Smooth/Low Speed Cylinders New

Reducing stick-slip in a low speed range

Smooth Cylinders *Series C□Y*

Stable operation possible even at a low speed of 5 mm/s (Measurement based on JIS B 8377)

Low sliding possible even in bi-directional operation
Can be operated regardless of the direction of pressure.

Lightweight/Improved functions
(New structure equivalent to the standard models)
· Better visibility for auto switches (only when the D-M9□/A9□ are used in the CJ2Y-Z, CM2Y-Z, CG1Y-Z)
· Female rod end available as standard (CG1Y-Z, CM2Y-Z, CQSY, CQ2Y-Z)

Added the CJ2Y-Z and MBY-Z series.

Interchangeable with the standard models
(CJ2Y-Z, CM2Y-Z, MBY-Z, CA2Y-Z, CS2Y)

CJ2Y-Z
(ø10, ø16)

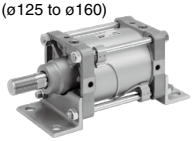
CM2Y-Z
(ø20 to ø40)

CG1Y-Z
(ø20 to ø100)

MBY-Z
(ø32 to ø100)

CA2Y-Z
(ø40 to ø100)

CS2Y
(ø125 to ø160)



CQSY
(ø12 to ø25)

CQ2Y-Z
(ø32 to ø100)

Reducing adhesion/quick extension

Low Speed Cylinders *Series C□X*

Smooth operation possible even at 0.5 mm/s
(1 mm/s for ø16 or smaller)

Minimum operating pressure is reduced in half. (Compared to previous version)
The new structure has improved low friction characteristics. (CM2X-Z, CQSX, CQ2X)

Improved functions
(New structure equivalent to the standard models)
· Better visibility for auto switches (only when the D-M9□/A9□ are used in the CJ2X-Z, CM2X-Z)
· Female rod end available as standard (CM2X-Z, CQSX, CQ2X)

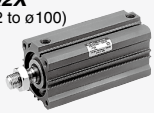
Interchangeable with the standard models

CJ2X-Z
(ø10, ø16)

CM2X-Z
(ø20 to ø40)

CQSX
(ø12 to ø25)

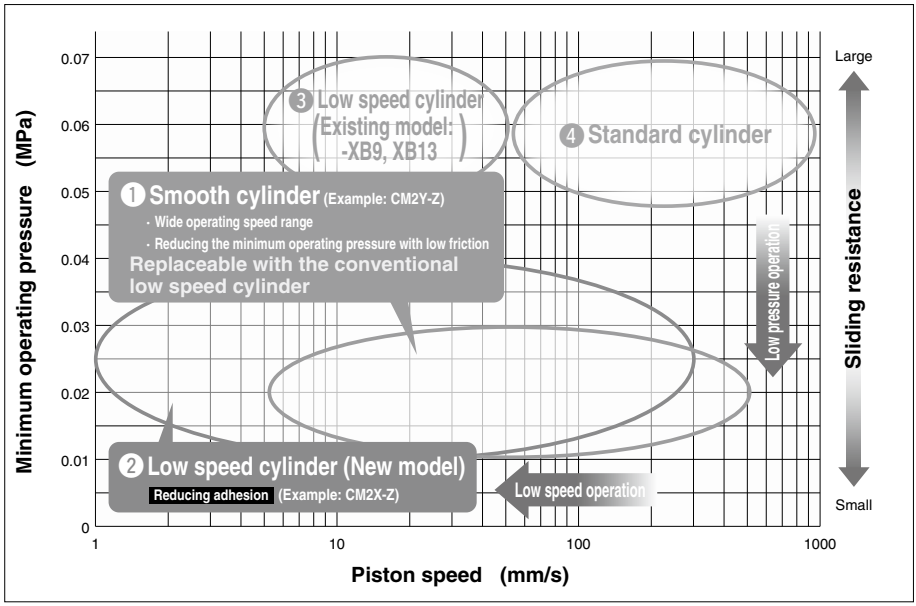
CQ2X
(ø32 to ø100)



CUX
(ø10 to ø32)

Clean room specification
Series 10-/11-

Series C□Y/C□X



1 Smooth cylinder

- **Low speed operation (from 5 mm/s)**
- **Low pressure operation**
- **Pressure on both sides**

· Pressing force control
· Balance control of winders etc.
· General low-speed operating applications
· Tension control

2 Low speed cylinder (New model)

- **Low speed operation (from 0.5 mm/s)**
- **Low pressure operation**
- **Pressure on both sides**
- **Reducing adhesion**

· Load transfer without a lateral load (Lightweight trays etc.)
· Transfer with less adhesion (Wafers etc.)
· Higher-accuracy pressing force control

3 Low speed cylinder (Existing model: -XB9, XB13)

- **Low speed operation**

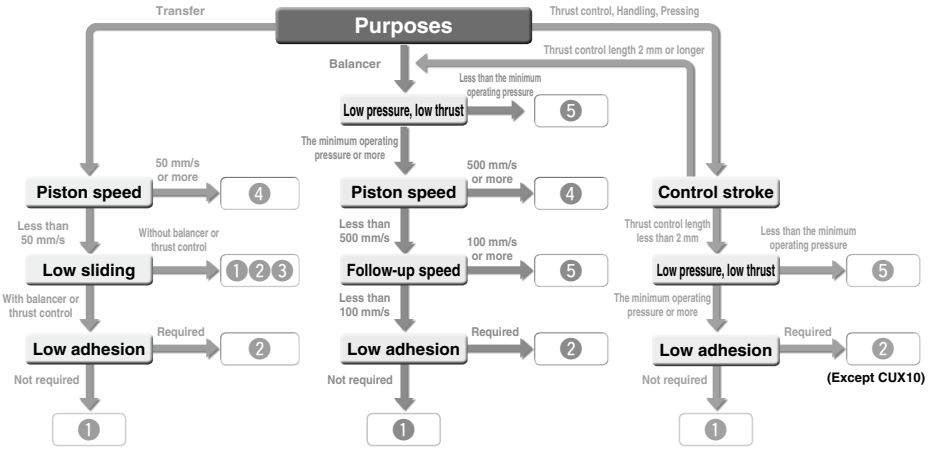
4 Standard non-lube cylinder

- **General applications**

Function	❶ Smooth cylinder	❷ Low speed cylinder (New model)	❸ Low speed cylinder (Existing model: -XB9, XB13)	❹ Standard non-lube cylinder
❶ Low pressure operation	◎	CUX10: × Others: ◎	△	△
❷ Low speed operation	○	◎	○	△
❸ Reducing adhesion	○	◎	○	△
❹ Reducing quick extension	○	◎	○	△
❺ Pressing force control	◎	CUX10: × Others: ◎	○	△
❻ Low sliding	◎	◎	○	△

◎: Excellent ○: Good △: Usable ×: Handle with caution.

Selection Procedures (Reference Example)



❶ Consider using the smooth cylinder. ❷ Consider using the low speed cylinder (New model).
❸ Consider using the low speed cylinder (Existing model: -XB9, XB13).
❹ Consider using the standard non-lube cylinder. ❺ Please consult with SMC.

Glossary Explanation

Average piston speed	Cylinder full stroke (length) divided by air pressure operating time.
Adhesive phenomenon	Quick extension or delay occurs when cylinders are not operated for long hours.
Thrust control	Control the pressing force by controlling air pressure in the cylinder.
Balancer	Cylinders move along with the moving workpiece.
Balancer follow-up speed	The speed of an air cylinder moving along with the workpiece at a small stroke.
Calculating thrust controlled	Calculate the cylinder thrust multiplying piston area by pressure. Piston area varies depending on models and bore sizes.

Applicable Model/Bore Size

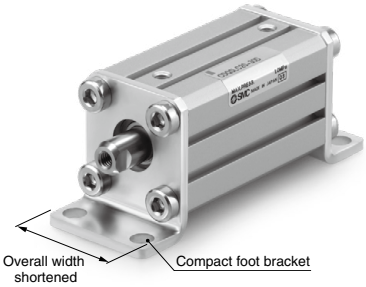
Type	❶ Smooth cylinder	❷ Low speed cylinder (New model)	❸ Low speed cylinder (Existing model: -XB9, XB13)	Representative model
Small	○	○	○	CJ2-Z
Round	○	○	○	CM2-Z
	○		○	CG1-Z
Tie-rod	○		○	MB-Z
	○			CA2-Z
	○			CS2
Compact	○	○	○	CQS
	○	○	○	CQ2-Z
Free mount		○	○	CU

○: Standard

Bore size (mm)	❶ Smooth cylinder								❷ Low speed cylinder (New model)				
	Round			Tie-rod			Compact		Round		Compact		Free mount
Model	CJ2Y-Z	CM2Y-Z	CG1Y-Z	CA2Y-Z	CS2Y	MBY-Z	CQSY	CQ2Y-Z	CJ2X-Z	CM2X-Z	CQSX	CQ2X	CUX
ø10	●								●				●
ø12							●				●		●
ø16	●						●		●		●		●
ø20		●	●				●			●	●		●
ø25		●	●				●			●	●		●
ø32		●	●			●		●		●		●	●
ø40		●	●	●		●		●		●		●	
ø50			●	●		●		●				●	
ø63			●	●		●		●				●	
ø80			●	●		●		●				●	
ø100			●	●		●		●				●	
ø125					●								
ø140					●								
ø160					●								
	P.1070	P.1084	P.1101	P.1127	P.1141	P.1112	P.1154	P.1163	P.1182	P.1196	P.1216	P.1225	P.1240

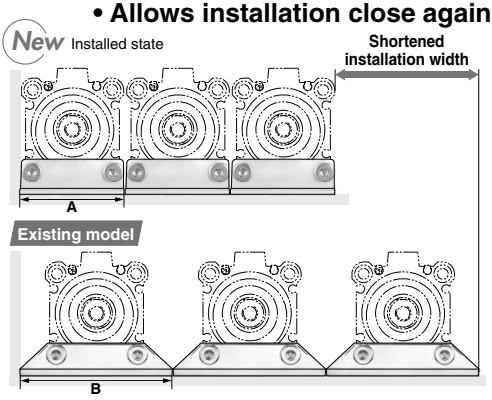
Added compact foot brackets.

■ Compact foot bracket has the same width as the cylinder. Overall width reduced by up to 43% (ø12)



■ More compact installation space possible

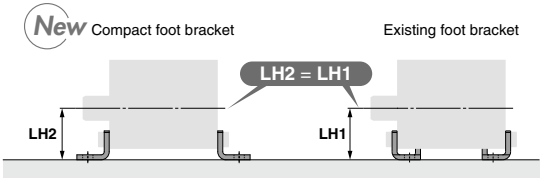
- **Short pitch mounting is possible.**
- **Allows installation close against a wall.**



Bore size (mm)	New Compact foot type width **A** (mm)	Existing foot type width **B** (mm)	Reduced width for short pitch mounting (mm)		
			1 unit	2 units	3 units
12	25	44	19	38	57
16	29	48	19	38	57
20	36	62	26	52	78
25	40	66	26	52	78
32	45	71	26	52	78
40	52	78	26	52	78
50	64	95	31	62	93
63	77	113	36	72	108
80	98	140	42	84	126
100	117	162	45	90	135

* Short pitch mounting is possible only without auto switch. Please consult with SMC for mounting with auto switch.

■ Height from the bottom of brackets to the center of a cylinder is the same as the existing model.



Applicable Cylinders: CQSY, CQ2Y (Smooth Cylinders), CQSX, CQ2X (Low Speed Cylinders)

New Part numbers with rod end bracket and/or pivot bracket available

Not necessary to order a bracket for the applicable cylinder separately

Note) Mounting bracket is shipped together with the product, but not assembled.

For CM2Y

Example) **CDM2Y C 20-50Z- N W -M9BW**

•Mounting

Pivot bracket	
Nil	None
N	Pivot bracket is shipped together with the product, but not assembled.

∗ Applicable to only mounting C, T, U, E, V, and UZ.

Rod end bracket	
Nil	None
V	Single knuckle joint
W	Double knuckle joint

Kit of pivot bracket and single clevis

Kit of pivot bracket and trunnion

With rod end bracket

V: Single knuckle joint **W**: Double knuckle joint

For CA2Y

Example) **CDA2Y D 40-100Z- N W -M9BW**

•Mounting

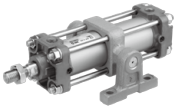
Pivot bracket	
Nil	None
N	Pivot bracket is shipped together with the product, but not assembled.

∗ Applicable to only mounting D (Double clevis) and T (Center trunnion).

Rod end bracket	
Nil	None
V	Single knuckle joint
W	Double knuckle joint

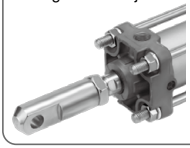
Kit of pivot bracket and double clevis

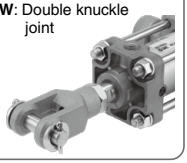
Kit of pivot bracket and trunnion



With rod end bracket

V: Single knuckle joint **W**: Double knuckle joint





Applicable Cylinders: CJ2Y, CM2Y, CG1Y, CA2Y, MBY (Smooth Cylinders)

Smooth Cylinders

Series CJ2Y-Z/CM2Y-Z/CG1Y-Z/MBY-Z/ CA2Y-Z/CS2Y/CQSY/CQ2Y-Z

Series	Action	Bore size (mm)	Minimum operating pressure (MPa)	Page
CJ2Y-Z 	Double acting	10, 16	0.03	1070
CM2Y-Z 		20, 25, 32, 40	0.02	1084
CG1Y-Z 		20, 25, 32, 40	0.02	1101
		50, 63, 80, 100	0.01	
MBY-Z 		32, 40	0.02	1112
		50, 63, 80, 100	0.01	
CA2Y-Z 		40	0.02	1127
		50, 63, 80, 100	0.01	
CS2Y 		125, 140, 160	0.005	1141
CQSY 		12, 16	0.03	1154
		20, 25	0.02	
CQ2Y-Z 		32, 40	0.02	1163
		50, 63, 80, 100	0.01	

Smooth Cylinder
Double Acting, Single Rod
Series CJ2Y
ø10, ø16

How to Order

Mounting

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

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

Bore size

10	10 mm
16	16 mm

Cylinder standard stroke (mm)
Refer to "Standard Strokes" on page 1071.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint
T	Rod end cap (Flat type)
U	Rod end cap (Round type)

∗ Rod end bracket is shipped together with the product, but not assembled.
∗ A knuckle joint pin is not provided with the single knuckle joint.

CJ2Y B 16 – 60 Z – – – –

With auto switch **CDJ2Y B 16 – 60 Z – – – M9BW – B –**

With auto switch (Built-in magnet)
Smooth cylinder

Auto switch

Nil	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 1082 for auto switch mounting brackets.

Made to Order
Refer to page 1071 for details.

Head cover port location

Nil	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.

Pivot bracket

Nil	None
N	Pivot bracket is shipped together with the product.

∗ Only for CJ2D (double clevis)
∗ Pivot bracket is shipped together with the product, but not assembled.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 1071.**

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Band mounting, Perpendicular	Band mounting, In-line	Rail mounting, Perpendicular	Rail mounting, In-line	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V,12 V	—	M9NV	M9N	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	M9PV	M9P	●	●	●	○	—	○		
				2-wire	12 V		M9BV	M9B	M9BV	M9B	●	●	●	○	—	○	—	
		Connector					—	H7C	J79C	—	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V,12 V		M9NWV	M9NW	M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V,12 V		M9NAV**	M9NA**	M9NAV**	M9NA**	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV**	M9PA**	M9PAV**	M9PA**	○	○	●	○	—	○		
				2-wire	12 V		M9BAV**	M9BA**	M9BAV**	M9BA**	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			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	—
				2-wire		—	200 V	—	—	A72	A72H	●	—	●	—	—	—	—	Relay, PLC
			No		24 V	12 V	100 V	A93V	A93	A93V	A93	●	—	●	●	—	—	—	
							100 V or less	A90V	A90	A90V	A90	●	—	●	—	—	—	IC circuit	
			Yes				—	C73C	A73C	—	●	—	●	●	●	—	—	
		Connector	No				24 V or less	—	C80C	A80C	—	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	Yes			—	—	—	—	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.

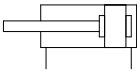
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Since there are other applicable auto switches than listed above, refer to page 1083 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ 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.)

INDEX

Symbol

Rubber bumper



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	

Made to Order

(For details, refer to pages 1247 to 1264.)

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

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Maximum manufacturable stroke (mm)
10	15, 30, 45, 60, 75, 100, 125, 150	400
16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200	400

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

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

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).

Mounting and Accessories/For details, refer to page 1077.

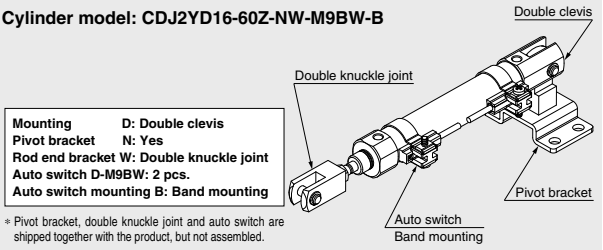
●···Mounted on the product. ○···Please order these separately.

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.

Ordering Example of Cylinder Assembly

Cylinder model: CDJ2YD16-60Z-NW-M9BW-B



Mounting **D: Double clevis**
Pivot bracket **N: Yes**
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.
Auto switch mounting B: Band mounting

* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

⚠Precautions

Be sure to read before handling. Refer to page 1574 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

1. 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.
2. 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

3. 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 ø10, use ultra thin pliers.
4. 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.

Weights

(g)

	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.

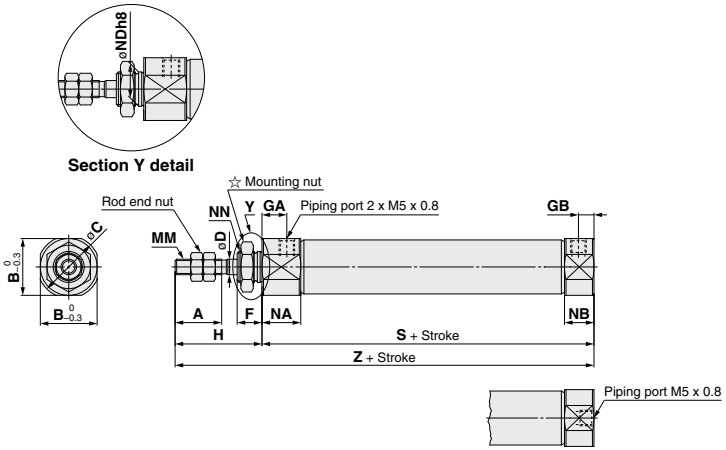
Calculation: Example) **CJ2YL10-45Z**
- Basic weight····· 22 (ø10)
- Additional weight····· 4/15 stroke
- Cylinder stroke····· 45 stroke
- Mounting bracket weight····· 8 (Axial foot)

22 + 4/15 x 45 + 8 = **42 g**

Dimensions

Basic (B)

CJ2YB **Bore size** – **Stroke** **Head cover port location** **Z**



∗ The overall cylinder length does not change.

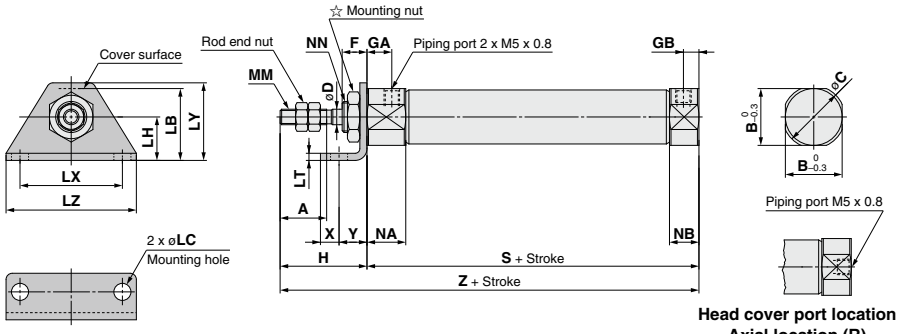
☆ Refer to page 1077 for details of the mounting nut.

(mm)

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**



☆ Refer to page 1077 for details of the mounting nut.

∗ The overall cylinder length does not change.

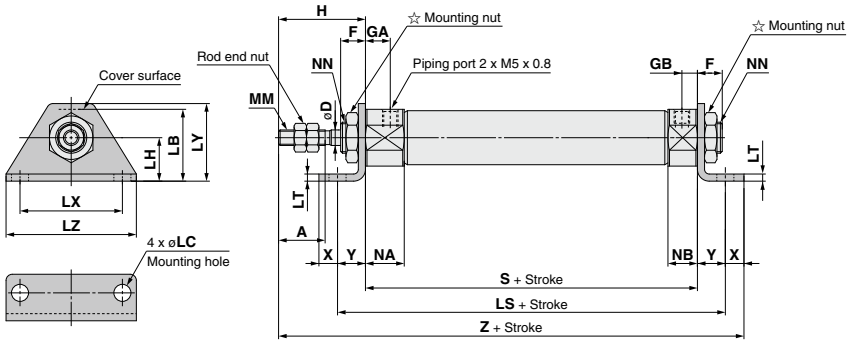
(mm)

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

Dimensions

Double foot (M)

CJ2YM Bore size – Stroke Z



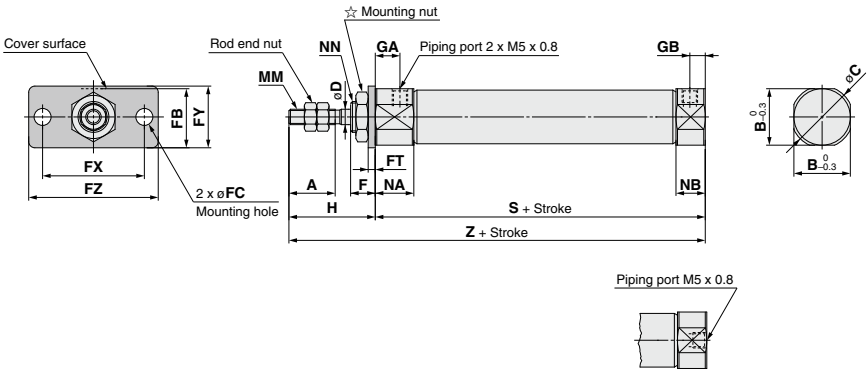
☆ Refer to page 1077 for details of the mounting nut.

(mm)

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



Head cover port location
Axial location (R)

∗ The overall cylinder length does not change.

☆ Refer to page 1077 for details of the mounting nut.

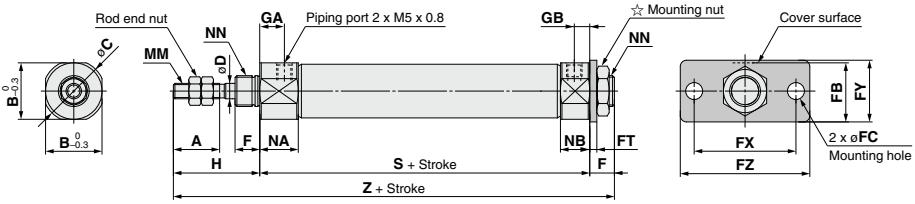
(mm)

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



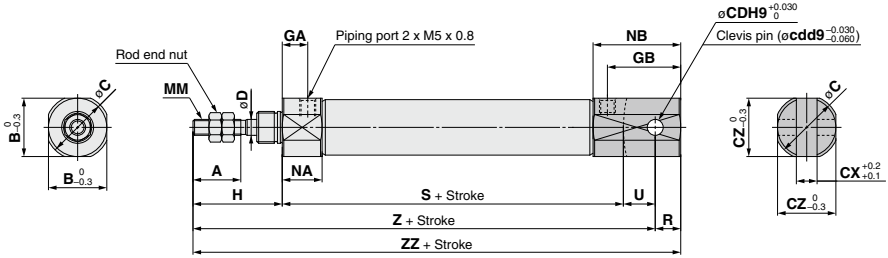
☆ Refer to page 1077 for details of the mounting nut.

(mm)

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.

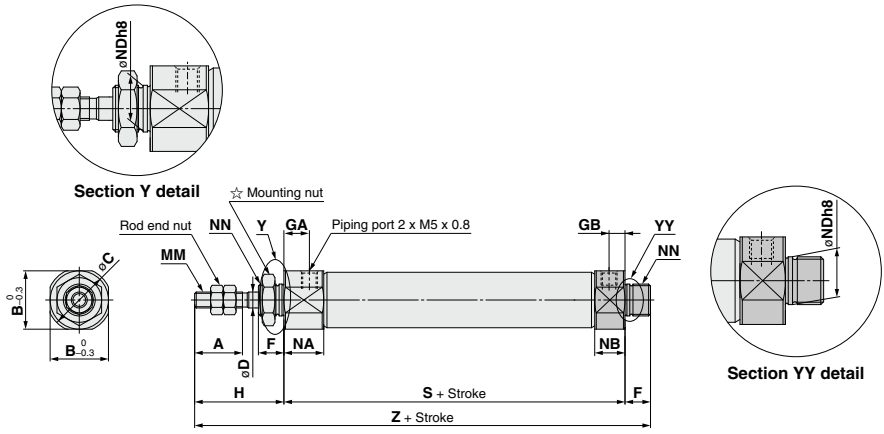
(mm)

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

Dimensions

Double-side bossed (E)

CJ2YE Bore size – Stroke Z



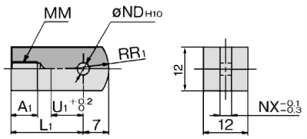
☆ Refer to page 1077 for details of the mounting nut.

(mm)

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	82
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	83

Dimensions of Accessories

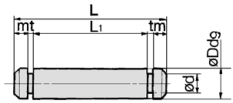
Single Knuckle Joint



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

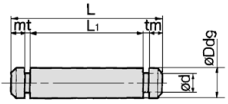


Material: Stainless steel

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

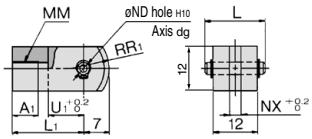


Material: Stainless steel

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 ø10, a clevis pin is diverted.
∗ Retaining rings are included with a knuckle pin.

Double Knuckle Joint



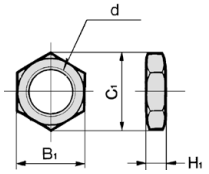
Material: Rolled steel

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.

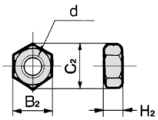
Mounting Nut



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

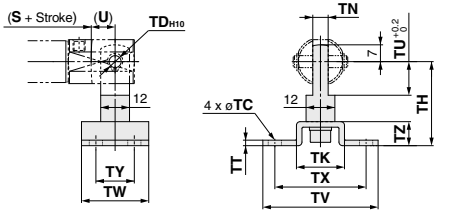
Rod End Nut



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

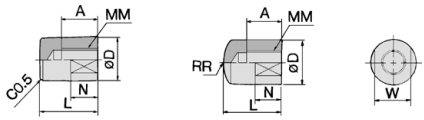


Part no.	Applicable bore size	TC	TD_{H10}	TH	TK	TN	TT	TU	TV	TW	TX	TY	TZ
CJ-T010C	**10**	4.5	$3.3^{+0.048}_{0}$	29	18	3.1	2	9	40	22	32	12	8
CJ-T016C	**16**	5.5	$5^{+0.048}_{0}$	35	20	6.4	2.3	14	48	28	38	16	10

∗ 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 1075.

Rod End Cap

Flat type/CJ-CF□□□ **Round type/CJ-CR□□□**



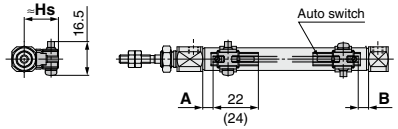
Material: Polyacetal

Part no.		Applicable bore size	A	D	L	MM	N	R	W
Flat type	Round type								
CJ-CF010	**CJ-CR010**	**10**	8	10	13	M4 x 0.7	6	10	8
CJ-CF016	**CJ-CR016**	**16**	10	12	15	M5 x 0.8	7	12	10

Auto Switch Mounting

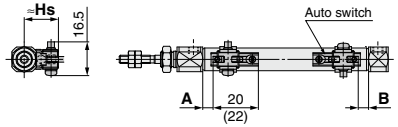
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Solid state auto switch
<Band mounting>
D-M9□
D-M9□W
D-M9□A



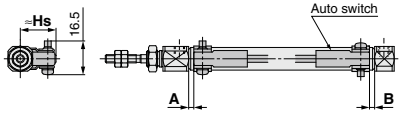
( ): Dimension of the D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□MV
D-M9□AV



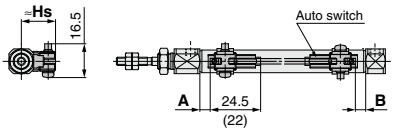
( ): Dimension of the D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-H7□
D-H7□W
D-H7BA
D-H7NF
D-H7C



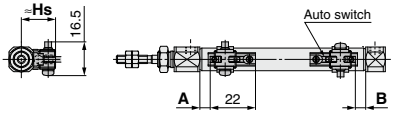
Reed auto switch
<Band mounting>

D-A9□



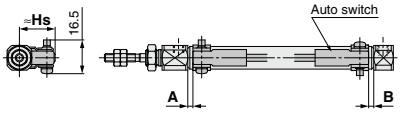
( ): Dimension of the D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V



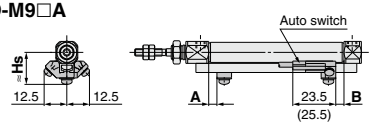
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80
D-C73C□/C80C



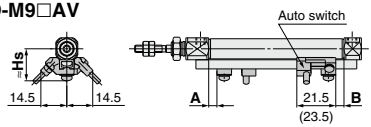
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Rail mounting>
D-M9□
D-M9□W
D-M9□A



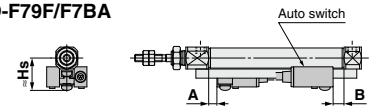
( ): Dimension of the D-M9□A

D-M9□V
D-M9□WV
D-M9□AV

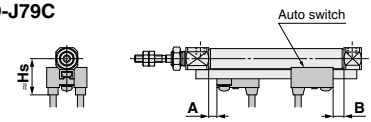


( ): Dimension of the D-M9□AV

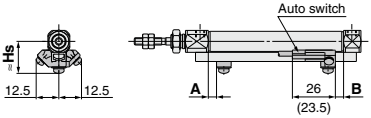
D-F7□/J79
D-F7□W/J79W
D-F79F/F7BA



D-F7□V/F7□WV
D-F7BAV
D-J79C

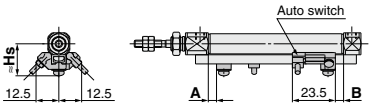


<Rail mounting>
D-A9□

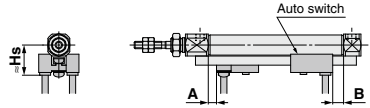


( ): Dimension of the D-A96

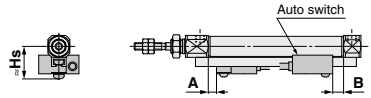
D-A9□V



D-A7□/A80
D-A73C/A80C
D-A79W



D-A7□H/A80H



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	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	
	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 / Bore size	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	
	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 / Bore size	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
	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 / Bore size	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
	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

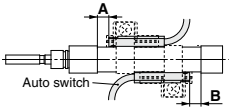
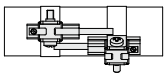
Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch mounting	Auto switch model	Number of auto switches				
		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)
	 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 1080.	 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.
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.

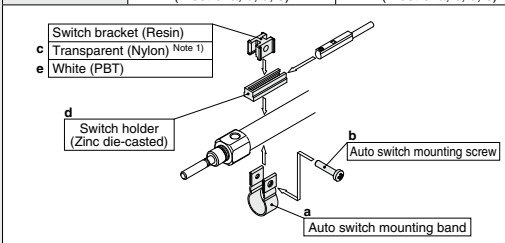
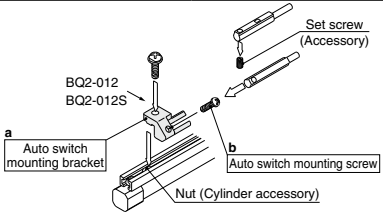
Operating Range

(mm)

	Auto switch model	Bore size 10	Bore size 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	3.5
	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	Bore size (mm) 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 Note 2) **D-M9□AV** Note 2)	BJ6-010S (A set of a, b, d, e)	BJ6-016S (A set of a, b, d, e)
			
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)
Note 4) Rail mounting	**D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A** Note 5) **D-M9□AV** Note 5) **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-□□□	• Auto switch mounting band (a) • Auto switch mounting screw (b)
BJ4-1	• Switch bracket (White/PBT) (e) • Switch holder (d)
BJ5-1	• 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 WEB catalog** or Best Pneumatics No. 3 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 WEB catalog** or Best Pneumatics No.3 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-color indication)
	Rail mounting	D-F79/F7P/J79		—
		D-F79W/F7PW/J79W		Diagnostic indication (2-color indication)
		D-F7NV/F7PV/F7BV	Grommet (Perpendicular)	—
		D-F7NWV/F7BWV		Diagnostic indication (2-color 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
		D-A73	Grommet (Perpendicular)	—
		D-A80		Without indicator light

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinder

Series CM2Y

ø20, ø25, ø32, ø40

How to Order

CM2Y **B** **40** □ – **150** □ **Z** – □ □ – □

With auto switch: CDM2Y **B** **40** □ – **150** □ **Z** – □ □ – **M9BW** □ – □

With auto switch (Built-in magnet)

Mounting

B	Basic (Double-side bossed)
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
U	Rod trunnion
T	Head trunnion
E	Integral clevis
V	Integral clevis (90°)
BZ	Boss-cut/Basic
FZ	Boss-cut/Rod flange
UZ	Boss-cut/Rod trunnion

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1085.

Rod end thread

Nil	Male rod end
F	Female rod end

Pivot bracket

Nil	None
N	Pivot bracket is shipped together with the product.

* Only for C, T, U, E, V, UZ mounting types
* Pivot bracket is shipped together with the product, but not assembled.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

* No bracket is provided for the female rod end type.
* A knuckle joint pin is not provided with the single knuckle joint.
* Rod end bracket is shipped together with the product, but not assembled.

Made to Order
Refer to page 1085 for details.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

* **Refer to "Ordering Example of Cylinder Assembly" on page 1086.**

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDM2YB20-100Z

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	—	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	●	—	●	○	—	○		
				2-wire	12 V		M9BV	M9B	●	—	●	○	—	○		
		Connector					—	H7C	●	—	●	●	●	—	—	
		Terminal conduit		3-wire (NPN)	5 V, 12 V		—	G39A	—	—	—	—	●	—	IC circuit	
				2-wire	12 V		—	K39A	—	—	—	—	●	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV***	M9NA***	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○	—	○		
				2-wire	12 V		M9BAV***	M9BA***	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)	5 V, 12 V		—	H7NF	●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—
			No	2-wire	12 V	100 V	A93V	A93	●	—	●	●	—	—	—	Relay, PLC
			Yes			100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	
			No			100 V, 200 V	—	B54	●	—	●	●	—	—	—	
			Yes			200 V or less	—	B64	●	—	●	—	—	—	—	
		Connector	No		24 V	—	—	C73C	●	—	●	●	●	—	—	
						24 V or less	—	C80C	●	—	●	●	●	—	IC circuit	
		Terminal conduit	Yes		12 V	—	—	A33A	—	—	—	—	●	—	—	PLC
						100 V, 200 V	—	A34A	—	—	—	—	●	—	—	Relay, PLC
		DIN terminal				—	—	A44A	—	—	—	—	●	—		
	Diagnostic indication (2-color indication)	Grommet			—	—	—	B59W	●	—	●	—	—	—		

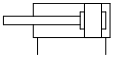
*** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m ·····Nil (Example) M9NW
  1 m ····· M (Example) M9NWM
  3 m ····· L (Example) M9NWL
  5 m ····· Z (Example) M9NWZ
  None ····· N (Example) H7CN
* Solid state auto switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on the D-A3□A/A44A/G39A/K39A models.
* Since there are other applicable auto switches than listed above, refer to page 1100 for details.
* For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
* The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)
* The D-C7□□/C80□/H7□□ auto switches are assembled before shipment.

