23.5	8.5	–6.5(–4)	27.5	12.5	–2.5	27.5	12.5	–4.5
	15		13.5	–11.5(–9)		17.5	–7.5		17.5	–9.5

Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 2) In the case of the 5 stroke or the 10 stroke, there are times in which the switch will not turn OFF or 2 switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).
Note 3) ( ) in column W is the dimensions of D-A93.

Free Mount Cylinder: Non-rotating Rod Type
Double Acting, Single Rod
Series CUK
ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CUK 6 — 30 D

With auto switch CDUK 6 — 30 D — F9BW ☐

Built-in magnet

Non-rotating rod type

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

ø6, ø10, ø16	5, 10, 15, 20, 25, 30
ø20, ø25, ø32	5, 10, 15, 20, 25, 30, 40, 50

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

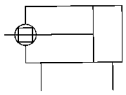
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93V	A93	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	○	○		
				2-wire		12 V		M9BV	M9B	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		F9NWV	F9NW	●	●	○	○	IC circuit	
				3-wire (PNP)				F9PWV	F9PW	●	●	○	○		
				2-wire		12 V		F9BWV	F9BW	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-5 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.

JIS Symbol
Double acting,
Single rod type



Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.15 MPa	0.10 MPa		0.08 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					
Rod non-rotating accuracy Note)	±0.8°			±0.5°		

Note) No load: Rod at retracted

Standard Stroke

Bore size (mm)	Standard stroke (mm)	
6, **10**, **16**	5, 10, 15, 20, 25, 30	For long stroke, refer to page 7-3-42.
20, **25**, **32**	5, 10, 15, 20, 25, 30, 40, 50	

Minimum Stroke for Auto Switch Mounting (mm)

No. of auto switches mounted	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

Weight /( ): Denotes the values with D-A93. (g)

Bore size (mm)	Stroke (mm)							
	5	10	15	20	25	30	40	50
C(D)UK6-□D	28 (33)	31 (41)	34 (44)	37 (47)	40 (50)	43 (53)	—	—
C(D)UK10-□D	43 (48)	47 (57)	51 (61)	55 (65)	59 (69)	63 (73)	—	—
C(D)UK16-□D	60 (85)	66 (96)	72 (102)	78 (108)	84 (114)	90 (120)	—	—
C(D)UK20-□D	113 (147)	124 (164)	136 (176)	148 (188)	160 (200)	172 (211)	195 (235)	219 (260)
C(D)UK25-□D	212 (266)	229 (288)	246 (305)	263 (322)	280 (339)	297 (356)	335 (390)	370 (424)
C(D)UK32-□D	331 (404)	357 (435)	383 (461)	409 (487)	435 (513)	461 (539)	513 (591)	565 (643)

∗ For the auto switch weight, refer to page 7-9-1.

Allowable Rotational Torque

Bore size (mm)	6	10	16	20	25	32
Allowable rotational torque (N·m)	0.0015	0.02	0.04	0.10	0.15	0.20

Made to Order Specifications (For details, refer to page 7-10-1.)

Symbol	Specifications
-XB6	Heat resistant cylinder (150°C)
-XB7	Cold resistant cylinder
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC18	NPT finish piping port
-XC19	Intermediate stroke (Compliant for spacer)
-XC22	Fluoro rubber seals
-XC34	Rod does not extend beyond non-rotating plate

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 7-13-3 to 7-13-6.

Operating Precautions

⚠ Caution

1. Do not place your fingers in the clearance between the non-rotating plate and the cylinder tube.
Your fingers could get caught between the non-rotating plate and the cylinder tube when the piston rod retracts. Therefore, never place your finger in this area.
Because the cylinder outputs a great force, it could lead to injury if precautions are not taken to prevent your fingers from getting caught.

2. When using the non-rotating style, make sure that rotational torque is not applied to the piston rod. If rotational torque must be applied due to unavoidable circumstances, make sure to use it at the allowable rotational torque or less, which is shown in the table on the right.

Tightening Torque

When mounting Series CUK, refer to page 7-3-5.

Theoretical Output

Specifications are the same as CU series double acting, single rod. Refer to page 7-3-5.

Auto Switch Mounting Position

For the auto switch mounting position of Series CDUK, refer to page 7-3-8, since specifications are the same as standard type, double acting, single rod type.

Copper-free

20-CUK **Bore size** — **Stroke** **D**

•Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Minimum Operating Pressure

(MPa)

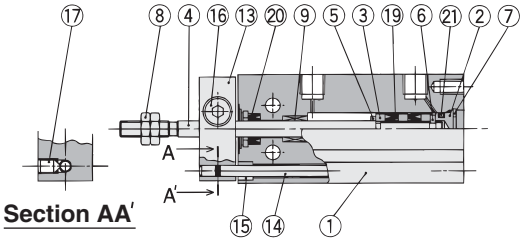
Bore size (mm)	6	10, 16	20, 25, 32
Minimum operating pressure	0.15	0.10	0.08

Specifications

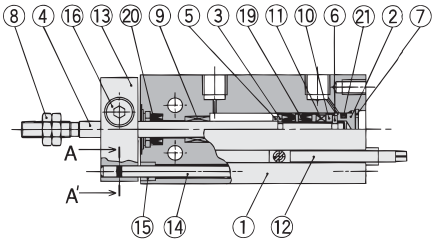
Action	Double acting, Single rod
Bore size (mm)	6, 10, 16, 20, 25, 32
Maximum operating pressure	1.05 MPa
Cushion	Rubber bumper
Stroke	Same as standard model (Refer to page 7-3-5.)
Auto switch	Mountable

Construction

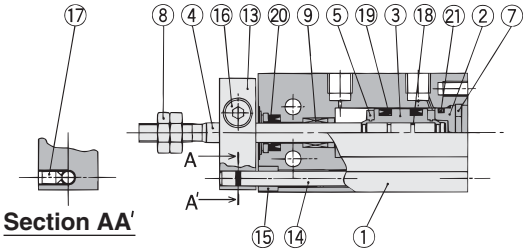
ø6

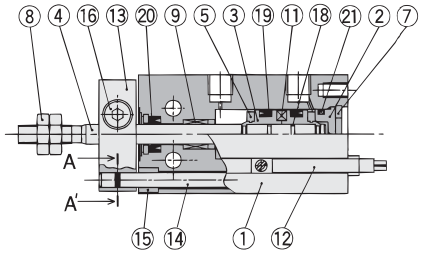


With auto switch

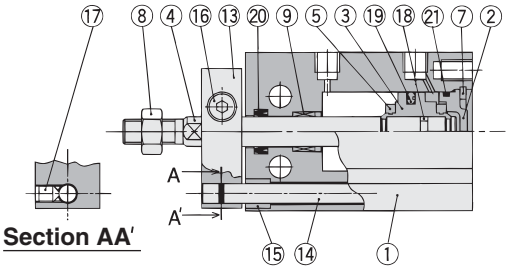


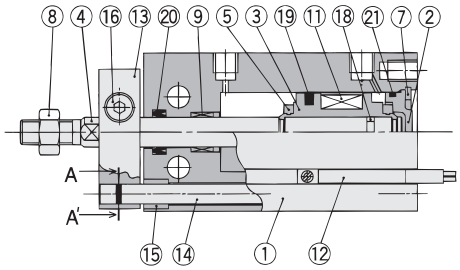
ø10





ø16 to ø32





Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
③	Piston	Brass	ø6 to ø10,
		Aluminum alloy	ø16 to ø32, Chromated
④	Piston rod	Stainless steel	
⑤	Bumper A	Urethane	
⑥	Bumper B	Urethane	
⑦	Snap ring	Carbon tool steel	Phosphate coated
⑧	Rod end nut	Carbon steel	Nickel plated
⑨	Bushing	Oil-impregnated sintered alloy	
⑩	Magnet holder	Brass	ø6

No.	Description	Material	Note
⑪	Magnet	Magnetic material	
⑫	Auto switch	———	
⑬	Non-rotating plate	Aluminum alloy	Nickel plated
⑭	Guide rod	Stainless steel	
⑮	Bushing	Oil-impregnated sintered alloy	
⑯	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑰	Hexagon socket head set screw	Carbon steel	Black zinc chromated
⑱	Piston gasket	NBR	
⑲ *	Piston seal		
⑳ *	Rod seal		
㉑ *	Gasket		

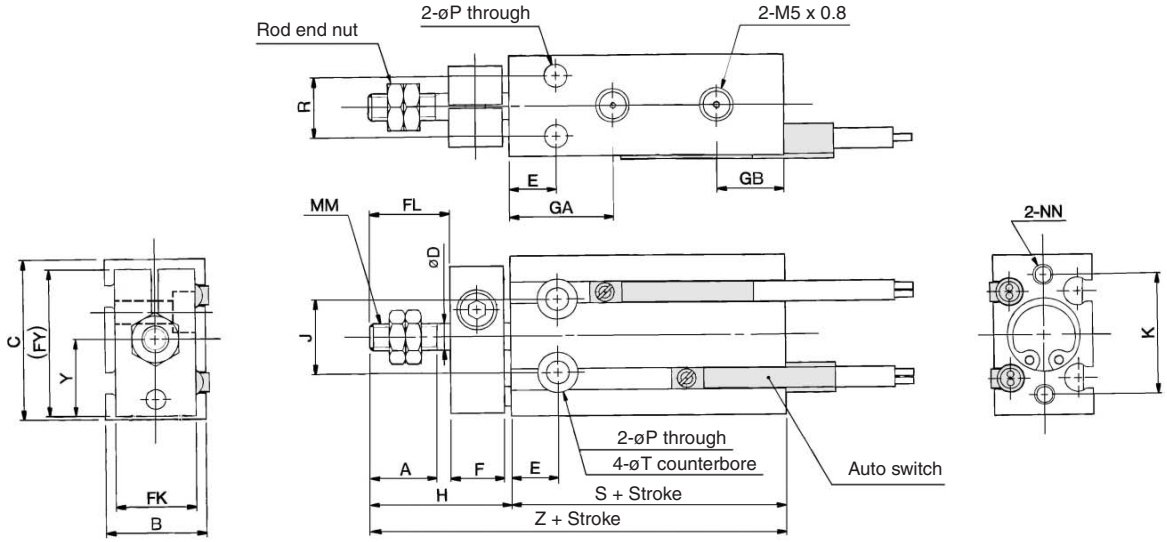
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
10	CU10D-PS	Set of nos. above ⑲, ⑳, ㉑.
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

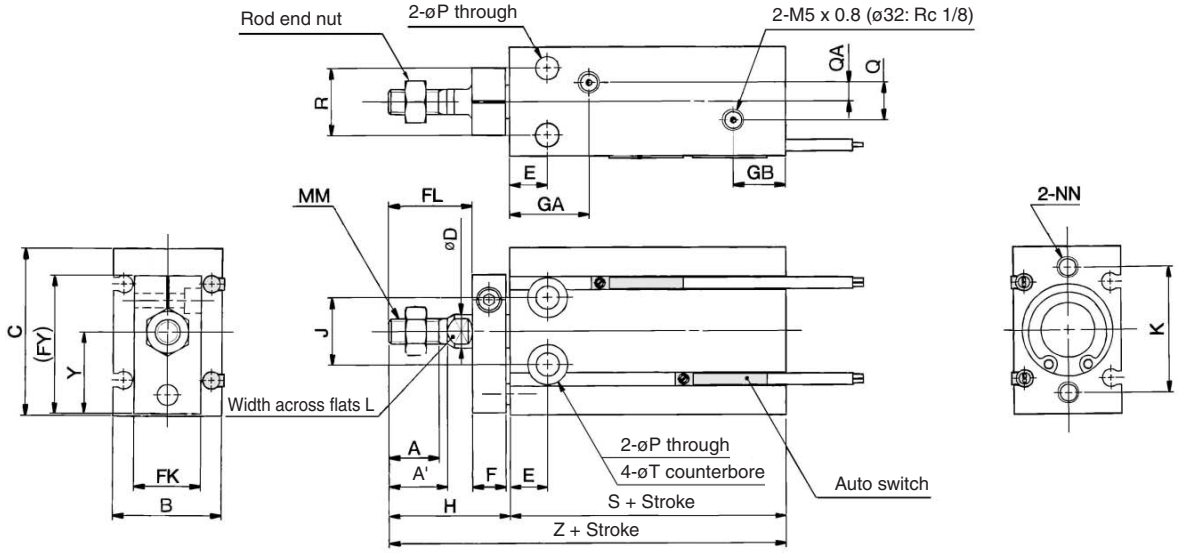
* Seal kit includes ⑲, ⑳, ㉑. Order the seal kit, based on each bore size.

Dimensions: Non-rotating Rod Type; Double Acting, Single Rod

ø6, ø10

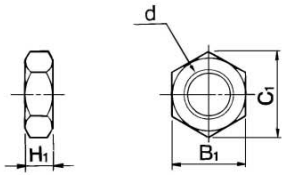


ø16 to ø32



Rod End Nut/Accessory

Material: Carbon steel



Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	F	FL	FK	FY	GA	GB	H	J	K	L	MM
6	7	—	13	22	3	7	8	9	11	20.5	15	10	18	10	17	—	M3 x 0.5
10	10	—	15	24	4	7	8	12	12	22	16.5	10	21	11	18	—	M4 x 0.7
16	11	12.5	20	32	6	7	8	17	13	28	16.5 Note)	11.5	26	14	25	5	M5 x 0.8
20	12	14	26	40	8	9	8	20	16	33	19	12.5	29	16	30	6	M6 x 1.0
25	15.5	18	32	50	10	10	10	22	20	43.5	21.5	13	33	20	38	8	M8 x 1.25
32	19.5	22	40	62	12	11	12	29	24	51.5	23	12.5	42	24	48	10	M10 x 1.25

Bore size (mm)	NN	P	Q	QA	R	T	Y	Without auto switch		With auto switch	
								S	Z	S	Z
6	M3 x 0.5 depth 5	3.2	—	—	7	6 depth 4.8	10.5	33	51	33	51
10	M3 x 0.5 depth 5	3.2	—	—	9	6 depth 5	11.5	36	57	36	57
16	M4 x 0.7 depth 6	4.5	4	2	12	7.6 depth 6.5	15.5	30	56	40	66
20	M5 x 0.8 depth 8	5.5	9	4.5	16	9.3 depth 8	19.5	36	65	46	75
25	M5 x 0.8 depth 8	5.5	9	4.5	20	9.3 depth 9	24.5	40	73	50	83
32	M6 x 1.0 depth 9	6.6	13.5	4.5	24	11 depth 11.5	30.5	42	84	52	94

Note) 5 stroke (CUK16-5D): GA = 14.5

Free Mount Cylinder: Non-rotating Rod Type
Double Acting, Double Rod
Series CUKW
ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CUKW 6 — 30 D

With auto switch CDUKW 6 — 30 D — F9BW ☐

- **Built-in magnet**
- **Non-rotating rod type**
- **Double rod**
- **Bore size**

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

- **Standard stroke (mm)**

ø6, ø10, ø16	5, 10, 15, 20, 25, 30
ø20, ø25, ø32	5, 10, 15, 20, 25, 30, 40, 50

- **Action**

D	Double acting

- **Auto switch**

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

- **Number of auto switches**

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.

Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.18 MPa	0.13 MPa		0.11 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					
Rod non-rotating accuracy Note)	±0.8°			±0.5°		

Note) No load: Rod in the non-rotating plate side at retracted

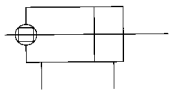
Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, **10**, **16**	5, 10, 15, 20, 25, 30
20, **25**, **32**	5, 10, 15, 20, 25, 30, 40, 50

Minimum Stroke for Auto Switch Mounting (mm)

No. of auto switches mounted	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

JIS Symbol
Non-rotating rod



Weight /( ): Denotes the values with D-A93. (g)

Model	Stroke (mm)							
	5	10	15	20	25	30	40	50
C(D)UKW6-□D	33 (38)	36 (46)	40 (50)	43 (53)	46 (56)	50 (60)	—	—
C(D)UKW10-□D	51 (56)	56 (66)	60 (70)	65 (75)	69 (79)	74 (84)	—	—
C(D)UKW16-□D	84 (109)	91 (121)	98 (128)	105 (135)	112 (142)	119 (149)	—	—
C(D)UKW20-□D	150 (185)	163 (203)	177 (217)	191 (231)	205 (245)	219 (259)	246 (286)	275 (315)
C(D)UKW25-□D	276 (330)	296 (355)	316 (375)	336 (395)	357 (416)	377 (436)	421 (476)	462 (516)
C(D)UKW32-□D	434 (507)	465 (543)	495 (573)	526 (604)	556 (634)	587 (665)	669 (747)	709 (787)

∗ For the auto switch weight, refer to page 7-9-1.

Theoretical Output

Specifications are the same as double acting, double rod (Series CUW). Refer to page 7-3-11.

Tightening Torque

When mounting Series CUKW, refer to page 7-3-5.

Allowable Rotational Torque

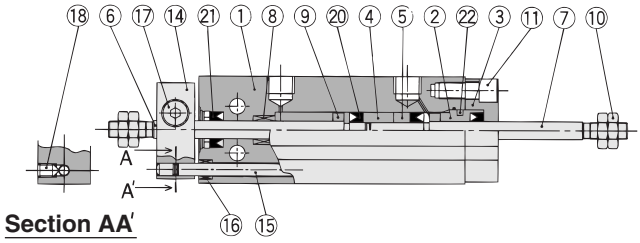
Ensure that rotational torque is not applied to the piston rod of Series CUKW. If rotational torque are applied unavoidably, refer to page 7-3-25.

Auto Switch Mounting Position

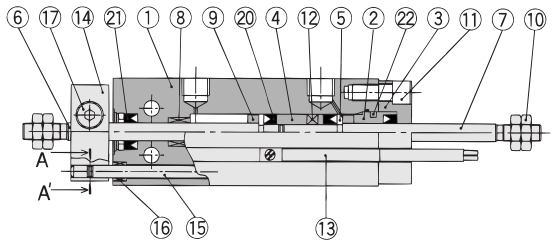
For the auto switch mounting position of Series CUKW, refer to page 7-3-14, since specifications are the same as double acting, double rod type.

Construction

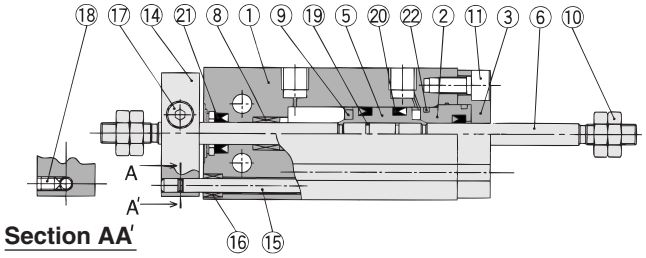
ø6

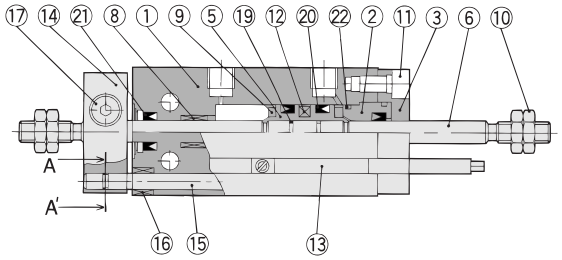


With auto switch

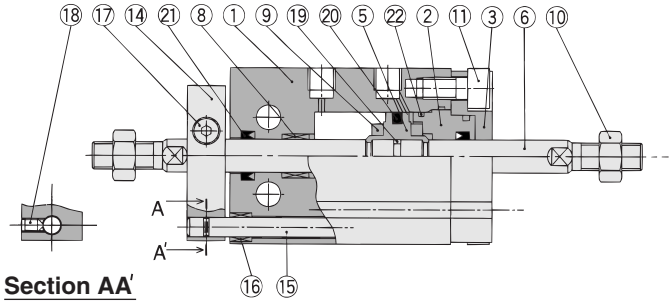


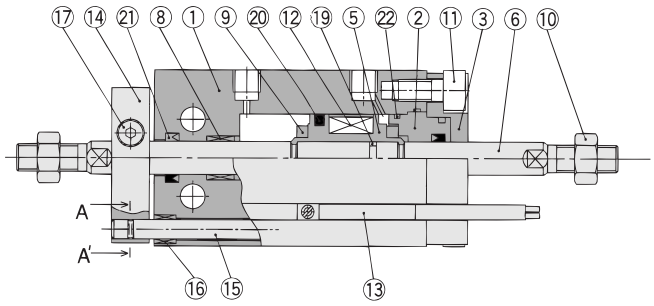
ø10





ø16 to ø32





Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover	Aluminum bearing alloy	Chromated
③	Rod cover retainer	Aluminum alloy	Hard anodized
④	Piston	Brass	ø6
⑤	Piston	Brass	ø6, ø10
		Aluminum alloy	ø16 to ø32, Chromated
⑥	Piston rod	Stainless steel	
⑦	Piston rod	Stainless steel	ø6
⑧	Bushing	Oil-impregnated sintered alloy	
⑨	Bumper	Urethane	
⑩	Rod end nut	Carbon steel	Nickel plated
⑪	Hexagon socket head cap screw	Carbon steel	Nickel plated

No.	Description	Material	Note
⑫	Magnet	Magnetic material	
⑬	Auto switch	—	
⑭	Non-rotating plate	Aluminum alloy	Nickel plated
⑮	Guide rod	Stainless steel	
⑯	Bushing	Oil-impregnated sintered alloy	
⑰	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑱	Hexagon socket head set screw	Carbon steel	Black zinc chromated
⑲	Piston gasket	NBR	
⑳	Piston seal		
㉑	Rod seal		
㉒	Gasket		

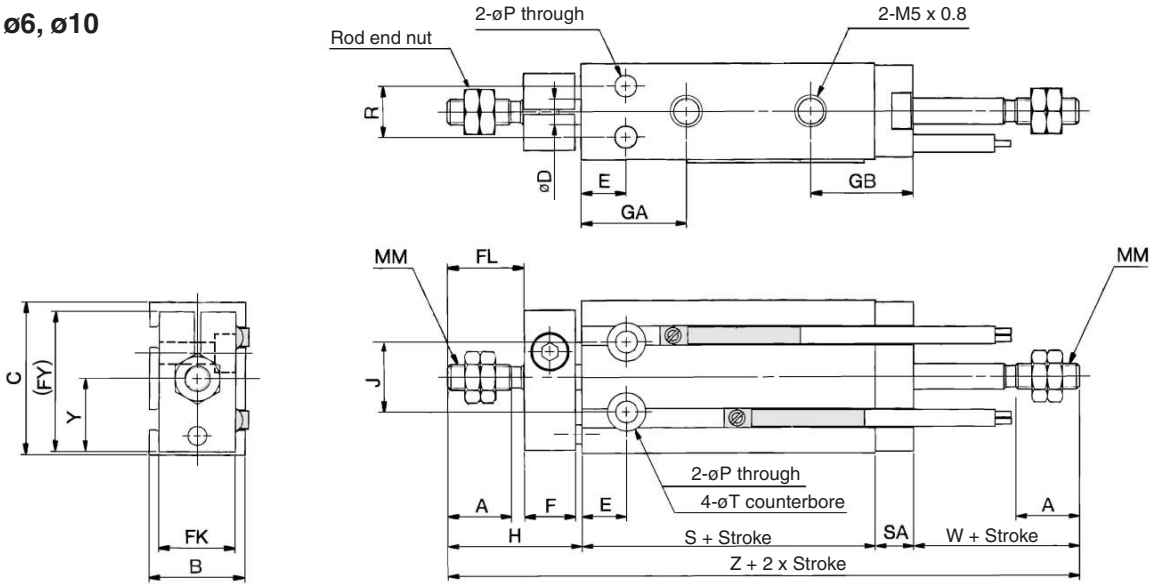
Replacement Parts: Seal Kit

	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
Kit no.	CUW10D-PS	CUW16D-PS	CUW20D-PS	CUW25D-PS	CUW32D-PS

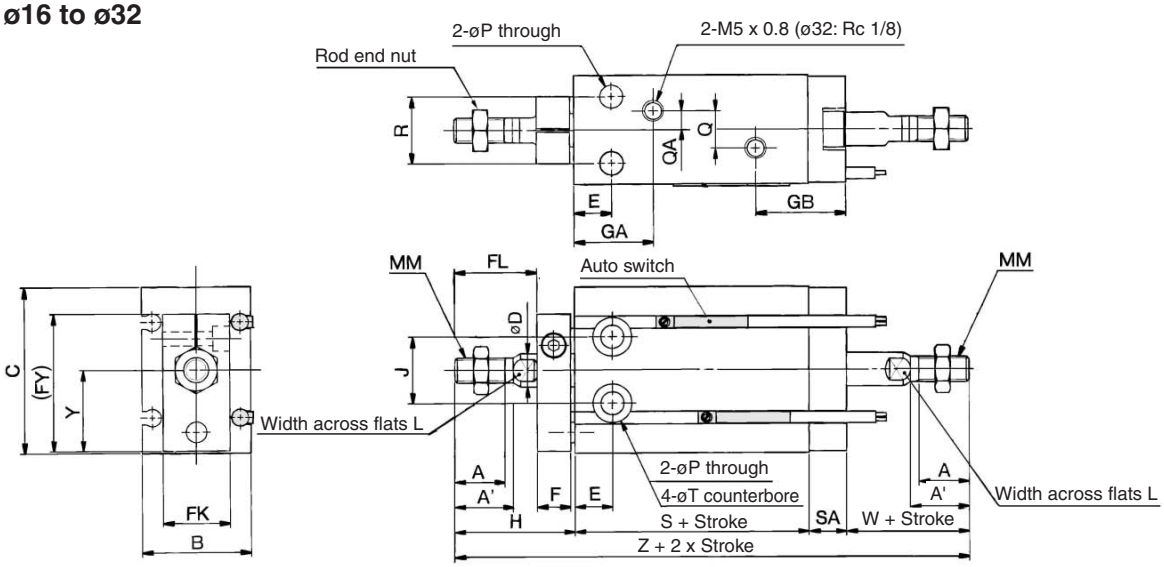
∗ Seal kit includes ⑳, ㉑, ㉒. Order the seal kit, based on each bore size.

Dimensions: Non-rotating Rod Type; Double Acting, Double Rod

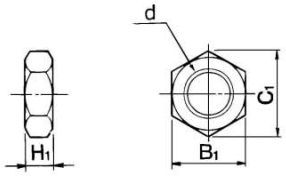
ø6, ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	F	FL	FK	FY	GA	GB	H	J	L	MM
6	7	—	13	22	3	7	8	9	11	20.5	15	16	18	10	—	M3 x 0.5
10	10	—	15	24	4	7	8	12	12	22	16.5	16	21	11	—	M4 x 0.7
16	11	12.5	20	32	6	7	8	17	13	28	16.5 Note)	19	26	14	5	M5 x 0.8
20	12	14	26	40	8	9	8	20	16	33	19	21.5	29	16	6	M6 x 1.0
25	15.5	18	32	50	10	10	10	22	20	43.5	21.5	22	33	20	8	M8 x 1.25
32	19.5	22	40	62	12	11	12	29	24	51.5	23	22.5	42	24	10	M10 x 1.25

Bore size (mm)	P	Q	QA	R	SA	T	W	Y	Without auto switch		With auto switch	
									S	Z	S	Z
6	3.2	—	—	7	6	6 depth 4.8	13	10.5	38	75	38	75
10	3.2	—	—	9	6	6 depth 5	16	11.5	36	79	36	79
16	4.5	4	2	12	7.5	7.6 depth 6.5	16	15.5	30	79.5	40	89.5
20	5.5	9	4.5	16	9	9.3 depth 8	19	19.5	36	93	46	103
25	5.5	9	4.5	20	9	9.3 depth 9	23	24.5	40	105	50	115
32	6.6	13.5	4.5	24	10	11 depth 11.5	27	30.5	42	121	52	131

Note) 5 stroke (CUKW16-5D): GA = 14.5

Free Mount Cylinder: Non-rotating Rod Type
Single Acting, Single Rod, Spring Return/Extend

Series CUK

ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CUK **10** **15** **S**

With auto switch CDUK **10** **15** **S** **F9BW** ☐

Built-in magnet

Non-rotating rod type

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

ø6, ø10, ø16 ø20, ø25, ø32	5, 10, 15

Action

S	Single acting, Spring return
T	Single acting, Spring extend

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

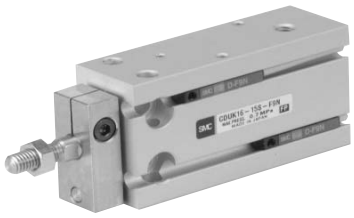
Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.



Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.23 MPa	0.18 MPa		0.16 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion (1)	Rubber bumper on both ends					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					
Rod non-rotating accuracy (2)	±0.8°			±0.5°		

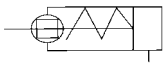
Note 1) ø6: With auto switch, single rubber bumper
Note 2) No load: Rod at retracted

Standard Stroke

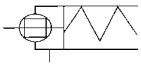
Bore size (mm)	Standard stroke (mm)
6, **10**, **16**, **20**, **25**, **32**	5, 10, 15

JIS Symbol

Single acting, Spring return



Single acting, Spring extend



Minimum Stroke for Auto Switch Mounting (mm)

No. of auto switches mounted	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

Weight /( ): Denotes the values with D-A93 (g)

Model	Stroke (mm)		
	5	10	15
C(D)UK6-□S/T	28 (33)	31 (41)	34 (44)
C(D)UK10-□S/T	43 (48)	47 (57)	55 (65)
C(D)UK16-□S/T	60 (85)	66 (90)	81 (111)
C(D)UK20-□S/T	113 (147)	124 (164)	153 (193)
C(D)UK25-□S/T	212 (266)	229 (288)	271 (330)
C(D)UK32-□S/T	331 (404)	357 (435)	422 (500)

∗ For the auto switch weight, refer to page 7-9-1.

Made to Order Specifications (For details, refer to page 7-10-1.)

Symbol	Specifications
-XC18	NPT finish piping port
-XC22	Fluoro rubber seals
-XC34	Rod does not extend beyond non-rotating plate

Tightening Torque

When mounting a CUK single acting series, refer to page 7-3-5.

Theoretical Output

Specifications are the same as single acting, spring return/spring extend type (Series CU). Refer to page 7-3-16.

Spring Reaction Force

For “Spring Reaction Force”, refer to page 7-12-2.

Auto Switch Mounting Position

For the auto switch mounting position of CDUK series single acting, spring return/spring extend, refer to page 7-3-21 to 22, since specification are the same as standard type, single acting, spring return/spring extend type.

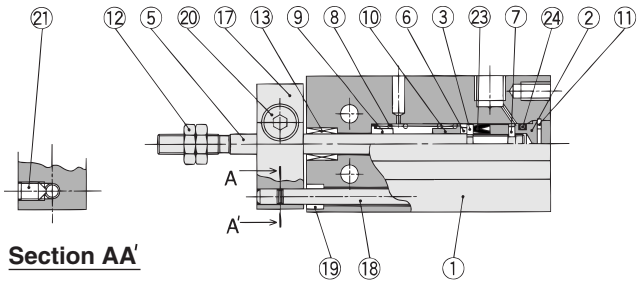
Allowable Rotational Torque

Make sure that rotational torque is not applied to the piston rod of the CUK series single acting type cylinder. If the rotation torque were applied unavoidably, refer to page 7-3-25.

Construction

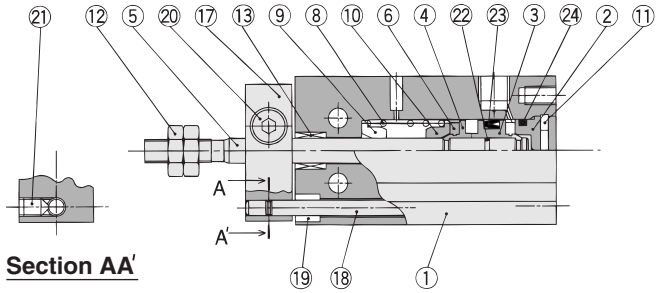
Single acting, Spring return

ø6



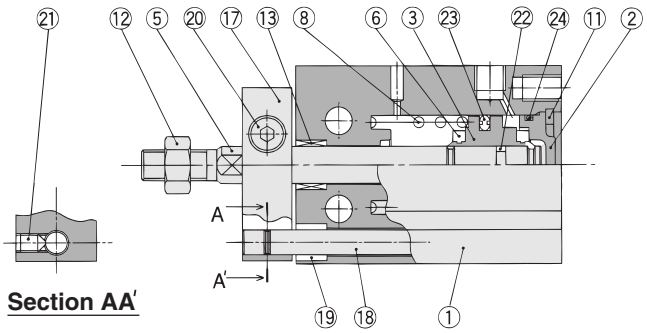
Section AA′

ø10



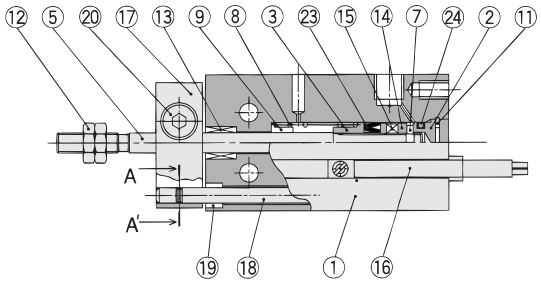
Section AA′

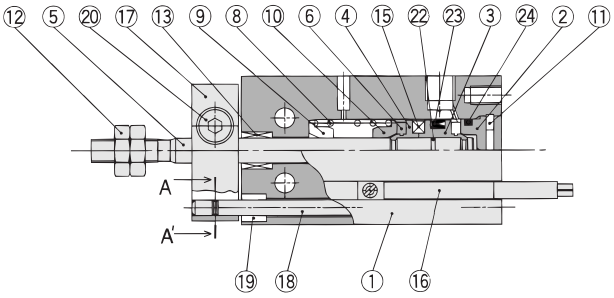
ø16 to ø32

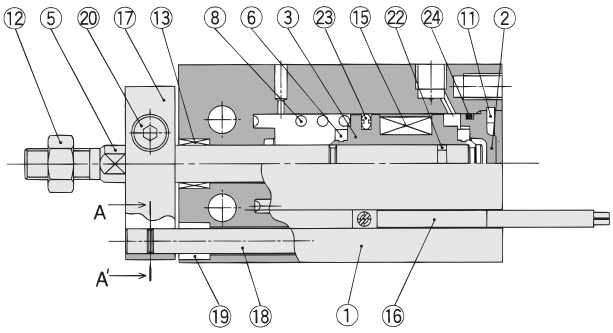


Section AA′

With auto switch







Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
③	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
④	Piston	Brass	ø10
⑤	Piston rod	Stainless steel	
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	
⑧	Return spring	Piano wire	Zinc chromated
⑨	Spring seat	Brass	
⑩	Spring seat	Brass	

No.	Description	Material	Note
⑪	Snap ring	Carbon tool steel	Phosphate coated
⑫	Rod end nut	Carbon steel	Nickel plated
⑬	Bushing	Oil-impregnated sintered alloy	
⑭	Magnet holder	Brass	ø6
⑮	Magnet	Magnetic material	
⑯	Auto switch	—	
⑰	Non-rotating plate	Aluminum alloy	Nickel plated
⑱	Guide rod	Stainless steel	
⑲	Bushing	Oil-impregnated sintered alloy	Black zinc chromated
⑳	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
㉑	Hexagon socket head set screw	Carbon steel	
㉒	Piston gasket	NBR	
㉓*	Piston seal		
㉔*	Gasket		

Replacement Parts: Seal Kit

	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
Kit no.	CU10S-PS	CU16S-PS	CU20S-PS	CU25S-PS	CU32S-PS

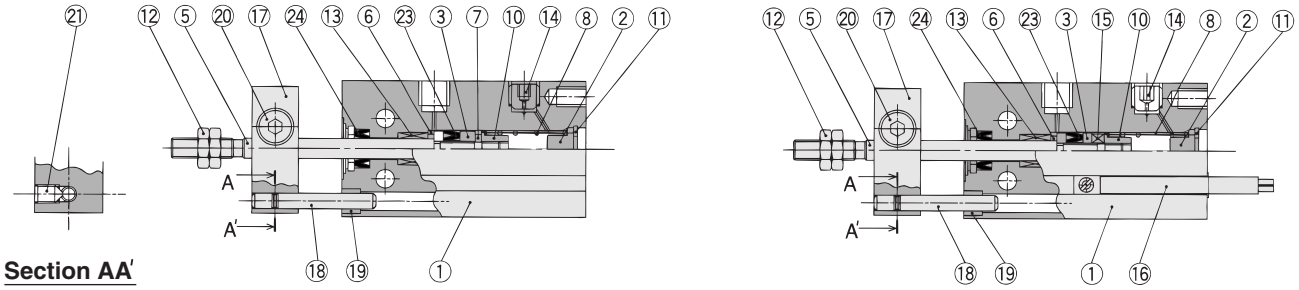
∗ Seal kit includes ㉓, ㉔. Order the seal kit, based on each bore size.

Construction

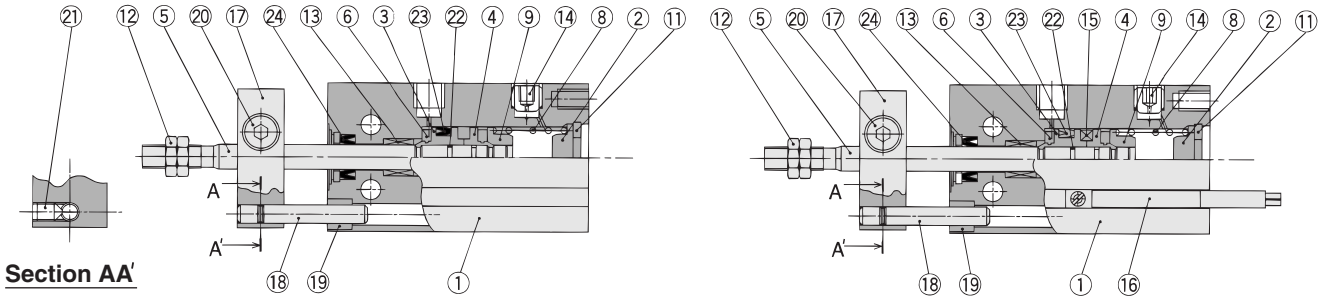
Single acting, Spring extend

With auto switch

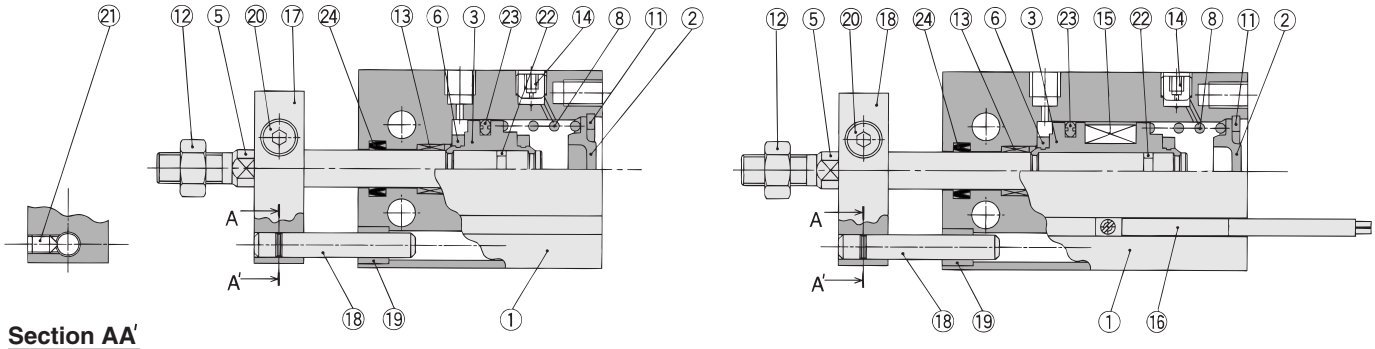
ø6



ø10



ø16 to ø32



Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
③	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
④	Piston	Brass	ø10
⑤	Piston rod	Stainless steel	
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	
⑧	Return spring	Piano wire	Zinc chromated
⑨	Spring seat	Brass	
⑩	stopper	Brass	ø6
⑪	Snap ring	Carbon tool steel	Phosphate coated

No.	Description	Material	Note
⑫	Rod end nut	Carbon steel	Nickel plated
⑬	Bushing	Oil-impregnated sintered alloy	
⑭	Plug with fixed orifice	Alloy steel	Black zinc chromated
⑮	Magnet	Magnetic material	
⑯	Auto switch	—	
⑰	Non-rotating plate	Aluminum alloy	Nickel plated
⑱	Guide rod	Stainless steel	
⑲	Bushing	Oil-impregnated sintered alloy	Black zinc chromated
⑳	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
㉑	Hexagon socket head set screw	Carbon steel	
㉒	Piston gasket	NBR	
㉓ *	Piston seal		
㉔ *	Rod seal		

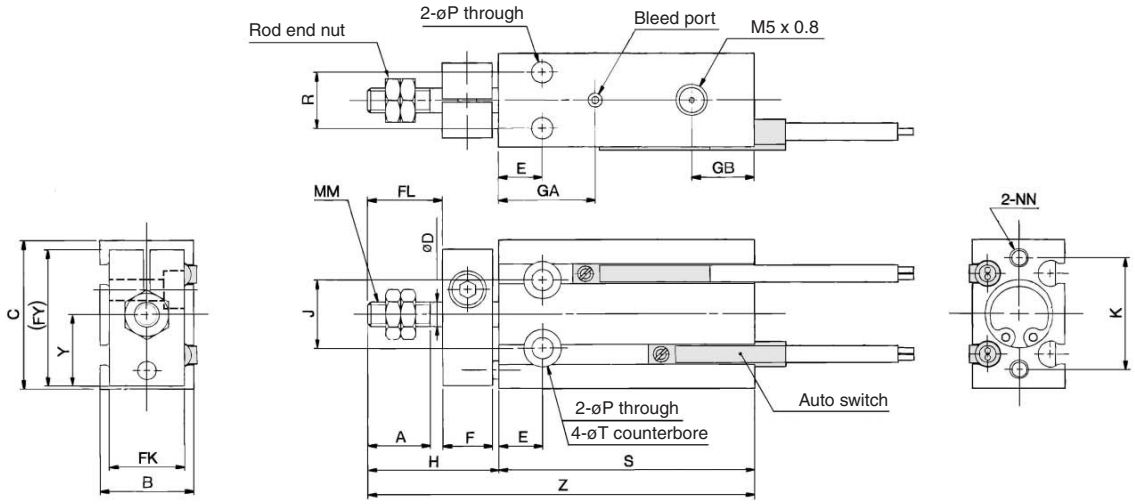
Replacement Parts: Seal Kit

	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
Kit no.	CU10T-PS	CU16T-PS	CU20T-PS	CU25T-PS	CU32T-PS

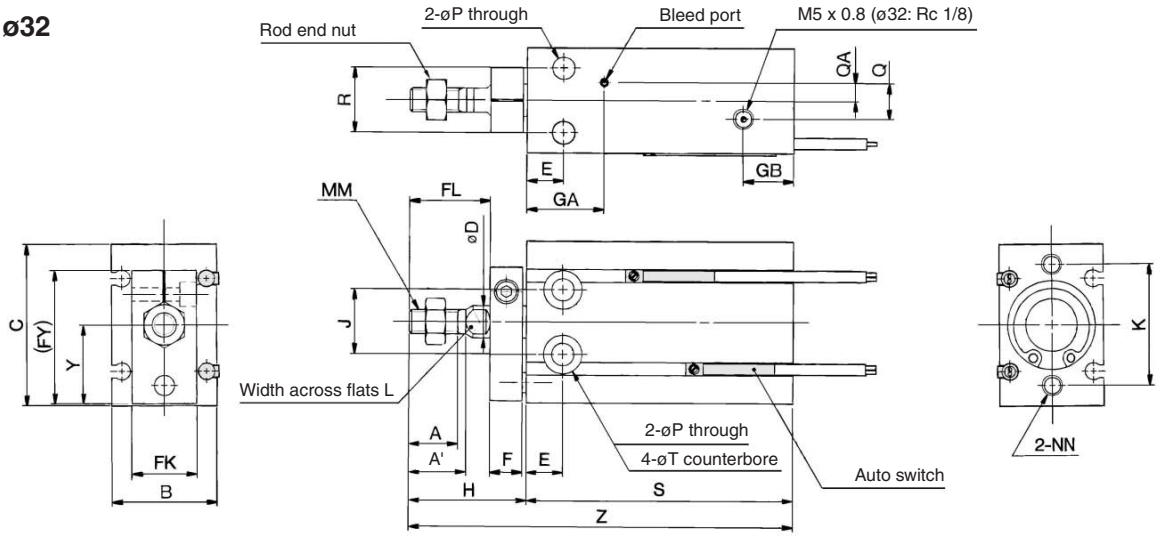
* Seal kit includes ㉓, ㉔. Order the seal kit, based on each bore size.

Dimensions: Non-rotating Rod Type; Single Acting, Spring Return

ø6, ø10

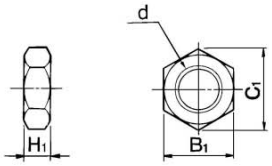


ø16 to ø32



Rod End Nut/Accessory

Material: Carbon steel



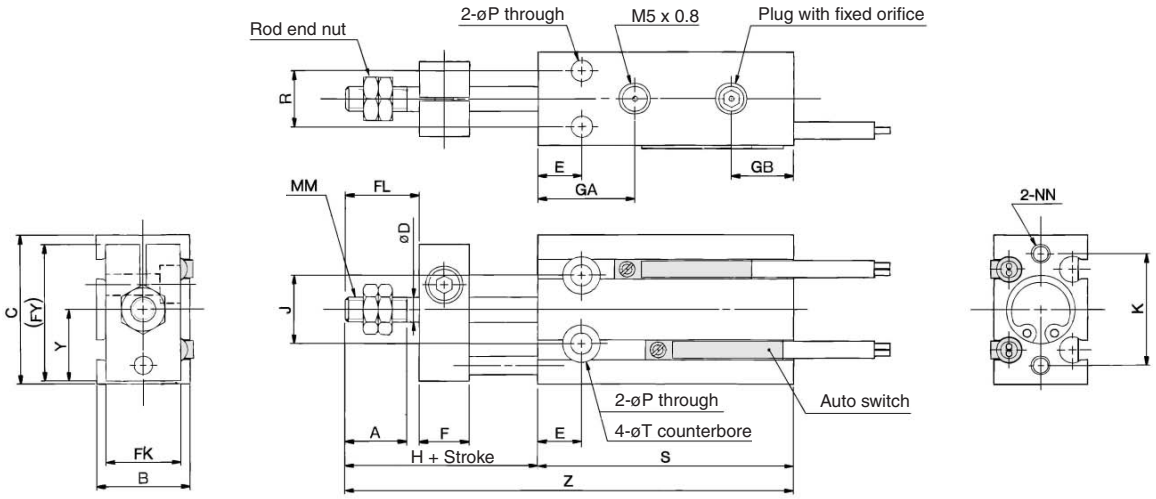
Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	F	FL	FK	FY	GA	GB	H	J	K	L	MM	NN
6	7	—	13	22	3	7	8	9	11	20.5	15	10	18	10	17	—	M3 x 0.5	M3 x 0.5 depth 5
10	10	—	15	24	4	7	8	12	12	22	16.5	10	21	11	18	—	M4 x 0.7	M3 x 0.5 depth 5
16	11	12.5	20	32	6	7	8	17	13	28	16.5	11.5	26	14	25	5	M5 x 0.8	M4 x 0.7 depth 6
20	12	14	26	40	8	9	8	20	16	33	19	12.5	29	16	30	6	M6 x 1.0	M5 x 0.8 depth 8
25	15.5	18	32	50	10	10	10	22	20	43.5	21.5	13	33	20	38	8	M8 x 1.25	M5 x 0.8 depth 8
32	19.5	22	40	62	12	11	12	29	24	51.5	23	12.5	42	24	48	10	M10 x 1.25	M6 x 1.0 depth 9

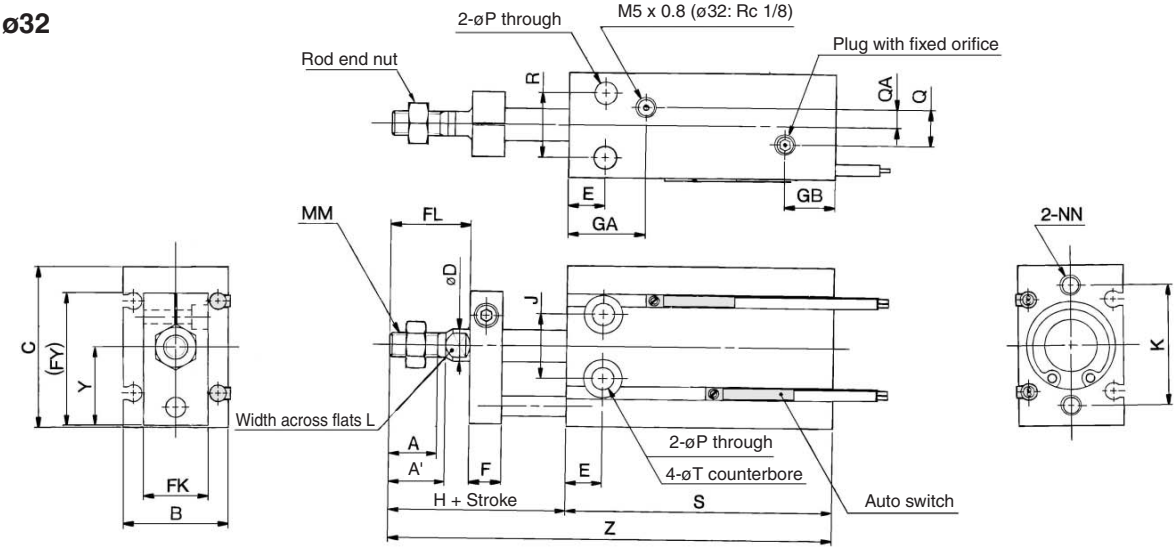
Bore size (mm)	P	Q	QA	R	T	Y	Without auto switch						With auto switch					
							S			Z			S			Z		
							5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st
6	3.2	—	—	7	6 depth 4.8	10.5	38	43	48	56	61	66	38	43	48	56	61	66
10	3.2	—	—	9	6 depth 5	11.5	41	46	56	62	67	77	41	46	56	62	67	77
16	4.5	4	2	12	7.6 depth 6.5	15.5	35	40	50	61	66	76	45	50	60	71	76	86
20	5.5	9	4.5	16	9.3 depth 8	19.5	41	46	56	70	75	85	51	56	66	80	85	95
25	5.5	9	4.5	20	9.3 depth 9	24.5	45	50	60	78	83	93	55	60	70	88	93	103
32	6.6	13.5	4.5	24	11 depth 11.5	30.5	47	52	62	89	94	104	57	62	72	99	104	114

Dimensions: Non-rotating Rod Type; Single Acting, Spring Extend

ø6, ø10

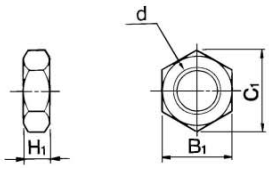


ø16 to ø32



Rod End Nut/Accessory

Material: Carbon steel



Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	F	FL	FK	FY	GA	GB	H	J	K	L	MM	NN
6	7	—	13	22	3	7	8	9	11	20.5	15	10	18	10	17	—	M3 x 0.5	M3 x 0.5 depth 5
10	10	—	15	24	4	7	8	12	12	22	16.5	10	21	11	18	—	M4 x 0.7	M3 x 0.5 depth 5
16	11	12.5	20	32	6	7	8	17	13	28	16.5	11.5	26	14	25	5	M5 x 0.8	M4 x 0.7 depth 6
20	12	14	26	40	8	9	8	20	16	33	19	12.5	29	16	30	6	M6 x 1.0	M5 x 0.8 depth 8
25	15.5	18	32	50	10	10	10	22	20	43.5	21.5	13	33	20	38	8	M8 x 1.25	M5 x 0.8 depth 8
32	19.5	22	40	62	12	11	12	29	24	51.5	23	12.5	42	24	48	10	M10 x 1.25	M6 x 1.0 depth 9

Bore size (mm)	P	Q	QA	R	T	Y	Without auto switch						With auto switch					
							S			Z			S			Z		
							5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15 st	5 st	10 st	15st
6	3.2	—	—	7	6 depth 4.8	10.5	38	43	48	61	71	81	38	43	48	61	71	81
10	3.2	—	—	9	6 depth 5	11.5	41	46	56	67	77	92	41	46	56	67	77	92
16	4.5	4	2	12	7.6 depth 6.5	15.5	45	50	60	76	86	101	45	50	60	76	86	101
20	5.5	9	4.5	16	9.3 depth 8	19.5	41	46	56	75	85	100	51	56	66	85	95	110
25	5.5	9	4.5	20	9.3 depth 9	24.5	45	50	60	83	93	108	55	60	70	93	103	118
32	6.6	13.5	4.5	24	11 depth 11.5	30.5	47	52	62	94	104	119	57	62	72	104	114	129

Free Mount Cylinder: Long Stroke Type
Double Acting, Single Rod
Series CU
ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CU [6] — [60] [D]

With auto switch CDU [6] — [60] [D] — [F9BW] [ ]

Built-in magnet

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Long stroke (mm)

ø6, ø10, ø16	40, 50, 60
ø20, ø25, ø32	60, 70, 80, 90, 100

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.

Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.12 MPa	0.06 MPa		0.05 MPa		
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, **10**, **16**	40, 50, 60
20, **25**, **32**	60, 70, 80, 90, 100

JIS Symbol
Double acting,
Spring rod type

Weight

/( ): Denotes the values with D-A93. (g)

Model	Stroke (mm)						
	40	50	60	70	80	90	100
C(D)U6-□D	43 (53)	49 (59)	50 (65)	—	—	—	—
C(D)U10-□D	64 (74)	72 (82)	80 (90)	—	—	—	—
C(D)U16-□D	92 (122)	104 (134)	116 (146)	—	—	—	—
C(D)U20-□D	—	—	216 (253)	238 (275)	260 (297)	282 (319)	304 (341)
C(D)U25-□D	—	—	363 (422)	397 (456)	431 (490)	465 (524)	499 (558)
C(D)U32-□D	—	—	526 (604)	574 (652)	622 (700)	670 (748)	718 (796)

∗ For the auto switch weight, refer to page 7-9-1.

Made to Order

Made to Order Specifications (For details, refer to page 7-10-1.)

Symbol	Specifications
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC19	Intermediate stroke (Spacer type)

Auto Switch Mounting Position

For the auto switch mounting position of CDU long stroke series, refer to page 7-3-8, since specifications are the same as standard type, double acting, single rod type.

Tightening Torque

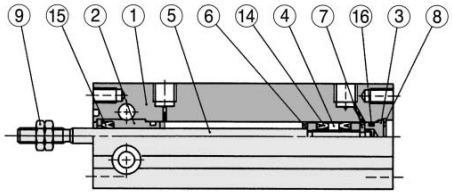
Refer to page 7-3-5 for mounting a long stroke type.

Theoretical Output

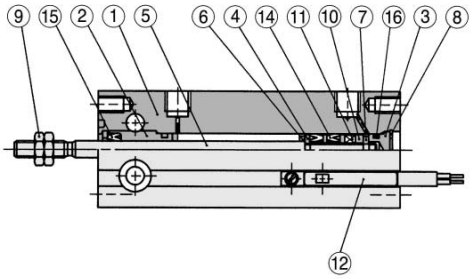
Specifications are the same as CU series double acting, single rod. Refer to page 7-3-5.

