

Smooth Cylinder Double Acting, Single Rod Series CJ2Y

∅ 10, ∅ 16

How to Order

Bore size

10	10 mm
16	16 mm

Cylinder standard stroke [mm]

∅ 10	15, 30, 45, 60, 75, 100, 125, 150
∅ 16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

* Intermediate stroke other than above is manufactured upon receipt of order.

Mounting

B	Basic	L	Single foot
E	Double-side bossed	M	Double foot
D	Double clevis	F	Rod flange
		G	Head flange

* Foot bracket and flange bracket are shipped together with the product, but not assembled.

Made to Order
Refer to page 2 for details.

With auto switch
CJ2Y L 16 - 60 [] Z - []

With auto switch (Built-in magnet)
CDJ2Y L 16 - 60 [] Z - M9BW [] - B - []

Head cover port location

—	Perpendicular to axis	
R	Axial	

* For double clevis, the product is perpendicular to the cylinder axis.
* For double-side bossed, the product is perpendicular to the cylinder axis.

Auto switch

—	Without auto switch
---	---------------------

* For applicable auto switches, refer to the table below.

Auto switch mounting type

A	Rail mounting
B	Band mounting

* For rail mounting, screws and nuts for 2 auto switches come with the rail.
* Refer to page 12 for auto switch mounting brackets.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Applicable Auto Switches/Refer to the Auto Switch Guide 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-wired connector	Applicable load		
					DC	AC	Band mounting		Rail mounting		0.5 (—)	1 [m]	3 (L)	5 (Z)	None (N)				
							Perpendicular	In-line	Perpendicular	In-line									
Solid state auto switch	—	Grommet	—	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC	
				3-wire (PNP)			M9PV	M9P	M9PV	M9P	●	●	●	○	—	○			
		Connector		2-wire			M9BV	M9B	M9BV	M9B	●	●	●	○	—	○			
				—			H7C	J79C	—	●	—	●	●	—	—	—			
	Diagnostic indication (2-colour indication)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NWV	M9NW	M9NWV	M9NW	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)			M9PWV	M9PW	M9PWV	M9PW	●	●	●	○	—	○			
				2-wire			M9BWV	M9BW	M9BWV	M9BW	●	●	●	○	—	○			
				3-wire (NPN)			M9NAV**	M9NA**	M9NAV**	M9NA**	○	○	●	○	—	○			
				3-wire (PNP)			M9PAV**	M9PA**	M9PAV**	M9PA**	○	○	●	○	—	○			
				2-wire			M9BAV**	M9BA**	M9BAV**	M9BA**	○	○	●	○	—	○			
Water resistant (2-colour indication)	Grommet	—	3-wire (NPN)	5 V, 12 V	—	M9NAV**	M9NA**	M9NAV**	M9NA**	○	○	●	○	—	○	IC circuit			
			3-wire (PNP)			M9PAV**	M9PA**	M9PAV**	M9PA**	○	○	●	○	—	○				
With diagnostic output (2-colour indication)	Grommet	Yes	4-wire (NPN)	5 V, 12 V	—	—	H7NF	—	F79F	●	—	●	○	—	○	IC circuit			
			—			—	—	—	—	—	—	—	—	—	—	—			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	5 V	—	A96V	A96	A96V	A96	●	—	●	—	—	—	IC circuit	Relay, PLC	
				—			—	—	A72	A72H	●	—	●	—	—	—			
				No			2-wire	100 V	A93V	A93	A93V	A93	●	—	●	●	—		—
								100 V or less	A90V	A90	A90V	A90	●	—	●	—	—		—
		Yes	2-wire	—	—	C73C	A73C	—	●	—	●	●	●	—	—	—			
				24 V or less	—	C80C	A80C	—	●	—	●	●	●	—	—	IC circuit			
		Connector	No	—	—	—	—	—	—	—	A79W	—	—	—	—	—	—		
				—	—	—	—	—	—	—	—	—	—	—	—	—	—		

** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m — (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX
None N (Example) H7CN

* Since there are other applicable auto switches than listed above, refer to page 13 for details.

* For details about auto switches with pre-wired connector, refer to the Auto Switch Guide.

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

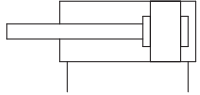
* The D-A9□□/M9□□□/A7□□/A80□/F7□□/J7□□ auto switches are shipped together, (but not assembled). (For band mounting, only the auto switch mounting brackets are assembled before shipment.)

Series CJ2Y



Symbol

Rubber bumper



Made to Order

Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port location
-XC9	Adjustable stroke cylinder/Adjustable retraction type

Mounting Brackets/Part No.

Mounting bracket	Bore size [mm]	
	10	16
Foot	CJ-L010C	CJ-L016C
Flange	CJ-F010C	CJ-F016C
T-bracket*	CJ-T010C	CJ-T016C

* A T-bracket is used with double clevis (D).

⚠ Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smcworld.com>

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining nut or to the rod cover body. If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below. Apply a Loctite® (no. 242 Blue) for mounting thread.

Bore size [mm]	Proper tightening torque for mounting thread (N·m) (Tightening torque for mounting nut)
10	3.0 to 3.2
16	5.4 to 5.9

- To remove and install the retaining ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C retaining ring).
Especially with Ø 10, use ultra thin pliers.
- In the case of auto switch rail mounting type, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.

Specifications

Bore size [mm]	10	16
Action	Double acting, Single rod	
Fluid	Air	
Proof pressure	1.05 MPa	
Maximum operating pressure	0.7 MPa	
Ambient and fluid temperature	Without auto switch: -10 °C to 70 °C With auto switch: -10 °C to 60 °C (No freezing)	
Cushion	Rubber bumper (Standard equipment)	
Lubrication	Not required (Non-lube)	
Stroke length tolerance	+1.0 0	
Piston speed	5 to 500 mm/s	
Allowable kinetic energy	Ø 10	0.035 J
	Ø 16	0.090 J

Minimum Operating Pressure

Unit: MPa

Bore size [mm]	10	16
Minimum operating pressure	0.03	

Standard Strokes

Bore size [mm]	Standard stroke [mm]
10	15, 30, 45, 60, 75, 100, 125, 150
16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

* Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)

Mounting and Accessories/For details, refer to page 7.

●---Mounted on the product. ○---Please order these separately.