Integral clevis

Symbol

Double acting, Single rod, Rubber bumper



Made to Order

Made to Order
(For details, refer to pages 1247 to 1264.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port location
-XC6	Made of stainless steel
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC13	Auto switch rail mounting
-XC20	Head cover axial port
-XC25	No fixed throttle of connection port
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw
-X1854	Low friction cylinder mounting

∗ Refer to page 1086 for "-X1854".

Replacement Parts/Rod Seal

Bore size (mm)	Part no.
20	CM20Z-PS
25	CM25Z-PS
32	CM32Z-PS
40	CM40Z-PS

Grease Pack for Maintenance

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: **GR-L-005** (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	20	25	32	40
Action	Double acting, Single rod			
Piston speed	5 to 500 mm/s			
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)			
Lubrication	Not required (Non-lube)			
Stroke length tolerance	$^{+1.4}_{0}$ mm			
Cushion	Rubber bumper			
Allowable leakage rate	0.5 L/min (ANR) or less			

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	20	25	32	40
Minimum operating pressure	0.02			

Mounting Brackets/Part No.

Mounting bracket	Min. order q'ty	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Axial foot∗	2	CM-L020B	CM-L032B		CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Single clevis∗∗	1	CM-C020B	CM-C032B		CM-C040B	1 single clevis, 3 liners
Double clevis (with pin)∗∗∗	1	CM-D020B	CM-D032B		CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Trunnion (with nut)	1	CM-T020B	CM-T032B		CM-T040B	1 trunnion, 1 trunnion nut

∗ Order 2 foots per cylinder.
∗∗ 3 liners are included with a clevis bracket for adjusting the mounting angle.
∗∗∗ A clevis pin and retaining rings (split pins for ø40) are included.

Mounting and Accessories

Accessories / Mounting	Standard			Option				
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Note 3) Double knuckle joint	Note 4) Clevis pivot bracket	Note 6) Pivot bracket	Note 7) Pivot bracket pin
Basic (Double-side bossed)	● (1 pc.)	●	—	●	●	—		
Axial foot	● (2)	●	—	●	●	—		
Rod flange	● (1)	●	—	●	●	—	—	—
Head flange	● (1)	●	—	●	●	—		
Integral clevis	— Note 1)	●	—	●	●	●		
Single clevis	— Note 1)	●	—	●	●	—	●	●
Double clevis Note 3)	— Note 1)	●	● Note 5)	●	●	—	—	—
Rod trunnion	● (1) Note 2)	●	—	●	●	—	●	—
Head trunnion	● (1) Note 2)	●	—	●	●	—		
Boss-cut/Basic	● (1)	●	—	●	●	—		
Boss-cut/Flange	● (1)	●	—	●	●	—	—	—
Boss-cut/Trunnion	● (1) Note 2)	●	—	●	●	—		

Note 1) Mounting nuts are not attached to the integral clevis, single clevis and double clevis types.
Note 2) Trunnion nuts are mounted on the rod trunnion and head trunnion types.
Note 3) A pin and retaining rings (split pins for ø40) are included with the double clevis and double knuckle joint types.
Note 4) A pin and retaining rings are included with the clevis pivot bracket.
Note 5) Retaining rings (split pins for ø40) are included with the clevis pin.
Note 6) A pin and retaining rings are included with the pivot bracket.
Note 7) Retaining rings are included with the pivot bracket pin.

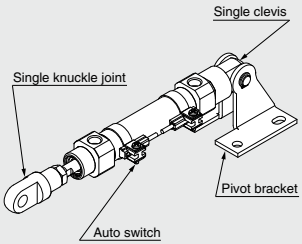
Standard Strokes

Bore size (mm)	Standard stroke (mm)
20, 25, 32, 40	25, 50, 75, 100, 125, 150, 200, 250, 300

Note 1) Manufacture of intermediate strokes in 1 mm intervals is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Option: Ordering Example of Cylinder Assembly

Cylinder model: **CDM2YC40-150Z-NV-M9BW**



Mounting C: Single clevis
Pivot bracket N: Yes
Rod end bracket V: Single knuckle joint
Auto switch D-M9BW: 2 pcs.

∗ Pivot bracket, single knuckle joint and auto switch are shipped together with the product, but not assembled.

∗ Pivot bracket is only applicable to mounting C, T, U, E, V and UZ.
∗ No rod end bracket is provided for the female rod end type.

Weights

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic (Double-side bossed)	0.14	0.21	0.28	0.56
	Axial foot	0.29	0.37	0.44	0.83
	Flange	0.20	0.30	0.37	0.68
	Integral clevis	0.12	0.19	0.27	0.52
	Single clevis	0.18	0.25	0.32	0.65
	Double clevis	0.19	0.27	0.33	0.69
	Trunnion	0.18	0.28	0.34	0.66
	Boss-cut/Basic	0.13	0.19	0.26	0.53
	Boss-cut/Flange	0.19	0.28	0.35	0.65
	Boss-cut/Trunnion	0.17	0.26	0.32	0.63
Additional weight per 50 mm of stroke		0.04	0.06	0.08	0.13
Option bracket	Clevis bracket (with pin)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (with pin)	0.07	0.07	0.07	0.20
	Pivot bracket	0.06	0.06	0.06	0.06
	Pivot bracket pin	0.02	0.02	0.02	0.03

Calculation: Example) **CM2YL32-100Z**
- Basic weight·····0.44 (Foot, ø32)
- Additional weight·····0.08/50 stroke
- Cylinder stroke·····100 stroke

0.44 + 0.08 x 100/50 = **0.60 kg**

Same Mounting Dimensions as the Low Friction Cylinder

CM2Y Mounting Bore size – Stroke Z – X1854

Same mounting dimensions as the CM2Q

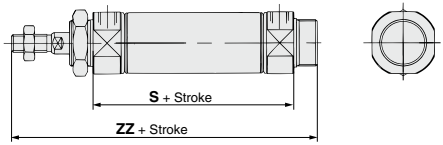
In order to adjust the mounting dimensions of the low friction cylinder (CM2Q), extend the longitudinal dimension (S, ZZ) by 3 mm.

Specifications

Cylinder bore size (mm)	20	25	32	40
Action	Double acting, Single rod			
Direction of low friction	Bi-directional			
Fluid	Air			
Proof pressure	1.05 MPa			
Maximum operating pressure	0.7 MPa			

∗ Low friction operates bi-directionally.

Dimensions



Bore size (mm)	S	ZZ
20	65	119
25	65	123
32	67	125
40	91	157

∗ Add 3 mm to S and ZZ dimensions of the double acting, single rod type on pages 1087 to 1093 for the dimensions for each mounting bracket other than the basic type.

⚠Precautions

Be sure to read before handling. Refer to page 1574 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

Operating Precautions

⚠Warning

1. Do not rotate the cover.
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠Caution

1. Not able to disassemble.
Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a retaining ring.
When replacing rod seals and removing and mounting a retaining ring, use a proper tool (retaining ring plier: tool for installing a type C retaining ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier. Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

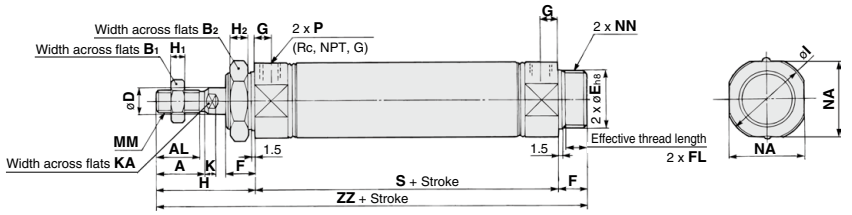
3. Do not use an air cylinder as an air-hydro cylinder.
If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

4. The oil stuck to the cylinder is grease.

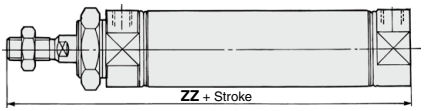
5. The base oil of grease may seep out.
The base oil of grease in the cylinder may seep out of the tube, cover, crimped part or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

Basic (Double-side Bossed) (B)

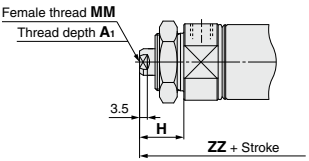
CM2YB **Bore size** – **Stroke** ☐ **Z**



Boss-cut



Female rod end



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	154

Boss-cut (mm)

Bore size	ZZ
20	103
25	107
32	109
40	138

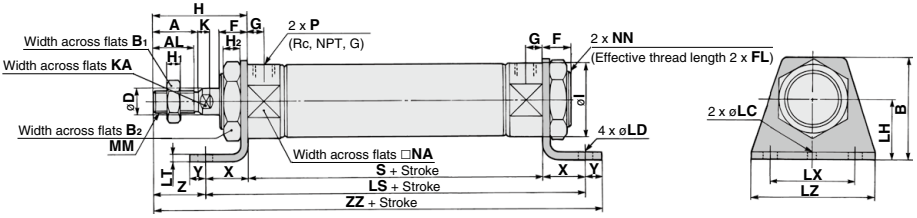
Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

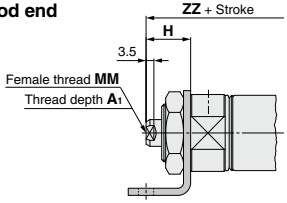
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Axial Foot (L)

CM2YL Bore size – Stroke ☐ **Z**



Female rod end



Female Rod End (mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	110
25	8	20	M5 x 0.8	110
32	12	20	M6 x 1	112
40	13	21	M8 x 1.25	142

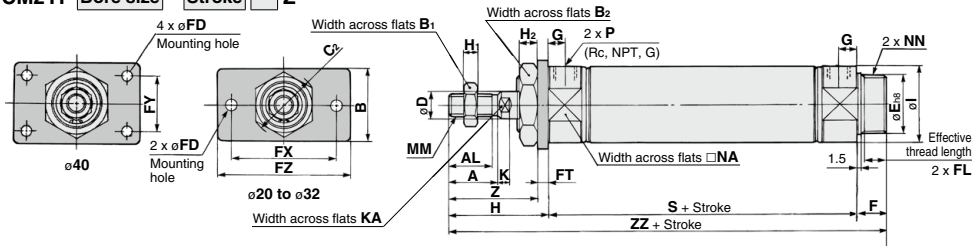
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

∗ Mounting bracket is shipped together with the product. (mm)

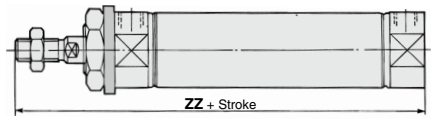
Bore size	A	AL	B	B1	B2	D	F	FL	G	H	H1	H2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	M20 x 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	M26 x 1.5	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	10.5	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	M26 x 1.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	13.5	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	M32 x 2	1/4	88	23	10	27	171

Rod Flange (F)

CM2YF Bore size – Stroke ☐ **Z**



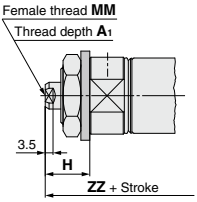
Boss-cut



Boss-cut (mm)

Bore size	ZZ
20	103
25	107
32	109
40	138

Female rod end



Female Rod End (mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

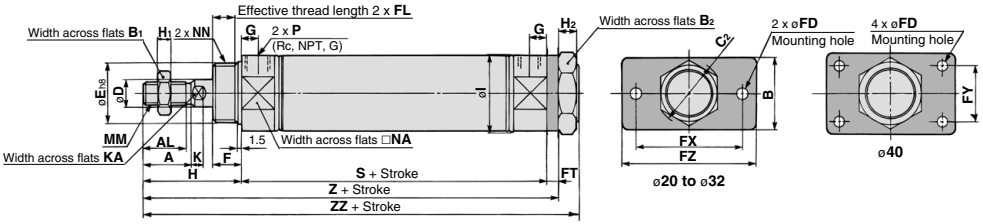
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

∗ Mounting bracket is shipped together with the product. (mm)

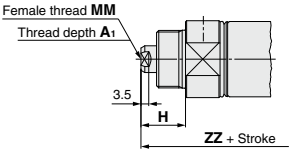
Bore size	A	AL	B	B1	B2	C2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	154

Head Flange (G)

CM2YG **Bore size** – **Stroke** ☐ **Z**



Female rod end



∗ Mounting bracket is shipped together with the product. (mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H1	H2	I
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5

(mm)

Bore size	K	KA	MM	NA	NN	P	S	Z	ZZ
20	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	107	116
25	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	111	120
32	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	113	122
40	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	143	154

Female Rod End

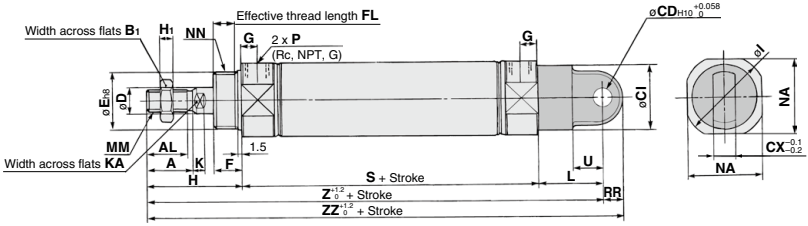
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

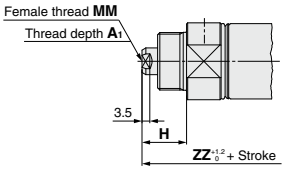
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Single Clevis (C)

CM2YC Bore size – Stroke ☐ **Z**



Female rod end



Female Rod End (mm)

Bore size	A1	H	MM	(ZZ)
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

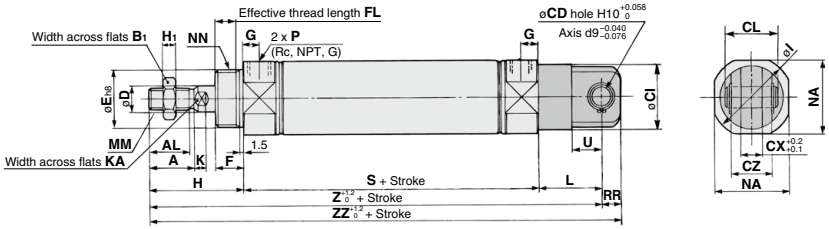
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

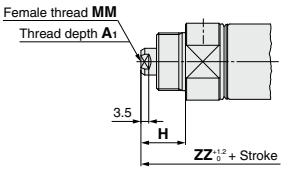
Bore size	A	AL	B1	CI	CD	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN	P	RR	S	U	(Z)	(ZZ)
20	18	15.5	13	24	9	10	8	20 0 −0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26 0 −0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26 0 −0.033	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	38	10	15	14	32 0 −0.039	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

Double Clevis (D)

CM2YD Bore size – Stroke ☐ **Z**



Female rod end



Female Rod End (mm)

Bore size	A1	H	MM	(ZZ)
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

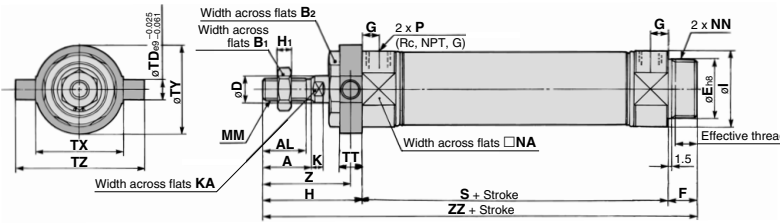
(mm)

Bore size	A	AL	B1	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN	P	RR	S	U	(Z)	(ZZ)
20	18	15.5	13	9	24	25	10	19	8	20 0 −0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	9	30	25	10	19	10	26 0 −0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	9	30	25	10	19	12	26 0 −0.033	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	10	38	41.2	15	30	14	32 0 −0.039	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

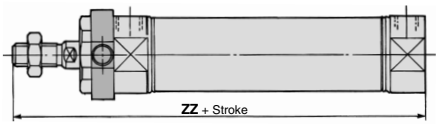
∗ A clevis pin and retaining rings (split pins for ø40) are shipped together.

Rod Trunnion (U)

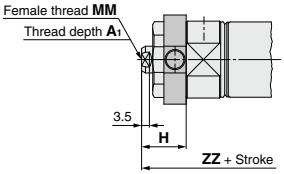
CM2YU Bore size – Stroke ☐ Z



Boss-cut



Female rod end



∗ Mounting bracket is shipped together with the product.

(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	I	K	KA	MM	NA	NN	P
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

(mm)

Bore size	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	36	116
25	62	9	10	40	40	60	40	120
32	64	9	10	40	40	60	40	122
40	88	10	11	53	53	77	44.5	154

Boss-cut (mm)

Bore size	ZZ
20	103
25	107
32	109
40	138

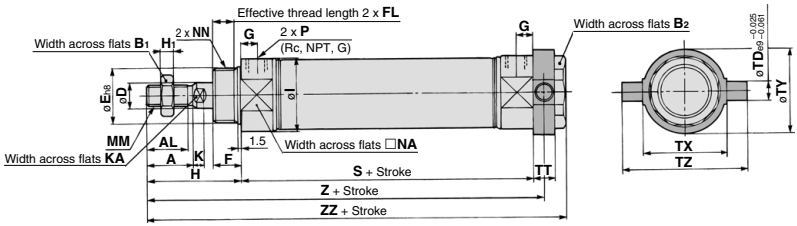
Female Rod End (mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

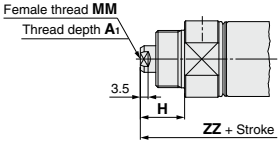
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Head Trunnion (T)

CM2YT Bore size – Stroke ☐ **Z**



Female rod end



∗ Mounting bracket is shipped together with the product.

(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	I	K	KA	MM	NA	NN	P
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

(mm)

Bore size	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	108	118
25	62	9	10	40	40	60	112	122
32	64	9	10	40	40	60	114	124
40	88	10	11	53	53	77	143.5	154

Female Rod End

(mm)

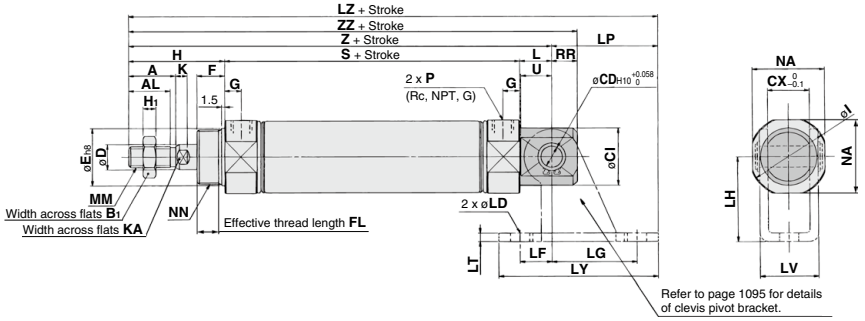
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	97
25	8	20	M5 x 0.8	97
32	12	20	M6 x 1	99
40	13	21	M8 x 1.25	125

∗ When female thread is used, use a thin wrench when tightening the piston rod.

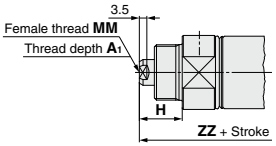
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Integral Clevis (E)

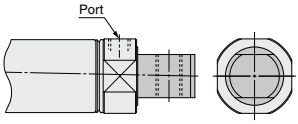
CM2YE Bore size – Stroke ☐ Z



Female rod end



Integral clevis (90°) (V)



∗ The outer dimensions are the same as those for the integral clevis (**E**).

(mm)

Bore size	A	AL	B1	CD	CI	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN
20	18	15.5	13	8	20	12	8	20 -0.033 0	13	10.5	8	41	5	28	5	6	12	M8 x 1.25	24	M20 x 1.5
25	22	19.5	17	8	22	12	10	26 -0.033 0	13	10.5	8	45	6	33.5	5.5	8	12	M10 x 1.25	30	M26 x 1.5
32	22	19.5	17	10	27	20	12	26 -0.033 0	13	10.5	8	45	6	37.5	5.5	10	15	M10 x 1.25	34.5	M26 x 1.5
40	24	21	22	10	33	20	14	32 -0.039 0	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	42.5	M32 x 2

(mm)

Bore size	P	RR	S	U	Z	ZZ
20	1/8	9	62	11.5	115	124
25	1/8	9	62	11.5	119	128
32	1/8	12	64	14.5	124	136
40	1/4	12	88	14.5	153	165

Female Rod End

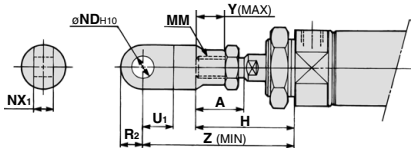
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	103
25	8	20	M5 x 0.8	103
32	12	20	M6 x 1	111
40	13	21	M8 x 1.25	136

∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Dimensions of Accessories

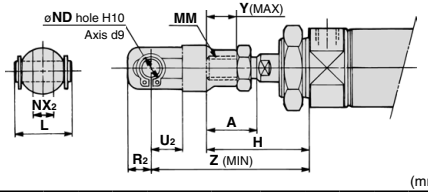
With Single Knuckle Joint



(mm)

Bore size	A	H	MM	ND_{H10}	NX_1	U_1	R_2	Y	Z
20	18	41	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	11	66
25, 32	22	45	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	14	69
40	24	50	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	20	14	13	92

With Double Knuckle Joint

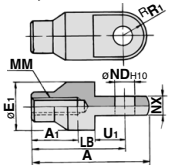


(mm)

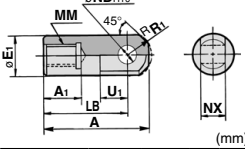
Bore size	A	H	L	MM	ND	NX_2	R_2	U_2	Y	Z
20	18	41	25	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	13	25	13	92

Single Knuckle Joint

I-020B, 032B Material: Carbon steel



I-040B Material: Free-cutting steel

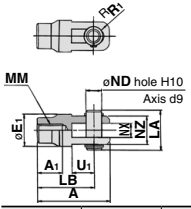


(mm)

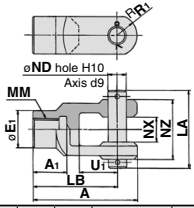
Part no.	Applicable bore size	A	A_1	E_1	LB	MM	ND_{H10}	NX	R_1	U_1
I-020B	**20**	46	16	20	36	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-032B	**25, 32**	48	18	20	38	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-040B	**40**	69	22	24	55	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	15.5	20

Double Knuckle Joint

Y-020B, 032B Material: Carbon steel



Y-040B Material: Cast iron



(mm)

Part no.	Applicable bore size	A	A_1	E_1	LA	LB	MM	ND	NX	NZ	R_1	U_1	Included pin part number	Retaining ring Split pin size
Y-020B	**20**	46	16	20	25	36	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-032B	**25, 32**	48	18	20	25	38	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-040B	**40**	68	22	24	49.7	55	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	38	13	25	CDP-3	ø3 x 18 L

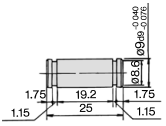
∗ A knuckle pin and retaining rings (split pins for ø40) are included.

Double Clevis Pin/Material: Carbon steel

(mm)

Bore size/ø20, ø25, ø32

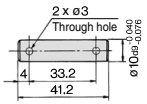
CDP-1



Retaining ring: Type C9 for axis

Bore size/ø40

CDP-2



Split pin: ø3 x 18 L

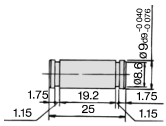
∗ Retaining rings (split pins for ø40) are included.

Double Knuckle Pin/Material: Carbon steel

(mm)

Bore size/ø20, ø25, ø32

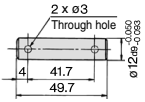
CDP-1



Retaining ring: Type C9 for axis

Bore size/ø40

CDP-3

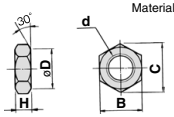


Split pin: ø3 x 18 L

∗ Retaining rings (split pins for ø40) are included.

Rod End Nut

Material: Carbon steel

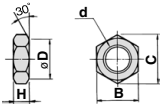


(mm)

Part no.	Applicable bore size	B	C	D	d	H
NT-02	**20**	13	15.0	12.5	M8 x 1.25	5
NT-03	**25, 32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8

Mounting Nut

Material: Carbon steel

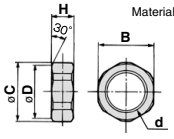


(mm)

Part no.	Applicable bore size	B	C	D	d	H
SN-020B	**20**	26	30	25.5	M20 x 1.5	8
SN-032B	**25, 32**	32	37	31.5	M26 x 1.5	8
SN-040B	**40**	41	47.3	40.5	M32 x 2.0	10

Trunnion Nut

Material: Carbon steel

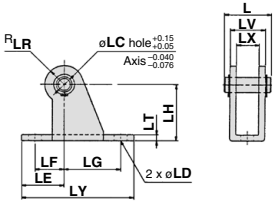


(mm)

Part no.	Applicable bore size	B	C	D	d	H
TN-020B	**20**	26	28	25.5	M20 x 1.5	10
TN-032B	**25, 32**	32	34	31.5	M26 x 1.5	10
TN-040B	**40**	41	45	40.5	M32 x 2	10

Clevis Pivot Bracket (For CM2YE(V))

Material: Carbon steel



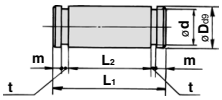
(mm)

Part no.	Applicable bore size	L	LC	LD	LE	LF	LG	LH	LR	LT	LX	LY	LV	Included pin part no.
CM-E020B	**20, 25**	24.5	8	6.8	22	15	30	30	10	3.2	12	59	18.4	CD-S02
CM-E032B	**32, 40**	34	10	9	25	15	40	40	13	4	20	75	28	CD-S03

Note 1) A clevis pivot bracket pin and retaining rings are included.
Note 2) It cannot be used for the single clevis (CM2YC) and the double clevis (CM2YD).

Clevis Pivot Bracket Pin (For CM2YE(V))

Material: Carbon steel

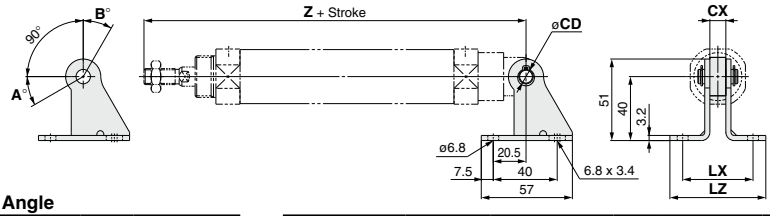


(mm)

Part no.	Applicable bore size	D_{d9}	d	L_1	L_2	m	t	Included retaining ring
CD-S02	**20, 25**	$8^{-0.040}_{-0.076}$	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	**32, 40**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

With Single Clevis



Rotation Angle

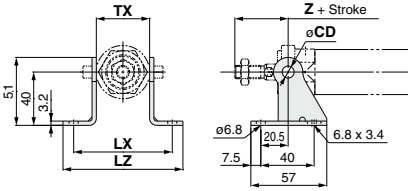
Bore size (mm)	A°	B°	A° + B° + 90°
20	25	85	200
25, 32	21	81	192
40	26	86	202

(mm)

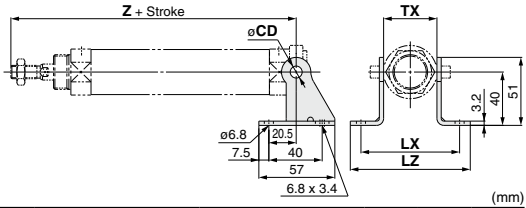
Mounting	Part no.	Applicable bore size	CX	Z + Stroke	CD	LX	LZ
CM2YC (Single clevis)	**CM-B032**	**20**	10	133	9	44	60
		25		137			
		32		139			
	CM-B040	**40**	15	177	10	49	65

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

With Rod Trunnion



With Head Trunnion



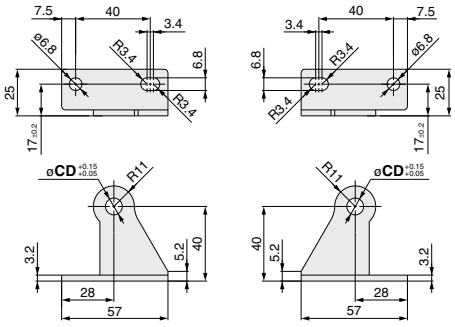
(mm)

Mounting	Part no.	Applicable bore size	TX	Rod trunnion Z + Stroke	Head trunnion Z + Stroke	CD	LX	LZ
CM2YU/CM2YT (Rod/Head trunnion)	**CM-B020**	**20**	32	36	108	8	66	82
	CM-B032	**25**	40	40	112	9	74	90
		32			114			
	CM-B040	**40**	53	44.5	143.5	10	87	103

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

Pivot Bracket

∗ Pivot brackets consists of a set of two brackets.

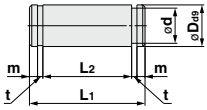


(mm)

Part no.	CD
CM-B020 Note 2)	8
CM-B032	9
CM-B040	10

Note 1) A pivot bracket pin and retaining rings are not included with the pivot bracket.
Note 2) Only for the trunnion

Pivot Bracket Pin (For CM2YC)



(mm)

Applicable bore size	Part no.	D_{d9}	d	L_1	L_2	m	t	Included retaining ring
20 to 32	**CDP-1**	$9^{-0.040}_{-0.076}$	8.6	25	19.2	1.75	1.15	Type C 9 for axis
40	**CD-S03**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C 10 for axis

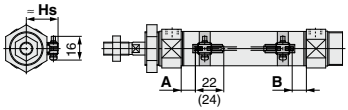
Note) Retaining rings are included with the pivot bracket pin.

Auto Switch Mounting

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

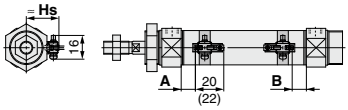
Solid state auto switch

D-M9□
D-M9□W
D-M9□A



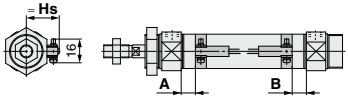
( ): Dimension of the D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□WV
D-M9□AV

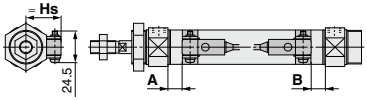


( ): Dimension of the D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

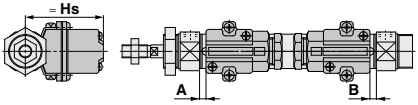
D-H7□/H7□W/H7NF/H7BA/H7C



D-G5NT

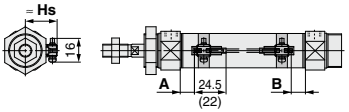


D-G39A/K39A



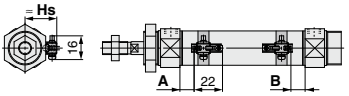
Reed auto switch

D-A9□



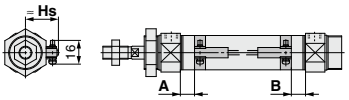
( ): Dimension of the D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

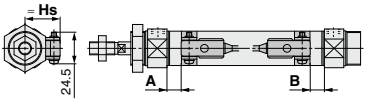


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

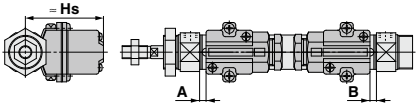
D-C7/C8/C73C/C80C



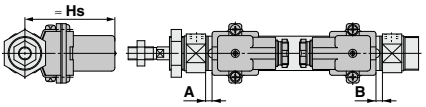
D-B5/B6/B59W



D-A33A/A34A



D-A44A



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□(V) D-M9□W(V) D-M9□A(V)		D-A9□(V)		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7□ D-H7C D-H7□W D-H7NF		D-G5NT	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	11	9.5	7	5.5	1.5	0	7.5	6	4	2.5	1	0	6.5	5	3	1.5
25	10	10	6	6	0.5	0.5	6.5	6.5	3.5	3.5	0	0	5.5	5.5	2	2
32	11.5	10.5	7.5	6.5	2	1	8	7	5	4	1.5	0.5	7	6	3.5	2.5
40	17.5	15.5	13.5	11.5	8	6	14	12	11	9	7.5	5.5	13	11	9.5	7.5

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

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-M9□V D-M9□WV D-M9□AV D-A9□V	D-B5□ D-B64 D-B59W D-G5NT D-H7C	D-M9□ D-M9□W D-M9□A D-A9□ D-C7□ D-C80 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C	D-A3□A D-G39A D-K39A	D-A44A
	Hs	**Hs**	**Hs**	**Hs**	**Hs**	**Hs**
20	23.5	25.5	22.5	25	60	69.5
25	26	28	25	27.5	62.5	72
32	29.5	31.5	28.5	31	66	75.5
40	33.5	35.5	32.5	35	70	79.5

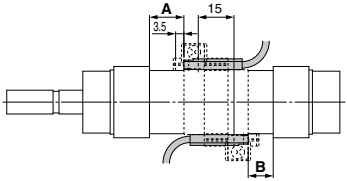
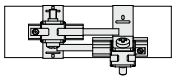
Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches				
	With 1 pc.	With 2 pcs.		With n pcs. (n: Number of auto switches)	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	5	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□W	10	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□A	10	25	40 Note 1)	$25 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□	5	15	30	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□V	5	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□V	5	15	25	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	25 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□WV **D-M9□AV**	10	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-C7□ **D-C80**	10	15	50	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-H7□ **D-H7□W** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 45 (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)	65 + 50 (n – 2) (n = 2, 3, 4, 5···)
D-B5□/B64 **D-G5NT**	10	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-B59W	15	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-A3□A/G39A **D-K39A/A44A**	10	35	100	35 + 30 (n – 2) (n = 2, 3, 4, 5···)	100 + 100 (n – 2) (n = 2, 3, 4, 5···)

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 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 The proper auto switch mounting position is 3.5 mm inward from the switch holder edge.	 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.
D-M9□ **D-M9□W**	Less than 20 stroke Note 2)	Less than 55 stroke Note 2)
D-M9□A	Less than 25 stroke Note 2)	Less than 60 stroke Note 2)
D-A9□	—	Less than 50 stroke Note 2)

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

Operating Range

(mm)

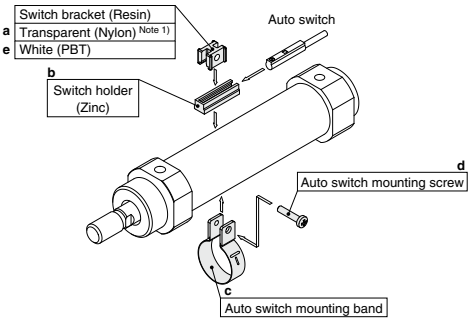
Auto switch model	Bore size			
	20	25	32	40
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	3.5	3	3.5	3
D-A9□(V)	6	6	6	6
D-C7□/C80 **D-C73C/C80C**	7	8	8	8
D-B5□/B64 **D-A3□A/A44A**	8	8	9	9

(mm)

Auto switch model	Bore size			
	20	25	32	40
D-B59W	12	12	13	13
D-H7□/H7□W **D-G5NT/H7NF**	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A	8	9	9	9

∗ 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.
Note) The D-A9□ and D-A9□V cannot be mounted on ø50.