Construction

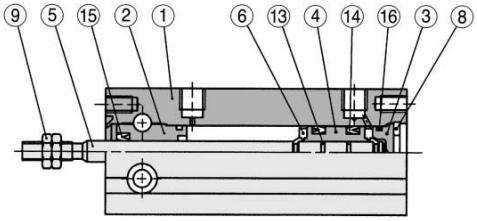
ø6

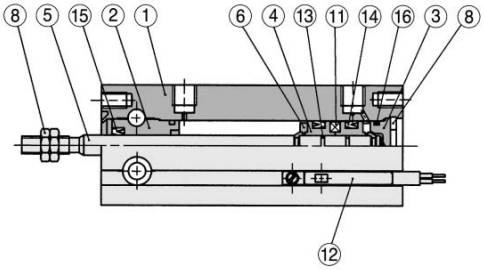


With auto switch

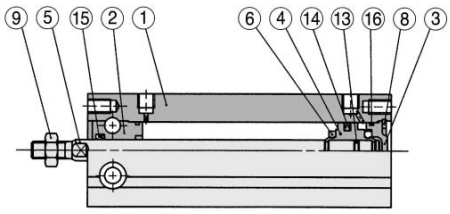


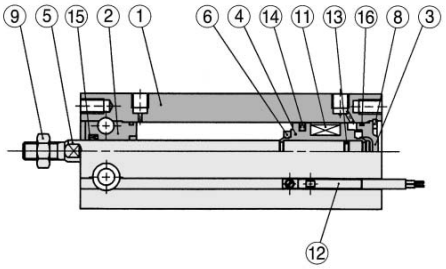
ø10





ø16 to ø32





Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover	Aluminum bearing alloy	Hard anodized
③	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
④	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
⑤	Piston rod	Stainless steel	
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	

No.	Description	Material	Note
⑧	Snap ring	Carbon tool steel	Phosphate coated
⑨	Rod end nut	Carbon steel	Nickel plated
⑩	Magnet holder	Brass	ø6
⑪	Magnet	Magnetic material	
⑫	Auto switch	—	
⑬	Piston gasket	NBR	
⑭	Piston seal		
⑮	Rod seal		
⑯	Gasket		

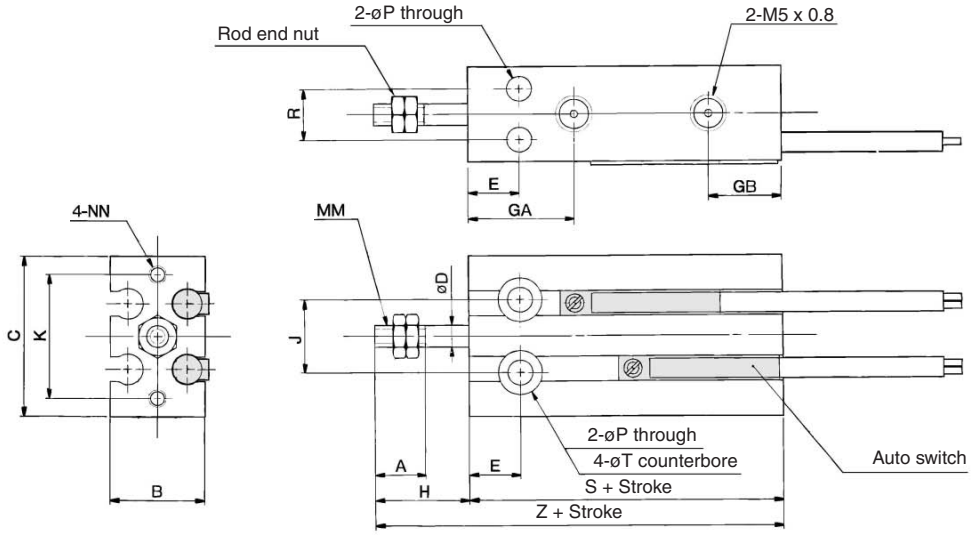
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
10	CU10D-PS	Set of nos. above ⑭, ⑮, ⑯.
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

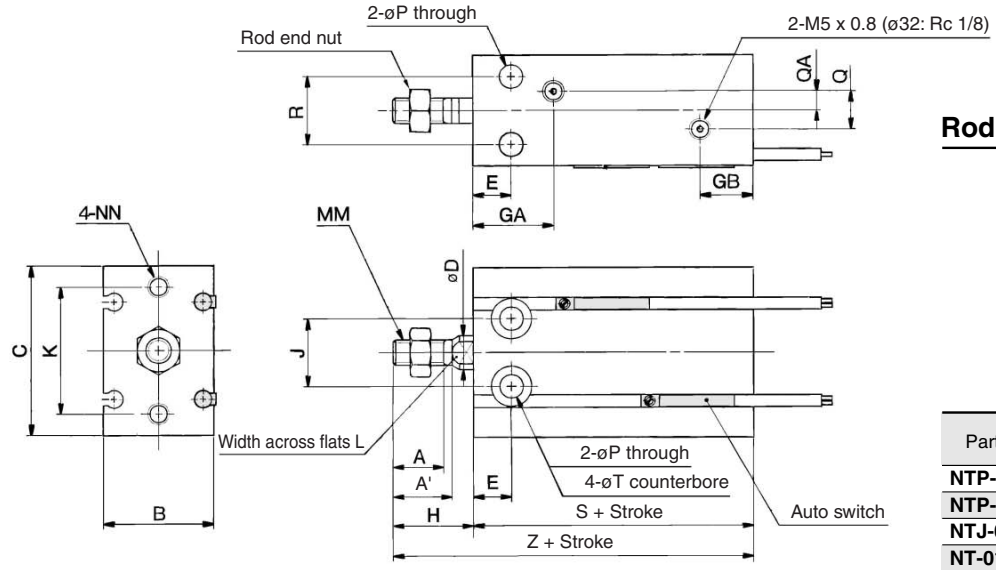
∗ Seal kit includes ⑭, ⑮, ⑯. Order the seal kit, based on each bore size.

Dimensions: Double Acting, Single Rod

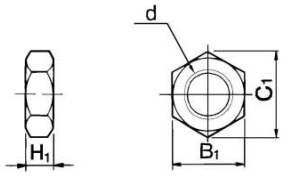
ø6, ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

Part no.	Applicable bore (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA
6	7	—	13	22	3	7	15	10	13	10	17	—	M3 x 0.5	M3 x 0.5 depth 5	3.2	—	—
10	10	—	15	24	4	7	16.5	10	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	—
16	11	12.5	20	32	6	7	16.5	11.5	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2
20	12	14	26	40	8	9	19	12.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9	4.5
25	15.5	18	32	50	10	10	21.5	13	23	20	38	8	M8 x 1.25	M5 x 0.8 depth 8	5.5	9	4.5
32	19.5	22	40	62	12	11	23	12.5	27	24	48	10	M10 x 1.25	M6 x 1.0 depth 9	6.6	13.5	4.5

Bore size (mm)	R	T	Without auto switch		With auto switch	
			S	Z	S	Z
6	7	6 depth 4.8	33	46	33	46
10	9	6 depth 5	36	52	36	52
16	12	7.6 depth 6.5	30	46	40	56
20	16	9.3 depth 8	36	55	46	65
25	20	9.3 depth 9	40	63	50	73
32	24	11 depth 11.5	42	69	52	79

Free Mount Cylinder: Long Stroke Type
Non-rotating Rod, Double Acting, Single Rod

Series CUK

ø6, ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CUK 6 — 60 D

With auto switch CDUK 6 — 60 D — F9BW □

Built-in magnet

Non-rotating rod type

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Cylinder stroke (mm)

ø6, ø10, ø16	40, 50, 60
ø20, ø25, ø32	60, 70, 80, 90, 100

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

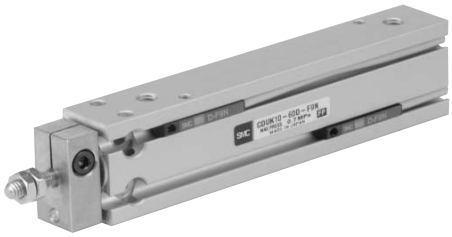
Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

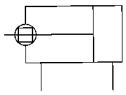
∗ Lead wire length symbols: 0.5 m·····Nil (Example) A93
3 m·····L (Example) A93L
5 m·····Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 7-3-9 for details.
• For details about auto switches with pre-wire connector, refer to page 7-9-36.



JIS Symbol
Double acting,
Single rod type



Made to Order Specifications (For details, refer to page 7-10-1.)

Symbol	Specifications
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC19	Intermediate stroke (Spacer type)

Specifications

Bore size (mm)	6	10	16	20	25	32
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Minimum operating pressure	0.15 MPa		0.10 MPa		0.08 MPa	
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Lubrication	Non-lube					
Piston speed	50 to 500 mm/s					
Cushion	Rubber bumper					
Rod end thread	Male thread					
Thread tolerance	JIS Class 2					
Stroke length tolerance	$^{+1.0}_{0}$ mm					
Rod non-rotating accuracy Note)	±0.8°			±0.5°		

Note) No load: Rod at retracted

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, **10**, **16**	40, 50, 60
20, **25**, **32**	60, 70, 80, 90, 100

Weight /( ): Denotes the values with D-A93. (g)

Model	Stroke (mm)						
	40	50	60	70	80	90	100
C(D)UK6-□D	49 (59)	55 (65)	61 (71)	—	—	—	—
C(D)UK10-□D	71 (81)	79 (89)	87 (97)	—	—	—	—
C(D)UK16-□D	102 (132)	114 (144)	126 (156)	—	—	—	—
C(D)UK20-□D	—	—	243 (284)	267 (308)	291 (332)	315 (356)	339 (380)
C(D)UK25-□D	—	—	405 (460)	440 (495)	475 (530)	510 (565)	545 (600)
C(D)UK32-□D	—	—	617 (695)	669 (747)	721 (799)	773 (851)	825 (903)

∗ For the auto switch weight, refer to page 7-9-1.

Allowable Rotational Torque

Make sure that rotational torque is not applied to the piston rod of a long stroke type cylinder. If the rotation torque were applied unavoidably, refer to page 7-3-25 for details.

Tightening Torque

When mounting a CUK long stroke series, refer to page 7-3-5.

Theoretical Output

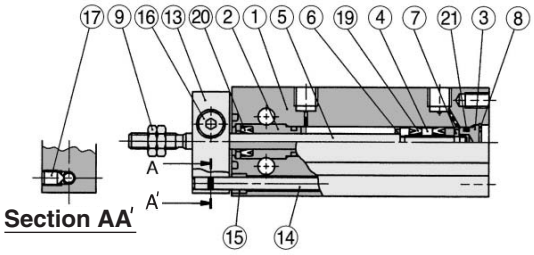
Specifications are the same as CU series double acting, single rod. Refer to page 7-3-5.

Auto Switch Mounting Position

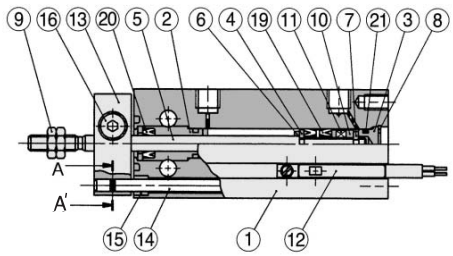
For the auto switch mounting position of CDU long stroke series, refer to page 7-3-8, since specifications are the same as standard type, double acting, single rod type.

Construction

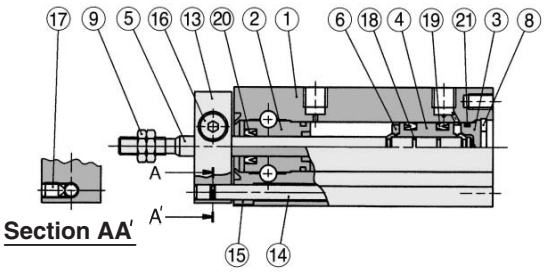
ø6

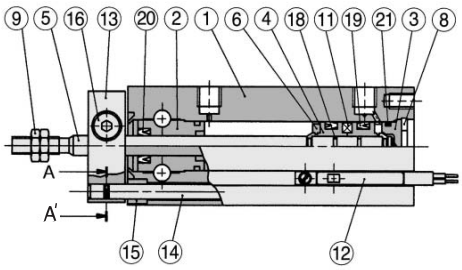


With auto switch

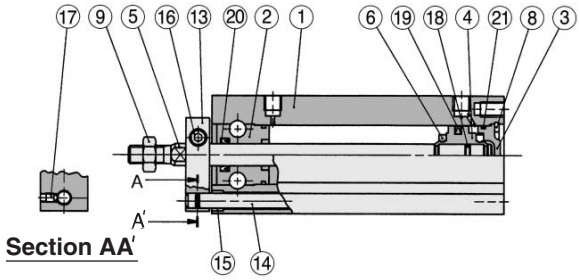


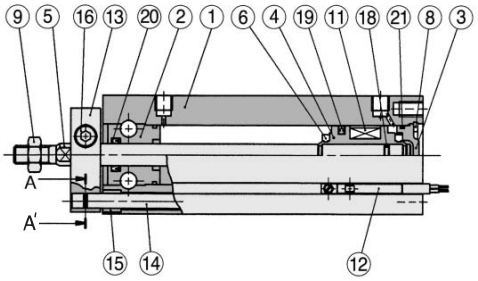
ø10





ø16 to ø32





Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover	Aluminum bearing alloy	Hard anodized
③	Head cover	Brass	ø6 to ø10, Nickel plated
		Aluminum alloy	ø16 to ø32, Clear chromated
④	Piston	Brass	ø6 to ø10
		Aluminum alloy	ø16 to ø32, Chromated
⑤	Piston rod	Stainless steel	
⑥	Bumper A	Urethane	
⑦	Bumper B	Urethane	
⑧	Snap ring	Carbon tool steel	Phosphate coated
⑨	Rod end nut	Carbon steel	Nickel plated
⑩	Magnet holder	Brass	ø6

No.	Description	Material	Note
⑪	Magnet	Magnetic material	
⑫	Auto switch	—	
⑬	Non-rotating plate	Aluminum alloy	Nickel plated
⑭	Guide rod	Stainless steel	
⑮	Bushing	Oil-impregnated sintered alloy	Black zinc chromated
⑯	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑰	Hexagon socket head set screw	Carbon steel	
⑱	Piston gasket	NBR	
⑲	Piston seal		
⑳	Rod seal		
㉑	Gasket		

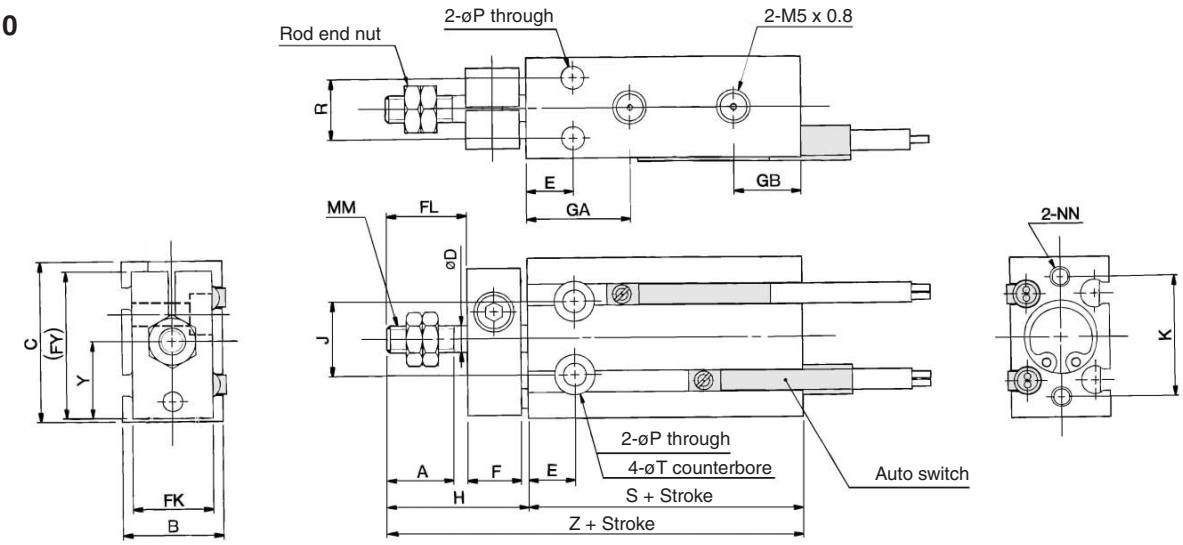
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
10	CU10D-PS	Set of nos. above ⑲, ⑳, ㉑.
16	CU16D-PS	
20	CU20D-PS	
25	CU25D-PS	
32	CU32D-PS	

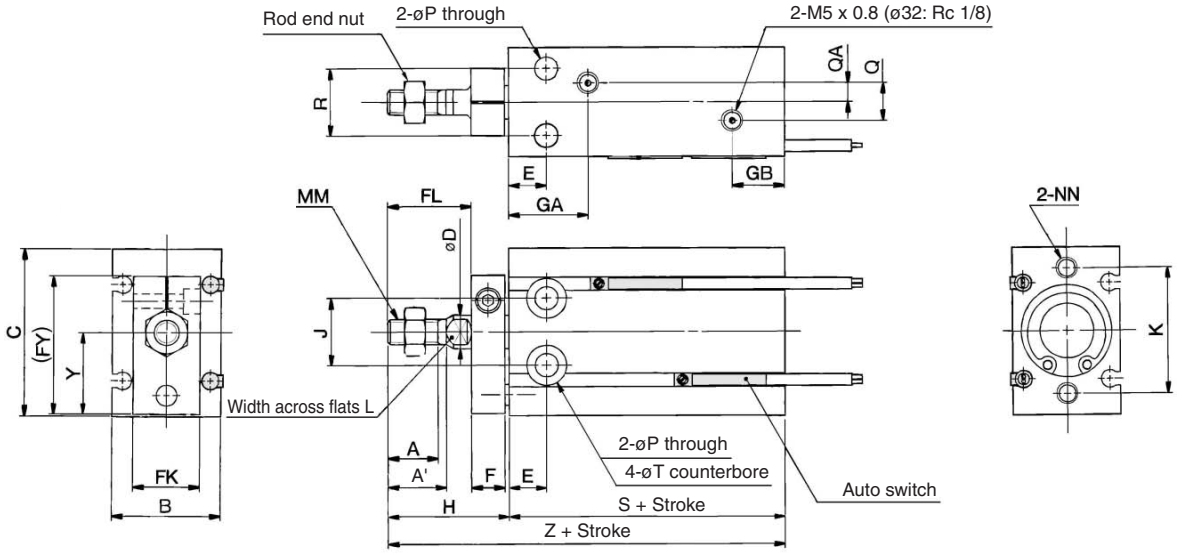
∗ Seal kit includes ⑲, ⑳, ㉑. Order the seal kit, based on each bore size.

Dimensions: Non-rotating Rod Type; Double Acting, Single Rod

ø6, ø10

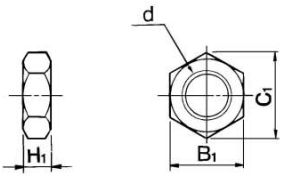


ø16 to ø32



Rod End Nut/Accessory

Material: Carbon steel



Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
NTP-006	**6**	M3 x 0.5	1.8	5.5	6.4
NTP-010	**10**	M4 x 0.7	2.4	7	8.1
NTJ-015A	**16**	M5 x 0.8	4	8	9.2
NT-015A	**20**	M6 x 1.0	5	10	11.5
NT-02	**25**	M8 x 1.25	5	13	15.0
NT-03	**32**	M10 x 1.25	6	17	19.6

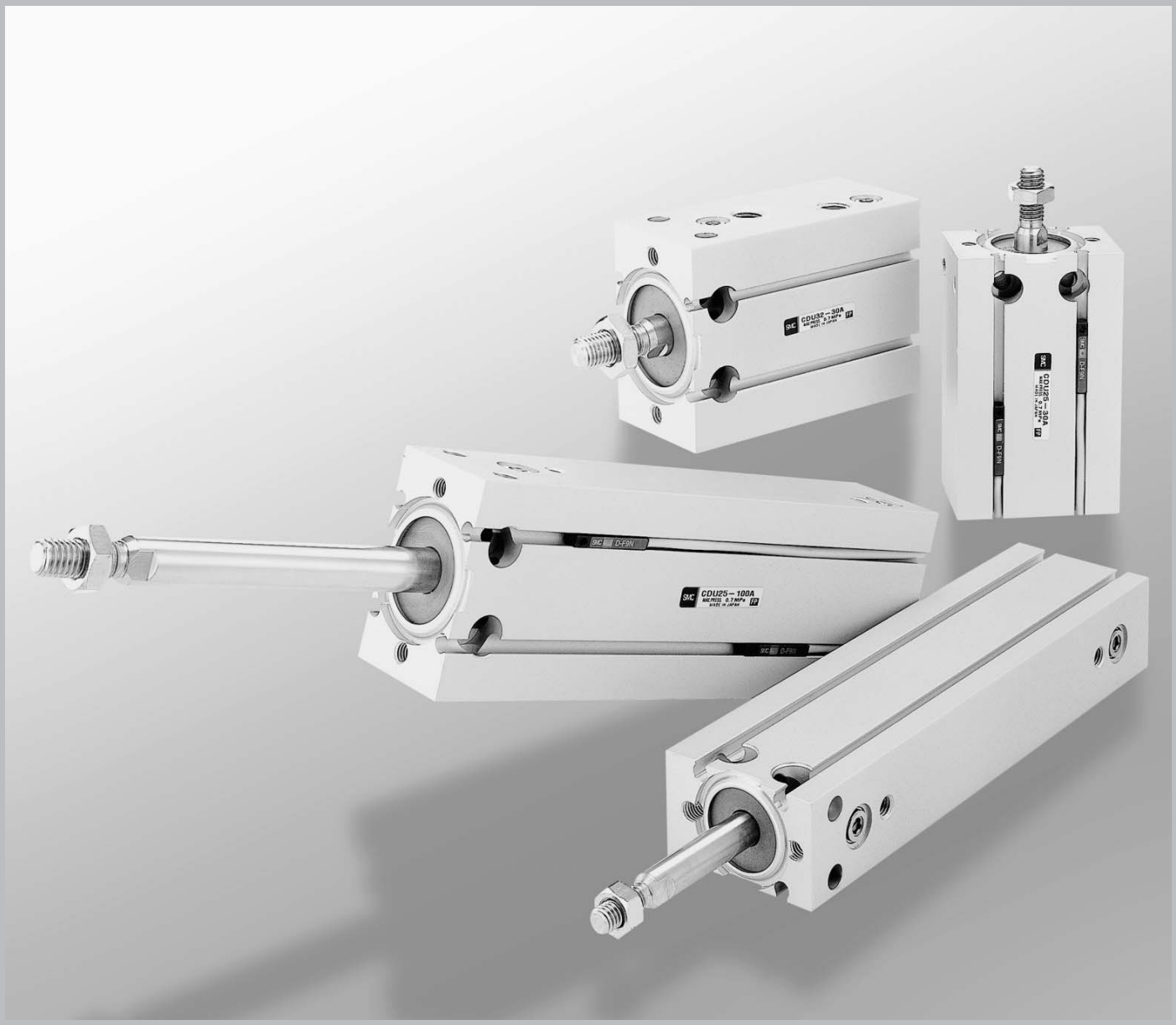
Bore size (mm)	A	A'	B	C	D	E	F	FL	FK	FY	GA	GB	H	J	K	L	MM
6	7	—	13	22	3	7	8	9	11	20.5	15	10	18	10	17	—	M3 x 0.5
10	10	—	15	24	4	7	8	12	12	22	16.5	10	21	11	18	—	M4 x 0.7
16	11	12.5	20	32	6	7	8	17	13	28	16.5	11.5	26	14	25	5	M5 x 0.8
20	12	14	26	40	8	9	8	20	16	33	19	12.5	29	16	30	6	M6 x 1.0
25	15.5	18	32	50	10	10	10	22	20	43.5	21.5	13	33	20	38	8	M8 x 1.25
32	19.5	22	40	62	12	11	12	29	24	51.5	23	12.5	42	24	48	10	M10 x 1.25

Bore size (mm)	NN	P	Q	QA	R	T	Y	Without auto switch		With auto switch	
								S	Z	S	Z
6	M3 x 0.5 depth 5	3.2	—	—	7	6 depth 4.8	10.5	33	51	33	51
10	M3 x 0.5 depth 5	3.2	—	—	9	6 depth 5	11.5	36	57	36	57
16	M4 x 0.7 depth 6	4.5	4	2	12	7.6 depth 6.5	15.5	30	56	40	66
20	M5 x 0.8 depth 8	5.5	9	4.5	16	9.3 depth 8	19.5	36	65	46	75
25	M5 x 0.8 depth 8	5.5	9	4.5	20	9.3 depth 9	24.5	40	73	50	83
32	M6 x 1.0 depth 9	6.6	13.5	4.5	24	11 depth 11.5	30.5	42	84	52	94

Free Mount Cylinder with Air Cushion

Series CU

ø20, ø25, ø32



A unique air cushion mechanism has been added to Series CU free mount cylinder.

Free Mount Cylinder with Air Cushion

Series CU

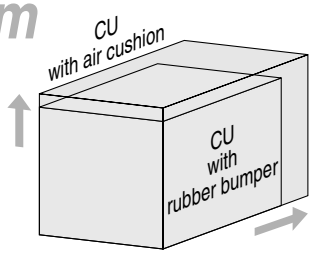
New air cushion mechanism

Free mount cylinder *Series CU* now employs an air cushion mechanism.

Extended dimensions (compared to the standard *CU* models) are hardly noticeable.

(with rubber bumper)

- **Overall length:** *+1.5 to 7 mm*
- **Overall height:** *+0 to 2 mm*
  No air cushion protrusion!
- **Overall width: not affected**



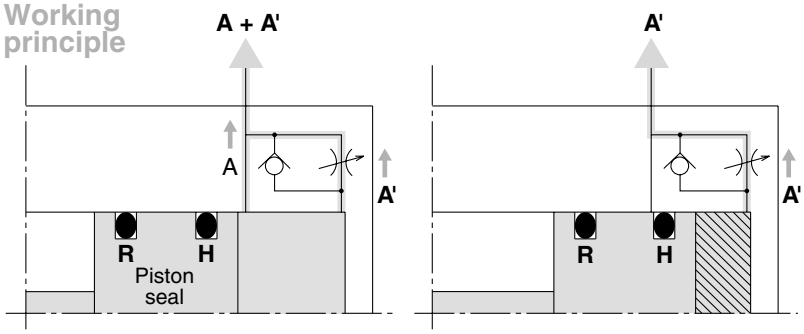
(mm)

Bore size	Extended dimensions	
	Length	Height
ø20	7	2
ø25	1.5	0
ø32	4	0

Unique air cushion construction requires no cushion ring.

Elimination of the cushion ring used in conventional type air cushions has made it possible to reduce the overall length of the cylinder while retaining all the advantages of a compact profile.

Working principle



① When the piston is retracting, air is exhausted through both A and A' until piston seal H passes air passage A.

② After piston seal H has passed air passage A, air is exhausted only through A'. The section marked with slanted lines becomes a cushion chamber, and an air cushion effect is achieved.

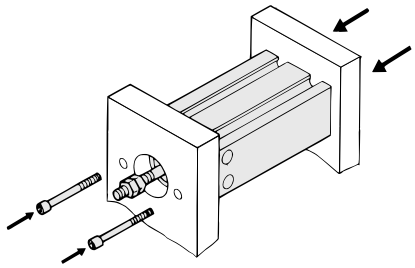
③ When air is supplied for the piston extension, the check valve opens and the piston extends with no delay.

Reduced stroke end impact and noise:
New standards to meet consumer demand.

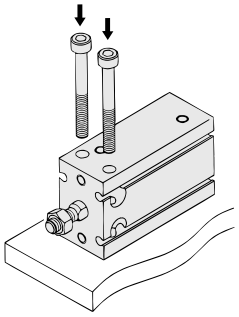
Free mounting

3 types of mounting orientations can be accommodated depending on the installation conditions.

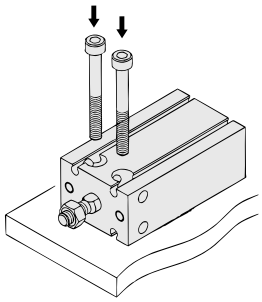
Axial mounting (Tapped hole)



Vertical mounting (Body through-hole)



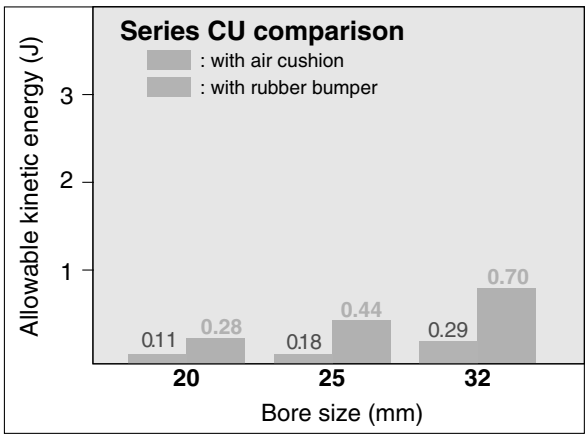
Lateral mounting (Body through-hole)



Approximately 2.4 times of allowable kinetic energy

(Compared to the old Series CU with rubber bumper)

Improved allowable kinetic energy absorption.



Improved repeatability

When compared to rubber bumper type actuators, air cushion type cylinders are less likely to be affected by pressure fluctuations, and therefore better able to achieve a stable and smooth stroke.