Mounting		Basic	Foot	Flange	Double* clevis
Standard	Mounting nut	●	●	●	—
	Rod end nut	●	●	●	●
	Clevis pin	—	—	—	●
Option	Single knuckle joint	○	○	○	○
	Double knuckle joint*	○	○	○	○
	Rod end cap (Flat/Round type)	○	○	○	○
	T-bracket	—	—	—	○

* A pin and retaining rings are included with double clevis and/or double knuckle joint.

Weights

Bore size [mm]		10	16
Basic weight (When the stroke is zero)	Basic	22	46
	Axial piping	22	46
	Double clevis (including clevis pin)	24	54
	Head-side bossed	23	48
Additional weight per 15 mm of stroke		4	7
Mounting bracket weight	Single foot	8	25
	Double foot	16	50
	Rod flange	5	13
	Head flange	5	13
Accessories	Single knuckle joint	17	23
	Double knuckle joint (including knuckle pin)	25	21
	Rod end cap (Flat type)	1	2
	Rod end cap (Round type)	1	2
	T-bracket	32	50

* Mounting nut and rod end nut are included in the basic weight. (Note) Mounting nut is not included in the basic weight for the double clevis.

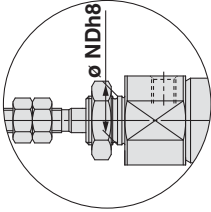
Calculation: Example) **CJ2YL10-45Z**

- Basic weight..... 22 (Ø 10)
- Additional weight..... 4/15 stroke
- Cylinder stroke..... 45 stroke
- Mounting bracket weight..... 8 (Axial foot)
22 + 4/15 x 45 + 8 = 42 g

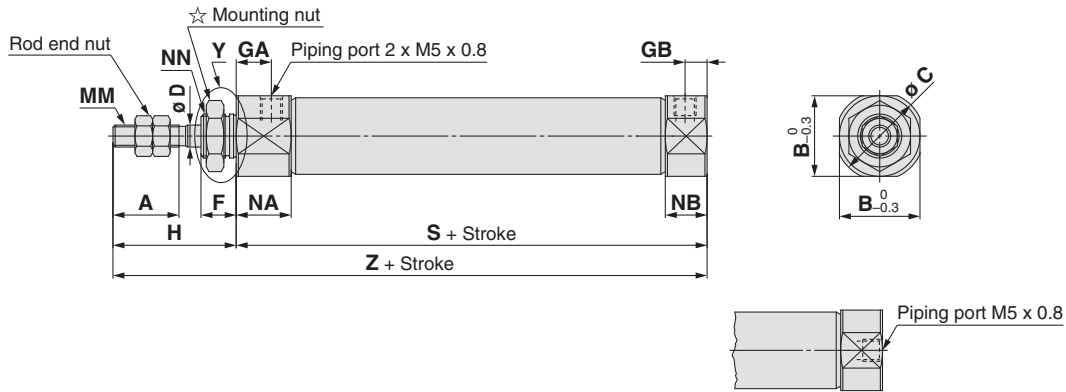
Dimensions

Basic (B)

CJ2YB Bore size – Stroke Head cover port location Z



Section Y detail



Head cover port location
Axial location (R)

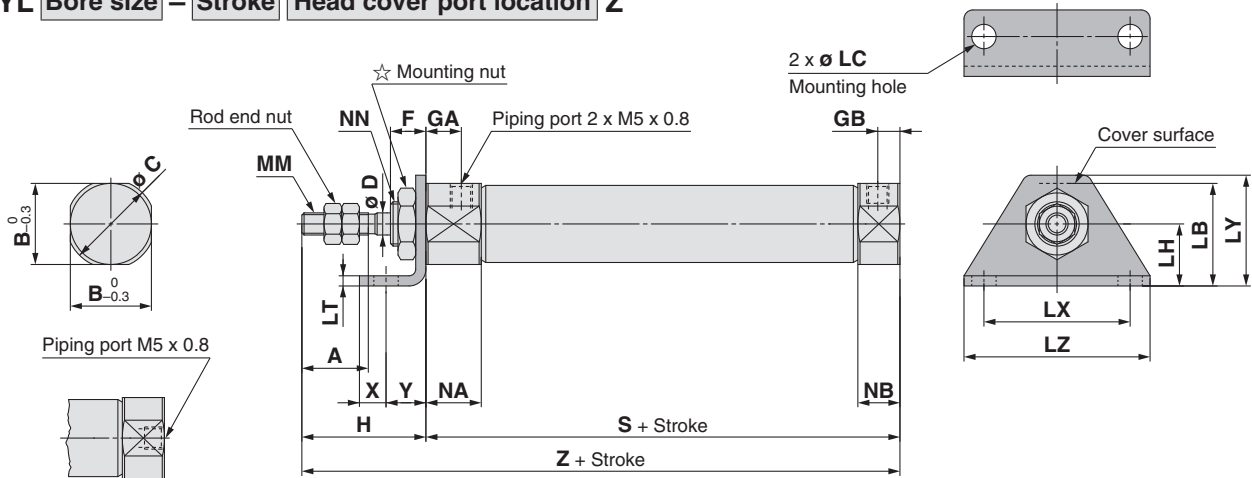
* The overall cylinder length does not change.

☆ Refer to page 7 for details of the mounting nut.

Bore size	A	B	C	D	F	GA	GB	H	MM	NA	NB	NDh8	NN	S	Z
10	15	12	14	4	8	8	5	28	M4 x 0.7	12.5	9.5	8 ⁰ _{-0.022}	M8 x 1.0	46	74
16	15	18.3	20	5	8	8	5	28	M5 x 0.8	12.5	9.5	10 ⁰ _{-0.022}	M10 x 1.0	47	75

Single foot (L)

CJ2YL Bore size – Stroke Head cover port location Z



Head cover port location
Axial location (R)

* The overall cylinder length does not change.

☆ Refer to page 7 for details of the mounting nut.