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-M9□(V) **D-M9□W(V)** **D-A9□(V)**	BM5-020 (A set of a, b, c, d)	BM5-025 (A set of a, b, c, d)	BM5-032 (A set of a, b, c, d)	BM5-040 (A set of a, b, c, d)
D-M9□A(V)	BM5-020S (A set of b, c, d, e)	BM5-025S (A set of b, c, d, e)	BM5-032S (A set of b, c, d, e)	BM5-040S (A set of b, c, d, e)
				
D-C7□/C80 **D-C73C/C80C** **D-H7□** **D-H7□W** **D-H7NF**	BM2-020A (A set of band and screw)	BM2-025A (A set of band and screw)	BM2-032A (A set of band and screw)	BM2-040A (A set of band and screw)
D-H7BA	BM2-020AS (A set of band and screw)	BM2-025AS (A set of band and screw)	BM2-032AS (A set of band and screw)	BM2-040AS (A set of band and screw)
D-B5□/B64 **D-B59W** **D-G5NT** **D-G5NB**	BA2-020 (A set of band and screw)	BA2-025 (A set of band and screw)	BA2-032 (A set of band and screw)	BA2-040 (A set of band and screw)
D-A3□A/A44A Note 3) **D-G39A/K39A**	BM3-020 (A set of band and screw)	BM3-025 (A set of band and screw)	BM3-032 (A set of band and screw)	BM3-040 (A set of band and screw)

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) The D-A3□A/A44A/G39A/K39A cannot be mounted on the CDM2□P series centralized piping type.

Band Mounting Brackets Set Part No.

Set part no.	Contents
BM2-□□□A(S) ∗ **S**: Stainless steel screw	•Auto switch mounting band (c) •Auto switch mounting screw (d)
BJ4-1	•Switch bracket (White/PBT) (e) •Switch holder (b)
BJ5-1	•Switch bracket (Transparent/Nylon) (a) •Switch holder (b)

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features
Solid state	D-H7A1/H7A2/H7B	Grommet (In-line)	—
	D-H7NW/H7PW/H7BW		Diagnostic indication (2-color indication)
	D-H7BA		Water resistant (2-color indication)
	D-G5NT		With timer
Reed	D-B53/C73/C76		—
	D-C80		Without indicator light

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Wide range detection type, solid state auto switch (D-G5NB) is also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinder

Series CG1Y

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CG1Y **B** **25** □ – **100** □ **Z** – □ □ – □

With auto switch: CDG1Y **B** **25** □ – **100** □ **Z** – □ □ – **M9BW** □ – □

With auto switch
(Built-in magnet)

Mounting

B	Basic
Z*	Basic (without trunnion mounting female thread)
L	Axial foot
F	Rod flange
G	Head flange
U*	Rod trunnion
T*	Head trunnion
D	Clevis

* Not available for ø80 or ø100.
* Mounting bracket is shipped together with the product, but not assembled.
* The cylinder for F, G, L, D mounting types is Z: Basic (without trunnion mounting female thread).

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	Rc	ø20 to ø100
TN	NPT	ø20 to ø100
TF	M5 x 0.8	ø20, ø25
	G	ø32 to ø100

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1102.

Rod end thread

Nil	Male rod end
F	Female rod end

Pivot bracket

Nil	None
N	Pivot bracket is shipped together with the product.

* Only for D, U, T mounting types
* Pivot bracket is shipped together with the product, but not assembled.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

* No bracket is provided for the female rod end type.
* Rod end bracket is shipped together with the product, but not assembled.
* A knuckle joint pin is not provided with the single knuckle joint.

Made to Order
Refer to page 1102 for details.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

* **Refer to "Ordering Example of Cylinder Assembly" on page 1102.**

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDG1YB32-150Z

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Applicable bore size ø20 to ø63 Perpendicular	Auto switch model: Applicable bore size ø20 to ø63 In-line	Auto switch model: Applicable bore size ø80, ø100 In-line	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	**M9NV**	**M9N**	—	●	●	●	○	—	○	IC circuit	Relay, PLC
							—	—	**G59**	●	—	●	○	—	○		
				3-wire (PNP)			**M9PV**	**M9P**	—	●	●	●	○	—	○		
							—	—	**G5P**	●	—	●	○	—	○		
				2-wire	12 V		**M9BV**	**M9B**	—	●	●	●	○	—	○	—	
							—	—	**K59**	●	—	●	○	—	○		
		Connector					—	**H7C**	—	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V		**M9NWV**	**M9NW**	—	●	●	●	○	—	○	IC circuit	
							—	—	**G59W**	●	—	●	○	—	○		
				3-wire (PNP)			**M9PWV**	**M9PW**	—	●	●	●	○	—	○		
							—	—	**G5PW**	●	—	●	○	—	○		
				2-wire	12 V		**M9BWV**	**M9BW**	—	●	●	●	○	—	○	—	
							—	—	**K59W**	●	—	●	○	—	○		
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		**M9NAV*****	**M9NA*****	—	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			**M9PAV*****	**M9PA*****	—	○	○	●	○	—	○		
				2-wire	12 V		**M9BAV*****	**M9BA*****	—	○	○	●	○	—	○	—	
							—	—	**G5BA*****	●	—	●	○	—	○		
	With diagnostic output (2-color indication)			4-wire (NPN)	5 V, 12 V		—	**H7NF**	**G59F**	●	—	●	○	—	○	IC circuit	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	5 V	—	**A96V**	**A96**	—	●	—	●	—	—	—	IC circuit	—
			No	2-wire	12 V	100 V	**A93V**	**A93**	—	●	—	●	●	—	—	—	Relay, PLC
			Yes			100 V or less	**A90V**	**A90**	—	●	—	●	—	—	—	IC circuit	
			No			100 V, 200 V	—	**B54**		●	—	●	●	—	—	—	
			Yes			200 V or less	—	**B64**		●	—	●	—	—	—	—	
		Connector	No			—	—	**C73C**	—	●	—	●	●	●	—	—	
			Yes			24 V or less	—	**C80C**	—	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	No		—	—	—	**B59W**		●	—	●	—	—	—	—	

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

* Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
  1 m····· M (Example) M9NWM
  3 m····· L (Example) M9NWL
  5 m····· Z (Example) M9NWZ
  None····· N (Example) H7CN
* Solid state auto switches marked with "○" are produced upon receipt of order.
* Since there are other applicable auto switches than listed, refer to page 1111 for details.
* For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
* The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

SMC

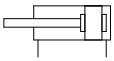
Specifications

Bore size (mm)			20	25	32	40	50	63	80	100
Action			Double acting, Single rod							
Type			Non-lube							
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)							
Piston speed			5 to 500 mm/s							
Stroke length tolerance			Up to $1000^{+1.4}_{0}$ mm, Up to $1500^{+1.8}_{0}$ mm							
Cushion			Rubber bumper							
Mounting			Basic, Basic (without trunnion mounting female thread), Axial foot, Rod flange, Head flange, Rod trunnion, Head trunnion, Clevis (used for changing the port location by 90°)							
Allowable leakage rate			0.5 L/min (ANR) or less							
Allowable kinetic energy (J)	Rubber bumper	**Male rod end**	0.28	0.41	0.66	1.20	2.00	3.40	5.90	9.90
		Female rod end	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54

∗ Cylinder sizes ø80 and ø100 do not have rod trunnion and head trunnion types. Foot, flange and clevis types of cylinder sizes from ø20 to ø63 do not have trunnion mounting female thread.
Operate the cylinder within the allowable kinetic energy.

Symbol

Rubber bumper



Made to Order

Made to Order
(For details, refer to pages 1247 to 1264.)

Symbol	Specifications
-XC6	Made of stainless steel

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	20	25	32	40	50	63	80	100
Minimum operating pressure	0.02				0.01			

Standard Strokes

Bore size (mm)	Standard stroke (mm) Note 1)	Max. manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150, 200	Up to 1500
25, 32, 40, 50, 63, 80, 100	25, 50, 75, 100, 125, 150, 200, 250, 300	Up to 1500

Note 1) Intermediate strokes not listed above are also available.
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	
20	CG1Y20Z-PS	Piston seal	1 pc.
25	CG1Y25Z-PS	Rod seal	1 pc.
32	CG1Y32Z-PS	Tube gasket	1 pc.
40	CG1Y40Z-PS	Grease pack (10 g)	1 pc.

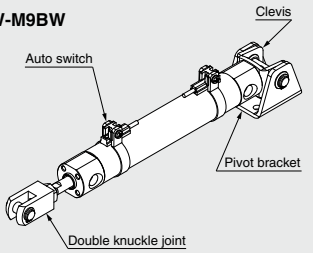
When maintenance requires only grease, use the following part numbers to order.
Grease pack part number: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Ordering Example of Cylinder Assembly

Cylinder model: **CDG1YD20-100Z-NW-M9BW**

Mounting D: Clevis
Pivot bracket N: Yes
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.

∗ Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.



Mounting Brackets/Part No.

Mounting bracket	Order q'ty	Bore size (mm) 20	25	32	40	50	63	80	100	Contents
Foot	2[Note]	CG-L020	CG-L025	CG-L032	CG-L040	CG-L050	CG-L063	CG-L080	CG-L100	2 foots, 8 mounting bolts
Flange	1	CG-F020	CG-F025	CG-F032	CG-F040	CG-F050	CG-F063	CG-F080	CG-F100	1 flange, 4 mounting bolts
Trunnion pin	1	CG-T020	CG-T025	CG-T032	CG-T040	CG-T050	CG-T063	—	—	2 trunnion pins, 2 trunnion bolts, 2 flat washers
Clevis	1	CG-D020	CG-D025	CG-D032	CG-D040	CG-D050	CG-D063	CG-D080	CG-D100	1 clevis, 4 mounting bolts, 1 clevis pin, 2 retaining rings
Pivot bracket	1	CG-020-24A	CG-025-24A	CG-032-24A	CG-040-24A	CG-050-24A	CG-063-24A	CG-080-24A	CG-100-24A	1 pivot bracket

Note) Order two foots per cylinder.

Weights

(mm)

Bore size (mm)		20	25	32	40	50	63	80	100
Basic weight	Basic	0.11	0.18	0.28	0.44	0.83	1.17	2.23	3.43
	Axial foot	0.22	0.31	0.44	0.66	1.31	1.89	3.19	5.18
	Flange	0.19	0.28	0.42	0.64	1.17	1.67	2.94	4.78
	Trunnion	0.12	0.20	0.31	0.49	0.97	1.31	—	—
	Clevis	0.16	0.26	0.43	0.67	1.23	1.85	2.94	4.71
Pivot bracket		0.08	0.09	0.17	0.25	0.44	0.80	0.98	1.75
Single knuckle joint		0.05	0.09	0.09	0.10	0.22	0.22	0.39	0.57
Double knuckle joint (with pin)		0.05	0.09	0.09	0.13	0.26	0.26	0.64	1.31
Additional weight per 50 mm of stroke		0.05	0.07	0.09	0.15	0.22	0.26	0.35	0.49
Weight reduction for female rod end		−0.01	−0.02	−0.02	−0.05	−0.10	−0.10	−0.18	−0.27

Calculation (Example) **CG1YL20-100Z** (Foot, ø20, 100 st)
- Basic weight ..... 0.22 (Foot, ø20)
- Additional weight ..... 0.05/50 stroke
- Air cylinder stroke ..... 100 stroke

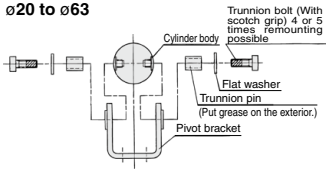
0.22 + 0.05 x 100/50 = **0.32 kg**

Mounting Procedure

Mounting procedure for trunnion

Follow the procedures below when mounting a pivot bracket on the trunnion.

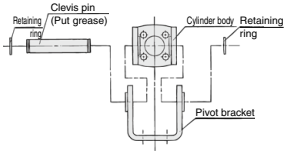
ø20 to ø63



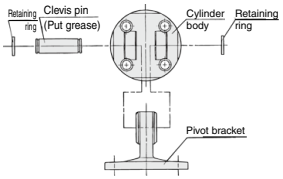
Mounting procedure for clevis

Follow the procedures below when mounting a pivot bracket on the clevis.

ø20 to ø63



ø80, ø100



⚠Precautions

Be sure to read before handling.
Refer to page 1574 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

Operating Precautions

⚠Warning

1. Operate within the specified cylinder speed.

Otherwise, cylinder and seal damage may occur.

2. When the cylinder is used as mounted with a single side fixed or free (basic, flange types), a bending moment will be applied to the cylinder due to the vibration generated at the stroke end, and the cylinder may be damaged. In such a case, mount a bracket to reduce the vibration of the cylinder or use the cylinder at a piston speed low enough to prevent the cylinder from vibrating at the stroke end.

⚠Caution

1. Tighten clevis bracket mounting bolts with the following proper tightening torque.

ø20: 1.5 N·m, ø25 to 32: 2.9 N·m, ø40: 4.9 N·m,
ø50: 11.8 N·m, ø63 to 80: 24.5 N·m, ø100: 42.2 N·m

Disassembly/Replacement

⚠Caution

1. Do not replace the bushings.

The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.

2. To replace a seal, apply grease to the new seal before installing it.

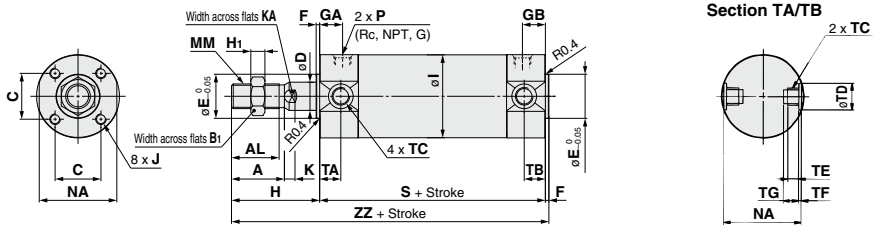
If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

3. Cylinders with ø50 or larger bore sizes cannot be disassembled.

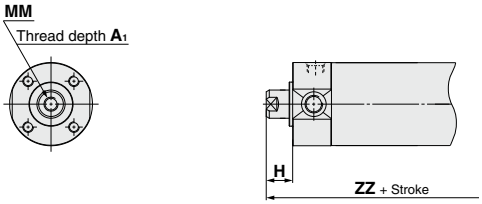
When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench etc., and then remove the cover. When retightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. If disassembly is required, please contact SMC.)

Dimensions: ø20 to ø100

Basic: CG1YB



Female rod end



Section TA/TB (mm)

Bore size (mm)	*TC	TD	TE	TF	TG
20	M5 x 0.8	8 +0.08 0	4	0.5	5.5
25	M6 x 0.75	10 +0.08 0	5	1	6.5
32	M8 x 1.0	12 +0.08 0	5.5	1	7.5
40	M10 x 1.25	14 +0.08 0	6	1.25	8.5
50	M12 x 1.25	16 +0.08 0	7.5	2	10
63	M14 x 1.5	18 +0.08 0	11.5	3	14.5

* Cylinder sizes ø80 and ø100 do not have trunnion mounting female thread on the width across flats NA.

(mm)

Bore size (mm)	Stroke range (mm)	A	AL	B1	C	D	E	F	H	H1	I	J	K	KA	MM	NA
20	Up to 1500	18	15.5	13	14	8	12	2	35	5	26	M4 x 0.7 depth 7	5	6	M8 x 1.25	24
25		22	19.5	17	16.5	10	14	2	40	6	31	M5 x 0.8 depth 7.5	5.5	8	M10 x 1.25	29
32		22	19.5	17	20	12	18	2	40	6	38	M5 x 0.8 depth 8	5.5	10	M10 x 1.25	35.5
40		30	27	19	26	16	25	2	50	8	47	M6 x 1 depth 12	6	14	M14 x 1.5	44
50		35	32	27	32	20	30	2	58	11	58	M8 x 1.25 depth 16	7	18	M18 x 1.5	55
63		35	32	27	38	20	32	2	58	11	72	M10 x 1.5 depth 16	7	18	M18 x 1.5	69
80		40	37	32	50	25	40	3	71	13	89	M10 x 1.5 depth 22	10	22	M22 x 1.5	86
100		40	37	41	60	30	50	3	71	16	110	M12 x 1.75 depth 22	10	26	M26 x 1.5	106

(mm)

Bore size (mm)	Stroke range (mm)	S	TA	TB	ZZ	Rc, NPT port			G port		
						GA	GB	P	GA	GB	P
20	Up to 1500	77	11	11	114	12	12	1/8	12	12	M5 x 0.8
25		77	11	11	119	12	12	1/8	12.5	12.5	M5 x 0.8
32		79	11	11	121	12	12	1/8	10.5	10.5	1/8
40		87	12	12	139	13	13	1/8	13	10	1/8
50		102	13	13	162	14	14	1/4	14	14	1/4
63		102	13	13	162	14	14	1/4	14	14	1/4
80		122	—	—	196	20	20	3/8	17.5	17.5	3/8
100		122	—	—	196	20	20	1/2	17.5	17.5	1/2

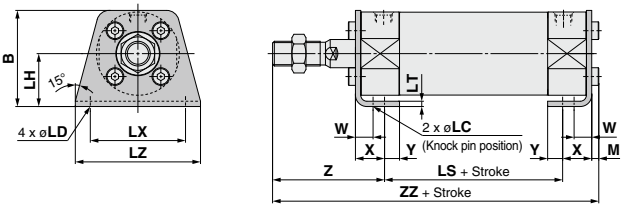
Female Rod End (mm)

Bore size	A1	H	MM	ZZ
20	8	13	M4 x 0.7	92
25	8	14	M5 x 0.8	93
32	12	14	M6 x 1	95
40	13	15	M8 x 1.25	104
50	18	16	M10 x 1.5	120
63	18	16	M10 x 1.5	120
80	21	19	M14 x 1.5	144
100	25	22	M16 x 1.5	147

* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Mounting Bracket

Axial foot: CG1YL

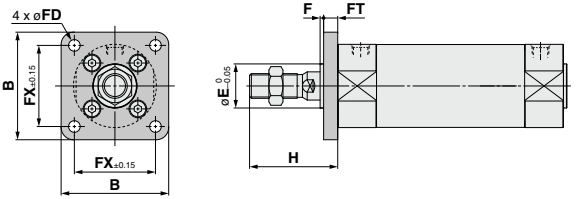


Axial Foot (mm)

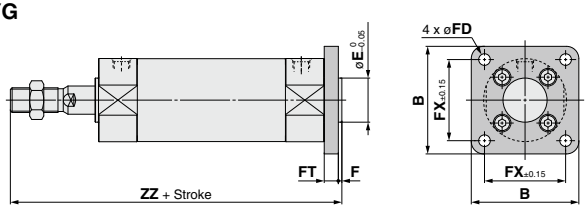
Bore size (mm)	B	LC	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ
20	34	4	6	20	53	3	32	44	3	10	15	7	47	118
25	38.5	4	6	22	53	3	36	49	3.5	10	15	7	52	123.5
32	45	4	7	25	53	3	44	58	3.5	10	16	8	53	125.5
40	54.5	4	7	30	60	3	54	71	4	10	16.5	8.5	63.5	144
50	70.5	5	10	40	67	4.5	66	86	5	17.5	22	11	75.5	169.5
63	82.5	5	12	45	67	4.5	82	106	5	17.5	22	13	75.5	169.5
80	101	6	11	55	74	4.5	100	125	5	20	28.5	14	95	202.5
100	121	6	14	65	74	6	120	150	7	20	30	16	95	206

∗ Other dimensions are the same as basic type.
∗ For female rod end, since the wrench flap (K and KA portions) will be inside of the bracket when the piston rod is retracted at the stroke end, extend the piston rod to tighten the nut using a tool, and mount a workpiece on the rod end.
∗ Refer to the basic type for the female rod end.

Rod flange: CG1YF



Head flange: CG1YG



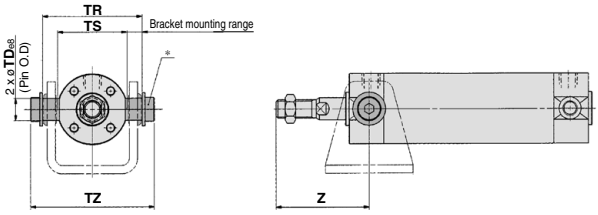
Flange (mm)

Bore size (mm)	B	E	F	FX	FD	FT	H	Head flange ZZ
20	40	12	2	28	5.5	6	35	120
25	44	14	2	32	5.5	7	40	126
32	53	18	2	38	6.6	7	40	128
40	61	25	2	46	6.6	8	50	147
50	76	30	2	58	9	9	58	171
63	92	32	2	70	11	9	58	171
80	104	40	3	82	11	11	71	207
100	128	50	3	100	14	14	71	210

Note) End boss is machined on the flange for øE.
∗ Other dimensions are the same as basic type.
∗ Refer to the basic type for the female rod end.

Mounting Bracket

Rod trunnion: CG1YU



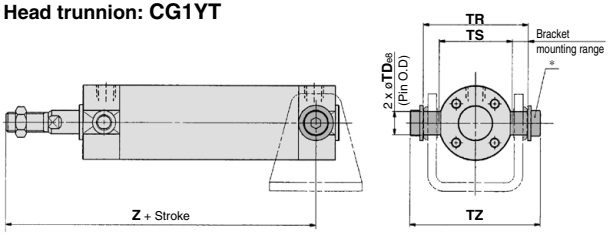
Trunnion (mm)

Bore size (mm)	TDe8	TR	TS
20	$8^{-0.025}_{-0.047}$	39	28
25	$10^{-0.025}_{-0.047}$	43	33
32	$12^{-0.032}_{-0.059}$	54.5	40
40	$14^{-0.032}_{-0.059}$	65.5	49
50	$16^{-0.032}_{-0.059}$	80	60
63	$18^{-0.032}_{-0.059}$	98	74

Bore size (mm)	TZ	Rod side	Head side
		Z	Z
20	47.6	46	101
25	53	51	106
32	67.7	51	108
40	78.7	62	125
50	98.6	71	147
63	119.2	71	147

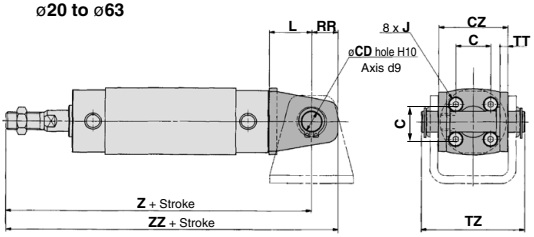
∗ Constructed of a trunnion pin, flat washer and hexagon socket head cap bolt.
Note) Refer to page 1107 for pivot bracket.
∗ Other dimensions are the same as basic type.
∗ Refer to the basic type for the female rod end.

Head trunnion: CG1YT



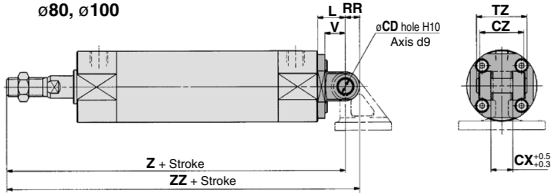
Clevis: CG1YD

ø20 to ø63



(The above shows the case port location is changed by 90°.)

ø80, ø100



∗ A clevis pin and retaining rings are shipped together for the clevis type.

Clevis (mm)

Bore size (mm)	CD	CX	CZ	L	RR	V
20	8	—	29	14	11	—
25	10	—	33	16	13	—
32	12	—	40	20	15	—
40	14	—	49	22	18	—
50	16	—	60	25	20	—
63	18	—	74	30	22	—
80	18	28	56	35	18	26
100	22	32	64	43	22	32

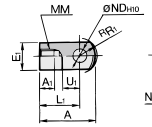
Bore size (mm)	TZ	Z	ZZ	Applicable pin part no.
20	43.4	126	137	CD-G02
25	48	133	146	CD-G25
32	59.4	139	154	CD-G03
40	71.4	159	177	CD-G04
50	86	185	205	CD-G05
63	105.4	190	212	CD-G06
80	64	228	246	IY-G08
100	72	236	258	IY-G10

Note) ∗ Refer to page 1107 for pivot bracket.
∗ Other dimensions are the same as basic type.
∗ Refer to the basic type for the female rod end.

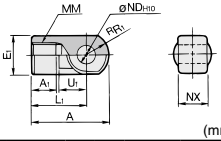
Series CG1Y
Dimensions of Accessories

Single Knuckle Joint

I-G02, G03
Material: Carbon steel



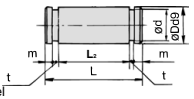
I-G04, G05, G08, G10
Material: Cast iron



(mm)

Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX
I-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	$8^{+0.058}_{0}$	$8^{-0.2}_{-0.4}$
I-G03	25, 32	41	10.5	□20	30	M10 x 1.25	12.8	14	$10^{+0.058}_{0}$	$10^{-0.2}_{-0.4}$
I-G04	40	42	14	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{-0.3}_{-0.5}$
I-G05	50, 63	56	18	ø28	40	M18 x 1.5	16	20	$14^{+0.070}_{0}$	$22^{-0.3}_{-0.5}$
I-G08	80	71	21	ø38	50	M22 x 1.5	21	27	$18^{+0.070}_{0}$	$28^{-0.3}_{-0.5}$
I-G10	100	79	21	ø44	55	M26 x 1.5	24	31	$22^{+0.084}_{0}$	$32^{-0.3}_{-0.5}$

Knuckle Pin

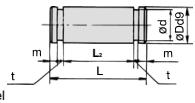


Material: Carbon steel (mm)

Part no.	Applicable bore size (mm)	Dd9	L	d	L_2	m	t	Included retaining ring
IY-G02	20	$8^{-0.040}_{-0.076}$	21	7.6	16.2	1.5	0.9	Type C8 for axis
IY-G03	25, 32	$10^{-0.040}_{-0.076}$	25.6	9.6	20.2	1.55	1.15	Type C10 for axis
IY-G04	40	$10^{-0.040}_{-0.076}$	41.6	9.6	36.2	1.55	1.15	Type C10 for axis
IY-G05	50, 63	$14^{-0.050}_{-0.093}$	50.6	13.4	44.2	2.05	1.15	Type C14 for axis
IY-G08	80	$18^{-0.050}_{-0.093}$	64	17	56.2	2.55	1.35	Type C18 for axis
IY-G10	100	$22^{-0.065}_{-0.117}$	72	21	64.2	2.55	1.35	Type C22 for axis

∗ Retaining rings are included.

Clevis Pin

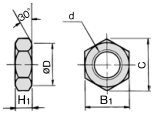


Material: Carbon steel (mm)

Part no.	Applicable bore size (mm)	Dd9	L	d	L_2	m	t	Included retaining ring
CD-G02	20	$8^{-0.040}_{-0.076}$	43.4	7.6	38.6	1.5	0.9	Type C8 for axis
CD-G25	25	$10^{-0.040}_{-0.076}$	48	9.6	42.6	1.55	1.15	Type C10 for axis
CD-G03	32	$12^{-0.050}_{-0.093}$	59.4	11.5	54	1.55	1.15	Type C12 for axis
CD-G04	40	$14^{-0.050}_{-0.093}$	71.4	13.4	65	2.05	1.15	Type C14 for axis
CD-G05	50	$16^{-0.050}_{-0.093}$	86	15.2	79.6	2.05	1.15	Type C16 for axis
CD-G06	63	$18^{-0.050}_{-0.093}$	105.4	17	97.8	2.45	1.35	Type C18 for axis

∗ Retaining rings are included.
∗ A clevis pin and a knuckle pin are common for the bore size ø80 and ø100.

Rod End Nut

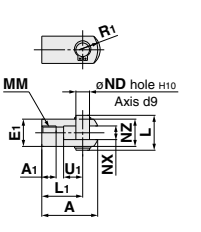


Material: Carbon steel (mm)

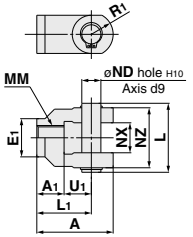
Part no.	Applicable bore size (mm)	d	H_1	B_1	C	D
NT-02	20	M8 x 1.25	5	13	(15)	12.5
NT-03	25, 32	M10 x 1.25	6	17	(19.6)	16.5
NT-G04	40	M14 x 1.5	8	19	(21.9)	18
NT-05	50, 63	M18 x 1.5	11	27	(31.2)	26
NT-08	80	M22 x 1.5	13	32	(37.0)	31
NT-10	100	M26 x 1.5	16	41	(47.3)	39

Double Knuckle Joint

Y-G02, G03
Material: Carbon steel



Y-G04, G05, G08, G10
Material: Cast iron



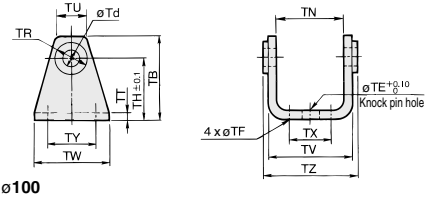
(mm)

Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	R_1	U_1	ND	NX	NZ	L	Included pin part no.
Y-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8	$8^{+0.4}_{+0.2}$	16	21	IY-G02
Y-G03	25, 32	41	10.5	□20	30	M10 x 1.25	12.8	14	10	$10^{+0.4}_{+0.2}$	20	25.6	IY-G03
Y-G04	40	42	16	ø22	30	M14 x 1.5	12	14	10	$18^{+0.5}_{+0.3}$	36	41.6	IY-G04
Y-G05	50, 63	56	20	ø28	40	M18 x 1.5	16	20	14	$22^{+0.5}_{+0.3}$	44	50.6	IY-G05
Y-G08	80	71	23	ø38	50	M22 x 1.5	21	27	18	$28^{+0.5}_{+0.3}$	56	64	IY-G08
Y-G10	100	79	24	ø44	55	M26 x 1.5	24	31	22	$32^{+0.5}_{+0.3}$	64	72	IY-G10

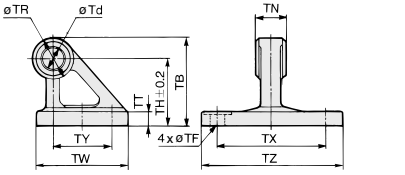
∗ A knuckle pin and retaining rings are included.

Pivot Bracket (Order separately)

ø20 to ø63
Material: Carbon steel



ø80, ø100
Material: Cast iron



(mm)

Part no.	Applicable bore size (mm)	TB	Td	TE	TF	TH	TN	TR	TT
CG-020-24A	20	36	8	10	5.5	25	(29.3)	13	3.2
CG-025-24A	25	43	10	10	5.5	30	(33.1)	15	3.2
CG-032-24A	32	50	12	10	6.6	35	(40.4)	17	4.5
CG-040-24A	40	58	14	10	6.6	40	(49.2)	21	4.5
CG-050-24A	50	70	16	20	9	50	(60.4)	24	6
CG-063-24A	63	82	18	20	11	60	(74.6)	26	8
CG-080-24A	80	73	18	—	11	55	$28^{+0.5}_{+0.3}$	36	11
CG-100-24A	100	90	22	—	13.5	65	$32^{+0.5}_{+0.3}$	50	12

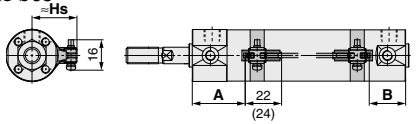
Part no.	Applicable bore size (mm)	TU	TV	TW	TX	TY	TZ	Applicable pin O.D.
CG-020-24A	20	(18.1)	(35.8)	42	16	28	38.3	$8d_9^{-0.040}_{-0.076}$
CG-025-24A	25	(20.7)	(39.8)	42	20	28	42.1	$10d_9^{-0.040}_{-0.076}$
CG-032-24A	32	(23.6)	(49.4)	48	22	28	53.8	$12d_9^{-0.050}_{-0.093}$
CG-040-24A	40	(27.3)	(58.4)	56	30	30	64.6	$14d_9^{-0.050}_{-0.093}$
CG-050-24A	50	(29.7)	(72.4)	64	36	36	79.2	$16d_9^{-0.050}_{-0.093}$
CG-063-24A	63	(34.3)	(90.4)	74	46	46	97.2	$18d_9^{-0.050}_{-0.093}$
CG-080-24A	80	—	—	72	85	45	110	$18d_9^{-0.050}_{-0.093}$
CG-100-24A	100	—	—	93	100	60	130	$22d_9^{-0.065}_{-0.117}$

Auto Switch Mounting

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

Solid state auto switch

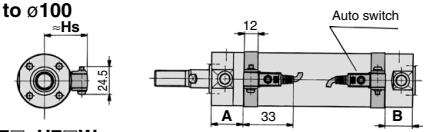
D-M9□
D-M9□W
ø20 to ø63



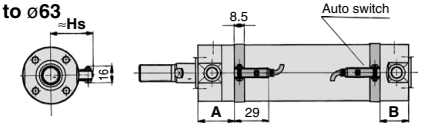
( ): Dimension of the D-M9□A

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

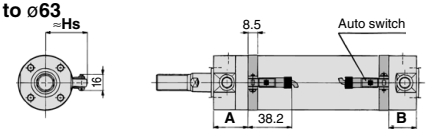
D-G5, K5, G5□W
D-K59W, D-G59F, D-G5NT
ø20 to ø100



D-H7□, H7□W
D-H7NF
ø20 to ø63

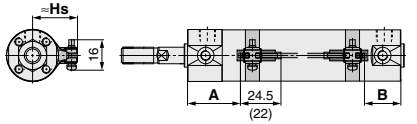


D-H7C
ø20 to ø63



Reed auto switch

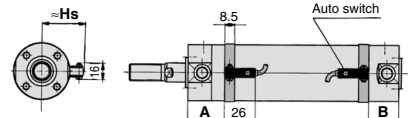
D-A9□
ø20 to ø63



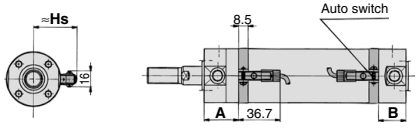
( ): Dimension of the D-A96

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

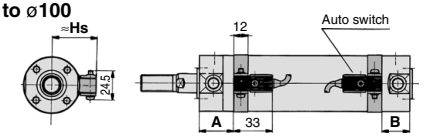
D-C7, C8
ø20 to ø63



D-C73C, C80C
ø20 to ø63



D-B5, B6, B59W
ø20 to ø100



Auto Switch Proper Mounting Position (Detection at stroke end) (mm)

Bore size \ Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-H7□W D-H7NF D-H7BA D-H7□ D-H7C		D-C7□ D-C80 D-C73C D-C80C		D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT D-G5BA		D-B5□ D-B64		D-B59W	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	33	32	29	28	28.5	27.5	29.5	28.5	25	24	23.5	22.5	26.5	23.5
25	32.5	32.5	28.5	28.5	28	28	29	29	24.5	24.5	23	23	26	26
32	34	33	30	29	29.5	28.5	30.5	29.5	26	25	24.5	23.5	27.5	26.5
40	39	36	35	32	34.5	31.5	35.5	32.5	31	28	29.5	26.5	32.5	29.5
50	46	44	42	40	41.5	39.5	42.5	40.5	38	36	36.5	34.5	39.5	37.5
63	44.5	45.5	40.5	41.5	40	41	41	42	36.5	37.5	35	36	38	39
80	—	—	—	—	—	—	—	—	49.5	44.5	48	43	51	46
100	—	—	—	—	—	—	—	—	48.5	45.5	47	44	50	47

Auto Switch Mounting Height (mm)

Bore size \ Auto switch model	D-M9□ (V) D-M9□W (V) D-M9□A (V) D-A9□ (V)	D-M9□ D-M9□W D-M9□A D-A9□ D-H7□ D-H7□W D-H7NF D-C7/C8	D-C73C D-C80C	D-B5/B6 D-K59W D-B59W D-G5NT D-G5/K5 D-G59F D-G5□W D-H7C
	Hs	Hs	Hs	Hs
20	25.5	24.5	27	27.5
25	28	27	29.5	30
32	31.5	30.5	33	33.5
40	36	35	37.5	38
50	41.5	40.5	43	43.5
63	48.5	47.5	50	50.5
80	—	—	—	59
100	—	—	—	69.5

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

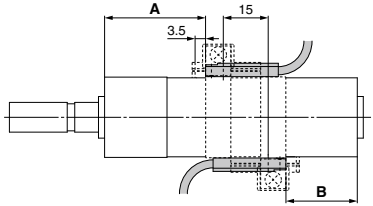
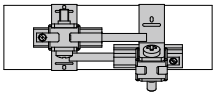
Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches				
	With 1 pc.	With 2 pcs.		With n pcs. (n: Number of auto switches)	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	5	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□W	10	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□A	10	25	40 Note 1)	$25 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□	5	15	30 Note 1)	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□V	5	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□V	5	15	25	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	25 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□WV **D-M9□AV**	10	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-C7□ **D-C80**	5	15	50	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-H7□ **D-H7□W** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-C73C **D-C80C**	5	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	65 + 50 (n – 2) (n = 2, 3, 4, 5···)
D-B5□ **D-B64** **D-G5□** **D-K59□**	5	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-B59W	10	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)

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 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 Correct auto switch mounting position is 3.5 mm from the back face of the switch holder.	 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.
D-M9□ **D-M9□W**	Less than 20 stroke Note 2)	Less than 55 stroke Note 2)
D-M9□A	Less than 20 stroke Note 2)	Less than 60 stroke Note 2)
D-A9□	—	Less than 50 stroke Note 2)

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

Operating Range

(mm)

Auto switch model	Bore size							
	20	25	32	40	50	63	80	100
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	4.5	5	4.5	5.5	5	5.5	—	—
D-A9□(V)	7	6	8	8	8	9	—	—
D-C7/C80 **D-C73C/C80C**	8	10	9	10	10	11	—	—
D-B5□/B64	8	10	9	10	10	11	11	11
D-B59W	13	13	14	14	14	17	16	18

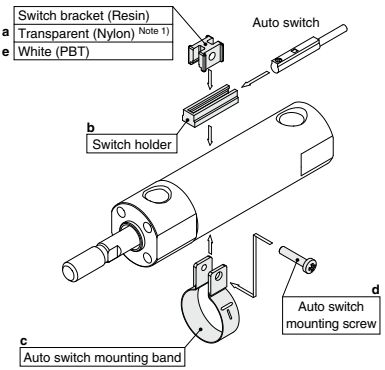
(mm)

Auto switch model	Bore size							
	20	25	32	40	50	63	80	100
D-H7□/H7mW **D-H7NF**	4	4	4.5	5	6	6.5	—	—
D-H7C	7	8.5	9	10	9.5	10.5	—	—
D-G5□/G5□W/G59F **D-G5BA/K59/K59W**	4	4	4.5	5	6	6.5	6.5	7
D-G5NT	4	4	4.5	5	6	6.5	6.5	7
D-G5NB	35	40	40	45	45	45	45	50

∗ 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 model	Bore size (mm)							
	20	25	32	40	50	63	80	100
D-M9□(V) **D-M9□W(V)** **D-A9□(V)**	BMA3-020 (A set of a, b, c, d)	BMA3-025 (A set of a, b, c, d)	BMA3-032 (A set of a, b, c, d)	BMA3-040 (A set of a, b, c, d)	BMA3-050 (A set of a, b, c, d)	BMA3-063 (A set of a, b, c, d)	—	—
D-M9□A(V) Note 2)	BMA3-020S (A set of b, c, d, e)	BMA3-025S (A set of b, c, d, e)	BMA3-032S (A set of b, c, d, e)	BMA3-040S (A set of b, c, d, e)	BMA3-050S (A set of b, c, d, e)	BMA3-063S (A set of b, c, d, e)	—	—



∗ Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

D-C7□/C80 **D-C73C** **D-C80C** **D-H7□** **D-H7□W** **D-H7NF**	BMA2-020A (A set of band and screw)	BMA2-025A (A set of band and screw)	BMA2-032A (A set of band and screw)	BMA2-040A (A set of band and screw)	BMA2-050A (A set of band and screw)	BMA2-063A (A set of band and screw)	—	—
D-H7BA	BMA2-020AS (A set of band and screw)	BMA2-025AS (A set of band and screw)	BMA2-032AS (A set of band and screw)	BMA2-040AS (A set of band and screw)	BMA2-050AS (A set of band and screw)	BMA2-063AS (A set of band and screw)	—	—
D-B5□/B64 **D-B59W** **D-G5□/K59** **D-G5□W/K59W** **D-G5BA/G59F** **D-G5NT** **D-G5NB**	BA-01 (A set of band and screw)	BA-02 (A set of band and screw)	BA-32 (A set of band and screw)	BA-04 (A set of band and screw)	BA-05 (A set of band and screw)	BA-06 (A set of band and screw)	BA-08 (A set of band and screw)	BA-10 (A set of band and screw)

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.