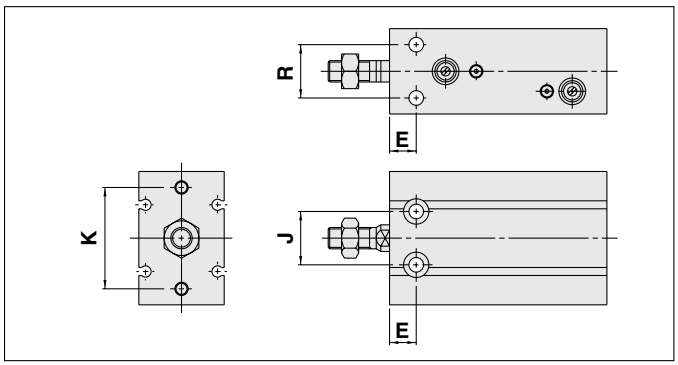
Improved sound insulation

(Reduced impact noise at the stroke end)

- Noise reduction of more than 11dB is possible (compared to Series CU20 with rubber bumper).

Interchangeable mounting

Mounting dimensions (J, K, R, and E) are the same as the rubber bumper type Series CU.



Size Variations

Model	Standard stroke	Auto switch
	20 30 40 50 60 70 80 90 100	
C(D)U20		• ø20 to ø32 Direct mounting style auto switch
C(D)U25		
C(D)U32		

Free Mount Cylinder with Air Cushion

Series CU

ø20, ø25, ø32

How to Order

Without auto switch CU 32 □ — 50 A

With auto switch CDU 32 □ — 50 A — F9BW □

Built-in magnet

Bore size

20	20 mm
25	25 mm
32	32 mm

Thread type

Symbol	Type	Bore size
Nil	M thread	ø20, ø25
	Rc	ø32
TN	NPT	
TF	G	

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 7-3-51.

Air cushion

A	With air cushion

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 7-9-1 for further infomation on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch model		Lead wire length (m)∗			Applicable load	
					DC		AC	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)		
Reed switch	—	Grommet	No	2-wire	24 V	5 V, 12 V	100 V or less	**A90V**	**A90**	●	●	—	IC circuit	Relay PLC
			Yes			12 V	100 V	**A93V**	**A93**	●	●	—	—	
				3-wire (NPN equiv.)	—	5 V	—	**A96V**	**A96**	●	●	—	IC circuit	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) A93
3 m ····· L A93L
5 m ····· Z F9NWZ

Note) Solid state switches marked "○" are produced upon receipt of order.

Specifications

Type	Pneumatic (Non-lube)
Fluid	Air
Proof pressure	1.0 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.08 MPa
Ambient and fluid temperature	Without auto switch: –10°C to 70°C (No freezing) With auto switch: –10°C to 60°C (No freezing)
Rod end thread	Male thread
Rod end thread tolerance	JIS Class 2
Stroke length tolerance	$^{+1.0}_{0}$
Piston speed	50 to 500 mm/s

Effective Cushion Length

Bore size (mm)	**20**	**25**	**32**
Effective cushion length (mm)	6.6	6.7	7.7

Standard Stroke

Bore size (mm)	Standard stroke (mm)
20, 25, 32	20, 30, 40, 50, 60, 70, 80, 90, 100

∗ Intermediate strokes are also available upon receipt of order. Please contact SMC.
Minimum stroke length is 20 mm.

Tightening Torque: When mounting Series CU refer to the table below.

Bore size (mm)	Hexagon socket head cap screw size (mm)	Proper tightening torque (N◊m)
20, 25	M5	5.10 ±10%
32	M6	8.04 ±10%

Allowable Kinetic Energy

Refer to "Selection" on 7-3-56 regarding allowable kinetic energy.

Theoretical Output

OUT IN

(N)

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
20	OUT	94.2	157	220
	IN	79.2	132	185
25	OUT	147	246	344
	IN	124	206	288
32	OUT	241	402	563
	IN	207	346	454

Weight

Basic Weight

(g)

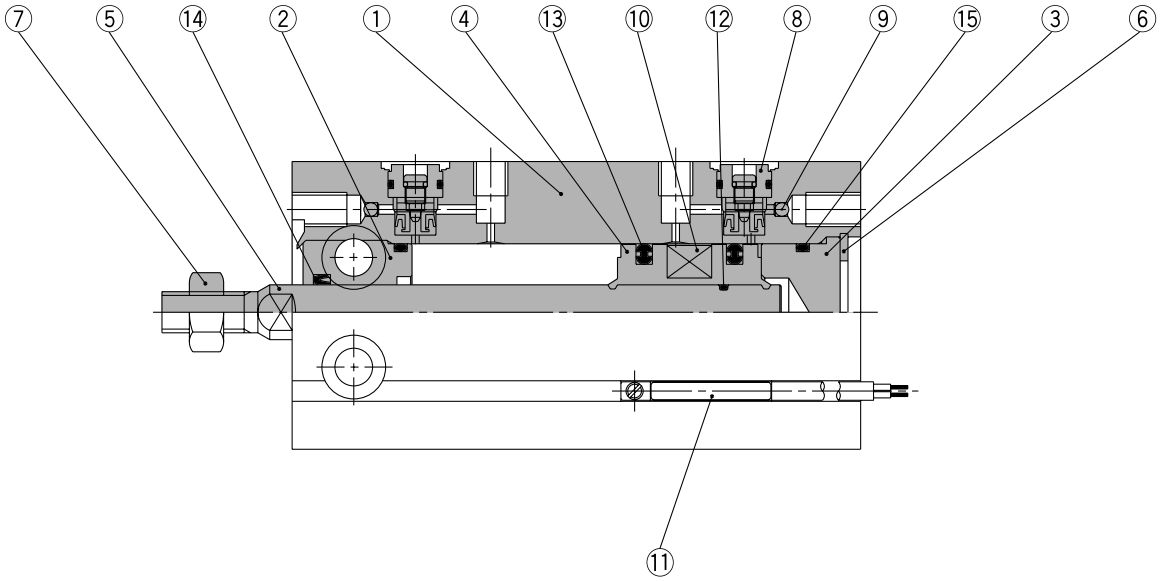
Bore size (mm)	Standard stroke (mm)								
	20	30	40	50	60	70	80	90	100
20	186	208	230	252	274	296	318	340	362
25	289	323	357	391	425	459	493	527	561
32	464	512	560	608	656	704	752	800	848

Additional Weight

(g)

Bore size (mm)	Magnet
20	5
25	6
32	11

Construction



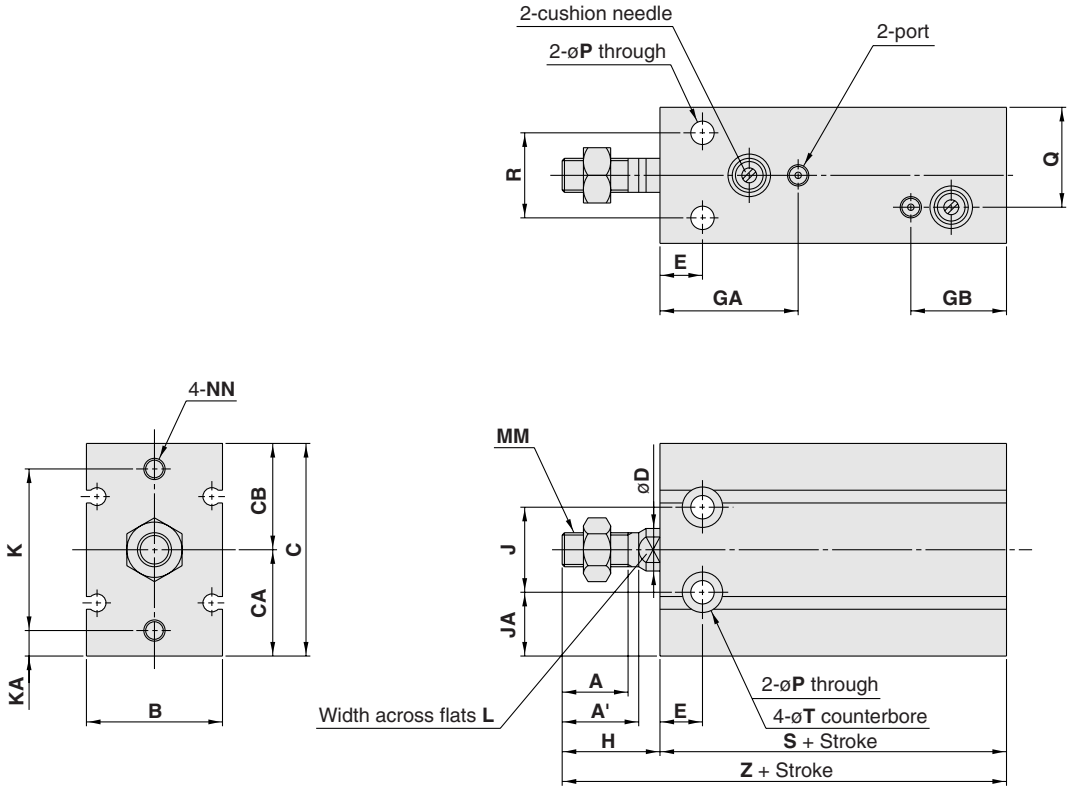
Component Parts

No.	Description	Material	No. of pcs.	Note
①	Cylinder tube	Aluminum alloy	1	Hard anodized
②	Rod cover/Bearing	Aluminum alloy	1	Hard anodized
③	Head cover	Aluminum alloy	1	Clear chromated
④	Piston	Aluminum alloy	1	Chromated
⑤	Piston rod	Stainless steel	1	
⑥	Snap ring	Carbon tool steel	1	Phosphate coated
⑦	Rod end nut	Carbon steel	1	Nickel plated
⑧	Cushion needle assembly	—	(2)	
⑨	Steel ball	Carbon steel	2	
⑩	Magnet	Magnetic material	1	
⑪	Auto switch	—	(2)	D-M9□ type
⑫	Piston gasket	NBR	1	
⑬	Piston seal	NBR	2	
⑭	Rod seal	NBR	1	
⑮	Gasket	NBR	1	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
20	CU20A-PS	⑬, ⑭, and ⑮
25	CU25A-PS	
32	CU32A-PS	

Dimensions

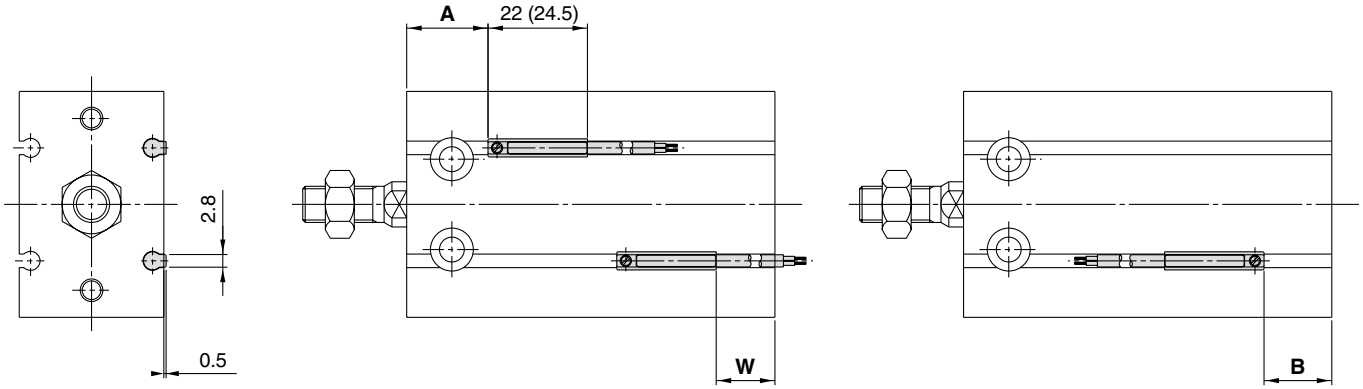


Bore size (mm)	Port size	A	A'	B	C	CA	CB	D	E	GA	GB	H	J	JA
20	M5 x 0.8	12	14	26	42	20	22	8	9	29	27	19	16	12
25	M5 x 0.8	15.5	18	32	50	25	25	10	10	32.5	22.5	23	20	15
32	Rc 1/8	19.5	22	40	62	31	31	12	11	35	25	27	24	19

Bore size (mm)	K	KA	L	MM	NN	P	Q	R	T	S	Z	Standard stroke
20	30	5	5	M6 x 1.0	M5 x 0.8 with depth 8	5.5	13	16	9.3 with depth 8	53	72	20, 30, 40, 50, 60, 70, 80, 90, 100
25	38	6	6	M8 x 1.25	M5 x 0.8 with depth 8	5.5	23.5	20	9.3 with depth 9	51.5	74.5	
32	48	7	8	M10 x 1.25	M6 x 1.0 with depth 9	6.6	29	24	11 with depth 11.5	56	83	

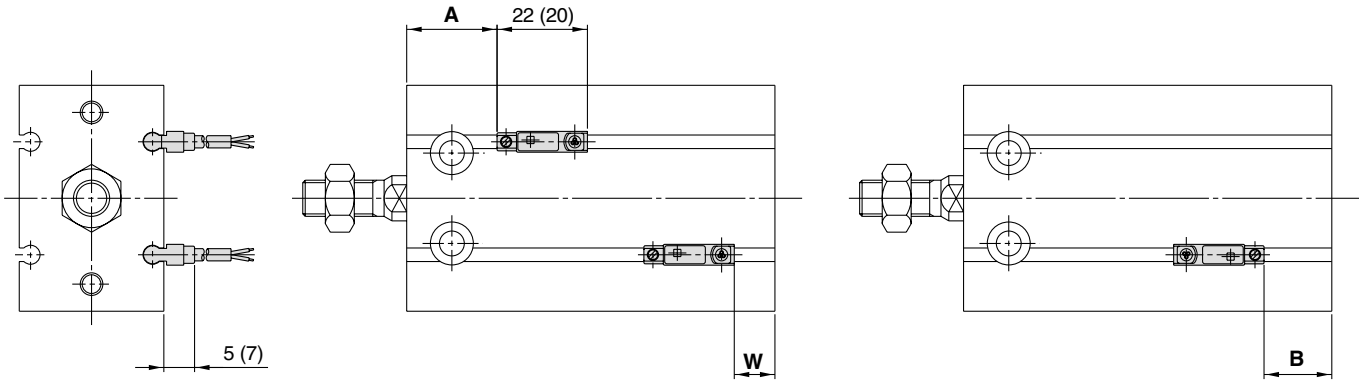
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Height

D-A9□
D-M9□
D-F9□W



The dimension in ( ) is for D-A93 type.

D-A9□V
D-M9□V
D-F9□WV



The dimension in ( ) is for D-M9□V and D-F9□WV.

Bore size (mm)	D-A9□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
	A	B	W	A	B	W	A	B	W
20	18	15	13 (10.5)	22	19	9	22	19	11
25	20	11	9 (6.5)	24.5	15	5	24.5	15	7
32	22.5	13.5	11.5 (9)	26.5	17.5	7.5	26.5	17.5	9.5

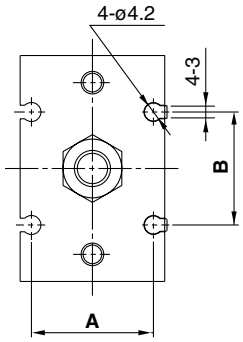
∗ Values in ( ) are dimensions for D-A93 type.

Operating Range

Switch model	Bore size (mm)		
	20	**25**	**32**
D-A9□, D-A9□V	11	12.5	14
D-M9□, D-M9□V	5	5	5
D-F9□W, D-F9□WV	6.5	7	7

∗ Values in this table include hysteresis and are to be used as a guide only. They do not guarantee an actual fixed range (expect approximately ±30% dispersion). Values may vary greatly depending on the operating environment.

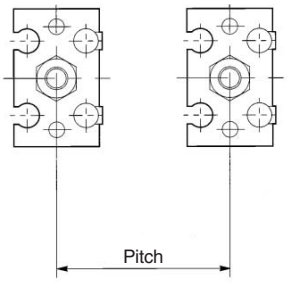
Auto Switch Rail Position



Bore size (mm)	A	B
20	21	23
25	27	25
32	35	27

Caution on Proximity Installation

When free mount cylinders equipped with D-A9□ or D-F9□ type auto switches are used, be sure to provide an extra clearance in addition to what is suggested in the table at right. If the distance between two cylinders is less than the noted value, auto switches may malfunction. When for some reason you cannot avoid installing cylinders closer than the required clearance, install a steel plate or magnetic shield plate (MU-SO25) on the side of the cylinder facing the auto switches to shield them. (Please contact SMC for details.) Auto switches may malfunction if a shielding plate is not used.



Bore size (mm)	Mounting pitch (mm)
20	40
25	46
32	56

Specific Product Precautions

Be sure to read before handling.

Installation and Removal of Snap Rings

⚠Caution

1. Use appropriate pliers (Type C snap ring installing tool) for installation and removal of snap rings.

2. Even when using appropriate pliers (Type C snap ring installing tool), proceed with caution as there is a danger of the snap ring flying off the end of the pliers (tool) and causing bodily injury or damage to nearby equipment. After installation, make sure that the snap ring is securely seated into the snap ring groove before supplying air.

Mounting

⚠Caution

1. Refer to the below table for mounting cylinders.

Tightening Torque

Bore sizes (mm)	Hexagon socket head cap screw (mm)	Proper tightening torque (N·m)
20, 25	M5	5.10 ±10%
32	M6	8.04 ±10%

Selection

⚠Caution

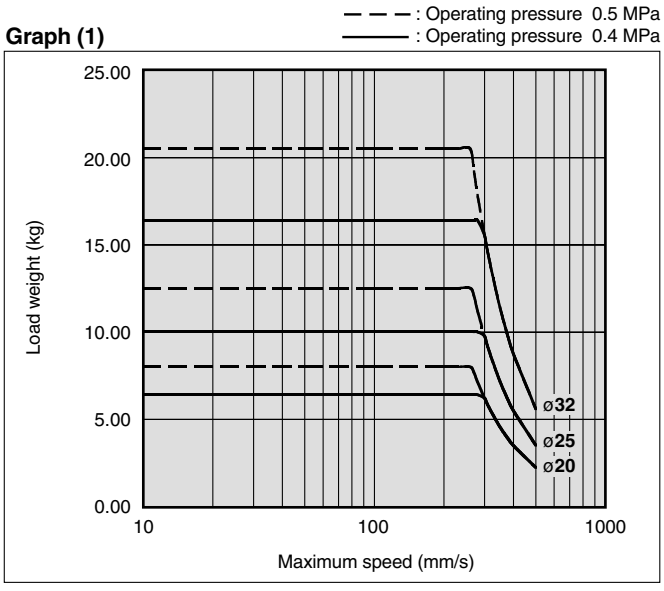
1. Operate the cylinder to the stroke end.

When the stroke is restricted by an external stopper or a clamped workpiece, sufficient cushioning and noise reduction may not be achieved.

2. Strictly observe the limiting ranges for load weight and maximum speed (Graph (1)). Also, the limiting ranges provided here are based on the condition that the cylinder is operated to the stroke end with a proper cushion needle adjustment.

If operated beyond the limiting ranges, excessive impact will occur and this may cause damage to equipment.

Graph (1)



Selection

⚠Caution

3. Adjust the cushion needle to reduce excessive kinetic energy from the piston impact at the stroke end by allowing it to absorb sufficient kinetic energy during the cushion stroke.

If due to improper adjustment, the piston impacts the stroke end with excessive kinetic energy (values above those given in Table (1)), an excessive impact will occur and this may cause damage to equipment.

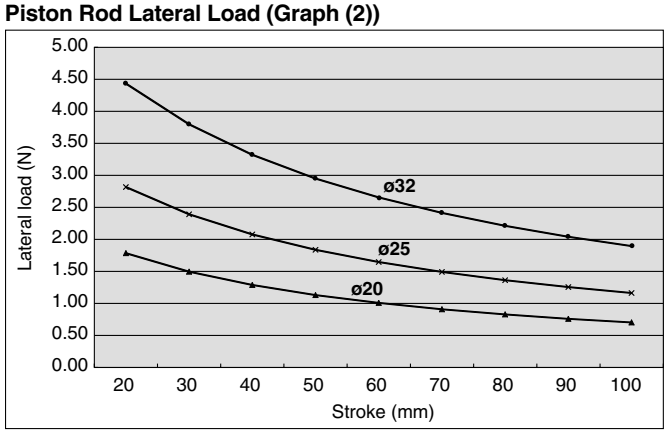
Table (1) Allowable Kinetic Energy at Piston Impact (J)

	20	25	32
Piston speed	50 to 500 mm/s		
Allowable kinetic energy	0.055	0.09	0.15

4. Strictly observe the limiting ranges for the piston rod lateral load (Graph (2)).

If operated beyond the limiting ranges, equipment life may be reduced or damage to equipment may occur.

Piston Rod Lateral Load (Graph (2))



Cushion Needle Adjustment

⚠Caution

1. Keep the adjustment range for the cushion needle between the fully closed position and the rotations shown below.

	Rotations
ø20 to ø32	2.5 rotations or less

Use a 3 mm flat head watchmakers' screwdriver to adjust the cushion needle. The adjustment range for the cushion needle must be between the fully closed position and the open position ranges indicated in the above table. A retaining mechanism prevents the cushion needle from slipping out; however, it may spring out during operation if it is rotated beyond the ranges shown above.

The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CU, CDU, refer to Best Pneumatics Vol. 7.

Low Speed Cylinder
Double Acting, Single Rod
Series CUX
ø10, ø16, ø20, ø25, ø32

How to Order

Without auto switch CUX 10 — 30 D

With auto switch CDUX 10 — 30 D — F9BW ☐

Built-in magnet

Low speed cylinder

Bore size

10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

10, 16	5, 10, 15, 20, 25, 30
20, 25, 32	5, 10, 15, 20, 25, 30, 40, 50

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

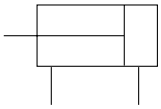
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	–	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) A93
3 m ····· L (Example) A93L
5 m ····· Z (Example) F9NWZ

∗ Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 7 for details.
• For details about auto switches with pre-wire connector, refer to page 10-20-66.

JIS Symbol
Double acting,
Single rod



Specifications

Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)
Lubrication	Not required (Non-lube)
Piston speed	ø10, ø16: 1 to 300 mm/s ø20 to ø32: 0.5 to 300 mm/s
Cushion	Rubber bumper on both ends
Rod end thread	Male thread
Thread tolerance	JIS Class 2
Stroke length tolerance	$^{+1.0}_{0}$ Note)
Mounting	Basic style

Note) Tolerance $^{+1.0}_{0}$

Minimum Operating Pressure

Bore size (mm)	10	16	20	25	32
Min. operating pressure (MPa)	0.06	0.06	0.05	0.05	0.05

Standard Stroke

Bore size (mm)	Standard stroke (mm)
10, **16**	5, 10, 15, 20, 25, 30
20, **25**, **32**	5, 10, 15, 20, 25, 30, 40, 50

⚠Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

Mounting

⚠Caution

1. Tightening the cylinder beyond the range of the indicated torque (shown in the table below) may affect operation. Apply Loctite® (no. 242, Blue) to the mounting threads.

Bore size (mm)	Hexagon socket head (mm)	Proper tightening torque (N·m) (Cylinder body)
10	M3	0.54 ±10%
16	M4	1.23 ±10%
20, 25	M5	2.55 ±10%
32	M6	4.02 ±10%

Operating Precautions

⚠Warning

1. It might not be able to control CUX10 by meter-out at a low speed operation.

⚠Caution

1. For Series CUX10, up to 0.1 Nℓ/min (ANR) of internal leakage is anticipated due to cylinder structure.

Maintenance

⚠Caution

1. Replacement parts/Seal kit
Order it in accordance with the bore size.

Bore size (mm)	Kit no.	Contents	
16	CUX16-PS	Piston seal:	1 pc.
20	CUX20-PS	Rod seal:	1 pc.
25	CUX25-PS	Gasket:	1 pc.
32	CUX32-PS	Grease pack (10 g):	1 pc.

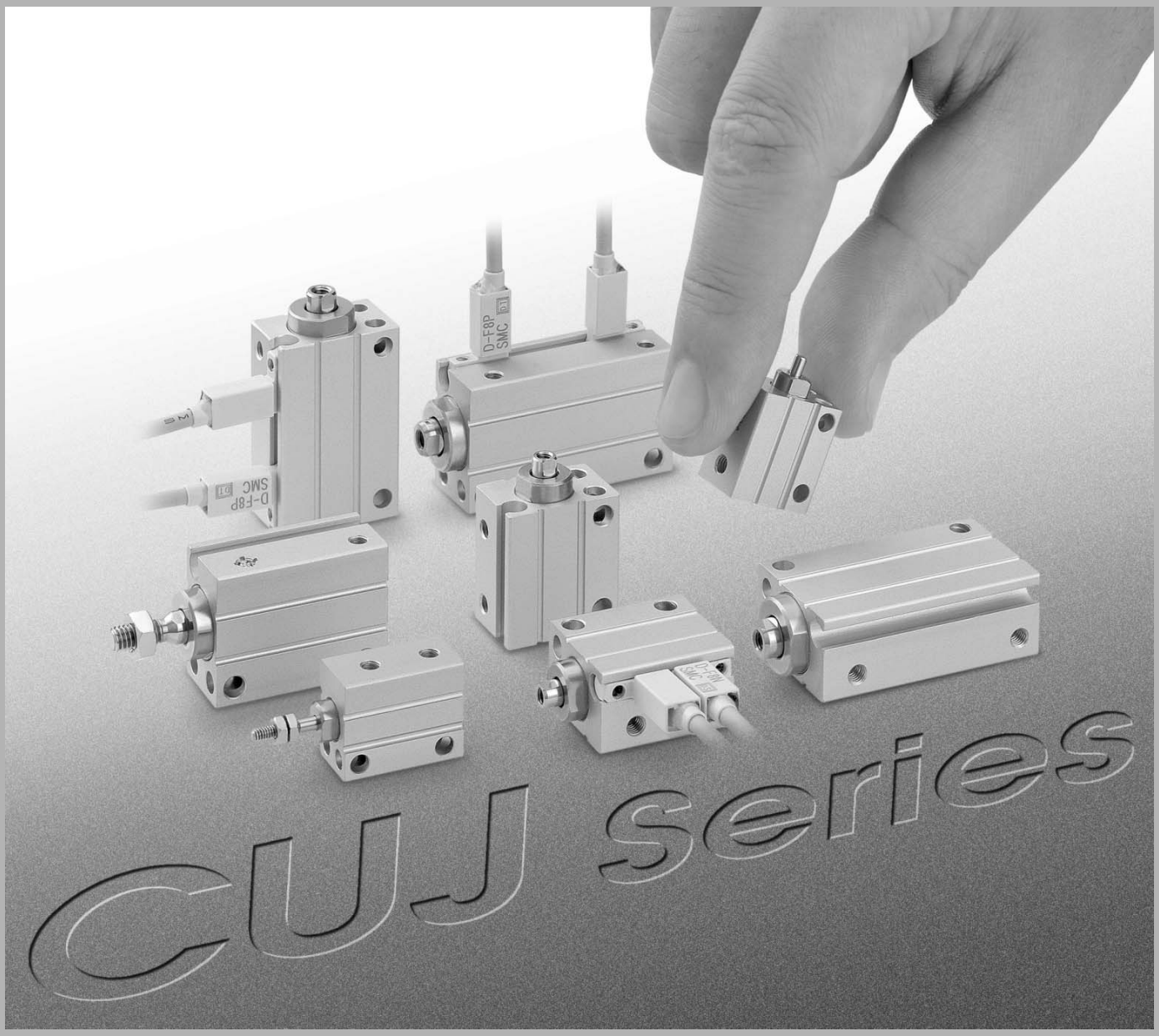
∗ It is impossible to replace seals in bore size 10 mm.