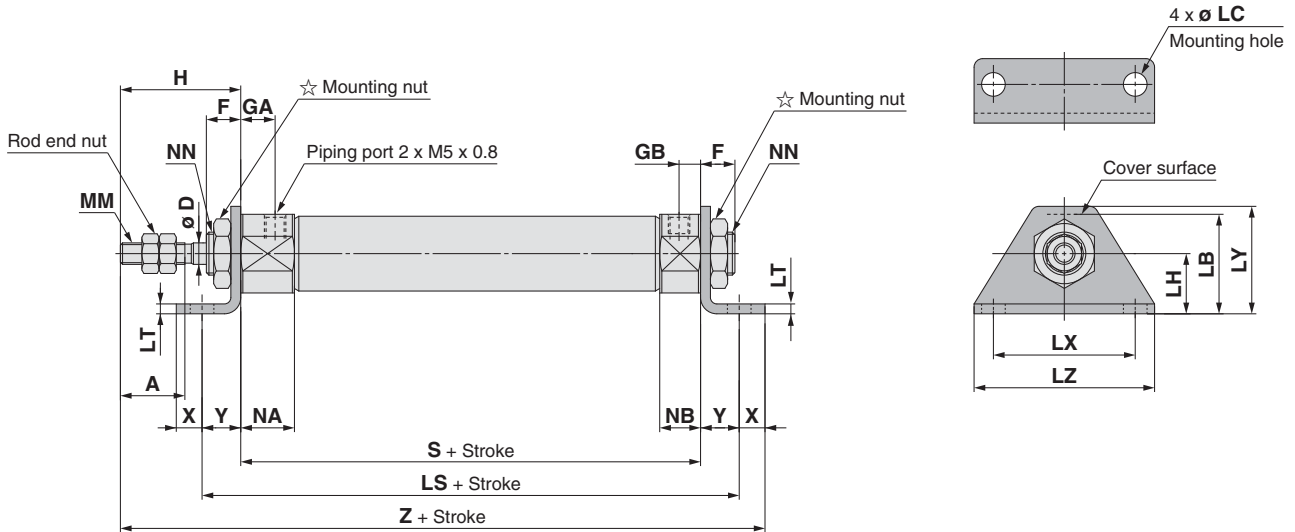
Bore size	A	B	C	D	F	GA	GB	H	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	S	X	Y	Z
10	15	12	14	4	8	8	5	28	15	4.5	9	1.6	24	16.5	32	M4 x 0.7	12.5	9.5	M8 x 1.0	46	5	7	74
16	15	18.3	20	5	8	8	5	28	23	5.5	14	2.3	33	25	42	M5 x 0.8	12.5	9.5	M10 x 1.0	47	6	9	75

Series CJ2Y

Dimensions

Double foot [m]

CJ2YM Bore size – Stroke Z

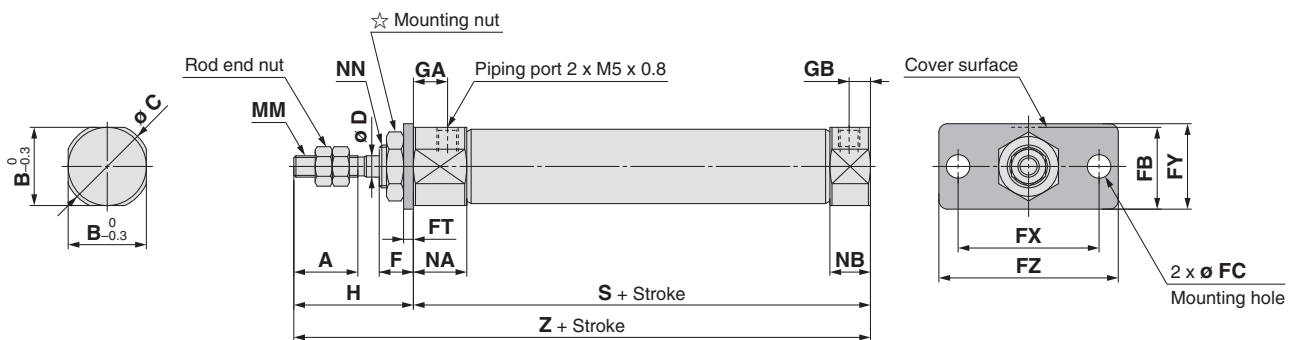


☆ Refer to page 7 for details of the mounting nut.

Bore size	A	D	F	GA	GB	H	LB	LC	LH	LS	LT	LX	LY	LZ	MM	NA	NB	NN	S	X	Y	Z
10	15	4	8	8	5	28	15	4.5	9	60	1.6	24	16.5	32	M4 x 0.7	12.5	9.5	M8 x 1.0	46	5	7	86
16	15	5	8	8	5	28	23	5.5	14	65	2.3	33	25	42	M5 x 0.8	12.5	9.5	M10 x 1.0	47	6	9	90

Rod flange (F)

CJ2YF Bore size – Stroke Head cover port location Z



Piping port M5 x 0.8

Head cover port location Axial location (R)

* The overall cylinder length does not change.

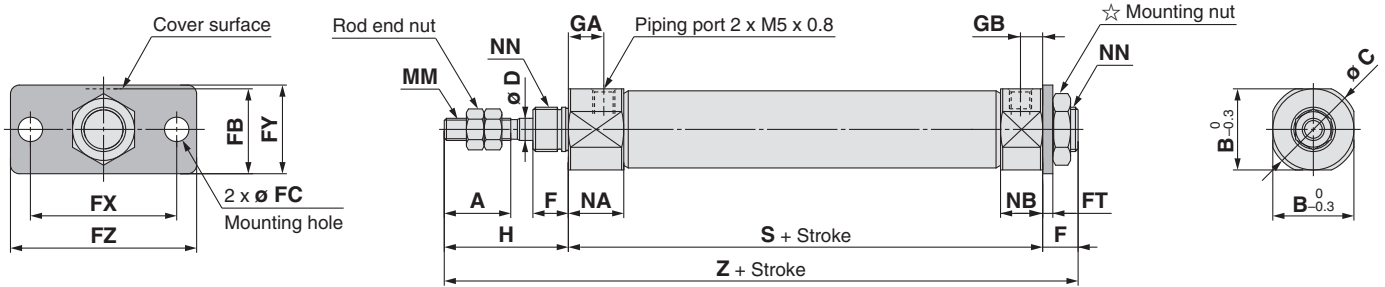
☆ Refer to page 7 for details of the mounting nut.