Band Mounting Brackets Set Part No.

Set part no.	Contents
BM2-□□□A(S) ∗ **S**: Stainless steel screw	· Auto switch mounting band (c) · Auto switch mounting screw (d)
BJ4-1	· Switch bracket (White/PBT) (e) · Switch holder (b)
BJ5-1	· Switch bracket (Transparent/Nylon) (a) · Switch holder (b)

[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.)

BBA3: D-B5/B6/G5/K5 types

Note 3) Refer to **the WEB catalog** or Best Pneumatics No. 3 for details on the BBA3. When the D-G5BA type auto switch is shipped independently, the BBA3 is attached.

Cylinder Mounting Bracket, by Stroke/Auto Switch Mounting Surfaces

Auto switch mounting surface varies depending on mounting brackets and cylinder strokes. Refer to the table below.

(mm)

Auto switch model	Basic, Foot, Flange, Clevis			Trunnion		
	With 1 pc. (Rod cover side)	With 2 pcs. (Different surfaces)	With 2 pcs. (Same surface)	With 1 pc. (Rod cover side)	With 2 pcs. (Different surfaces)	With 2 pcs. (Same surface)
Auto switch mounting surface / Auto switch type	Port surface 	Port surface 	Port surface 			
D-M9□(V) D-M9□W(V) D-M9□A(V) D-A9□(V)	10 st or more	15 to 44 st	45 st or more	10 st or more	15 to 44 st	45 st or more
D-C7/C8	10 st or more	15 to 49 st	50 st or more	10 st or more	15 to 49 st	50 st or more
D-H7□/H7□W D-H7NF	10 st or more	15 to 59 st	60 st or more	10 st or more	15 to 59 st	60 st or more
D-C73C/C80C/H7C	10 st or more	15 to 64 st	65 st or more	10 st or more	15 to 64 st	65 st or more
D-B5/B6/G5/K5 D-G5□W/K59W D-G59F/G5NT	10 st or more	15 to 74 st	75 st or more	10 st or more	15 to 74 st	75 st or more
D-B59W	15 st or more	20 to 74 st	75 st or more	15 st or more	20 to 74 st	75 st or more

∗ Trunnion type is not available for ø80 and ø100.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features	Applicable bore size (mm)
Solid state	D-H7A1/H7A2/H7B	Grommet (In-line)	—	ø20 to ø63
	D-H7NW/H7PW/H7BW		Diagnostic indication (2-color indication)	
	D-H7BA		Water resistant (2-color indication)	
	D-G5NT		With timer	ø20 to ø100
Reed	D-C73/C76		—	ø20 to ø63
	D-C80		Without indicator light	
	D-B53		—	ø20 to ø100

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Wide range detection type, solid state auto switch (D-G5NB) is also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinder

Series MBY

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

MBY **B** **40** □ – **150** **Z** – □ □ – □

With auto switch: MDBY **B** **40** □ – **150** **Z** – □ □ – **M9BW** □ – □

With auto switch (Built-in magnet)

Mounting

B	Basic
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Accessories 1

Nil	None
N	Pivot bracket

∗ Only for D and T mounting types
∗ Pivot bracket is shipped together with the product, but not assembled.

Accessories 2

Nil	None
V	Single knuckle joint
W	Double knuckle joint

∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1113.

Made to Order
Refer to page 1113 for details.

Number of auto switches

Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) MDBYB40-100Z

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 1114.**

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V,12 V	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9P	—	●	●	●	○	○	IC circuit	
				2-wire		12 V	M9B	—	●	●	●	○	○		
					—	—	J51	—	●	—	●	○	—	—	
		Terminal conduit		3-wire (NPN)	24 V	5 V,12 V	—	G39	—	—	—	—	—		
				2-wire		12 V	—	K39	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V,12 V	M9NW	—	●	●	●	○	○	IC circuit	
				3-wire (PNP)			M9PW	—	●	●	●	○	○		
				2-wire		12 V	M9BW	—	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V,12 V	M9NA**	—	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PA**	—	○	○	●	○	○		
				2-wire		12 V	M9BA**	—	○	○	●	○	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V,12 V	F59F	—	●	—	●	○	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—	P3DW	—	●	—	●	●	○	—	
							P4DW	—	—	—	●	●	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	100 V	12 V	A93	—	●	—	●	●	—	—	—
			No			100 V or less		A90	—	●	—	●	—	—	IC circuit	Relay, PLC
			Yes			100 V, 200 V		A54	—	●	—	●	●	—		
			No			200 V or less		A64	—	●	—	●	—	—		
		Terminal conduit	Yes			—	—	A33	—	—	—	—	—	—		—
						100 V, 200 V	—	A34	—	—	—	—	—	—		PLC
		DIN terminal					—	A44	—	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	—	●	—	●	—	—		

∗∗ Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. A water resistant type cylinder is recommended for use in an environment which requires water resistance.

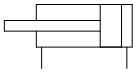
∗ Lead wire length symbols: 0.5 m……Nil (Example) M9NW
1 m…… M (Example) M9NWM
3 m…… L (Example) M9NWL
5 m…… Z (Example) M9NWZ

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

∗ Since there are other applicable auto switches then listed above, refer to page 1126 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
For the D-P3DW, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ The D-A9□/M9□□□/P3DW auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

INDEX

Symbol



Minimum Operating Pressure

Unit: MPa

Bore size (mm)	32	40	50	63	80	100
Min. operating pressure	0.02		0.01			

Made to Order

(For details, refer to pages 1247 to 1264.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC30	Rod trunnion
-XC65	Made of stainless steel (Combination of XC7 and XC68)
-XC68	Made of stainless steel (with hard chrome plated piston rod)

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	
32	MBY32Z-PS		
40	CA2Y40Z-PS	Rod seal	1 pc.
50	CA2Y50Z-PS	Piston seal	1 pc.
63	CA2Y63Z-PS	Cylinder tube gasket	2 pcs.
80	CA2Y80Z-PS	Grease pack (10 g)	1 pc.
100	CA2Y100Z-PS		

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	32	40	50	63	80	100
Action	Double acting					
Piston speed	5 to 500 mm/s					
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	None					
Lubrication	Not required (Non-lube)					
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion					
Allowable leakage rate	0.5 L/min (ANR)					

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Max. manufacturable stroke
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	1000
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	1000
50	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000
63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000

Note 1) Intermediate strokes not listed above are also available.
Please consult with SMC for strokes outside the above ranges.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Accessories

Mounting		Basic	Axial foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

Mounting Brackets/Part No.

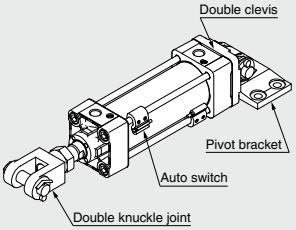
Bore size (mm)	32	40	50	63	80	100
Axial foot Note1)	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10
Flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10
Single clevis	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10
Double clevis	MB-D03	MB-D04	MB-D05	MB-D06	MB-D08	MB-D10

Note 1) Order two foots per cylinder.

Note 2) Accessories for each mounting bracket are as follows: Axial foot, Flange, Single clevis: Body mounting bolt, Double clevis: Body mounting bolt, Clevis pin, Flat washers and Split pins. → Refer to page 1120 for details.

Ordering Example of Cylinder Assembly

Cylinder model: MDBYD40-150Z-NW-M9BW



Mounting D : Double clevis
Pivot bracket N : Yes
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.

∗ Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

Weights

(kg)

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic	0.44	0.59	1.04	1.29	2.41	3.36
	Axial foot	0.56	0.73	1.26	1.57	2.91	4.02
	Flange	0.73	0.96	1.49	2.08	3.86	6.67
	Single clevis	0.69	0.82	1.38	1.92	3.52	6.53
	Double clevis	0.7	0.86	1.47	2.08	3.81	7.05
	Trunnion	0.73	0.95	1.52	2.09	3.96	7.03
Additional weight per 50 mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessories	Single knuckle joint	0.15	0.23	0.26	0.26	0.60	0.83
	Double knuckle joint (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

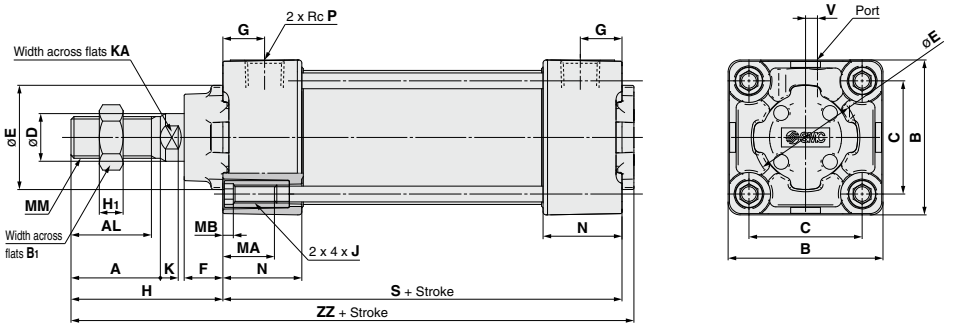
Calculation Example) **MBYB32-100Z** (Basic, ø32, 100 st)

- Basic weight·····0.44 (Basic, ø32)
- Additional weight·····0.11/50 stroke
- Cylinder stroke·····100 stroke

0.44 + 0.11 x 100/50 = **0.66 kg**

Standard

Basic: MBYB



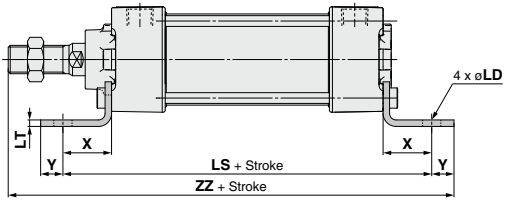
Dimensions (mm)

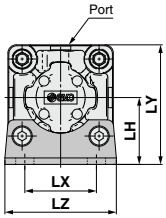
Bore size (mm)	A	AL	B	B1	C	D	E	F	G	H	H1	J	K	KA	MA	MB	MM	N	P	S	V	ZZ
32	22	19.5	46	17	32.5	12	30	13	13	47	6	M6 x 1	6	10	16	4	M10 x 1.25	26.5	1/8	84	4	135
40	30	27	52	22	38	16	35	13	14	51	8	M6 x 1	6	14	16	4	M14 x 1.5	26.5	1/4	84	4	139
50	35	32	65	27	46.5	20	40	14	15.5	58	11	M8 x 1.25	7	18	16	4	M18 x 1.5	31	1/4	94	5	156
63	35	32	75	27	56.5	20	45	14	16.5	58	11	M8 x 1.25	7	18	16	4	M18 x 1.5	31	3/8	94	9	156
80	40	37	95	32	72	25	45	20	19	72	13	M10 x 1.5	10	22	16	5	M22 x 1.5	37.5	3/8	114	11.5	190
100	40	37	114	41	89	30	55	20	19	72	16	M10 x 1.5	10	26	16	5	M26 x 1.5	37.5	1/2	114	17	190

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

Axial foot: MBYL

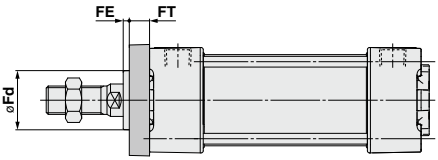


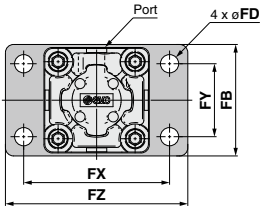


Axial Foot (mm)

Bore size (mm)	LD	LH	LS	LT	LX	LY	LZ	X	Y	ZZ
32	7	30	128	3.2	32	53	50	22	9	162
40	9	33	132	3.2	38	59	55	24	11	170
50	9	40	148	3.2	46	72.5	70	27	11	190
63	12	45	148	3.6	56	82.5	80	27	14	193
80	12	55	174	4.5	72	102.5	100	30	14	230
100	14	65	178	4.5	89	122	120	32	16	234

Rod flange: MBYF





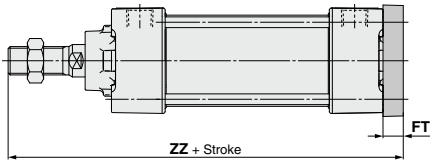
Rod Flange (mm)

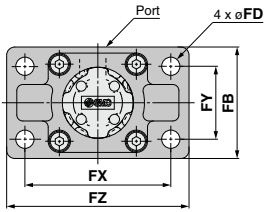
Bore size (mm)	FB	FD	FE	FT	FX	FY	FZ	Fd
32	50	7	3	10	64	32	79	24.5
40	55	9	3	10	72	36	90	30.5
50	70	9	2	12	90	45	110	36.5
63	80	9	2	12	100	50	120	39.5
80	100	12	4	16	126	63	153	39.5
100	120	14	4	16	150	75	178	46.5

Standard/With Mounting Bracket

∗ Refer to Basic (B) for other dimensions.

Head flange: MBYG

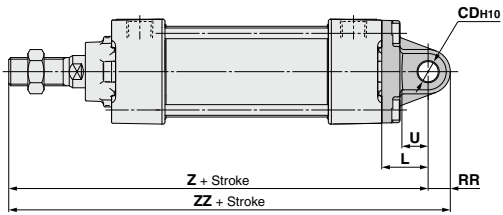


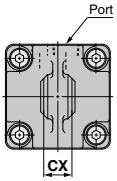


Head Flange (mm)

Bore size (mm)	FB	FD	FT	FX	FY	FZ	ZZ
32	50	7	10	64	32	79	141
40	55	9	10	72	36	90	145
50	70	9	12	90	45	110	164
63	80	9	12	100	50	120	164
80	100	12	16	126	63	153	202
100	120	14	16	150	75	178	202

Single clevis: MBYC





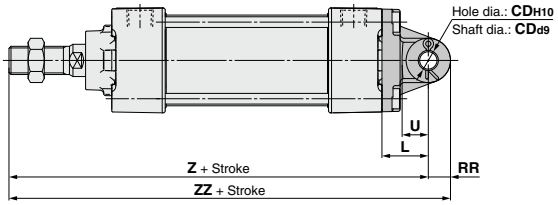
Single Clevis (mm)

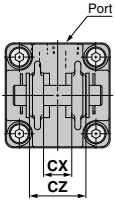
Bore size (mm)	CD_{H10}	CX	L	RR	U	Z	ZZ
32	$10^{+0.058}_{0}$	$14^{-0.1}_{-0.3}$	23	10.5	13	154	164.5
40	$10^{+0.058}_{0}$	$14^{-0.1}_{-0.3}$	23	11	13	158	169
50	$14^{+0.070}_{0}$	$20^{-0.1}_{-0.3}$	30	15	17	182	197
63	$14^{+0.070}_{0}$	$20^{-0.1}_{-0.3}$	30	15	17	182	197
80	$22^{+0.084}_{0}$	$30^{-0.1}_{-0.3}$	42	23	26	228	251
100	$22^{+0.084}_{0}$	$30^{-0.1}_{-0.3}$	42	23	26	228	251

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

Double clevis: MBYD

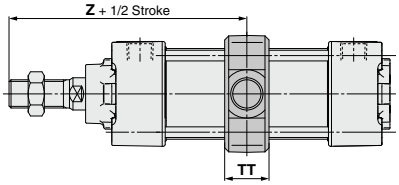


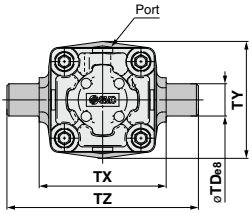


Double Clevis (mm)

Bore size (mm)	CD_{H10}	CD_{d9}	CX	CZ	L	RR	U	Z	ZZ
32	$10^{+0.058}_{0}$	$10^{-0.040}_{-0.076}$	$14^{+0.3}_{+0.1}$	28	23	10.5	13	154	164.5
40	$10^{+0.058}_{0}$	$10^{-0.040}_{-0.076}$	$14^{+0.3}_{+0.1}$	28	23	11	13	158	169
50	$14^{+0.070}_{0}$	$14^{-0.050}_{-0.093}$	$20^{+0.3}_{+0.1}$	40	30	15	17	182	197
63	$14^{+0.070}_{0}$	$14^{-0.050}_{-0.093}$	$20^{+0.3}_{+0.1}$	40	30	15	17	182	197
80	$22^{+0.084}_{0}$	$22^{-0.065}_{-0.117}$	$30^{+0.3}_{+0.1}$	60	42	23	26	228	251
100	$22^{+0.084}_{0}$	$22^{-0.065}_{-0.117}$	$30^{+0.3}_{+0.1}$	60	42	23	26	228	251

Center trunnion: MBYT





Center Trunnion (mm)

Bore size (mm)	TD_{e8}	TT	TX	TY	TZ	Z
32	$12^{-0.032}_{-0.059}$	17	50	49	74	89
40	$16^{-0.032}_{-0.059}$	22	63	58	95	93
50	$16^{-0.032}_{-0.059}$	22	75	71	107	105
63	$20^{-0.040}_{-0.073}$	28	90	87	130	105
80	$20^{-0.040}_{-0.073}$	34	110	110	150	129
100	$25^{-0.040}_{-0.073}$	40	132	136	182	129

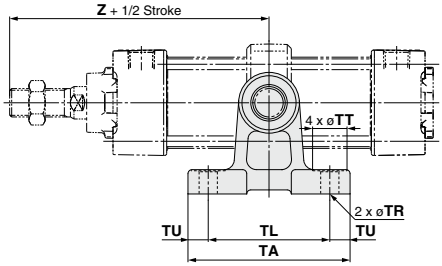
Pivot Bracket/Trunnion and Double Clevis Pivot Bracket

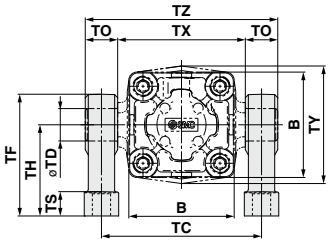
Part No.

Description \ Bore size	MB□32	MB□40	MB□50	MB□63	MB□80	MB□100
Trunnion pivot bracket Note)	MB-S03	MB-S04		MB-S06		MB-S10
Double clevis pivot bracket	MB-B03		MB-B05		MB-B08	

Note) Order 2 trunnion pivot brackets per cylinder.

Trunnion pivot bracket

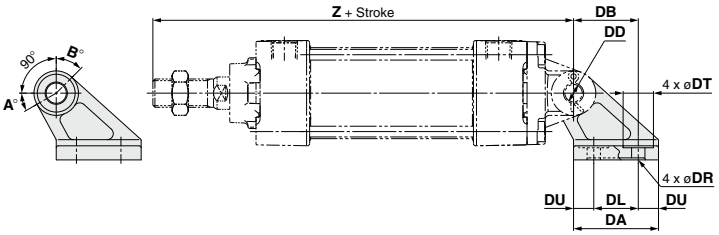


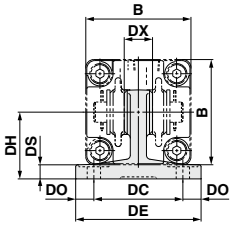


(mm)

Part no.	Bore size (mm)	B	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	Z**	TD H10
MB-S03	32	46	62	45	8.5	62	50	74	12	7	13	10	35	47	89	$12^{+0.070}_{0}$
MB-S04	40	52	80	60	10	80	63	97	17	9	17	12	45	60	93	$16^{+0.070}_{0}$
	50	65	80	60	10	92	75	109	17	9	17	12	45	60	105	$16^{+0.070}_{0}$
MB-S06	63	75	100	70	15	110	90	130	20	11	22	14	60	80	105	$20^{+0.084}_{0}$
	80	95	100	70	15	130	110	150	20	11	22	14	60	80	129	$20^{+0.084}_{0}$
MB-S10	100	114	120	90	15	158	132	184	26	13.5	24	17	75	100	129	$25^{+0.084}_{0}$

Double clevis pivot bracket





(mm)

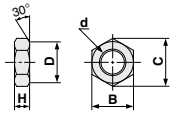
Part no.	Bore size (mm)	B	DA	DB	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	Z*	DD H10
MB-B03	32	46	42	32	22	10	44	14	62	9	6.6	15	7	33	154	$10^{+0.058}_{0}$
	40	52	42	32	22	10	44	14	62	9	6.6	15	7	33	158	$10^{+0.058}_{0}$
MB-B05	50	65	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	$14^{+0.070}_{0}$
	63	75	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	$14^{+0.070}_{0}$
MB-B08	80	95	73	64	45	14	86	30	111	12.5	11	22	10	65	228	$22^{+0.084}_{0}$
	100	114	73	64	45	14	86	30	111	12.5	11	22	10	65	228	$22^{+0.084}_{0}$

Rotating Angle

Bore size (mm)	A°	B°	A° + B° + 90°
32, 40	25°	45°	160°
50, 63	40°	60°	190°
80, 100	30°	55°	175°

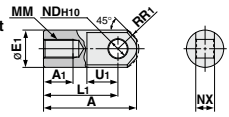
Dimensions of Accessories

Rod end nut
(Standard)



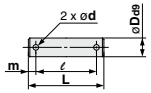
Part no.	Bore size (mm)	d	H	B	C	D
NT-03	**32**	M10 x 1.25	6	17	19.6	16.5
NT-04	**40**	M14 x 1.5	8	22	25.4	21
NT-05	**50, 63**	M18 x 1.5	11	27	31.2	26
NT-08	**80**	M22 x 1.5	13	32	37.0	31
NT-10	**100**	M26 x 1.5	16	41	47.3	39

I type
Single knuckle joint



Part no.	Bore size (mm)	A	A1	E1	L1	MM	R1	U1	ND H10	NX
I-03M	**32**	40	14	20	30	M10 x 1.25	12	16	$10^{+0.058}_{0}$	$14^{-0.10}_{-0.30}$
I-04M	**40**	50	19	22	40	M14 x 1.5	12.5	19	$10^{+0.058}_{0}$	$14^{-0.10}_{-0.30}$
I-05M	**50, 63**	64	24	28	50	M18 x 1.5	16.5	24	$14^{+0.070}_{0}$	$20^{-0.10}_{-0.30}$
I-08M	**80**	80	26	40	60	M22 x 1.5	23.5	34	$22^{+0.084}_{0}$	$30^{-0.10}_{-0.30}$
I-10M	**100**	80	26	40	60	M26 x 1.5	23.5	34	$22^{+0.084}_{0}$	$30^{-0.10}_{-0.30}$

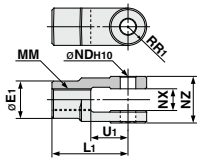
Knuckle joint pin
Clevis pin



Part no.	Bore size (mm) Clevis	Bore size (mm) Knuckle	Dd9	L	ℓ	m	d (Drill through)	Applicable split pin
CD-M03	**32, 40**		$10^{-0.040}_{-0.076}$	44	36	4	3	ø3 x 18ℓ
CD-M05	**50, 63**		$14^{-0.050}_{-0.093}$	60	51	4.5	4	ø4 x 25ℓ
CD-M08	**80, 100**		$22^{-0.065}_{-0.117}$	82	72	5	4	ø4 x 35ℓ

Note) Split pins and flat washers are included.

Y type
Double knuckle joint



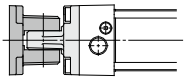
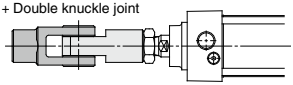
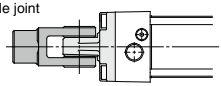
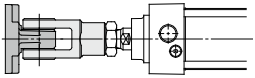
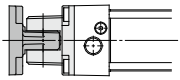
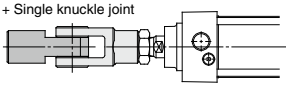
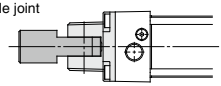
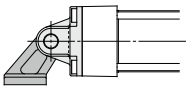
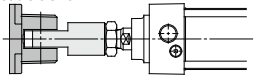
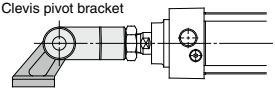
Part no.	Bore size (mm)	E1	L1	MM	R1	U1	ND H10	NX	NZ
Y-03M	**32**	20	30	M10 x 1.25	10	16	$10^{+0.058}_{0}$	$14^{+0.30}_{+0.10}$	$28^{-0.10}_{-0.30}$
Y-04M	**40**	22	40	M14 x 1.5	11	19	$10^{+0.058}_{0}$	$14^{+0.30}_{+0.10}$	$28^{-0.10}_{-0.30}$
Y-05M	**50, 63**	28	50	M18 x 1.5	14	24	$14^{+0.070}_{0}$	$20^{+0.30}_{+0.10}$	$40^{-0.10}_{-0.30}$
Y-08M	**80**	40	65	M22 x 1.5	20	34	$22^{+0.084}_{0}$	$30^{+0.30}_{+0.10}$	$60^{-0.10}_{-0.30}$
Y-10M	**100**	40	65	M26 x 1.5	20	34	$22^{+0.084}_{0}$	$30^{+0.30}_{+0.10}$	$60^{-0.10}_{-0.30}$

Note) A pin, split pins and flat washers are included.

Bracket Combinations

Bracket combination available ····· ▶Refer to the figure below.

Bracket for cylinder \ Bracket for workpiece	Single clevis	Double clevis	Single knuckle joint	Double knuckle joint	Clevis pivot bracket
Single clevis	—	①	—	②	—
Double clevis	③	—	④	—	⑨
Single knuckle joint	—	⑤	—	⑥	—
Double knuckle joint	⑦	—	⑧	—	⑩

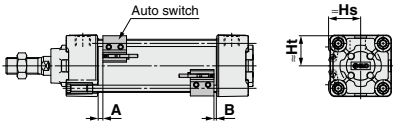
No.	Appearance	No.	Appearance
①	Single clevis + Double clevis 	⑥	Single knuckle joint + Double knuckle joint 
②	Single clevis + Double knuckle joint 	⑦	Double knuckle joint + Single clevis 
③	Double clevis + Single clevis 	⑧	Double knuckle joint + Single knuckle joint 
④	Double clevis + Single knuckle joint 	⑨	Double clevis + Clevis pivot bracket 
⑤	Single knuckle joint + Double clevis 	⑩	Double knuckle joint + Clevis pivot bracket 

Auto Switch Mounting

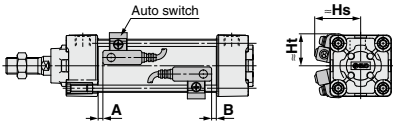
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mounting>

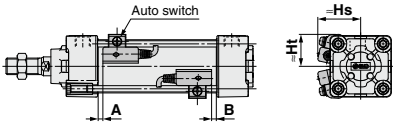
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV/Y7BA



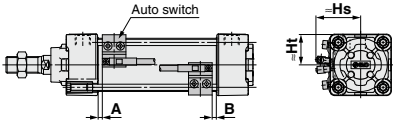
D-A5□/A6□
D-A59W



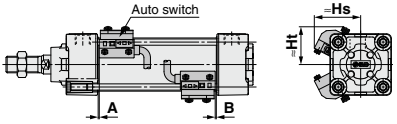
D-F5□/J5□
D-F5□W/J59W/F5BA
D-F59F/F5NT



D-P3DW

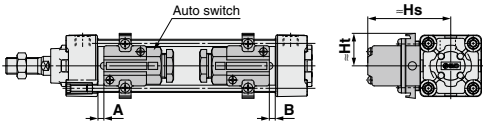


D-P4DW

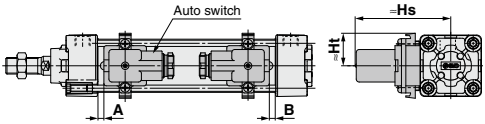


<Band mounting>

D-A3□/G39/K39



D-A44



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-A5□ D-A6□		D-A59W		D-F5□ D-J5□ D-F59F		D-F5NT		D-J51		D-A3□ D-A44 D-G39 D-K39		D-Z7□ D-Z8□ D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7H D-Y7□W D-Y7□WV		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	10	8	6	4	0	0	4	2	6.5	4.5	11.5	9.5	6	4	0	0	3.5	1.5	5.5	3.5	3	1
40	9	9	5	5	0	0	3	3	5.5	5.5	10.5	10.5	5	5	0	0	2.5	2.5	4.5	4.5	2	2
50	10	9	6	5	0	0	4	3	6.5	5.5	11.5	10.5	6	5	0	0	3.5	2.5	5.5	4.5	3	2
63	10	9	6	5	0	0	4	3	6.5	5.5	11.5	10.5	6	5	0	0	3.5	2.5	5.5	4.5	3	2
80	14.5	11.5	10.5	7.5	4.5	1.5	8.5	5.5	11	8	16	13	10.5	7.5	4.5	1.5	8	5	5.5	2	7.5	4.5
100	14	12	10	8	4	2	8	6	10.5	8.5	15.5	13.5	10	8	4	2	7.5	5.5	5	2.5	7	5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Proper Mounting Height

(mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-M9□A D-A9□		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F59F D-F5□W D-J59W D-F5BA D-F5NT		D-A3□ D-G39 D-K39		D-A44		D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA		D-Y69□ D-Y7PV D-Y7□WV		D-P3DW		D-P4DW	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
32	24.5	23	27.5	23	30.5	23	35	24.5	32.5	25	67	27.5	77	27.5	25.5	23	26.5	23	34	23	38	31
40	28.5	25.5	31.5	25.5	34	25.5	38.5	27.5	36.5	27.5	71.5	27.5	81.5	27.5	29.5	26	30	26	38	26	42	33
50	33.5	31	36	31	38.5	31	43.5	34.5	41	34	77	—	87	—	33.5	31	34.5	31	42	31	46.5	39
63	38.5	36	40.5	36	43	36	48.5	39.5	46	39	83.5	—	93.5	—	39	36	40	36	50	36	51.5	44
80	46.5	45	49	45	52	45	55	46.5	52.5	46.5	92.5	—	103	—	47.5	45	48.5	45	56	45	58	51.5
100	54	53.5	57	53.5	59.5	53.5	62	55	59.5	55	103	—	113.5	—	55.5	53.5	56.5	53.5	63.5	53.5	65.5	60.5

Operating Range

(mm)

Auto switch model	Bore size					
	32	**40**	**50**	**63**	**80**	**100**
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4	4.5	5	6	6	6
D-A9□/A9□V	7	7.5	8.5	9.5	9.5	10.5
D-Z7□/Z80	7.5	8.5	7.5	9.5	9.5	10.5
D-A5□/A6□	9	9	10	11	11	11
D-A59W	13	13	13	14	14	15
D-A3□/A44	9	9	10	11	11	11
D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV D-Y7BA	5.5	5.5	7	7.5	6.5	5.5
D-F5□/J5□ D-F5□W/J59W D-F5BA/F5NT D-F59F	3.5	4	4	4.5	4.5	4.5
D-G39/K39	9	9	9	10	10	11
D-P3DW	4.5	5	5	5.5	4	6.5
D-P4DW	4	4	4	4.5	4	4.5

∗ 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.