2. Grease pack
When maintenance requires only grease, use the following part numbers to order.
Grease pack
GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

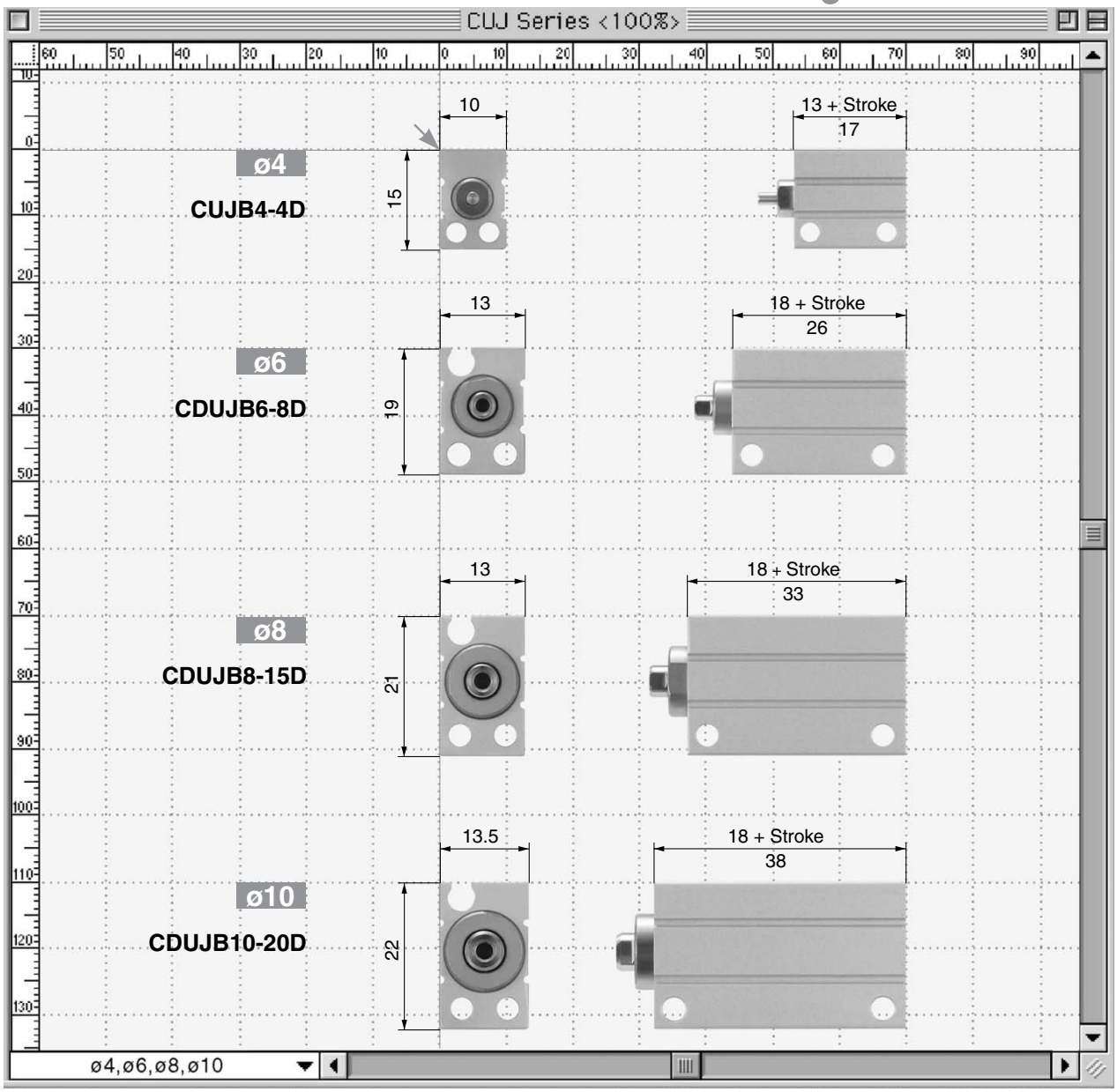
Mini-free Mount Cylinder

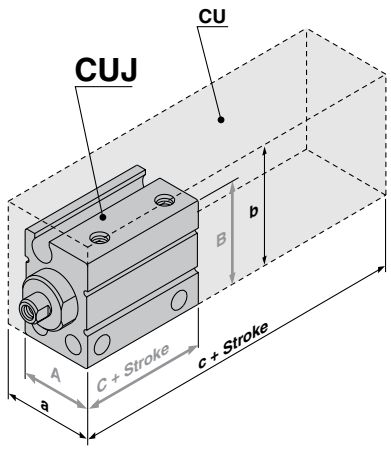
Series CUJ

ø4, ø6, ø8, ø10



Miniature Body





- Length is shortened by approx. **64%** max.
- Volume is reduced by approx. **70%** max.

(As compared with SMC Series CU cylinders without magnet)

Dimensions (Without magnet)

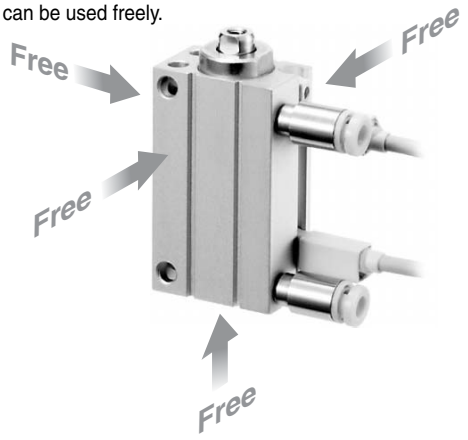
Bore size (mm)	A(a)	B(b)	C(c)
4	10(—)	15(—)	13(—)
6	13(13)	19(22)	13(33)
8	13(—)	21(—)	13(—)
10	13.5(15)	22(24)	13(36)

Numbers in parentheses are the dimensions of SMC Series CU cylinders.

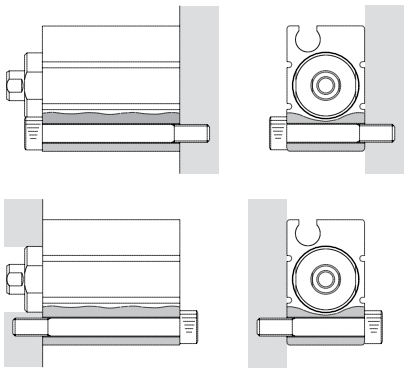
Series CUJ ø4, ø6, ø8, ø10

Concentrates wiring and piping on one side

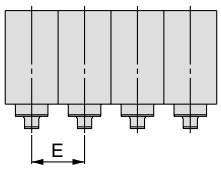
Allows more efficient installation, since four directions can be used freely.



Free mount design allows installation from four directions.



Short pitch mounting is possible.

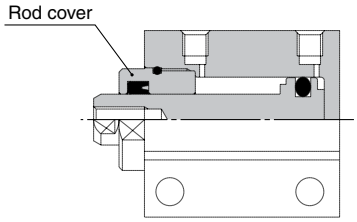


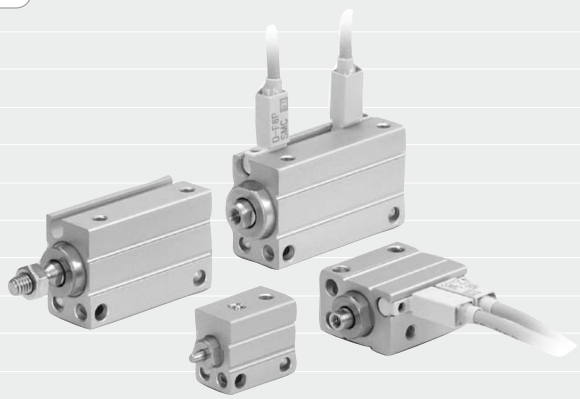
Pitch Dimensions (Without magnet)

Bore (mm)	E
4	10
6	13
8	13
10	13.5

Easy seal replacement

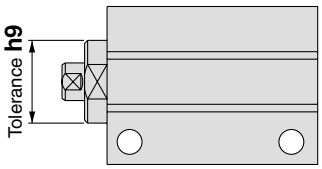
Seals can be replaced easily just by removing the rod cover.



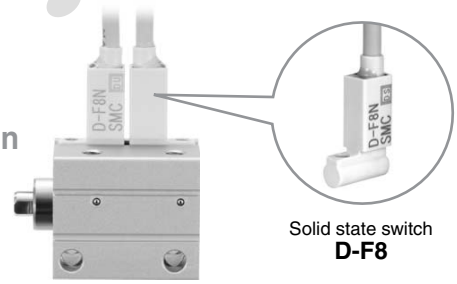


With boss in rod side (h9)

Centering can be done easily.



Two auto switches can be installed even for 4 mm strokes.



Solid state switch
D-F8

Compliant for clean room Clean Series

10-/11- Series CUJ

Series Variations

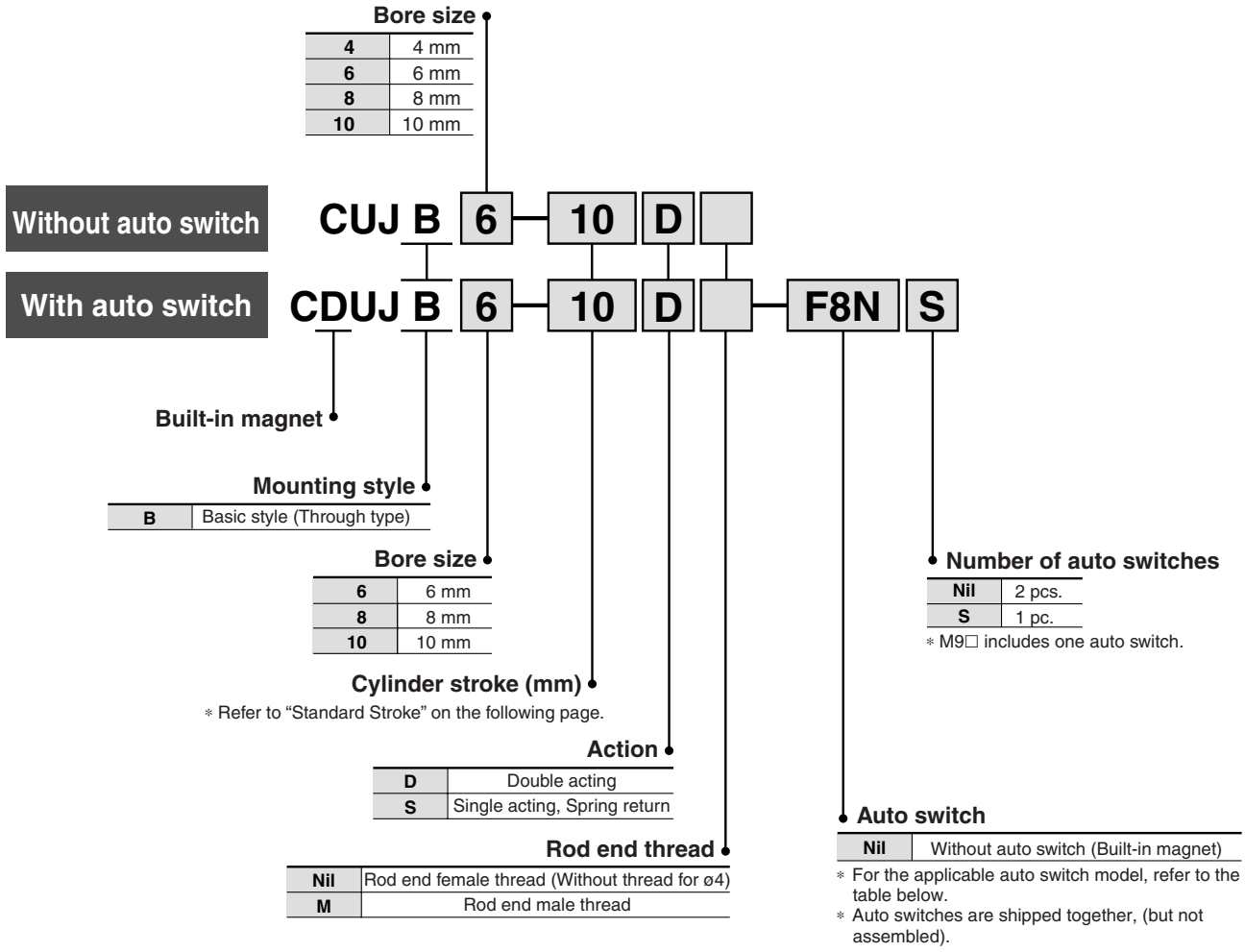
Series	Bore size (mm)	Action	Stroke (mm) 4	6	8	10	15	20	Clean series	Auto switch	Rod end configuration
CUJ	4	Double acting								None	Male thread Without thread
		Single acting, Spring return									
	6	Double acting								Solid state switch D-F8□ D-M9□	Female thread Male thread
		Single acting, Spring return									
	8	Double acting									
		Single acting, Spring return									
	10	Double acting									
		Single acting, Spring return									

Mini-free Mount Cylinder

Series CUJ

ø4, ø6, ø8, ø10

How to Order



Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

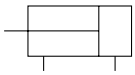
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m) ∗			Pre-wire connector	Applicable load	
					DC		AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
								Perpendicular	In-line						
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	12 V	—	—	M9N	●	●	○	○	—	Relay, PLC
								F8N	—	●	●	○	—		
				3-wire (PNP)				—	M9P	●	●	○	○		
								F8P	—	●	●	○	—		
				2-wire				—	M9B	●	●	○	○		
								F8B	—	●	●	○	—		

∗ Lead wire length symbols: 0.5 m·····Nil (Example) F8N
3 m····· L (Example) F8NL

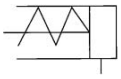
∗ Auto switches marked with "○" are produced upon receipt of order.

JIS Symbol

Double acting,
Single rod type



Single acting,
Spring return



Standard Stroke

Action	Bore size (mm)	Standard stroke (mm)
Double acting	4	4, 6, 8, 10
	6	4, 6, 8, 10, 15
	8, 10	4, 6, 8, 10, 15, 20
Single acting, Spring return	4	4, 6
	6	4, 6, 8
	8, 10	4, 6, 8, 10

Specifications

Bore size (mm)		4	6	8	10
Action		Double acting/Single acting, Spring return			
Fluid		Air			
Proof pressure		1.05 MPa			
Minimum operating pressure	Double acting	0.15 MPa			0.1 MPa
	Single acting, Spring return	0.35 MPa	0.3 MPa		0.2 MPa
Maximum operating pressure		0.7 MPa			
Ambient and fluid temperature		Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)			
Cushion		None			
Lubrication		Non-lube			
Piston speed		50 to 500 mm/s			
Thread tolerance		JIS Class 2			
Stroke length tolerance		$^{+0.5}_{0}$			
Mounting		Through-hole			

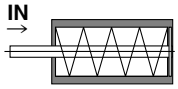
Theoretical Output/Double Acting

(N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)		
				0.3	0.5	0.7
4	2	OUT	12.6	3.76	6.28	8.79
		IN	9.4	2.82	4.71	6.59
6	4	OUT	28.3	8.48	14.13	19.79
		IN	15.7	4.71	7.85	10.99
8	5	OUT	50.3	15.07	25.13	35.18
		IN	30.6	9.18	15.31	21.44
10	6	OUT	78.5	23.56	39.26	54.97
		IN	50.3	15.07	25.13	35.18

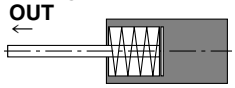
Spring Reaction Force/Single Acting

Spring in pre-loaded condition



When the spring is set in the cylinder

Spring in loaded condition



When the spring is contracted by applying air

(N)

Bore size (mm)	Spring condition	Stroke (mm)			
		4	6	8	10
4	Pre-loaded	1.70	1.27	—	—
	Loaded	2.55	2.55	—	—
6	Pre-loaded	2.45	2.01	1.57	—
	Loaded	3.33	3.33	3.33	—
8	Pre-loaded	4.67	3.76	2.86	1.96
	Loaded	6.47	6.47	6.47	6.47
10	Pre-loaded	5.04	4.18	3.31	2.45
	Loaded	6.77	6.77	6.77	6.77

Weight/Double Acting

(g)

Bore size (mm)	Standard stroke (mm)						Additional weight	
	4	6	8	10	15	20	With magnet	Rod end male thread
CUJB4	7.2	7.9	8.6	9.3	—	—	—	0.4
CUJB6	12.4	13.6	14.8	16.0	18.9	—	2.7	0.8
CUJB8	15.6	17.0	18.4	19.7	23.0	26.4	3.0	1.5
CUJB10	17.9	19.4	20.8	22.3	25.9	29.5	3.2	2.6

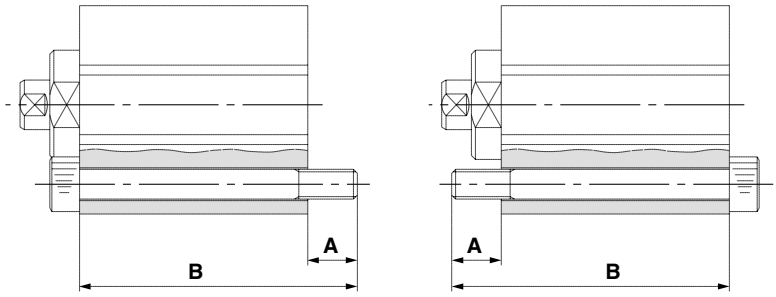
Weight/Single Acting

(g)

Bore size (mm)	Standard stroke (mm)				Additional weight	
	4	6	8	10	With magnet	Rod end male thread
CUJB4	7.2	7.9	—	—	—	0.4
CUJB6	12.8	14.0	15.2	—	2.4	0.8
CUJB8	15.8	17.2	18.6	19.9	2.5	1.5
CUJB10	17.9	19.4	20.8	22.3	2.4	2.6

Mounting

Through-hole mounting bolts are available for mounting a cylinder.
Ordering: Add the word "CUJ-" in front of the bolts to be used.
(Example) CUJ-M3 x 27ℓ



Axial mounting style **Lateral mounting style**

Without Auto Switch For Axial Mounting

Model	A	B	Mounting bolt
CUJB4-4	4	21	M2.5 x 21ℓ
-6		23	M2.5 x 23ℓ
-8		25	M2.5 x 25ℓ
-10		27	M2.5 x 27ℓ
CUJB6-4	5	22	M3 x 22ℓ
-6		24	M3 x 24ℓ
-8		26	M3 x 26ℓ
-10		28	M3 x 28ℓ
-15		33	M3 x 33ℓ
CUJB8-4	5	22	M3 x 22ℓ
-6		24	M3 x 24ℓ
-8		26	M3 x 26ℓ
-10		28	M3 x 28ℓ
-15		33	M3 x 33ℓ
-20		38	M3 x 38ℓ
CUJB10-4	5	22	M3 x 22ℓ
-6		24	M3 x 24ℓ
-8		26	M3 x 26ℓ
-10		28	M3 x 28ℓ
-15		33	M3 x 33ℓ
-20		38	M3 x 38ℓ

For Lateral Mounting

Model	C	D	Mounting bolt
CUJB4-4	4	14	M2.5 x 14ℓ
-6			
-8			
-10			
CUJB6-4	5	18	M3 x 18ℓ
-6			
-8			
-10			
-15			
CUJB8-4	5	18	M3 x 18ℓ
-6			
-8			
-10			
-15			
-20			
CUJB10-4	5	18	M3 x 18ℓ
-6			
-8			
-10			
-15			
-20			

With Auto Switch For Axial Mounting

Model	A	B	Mounting bolt
CDUJB6-4	5	27	M3 x 27ℓ
-6		29	M3 x 29ℓ
-8		31	M3 x 31ℓ
-10		33	M3 x 33ℓ
-15		38	M3 x 38ℓ
CDUJB8-4	5	27	M3 x 27ℓ
-6		29	M3 x 29ℓ
-8		31	M3 x 31ℓ
-10		33	M3 x 33ℓ
-15		38	M3 x 38ℓ
-20		43	M3 x 43ℓ
CDUJB10-4	5	27	M3 x 27ℓ
-6		29	M3 x 29ℓ
-8		31	M3 x 31ℓ
-10		33	M3 x 33ℓ
-15		38	M3 x 38ℓ
-20		43	M3 x 43ℓ

For Lateral Mounting

Model	C	D	Mounting bolt
CDUJB6-4	5	18	M3 x 18ℓ
-6			
-8			
-10			
-15			
CDUJB8-4	5	18	M3 x 18ℓ
-6			
-8			
-10			
-15			
-20			
CDUJB10-4	5	18	M3 x 18ℓ
-6			
-8			
-10			
-15			
-20			

■ Clean Series

How to Order

Double acting

10—C **D** UJB **6**—**8** D □—**F8N** □

Clean Series

10	Relief type
11	Vacuum suction type

Built-in magnet

Nil	None
D	Yes (Built-in)

Bore size

6	6 mm
8	8 mm
10	10 mm

Stroke

The specifications are the same as those for the standard double acting type.
Refer to "Standard Stroke" on page 7-2-5.

Rod end male thread

Nil	Rod end female thread
M	Rod end male thread

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ Applicable auto switch models are the same as those for the standard, double acting type. Refer to page 7-2-5.

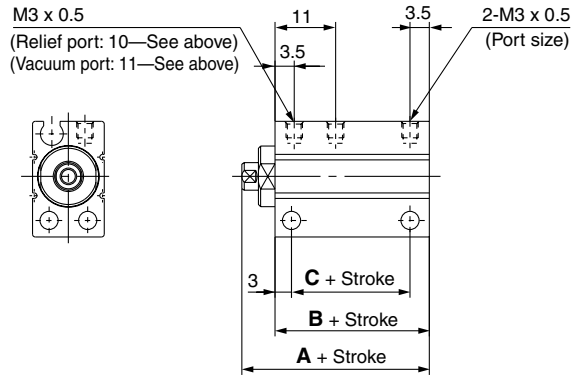
Number of auto switches

Nil	2 pcs.
S	1 pc.

Specifications

The specifications are the same as those for the standard double acting type. Refer to page 7-2-5.

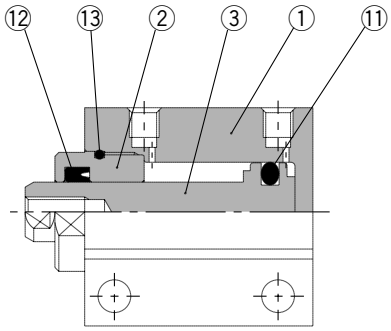
Dimensions



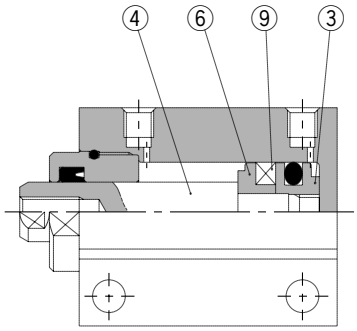
Bore size (mm)	Without auto switch			With auto switch		
	A	**B**	**C**	**A**	**B**	**C**
6, 8, 10	24	18	11.5	29	23	16.5

Construction

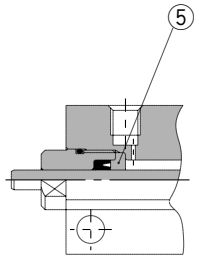
Double acting



Without magnet

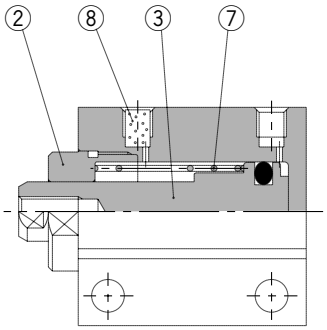


Built-in magnet

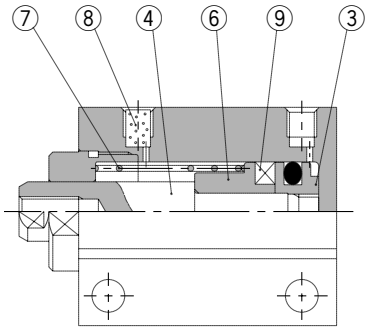


ø4

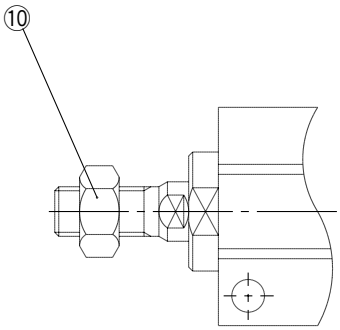
Single acting



Without magnet



Built-in magnet



Rod end male thread

Component Parts

No.	Description		Material	Note
①	Cylinder tube		Aluminum alloy	Hard anodized
②	Rod cover		Copper alloy	Electroless nickel plated
③	Piston	Without switch	Stainless steel	
		With switch	Aluminum alloy	Chromated
④	Piston rod		Stainless steel	
⑤	Seal retainer		Stainless steel	CUJB4 only
⑥	Magnet retainer		Aluminum alloy	Chromated
⑦	Return spring		Piano wire	
⑧	Bronze element		Sintered metallic BC	
⑨	Magnet		—	
⑩	Rod end nut		Steel	Nickel plated
⑪	Piston seal		NBR	
⑫	Rod seal		NBR	
⑬	Tube gasket		NBR	

Replacement Parts: Seal Kit (For double acting)

Bore size (mm)	Kit no.	Contents
4	CUJB4-PS	Set of nos. above ⑪, ⑫, ⑬ and an exclusive grease pack.
6	CUJB6-PS	
8	CUJB8-PS	
10	CUJB10-PS	

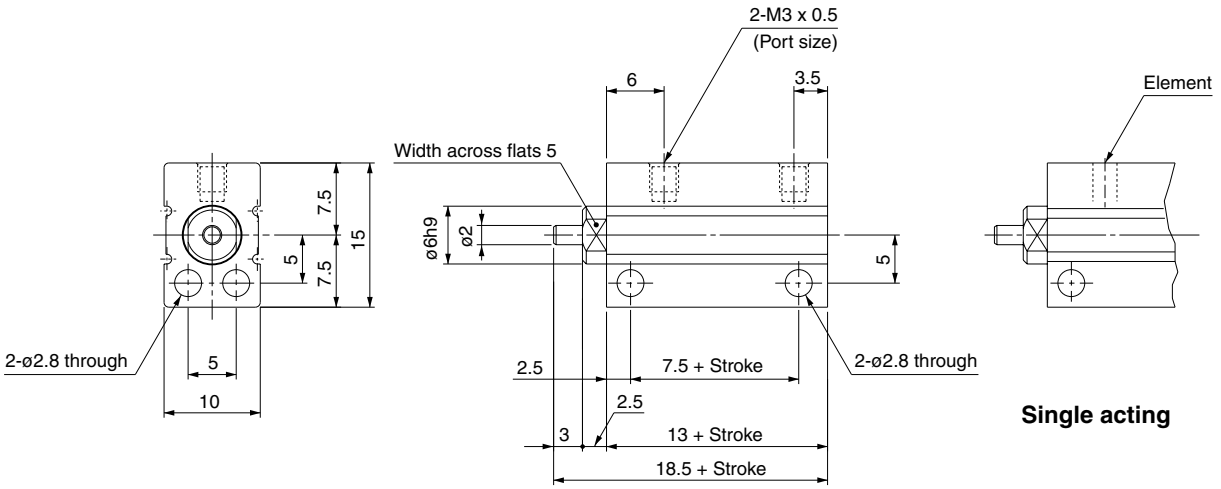
Replacement Parts: Seal Kit (For single acting)

Bore size (mm)	Kit no.	Contents
4	CUJB4-S-PS	Set of nos. above ⑪ and an exclusive grease pack.
6	CUJB6-S-PS	
8	CUJB8-S-PS	
10	CUJB10-S-PS	

Dimensions for ø4 Double Acting/Single Acting

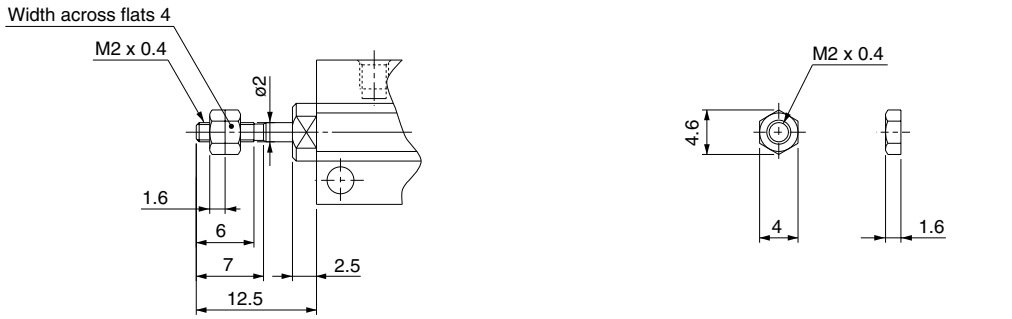
Without magnet: CUJB4

Note) The angular position of the width across flats is not fixed with respect to the tube.