Bore size	A	B	C	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	H	MM	NA	NB	NN	S	Z
10	15	12	14	4	8	13	4.5	1.6	24	14	32	8	5	28	M4 x 0.7	12.5	9.5	M8 x 1.0	46	74
16	15	18.3	20	5	8	19	5.5	2.3	33	20	42	8	5	28	M5 x 0.8	12.5	9.5	M10 x 1.0	47	75

Dimensions

Head flange [g]

CJ2YG Bore size – Stroke Z

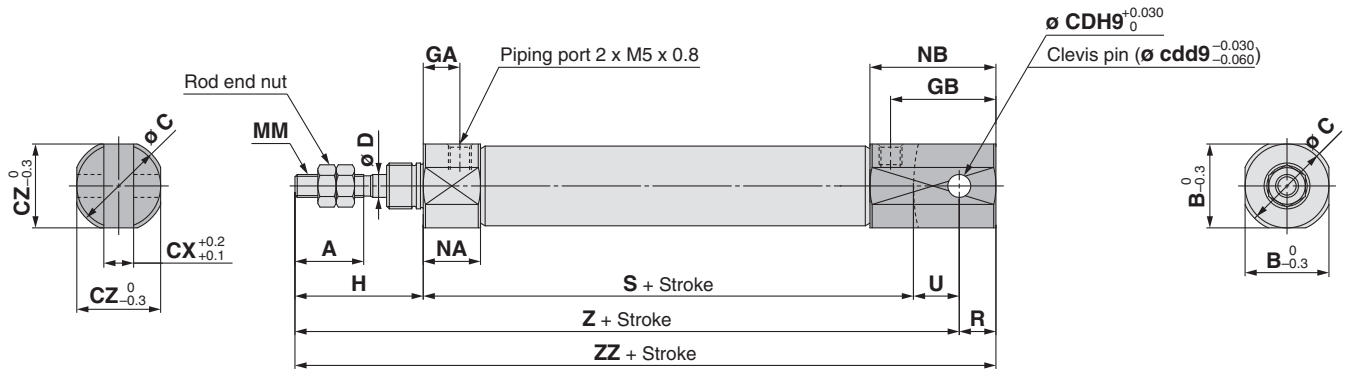


☆ Refer to page 7 for details of the mounting nut.

Bore size	A	B	C	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	H	MM	NA	NB	NN	S	Z
10	15	12	14	4	8	13	4.5	1.6	24	14	32	8	5	28	M4 x 0.7	12.5	9.5	M8 x 1.0	46	82
16	15	18.3	20	5	8	19	5.5	2.3	33	20	42	8	5	28	M5 x 0.8	12.5	9.5	M10 x 1.0	47	83

Double clevis (D)

CJ2YD Bore size – Stroke Z



* A clevis pin and retaining rings are included.

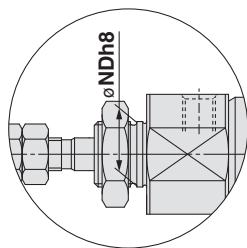
Bore size	A	B	C	CD (cd)	CX	CZ	D	GA	GB	H	MM	NA	NB	R	S	U	Z	ZZ
10	15	12	14	3.3	3.2	12	4	8	18	28	M4 x 0.7	12.5	22.5	5	46	8	82	87
16	15	18.3	20	5	6.5	18.3	5	8	23	28	M5 x 0.8	12.5	27.5	8	47	10	85	93

Series CJ2Y

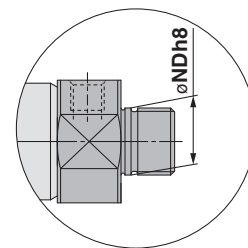
Dimensions

Double-side bossed (E)

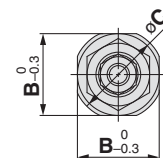
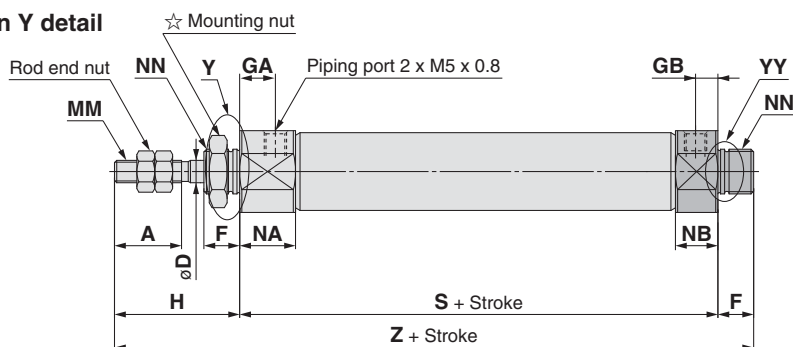
CJ2YE Bore size – Stroke Z



Section Y detail



Section YY detail



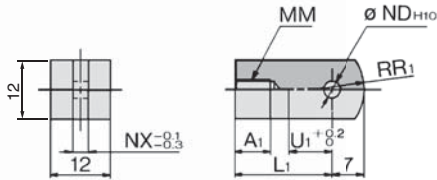
☆ Refer to page 7 for details of the mounting nut.

Bore size	A	B	C	D	F	GA	GB	H	MM	NA	NB	NDh8	NN	S	Z
10	15	12	14	4	8	8	5	28	M4 x 0.7	12.5	9.5	$8_{-0.022}^0$	M8 x 1.0	46	82
16	15	18.3	20	5	8	8	5	28	M5 x 0.8	12.5	9.5	$10_{-0.022}^0$	M10 x 1.0	47	83

Series CJ2Y

Dimensions of Accessories

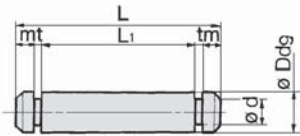
Single Knuckle Joint



Material: Rolled steel

Part no.	Applicable bore size	A ₁	L ₁	MM	ND _{H10}	NX	R ₁	U ₁
I-J010C	10	8	21	M4 x 0.7	3.3 ^{+0.048} ₀	3.1	8	9
I-J016C	16	8	25	M5 x 0.8	5 ^{+0.048} ₀	6.4	12	14

Clevis Pin

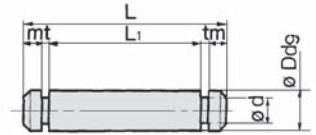


Material: Stainless steel

Part no.	Applicable bore size	Dd9	d	L	L ₁	m	t	Included retaining ring
CD-J010	10	3.3 ^{-0.030} _{-0.060}	3	15.2	12.2	1.2	0.3	Type C 3.2
CD-Z015	16	5 ^{-0.030} _{-0.060}	4.8	22.7	18.3	1.5	0.7	Type C 5

* Retaining rings are included with a clevis pin.