Minimum Stroke for Auto Switch Mounting/Mounting Brackets other than Center Trunnion

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted	Mounting brackets other than center trunnion	
		ø32, ø40, ø50, ø63	**ø80, ø100**
D-M9□ **D-M9□W**	2 (Different surfaces, same surface) 1	15	
	n	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	
D-M9□V **D-M9□WV**	2 (Different surfaces, same surface) 1	10	
	n	$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	
D-M9□A	2 (Different surfaces, same surface) 1	15	
	n	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	
D-M9□AV	2 (Different surfaces, same surface) 1	15	
	n	$15 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	
D-A9□	2 (Different surfaces, same surface) 1	15	
	n	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	
D-A9□V	2 (Different surfaces, same surface) 1	10	
	n	$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	
D-A3□ **D-G39** **D-K39**	2 (Different surfaces)	35	
	2 (Same surface)	100	
	n (Different surfaces)	35 + 30 (n – 2) (n = 2, 3, 4…)	
	n (Same surface)	100 + 100 (n – 2) (n = 2, 3, 4…)	
	1	10	
D-A44	2 (Different surfaces)	35	
	2 (Same surface)	55	
	n (Different surfaces)	35 + 30 (n – 2) (n = 2, 3, 4…)	
	n (Same surface)	55 + 50 (n – 2) (n = 2, 3, 4…)	
	1	10	
D-A5□ **D-A6□**	2 (Different surfaces, same surface) 1	15	20
	n (Different surfaces)	$15 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	$20 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)
D-A59W	2 (Different surfaces, same surface)	20	25
	n (Same surface)	$20 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	$25 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)
	1	15	25
D-F5□ **D-J5□** **D-F5□W** **D-J59W** **D-F5BA** **D-F59F**	2 (Different surfaces, same surface)	15	25
	n (Same surface)	$15 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	$25 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)
	1	10	25
D-F5NT	2 (Different surfaces, same surface)	15	25
	n (Same surface)	$15 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	$25 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)
	1	10	25
D-Z7□ **D-Z80** **D-Y59□** **D-Y7P** **D-Y7□W**	2 (Different surfaces, same surface) 1	15	
	n	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8…) Note 1)	

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting/Mounting Brackets other than Center Trunnion

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted	Mounting brackets other than center trunnion		
		ø32, ø40	**ø50, ø63**	**ø80, ø100**
D-Y69□ **D-Y7PV** **D-Y7□WV**	2 (Different surfaces, same surface) 1	10		
	n	$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)		
D-Y7BA	2 (Different surfaces, same surface) 1	20		
	n	$20 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)		
D-P3DW	2 (Different surfaces), 1	25		
	2 (Same surface)	45	25	
	n (Different surfaces)	$25 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)		
	n (Same surface)	$45 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	$25 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	
D-P4DW	2 (Different surfaces, same surface) 1	15		
	n	$15 + 65\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)		

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting/Center Trunnion

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted	Center trunnion					
		ø32	**ø40**	**ø50**	**ø63**	**ø80**	**ø100**
D-M9□ **D-M9□W**	2 (Different surfaces, same surface) 1	75	80		85	90	95
	n	$75 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$80 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$85 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$90 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$95 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-M9□V **D-M9□WV**	2 (Different surfaces, same surface) 1	50	55		60	65	70
	n	$50 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$55 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$60 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$65 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$70 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-M9□A	2 (Different surfaces, same surface) 1	80	85		90	95	100
	n	$80 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$85 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$90 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$95 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$100 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-M9□AV	2 (Different surfaces, same surface) 1	55	60		65	70	75
	n	$55 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$60 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$65 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$70 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$75 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-A9□	2 (Different surfaces, same surface) 1	70	75		80	85	95
	n	$70 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$75 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$80 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$85 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$95 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-A9□V	2 (Different surfaces, same surface) 1	45	50		55	60	70
	n	$45 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$50 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$55 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$60 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$70 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)

Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting/Center Trunnion

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted	Center trunnion					
		ø32	ø40	ø50	ø63	ø80	ø100
D-A3□ **D-G39** **D-K39**	2 (Different surfaces)	60	65		75	80	85
	2 (Same surface)	90	95		100	105	110
	n (Different surfaces)	60 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	65 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)		75 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	80 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	85 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)
	n (Same surface)	90 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)	95 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)		100 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)	105 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)	110 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)
	1	60	65		75	80	85
D-A44	2 (Different surfaces)	70	75		80		85
	2 (Same surface)						
	n (Different surfaces)	70 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	75 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)		85 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)
	n (Same surface)	70 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)	75 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)		85 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)
	1	70	75		80		85
D-A5□ **D-A6□**	2 (Different surfaces, same surface) 1	60		80	105	110	115
	n (Same surface)	60 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		80 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	105 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	110 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	115 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-A59W	2 (Different surfaces, same surface)	60	70	85	110	115	120
	n (Same surface)	60 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	70 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	85 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	110 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	115 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	120 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
	1	60	70	85	110	115	120
D-F5□/J5□ **D-F5□W** **D-J59W** **D-F5BA** **D-F59F**	2 (Different surfaces, same surface)	90	95		110	115	120
	n (Same surface)	90 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	95 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		110 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	115 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	120 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
	1	90	95		110	115	120
D-F5NTL	2 (Different surfaces, same surface)	100	105		120	125	130
	n (Same surface)	100 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	105 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		120 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	125 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	130 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
	1	100	105		120	125	130
D-Z7□ **D-Z80** **D-Y59□** **D-Y7P** **D-Y7□W**	2 (Different surfaces, same surface) 1	80	85	90		95	100
	n	80 + 40 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	85 + 40 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	90 + 40 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		95 + 40 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	100 + 40 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-Y69□ **D-Y7PV** **D-Y7□WV**	2 (Different surfaces, same surface) 1	60	65		70	75	85
	n	60 + 30 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	65 + 30 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		70 + 30 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	75 + 30 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	85 + 30 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-Y7BA	2 (Different surfaces, same surface) 1	85	90		100	105	110
	n	85 + 45 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	90 + 45 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		100 + 45 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	105 + 45 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	110 + 45 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-P3DW	2 (Different surfaces, same surface) 1	80	85		90		95
	n	80 + 50 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	80 + 50 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		90 + 50 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		95 + 50 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-P4DW	2 (Different surfaces, same surface) 1	120		130		140	
	n	120 + 65 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		130 + 65 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		140 + 65 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size (mm)					
	ø32	ø40	ø50	ø63	ø80	ø100
D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V D-M9□/M9□V	BMB5-032	BMB5-032	BA7-040	BA7-040	BA7-063	BA7-063
D-A3□/A44 D-G39/K39	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100
D-A5□/A6□/A59W D-F5□/J5□ D-F5□W/J59W D-F59F/F5BA D-F5NT	BT-03	BT-03	BT-05	BT-05	BT-06	BT-06
D-P3DW	BMB9-032S	BMB9-032S	BMB9-050S	BMB9-050S	BA9T-063S	BA9T-063S
D-P4DW	BMB3T-040	BMB3T-040	BMB3T-050	BMB3T-050	BMB3T-080	BMB3T-080
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	BMB4-032	BMB4-032	BMB4-050	BMB4-050	BA4-063	BA4-063

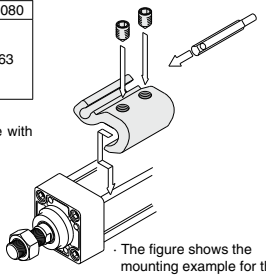
[Stainless Steel Mounting Screw]

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

BBA1: For D-A5/A6/F5/J5 types

Note 1) Refer to **the WEB catalog** or Best Pneumatics No. 3 for details on the BBA1.
The above stainless steel screws are used when a cylinder is shipped with the D-F5BA auto switch. When only the auto switch is shipped independently, the BBA1 is attached.

Note 2) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BMB5-032, BA7-□□□, BMB4-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6 L stainless steel set screws included in the BBA1.



· The figure shows the mounting example for the D-A9□(V)/M9□(V)/ M9□W(V)/M9□A(V).

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features
Reed	D-A93V/A96V	Grommet (Perpendicular)	—
	D-A90V		Without indicator light
	D-B35	Grommet (In-line)	—
	D-A53/A56/Z73/Z76		
	D-A67/Z80		Without indicator light
Solid state	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		
	D-M9NWV/M9PWV/M9BWV		Diagnostic indication (2-color indication)
	D-Y7NWV/Y7PWV/Y7BWV		
	D-M9NAV/M9PAV/M9BAV		Water resistant (2-color indication)
	D-P4DW		Magnetic field resistant (2-color indication)
	D-F59/F5P/J59	Grommet (In-line)	—
	D-Y59A/Y59B/Y7P		
	D-Y7H		
	D-F59W/F5PW/J59W		Diagnostic indication (2-color indication)
	D-Y7NW/Y7PW/Y7BW		
	D-F5BA/Y7BA		Water resistant (2-color indication)
	D-F5NT		With timer
	D-P5DW		Magnetic field resistant (2-color indication)

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinder

Series CA2Y

ø40, ø50, ø63, ø80, ø100

How to Order

	CA2Y	B	40		–	150	Z	–			–								
With auto switch	CDA2Y	B	40		–	150	Z	–			–	M9BW		–					

With auto switch (Built-in magnet)

Mounting

B	Basic
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Bore size

40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Accessories 1

Nil	No bracket
N	Pivot bracket

∗ Only for D and T mounting types
∗ Pivot bracket is shipped together with the product, but not assembled.

Accessories 2

Nil	No bracket
V	Single knuckle joint
W	Double knuckle joint

∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1128.

Made to Order
Refer to page 1128 for details.

Number of auto switches

Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDA2YB40-100Z

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 1129.**

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model Tie-rod mounting	Auto switch model Band mounting	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet		3-wire (NPN)	24 V	5 V, 12 V	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
							—	G59	●	—	●	○	○		
				3-wire (PNP)			M9P	—	●	●	●	○	○		
							—	G5P	●	—	●	○	○		
				2-wire		12 V	M9B	—	●	●	●	○	○	—	
							—	K59	●	—	●	○	○		
					—	—	100 V, 200 V	J51	—	●	—	●	○	—	
		Terminal conduit		3-wire (NPN)	24 V	12 V		G39C	G39	—	—	—	—	IC circuit	
				2-wire				K39C	K39	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)		5 V, 12 V		M9NW	—	●	●	●	○		
								—	G59W	●	—	●	○		
				3-wire (PNP)				M9PW	—	●	●	●	○		
								—	G5PW	●	—	●	○		
				2-wire		12 V		M9BW	—	●	●	●	○	—	
								—	K59W	●	—	●	○		
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NA***	—	○	○	●	○	IC circuit	
				3-wire (PNP)				M9PA***	—	○	○	●	○		
				2-wire		12 V		M9PA***	—	○	○	●	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	G59F	●	—	●	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		P3DW	—	●	—	●	●	○	—
								P4DW	—	—	—	●	●	○	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96**	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93**	—	●	—	●	●	—	IC circuit	Relay, PLC
			No				100 V or less	A90**	—	●	—	●	—	—		
			Yes				100 V, 200 V	A54	B54	●	—	●	●	—		
			No				200 V or less	A64	B64	●	—	●	—	—		
		Terminal conduit	Yes				—	A33C	A33	—	—	—	—	—	—	PLC
							100 V, 200 V	A34C	A34	—	—	—	—	—		
		DIN terminal						A44C	A44	—	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color indication)	Grommet			—	—		A59W	B59W	●	—	●	—	—		

∗∗∗ 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 ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

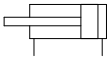
∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗∗ The D-A9□ and D-A9□V cannot be mounted on ø50.

∗ Since there are other applicable auto switches then listed above, refer to page 1140 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
For the D-P3DW□, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ The D-A9□/M9□□□/P3DW auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled for the D-A9□/M9□□□ before shipment.)

SMC

Symbol

Without cushion



Specifications

Bore size (mm)	40	50	63	80	100
Action	Double acting				
Piston speed	5 to 500 mm/s				
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 (No freezing) With auto switch: –10°C to 60°C				
Cushion	None				
Lubrication	Not required (Non-lube)				
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion				
Allowable leakage rate	0.5 L/min (ANR)				

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	40	50	63	80	100
Minimum operating pressure	0.02	0.01			

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Max. manufacturable stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	1000
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700	1000

Note 1) Intermediate strokes not listed above are also available.
Please consult with SMC for strokes outside the above ranges.

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●

Made to Order

Made to Order

(For details, refer to pages 1247 to 1264.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC28	Compact flange made of SS400
-XC29	Double knuckle joint with spring pin
-XC30	Rod trunnion
-XC65	Made of stainless steel (Combination of XC7 and XC68)
-XC68	Made of stainless steel (with hard chrome plated piston rod)

Replacement Parts/Seal Kit

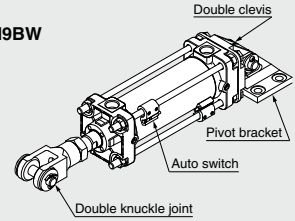
Bore size (mm)	Kit no.	Contents	
40	CA2Y40Z-PS	Rod seal	1 pc.
50	CA2Y50Z-PS	Piston seal	1 pc.
63	CA2Y63Z-PS	Cylinder tube gasket	2 pcs.
80	CA2Y80Z-PS	Grease pack (10 g)	1 pc.
100	CA2Y100Z-PS		

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: **GR-L-005** (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Ordering Example of Cylinder Assembly

Cylinder model:
CDA2YD40-150Z-NW-M9BW



Mounting **D: Double clevis**
Pivot bracket **N: Yes**
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.

∗ Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

Weights/Aluminum Tube

(kg)

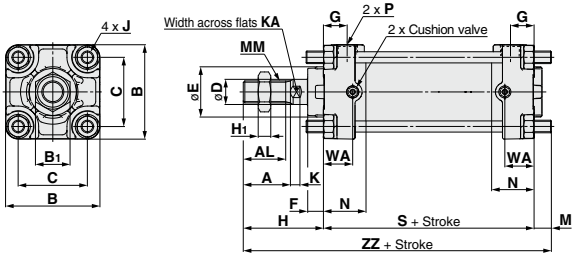
Bore size (mm)		40	50	63	80	100
Basic weight	Basic	0.73	1.06	1.53	2.73	3.71
	Axial foot	0.91	1.25	1.83	3.40	4.64
	Flange	1.09	1.48	2.28	4.18	5.57
	Single clevis	0.95	1.37	2.12	3.84	5.43
	Double clevis	0.99	1.46	2.28	4.13	5.95
	Trunnion	1.08	1.51	2.29	4.28	5.93
Additional weight per 50 mm of stroke	All mounting brackets	0.20	0.25	0.31	0.46	0.58
Accessories	Single knuckle joint	0.23	0.26	0.26	0.60	0.83
	Double knuckle joint (with pin)	0.37	0.43	0.43	0.87	1.27

Calculation (Example) **CA2YL40-100Z** (Axial foot, ø40, 100 st)

- Basic weight·····0.91kg
- Additional weight·····0.20/50 stroke
- Cylinder stroke·····100 stroke

0.91 + 0.20 x 100/50 = **1.31 kg**

Basic: CA2YB

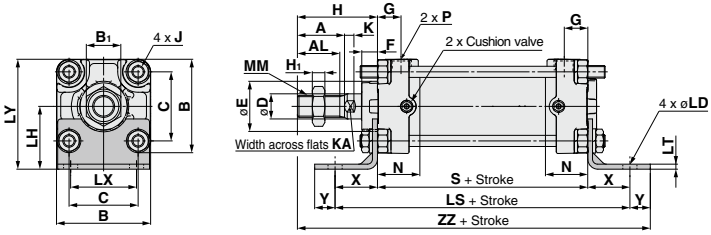


(mm)

Bore size (mm)	A	AL	B	B1	C	D	E	F	G	H	H1	J	K	KA
40	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14
50	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18
63	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18
80	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22
100	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26

Bore size (mm)	M	MM	N	P	S	WA	ZZ
40	11	M14 x 1.5	27	1/4	84	18.5	146
50	11	M18 x 1.5	30	3/8	90	18.5	159
63	14	M18 x 1.5	31	3/8	98	23	170
80	17	M22 x 1.5	37	1/2	116	28.5	204
100	17	M26 x 1.5	40	1/2	126	28.5	215

Axial Foot: CA2YL

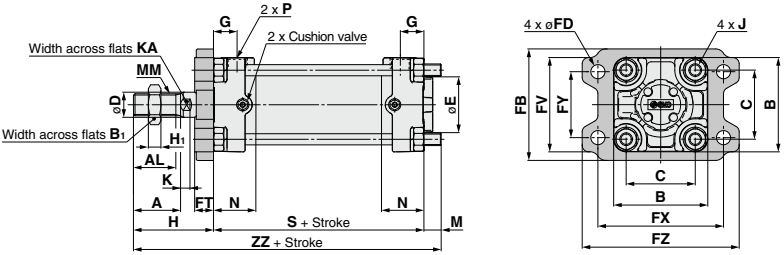


(mm)

Bore size (mm)	A	AL	B	B1	C	D	E	F	G	H	H1	J	K	KA	LD	LH	LS	LT
40	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	9	40	138	3.2
50	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	9	45	144	3.2
63	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	11.5	50	166	3.2
80	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	13.5	65	204	4.5
100	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	13.5	75	212	6

Bore size (mm)	LX	LY	MM	N	P	S	X	Y	ZZ
40	42	70	M14 x 1.5	27	1/4	84	27	13	175
50	50	80	M18 x 1.5	30	3/8	90	27	13	188
63	59	93	M18 x 1.5	31	3/8	98	34	16	206
80	76	116	M22 x 1.5	37	1/2	116	44	16	247
100	92	133	M26 x 1.5	40	1/2	126	43	17	258

Rod Flange: CA2YF

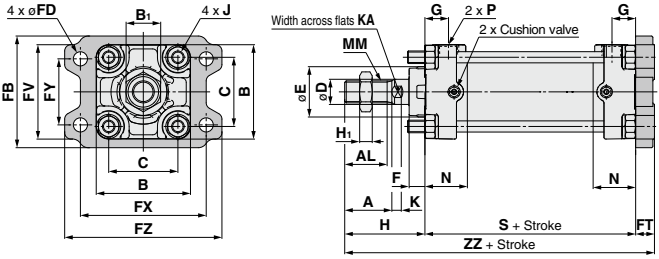


(mm)

Bore size (mm)	A	AL	B	B_1	C	D	E	FB	FD	FT	FV	FX	FY	FZ	G	H	H_1	J	K
40	30	27	60	22	44	16	32	71	9	12	60	80	42	100	15	51	8	M8 x 1.25	6
50	35	32	70	27	52	20	40	81	9	12	70	90	50	110	17	58	11	M8 x 1.25	7
63	35	32	85	27	64	20	40	101	11.5	15	86	105	59	130	17	58	11	M10 x 1.25	7
80	40	37	102	32	78	25	52	119	13.5	18	102	130	76	160	21	71	13	M12 x 1.75	10
100	40	37	116	41	92	30	52	133	13.5	18	116	150	92	180	21	72	16	M12 x 1.75	10

Bore size (mm)	KA	M	MM	N	P	S	ZZ
40	14	11	M14 x 1.5	27	1/4	84	146
50	18	11	M18 x 1.5	30	3/8	90	159
63	18	14	M18 x 1.5	31	3/8	98	170
80	22	17	M22 x 1.5	37	1/2	116	204
100	26	17	M26 x 1.5	40	1/2	126	215

Head Flange: CA2YG

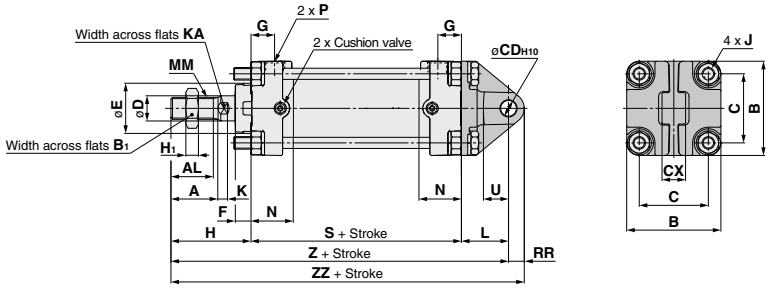


(mm)

Bore size (mm)	A	AL	B	B_1	C	D	E	F	FB	FD	FT	FV	FX	FY	FZ	G	H	H_1
40	30	27	60	22	44	16	32	10	71	9	12	60	80	42	100	15	51	8
50	35	32	70	27	52	20	40	10	81	9	12	70	90	50	110	17	58	11
63	35	32	85	27	64	20	40	10	101	11.5	15	86	105	59	130	17	58	11
80	40	37	102	32	78	25	52	14	119	13.5	18	102	130	76	160	21	71	13
100	40	37	116	41	92	30	52	14	133	13.5	18	116	150	92	180	21	72	16

Bore size (mm)	J	K	KA	MM	N	P	S	ZZ
40	M8 x 1.25	6	14	M14 x 1.5	27	1/4	84	147
50	M8 x 1.25	7	18	M18 x 1.5	30	3/8	90	160
63	M10 x 1.25	7	18	M18 x 1.5	31	3/8	98	171
80	M12 x 1.75	10	22	M22 x 1.5	37	1/2	116	205
100	M12 x 1.75	10	26	M26 x 1.5	40	1/2	126	216

Single Clevis: CA2YC

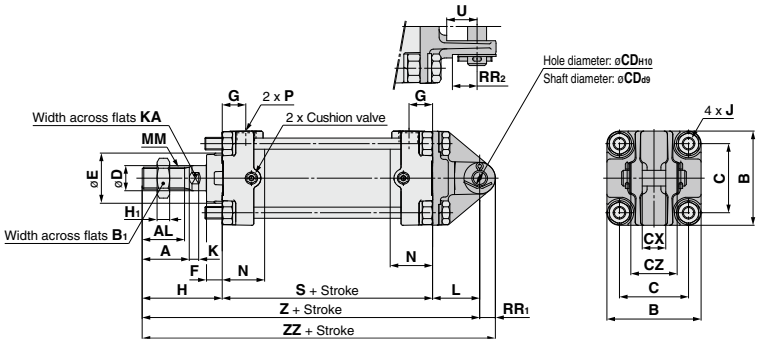


(mm)

Bore size (mm)	A	AL	B	B1	C	CDH10	CX	D	E	F	G	H	H1	J	K	KA
40	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{-0.1}_{-0.3}$	16	32	10	15	51	8	M8 x 1.25	6	14
50	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{-0.1}_{-0.3}$	20	40	10	17	58	11	M8 x 1.25	7	18
63	35	32	85	27	64	$16^{+0.070}_{0}$	$25^{-0.1}_{-0.3}$	20	40	10	17	58	11	M10 x 1.25	7	18
80	40	37	102	32	78	$20^{+0.084}_{0}$	$31.5^{-0.1}_{-0.3}$	25	52	14	21	71	13	M12 x 1.75	10	22
100	40	37	116	41	92	$25^{+0.084}_{0}$	$35.5^{-0.1}_{-0.3}$	30	52	14	21	72	16	M12 x 1.75	10	26

Bore size (mm)	L	MM	N	P	RR	S	U	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	84	16	165	175
50	35	M18 x 1.5	30	3/8	12	90	19	183	195
63	40	M18 x 1.5	31	3/8	16	98	23	196	212
80	48	M22 x 1.5	37	1/2	20	116	28	235	255
100	58	M26 x 1.5	40	1/2	25	126	36	256	281

Double Clevis: CA2YD



∗ A pin and retaining rings are shipped together with double clevis and/or double knuckle joint.

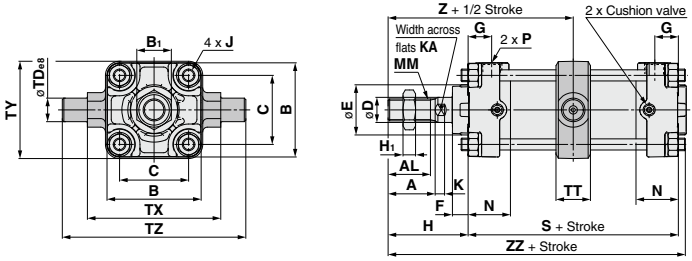
(mm)

Bore size (mm)	A	AL	B	B1	C	CDH10	CX	CZ	D	E	F	G	H	H1	J	K	KA
40	30	27	60	22	44	$10^{+0.058}_{0}$	$15^{+0.3}_{+0.1}$	29.5	16	32	10	15	51	8	M8 x 1.25	6	14
50	35	32	70	27	52	$12^{+0.070}_{0}$	$18^{+0.3}_{+0.1}$	38	20	40	10	17	58	11	M8 x 1.25	7	18
63	35	32	85	27	64	$16^{+0.070}_{0}$	$25^{+0.3}_{+0.1}$	49	20	40	10	17	58	11	M10 x 1.25	7	18
80	40	37	102	32	78	$20^{+0.084}_{0}$	$31.5^{+0.3}_{+0.1}$	61	25	52	14	21	71	13	M12 x 1.75	10	22
100	40	37	116	41	92	$25^{+0.084}_{0}$	$35.5^{+0.3}_{+0.1}$	64	30	52	14	21	72	16	M12 x 1.75	10	26

Bore size (mm)	L	MM	N	P	RR1	RR2	S	U	Z	ZZ
40	30	M14 x 1.5	27	1/4	10	16	84	16	165	175
50	35	M18 x 1.5	30	3/8	12	19	90	19	183	195
63	40	M18 x 1.5	31	3/8	16	23	98	23	196	212
80	48	M22 x 1.5	37	1/2	20	28	116	28	235	255
100	58	M26 x 1.5	40	1/2	25	23.5	126	36	256	281

∗ A clevis pin, flat washers and split pins are included.

Center Trunnion: CA2YT



(mm)

Bore size (mm)	A	AL	B	B_1	C	D	E	F	G	H	H_1	J	K	KA	MM	N	P
40	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4
50	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8
63	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8
80	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2
100	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2

Bore size (mm)	S	TD_{e8}	TT	TX	TY	TZ	Z	ZZ
40	84	$15^{-0.032}_{-0.059}$	22	85	62	117	93	140
50	90	$15^{-0.032}_{-0.059}$	22	95	74	127	103	154
63	98	$18^{-0.032}_{-0.059}$	28	110	90	148	107	162
80	116	$25^{-0.040}_{-0.073}$	34	140	110	192	129	194
100	126	$25^{-0.040}_{-0.073}$	40	162	130	214	135	206

∗ Do not disassemble the trunnion type. (Refer to the standard type.)

Trunnion and Double Clevis Pivot Bracket

● Strength is the same as cylinder brackets.

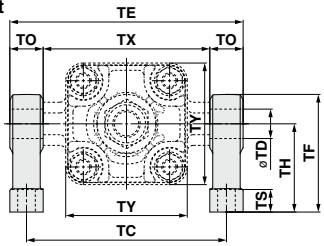
Type

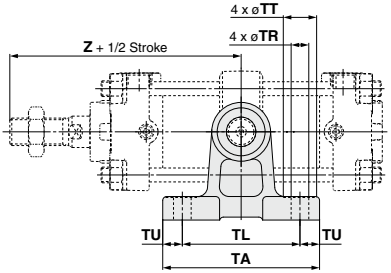
Description \ Bore size	CA2□40	CA2□50	CA2□63	CA2□80	CA2□100
Trunnion pivot bracket	CA2-S04		CA2-S06	MB-S10	
Double clevis pivot bracket	CA2-B04	CA2-B05	CA2-B06	CA2-B08	CA2-B10

∗ Order 2 trunnion pivot brackets per cylinder.

Trunnion pivot bracket

Material: Cast iron



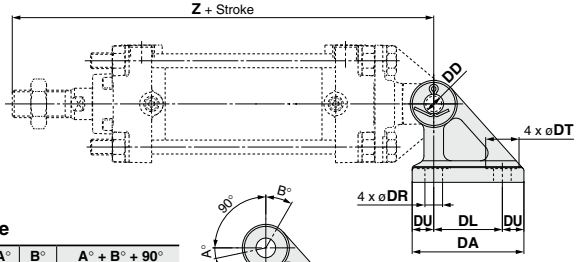


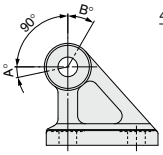
(mm)

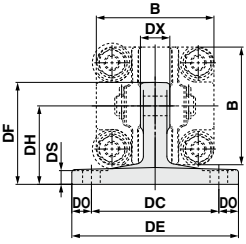
Part no.	Bore size (mm)	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	TY	Z	TD-H10 (Hole)
CA2-S04	40	80	60	10	102	85	119	17	9	17	12	45	60	62	93	$15^{+0.070}_{0}$
	50	80	60	10	112	95	129	17	9	17	12	45	60	74	103	$15^{+0.070}_{0}$
CA2-S06	63	100	70	15	130	110	150	20	11	22	14	55	73	90	107	$18^{+0.070}_{0}$
MB-S10	80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	129	$25^{+0.084}_{0}$
	100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	135	$25^{+0.084}_{0}$

Double clevis pivot bracket

Material: Cast iron







Rotating Angle

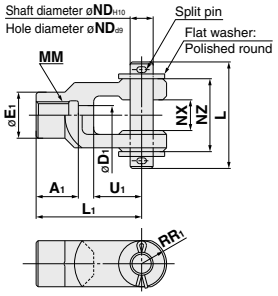
Bore size (mm)	A°	B°	A° + B° + 90°
40 to 100	12°	60°	162°

(mm)

Part no.	Bore size (mm)	DA	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	DF	B	Z	DDH10 (Hole)
CA2-B04	40	57	35	11	65	15	85	10	9	17	8	40	52	60	165	$10^{+0.058}_{0}$
CA2-B05	50	57	35	11	65	18	85	10	9	17	8	40	52	70	183	$12^{+0.070}_{0}$
CA2-B06	63	67	40	13.5	80	25	105	12.5	11	22	10	50	66	85	196	$16^{+0.070}_{0}$
CA2-B08	80	93	60	16.5	100	31.5	130	15	13.5	24	12	65	90	102	235	$20^{+0.084}_{0}$
CA2-B10	100	93	60	16.5	100	35.5	130	15	13.5	24	12	65	90	116	256	$25^{+0.084}_{0}$

Dimensions of Accessories

Y Type Double Knuckle Joint

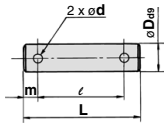


Material: Cast iron (mm)

Part no.	Applicable bore size (mm)	A$_1$	E$_1$	D$_1$	L$_1$	MM	RR$_1$	U$_1$	ND	NX	NZ	L	Split pin size	Flat washer size
Y-04D	**40**	22	24	10	55	M14 x 1.5	13	25	12	$16^{+0.3}_{+0.1}$	38	55.5	ø3 x 18 ℓ	Polished round 12
Y-05D	**50, 63**	27	28	14	60	M18 x 1.5	15	27	12	$16^{+0.3}_{+0.1}$	38	55.5	ø3 x 18 ℓ	Polished round 12
Y-08D	**80**	37	36	18	71	M22 x 1.5	19	28	18	$28^{+0.3}_{+0.1}$	55	76.5	ø4 x 25 ℓ	Polished round 18
Y-10D	**100**	37	40	21	83	M26 x 1.5	21	38	20	$30^{+0.3}_{+0.1}$	61	83	ø4 x 30 ℓ	Polished round 20

∗ A knuckle pin, split pins and flat washers are included.

Clevis Pin/Knuckle Pin

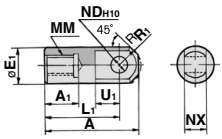


Material: Carbon steel (mm)

Part no.	Applicable bore size		Dd9	L	ℓ	m	d Drill through	Included split pin	Included flat washer
	Clevis	Knuckle							
CDP-2A	**40**	—	$10^{-0.040}_{-0.076}$	46	38	4	3	ø3 x 18 ℓ	Polished round 10
CDP-3A	**50**	**40, 50, 63**	$12^{-0.050}_{-0.093}$	55.5	47.5	4	3	ø3 x 18 ℓ	Polished round 12
CDP-4A	**63**	—	$16^{-0.050}_{-0.093}$	71	61	5	4	ø4 x 25 ℓ	Polished round 16
CDP-5A	—	**80**	$18^{-0.050}_{-0.093}$	76.5	66.5	5	4	ø4 x 25 ℓ	Polished round 18
CDP-6A	**80**	**100**	$20^{-0.065}_{-0.117}$	83	73	5	4	ø4 x 30 ℓ	Polished round 20
CDP-7A	**100**	—	$25^{-0.065}_{-0.117}$	88	78	5	4	ø4 x 36 ℓ	Polished round 24

∗ Split pins and flat washers are included.