Single acting

Rod end male thread

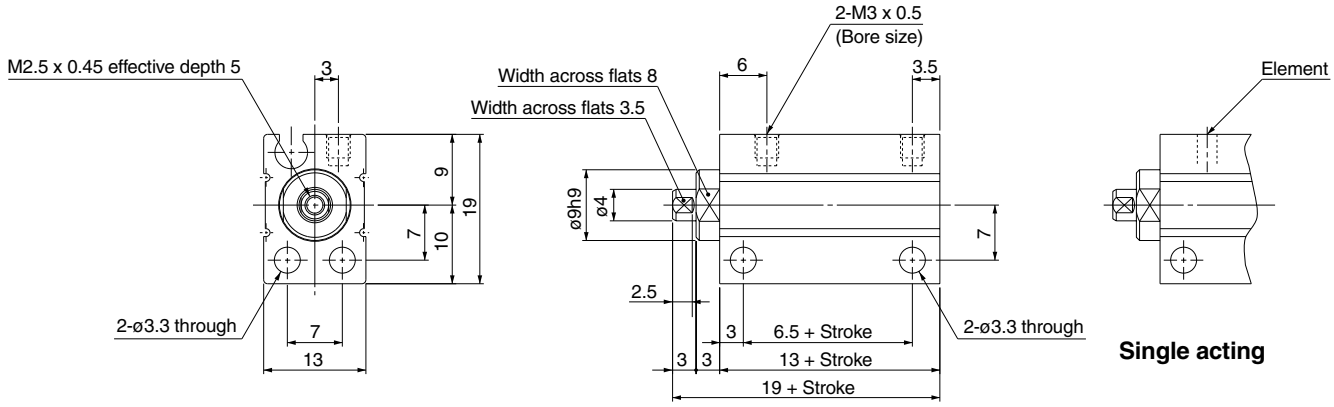


Rod end nut part no. : NTJ-004

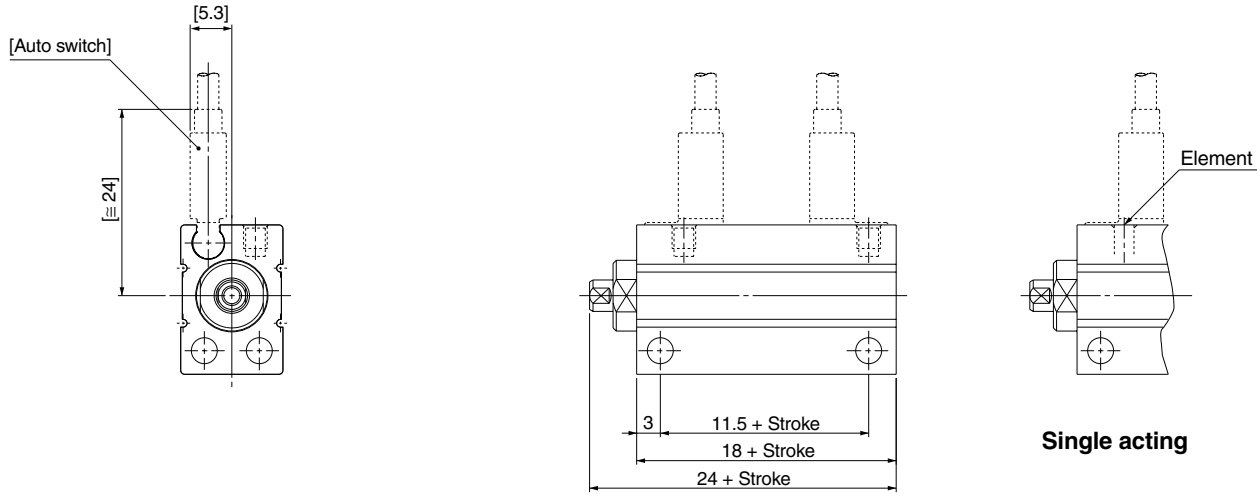
Dimensions for ø6 Double Acting/Single Acting

Without magnet: CUJB6

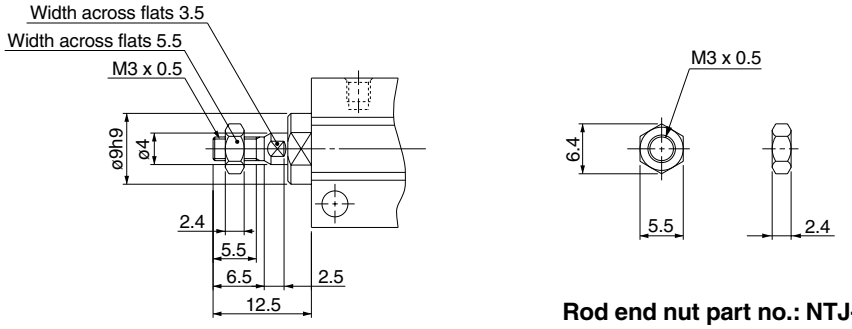
Note) The angular position of the width across flats is not fixed with respect to the tube.



Built-in magnet: CDUJB6



Rod end male thread

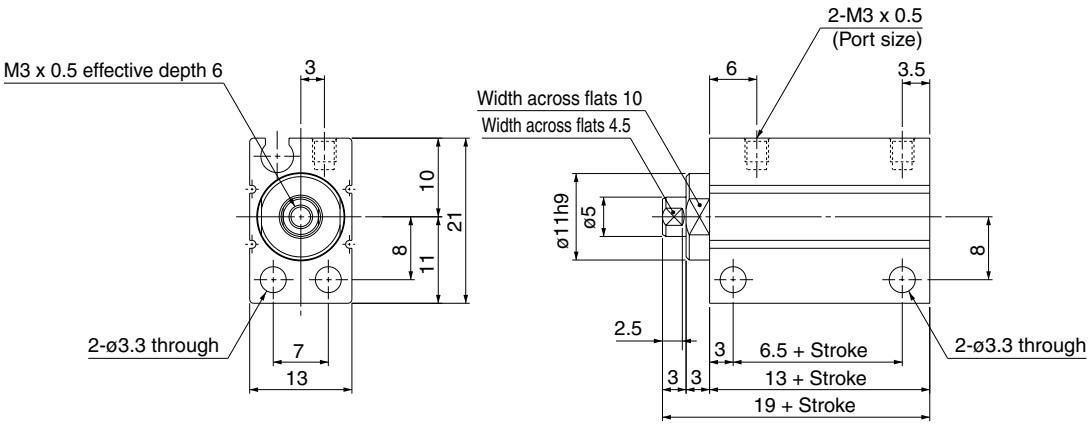


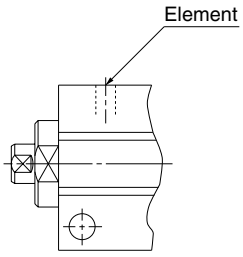
Rod end nut part no.: NTJ-006A

Dimensions for ø8 Double Acting/Single Acting

Without magnet: CUJB8

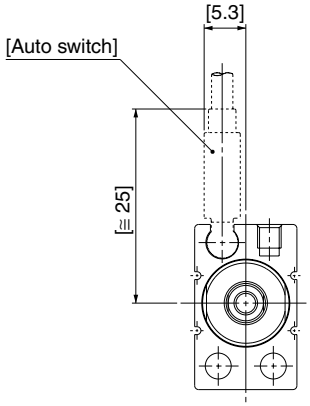
Note) The angular position of the width across flats is not fixed with respect to the tube.

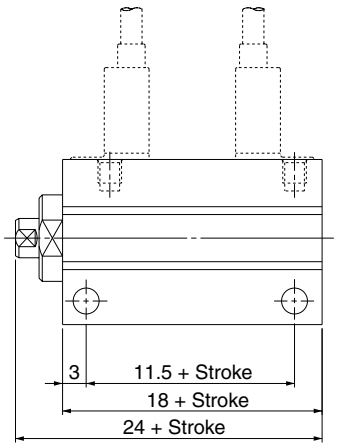


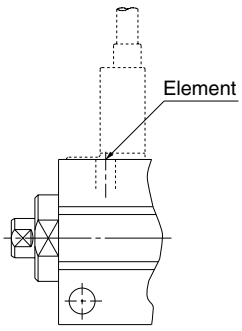


Single acting

Built-in magnet: CDUJB8

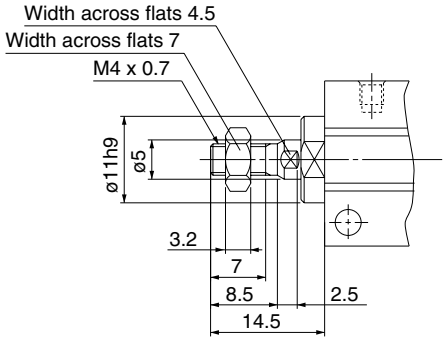


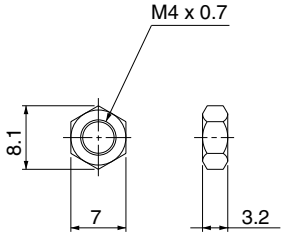




Single acting

Rod end male thread



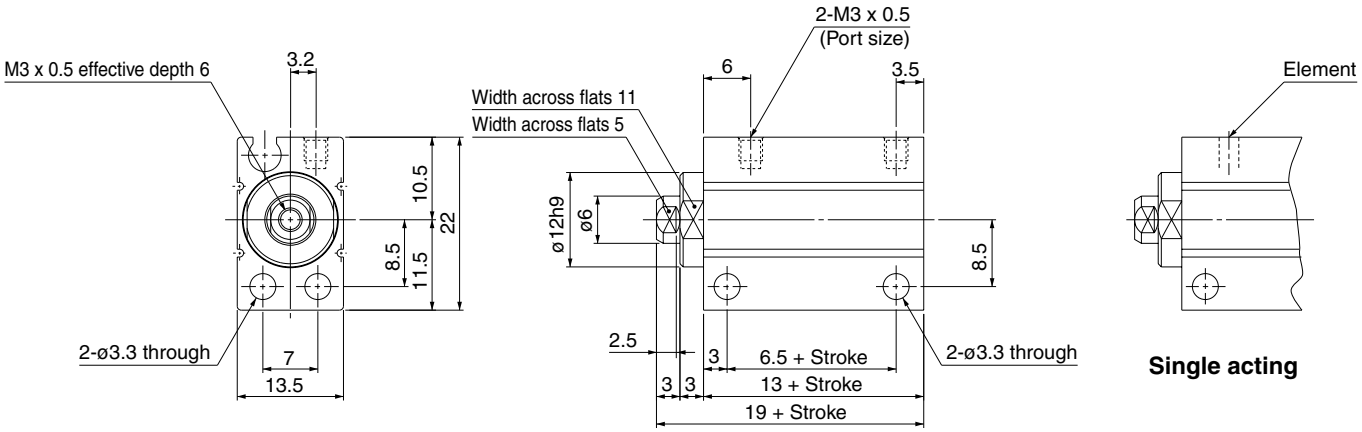


Rod end nut part no.: NTJ-010A

Dimensions for ø10 Double Acting/Single Acting

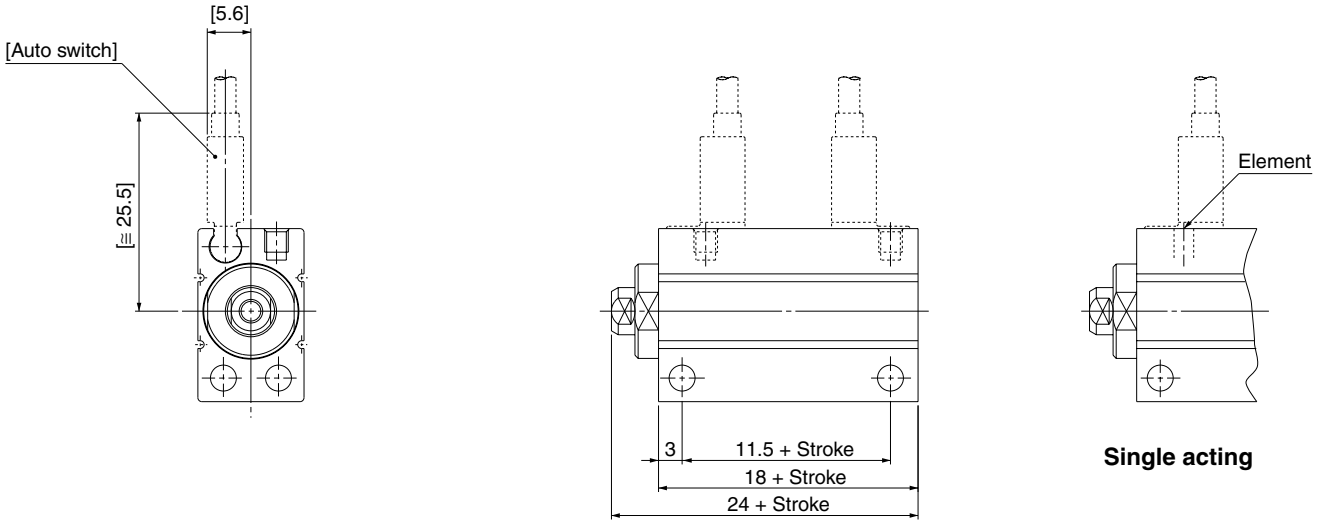
Without magnet: CUJB10

Note) The angular position of the width across flats is not fixed with respect to the tube.



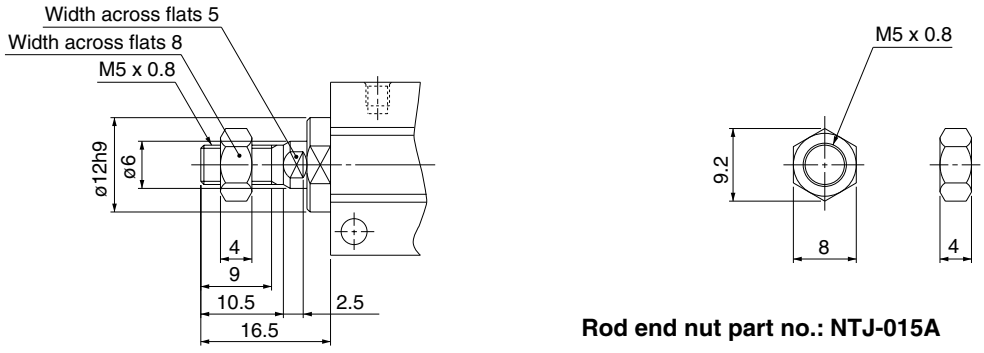
Single acting

Built-in magnet: CDUJB10



Single acting

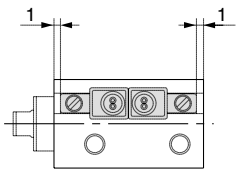
Rod end male thread



Rod end nut part no.: NTJ-015A

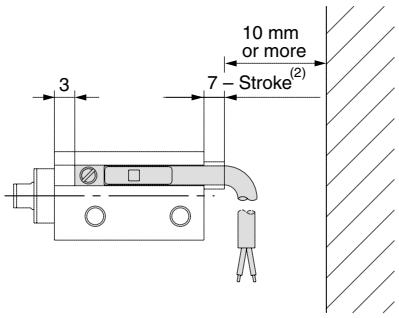
Proper Auto Switch Mounting Position (Detection at stroke end) (ø6, ø8, ø10 common)

D-F8N/F8P/F8B

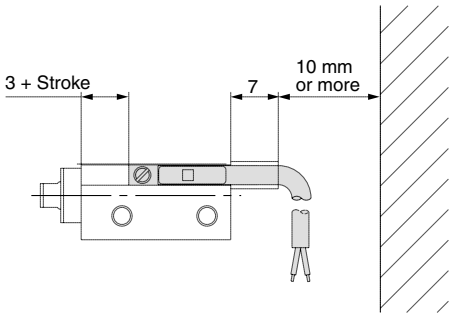


D-M9N/M9P/M9B

• When detecting extended stroke end

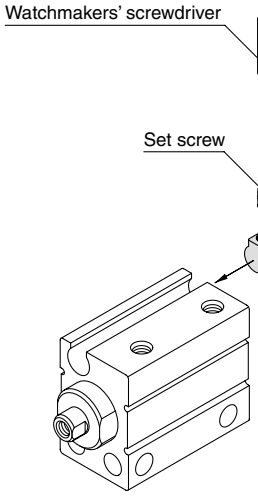


• When detecting retracted stroke end



Note 1) Solid state switch: D-M9□ includes one auto switch.
Note 2) To prevent interference caused by the lead wire, provide a clearance of 10 mm or more in addition to the dimensions stated above.

Mounting of Auto Switch



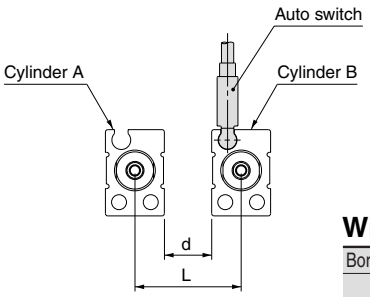
- When tightening an auto switch mounting screw, use a watchmakers' screwdriver with a handle of approximately 5 to 6 mm in diameter.
- Use a tightening torque of approximately 0.10 to 0.20 N·m.

Operating Range

Auto switch model	Applicable bore size (mm)		
	6	8	10
D-F8□	2	2.5	2.5
D-M9□	2	2	2

Caution on Proximity Installation

1. When cylinders with auto switches are adjacent to one another as shown in the figure below, provide at least the amount of space shown in the tables below between them.
If the space is not sufficient, the magnets in adjacent cylinders may cause auto switches to malfunction.



∗ The space can be reduced by attaching shielding plates (steel plates 0.2 to 0.3 mm thick) to the sides of the cylinders facing each other. In the case of bore size ø6, be sure to attach a plate on Cylinder A (on the surface opposite to the switch groove).

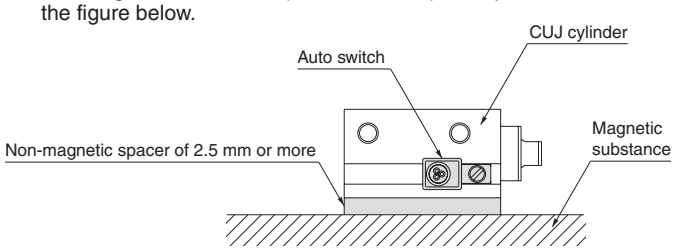
Without Shielding Plate

Bore (mm)	6	8	10
L	19	19	19.5
d	6	6	6

With Shielding Plate

Bore (mm)	6	8	10
L	16	13.5	14
d	3	0.5	0.5

2. In the case of bore size ø6 cylinders with auto switches, keep the switch groove side surface at least 2.5 mm away from a magnetic substance.
If a magnetic substance is getting closer within 2.5 mm, auto switches may malfunction due to a drop in magnetic force.
∗ If this surface is to be used for mounting, a spacer composed of a non-magnetic substance (aluminum, etc.) is required as shown in the figure below.



Specific Product Precautions 1

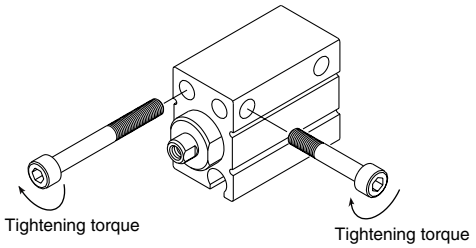
Be sure to read before handling.

Mounting

⚠ Caution

When mounting a mini-free mount cylinder, tighten the bolts with the proper tightening torque.

	Bolt	Proper tightening torque (N·m)
CUJB4	M2.5 x 0.45	0.54
C(D)UJB6	M3 x 0.5	1.06
C(D)UJB8		
C(D)UJB10		

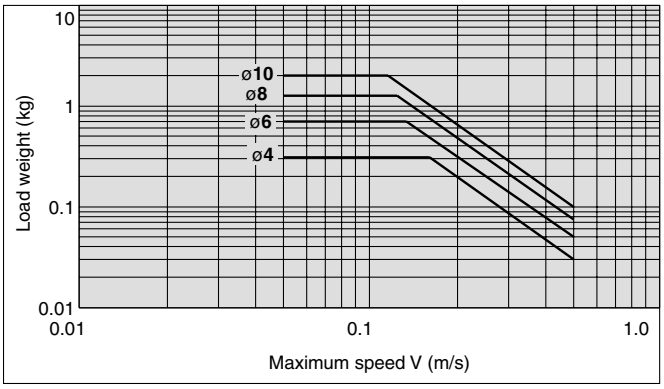


Allowable Kinetic Energy

⚠ Caution

When driving an inertial load, operate a cylinder with kinetic energy within the allowable value. The range in the chart below that is delineated by bold solid lines indicates the relation between load weights and maximum driving speeds.

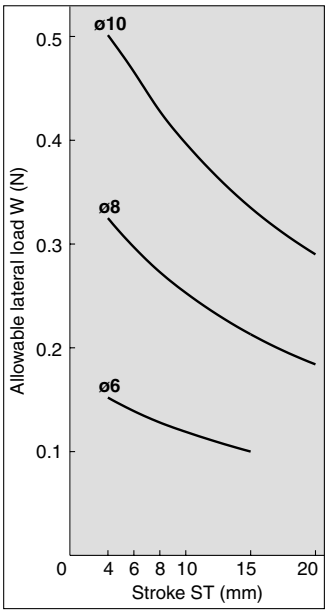
Bore size (mm)	**4**	**6**	**8**	**10**
Piston speed (m/s)	0.05 to 0.5			
Allowable kinetic energy (J)	3.8×10^{-3}	6.25×10^{-3}	9.35×10^{-3}	12.5×10^{-3}



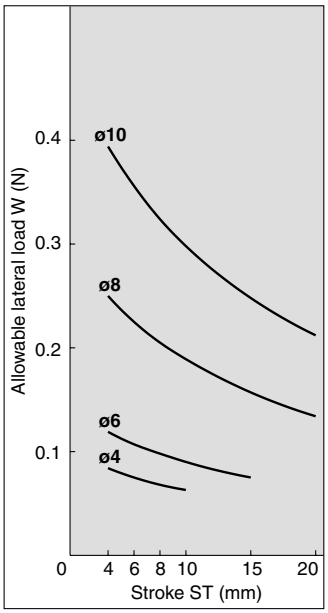
Selection

Strictly observe the limiting range of lateral load on a piston rod. (Refer to the graphs below.) If this product is used beyond the limits, it may shorten the machine life or cause damage.

With Auto Switch



Without Auto Switch



Specific Product Precautions 2

Be sure to read before handling.

Mounting of Speed Controllers and Fittings

⚠ Caution

Since the cylinder port size of M3 x 0.5 is used, use the cylinder series models listed below when connecting speed controllers and fittings directly to cylinders.

1. After manually tightening speed controllers and fittings, tighten approximately a quarter turn more using a tightening tool. In cases where there are gaskets in two places such as universal elbows, universal tees, etc., double the additional tightening to a half turn. If screws are tightened excessively, air leakage may result due to broken threads or a deformed gasket. If screws are tightened insufficiently, looseness and accompanying air leakage are likely to occur.

<Speed Controllers>
With Auto Switch

Bore size (mm)	6, 8, 10
Port size	M3 x 0.5
Stroke (mm)	4 or more
AS12□1F-M3-23	●
AS12□1F-M3-04	●
AS13□1F-M3-23	●
AS13□1F-M3-04	●

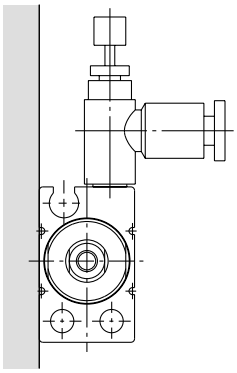
∗ Only applicable to the mounting position shown in Fig. (1) below.

Without Auto Switch

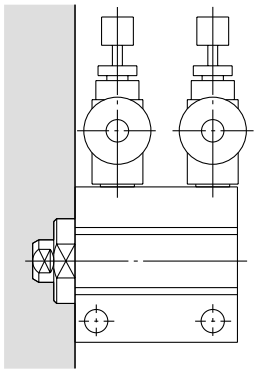
Bore size (mm)	4, 6, 8, 10	
Port size	M3 x 0.5	
Stroke (mm)	6	8 or more
AS12□1F-M3-23	●	●
AS12□1F-M3-04	—	●
AS13□1F-M3-23	●	●
AS13□1F-M3-04	—	●

∗ Only applicable to the mounting position shown in Fig. (1) below.

Fig. (1)



a) Side mounting



b) Rod side mounting

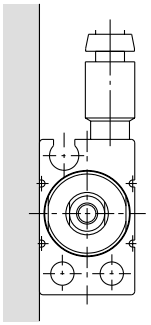
<One-touch Fittings and Hose Nipples>
With Auto Switch

Bore size (mm)		6, 8, 10	
Port size		M3 x 0.5	
Stroke (mm)		4	6 or more
One-touch fitting	**KJS23-M3**	●	●
Hose nipple	**M-3AU**	●	●
	M-3ALU	●	●

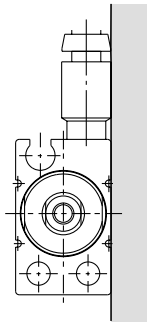
Without Auto Switch

Bore size (mm)		4		6, 8, 10	
Port size		M3 x 0.5			
Stroke (mm)		4	6 or more	4	6 or more
One-touch fitting	**KJS23-M3**	●	●	●	●
	KJS04-M3	—	○	—	△
	KJH23-M3	—	○	—	△
	KJH04-M3	—	○	—	△
	KJL23-M3	—	○	—	△
	KJL04-M3	—	○	—	△
	KJW23-M3	—	○	—	△
	KJW04-M3	—	○	—	△
Hose nipple	**M-3AU**	●	●	●	●
	M-3ALU	●	●	●	●

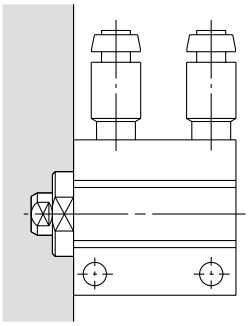
● : Applicable to mounting positions 1, 2, 3 and 4.
○ : Applicable to mounting positions 1, 2 and 3.
△ : Applicable to mounting positions 1 and 3.



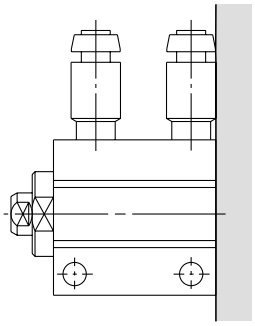
Mounting condition 1



Mounting condition 2

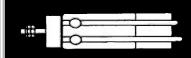


Mounting condition 3



Mounting condition 4

∗ The above figures show the mounting positions with series KJS One-touch fittings installed.
∗∗ Refer to the sections starting “Best Pneumatics Vol. 15” for the details of One-touch fittings and hose nipples.

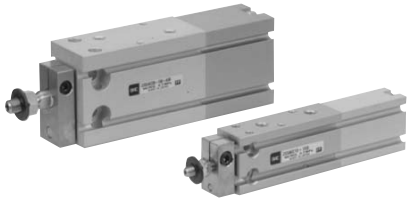


Free Mount Cylinder for Vacuum

Series ZCUK

A free mount cylinder with a vacuum passage in the rod to meet the requirements for Air cylinder + Vacuum pad.

A vacuum passage has been provided in the rod of the CUK cylinder to enable a vacuum pad to be installed on the end of the rod.



Not necessary to provide vacuum tubing space at the end of the rod.

The area around the vacuum pad is uncluttered.

● Non-rotationg rod

A guide is provided as standard equipment Non-rotating Rod Accuracy (no load: when the rod is retracted on the detent plate side):
ø10, ø16 ——— ±0.8°
ø20, ø25, ø32 ——— ±0.5°
Do not apply a lateral load to the piston rod. Because the piston rod is a hollow rod, a lateral load can cause the piston rod to bend or break.

● Auto switch

Reed switch:
D-A9□ (Heavy-duty cord, in-line entry)
D-A9□V (Heavy-duty cord, perpendicular entry)

Solid state switch:
D-M9□, D-F9□W (Heavy-duty cord, in-line entry)
D-M9□V, D-F9□WV (Heavy-duty cord, perpendicular entry)

● How to provide piping to the vacuum side

Cap piping

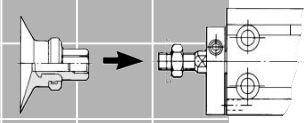
The piston rod of the vacuum side does not protrude. Also, the vacuum outlet tube does not move when the piston is operating.
Vacuum port pressure range: –101 kPa to 0.6 MPa
Pressurize only when releasing the vacuum. At that time, use it under the cylinder operating pressure.

Rod piping

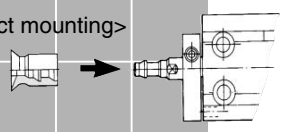
Lighter weight than the cap piping.
Can also be used for air blowing.
Vacuum port pressure range: –101 kPa to 0.6 MPa

● Vacuum pad (Pad diameter: ø2 to ø50)

<Vertical female thread> <Male thread>



<Direct mounting>



<Barb fitting>

Free Mount Cylinder for Vacuum

Series ZCUK

How to Order

Without auto switch

ZCUK **C** **16** – **20** **D**

With auto switch

ZC **D** **UK** **C** **16** – **20** **D** – **F9BW** **S**

Number of auto switches
Nil — 2 pcs.
S — 1 pc.