Knuckle Pin



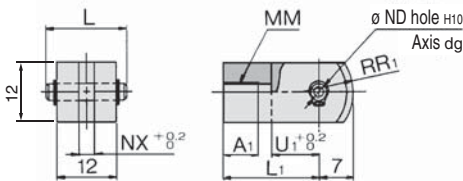
Material: Stainless steel

Part no.	Applicable bore size	Dd9	d	L	L ₁	m	t	Included retaining ring
CD-J010	10	3.3 ^{-0.030} _{-0.060}	3	15.2	12.2	1.2	0.3	Type C 3.2
IY-J015	16	5 ^{-0.030} _{-0.060}	4.8	16.6	12.2	1.5	0.7	Type C 5

* For size Ø 10, a clevis pin is diverted.

* Retaining rings are included with a knuckle pin.

Double Knuckle Joint



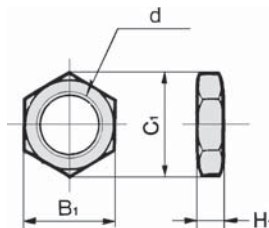
Material: Rolled steel

Part no.	Applicable bore size	A ₁	L	L ₁	MM
Y-J010C	10	8	15.2	21	M4 x 0.7
Y-J016C	16	11	16.6	21	M5 x 0.8

Part no.	ND _{d9}	ND _{H10}	NX	R ₁	U ₁
Y-J010C	3.3 ^{-0.030} _{-0.060}	3.3 ^{+0.048} ₀	3.2	8	10
Y-J016C	5 ^{-0.030} _{-0.060}	5 ^{+0.048} ₀	6.5	12	10

* A knuckle pin and retaining rings are included.

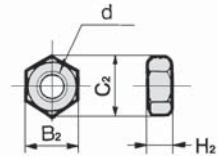
Mounting Nut



Material: Carbon steel

Part no.	Applicable bore size	B ₁	C ₁	d	H ₁
SNJ-010C	10	11	12.7	M8 x 1.0	4
SNJ-016C	16	14	16.2	M10 x 1.0	4

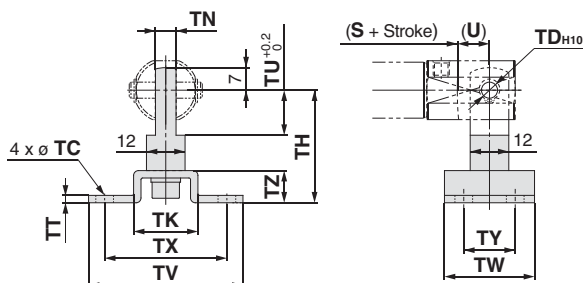
Rod End Nut



Material: Carbon steel

Part no.	Applicable bore size	B ₂	C ₂	d	H ₂
NTJ-010C	10	7	8.1	M4 x 0.7	3.2
NTJ-015C	16	8	9.2	M5 x 0.8	4

T-bracket



Part no.	Applicable bore size	TC	TD _{H10}	TH	TK	TN	TT	TU	TV	TW	TX	TY	TZ
CJ-T010C	10	4.5	3.3 ^{+0.048} ₀	29	18	3.1	2	9	40	22	32	12	8
CJ-T016C	16	5.5	5 ^{+0.048} ₀	35	20	6.4	2.3	14	48	28	38	16	10

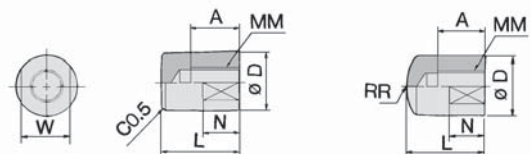
* A T-bracket includes a T-bracket base, single knuckle joint, hexagon socket head bolt and spring washer.

* For dimensions of (U) and (S + Stroke), refer to the double clevis drawing on page 5.

Rod End Cap

Flat type/CJ-CF□□□

Round type/CJ-CR□□□



Material: Polyacetal

Part no.	Applicable bore size	A	D	L	MM	N	R	W
CJ-CF010	10	8	10	13	M4 x 0.7	6	10	8
CJ-CF016	16	10	12	15	M5 x 0.8	7	12	10