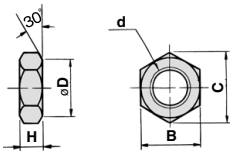
I Type Single Knuckle Joint



Material: Free cutting sulfur steel (mm)

Part no.	Applicable bore size (mm)	A	A$_1$	E$_1$	L$_1$	MM	R$_1$	U$_1$	ND$_{H10}$	NX
I-04A	**40**	69	22	24	55	M14 x 1.5	15.5	20	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$
I-05A	**50, 63**	74	27	28	60	M18 x 1.5	15.5	20	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$
I-08A	**80**	91	37	36	71	M22 x 1.5	22.5	26	$18^{+0.070}_{0}$	$28^{-0.1}_{-0.3}$
I-10A	**100**	105	37	40	83	M26 x 1.5	24.5	28	$20^{+0.084}_{0}$	$30^{-0.1}_{-0.3}$

Rod End Nut (Standard)



Material: Rolled steel (mm)

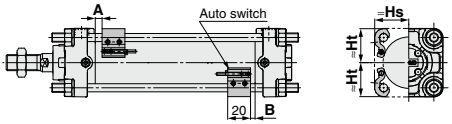
Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-04	**40**	M14 x 1.5	8	22	25.4	21
NT-05	**50, 63**	M18 x 1.5	11	27	31.2	26
NT-08	**80**	M22 x 1.5	13	32	37.0	31
NT-10	**100**	M26 x 1.5	16	41	47.3	39

Auto Switch Mounting

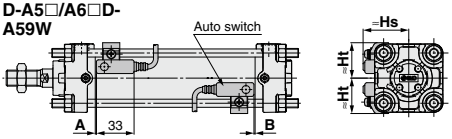
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mounting>

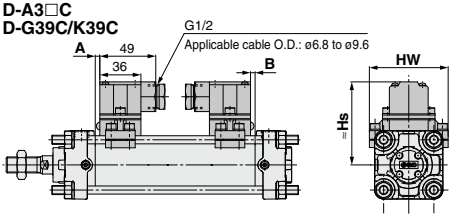
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BA



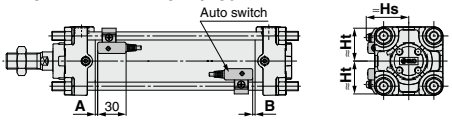
D-A5□/A6□D-A59W



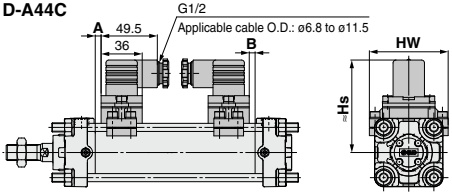
D-A3□C
D-G39C/K39C



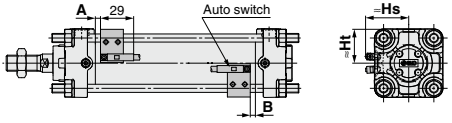
D-F5□/J5□ **D-F5□W/J59W**
D-F5NT **D-F5BA/F59F**



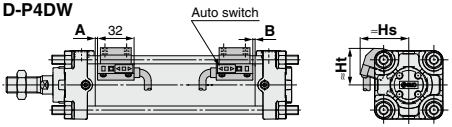
D-A44C



D-P3DW

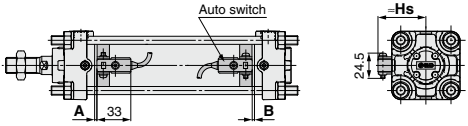


D-P4DW

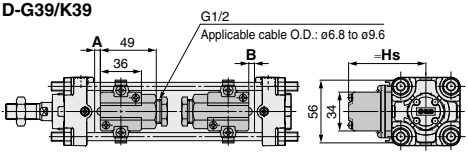


<Band mounting>

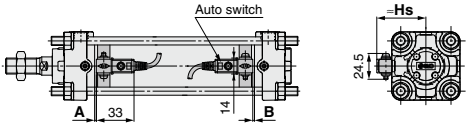
D-B5□/B64/B59W



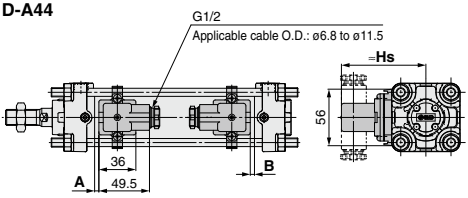
D-A3□
D-G39/K39



D-G5□/K59 **D-G5BAL**
D-G5□W/K59W **D-G59F/G5NTL**



D-A44



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V D-J51		D-Y59□□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA D-Z7□ D-Z80 D-B59W		D-P3DW		D-P4DW		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA		D-A59W		D-F5NT		D-G39 D-G39C D-K39 D-K39C D-A5□ D-A6□ D-A3□ D-A3□C D-A44 D-A44C		D-G5□ D-K59 D-G5NT D-G5□W D-K59W D-G5BA D-G59F		D-B5□ D-B64	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	9	9	5	5	2.5	2.5	4.5	4.5	2	2	5.5	5.5	3	3	10.5	10.5	0	0	1	1	0	0
50	9.5	8.5	5.5	4.5	3	2	5	4	2.5	1.5	6	5	3.5	2.5	11	10	0	0	1.5	0.5	0	0
63	12.5	11.5	8.5	7.5	6	5	3	2.5	5.5	4.5	9	8	6.5	5.5	14	13	2.5	1.5	4.5	3.5	3	2
80	16.5	13.5	12.5	9.5	10	7	7.5	4	9.5	6.5	13	10	10.5	7.5	18	15	6.5	3.5	8.5	5.5	7	4
100	18	16	14	12	11.5	9.5	9	6.5	11	9	14.5	12.5	12	10	19.5	17.5	8	6	10	8	8.5	6.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-M9□A D-A9□		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7BA D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV		D-P3DW		D-P4DW		D-B5□ D-B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G5BAL D-G59F		D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-J59W D-F5BA D-F59F D-F5NT		D-A3□C D-G39C D-K39C		D-A44C	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs		Hs		Hs		Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
40	30	30	31	30	34	30	30	30	30	30	38	30	42.5	33	37		71.5		81.5		38.5	31.5	38	31.5	73	69	81	69
50	34	34	35	34	38	34	34	34	34	34	42	34	46.5	37.5	42		76.5		86.5		42	35.5	42	35.5	78.5	77	86.5	77
63	41	41	41.5	41	44	41	41	41	41	41	49	41	52	43	49		83.5		93.5		46.5	43	47	43	85.5	91	93.5	91
80	49.5	49	50	49	52.5	49	49.5	49	49.5	49	56	49	58.5	51.5	57.5		92		102		53.5	51	53.5	51	94	107	102	107
100	56.5	56	58.5	56	61	56	56.5	55.5	57.5	55.5	65	56	66	58.5	68		102.5		112.5		61.5	57.5	61	57.5	104	121	112	121

Operating Range

Auto switch model	Bore size				
	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4.5	5	5.5	5	6
D-A9□/A9□V	7.5	8.5	9.5	9.5	10.5
D-Z7□/Z80	8.5	7.5	9.5	9.5	10.5
D-A3□/A44 D-A3□C/A44C	9	10	11	11	11
D-A5□/A6□					
D-B5□/B64					
D-A59W	13	13	14	14	15
D-B59W	14	14	17	16	18

(mm)

Auto switch model	Bore size				
	40	50	63	80	100
D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV D-Y7BA	8	7	5.5	6.5	6.5
D-F5□/J5□/F5□W D-J59W/F5BA D-F5NT/F59F	4	4	4.5	4.5	4.5
D-G5□/K59/G5□W D-K59W/G5BA D-G5NT/G59F	5	6	6.5	6.5	7
D-G5NBL	35	35	40	40	40
D-G39/K39 D-G39C/K39C	9	9	10	10	11
D-P3DW	4.5	5	6	5.5	6
D-P4DW	4	4	4.5	4	4.5

∗ 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.

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted		Mounting brackets other than center trunnion	Center trunnion				
				ø40	ø50	ø63	ø80	ø100
D-M9□ D-M9□W	2 (Different surfaces and same surface) 1		15	80		85	90	95
	n		15 + 40 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	80 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		85 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	90 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	95 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-M9□V D-M9□WV	2 (Different surfaces and same surface) 1		10	55		60	65	70
	n		10 + 30 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	55 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		60 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	65 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	70 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-M9□A	2 (Different surfaces and same surface) 1		15	80		85	95	100
	n		15 + 40 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	80 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		85 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	95 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	100 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-M9□AV	2 (Different surfaces and same surface) 1		10	60		65	70	75
	n		10 + 30 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	60 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		65 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	70 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	75 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-A9□	2 (Different surfaces and same surface) 1		15	75		80	85	90
	n		15 + 40 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	75 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		80 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	85 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	90 + 40 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-A9□V	2 (Different surfaces and same surface) 1		10	50		55	60	65
	n		10 + 30 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	50 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		55 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	60 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	65 + 30 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-A5□/A6 D-F5□/J5 D-F5□W/J59W D-F5BA/F59F	2 (Different surfaces and same surface) 1		15	90		100	110	120
	n (Same surface)		15 + 55 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	90 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		100 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	110 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	120 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-A59W	2 (Different surfaces and same surface) 1		20	90		100	110	120
	n (Same surface)		20 + 55 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	90 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		100 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	110 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	120 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
	1		15	90		100	110	120
D-F5NT	2 (Different surfaces and same surface) 1		25	110		120	130	140
	n (Same surface)		25 + 55 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	110 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		120 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	130 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	140 + 55 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G5BA D-G59F D-G5NT	2	Different surfaces	15	90		100	110	
		Same surface	75					
	n	Different surfaces	15 + 50 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	90 + 50 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		100 + 50 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	110 + 50 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	
		Same surface	75 + 50 (n − 2) (n = 2, 3, 4···)	90 + 50 (n − 2) (n = 2, 4, 6, 8···) Note 1)		100 + 50 (n − 2) (n = 2, 4, 6, 8···) Note 1)	110 + 50 (n − 2) (n = 2, 4, 6, 8···) Note 1)	
	1		10	90		100	110	
D-B59W	2	Different surfaces	20	90		100	110	
		Same surface	75					
	n	Different surfaces	20 + 50 (n − 2)/2 (n = 2, 4, 6, 8···) Note 1)	90 + 50 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)		100 + 50 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	110 + 50 (n − 4)/2 (n = 4, 8, 12, 16···) Note 2)	
		Same surface	75 + 50 (n − 2) (n = 2, 3, 4···)	90 + 50 (n − 2) (n = 2, 4, 6, 8···) Note 1)		100 + 50 (n − 2) (n = 2, 4, 6, 8···) Note 1)	110 + 50 (n − 2) (n = 2, 4, 6, 8···) Note 1)	
	1		15	90		100	110	

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

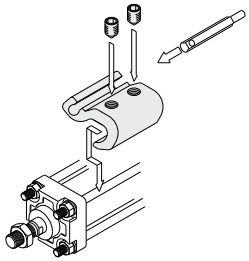
Auto switch model	Number of auto switches mounted		Mounting brackets other than center trunnion	Center trunnion				
				ø40	ø50	ø63	ø80	ø100
D-A3□ D-G39 D-K39	2	Different surfaces	35	75		80	90	
		Same surface	100	100		100	100	
	n	Different surfaces	35 + 30 (n – 2) (n = 2, 3, 4···)	75 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	90 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	
		Same surface	100 + 100 (n – 2) (n = 2, 3, 4···)	100 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)				
	1		10	75		80	90	
D-A44	2	Different surfaces	35	75		80	90	
		Same surface	55					
	n	Different surfaces	35 + 3 (n – 2) (n = 2, 3, 4···)	75 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	90 + 30 (n – 2) (n = 2, 4, 6, 8···) Note 1)	
		Same surface	55 + 50 (n – 2) (n = 2, 3, 4···)	75 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)	90 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)	
	1		10	75		80	90	
D-A3□C D-G39C D-K39C	2	Different surfaces	20	75		80	90	
		Same surface	100	100		100	100	
	n	Different surfaces	20 + 35 (n – 2) (n = 2, 3, 4···)	75 + 35 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 35 (n – 2) (n = 2, 4, 6, 8···) Note 1)	90 + 35 (n – 2) (n = 2, 4, 6, 8···) Note 1)	
		Same surface	100 + 100 (n – 2) (n = 2, 3, 4, 5···)	100 + 100 (n – 2) (n = 2, 4, 6, 8···) Note 1)				
	1		10	75		80	90	
D-A44C	2	Different surfaces	20	75		80	90	
		Same surface	55					
	n	Different surfaces	20 + 35 (n – 2) (n = 2, 3, 4···)	75 + 35 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 35 (n – 2) (n = 2, 4, 6, 8···) Note 1)	90 + 35 (n – 2) (n = 2, 4, 6, 8···) Note 1)	
		Same surface	55 + 50 (n – 2) (n = 2, 3, 4···)	75 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)		80 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)	90 + 50 (n – 2) (n = 2, 4, 6, 8···) Note 1)	
	1		10	75		80	90	
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	2 (Different surfaces and same surface) 1		15	80	85	90	95	105
	n		$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	$80 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$85 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$90 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$95 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$105 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-Y69□/Y7PV D-Y7□WV	2 (Different surfaces and same surface) 1		10	65		75	80	90
	n		$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	$65 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$75 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$80 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$90 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-Y7BA	2 (Different surfaces and same surface) 1		20	95		100	105	110
	n		$20 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	$95 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$100 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$105 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$110 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)
D-P3DW	2 (Different surfaces and same surface) 1		15	85				
	n		$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	$85 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)				
D-P4DW	2 (Different surfaces and same surface) 1		15	120		130	140	
	n		$15 + 65\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note 1)	$120 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)		$130 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	$140 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···) Note 2)	

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Auto Switch Mounting Brackets/Part No.

<Tie-rod mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	BA7-040	BA7-040	BA7-063	BA7-080	BA7-080
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F59F/F5NT	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□C/A44C D-G39C/K39C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P3DW	BMB9-050S	BMB9-050S	BA9T-063S	BA9T-080S	BA9T-080S
D-P4DW	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080



∗ The figure shows the mounting example for the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types.

<Band mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A3□/A44 D-G39/K39	BDS-04M	BDS-05M	BMB1-063	BMB1-080	BMB1-100
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NT D-G5NB	BH2-040	BA5-050	BAF-06	BAF-08	BAF-10

Note 1) The auto switch mounting bracket is included in the D-A3□C/A44C/G39C/K39C types. Specify the part number as follows depending on the cylinder size when ordering.
(Example) ø40: D-A3□C-4, ø50: D-A3□C-5, ø63: D-A3□C-6, ø80: D-A3□C-8, ø100: D-A3□C-10

[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit (including set screws) is also available. Use it in accordance with the operating environment.
(Since the auto switch mounting bracket is not included, order it separately.)
BBA1: For D-A5/A6/F5/J5 types
BBA3: For D-B5/B6/G5/K5 types

Note 2) Refer to **the WEB catalog** or Best Pneumatics No. 3 for details on the BBA1 and BBA3.
The above stainless steel screws are used when a cylinder is shipped with D-F5BA or G5BA auto switches. When only an auto switch is shipped independently, the BBA1 or BBA3 is attached.

Note 3) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BA7-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6L stainless steel set screws included in the BBA1.

Note 4) There is a difference in the cylinder tube thickness depending on the cylinder model. When a band mounting type is used as an applicable auto switch and a cylinder model is changed, use caution.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.
Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features
Reed	D-A93V/A96V	Grommet (Perpendicular)	—
	D-A90V		Without indicator light
	D-A53/A56/B53/Z73/Z76	Grommet (In-line)	—
	D-A67/Z80		Without indicator light
Solid state	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		
	D-M9NWV/M9PWV/M9BWV		Diagnostic indication (2-color indication)
	D-Y7NWV/Y7PWV/Y7BWV		
	D-M9NAV/M9PAV/M9BAV		Water resistant (2-color)
	D-Y59A/Y59B/Y7P	Grommet (In-line)	—
	D-F59/F5P/J59		
	D-Y7NW/Y7PW/Y7BW		Diagnostic indication (2-color indication)
	D-F59W/F5PW/J59W		
	D-F5BA/Y7BA		Water resistant (2-color)
	D-F5NT/G5NT		With timer
	D-P5DW		Magnetic field resistant (2-color)

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Wide range detection type, solid state auto switch (D-G5NBL) is also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinder

Series CS2Y

ø125, ø140, ø160

How to Order

	CS2	Y	L	160		–	300		–				
With auto switch	CDS2	Y	L	160		–	300		–	M9BW		–	

With auto switch (Built-in magnet)

Smooth cylinder

Mounting

B	Basic
L	Foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Bore size

125	125 mm
140	140 mm
160	160 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Maximum Strokes" on page 1142.

Suffix for cylinder

Rod boot	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
With/without cushion	A	With double-side cushion
	R	With rod cushion
	H	With head cushion
	Nil	Without cushion

∗ When more than one symbol is specified, indicate them in alphabetical order.

Auto switch

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Made to Order
Refer to page 1142 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDS2YL125-200

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage: DC		Load voltage: AC	Auto switch model: Tie-rod mounting	Auto switch model: Band mounting	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9P	—	●	●	●	○	○		
				2-wire		12 V		M9B	—	●	●	●	○	○	—	
					—	—	100 V, 200 V	J51	—	●	—	●	○	—		
		Terminal conduit		3-wire (NPN)	24 V	5 V, 12 V	—	—	G39	—	—	—	—	—	IC circuit	
				2-wire		12 V		—	K39	—	—	—	—	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V	—	M9NW	—	●	●	●	○	○	IC circuit	
				3-wire (PNP)				M9PW	—	●	●	●	○	○		
				2-wire		12 V		M9BW	—	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NA**	—	○	○	●	○	○	IC circuit	
				3-wire (PNP)				M9PA**	—	○	○	●	○	○		
				2-wire		12 V		M9BA**	—	○	○	●	○	○	—	
	Diagnostic indication (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	—	●	—	●	○	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93	—	●	—	●	●	—	—	Relay, PLC
			No			5 V, 12 V	100 V or less	A90	—	●	—	●		—	IC circuit	
			Yes			12 V	100 V, 200 V	A54	—	●	—	●	●	—	—	
			No				200 V or less	A64	—	●	—	●	—	—		
		Terminal conduit	Yes				—	—	A33	—	—	—	—	—	—	PLC
							100 V, 200 V	—	A34	—	—	—	—	—		Relay, PLC
		DIN terminal						—	A44	—	—	—	—	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	—	●	—	●	—	—		

∗∗ 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 ·····Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

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

∗ Since there are other applicable auto switches than listed, refer to page 1153 for details.

∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ The D-A9□/M9□/M9□W/M9□A auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

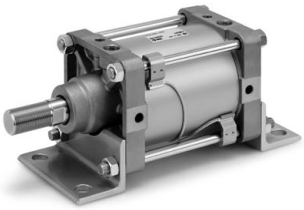
SMC

Designed with a low sliding resistance of the piston, this air cylinder is ideal for applications such as contact pressure control, which requires smooth movements at low pressure.

Low sliding resistance

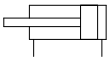
Min. operating pressure — 0.005 MPa

Auto switch mounting is possible.



Symbol

Double acting/Without cushion



Made to Order

Made to Order
(For details, refer to pages 1247 to 1264.)

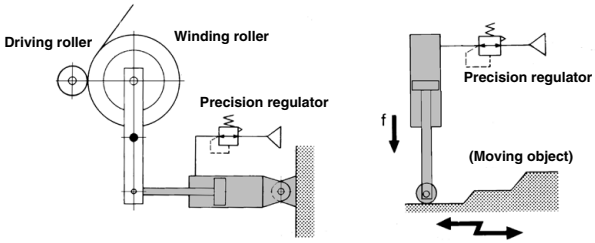
Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port position
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers
-XC27	Double clevis and double knuckle pins made of stainless steel
-XC30	Rod side trunnion
-XC68	Made of stainless steel (with hard chrome plated piston rod)
-XC86	With rod end bracket

Refer to pages 1151 to 1153 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Application Example

Low friction cylinder is used in combination with precision regulator (Series IR).



Specifications

Bore size (mm)	125	140	160
Action	Double acting, Single rod		
Direction of low friction	Both directions		
Fluid	Air		
Proof pressure	1.05 MPa		
Maximum operating pressure	0.7 MPa		
Ambient and fluid temperature	Without auto switch: 0°C to 70°C With auto switch: 0°C to 60°C (No freezing)		
Allowable leakage	Less than 0.5 L/min (ANR)		
Cushion	Without cushion* (manufacturable with cushion)		
Lubrication	Not required (Non-lube)		
Mounting	Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion		

* If an air cushion is not used, set the energy at the stroke end to 0.36 J or less.

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	125	140	160
Minimum operating pressure	0.005 MPa*		

* If a cushion is used, this value will not include the operating pressure within the cushion stroke.

Maximum Strokes

(mm)

Tube material	Aluminum alloy	Carbon steel tube	
Mounting bracket / Bore size (mm)	Basic, Head flange, Single clevis, Double clevis, Center trunnion Rod flange	Basic, Head flange, Single clevis, Double clevis, Center trunnion	Foot, Rod flange
125	1000 or less	1000 or less	1600 or less
140	1000 or less	1000 or less	1600 or less
160	1200 or less	1200 or less	1600 or less

Accessories

Mounting		Basic	Foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Clevis pin	—	—	—	—	—	●	—
Option	Rod end nut	●	●	●	●	●	●	●
	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with knuckle pin, split pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

Mounting Brackets/Part No.

Bore size (mm)	125	140	160
Foot*	CS2–L12	CS2–L14	CS2–L16
Flange	CS2–F12	CS2–F14	CS2–F16
Single clevis	CS2–C12	CS2–C14	CS2–C16
Double clevis**	CS2–D12	CS2–D14	CS2–D16

* Order two foot brackets per cylinder.
** When ordering the double clevis type, the clevis pin and 2 split pins are included as accessories.

Rod Boot Material

Symbol	Material	Max. ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C*

* Maximum ambient temperature for the rod boot itself.

Weights

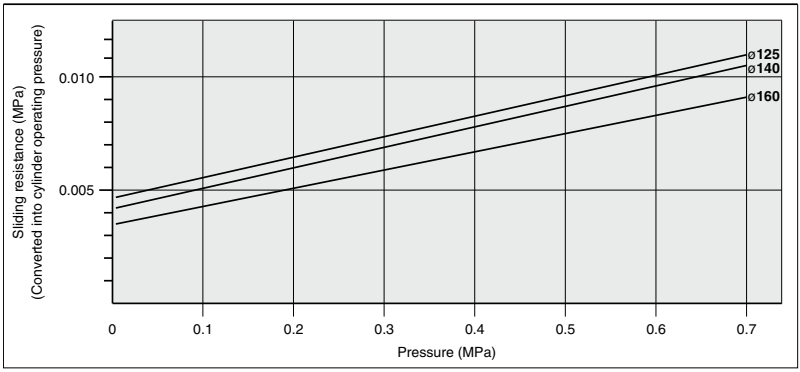
(kg)

Bore size (mm)		125	140	160
Basic weight	Basic	5.46	6.50	9.07
	Foot	7.49	9.50	12.45
	Rod flange	8.51	12.03	15.80
	Head flange	8.51	12.03	15.80
	Single clevis	8.53	10.79	14.56
	Double clevis	8.99	11.54	15.41
	Trunnion	9.59	12.23	15.47
Additional weight with magnet (With built-in magnet and auto switch)		0.07	0.07	0.08
Additional weight per 100 mm of stroke		1.55	1.67	2.23
Accessories	Single knuckle	0.91	1.16	1.56
	Double knuckle (With Knuckle pin, Split pin)	1.37	1.81	2.48
	Rod end nut	0.16	0.16	0.23

Calculation: (Example) **CS2Y160-500**
- Basic weight·····12.45 (kg)
- Additional weight·····2.23 (kg/100 mm)
- Cylinder stroke·····500 (mm)

12.45 + 2.23 x 500/100 = **23.60 kg**

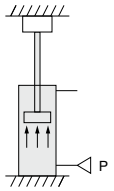
Sliding Resistance



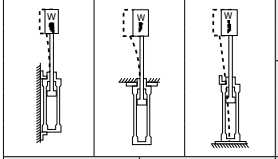
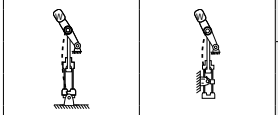
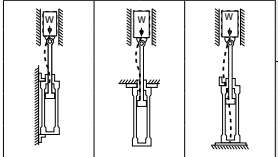
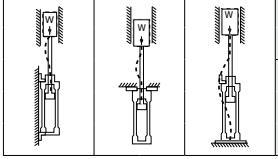
Relationship between Cylinder Size and Maximum Stroke

The below table shows the applicable maximum stroke (in cm units), found by calculation assuming the case where the force generated by the cylinder itself acts as buckling force on the piston rod, or piston rod and cylinder tube.
Therefore, it is possible to find the applicable maximum stroke for each cylinder size using the relationship between the size of the operating pressure and the cylinder support type, regardless of the load ratio.

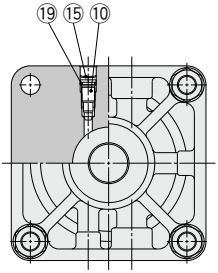
[Reference] If it is stopped with the external stopper on the cylinder extension side, even with a light load, the maximum generated force of the cylinder will act on the cylinder itself.

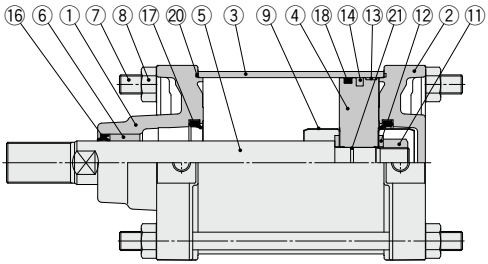


(cm)

Mounting			Nominal symbol	Operating pressure (MPa)	Applicable maximum stroke according to buckling strength (cm)		
Support bracket nominal symbol and schematic diagram					125	140	160
Foot: **L**	Rod flange: **F**	Head flange: **G**	**L, F**	0.3	103	92	113
				0.5	79	70	86
				0.7	66	58	72
			G	0.3	45	38	47
				0.5	33	27	34
				0.7	26	22	27
Clevis: **C, D**		Center trunnion: **T**	**C, D**	0.3	96	83	106
				0.5	71	61	76
				0.7	59	50	62
			T	0.3	135	119	147
				0.5	101	89	111
				0.7	84	74	91
Foot: **L**	Rod flange: **F**	Head flange: **G**	**L, F**	0.3	301	267	330
				0.5	231	207	253
				0.7	193	172	212
			G	0.3	144	126	156
				0.5	109	94	118
				0.7	90	78	97
Foot: **L**	Rod flange: **F**	Head flange: **G**	**L, F**	0.3	433	386	476
				0.5	334	297	367
				0.7	281	250	309
			G	0.3	210	185	229
				0.5	160	141	175
				0.7	134	117	129

Construction





Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum die-cast	Chromated
2	**Head cover**	Aluminum die-cast	Chromated
3	**Cylinder tube**	Aluminum alloy	Hard anodized
4	**Piston**	Aluminum alloy	Chromated
5	**Piston rod**	Carbon steel	Hard chrome plating
6	**Bushing**	Oil-impregnated sintered alloy	
7	**Tie-rod**	Carbon steel	Zinc chromated
8	**Tie-rod nut**	Rolled steel	Nickel plating
9	**Cushion ring**	Stainless steel	
10	**Cushion valve**	Rolled steel	Nickel plating
11	**Piston nut**	Carbon steel	Nickel plating
12	**Flat washer**	Carbon steel	Nickel plating
13	**Wear ring**	Resin	
14	**Magnet**∗	—	
15	**Retaining ring**	Spring steel	Phosphate treatment
16	**Rod seal**	NBR	
17	**Cushion seal**∗∗	Urethane	
18	**Piston seal**	NBR	
19	**Valve seal**	NBR	
20	**Tube gasket**	NBR	
21	**Piston gasket**	NBR	

∗ For types with built-in magnet or with auto switch
∗∗ Used with cushion only

Replacement Parts/Seal Kit

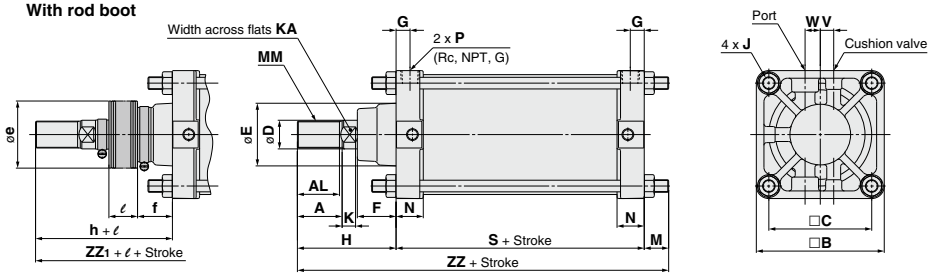
Bore size (mm)	Kit no.	Contents
125	CS2Y125A-PS	Without cushion Consists of ⑯, ⑱, ⑳
140	CS2Y140A-PS	
160	CS2Y160A-PS	
125	CS2Y125AA-PS	With single-side cushion Consists of ⑯, ⑰ (two), ⑱, ⑳
140	CS2Y140AA-PS	
160	CS2Y160AA-PS	
125	CS2Y125AR-PS	With single-side cushion Consists of ⑯, ⑰ (one), ⑱, ⑳
140	CS2Y140AR-PS	
160	CS2Y160AR-PS	

∗ Seal kit does not include a grease pack.
When only the grease is necessary, use the following part numbers to order.
Grease pack part number: GR-L-005 (5 g), **GR-S-010** (10 g), **GR-L-150** (150 g)

Dimensions

Basic: CS2YB

With rod boot



(mm)

Bore size (mm)	A	AL	□B	□C	D	E	F	G	J	V	W	K	KA	M	MM
125	50	47	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	27	M30 x 1.5
140	50	47	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	27	M30 x 1.5
160	56	53	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	30.5	M36 x 1.5

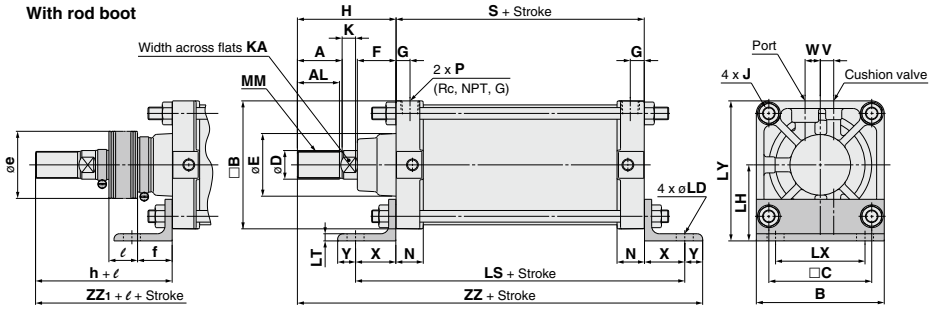
(mm)

Bore size (mm)	N	P	S	Without rod boot		With rod boot				
				H	ZZ	e	f	h	ℓ	ZZ1
125	30.5	1/2	98	110	235	75	40	133	1/5 Stroke	258
140	30.5	1/2	98	110	235	75	40	133	1/5 Stroke	258
160	34.5	3/4	106	120	256.5	75	40	141	1/5 Stroke	277.5

∗ The minimum stroke with rod boot is 30 mm or more.
∗∗ For auto switch mounting position and its mounting height, refer to page 1151.
∗∗∗ Refer to "Minimum Stroke for Auto Switch Mounting" on page 1152.

Foot: CS2YL

With rod boot



(mm)

Bore size (mm)	A	AL	□B	B	□C	D	E	F	G	J	V	W	K	KA	LD	LH	LS
125	50	47	143	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	19	85	188
140	50	47	157	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	19	100	188
160	56	53	177	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	19	106	206

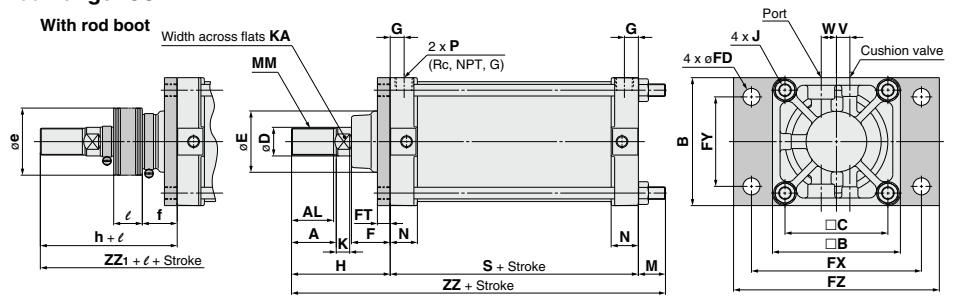
(mm)

Bore size (mm)	LT	LX	LY	MM	N	P	S	X	Y	Without rod boot		With rod boot				
										H	ZZ	e	f	h	ℓ	ZZ1
125	8	100	156.5	M30 x 1.5	30.5	1/2	98	45	20	110	273	75	40	133	1/5 Stroke	296
140	9	112	178.5	M30 x 1.5	30.5	1/2	98	45	30	110	283	75	40	133	1/5 Stroke	306
160	9	118	194.5	M36 x 1.5	34.5	3/4	106	50	25	120	301	75	40	141	1/5 Stroke	322

∗ The minimum stroke with rod boot is 30 mm or more.
∗∗ For auto switch mounting position and its mounting height, refer to page 1151.
∗∗∗ Refer to "Minimum Stroke for Auto Switch Mounting" on page 1152.

Dimensions

Rod flange: CS2YF



(mm)

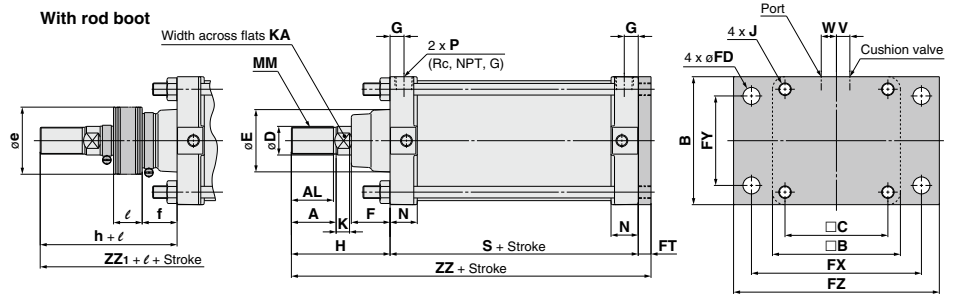
Bore size (mm)	A	AL	□B	B	□C	D	E	F	FD	FT	FX	FY	FZ	G	J	V
125	50	47	143	145	115	32	71	43	19	14	190	100	230	15	M14 x 1.5	15
140	50	47	157	160	128	32	71	43	19	20	212	112	255	15	M14 x 1.5	15
160	56	53	177	180	144	38	78.5	42	19	20	236	118	275	18	M16 x 1.5	15

(mm)

Bore size (mm)	W	K	KA	M	MM	N	P	S	Without rod boot		With rod boot				
									H	ZZ	e	f	h	ℓ	ZZ1
125	17	15	27	13	M30 x 1.5	30.5	1/2	98	110	221	75	40	133	1/5 Stroke	244
140	17	15	27	13	M30 x 1.5	30.5	1/2	98	110	221	75	40	133	1/5 Stroke	244
160	20	17	34	15	M36 x 1.5	34.5	3/4	106	120	241	75	40	141	1/5 Stroke	262

∗ The minimum stroke with rod boot is 30 mm or more.
∗∗ For auto switch mounting position and its mounting height, refer to page 1151.
∗∗∗ Refer to “Minimum Stroke for Auto Switch Mounting” on page 1152.

Head flange: CS2YG



(mm)

Bore size (mm)	A	AL	□B	B	□C	D	E	F	FD	FT	FX	FY	FZ	G	J	V
125	50	47	143	145	115	32	71	43	19	14	190	100	230	15	M14 x 1.5	15
140	50	47	157	160	128	32	71	43	19	20	212	112	255	15	M14 x 1.5	15
160	56	53	177	180	144	38	78.5	42	19	20	236	118	275	18	M16 x 1.5	15

(mm)

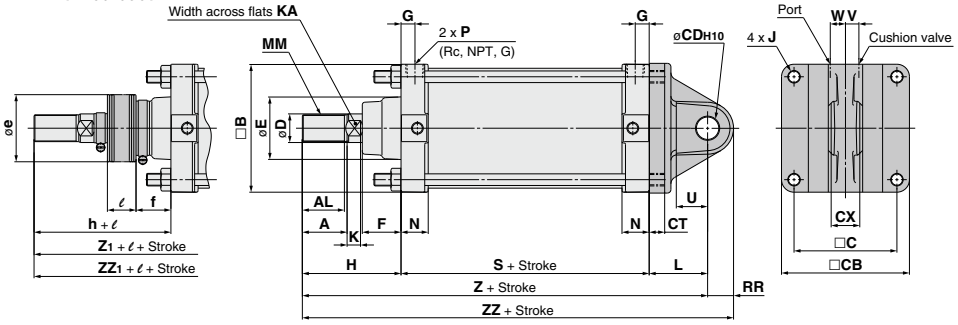
Bore size (mm)	W	K	KA	MM	N	P	S	Without rod boot		With rod boot				
								H	ZZ	e	f	h	ℓ	ZZ1
125	17	15	27	M30 x 1.5	30.5	1/2	98	110	222	75	40	133	1/5 Stroke	245
140	17	15	27	M30 x 1.5	30.5	1/2	98	110	228	75	40	133	1/5 Stroke	251
160	20	17	34	M36 x 1.5	34.5	3/4	106	120	246	75	40	141	1/5 Stroke	267

∗ The minimum stroke with rod boot is 30 mm or more.
∗∗ For auto switch mounting position and its mounting height, refer to page 1151.
∗∗∗ Refer to “Minimum Stroke for Auto Switch Mounting” on page 1152.