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Built-in magnet

Style (Tubing method in vacuum side)/ (Rod end shape)
C — Cap piping/Male thread
D — Cap piping/Male thread
Q — Rod piping/Male thread
R — Rod piping/Pad direct mounting

Bore size
10 — 10 mm
16 — 16 mm
20 — 20 mm
25 — 25 mm
32 — 32 mm

Acting
D — Double acting

Bore size – Stroke (mm)
10, **16** — 5, 10, 15, 20, 25, 30
20, **25**, **32** — 5, 10, 15, 20, 25, 30, 40, 50

Applicable Auto Switch/

Refer to Best Pneumatics Vol. 11/12 for further infomation on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	lead wire length∗ (m) 0.5 (Nil)	3 (L)	5 (Z)	Prewire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (PNP)	24 V	5 V,12 V	—	**M9NV**	**M9N**	●	●	○	○	IC	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnosis indication (2 colors)			3-wire (PNP)		5 V,12 V		**F9NWV**	**F9NW**	●	●	○	○	IC	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m ·····Nil Ex.) A93
3 m ·····L Ex.) A93L
5 m ·····Z Ex.) F9NWZ

∗ ○: Can be manufactured upon receipt of the order.

• For details about auto switches with pre-wire connector, refer to Best Pneumatics Vol. 11/12.

How to Order Vacuum Pad

<In the case of rod end male>

ZPT **02** **U** **N** – **B4**

Dia. (mm)
02 — ø2
04 — ø4
06 — ø6
08 — ø8
10 — ø10
13 — ø13
16 — ø16
20 — ø20
25 — ø25
32 — ø32
40 — ø40
50 — ø50

Pad type
U — Flat
C — Flat with ribs
D — Deep
B — Bellows
(Application: Refer to "Table (1)".)

Vacuum entry (Mounting thread diameter)

	Symbol	Thread dia.	ø2 to ø8	ø10 to ø16	ø20 to ø32	ø40, ø50
Female thread	**B4**	M4 x 0.7	●	—	—	—
	B5	M5 x 0.8	●	●	—	—
	B6	M6 x 1	—	●	●	—
	B8	M8 x 1.25	—	—	●	●
	B10	M10 x 1.25	—	—	●	●

Material
N — NBR
S — Silicon rubber
U — Urethane rubber
F — Fluoro rubber
GN — Conductive NBR (ø2 to ø16)
GS — Conductive silicon rubber (ø2 to ø16)

Table (1) Pad Dia./Pad Type

Dia. (mm) / Type	2	4	6	8	10	13	16	20	25	32	40	50
Flat	●	●	●	●	●	●	●	●	●	●	●	●
Flat with ribs	—	—	—	—	●	●	●	●	●	●	●	●
Deep	—	—	—	—	●	—	●	—	●	—	●	—
Bellows	—	—	●	●	●	●	●	●	●	●	●	●

Note) Refer to page 13-12-4 for combination of cylinder and pad.

<In the case of pad direct mounting>

ZP **04** **U** **N** – **X11**

Dia. (mm)
02 — ø2
04 — ø4
06 — ø6
08 — ø8
10 — ø10
13 — ø13
16 — ø16
20 — ø20
25 — ø25
32 — ø32
40 — ø40
50 — ø50

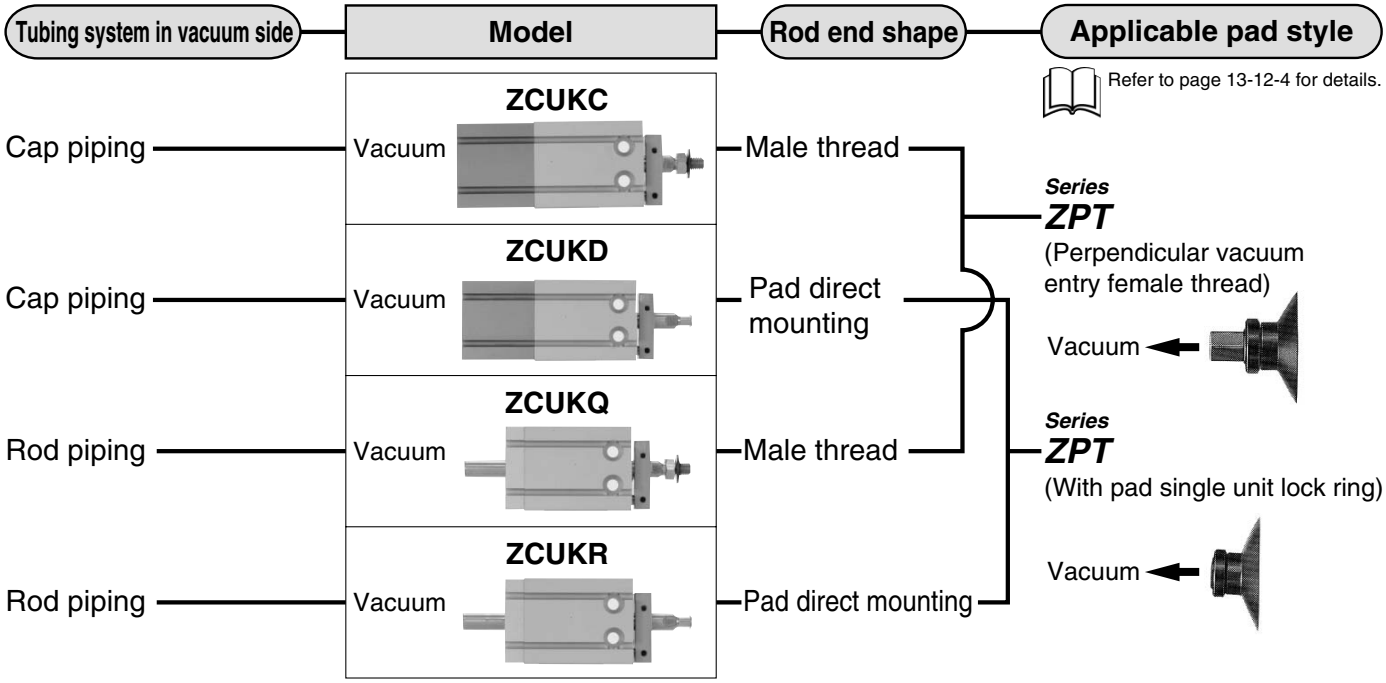
Pressure gauge position

Symbol	Applicable cylinder model
X11	ZC(D)UK$^{D}_{R}$10
Nil	ZC(D)UK$^{D}_{R}$16/32

Note) "-X11" Pad: ø2 to ø8 diameter and flat style only available.

Material
N — NBR
S — Silicon rubber
U — Urethane rubber
F — Fluoro rubber
GN — Conductive NBR (ø2 to ø16)
GS — Conductive silicon rubber (ø2 to ø16)

Pad type
U — Flat
C — Flat with ribs
D — Deep
B — Bellows (Except "-X11")



ZX
ZR
ZM
ZH
ZU
ZL
ZY
ZQ
ZF
ZP
ZCU
AMJ
Misc.

⚠ Precautions

Be sure to read before handling. Refer to pages 13-15-3 to 13-15-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to page 13-1-5 for Precautions on every series.

⚠ Caution

1. **Do not place your finger in the clearance between the detent plate and the cylinder tube.**
   Never put your finger between the non-rotating plate and cylinder tube. Your finger may be pinched when the piston rod retracts.
   If your finger is caught, it could injure your finger because the cylinder outputs a considerable amount of force.
2. Make sure that rotational torque is not applied to the piston rod. If this is unavoidable, operate the cylinder within the allowable rotational torque listed in the table below.

Allowable Rotational Torque

Bore size (mm)	10	16	20	25	32
Allowable rotational torque (N·m)	0.02	0.04	0.10	0.15	0.20

3. To secure a workpiece to the end of the piston rod, tighten the workpiece onto the piston rod with the piston rod fully retracted so that torque is not applied to the piston rod.
4. To install a cylinder, tighten it within the torque values indicated in the table below.

Proper Tightening Torque

Bore size (mm)	Hexagon socket head bolt diameter (mm)	Proper tightening torque (N·m)
ø10	M3	1.08 ±10%
ø16	M4	2.45 ±10%
ø20, ø25	M5	5.10 ±10%
ø32	M6	8.04 ±10%

Specifications

Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Vacuum port pressure	–101 kPa to 0.6 MPa (At vacuum release 0 to 0.6 MPa) Note)
Ambient and fluid temperature	Without auto-switch: –10 to +70°C (No freezing) With auto-switch: –10 to +60°C (No freezing)
Lubrication	Not required
Piston speed	50 to 500mm/s
Cushion	Rubber bumper at both sides
Stroke allowance	$^{+1.0}_{0}$
Thread tolerance	JIS Class 2
Rod tip screw	With or without (Pad direct mounting)
Mounting	Basic type
Applicable pad	Refer to page 13-12-4 for details.

Note) For a cap style, supply pressure only when vacuum is released. That pressure should be less than the cylinder pressure.

Non-rotating Rod Accuracy (No load/At retraction of the rod at the locking plateside)

Bore size (mm)	10	16	20	25	32
Non-rotating rod accuracy	±0.8°		±0.5°		

Minimum Operating Pressure (MPa)

Bore size (mm)	10	16	20	25	32
Min. Operating Pressure (MPa)	0.13	0.13	0.11	0.11	0.11

Applicable Auto Switch

Refer to Best Pneumatics Vol. 11/12 for more detailed specifications.

Model	Part no.	Electrical entry	Features
Reed switch	**D-A90**	Grommet (In-line)	Without indicator light
	D-A90V	Grommet (Perpendicular)	

• With Normally closed (NC = b contact), and solid state switches(D-F9G/F9H type) are also available. Refer to Best Pneumatics Vol. 11/12 for details.

Standard Stroke

Applicable cylinder / Stroke (mm)	Double acting style/Single rod type/Non-rotating rod							
	Stroke (mm)							
Bore size (mm)	5	10	15	20	25	30	40	50
10	●	●	●	●	●	●	—	—
16	●	●	●	●	●	●	—	—
20	●	●	●	●	●	●	●	●
25	●	●	●	●	●	●	●	●
32	●	●	●	●	●	●	●	●

Theoretical Output/Double Acting Type

(N)

Bore size (mm)	Rod dia. (mm)	Piston area (mm^2)	Operating pressure (MPa)		
			0.3	0.5	0.7
10	4	66.0	19.8	33	46.2
16	6	172	51.6	86	121
20	8	264	79.2	132	185
25	10	412	124	206	289
32	12	691	207	346	484

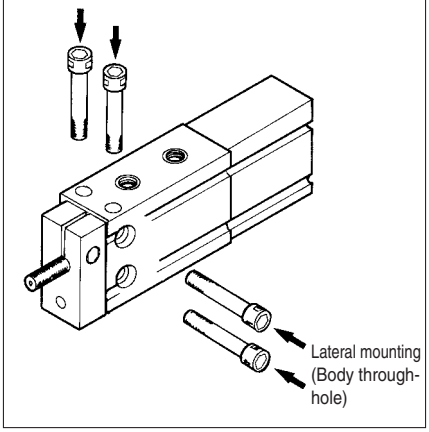
1 MPa ≅ 10.2 kgf/cm^2, 1 N ≅ 0.102 kgf

Minimum Stroke for Mounting Auto Switch

Number of auto switches	Applicable auto switch		
	D-A9□, D-A9□V	**D-M9□, D-M9□V**	**D-F9□W, D-F9□WV**
1 pc.	5	5	5
2 pcs.	10	5	10

Mounting

Vertical mounting (Body through-hole)



Cylinder/Applicable Pad

• In the case of rod end male thread

Use series ZPT pad (vertical vacuum entry/female thread mounting).

Cylinder Model	Bore size (mm)	Pad (ZPT02 to 50□□-B4 to 10) Rod dia. (mm) 2	4	6	8	10	13	16	20	25	32	40	50	Thread dia.
ZCUKC ZCUKQ ZCDUKC ZCDUKQ	**10**	●	●	●	●	—	—	—	—	—	—	—	—	M4 x 0.7
	16	●	●	●	●	●	●	●	—	—	—	—	—	M5 x 0.8
	20	—	—	—	—	●	●	●	●	●	●	—	—	M6 x 1.0
	25	—	—	—	—	—	—	—	●	●	●	●	●	M8 x 1.25
	32	—	—	—	—	—	—	—	●	●	●	●	●	M10 x 1.25

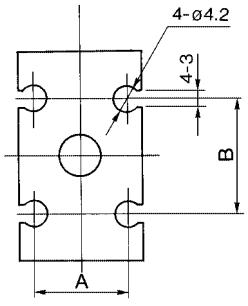
• In the case of pad direct mounting

Use series ZP pad (single unit).

Cylinder Model	Bore size (mm)	Pad (ZP02 to 50□□) Rod dia. (mm) 2	4	6	8	10	13	16	20	25	32	40	50
ZCUKD ZCUKR ZCDUKD ZCDUKR	**10** Note)	●	●	●	●	—	—	—	—	—	—	—	—
	16	●	●	●	●	—	—	—	—	—	—	—	—
	20	—	—	—	—	●	●	●	—	—	—	—	—
	25	—	—	—	—	—	—	—	●	●	●	—	—
	32	—	—	—	—	—	—	—	—	—	—	●	●

Note) When using "ZC(D)UK $^{U}_{R}$10", use ZP02 to 08U∗-X11. Pad shape is flat only.

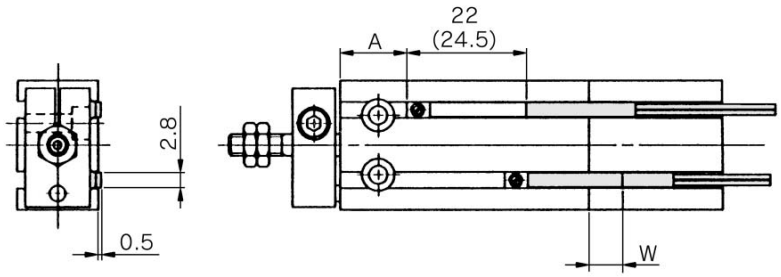
Switch Groove Location



Bore size (mm)	A	B
10	10.3	13
16	15	18
20	21	23
25	27	25
32	35	27

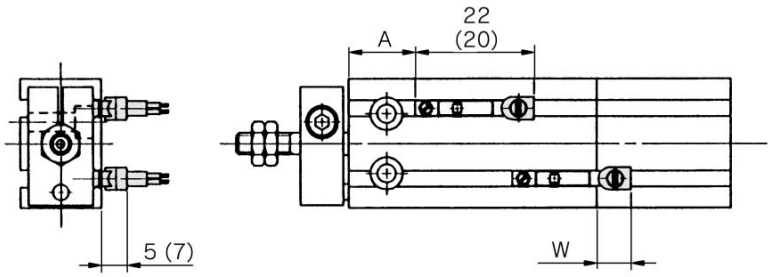
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A9□
D-M9□
D-F9□W



( ): Dimensions for "D-A93"

D-A9□V
D-M9□V
D-F9□WV



( ): Dimensions for "D-F9□V", "D-F9□WV"

Bore size (mm)	D-A9□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
	A	B	W	A	B	W	A	B	W
10	12.5	3	–1.5 (1)	16.5	7.5	2.5	16.5	7.5	0.5
16	16	4	–2 (0.5)	20	8	1.5	20	8	0
20	20	6	–4 (–1.5)	24	10	0	24	10	–2
25	22.5	7	–5.5 (–3)	26.5	11.5	–1.5	26.5	11.5	–3.5
32	23.5	8	–6.5 (–4)	27.5	12.5	–2.5	27.5	12.5	–4.5

Note 1) Negative figures in the table show dimensions mounted inside cylinder body.
Note 2) In the case of 5 mm stroke or the 10 mm stroke, there are times in which the switch will not turn OFF or 2 switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).
Note 3) Figures in ( ) in the table W are D-A93.

Operation Range

Auto switch model	Bore size (mm)				
	10	**16**	**20**	**25**	**32**
D-A9□/A9□V	6	9	11	12.5	14
D-M9□/M9□V	2.5	3	4	4	5
D-F9□W/F9□WV	3.5	5.5	6.5	7	7

∗ Since this is the average value at a normal temperature including hysteresis (tolerance ±30%), it is not guaranteed.

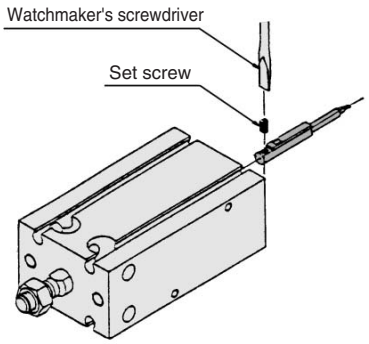
⚠ Precautions

Be sure to read before handling. Refer to pages 13-15-3 to 13-15-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to page 13-1-5 for Precautions on every series.

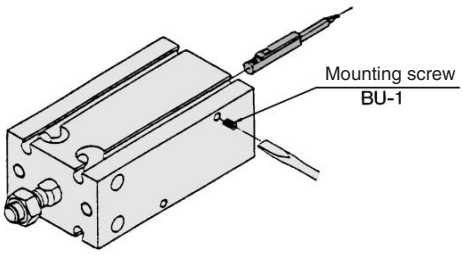
Auto Switch Specifications

Mounting of Auto Switch

Mounting



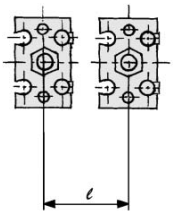
- **To tighten the auto switch mounting screws, use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm.**
- **Tighten the screws to a torque of approximately 0.10 to 0.20 N·m.**



- **Do not install using BU-1 (mounting screws used exclusively for D-9□ model auto switch).**
  (Failure to observe this precaution could cause the auto switch to break.)

Precautions on Proximity Installation

If the mounting pitch of a free-mount cylinder with D-A9, D-F9 type auto switch is less than the dimensions indicated in the table below, the auto switch could malfunction. Therefore, make sure to provide a greater clearance. If use under the dimensions indicated below is unavoidable, it is necessary to provide a shield. To do so, affix a steel plate or a magnetic shield plate (MU-S025) to the corresponding position of the cylinder that is placed near the auto switch. (Please contact SMC for further details.)
If a shield plate is not used, it could cause the auto switch to malfunction.



Bore size (mm)	Mounting pitch (mm)
10	20
16	33
20	40
25	46
32	56

Weight

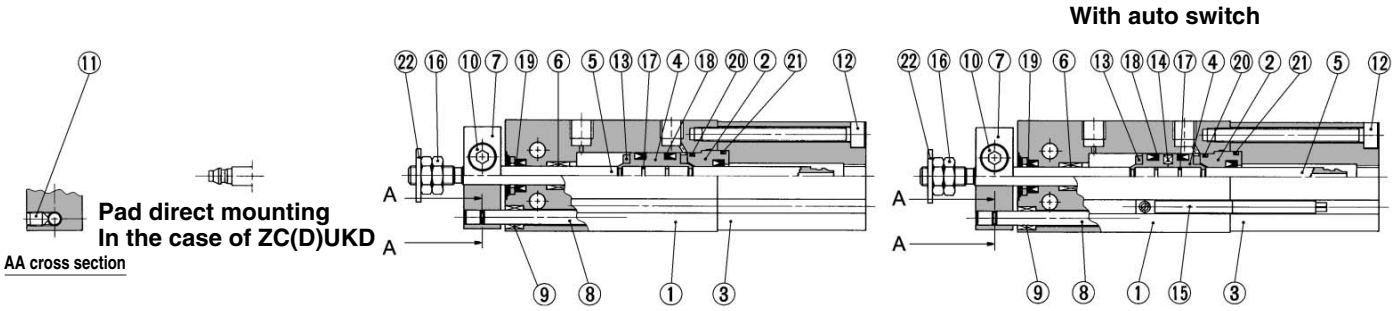
Basic Style/With Auto Switch

( ): Denotes the values with D-A93. (g)

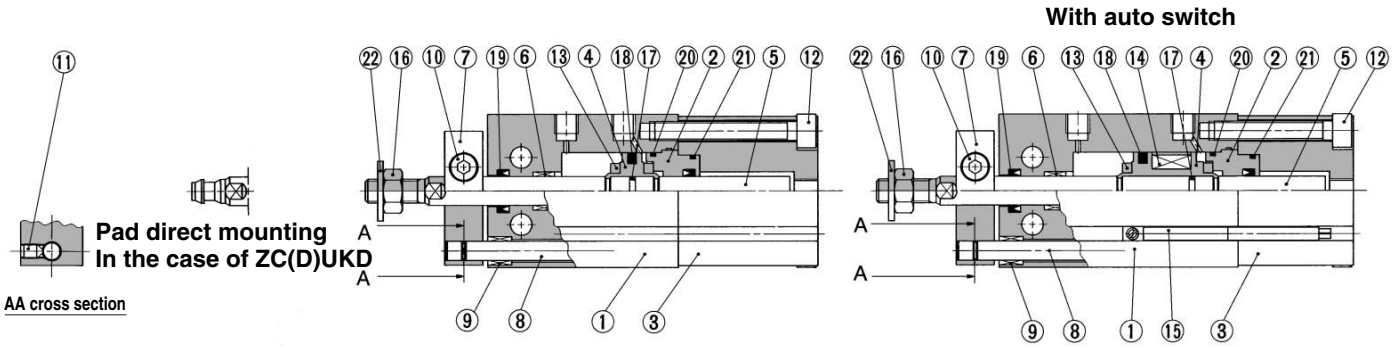
Model	Bore size (mm)	Cylinder stroke (mm)							
		5	**10**	**15**	**20**	**25**	**30**	**40**	**50**
ZC(D)UKC	**10**	63 (68)	69 (79)	75 (85)	81 (91)	87 (97)	93 (103)	—	—
	16	103 (128)	115 (145)	127 (157)	139 (169)	151 (181)	163 (193)	—	—
	20	180 (214)	204 (244)	228 (267)	252 (292)	276 (316)	300 (340)	348 (388)	396 (436)
	25	304 (358)	343 (402)	382 (441)	421 (480)	460 (519)	499 (558)	577 (636)	655 (714)
	32	514 (587)	574 (652)	634 (712)	694 (772)	754 (832)	814 (892)	934 (1012)	1054 (1132)
ZC(D)UKQ	**10**	49 (54)	53 (63)	57 (67)	61 (71)	65 (75)	69 (79)	—	—
	16	79 (104)	86 (116)	93 (123)	100 (130)	107 (137)	114 (144)	—	—
	20	145 (179)	159 (198)	173 (212)	187 (226)	201 (240)	215 (254)	243 (282)	271 (310)
	25	259 (313)	279 (338)	299 (358)	319 (378)	339 (398)	359 (418)	399 (458)	439 (498)
	32	421 (494)	451 (529)	481 (559)	511 (589)	541 (619)	571 (649)	631 (709)	691 (769)

Construction

Cap piping/Male thread: ZC(D)UKC
ø10



ø16 to ø32



Component Parts

No.	Description	Material	Note
①	Cylinder tubing	Aluminum alloy	Hard anodized
②	Rod cover B	Aluminum bearing alloy	Chromated
③	Cap	Aluminum alloy	Hard anodized
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Stainless steel	
⑥	Bush	Oil impregnated sintered metal	
⑦	Plate	Aluminum alloy	Nickel plated
⑧	Guide rod	Stainless steel	
⑨	Bush	Oil impregnated sintered metal	
⑩	Hexagon set screw	Carbon steel	Black zinc chromated
⑪	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑫	Hexagon set screw	Carbon steel	Nickel plated

Component Parts

No.	Description	Material	Note
⑬	Damper	Urethane	
⑭	Magnet	Magnetic material	
⑮	Auto switch	—	
⑯	Jam nut	Carbon steel	Nickel plated
⑰	Piston gasket	NBR	
⑱*	Piston seal	NBR	
⑲*	Rod seal		
⑳*	Gasket		
㉑*	Gasket for cap		
㉒	Seal washer	Rolled steel/NBR	

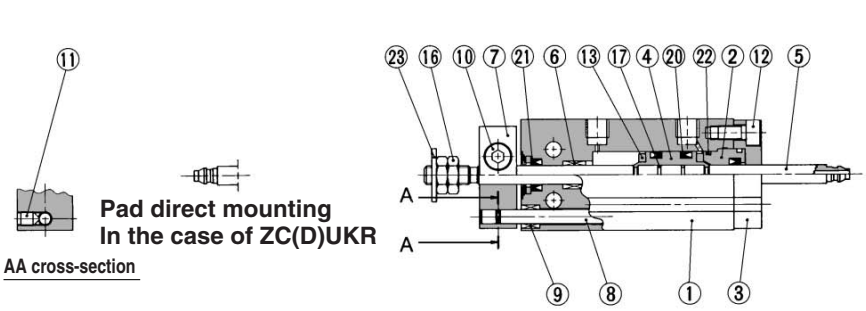
Replacement Parts: Seal Kit (Cap piping)

Part no.	Bore size/Part no.				
	ø10	**ø16**	**ø20**	**ø25**	**ø32**
	ZCU10-PS	ZCU16-PS	ZCU20-PS	ZCU25-PS	ZCU32-PS

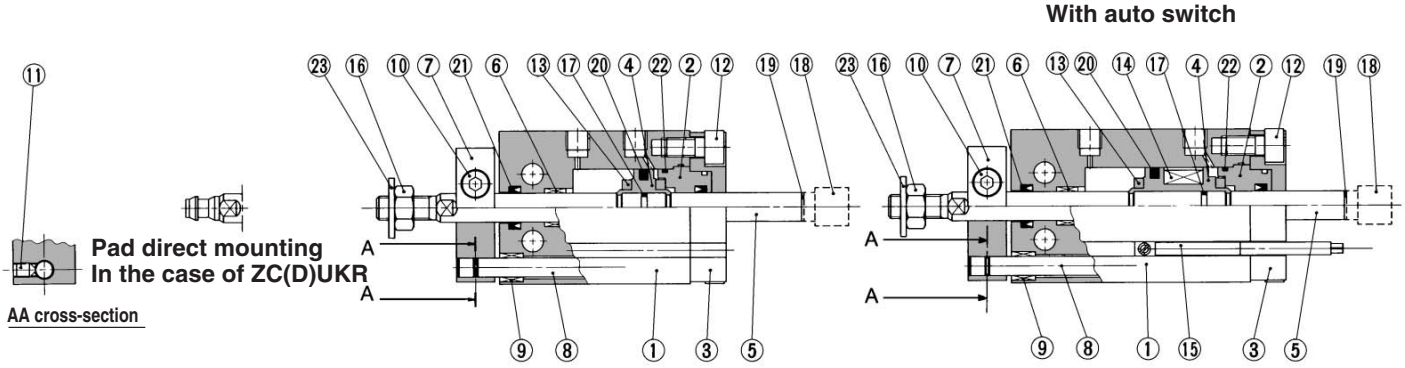
Seal kit consist of item ⑱, ⑲, ⑳, ㉑ contained in one kit, and can be ordered using the order number for each respective tubing bore size.