Series CJ2Y

Auto Switch Mounting

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

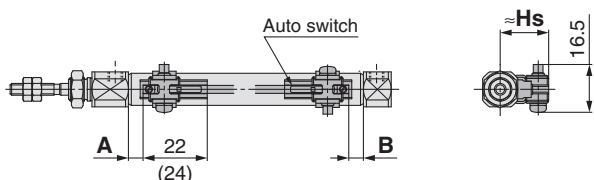
Solid state auto switch

<Band mounting>

D-M9□

D-M9□W

D-M9□A

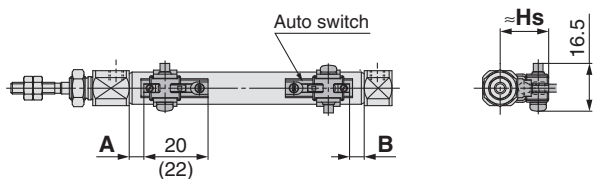


() : Dimension of the D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V

D-M9□MV

D-M9□AV



() : Dimension of the D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

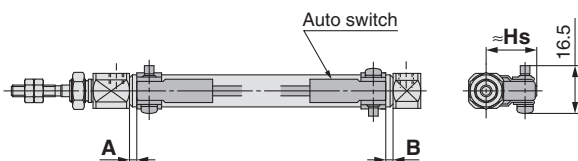
D-H7□

D-H7□W

D-H7BA

D-H7NF

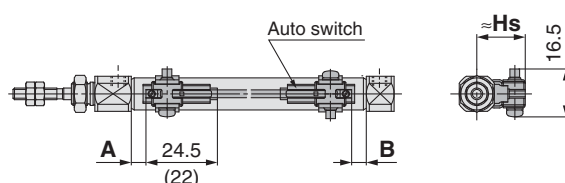
D-H7C



Reed auto switch

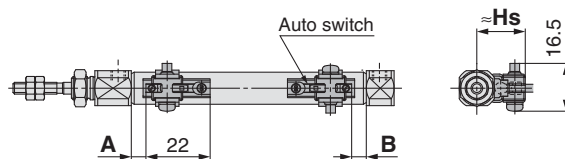
<Band mounting>

D-A9□



() : Dimension of the D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

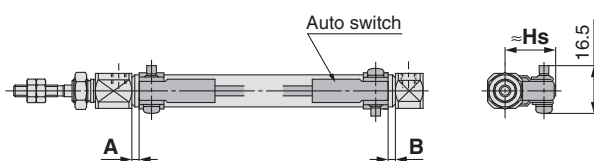
D-A9□V



A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80

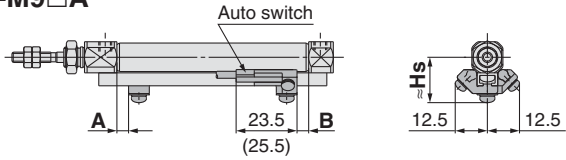
D-C73C□/C80C



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

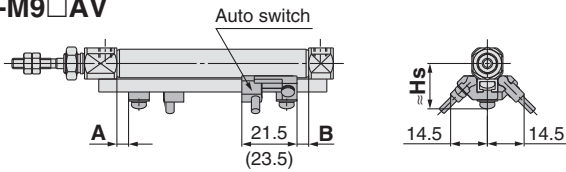
<Rail mounting>

D-M9□
D-M9□W
D-M9□A



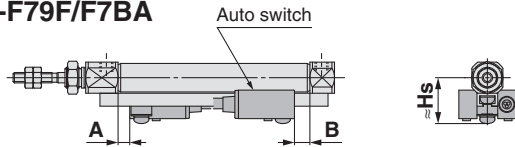
(): Dimension of the D-M9□A

D-M9□V
D-M9□WV
D-M9□AV

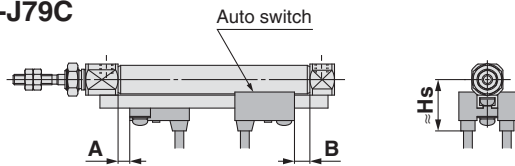


(): Dimension of the D-M9□AV

D-F7□/J79
D-F7□W/J79W
D-F79F/F7BA

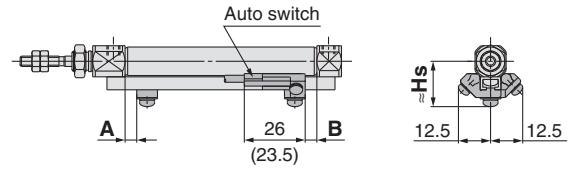


D-F7□V/F7□WV
D-F7BAV
D-J79C



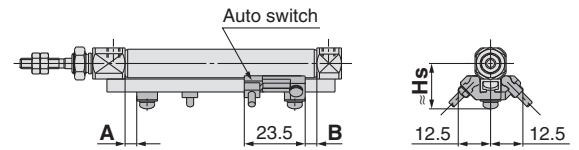
<Rail mounting>

D-A9□

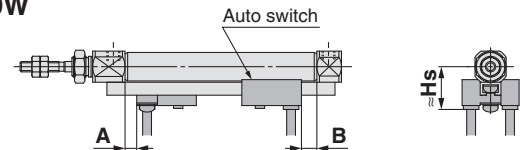


(): Dimension of the D-A96

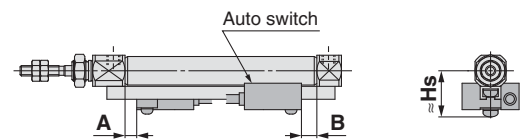
D-A9□V



D-A7□/A80
D-A73C/A80C
D-A79W



D-A7□H/A80H



Series CJ2Y

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

Auto Switch Proper Mounting Position

[mm]

Auto switch model	Band mounting							
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-C7□ D-C80 D-C73C D-C80C		D-H7□ D-H7C D-H7NF D-H7□W D-H7BA	
Bore size	A	B	A	B	A	B	A	B
10	(5) 6	(5) 6	(1) 2	(1) 2	2.5	2.5	1.5	1.5
16	(5.5) 6.5	(5.5) 6.5	(1.5) 2.5	(1.5) 2.5	3	3	2	2

* The values in () are measured from the end of the auto switch mounting bracket.

[mm]

Auto switch model	Rail mounting											
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-A7□ D-A80		D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F D-J79C D-F7BA D-F7BAV		D-F7NT		D-A79W	
Bore size	A	B	A	B	A	B	A	B	A	B	A	B
10	4.5	4.5	0.5	0.5	3	3	3.5	3.5	8.5	8.5	0.5	0.5
16	5	5	1	1	3.5	3.5	4	4	9	9	1	1

* Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

[mm]

Auto switch model	Band mounting								
	D-M9□ D-M9□W D-M9□A D-A9□		D-M9□V D-M9□WV D-M9□AV D-A9□V		D-C7□/C80 D-H7□/H7□W D-H7NF D-H7BA		D-C73C D-C80C	D-H7C	D-A7□ D-A80
Bore size	Hs		Hs		Hs		Hs	Hs	Hs
10	17		18		17		19.5	20	16.5
16	20.5		21		20.5		23	23.5	19.5

[mm]

Auto switch model	Rail mounting							
	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV D-A9□ D-A9□V		D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BA/F79F D-F7NT		D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A79W
Bore size	Hs		Hs		Hs	Hs	Hs	Hs
10	17.5		17.5		23.5	20	23	19
16	21		20.5		26.5	23	26	22