Dimensions

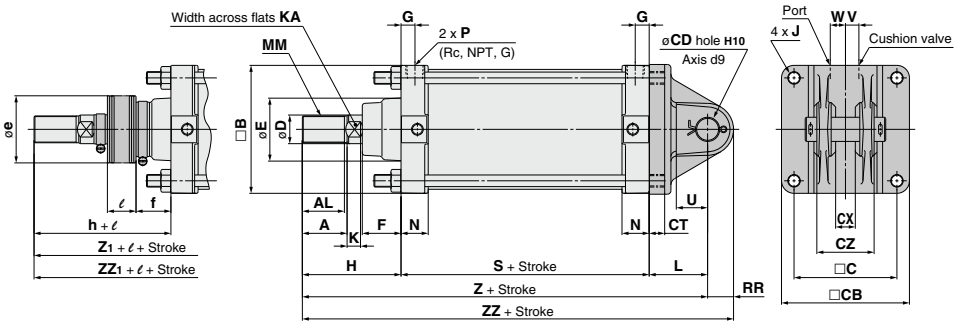
Single clevis: CS2YC

With rod boot



Double clevis: CS2YD

With rod boot



(mm)

Bore size (mm)	A	AL	□B	□C	□CB	CDH10	CT	Single clevis	Double clevis		D	E	F	G	J	V	W
								CX	CX	CZ							
125	50	47	143	115	145	$25^{+0.084}_{0}$	17	$32^{-0.1}_{-0.3}$	$32^{+0.3}_{+0.1}$	$64^{0}_{-0.2}$	32	71	43	15	M14 x 1.5	15	17
140	50	47	157	128	160	$28^{+0.084}_{0}$	17	$36^{-0.1}_{-0.3}$	$36^{+0.3}_{+0.1}$	$72^{0}_{-0.2}$	32	71	43	15	M14 x 1.5	15	17
160	56	53	177	144	180	$32^{+0.100}_{0}$	20	$40^{-0.1}_{-0.3}$	$40^{+0.3}_{+0.1}$	$80^{0}_{-0.2}$	38	78.5	42	18	M16 x 1.5	15	20

(mm)

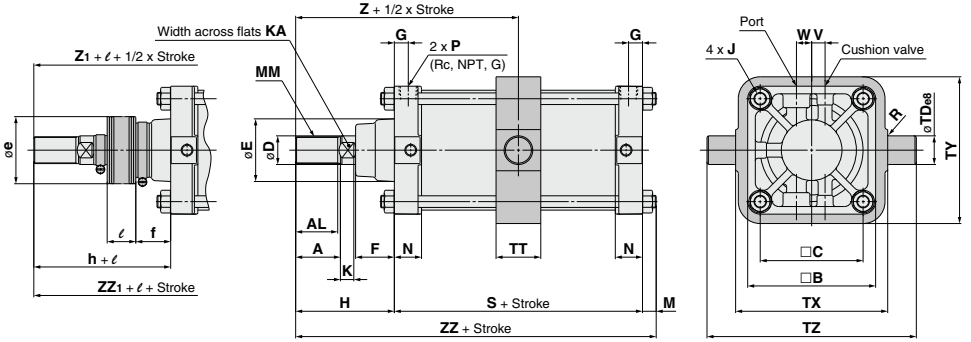
Bore size (mm)	K	KA	L	MM	N	P	S	U	RR	Without rod boot			With rod boot					
										H	Z	ZZ	e	f	h	ℓ	Z1	ZZ1
125	15	27	65	M30 x 1.5	30.5	1/2	98	35	29	110	273	302	75	40	133	1/5 Stroke	296	325
140	15	27	75	M30 x 1.5	30.5	1/2	98	40	32	110	283	315	75	40	133	1/5 Stroke	306	338
160	17	34	80	M36 x 1.5	34.5	3/4	106	45	36	120	306	342	75	40	141	1/5 Stroke	327	363

∗ The minimum stroke with rod boot is 30 mm or more.
∗∗ For auto switch mounting position and its mounting height, refer to page 1151.
∗∗∗ Refer to "Minimum Stroke for Auto Switch Mounting" on page 1152.

Dimensions

Center trunnion: CS2YT

With rod boot



(mm)

Bore size (mm)	A	AL	□B	□C	D	E	F	G	J	V	W	K	KA	M	MM	N
125	50	47	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	13	M30 x 1.5	30.5
140	50	47	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	13	M30 x 1.5	30.5
160	56	53	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	15	M36 x 1.5	34.5

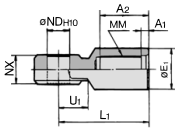
(mm)

Bore size (mm)	P	R	S	TD_{e8}	TT	TX	TY	TZ	Without rod boot			With rod boot					
									H	Z	ZZ	e	f	h	ℓ	Z_1	ZZ_1
125	1/2	1	98	$32^{-0.050}_{-0.089}$	50	170	164	234	110	159	221	75	40	133	1/5 Stroke	182	244
140	1/2	1.5	98	$36^{-0.050}_{-0.089}$	55	190	184	262	110	159	221	75	40	133	1/5 Stroke	182	244
160	3/4	1.5	106	$40^{-0.050}_{-0.089}$	60	212	204	292	120	173	241	75	40	141	1/5 Stroke	194	262

∗ The minimum stroke with rod boot is 30 mm or more for ø125, ø140 and 35 mm or more for ø160.
∗∗ For auto switch mounting position and its mounting height, refer to page 1151.
∗∗∗ Refer to “Minimum Stroke for Auto Switch Mounting” on page 1152.

Dimensions of Accessories

I Type Single Knuckle Joint*

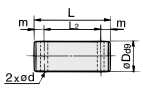


Material: Cast iron

(mm)

Part no.	Applicable bore size (mm)	A_1	A_2	E_1	L_1	MM	ND_{H10}	NX	RR_1	U_1
I-12A	**125**	8	54	46	100	M30 x 1.5	$25^{+0.084}_{0}$	$32^{-0.1}_{-0.3}$	27	33
I-14A	**140**	8	54	48	105	M30 x 1.5	$28^{+0.084}_{0}$	$36^{-0.1}_{-0.3}$	30	39
I-16A	**160**	8	60	55	110	M36 x 1.5	$32^{+0.1}_{0}$	$40^{-0.1}_{-0.3}$	34	39

Knuckle Pin/Clevis Pin



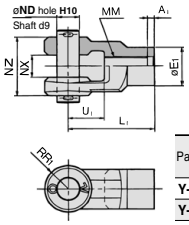
Material: Carbon steel

(mm)

Part no.	Applicable bore size (mm)	D_{d9}	L	L_2	m	d (Drill through)	Applicable split pin
IY-12	**125**	$25^{-0.065}_{-0.117}$	79.5	69.5	5	4	ø4 x 40
IY-14	**140**	$28^{-0.065}_{-0.117}$	86.5	76.5	5	4	ø4 x 40
IY-16	**160**	$32^{-0.080}_{-0.142}$	94.5	84.5	5	4	ø4 x 40

* Split pins are included.

Y Type Double Knuckle Joint*



Material: Cast iron

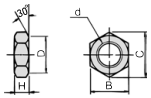
(mm)

Part no.	Applicable bore size (mm)	A_1	E_1	L_1	MM	ND_{H10}	NX	NZ	RR_1	U_1
Y-12A	**125**	8	46	100	M30 x 1.5	$25^{+0.084}_{0}$	$32^{+0.3}_{+0.1}$	$64^{-0.1}_{-0.3}$	27	42
Y-14A	**140**	8	48	105	M30 x 1.5	$28^{+0.084}_{0}$	$36^{+0.3}_{+0.1}$	$72^{-0.1}_{-0.3}$	30	47
Y-16A	**160**	8	55	110	M36 x 1.5	$32^{+0.1}_{0}$	$40^{+0.3}_{+0.1}$	$80^{-0.1}_{-0.3}$	34	46

* Use a single knuckle joint or a double knuckle joint individually.
(Screw it entirely over the rod end threads and tighten it.)
* Extend the dimensions of A, H. when using a single/double knuckle joint together with a rod end nut.
(To extend dimensions A, H, refer to the below table, and specify the product as made-to-order -XA0.)
* A pin and split pins are included with the double knuckled joint.

● "Made to Order" with rod end bracket (**-XC86**) is available when ordering cylinders and accessories together. Refer to page 1264 for details.

Rod End Nut

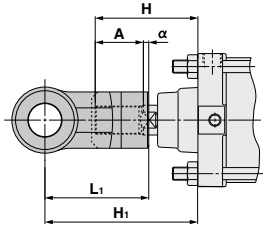


Material: Rolled steel

(mm)

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-12	**125, 140**	M30 x 1.5	18	46	53.1	44
NT-16	**160**	M36 x 1.5	21	55	63.5	53

Single/Double Knuckle Joint



(mm)

Bore size (mm) \ Symbol	H	A	α	L_1	H_1	Applicable knuckle joint part number	
						I type single knuckle	Y type double knuckle
125	110	50	3.5	100	156.5	I-12A	Y-12A
140	110	50	3.5	105	161.5	I-14A	Y-14A
160	120	56	3.5	110	170.5	I-16A	Y-16A

A, H Dimensions when Mounting a Single/Double Knuckle Joint together with a Rod End Nut (mm)

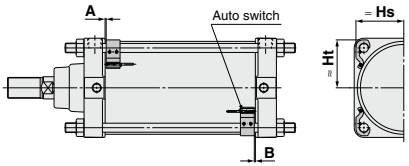
Bore size (mm)	A	H
125	65	125
140	65	125
160	76	140

Series CS2Y
Auto Switch Mounting

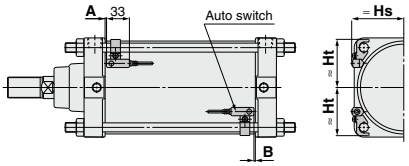
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Tie-rod mounting>

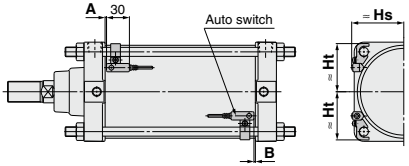
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BA



D-A5□/A6□

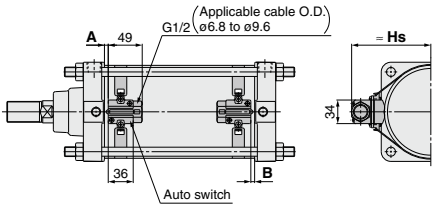


D-F5□/J5□/D-F5NT
D-F5BA/F59F
D-F5□W/J59W

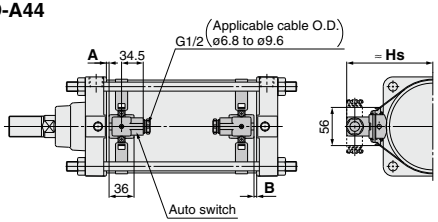


<Band mounting>

D-A3□
D-G3/K3



D-A44



∗ The indicator light faces the inside.

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BA		D-A5□ D-A6□ D-A3□ D-A44 D-G39 D-K39		D-A59W		D-F5□W D-J59W D-F5BA D-F5□ D-J5□ D-F59F		D-F5NT	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
125	13	12	9	8	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5
140	13	12	9	8	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5
160	13	12	9	8	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5

∗ Provided as guidelines for auto switch proper mounting position (detection at stroke end).
Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-M9□A D-A9□ D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA		D-A3□ D-G39 D-K39	D-A44	D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F5□W D-J59W D-F5BA D-F59F D-F5NT	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Ht	Hs	Ht
125	69	69.5	71.5	69.5	69	69.5	116	126	75.5	69.5	74.5	70
140	76	76	77.5	76	76	76	124	134	81	76.5	80	76.5
160	85	85	86	85	85	85	134.5	144.5	89	87.5	88	87.5

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches		Mounting brackets other than center trunnion	Center trunnion ø125	Center trunnion ø140	Center trunnion ø160
D-M9□ **D-M9□W**	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		15	105	110	115
	With n pcs.		$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$105 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$110 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$115 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)
D-M9□V **D-M9□WV**	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		10	80	85	90
	With n pcs.		$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$80 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$85 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$90 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)
D-M9□A	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		20	115	120	
	With n pcs.		$20 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$115 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$120 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	
D-M9□AV	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		15	90	95	
	With n pcs.		$15 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$90 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$95 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	
D-A9□	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		15	100	105	110
	With n pcs.		$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$100 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$105 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$110 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)
D-A9□V	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		10	75	80	85
	With n pcs.		$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$75 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$80 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$85 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)
D-A5□/A6□ **D-A59W** **D-F5□/J5□** **D-F5□W** **D-J59W** **D-F5BA** **D-F59F**	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		25	125	135	
	With n pcs. (Same surface)		$25 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$125 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$135 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	
D-F5NT	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		35	145	155	
	With n pcs. (Same surface)		$35 + 55\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$145 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$155 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	
D-A3□ **D-G39** **D-K39**	With 2 pcs.	Different surfaces	35	110		
		Same surface	100			
	With n pcs.	Different surfaces	35 + 30(n – 2)	110 + 30(n – 2) (n = 2, 4, 6, 8···)		
		Same surface	100 + 100(n – 2)	110 + 100(n – 2) (n = 2, 4, 6, 8···)		
	With 1 pc.		15	110		
D-A44	With 2 pcs.	Different surfaces	35	110		
		Same surface	55			
	With n pcs.	Different surfaces	35 + 30(n – 2)	110 + 30(n – 2) (n = 2, 4, 6, 8···)		
		Same surface	55 + 55(n – 2)	110 + 50(n – 2) (n = 2, 4, 6, 8···)		
	With 1 pc.		15	110		
D-Z7□ **D-Z80** **D-Y59□** **D-Y7P** **D-Y7□W**	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		15	105	110	115
	With n pcs.		$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$105 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$110 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$115 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)
D-Y69□ **D-Y7PV** **D-Y7□WV**	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		10	90	95	100
	With n pcs.		$10 + 30\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$90 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$95 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$100 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)
D-Y7BA	With 2 pcs. (Different surfaces, Same surface), With 1 pc.		20	115	120	125
	With n pcs.		$20 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···)	$115 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$120 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)	$125 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16···)

Operating Range

(mm)

Auto switch model	Bore size		
	125	140	160
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	6	6.5	6.5
D-A9□/A9□V	12	12.5	11.5
D-Z7□/Z80	14	14.5	13
D-A3□/A44 D-A5□/A6□	10	10	10
D-A59W	17	17	17
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	12	13	7
D-F5□/J5□/F5□W D-J59W/F5BA D-F5NT/F59F	5	5	5.5
D-G39/K39	11	11	10

∗ 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 model	Bore size (mm)		
	ø125	ø140	ø160
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	BS5-125	BS5-125	BS5-160
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5NT D-F5□W/J59W D-F5BA/F59F	BT-12	BT-12	BT-16
D-A3□/A44 D-G39/K39	BS1-125	BS1-140	BS1-160
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	BS4-125	BS4-125	BS4-160

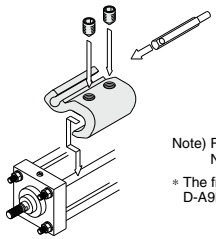
[Stainless Steel Mounting Screw]

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

BBA1: For D-A5/A6/F5/J5 types

The above stainless steel screws are used when a cylinder is shipped with the D-F5BA auto switch. When only the auto switch is shipped independently, the BBA1 is attached.

Note) When using the D-M9□A/M9□AV or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BS5-□□□, BS4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 8L stainless steel set screws included in the BBA1.



Note) Refer to **the WEB catalog** or Best Pneumatics No. 3. for details on the BBA1.

∗ The figure shows the mounting example for the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features
Reed	D-A90V	Grommet (Perpendicular)	Without indicator light
	D-A93V/A96V		—
	D-Z73/Z76	Grommet (In-line)	
	D-A53/A56		
	D-A67		Without indicator light
	D-Z80		
Solid state	D-F59/F5P/J59	Grommet (In-line)	—
	D-Y59A/Y59B/Y7P		
	D-F59W/F5PW/J59W		2-color indication
	D-Y7NW/Y7PW/Y7BW		
	D-F5BA/Y7BA		Water resistant (2-color indication)
	D-F5NT		With timer
	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		
	D-M9NWV/M9PWV/M9BWV		2-color indication
	D-Y7NWV/Y7PWV/Y7BWV		
	D-M9NAV/M9PAV/M9BAV		Water resistant (2-color indication)

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Smooth Cylinder

Series CQSY

ø12, ø16, ø20, ø25

How to Order

CQSY B 20 – 30 D C

With auto switch **CDQSY B 20 – 30 D C – M9BW ☐**

With auto switch
(Built-in magnet)

Mounting

B	Through-hole/Both ends tapped (Standard)
L	Foot Note)
LC	Compact foot
F	Rod flange
G	Head flange
D	Double clevis

∗ Mounting bracket is shipped together with the product, (but not assembled).

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1155.

Action

D	Double acting

Cushion/Rod end thread

C	With rubber bumper Female rod end
CM	With rubber bumper Male rod end

Auto switch

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSYL25-30DC

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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 (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	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)			3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV***	M9NA***	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○	○		
				2-wire	12 V		M9BAV***	M9BA***	○	○	●	○	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—		—	P3DW**	●	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	●	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

*** 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 ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

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

** The D-P3DW□ is only compatible with ø25.
It is mounted away from the port side to avoid interference with fittings.

∗ Since there are other applicable auto switches than listed, refer to page 1161 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
For the D-P3DW□, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Auto switches are shipped together, (but not assembled).
Note) The D-A9□V/M9□V/M9□WV/M9□AV auto switches may not be mounted on the port side depending on the cylinder stroke or the fitting size of piping.

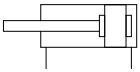
Specifications

Bore size (mm)	12	16	20	25
Type	Pneumatic (Non-lube)			
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			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0}_{0}$ mm Note)			
Piston speed	5 to 500 mm/s			
Allowable leakage rate	0.5 L/min (ANR) or less			

Note) Stroke length tolerance does not include the amount of bumper change.

Symbol

Rubber bumper



Minimum Operating Pressure

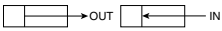
Unit: MPa

Bore size (mm)	12	16	20	25
Minimum operating pressure	0.03		0.02	

Standard Strokes

Bore size (mm)	Standard stroke (mm)
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Theoretical Output



Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)		
				0.3	0.5	0.7
12	6	IN	84.8	25	42	59
		OUT	113	34	57	79
16	8	IN	151	45	75	106
		OUT	201	60	101	141
20	10	IN	236	71	118	165
		OUT	314	94	157	220
25	12	IN	378	113	189	264
		OUT	491	147	245	344

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	
12	CQSY12-PS	Piston seal	1 pc.
16	CQSY16-PS	Rod seal	1 pc.
20	CQSY20-PS	Tube gasket	1 pc.
25	CQSY25-PS	Grease pack (10 g)	1 pc.

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: **GR-L-005** (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Intermediate Stroke

Method		Installation of spacer on standard stroke body.	
Model no.		Refer to page 1154 for standard model no.	
Standard stroke	Method	Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders.	
	Stroke range	Bore size (mm)	Stroke range (mm)
		12, 16	1 to 29
		20, 25	1 to 49
Example		Part no.: CQSYB25-47DC CQSYB25-50DC with 3 mm width spacer inside. B dimension is 77.5 mm. Calculation:ø25, B dimension 27.5 mm (without auto switch) 27.5 (B dimension) + 50 (st) = 77.5 (mm)	

Weights/Without Auto Switch

(g)

Bore size (mm)	Cylinder stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	37	43	50	57	63	70	—	—	—	—
16	49	57	66	74	83	92	—	—	—	—
20	75	88	101	114	127	140	153	165	178	191
25	109	125	140	156	172	188	204	220	236	252

Weights/With Auto Switch (Built-in magnet)

(g)

Bore size (mm)	Cylinder stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	45	51	58	65	71	78	—	—	—	—
16	59	67	76	85	94	103	—	—	—	—
20	106	119	132	145	157	170	183	195	208	221
25	151	167	183	199	215	231	246	262	278	294

Additional Weights

(g)

Bore size (mm)		**12**	**16**	**20**	**25**
Male rod end	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Foot (Including mounting bolt)		55	65	159	181
Compact foot (Including mounting bolt)		32	40	97	116
Rod flange (Including mounting bolt)		58	70	143	180
Head flange (Including mounting bolt)		56	66	137	171
Double clevis (Including pin, retaining ring, mounting bolt)		34	40	92	127

For standard strokes

Calculation: (Example) **CQSYD20-20DCM**

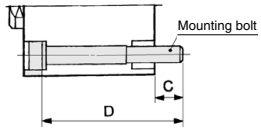
- Basic weight: CQSYB20-20DC ····· 114 g
- Additional weight: Male rod end ····· 10 g
  : Double clevis ····· 92 g

216 g

Mounting Bolt for CQSYB without Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of the CQSYB is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3X30L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CQSYB12-5DC	6.5	30	CQ-M3X30L
-10DC		35	X35L
-15DC		40	X40L
-20DC		45	X45L
-25DC		50	X50L
-30DC		55	X55L
CQSYB16-5DC	6.5	30	CQ-M3X30L
-10DC		35	X35L
-15DC		40	X40L
-20DC		45	X45L
-25DC		50	X50L
-30DC		55	X55L
CQSYB20-5DC	6.5	30	CQ-M5X30L
-10DC		35	X35L
-15DC		40	X40L
-20DC		45	X45L

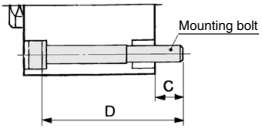
Cylinder model	C	D	Mounting bolt part no.
CQSYB20-25DC	6.5	50	CQ-M5X50L
-30DC		55	X55L
-35DC		60	X60L
-40DC		65	X65L
-45DC		70	X70L
-50DC		75	X75L
CQSYB25-5DC	8.5	35	CQ-M5X35L
-10DC		40	X40L
-15DC		45	X45L
-20DC		50	X50L
-25DC		55	X55L
-30DC		60	X60L
-35DC		65	X65L
-40DC		70	X70L
-45DC		75	X75L
-50DC		80	X80L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSYB with Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of the CDQSYB is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3X35L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CDQSYB12-5DC	6.5	35	CQ-M3X35L
-10DC		40	X40L
-15DC		45	X45L
-20DC		50	X50L
-25DC		55	X55L
-30DC		60	X60L
CDQSYB16-5DC	6.5	35	CQ-M3X35L
-10DC		40	X40L
-15DC		45	X45L
-20DC		50	X50L
-25DC		55	X55L
-30DC		60	X60L
CDQSYB20-5DC	6.5	40	CQ-M5X40L
-10DC		45	X45L
-15DC		50	X50L
-20DC		55	X55L

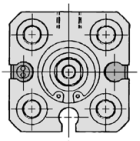
Cylinder model	C	D	Mounting bolt part no.
CDQSYB20-25DC	6.5	60	CQ-M5X60L
-30DC		65	X65L
-35DC		70	X70L
-40DC		75	X75L
-45DC		80	X80L
-50DC		85	X85L
CDQSYB25-5DC	8.5	45	CQ-M5X45L
-10DC		50	X50L
-15DC		55	X55L
-20DC		60	X60L
-25DC		65	X65L
-30DC		70	X70L
-35DC		75	X75L
-40DC		80	X80L
-45DC		85	X85L
-50DC		90	X90L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

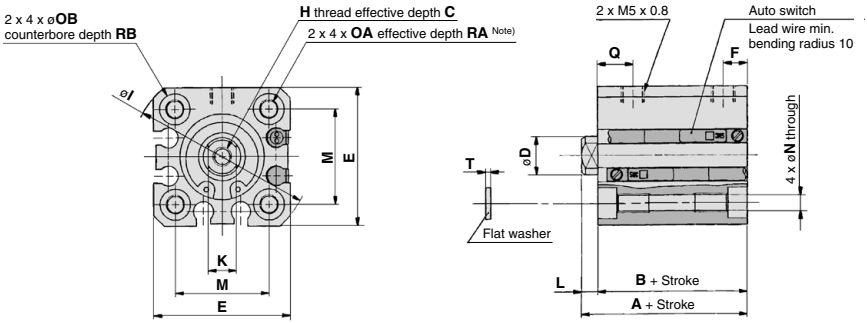
Dimensions: ø12 to ø25

Standard (Through-hole/Both ends tapped): CQSYB/CDQSYB

ø12

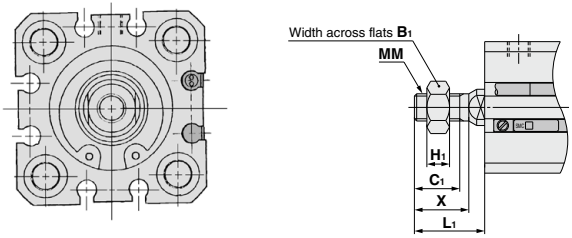


ø16



ø20, ø25

Male rod end



Male Rod End

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

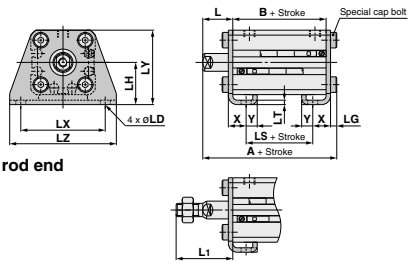
Standard

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
		A	B	A	B																
12	5 to 30	25.5	22	30.5	27	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	8	29	5	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	9	8	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	9	10	7	1

Note) Threaded through-hole is used for the standard of ø20 with 5 to 10 mm strokes and ø25 with a 5 mm stroke.

Dimensions: ø12 to ø25

Foot: CQSYL/CDQSYL



Male rod end

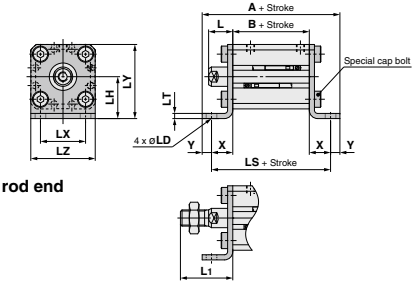
Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
12	5 to 30	40.3	22	10	45.3	27	15
16	5 to 30	40.3	22	10	45.3	27	15
20	5 to 50	46.2	24.5	12.5	56.2	34.5	22.5
25	5 to 50	49.7	27.5	12.5	59.7	37.5	22.5

Bore size (mm)	L	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQSYLC/CDQSYLC



Male rod end

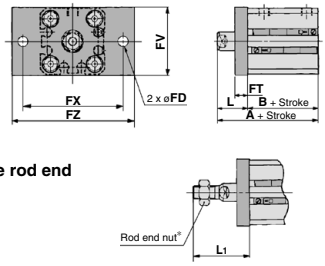
Compact Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
12	5 to 30	49.6	22	40.6	54.6	27	45.6
16	5 to 30	50.6	22	40.6	55.6	27	45.6
20	5 to 50	62.5	24.5	50.9	72.5	34.5	60.9
25	5 to 50	65.5	27.5	53.9	75.5	37.5	63.9

Bore size (mm)	L	L1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQSYF/CDQSYF



Male rod end

Rod Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
12	5 to 30	35.5	22	40.5	27
16	5 to 30	35.5	22	40.5	27
20	5 to 50	39	24.5	49	34.5
25	5 to 50	42.5	27.5	52.5	37.5

Bore size (mm)	FD	FT	FV	FX	FZ	L	L1
12	4.5	5.5	25	45	55	13.5	24
16	4.5	5.5	30	45	55	13.5	25.5
20	6.6	8	39	48	60	14.5	28.5
25	6.6	8	42	52	64	15	32.5

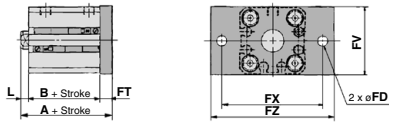
Flange bracket material: Carbon steel
Surface treatment: Nickel plating

* For details about the rod end nut and accessory brackets, refer to page 1174.

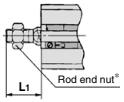
Air Cylinders
CJ2
CM2
CG1
MB
CA2
CQ2 CQS
Lube-retainer
JA
MXH
MXQ
MGP
C□Y C□X
CK□1
C(L)K□
C(L)KU
CKQ
CKZ2N
WRF
INDEX

Dimensions: ø12 to ø25

Head flange: CQSYG/CDQSYG



Male rod end



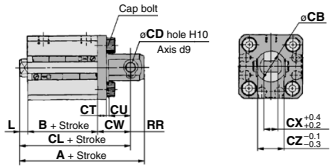
Head Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
12	5 to 30	31	22	36	27
16	5 to 30	31	22	36	27
20	5 to 50	37	24.5	47	34.5
25	5 to 50	40.5	27.5	50.5	37.5

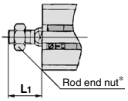
Bore size (mm)	FD	FT	FV	FX	FZ	L	L1
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	8	39	48	60	4.5	18.5
25	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

Double clevis: CQSYD/CDQSYD



Male rod end



Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
12	5 to 30	45.5	22	39.5	50.5	27	44.5
16	5 to 30	46.5	22	40.5	51.5	27	45.5
20	5 to 50	56	24.5	47	66	34.5	57
25	5 to 50	62.5	27.5	52.5	72.5	37.5	62.5

Bore size (mm)	CB	CD	CT	CU	CW	CX	CZ	L	L1	RR
12	12	5	4	7	14	5	10	3.5	14	6
16	14	5	4	10	15	6.5	12	3.5	15.5	6
20	20	8	5	12	18	8	16	4.5	18.5	9
25	24	10	5	14	20	10	20	5	22.5	10

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plating

∗ For details about the rod end nut and accessory brackets, refer to page 1174.

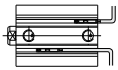
Auto Switch Mounting

Minimum Stroke for Auto Switch Mounting

(mm)

Number of auto switches	D-M9□V	D-A9□V	D-M9□WV D-M9□AV	D-A9□	D-M9□W D-M9□A	D-M9□	D-P3DW□ Note 1)
With 1 pc.	5	5	10	10(5)	15(10)	15(5)	15
With 2 pcs.	5	10	10	10	15(10)	15(5)	15

Note 1) ø25 is only applicable for the D-P3DW□.
Note 2) The dimensions stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure on the right.) Order auto switches separately.



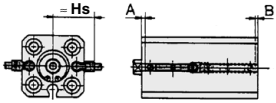
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

ø12

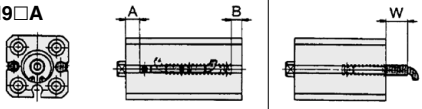
Mounting

a) b)

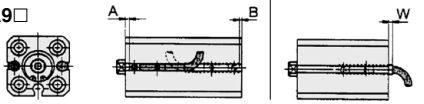
D-M9□V
D-M9□WV
D-M9□AV
D-A9□V



D-M9□
D-M9□W
D-M9□A



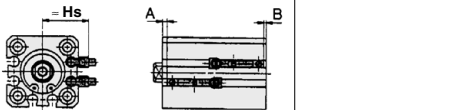
D-A9□

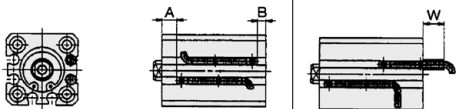


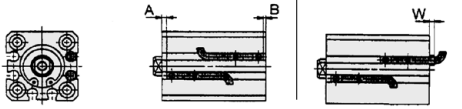
ø16 to ø25

Mounting

a) b)

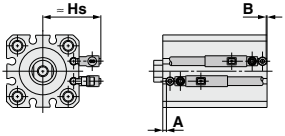






D-P3DW□

ø25



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□/M9□W			D-M9□A			D-M9□V/M9□WV D-M9□AV			D-A9□			D-A9□V			D-P3DW□		
	A	B	W	A	B	W	A	B	Hs	A	B	W	A	B	Hs	A	B	Hs
12	5.5	3.5	5.5	5.5	3.5	7.5	5.5	3.5	19.5	1.5	0	1.5 [4] [5]	1.5	0	17	—	—	—
16	6	4	6	6	4	8	6	4	21.5	2	0	2 [4.5]	2	0	19	—	—	—
20	10	7.5	2.5	10	7.5	4.5	10	7.5	25	6	3.5	–1.5 [1]	6	3.5	22.5	—	—	—
25	11	9.5	0.5	11	9.5	2.5	11	9.5	27	7	5.5	–3.5 [–1]	7	5.5	24.5	1.5	0	32

Note 1) [ ]: Denotes the dimensions of the D-A93.
Note 2) Adjust the auto switch after confirming the operating condition in the actual setting.
Note 3) The product is shipped out of the factory in installation state "a)". To change the electrical entry direction of the switch on the head, refer to installation state "b)".
Note 4) Negative figures for W indicate an auto switch is mounted inward from the edge of the cylinder body.

Operating Range

(mm)

Auto switch model	Bore size			
	12	**16**	**20**	**25**
D-M9□/M9□V **D-M9□W/M9□WV** **D-M9□A/M9□AV**	3	3.5	5.5	4.5
D-A9□/A9□V	6	7.5	10	10
D-P3DW	—	—	—	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.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

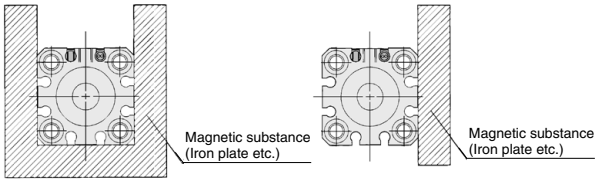
∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

⚠Precautions

Be sure to read before handling.
Refer to page 1574 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

• If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the figure on the right (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable. Therefore, please consult with SMC for this type of application.



Smooth Cylinder

Series CQ2Y

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CQ2Y B 32 – 30 D C Z

With auto switch **CDQ2Y B 32 – 30 D C Z – M9BW**

With auto switch (Built-in magnet)

Mounting

B	Through-hole (Standard)
A	Both ends tapped
L	Foot Note)
LC	Compact foot
F	Rod flange
G	Head flange
D	Double clevis

∗ Mounting bracket is shipped together with the product, (but not assembled).

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1164.

Action

D	Double acting

Cushion

C	Rubber bumper

Body option

Nil	Standard (Female rod end)
M	Male rod end

Auto switch mounting groove

Z	4 surfaces

Auto switch

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2YL40-50DCZ

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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 (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load:	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	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		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV**	M9NA**	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV**	M9PA**	○	○	●	○	—	○		
				2-wire	12 V		M9BAV**	M9BA**	○	○	●	○	—	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—		—	P3DW	●	—	●	●	—	○	—	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	Relay, PLC
			No	2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	●	—	—	—	
						5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	

∗∗ 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 ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

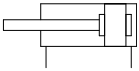
∗ Solid state auto switches marked with "○" are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed, refer to page 1179 for details.

∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.

Symbol

Rubber bumper



Specifications

Bore size (mm)	32	40	50	63	80	100
Type	Pneumatic (Non-lube)					
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)					
Stroke length tolerance	$^{+1.0\ \text{mm}\ \text{Note)}}_{0}$					
Piston speed range	5 to 500 mm/s					
Allowable leakage rate	0.5 L/min (ANR) or less					

Note) Stroke length tolerance does not include the amount of bumper change.

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	32	40	50	63	80	100
Minimum operating pressure	0.02		0.01			

Standard Strokes

Bore size (mm)	Standard stroke (mm)
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63, 80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

Theoretical Output

OUT IN

Unit: N

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1155
	OUT	589	982	1374
63	IN	841	1402	1962
	OUT	935	1559	2182
80	IN	1361	2268	3175
	OUT	1508	2513	3519
100	IN	2144	3574	5003
	OUT	2356	3927	5498

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
32	CQ2Y32-PS	Piston seal 1 pc. Rod seal 1 pc. Tube gasket 1 pc. Grease pack (10 g) 1 pc.
40	CQ2Y40-PS	
50	CQ2Y50-PS	
63	CQ2Y63-PS	
80	CQ2Y80-PS	
100	CQ2Y100-PS	

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number: **GR-L-005** (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

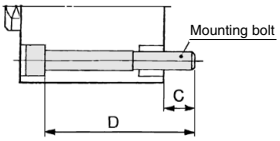
Intermediate Stroke

Method		Installation of spacer on standard stroke body.
Model no.		Refer to page 1163 for standard model no.
Standard stroke	Method	Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders.
	Stroke range	Bore size (mm): 32 to 100 / Stroke range (mm): 1 to 99
Example		Part no.: CQ2YB50-57DCZ CQ2YB50-75DCZ with 18 mm width spacer inside. B dimension is 125.5 mm. Calculation:ø50, B dimension 50.5 mm (without switch) 50.5 (B dimension) + 75 (st) = 125.5 (mm)

Mounting Bolt

Mounting method: Mounting bolt for through-hole mounting style of the CQ2YB is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M5X40L 2 pcs.