Construction

Rod piping-Male thread: ZC(D)UKQ
ø10



ø16 to ø32



Component Parts

No.	Description	Material	Note
①	Cylinder tubing	Aluminum alloy	Hard anodized
②	Rod cover B	Aluminum bearing alloy	Chromated
③	Rod cover retainer plate	Aluminum alloy	Hard anodized
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Stainless steel	
⑥	Bush	Oil impregnated sintered metal	
⑦	Plate	Aluminum alloy	Nickel plated
⑧	Guide rod	Stainless steel	
⑨	Bush	Oil impregnated sintered metal	
⑩	Hexagon set screw	Carbon steel	Black zinc chromated
⑪	Hexagon socket head cap screw	Carbon steel	Black zinc chromated
⑫	Hexagon set screw	Carbon steel	Nickel plated

Component Parts

No.	Description	Material	Note
⑬	Damper	Urethane	
⑭	Magnet	Magnetic material	
⑮	auto switch	——	
⑯	Jam nut	Carbon steel	Nickel plated
⑰	Piston gasket	NBR	
⑱	Socket	Carbon steel	ø16 only
⑲	Gasket	NBR	ø16 only
⑳*	Piston seal		
㉑*	Rod seal		
㉒*	Gasket		
㉓	Seal washer	Rolled steel/NBR	

Replacement Parts: Seal Kit (Rod piping)

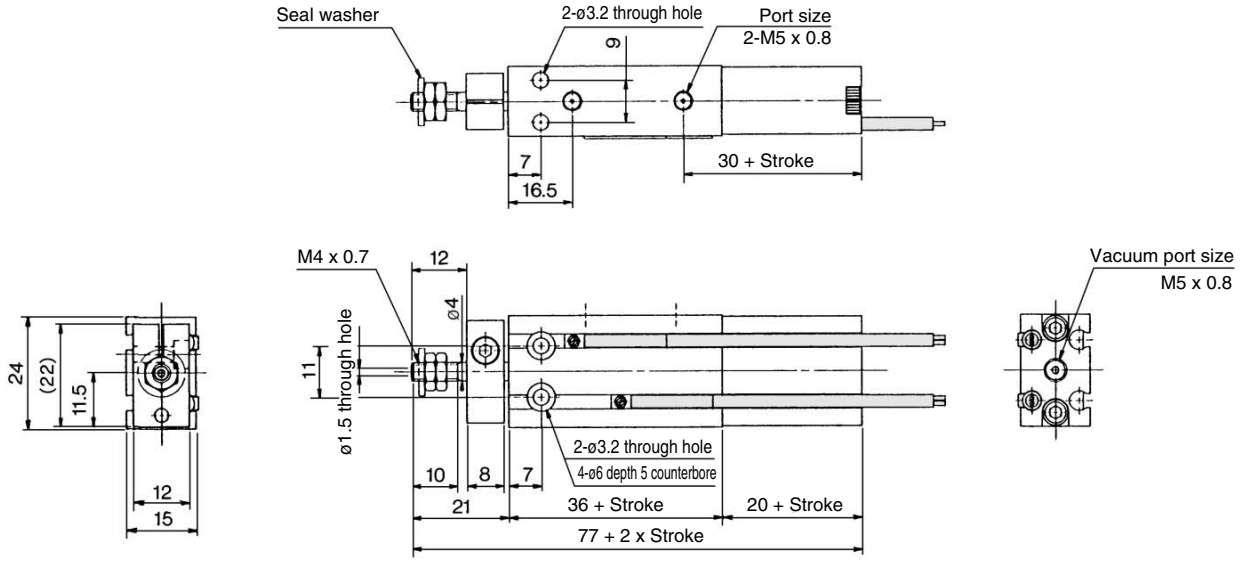
Part no.	Bore size/Part no.				
	ø10	**ø16**	**ø20**	**ø25**	**ø32**
	CUW10-PS	CUW16-PS	CUW20-PS	CUW25-PS	CUW32-PS

Seal kit consist of item ⑳, ㉑, ㉒ contained in one kit, and can be ordered using the order number for each respective tubing bore size.

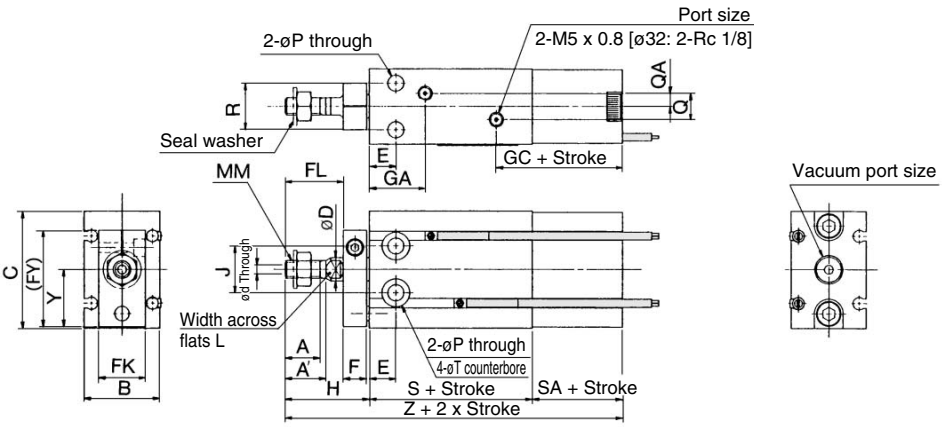
Vacuum Piping: Cap Piping/Rod End Shape: Male Thread

ZC(D)UKC Cylinder bore — Stroke D

ø10



ø16 to ø32



Model	Port size		Stroke range (mm)	A	A'	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKC16	M5 x 0.8	M5 x 0.8	5 to 30	11	12.5	20	32	2	6	7	8	13	17	28	16.5 Note)	31
ZC(D)UKC20	M5 x 0.8	Rc 1/8	5 to 50	12	14	26	40	3	8	9	8	16	20	33	19	33.5
ZC(D)UKC25	M5 x 0.8	Rc 1/8	5 to 50	15.5	18	32	50	4	10	10	10	20	22	43.5	21.5	34
ZC(D)UKC32	Rc 1/8	Rc 1/8	5 to 50	19.5	22	40	62	5	12	11	12	24	29	51.5	23	35

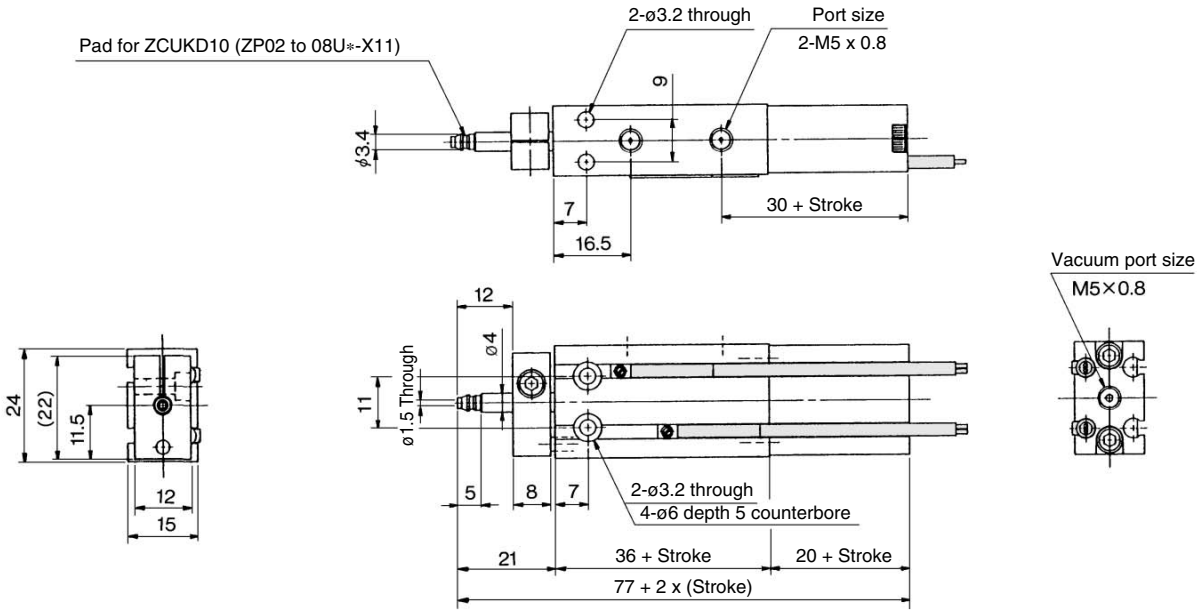
Model	H	J	L	MM	øP	Q	QA	R	S	SA	øT	Y	Z
ZC(D)UKC16	26	14	5	M5 x 0.8	4.5	4	2	12	30 (40)	19.5	7.6 depth 6.5	15.5	75.5 (85.5)
ZC(D)UKC20	29	16	6	M6 x 1.0	5.5	9	4.5	16	36 (46)	21	9.3 depth 9	19.5	86 (96)
ZC(D)UKC25	33	20	8	M8 x 1.25	5.5	9	4.5	20	40 (50)	21	9.3 depth 8	24.5	94 (104)
ZC(D)UKC32	42	24	10	M10 x 1.25	6.6	13.5	4.5	24	42 (52)	22	11 depth 11.5	30.5	106 (116)

( ): In the case of a mounted auto switch. Note) In the case of ZCUKC16-5D: 14.5 mm.

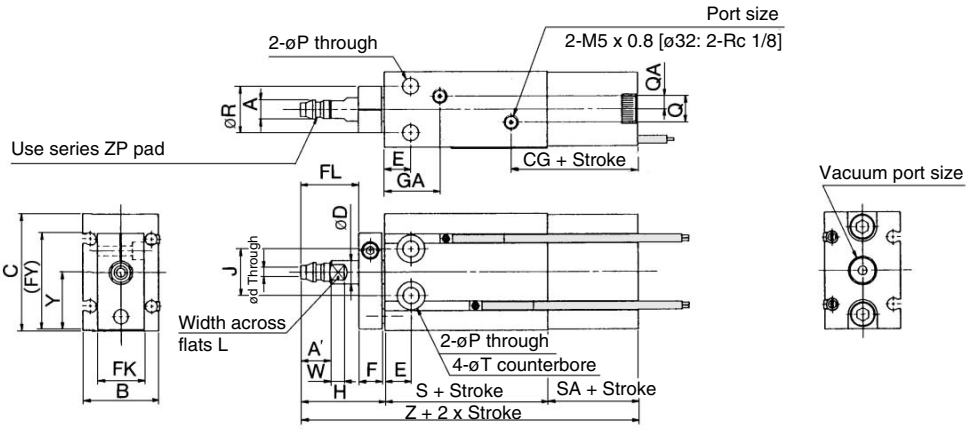
Vacuum Piping: Cap Piping/Rod End Shape: Pad Direct Mounting

ZC(D)UKD Cylinder bore — Stroke D

ø10



ø16 to ø32



Model	Port size		Stroke range (mm)	øA	A'	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKD16	M5 x 0.8	M5 x 0.8	5 to 30	5	7	20	32	2	6	7	8	13	17	28	16.5 Note)	31
ZC(D)UKD20	M5 x 0.8	Rc 1/8	5 to 50	6.6	8	26	40	3	8	9	8	16	20	33	19	33.5
ZC(D)UKD25	M5 x 0.8	Rc 1/8	5 to 50	8	9	32	50	4	10	10	10	20	22	43.5	21.5	34
ZC(D)UKD32	Rc 1/8	Rc 1/8	5 to 50	11.5	10.5	40	62	5	12	11	12	24	29	51.5	23	35

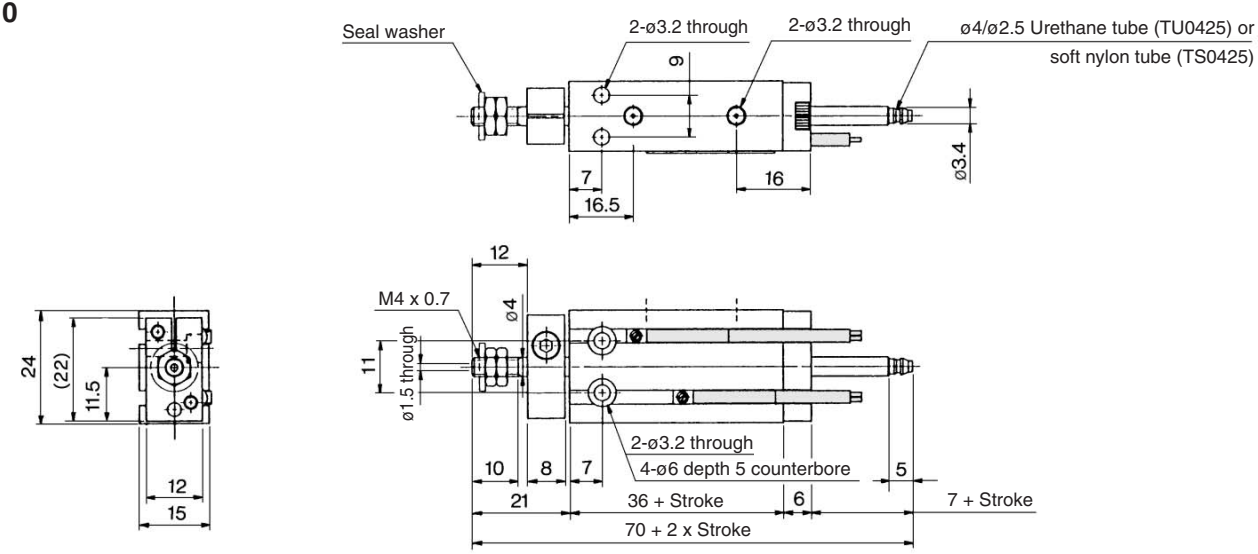
Model	H	J	L	øP	Q	QA	R	S	SA	øT	W	Y	Z
ZC(D)UKD16	26	14	5	4.5	4	2	12	30 (40)	19.5	7.6 depth 6.5	3.5	15.5	75.5 (85.5)
ZC(D)UKD20	29	16	6	5.5	9	4.5	16	36 (46)	21	9.3 depth 8	5	19.5	86 (96)
ZC(D)UKD25	33	20	8	5.5	9	4.5	20	40 (50)	21	9.3 depth 9	5	24.5	94 (104)
ZC(D)UKD32	42	24	10	6.6	13.5	4.5	24	42 (52)	22	11 depth 11.5	5	30.5	106 (116)

( ): In the case of a mounted auto switch. Note) In the case of ZCUKD16-5D: 14.5 mm.

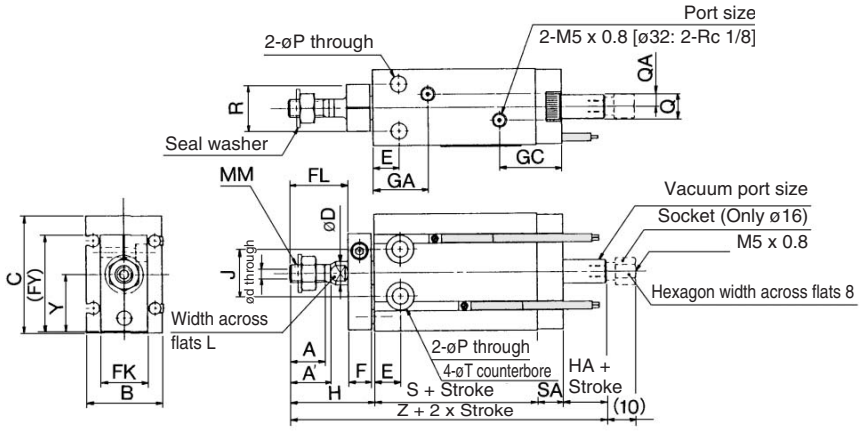
Vacuum Piping: Rod Piping/Rod End Shape: Male Thread

ZC(D)UKQ Cylinder bore — Stroke D

ø10



ø16 to ø32



Model	Port size		Stroke range (mm)	A	A'	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKQ16	M5 x 0.8	M5 x 0.8(2)	5 to 30	11	12.5	20	32	2	6	7	8	13	17	28	16.5(1)	19
ZC(D)UKQ20	M5 x 0.8	M5 x 0.8	5 to 50	12	14	26	40	3	8	9	8	16	20	33	19	21.5
ZC(D)UKQ25	M5 x 0.8	M5 x 0.8	5 to 50	15.5	18	32	50	4	10	10	10	20	22	43.5	21.5	22
ZC(D)UKQ32	Rc 1/8	Rc 1/8	5 to 50	19.5	22	40	62	5	12	11	12	24	29	51.5	23	23

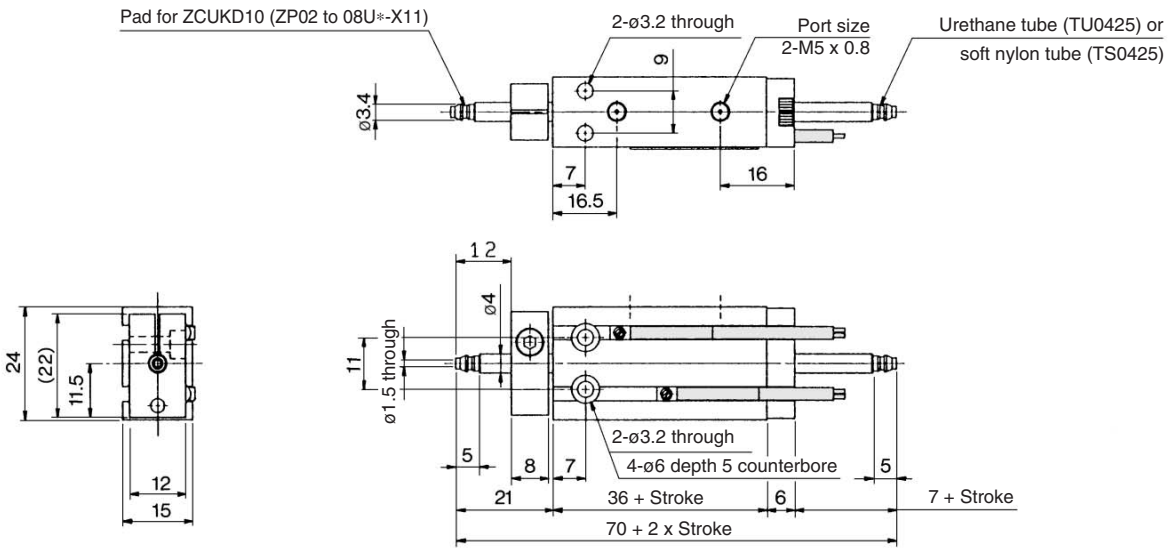
Model	H	HA	J	L	MM	øP	Q	QA	R	S	SA	øT	Y	Z
ZC(D)UKQ16	26	5	14	5	M5 x 0.8	4.5	4	2	12	30 (40)	7.5	7.6 depth 6.5	15.5	68.5 (78.5)
ZC(D)UKQ20	29	5	16	6	M6 x 1.0	5.5	9	4.5	16	36 (46)	9	9.3 depth 8	19.5	79 (89)
ZC(D)UKQ25	33	5	20	8	M8 x 1.25	5.5	9	4.5	20	40 (50)	9	9.3 depth 9	24.5	87 (97)
ZC(D)UKQ32	42	5	24	10	M10 x 1.25	6.6	13.5	4.5	24	42 (52)	10	11 depth 11.5	30.5	99 (109)

( ): In the case of a mounted auto switch. Note 1) In the case of ZCUKR16-5D: 14.5 mm. Note 2) In the case of socket equipped type.

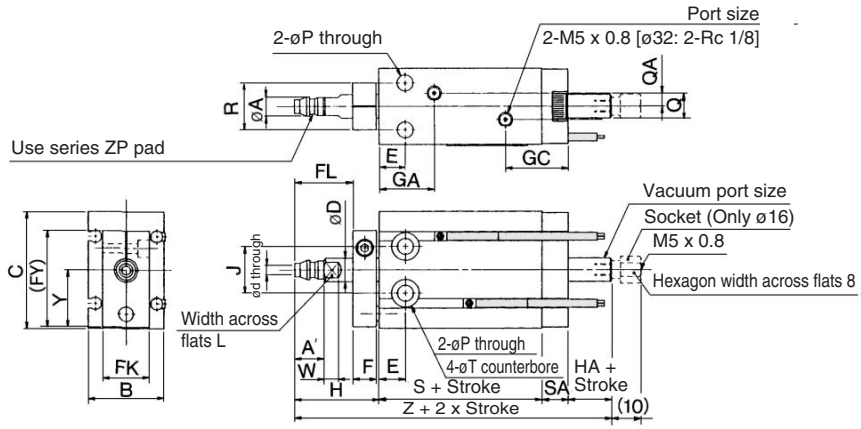
Vacuum Piping: Rod Piping/Rod End Shape: Pad Direct Mounting

ZC(D)UKR Cylinder bore—Stroke D

ø10



ø16 to ø32



Model	Port size		Stroke range (mm)	øA	A	B	C	ød	øD	E	F	FK	FL	FY	GA	GC
	Air port	Vacuum port														
ZC(D)UKR16	M5 x 0.8	M5 x 0.8(2)	5 to 30	5	7	20	32	2	6	7	8	13	17	28	16.5(1)	19
ZC(D)UKR20	M5 x 0.8	M5 x 0.8	5 to 50	6.6	8	26	40	3	8	9	8	16	20	33	19	21.5
ZC(D)UKR25	M5 x 0.8	M5 x 0.8	5 to 50	8	9	32	50	4	10	10	10	20	22	43.5	21.5	22
ZC(D)UKR32	Rc 1/8	Rc 1/8	5 to 50	11.5	10.5	40	62	5	12	11	12	24	29	51.5	23	23

Model	H	HA	J	L	øP	Q	QA	R	S	SA	øT	W	Y	Z
ZC(D)UKR16	26	5	14	5	4.5	4	2	12	30 (40)	7.5	7.6 depth 6.5	3.5	15.5	68.5 (78.5)
ZC(D)UKR20	29	5	16	6	5.5	9	4.5	16	36 (46)	9	9.3 depth 8	5	19.5	79 (89)
ZC(D)UKR25	33	5	20	8	5.5	9	4.5	20	40 (50)	9	9.3 depth 9	5	24.5	87 (97)
ZC(D)UKR32	42	5	24	10	6.6	13.5	4.5	24	42 (52)	10	11 depth 11.5	5	30.5	99 (109)

( ): In the case of a mounted auto switch.

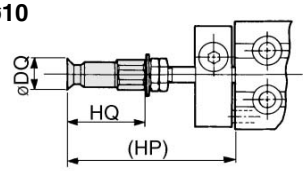
Note 1) In the case of ZCUKR16-5D: 14.5 mm.

Note 2) In the case of socket equipped type.

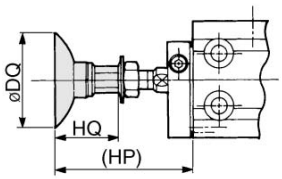
Dimensions of Pad Mounted Model

Rod end shape: Male thread

Tubing bore: ø10



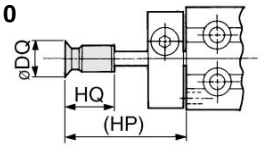
Tubing bore: ø16 to ø50



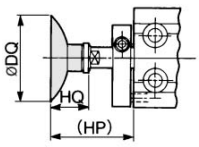
Model		Flat/Flat with ribs												Deep				Bellows										Applicable pad model
	Dia.(mm)	2	4	6	8	10	13	16	20	25	32	40	50	10	16	25	40	6	8	10	13	16	20	25	32	40	50	
ZC(D)UKC10 ZC(D)UKQ10	øDQ	2.6	4.8	7	9	—	—	—	—	—	—	—	—	—	—	—	—	7	9	—	—	—	—	—	—	—	—	ZPT□□□-B4
	HQ	19.5	19.5	19.5	19.5	—	—	—	—	—	—	—	—	—	—	—	—	20.5	20.5	—	—	—	—	—	—	—	—	
	HP	36.5	36.5	36.5	36.5	—	—	—	—	—	—	—	—	—	—	—	—	37.5	37.5	—	—	—	—	—	—	—	—	
ZC(D)UKC16 ZC(D)UKQ16	øDQ	2.6	4.8	7	9	12	15	18	—	—	—	—	—	12	18	—	—	7	9	12	15	18	—	—	—	—	—	ZPT□□□-B5
	HQ	19.5	19.5	19.5	19.5	21	21	21.5	—	—	—	—	—	24	25	—	—	20.5	20.5	25	27.5	29	—	—	—	—	—	
	HP	41.5	41.5	41.5	41.5	44	42	42.5	—	—	—	—	—	45	46	—	—	42.5	42.5	46	48.5	50	—	—	—	—	—	
ZC(D)UKC20 ZC(D)UKQ20	øDQ	—	—	—	—	12	15	18	23	28	35	—	—	12	18	28	—	—	—	12	15	18	22	27	34	—	—	ZPT□□□-B6
	HQ	—	—	—	—	21	21	21.5	23	23	23.5	—	—	24	25	29	—	—	—	25	27.5	29	32.5	33	38	—	—	
	HP	—	—	—	—	44	44	44.5	46	46	46.5	—	—	47	48	52	—	—	—	48	50.5	52	55.5	56	61	—	—	
ZC(D)UKC25 ZC(D)UKQ25	øDQ	—	—	—	—	—	—	—	23	28	35	43	53	—	—	28	43	—	—	—	—	—	22	27	34	43	53	ZPT□□□-B8
	HQ	—	—	—	—	—	—	—	29	29	29.5	32	33	—	—	35	42.5	—	—	—	—	—	38.5	39	44	47.5	51.5	
	HP	—	—	—	—	—	—	—	54	54	54.5	57	58	—	—	60	67.5	—	—	—	—	—	63.5	64	69	72.5	76.5	
ZC(D)UKC32 ZC(D)UKQ32	øDQ	—	—	—	—	—	—	—	23	28	35	43	53	—	—	28	43	—	—	—	—	—	22	27	34	43	53	ZPT□□□-B10
	HQ	—	—	—	—	—	—	—	32	32	32.5	35	36	—	—	38	45.5	—	—	—	—	—	41.5	42	47	50.5	54.5	
	HP	—	—	—	—	—	—	—	64	64	64.5	67	68	—	—	70	77.5	—	—	—	—	—	73.5	74	79	82.5	86.5	

Rod end shape: Pad direct mounting

Tubing bore: ø10



Tubing bore: ø16 to ø50

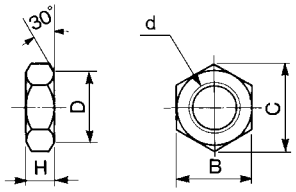


Model		Flat/Flat with ribs												Deep				Bellows										Applicable pad model
	Dia.(mm)	2	4	6	8	10	13	16	20	25	32	40	50	10	16	25	40	6	8	10	13	16	20	25	32	40	50	
ZC(D)UKD10 ZC(D)UKR10	øDQ	2.6	4.8	7	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Note)
	HQ	10	10	10	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	ZP□U□-X11
	HP	26	26	26	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
ZC(D)UKD16 ZC(D)UKR16	øDQ	2.6	4.8	7	9	—	—	—	—	—	—	—	—	—	—	—	—	7	9	—	—	—	—	—	—	—	—	ZP□□□
	HQ	12	12	12	12	—	—	—	—	—	—	—	—	—	—	—	—	13	13	—	—	—	—	—	—	—	—	
	HP	31	31	31	31	—	—	—	—	—	—	—	—	—	—	—	—	32	32	—	—	—	—	—	—	—	—	
ZC(D)UKD20 ZC(D)UKR20	øDQ	—	—	—	—	12	15	18	—	—	—	—	—	12	18	—	—	—	—	12	15	18	—	—	—	—	—	ZP□□□
	HQ	—	—	—	—	12	12	12.5	—	—	—	—	—	15	16	—	—	—	—	16	18.5	20	—	—	—	—	—	
	HP	—	—	—	—	33	33	33.5	—	—	—	—	—	36	37	—	—	—	—	37	39.5	41	—	—	—	—	—	
ZC(D)UKD25 ZC(D)UKR25	øDQ	—	—	—	—	—	—	—	23	28	35	—	—	—	—	28	—	—	—	—	—	—	22	27	34	—	—	ZP□□□
	HQ	—	—	—	—	—	—	—	14	14	14.5	—	—	—	—	20	—	—	—	—	—	—	23.5	24	29	—	—	
	HP	—	—	—	—	—	—	—	38	38	38.5	—	—	—	—	44	—	—	—	—	—	—	47.5	48	53	—	—	
ZC(D)UKD32 ZC(D)UKR32	øDQ	—	—	—	—	—	—	—	—	—	—	43	53	—	—	—	43	—	—	—	—	—	—	—	—	43	53	ZP□□□
	HQ	—	—	—	—	—	—	—	—	—	—	18.5	19.5	—	—	—	29	—	—	—	—	—	—	—	—	34	38	
	HP	—	—	—	—	—	—	—	—	—	—	50	51	—	—	—	60.5	—	—	—	—	—	—	—	—	65.5	69.5	

Note) ZP□U□-X11: Flat type only.

Accessory Dimensions (Attached only to a rod end male thread type.)

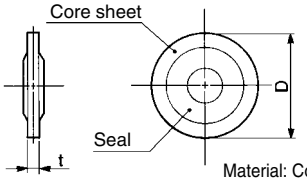
Rod end nut



Material: Carbon steel

Part no.	Applicable cylinder bore (mm)	d	H	B	C	D
NTP-010	10	M4 x 0.7	2.4	7	8.1	6.8
NTJ-015A	16	M5 x 0.8	4	8	9.2	7.8
NT-015A	20	M6 x 1.0	5	10	11.5	9.8
NT-02	25	M8 x 1.25	5	13	15.0	12.5
NT-03	32	M10 x 1.25	6	17	19.6	16.5

Seal washer



Material: Core sheet — Rolled steel
Seal — NBR

Part no.	Applicable cylinder bore (mm)	t	D
WCS4 x 0.7	10	1.2	11.5
WCS5 x 0.8	16	1.2	12.5
WCS6 x 1	20	1.2	14.0
WCS8 x 1	25	1.6	15.5
WCS10 x 1	32	1.6	18.0