Minimum Stroke for Auto Switch Mounting

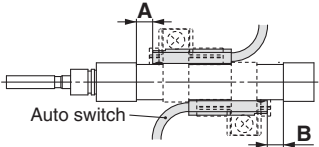
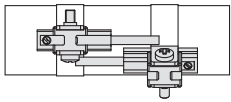
		Number of auto switches				
Auto switch mounting	Auto switch model	With 1 pc.	With 2 pcs.		With n pcs. (n: Number of auto switches)	
			Different surfaces	Same surface	Different surfaces	Same surface
Band mounting	D-M9□ D-M9□W D-M9□A D-A9□	10	15 Note 1)	45 Note 1)	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$45 + 15 (n-2)$ (n = 2, 3, 4, 5...)
	D-M9□V	5	15 Note 1)	35	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$35 + 25 (n-2)$ (n = 2, 3, 4, 5...)
	D-M9□WV D-M9□AV	10	15 Note 1)	35	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$35 + 25 (n-2)$ (n = 2, 3, 4, 5...)
	D-A9□V	5	10	35	$10 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$35 + 25 (n-2)$ (n = 2, 3, 4, 5...)
	D-C7□ D-C80	10	15	50	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$50 + 20 (n-2)$ (n = 2, 3, 4, 5...)
	D-H7□/H7□W D-H7BA D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$60 + 22.5 (n-2)$ (n = 2, 3, 4, 5...)
	D-C73C D-C80C D-H7C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6... Note 3)	$50 + 27.5 (n-2)$ (n = 2, 3, 4, 5...)
Rail mounting	D-M9□V	5	—	5	—	$10 + 10 (n-2)$ (n = 4, 6... Note 4)
	D-A9□V	5	—	10	—	$10 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-M9□ D-A9□	10	—	10	—	$15 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-M9□WV D-M9□AV	10	—	15	—	$15 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-M9□W	15	—	15	—	$20 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-M9□A	15	—	20	—	$20 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-A7□/A80 D-A7□H/A80H D-A73C/A80C	5	—	10	—	$15 + 10 (n-2)$ (n = 4, 6... Note 4)
	D-A7□H D-A80H	5	—	10	—	$15 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-A79W	10	—	15	—	$10 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-F7□ D-J79	5	—	5	—	$15 + 15 (n-2)$ (n = 4, 6... Note 4)
	D-F7□V D-J79C	5	—	5	—	$10 + 10 (n-2)$ (n = 4, 6... Note 4)
	D-F7□W/J79W D-F7BA/F79F/F7NT	10	—	15	—	$15 + 20 (n-2)$ (n = 4, 6... Note 4)
D-F7□WV D-F7BAV	10	—	15	—	$10 + 15 (n-2)$ (n = 4, 6... Note 4)	

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 4) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

However, the minimum even number is 4. So, 4 is used for the calculation when "n" is 1 to 3.

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
 <p>The proper auto switch mounting position is 5.5 mm inward from the switch holder edge. The above A and B indicate values for band mounting in the table of page 10.</p>	 <p>The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.</p>	
D-M9□/M9□W/M9□A	Less than 20 stroke Note 2)	Less than 55 stroke Note 2)
D-A90/A93	—	Less than 50 stroke Note 2)

Note 2) Minimum stroke for auto switch mounting in styles other than those mentioned in Note 1.

Series CJ2Y

Operating Range

Auto switch model		Bore size [mm]	
		10	16
Band mounting	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	2.5	3
	D-A9□	6	7
	D-C7□/C80/C73C/C80C	7	7
	D-H7□/H7□W D-H7BA/H7NF	4	4
	D-H7C	8	9
	Rail mounting	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3
D-A9□/A9□V		6	6.5
D-A7□/A80/A7H/A80H D-A73C/A80C		8	9
D-A79W		11	13
D-F7□/J79/F7□W/J79W D-F7□V/F7□WV/F79F D-J79C/F7BA/F7BAV D-F7NT		5	5

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Brackets/Part No.

Auto switch mounting	Auto switch model	Bore size [mm]	
		10	16
Band mounting	D-M9□ D-M9□V D-M9□W D-M9□WV D-A9□ D-A9□V	BJ6-010 (A set of a, b, c, d)	BJ6-016 (A set of a, b, c, d)
	D-M9□A <small>Note 2)</small> D-M9□AV <small>Note 2)</small>	BJ6-010S (A set of a, b, d, e)	BJ6-016S (A set of a, b, d, e)
Band mounting			
Band mounting	D-C7□/C80 D-C73C/C80C D-H7□/H7□W D-H7BA/H7NF	BJ2-010 (A set of band and screw)	BJ2-016 (A set of band and screw)
Rail mounting <small>Note 4)</small>	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A <small>Note 5)</small> D-M9□AV <small>Note 5)</small> D-A9□ D-A9□V	BQ2-012(S) (A set of a and b)	BQ2-012(S) (A set of a and b)

Note 1) Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please contact SMC regarding other chemicals.

Note 2) Avoid the indicator LED for mounting the switch bracket. As the indicator LED is projected from the switch unit, indicator LED may be damaged if the switch bracket is fixed on the indicator LED.

Note 3) When the cylinder is shipped, the auto switch mounting bracket and the auto switch will be included.

Note 4) For the D-M9□A(V), order the BQ2-012S, which uses stainless steel mounting screws.

Band Mounting Brackets Set Part No.

Set part no.	Contents
BJ2-□□□	<ul style="list-style-type: none"> Auto switch mounting band (a) Auto switch mounting screw (b)
BJ4-1	<ul style="list-style-type: none"> Switch bracket (White/PBT) (e) Switch holder (d)
BJ5-1	<ul style="list-style-type: none"> Switch bracket (Transparent/Nylon) (c) Switch holder (d)

[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

BBA4: For D-C7/C8/H7 types

Note 5) Refer to **the Auto Switch Guide** for details on the BBA4.

When the D-H7BA type auto switch is shipped independently, the BBA4 is attached.

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.
 Refer to **the Auto Switch Guide** for the detailed specifications.

Type	Mounting	Model	Electrical entry	Features
Sold state	Band mounting	D-H7A1/H7A2/H7B	Grommet (In-line)	—
		D-H7NW/H7PW/H7BW		Diagnostic indication (2-colour indication)
	Rail mounting	D-F79/F7P/J79		—
		D-F79W/F7PW/J79W		Diagnostic indication (2-colour indication)
		Grommet (Perpendicular)	D-F7NV/F7PV/F7BV	—
			D-F7NWW/F7BWW	Diagnostic indication (2-colour indication)
Reed	Band mounting	D-C73/C76	Grommet (In-line)	—
		D-C80		Without indicator light
	Rail mounting	D-A73H/A76H		—
		D-A80H		Without indicator light
		Grommet (Perpendicular)	D-A73	—
			D-A80	Without indicator light

* With pre-wired connector is also available for solid state auto switches. For details, refer to **the Auto Switch Guide**.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the Auto Switch Guide**.



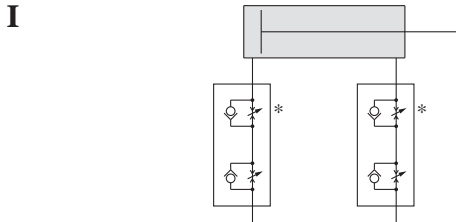
Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 1

Be sure to read before handling. Refer to back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smcworld.com>

Recommended Pneumatic Circuit

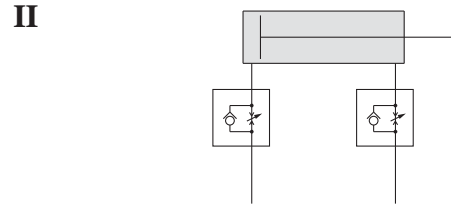
Warning

Horizontal Operation



Dual speed controller

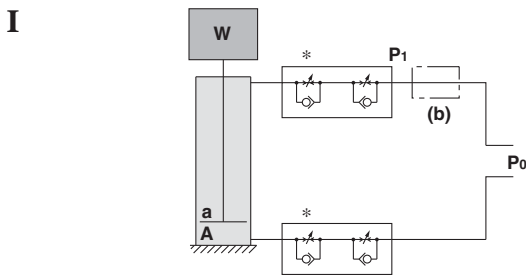
Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip. More stable low speed operation can be achieved than meter-in circuit alone.



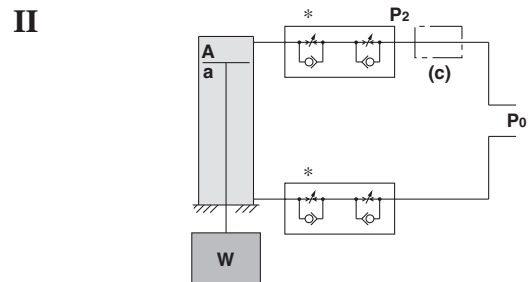
Meter-in speed controller

Meter-in speed controllers can reduce lurching while controlling the speed. The two adjustment needles facilitate adjustment.

Vertical Operation



- (1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.*
- (2) Depending on the size of the load, installing a regulator with check valve at position **(b)** can reduce lurching during descent and operation delay during ascent.
As a guide,
when $W + P_0a > P_0A$,
adjust P_1 to make $W + P_1a = P_0A$.



- (1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.*
- (2) Installing a regulator with check valve at position **(c)** can reduce lurching during descent and operation delay during ascent.
As a guide,
adjust P_2 to make $W + P_2A = P_0a$.

W: Load [N] **P₀**: Operating pressure [MPa] **P₁, P₂**: Reduced pressure [MPa] **a**: Rod side piston area [mm²] **A**: Head side piston area [mm²]



Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smworld.com>

Design

⚠ Caution

- 1. Provide a construction that does not apply a lateral load to the cylinder.**
Applying a lateral load to the cylinder may cause a malfunction. (Only for low speed cylinders)
- 2. Design the system to prevent vibration from being applied to the cylinder.**
A malfunction may occur due to the vibration.
- 3. Avoid using a guide with obvious variations in operating resistance.**
Operation may become unstable when using a guide that manifests variations in operating resistance, or when the external load changes.
- 4. Avoid a system structure in which the mounting orientation changes.**
Operation may become unstable if the mounting orientation changes.
- 5. Avoid operation where the temperature fluctuates greatly. Also, when using at low temperatures, make sure that frost does not form inside the cylinder and on the piston rod.**
Operation may become unstable.
- 6. Do not use the product at a high frequency.**
Use it at 30 cpm or less as a guideline.
- 7. Adjust the speed in accordance with the operating environment.**
When the operating environment changes, the speed adjustment will be off unless it is reset to reflect operation in the new environment.
- 8. For cylinders with long strokes, sliding resistance will increase due to the deflection of the piston rod and other factors. Take measures such as the installation of a guide. (Only for smooth cylinders)**
- 9. Do not apply excessive lateral load to the piston rod. (Only for smooth cylinders)** ^{Note 1)}
Note 1) Easy checking method
Minimum operating pressure after the cylinder is mounted to the equipment [MPa] = Minimum operating pressure of cylinder [MPa] + {Load weight [kg] x Friction coefficient of guide/Sectional area of cylinder [mm²]}.
If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

Pneumatic Circuit

⚠ Caution

- 1. The piping length between the speed controller and the cylinder port must be kept as short as possible.**
If the speed controller and the cylinder port are far apart, speed adjustment may be unstable.
- 2. Use a speed controller for low speed operation to easily adjust for low speed operation or a dual speed controller (Series ASD) to prevent cylinders from popping out.**
(When the speed controller for low speed operation is used, the maximum speed may be limited.)
Refer to “Recommended Pneumatic Circuit” on page 14.

Mounting

⚠ Caution

- 1. Do not apply a lateral load to the piston rod.**
Applying a lateral load to the piston rod may cause a malfunction. (Only for low speed cylinders)
- 2. Do not apply excessive lateral load to the piston rod. (Only for smooth cylinders)** ^{Note 1)}
Note 1) Easy checking method
Minimum operating pressure after the cylinder is mounted to the equipment [MPa] = Minimum operating pressure of cylinder [MPa] + {Load weight [kg] x Friction coefficient of guide/Sectional area of cylinder [mm²]}.
If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

Lubrication

⚠ Caution

- 1. Operate without lubrication from a pneumatic system lubricator.**
A malfunction may occur when lubricated in this fashion.
- 2. Only use the grease recommended by SMC.**
The low speed cylinder and the low speed cylinder with clean room specifications use different types of grease. The use of grease other than the specified type can cause a malfunction and particulate generation.
 - Order using the following part numbers when only maintenance grease is needed.

Volume	Part no.
5 g	GR-L-005
10 g	GR-L-010
150 g	GR-L-150
- 3. Do not wipe out the grease in the sliding part of the air cylinder.**
Doing so may cause a malfunction.

Air Supply

⚠ Caution

- 1. Take measures to prevent pressure fluctuation.**
A malfunction may occur with the fluctuation of pressure.