Mounting Bolt for CQ2YB without Auto Switch

Cylinder model	C	D	Mounting bolt part no.
CQ2YB32- 5DC	9	40	CQ-M5X40L
- 10DC		45	X45L
- 15DC		50	X50L
- 20DC		55	X55L
- 25DC		60	X60L
- 30DC		65	X65L
- 35DC		70	X70L
- 40DC		75	X75L
- 45DC		80	X80L
- 50DC		85	X85L
- 75DC		120	X120L
-100DC		145	X145L
CQ2YB40- 5DC	7.5	45	CQ-M5X45L
- 10DC		50	X50L
- 15DC		55	X55L
- 20DC		60	X60L
- 25DC		65	X65L
- 30DC		70	X70L
- 35DC		75	X75L
- 40DC		80	X80L
- 45DC		85	X85L
- 50DC		90	X90L
- 75DC		125	X125L
-100DC		150	X150L
CQ2YB50- 10DC	12.5	55	CQ-M6X55L
- 15DC		60	X60L
- 20DC		65	X65L
- 25DC		70	X70L
- 30DC		75	X75L
- 35DC		80	X80L
- 40DC		85	X85L
- 45DC		90	X90L
- 50DC		95	X95L
- 75DC		130	X130L
-100DC		155	X155L

Cylinder model	C	D	Mounting bolt part no.
CQ2YB63- 10DC	14.5	60	CQ-M8X60L
- 15DC		65	X65L
- 20DC		70	X70L
- 25DC		75	X75L
- 30DC		80	X80L
- 35DC		85	X85L
- 40DC		90	X90L
- 45DC		95	X95L
- 50DC		100	X100L
- 75DC		135	X135L
-100DC		160	X160L
CQ2YB80- 10DC	15	65	CQ-M10X65L
- 15DC		70	X70L
- 20DC		75	X75L
- 25DC		80	X80L
- 30DC		85	X85L
- 35DC		90	X90L
- 40DC		95	X95L
- 45DC		100	X100L
- 50DC		105	X105L
- 75DC		140	X140L
-100DC		165	X165L
CQ2YB100- 10DC	15.5	75	CQ-M10X75L
- 15DC		80	X80L
- 20DC		85	X85L
- 25DC		90	X90L
- 30DC		95	X95L
- 35DC		100	X100L
- 40DC		105	X105L
- 45DC		110	X110L
- 50DC		115	X115L
- 75DC		150	X150L
-100DC		175	X175L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQ2YB with Auto Switch (Built-in magnet)

Cylinder model	C	D	Mounting bolt part no.
CDQ2YB32- 5	9	50	CQ-M5X50L
- 10		55	X55L
- 15		60	X60L
- 20		65	X65L
- 25		70	X70L
- 30		75	X75L
- 35		80	X80L
- 40		85	X85L
- 45		90	X90L
- 50		95	X95L
- 75		120	X120L
-100		145	X145L
CDQ2YB40- 5	7.5	55	CQ-M5X55L
- 10		60	X60L
- 15		65	X65L
- 20		70	X70L
- 25		75	X75L
- 30		80	X80L
- 35		85	X85L
- 40		90	X90L
- 45		95	X95L
- 50		100	X100L
- 75		125	X125L
-100		150	X150L
CDQ2YB50- 10	12.5	65	CQ-M6X65L
- 15		70	X70L
- 20		75	X75L
- 25		80	X80L
- 30		85	X85L
- 35		90	X90L
- 40		95	X95L
- 45		100	X100L
- 50		105	X105L
- 75		130	X130L
-100		155	X155L

Cylinder model	C	D	Mounting bolt part no.
CDQ2YB63- 10	14.5	70	CQ-M8X70L
- 15		75	X75L
- 20		80	X80L
- 25		85	X85L
- 30		90	X90L
- 35		95	X95L
- 40		100	X100L
- 45		105	X105L
- 50		110	X110L
- 75		135	X135L
-100		160	X160L
CDQ2YB80- 10	15	75	CQ-M10X75L
- 15		80	X80L
- 20		85	X85L
- 25		90	X90L
- 30		95	X95L
- 35		100	X100L
- 40		105	X105L
- 45		110	X110L
- 50		115	X115L
- 75		140	X140L
-100		165	X165L
CDQ2YB100- 10	15.5	85	CQ-M10X85L
- 15		90	X90L
- 20		95	X95L
- 25		100	X100L
- 30		105	X105L
- 35		110	X110L
- 40		115	X115L
- 45		120	X120L
- 50		125	X125L
- 75		150	X150L
-100		175	X175L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Bore Size

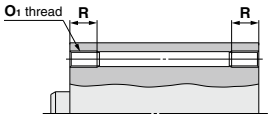
ø32 to ø50

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Through-hole: CQ2YB/CDQ2YB

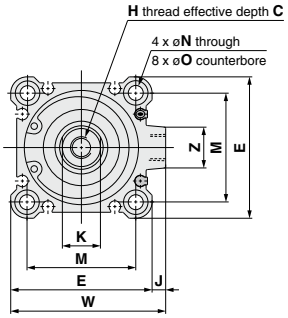
Both ends tapped: CQ2YA/CDQ2YA

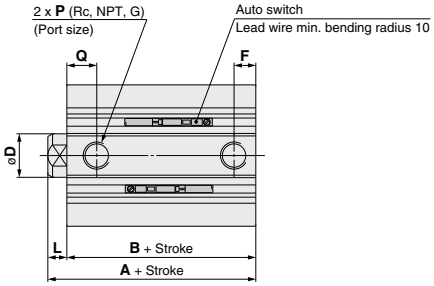
CDQ2YA



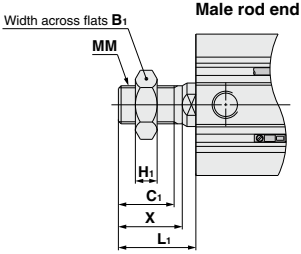
Both Ends Tapped (mm)

Bore size (mm)	O_1	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14





Male rod end



Male Rod End (mm)

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

(mm)

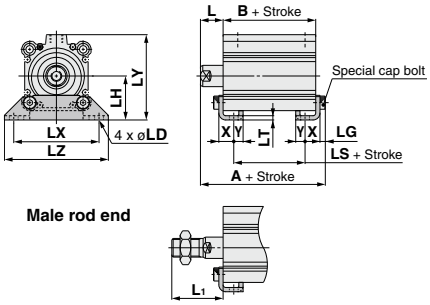
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B															
32	5 to 50	40	33	50	43	13	16	45	7.5	M8 x 1.25	4.5	14	7	34	5.5	9 depth 7	1/8	10	49.5	14
	75, 100	50	43																	
40	5 to 50	46.5	39.5	56.5	49.5	13	16	52	7.5	M8 x 1.25	5	14	7	40	5.5	9 depth 7	1/8	12.5	57	14
	75, 100	56.5	49.5																	
50	10 to 50	48.5	40.5	58.5	50.5	15	20	64	10.5	M10 x 1.5	7	17	8	50	6.6	11 depth 8	1/4	10.5	71	19
	75, 100	58.5	50.5																	

Bore Size

ø32 to ø50

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Foot: CQ2YL/CDQ2YL



Foot

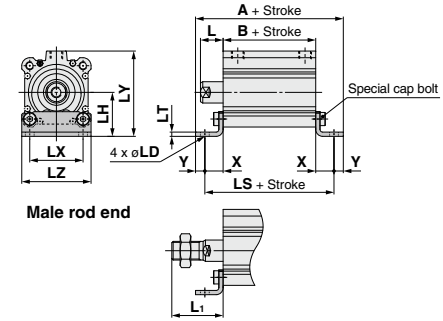
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
32	5 to 50	57.2	33	17	67.2	43	27	17	38.5	6.6
	75, 100	67.2	43	27						
40	5 to 50	63.7	39.5	23.5	73.7	49.5	33.5	17	38.5	6.6
	75, 100	73.7	49.5	33.5						
50	10 to 50	66.7	40.5	17.5	76.7	50.5	27.5	18	43.5	9
	75, 100	76.7	50.5	27.5						

Bore size (mm)	Stroke range (mm)	LG	LH	LT	LX	LY	LZ	X	Y
32	5 to 50	4	30	3.2	57	57	71	11.2	5.8
	75, 100								
40	5 to 50	4	33	3.2	64	64	78	11.2	7
	75, 100								
50	10 to 50	5	39	3.2	79	78	95	14.7	8
	75, 100								

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQ2YLC/CDQ2YLC



Compact Foot

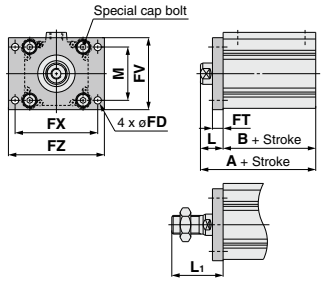
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
32	5 to 50	72	33	60.4	82	43	70.4	17	38.5	6.6
	75, 100	82	43	70.4						
40	5 to 50	80.9	39.5	66.9	90.9	49.5	76.9	17	38.5	6.6
	75, 100	90.9	49.5	76.9						
50	10 to 50	89.9	40.5	73.9	99.9	50.5	83.9	18	43.5	9
	75, 100	99.9	50.5	83.9						

Bore size (mm)	Stroke range (mm)	LH	LT	LX	LY	LZ	X	Y
32	5 to 50	30	3.2	34	57	45	13.7	5.8
	75, 100							
40	5 to 50	33	3.2	40	64	52	13.7	7
	75, 100							
50	10 to 50	39	3.2	50	78	64	16.7	8
	75, 100							

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQ2YF/CDQ2YF



Rod Flange

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	With auto switch A	B	FD	FT	FV	FX	FZ
32	5 to 50	50	33	60	43	5.5	8	48	56	65
	75, 100	60	43							
40	5 to 50	56.5	39.5	66.5	49.5	5.5	8	54	62	72
	75, 100	66.5	49.5							
50	10 to 50	58.5	40.5	68.5	50.5	6.6	9	67	76	89
	75, 100	68.5	50.5							

Bore size (mm)	Stroke range (mm)	L	L1	M
32	5 to 50	17	38.5	34
	75, 100			
40	5 to 50	17	38.5	40
	75, 100			
50	10 to 50	18	43.5	50
	75, 100			

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

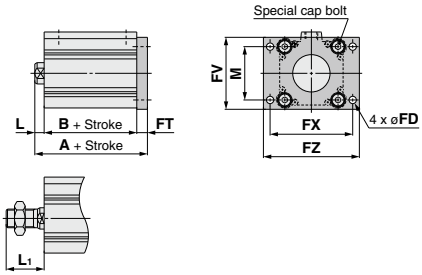
∗ For details about the rod end nut and accessory brackets, refer to page 1174.

Bore Size

ø32 to ø50

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Head flange: CQ2YG/CDQ2YG



Head Flange

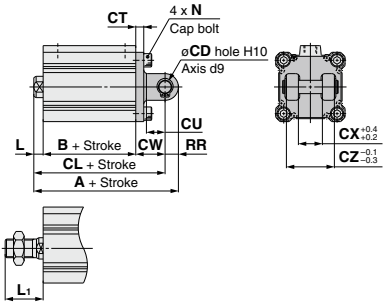
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	With auto switch A	L	L1
32	5 to 50	48	58	7	28.5
	75, 100	58			
40	5 to 50	54.5	64.5	7	28.5
	75, 100	64.5			
50	10 to 50	57.5	67.5	8	33.5
	75, 100	67.5			

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

(∗ Dimensions except A, L and L1 are the same as rod flange type.)

Double clevis: CQ2YD/CDQ2YD



Double Clevis

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	CL	With auto switch A	B	CL	CD	CT	CU
32	5 to 50	70	33	60	80	43	70	10	5	14
	75, 100	80	43	70						
40	5 to 50	78.5	39.5	68.5	88.5	49.5	78.5	10	6	14
	75, 100	88.5	49.5	78.5						
50	10 to 50	90.5	40.5	76.5	100.5	50.5	86.5	14	7	20
	75, 100	100.5	50.5	86.5						

Bore size (mm)	Stroke range (mm)	CW	CX	CZ	L	L1	N	RR
32	5 to 50	20	18	36	7	28.5	M6 x 1.0	10
	75, 100							
40	5 to 50	22	18	36	7	28.5	M6 x 1.0	10
	75, 100							
50	10 to 50	28	22	44	8	33.5	M8 x 1.25	14
	75, 100							

Double clevis bracket material: Cast iron
Surface treatment: Painted

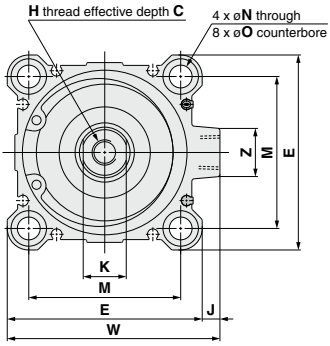
∗ For details about the rod end nut and accessory brackets, refer to page 1174.
∗ A double clevis pin and retaining rings are included.

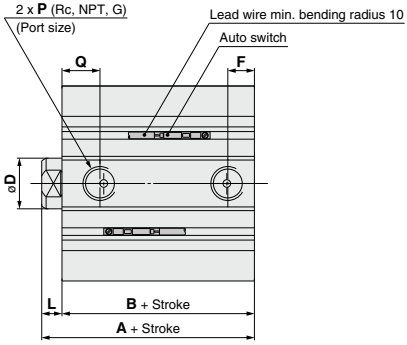
Bore Size

ø63 to ø100

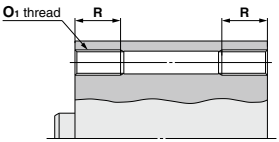
(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Through-hole: CQ2YB/CDQ2YB





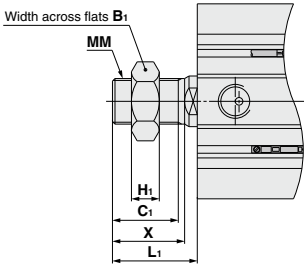
Both ends tapped: CQ2YA/CDQ2YA



Both Ends Tapped (mm)

Bore size (mm)	O1	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

Male rod end



Male Rod End (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

(mm)

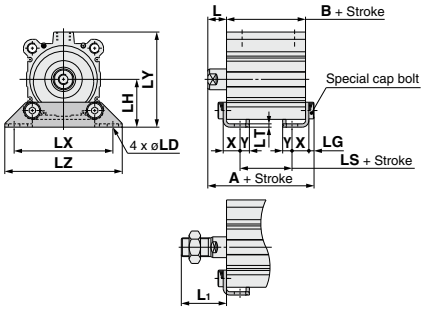
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B															
63	10 to 50	54	46	64	56	15	20	77	10.5	M10 x 1.5	7	17	8	60	9	14 depth 10.5	1/4	15	84	19
	75, 100	64	56																	
80	10 to 50	63.5	53.5	73.5	63.5	21	25	98	12.5	M16 x 2.0	6	22	10	77	11	17.5 depth 13.5	3/8	16	104	25
	75, 100	73.5	63.5																	
100	10 to 50	75	63	85	73	27	30	117	13	M20 x 2.5	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	123.5	25
	75, 100	85	73																	

Bore Size

ø63 to ø100

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Foot: CQ2YL/CDQ2YL



Foot

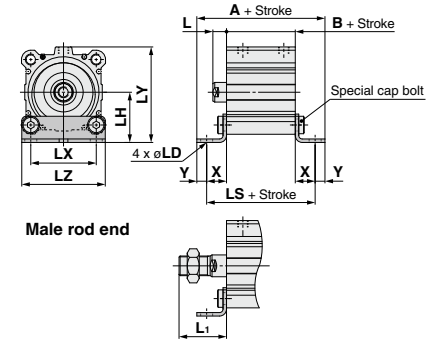
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
63	10 to 50	72.2	46	20	82.2	56	30	18	43.5	11
	75, 100	82.2	56	30						
80	10 to 50	85	53.5	23.5	95	63.5	33.5	20	53.5	13
	75, 100	95	63.5	33.5						
100	10 to 50	98	63	29	108	73	39	22	53.5	13
	75, 100	108	73	39						

Bore size (mm)	Stroke range (mm)	LG	LH	LT	LX	LY	LZ	X	Y
63	10 to 50	5	46	3.2	95	91.5	113	16.2	9
	75, 100								
80	10 to 50	7	59	4.5	118	114	140	19.5	11
	75, 100								
100	10 to 50	7	71	6	137	136	162	23	12.5
	75, 100								

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQ2YLC/CDQ2YLC



Compact Foot

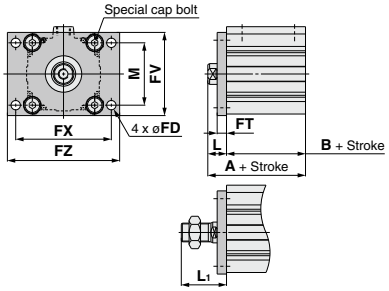
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
63	10 to 50	100.4	46	82.4	110.4	56	92.4	18	43.5	11
	75, 100	110.4	56	92.4						
80	10 to 50	120.5	53.5	98.5	130.5	63.5	108.5	20	53.5	13
	75, 100	130.5	63.5	108.5						
100	10 to 50	136	63	111	146	73	121	22	53.5	13
	75, 100	146	73	121						

Bore size (mm)	Stroke range (mm)	LH	LT	LX	LY	LZ	X	Y
63	10 to 50	46	3.2	60	91.5	77	18.2	9
	75, 100							
80	10 to 50	59	4.5	77	114	98	22.5	11
	75, 100							
100	10 to 50	71	6	94	136	117	24	12.5
	75, 100							

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQ2YF/CDQ2YF



Rod Flange

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	With auto switch A	B	FD	FT	FV	FX	FZ
63	10 to 50	64	46	74	56	9	9	80	92	108
	75, 100	74	56							
80	10 to 50	73.5	53.5	83.5	63.5	11	11	99	116	134
	75, 100	83.5	63.5							
100	10 to 50	85	63	95	73	11	11	117	136	154
	75, 100	95	73							

Bore size (mm)	Stroke range (mm)	L	L1	M
63	10 to 50	18	43.5	60
	75, 100			
80	10 to 50	20	53.5	77
	75, 100			
100	10 to 50	22	53.5	94
	75, 100			

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

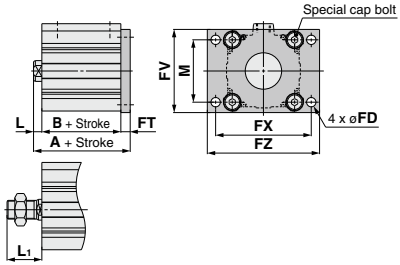
∗ For details about the rod end nut and accessory brackets, refer to page 1174.

Bore Size

ø63 to ø100

(Types with auto switch and without auto switch only differ in the A and B dimensions. Refer to the table below.)

Head flange: CQ2YG/CDQ2YG



Head Flange

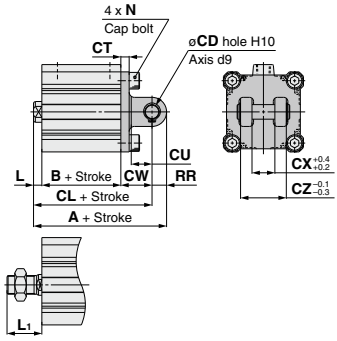
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	With auto switch A	L	L1
63	10 to 50	63	73	8	33.5
	75, 100	73			
80	10 to 50	74.5	84.5	10	43.5
	75, 100	84.5			
100	10 to 50	86	96	12	43.5
	75, 100	96			

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

(* Dimensions except A, L and L1 are the same as rod flange type.)

Double clevis: CQ2YD/CDQ2YD



Double Clevis

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	CL	With auto switch A	B	CL	CD	CT	CU
63	10 to 50	98	46	84	108	56	94	14	8	20
	75, 100	108	56	94						
80	10 to 50	119.5	53.5	101.5	129.5	63.5	111.5	18	10	27
	75, 100	129.5	63.5	111.5						
100	10 to 50	142	63	120	152	73	130	22	13	31
	75, 100	152	73	130						

Bore size (mm)	Stroke range (mm)	CW	CX	CZ	L	L1	N	RR
63	10 to 50	30	22	44	8	33.5	M10 x 1.5	14
	75, 100							
80	10 to 50	38	28	56	10	43.5	M12 x 1.75	18
	75, 100							
100	10 to 50	45	32	64	12	43.5	M12 x 1.75	22
	75, 100							

Double clevis bracket material: Cast iron
Surface treatment: Painted

* For details about the rod end nut and accessory brackets, refer to page 1174.
* A double clevis pin and retaining rings are included.

Weights

Weights/Without Auto Switch

(g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
32	134	154	174	193	213	233	252	272	291	311	457	556
40	211	232	254	275	297	318	340	361	383	404	577	689
50	—	369	402	435	467	500	533	566	598	632	902	1073
63	—	557	595	633	671	709	747	786	824	862	1189	1386
80	—	983	1043	1104	1164	1224	1284	1345	1405	1465	1985	2281
100	—	1711	1792	1872	1952	2033	2113	2194	2274	2354	3086	3494

Additional Weights

(g)

Bore size (mm)		**32**	**40**	**50**	**63**	**80**	**100**
Both ends tapped		6	6	6	19	45	45
Male rod end	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolt)		142	154	243	320	690	1057
Compact foot (Including mounting bolt)		99	114	177	241	501	770
Rod flange (Including mounting bolt)		180	214	373	559	1056	1365
Head flange (Including mounting bolt)		165	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, mounting bolt)		151	196	393	554	1109	1887

Calculation (Example) **CQ2DS32-20DCMZ**

- Basic weight: CQ2BS32-20DCZ·····193 g
- Additional weight: Both ends tapped····· 6 g
  Male rod end····· 43 g
  Double clevis ·····151 g

Total **393 g**

Weights/With Auto Switch (Built-in magnet)

(g)

Bore size (mm)	Cylinder stroke											
	5	10	15	20	25	30	35	40	45	50	75	100
32	191	211	230	250	270	289	309	329	348	368	468	567
40	284	305	327	348	369	391	412	434	455	477	589	701
50	—	480	513	546	579	611	644	677	710	743	915	1087
63	—	710	748	787	825	863	901	939	977	1015	1211	1408
80	—	1229	1289	1350	1410	1470	1530	1591	1651	1711	2008	2305
100	—	2070	2150	2231	2311	2391	2472	2552	2633	2713	3121	3529

Additional Weights

(g)

Bore size (mm)		**32**	**40**	**50**	**63**	**80**	**100**
Both ends tapped		6	6	6	19	45	45
Male rod end	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolt)		142	154	243	320	690	1057
Compact foot (Including mounting bolt)		84	98	152	216	462	714
Rod flange (Including mounting bolt)		180	214	373	559	1056	1365
Head flange (Including mounting bolt)		165	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, mounting bolt)		151	196	393	554	1109	1887

Calculation (Example) **CDQ2DS32-20DCMZ**

- Basic weight: CDQ2BS32-20DCZ·····250 g
- Additional weight: Both ends tapped····· 6 g
  Male rod end····· 43 g
  Double clevis ·····151 g

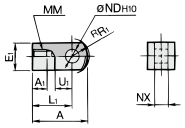
Total **450 g**

Add each weight of auto switches when auto switches are mounted.

Dimensions of Accessories

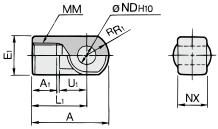
Single Knuckle Joint

For I-G012, I-Z015A
I-G02, I-G03



Material: Carbon steel
Surface treatment: Nickel plating

For I-G04, I-G05
I-G08, I-G10



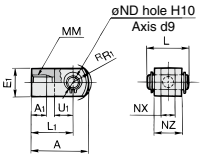
Material: Cast iron
Surface treatment: Nickel plating

(mm)

Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	$^{R}R_1$	U_1	ND_{H10}	NX
I-G04	**32, 40**	42	14	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{-0.3}_{-0.5}$
I-G05	**50, 63**	56	18	ø28	40	M18 x 1.5	16	20	$14^{+0.070}_{0}$	$22^{-0.3}_{-0.5}$
I-G08	**80**	71	21	ø38	50	M22 x 1.5	21	27	$18^{+0.070}_{0}$	$28^{-0.3}_{-0.5}$
I-G10	**100**	79	21	ø44	55	M26 x 1.5	24	31	$22^{+0.084}_{0}$	$32^{-0.3}_{-0.5}$

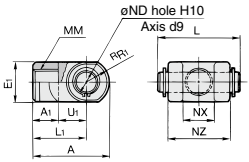
Double Knuckle Joint

For Y-G012, Y-Z015A
Y-G02, Y-G03



Material: Carbon steel
Surface treatment: Nickel plating

For Y-G04, Y-G05
Y-G08, Y-G10



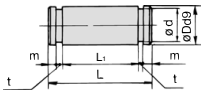
Material: Cast iron
Surface treatment: Nickel plating

(mm)

Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	$^{R}R_1$	U_1	ND_{H10}	NX	NZ	L	Applicable pin part no.
Y-G04	**32, 40**	42	16	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{+0.5}_{+0.3}$	36	41.6	IY-G04
Y-G05	**50, 63**	56	20	ø28	40	M18 x 1.5	16	20	$14^{+0.070}_{0}$	$22^{+0.5}_{+0.3}$	44	50.6	IY-G05
Y-G08	**80**	71	23	ø38	50	M22 x 1.5	21	27	$18^{+0.070}_{0}$	$28^{+0.5}_{+0.3}$	56	64	IY-G08
Y-G10	**100**	79	24	ø44	55	M26 x 1.5	24	31	$22^{+0.084}_{0}$	$32^{+0.5}_{+0.3}$	64	72	IY-G10

∗ A knuckle pin and retaining rings are included.

Knuckle Pin (Common with double clevis pin)



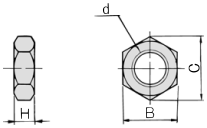
Material: Carbon steel

(mm)

Part no.	Applicable bore size (mm)	Dd9	L	d	L_1	m	t	Applicable retaining ring
IY-G04	**32, 40**	$10^{-0.040}_{-0.076}$	41.6	9.6	36.2	1.55	1.15	Type C 10 for axis
IY-G05	**50, 63**	$14^{-0.050}_{-0.093}$	50.6	13.4	44.2	2.05	1.15	Type C 14 for axis
IY-G08	**80**	$18^{-0.050}_{-0.093}$	64	17	56.2	2.55	1.35	Type C 18 for axis
IY-G10	**100**	$22^{-0.065}_{-0.117}$	72	21	64.2	2.55	1.35	Type C 22 for axis

∗ Type C retaining rings for axis are included.

Rod End Nut

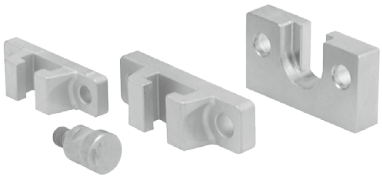


Material: Carbon steel
Surface material: Nickel plating

(mm)

Part no.	Applicable bore size (mm)	d	H	B	C
NT-04	**32, 40**	M14 x 1.5	8	22	25.4
NT-05	**50, 63**	M18 x 1.5	11	27	31.2
NT-08	**80**	M22 x 1.5	13	32	37.0
NT-10	**100**	M26 x 1.5	16	41	47.3

Simple Joint: ø32 to ø100



Joint and Mounting Bracket (Type A, Type B) Part No.

YA – **03**

Applicable air cylinder bore

03	For ø32, ø40
05	For ø50, ø63
08	For ø80
10	For ø100

Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket
YU	Joint

Allowable Eccentricity

(mm)

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Eccentricity tolerance	±1				±1.5	±2
Backlash	0.5					

<Ordering>

• Joints are not included with the A or B type mounting brackets. Order them separately.

(Example)

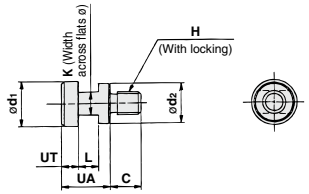
Bore size ø40 Part no.

• Type A mounting bracket part no.·····YA-03

• Joint·····YU-03

Joint and Mounting Bracket (Type A, Type B) Part No.

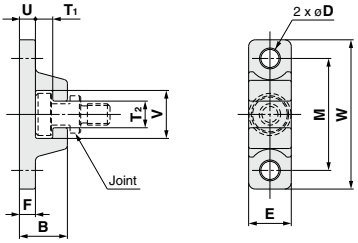
Bore size (mm)	Joint part no.	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10



Material: Chromium molybdenum steel (Nickel plating)

Part no.	Applicable bore size (mm)	UA	C	d_1	d_2	H	K	L	UT	Weight (g)
YU-03	**32, 40**	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	**50, 63**	17	13	19.8	18	M10 x 1.5	10	7	6	40
YU-08	**80**	22	20	24.8	23	M16 x 2	13	9	8	90
YU-10	**100**	26	26	29.8	28	M20 x 2.5	14	11	10	160

Type A Mounting Bracket



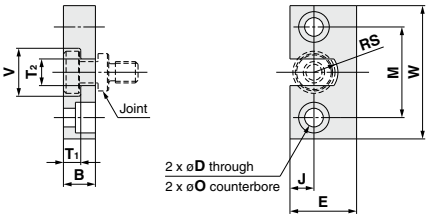
Material: Chromium molybdenum steel (Nickel plating)

(mm)

Part no.	Bore size (mm)	B	D	E	F	M	T_1	T_2
YA-03	**32, 40**	18	6.8	16	6	42	6.5	10
YA-05	**50, 63**	20	9	20	8	50	6.5	12
YA-08	**80**	26	11	25	10	62	8.5	16
YA-10	**100**	31	14	30	12	76	10.5	18

Part no.	Bore size (mm)	U	V	W	Weight (g)
YA-03	**32, 40**	6	18	56	55
YA-05	**50, 63**	8	22	67	100
YA-08	**80**	10	28	83	195
YA-10	**100**	12	36	100	340

Type B Mounting Bracket



Material: Stainless steel

(mm)

Part no.	Bore size (mm)	B	D	E	J	M	øO
YB-03	**32, 40**	12	7	25	9	34	11.5 depth 7.5
YB-05	**50, 63**	12	9	32	11	42	14.5 depth 8.5
YB-08	**80**	16	11	38	13	52	18 depth 12
YB-10	**100**	19	14	50	17	62	21 depth 14

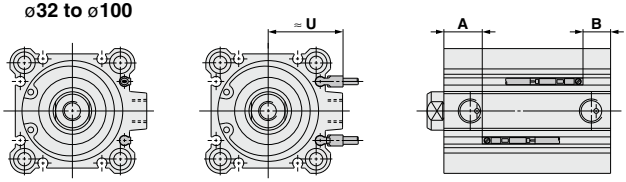
Part no.	Bore size (mm)	T_1	T_2	V	W	RS	Weight (g)
YB-03	**32, 40**	6.5	10	18	50	9	80
YB-05	**50, 63**	6.5	12	22	60	11	120
YB-08	**80**	8.5	16	28	75	14	230
YB-10	**100**	10.5	18	36	90	18	455

Auto Switch Mounting

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

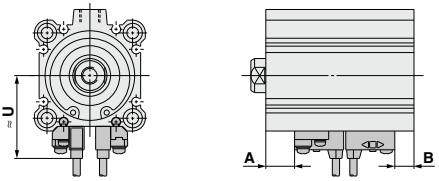
D-M9□
D-M9□W
D-M9□A
D-A9□V
D-M9□V
D-M9□WV
D-M9□AV
D-A9□

ø32 to ø100



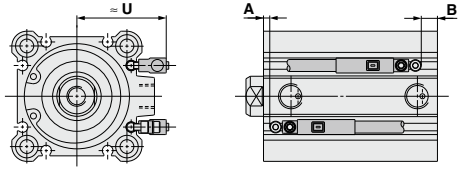
D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F
D-F7NT
D-A73C
D-A80C
D-J79C
D-A79W
D-F7□WV
D-F7□V

ø32 to ø100



D-P3DW

ø32 to ø100



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□/D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV		D-F7NT		D-A79W		D-P3DW	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	18	13	14	9	15	10	15.5	10.5	20.5	15.5	12.5	7.5	8	3.5
40	21.5	16	17.5	12	18.5	13	19	13.5	24	18.5	16	10.5	11.5	6.5
50	19	19.5	15	15.5	16	16.5	16.5	17	21.5	22	13.5	14	9.5	9.5
63	21.5	22.5	17.5	18.5	18.5	19.5	19	20	24	25	16	17	12	12.5
80	24.5	27	20.5	23	21.5	24	22	24.5	27	29.5	19	21.5	15	17
100	27.5	33.5	23.5	29.5	24.5	30.5	25	31	30	36	22	28	18	24

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

Auto Switch Mounting Height

(mm)

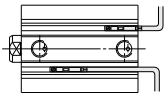
Auto switch model / Bore size	D-M9□V	D-A9□V	D-F7□/J79 D-F7□W/J79W D-F7BA D-F79F/F7NT D-A7□H/A80H	D-F7□V D-F7□WV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W	D-P3DW
	U	U	U	U	U	U	U	U	U
32	30	27.5	36	36.5	39.5	34	40.5	37.5	33
40	32	30	38	40	42.5	37.5	43.5	40.5	36.5
50	37.5	35	43.5	45	48	43	49	46	42
63	42.5	40.5	48.5	50.5	53.5	48	54.5	51.5	47
80	51	49	57	59	61.5	56.5	62.5	59.5	55.5
100	59	57	65.5	67	70	64.5	71	68	65.5

Minimum Stroke for Auto Switch Mounting

(mm)

Number of auto switches	D-M9□V D-F7□V D-J79C	D-A9□V D-A7□ D-A80 D-A73C D-A80C	D-A9□	D-M9□WV D-M9□AV D-F7□WV	D-M9□ D-F7□ D-J79	D-M9□W D-M9□A	D-A7□H D-A80H	D-A79W	D-F7□W D-J79W D-F79F D-F7NT	D-P3DW
With 1 pc.	5	5	10(5)	10	15(5)	15(10)	15(5)	15	20(10)	15
With 2 pcs.	5	10	10	15	15(5)	15	15(10)	20	20(15)	15

Note) The dimensions stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure below.)
Order auto switches and auto switch mounting brackets separately.



Operating Range

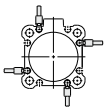
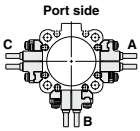
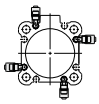
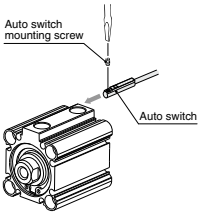
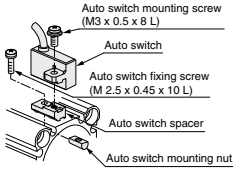
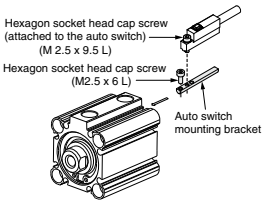
(mm)

Auto switch model	Bore size					
	32	40	50	63	80	100
D-M9□(V) D-M9□W(V) D-M9□A(V)	5	5	6	6.5	7	7.5
D-A9□(V)	9	9.5	9.5	11	10.5	10.5
D-A7□(H)(C) D-A80□(H)(C)	10.5	11.5	11	13	11.5	11.5
D-A79W	14	15.5	14.5	17	15	15.5
D-F7□(V) D-J79(C) D-F7□W(V) D-F7NT D-F79F	5	5	5	6	7	8
D-P3DW	3	4.5	4.5	6	5.5	6.5

∗ 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.
∗ The auto switch mounting bracket BQ2-012 is not used for ø32 or more with the D-M9□(V)/M9□W(V)/M9□A(V)/A9□(V) types. The above values indicate the operating range when mounted with the conventional auto switch installation groove.

Auto Switch Mounting Brackets/Part No.

Applicable Cylinder Series: CDQ2

Applicable auto switch	**D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V**	**D-F7□/F7□V/J79/J79C/F7□W J79W/F7□WV/D-F7BA/F7BAV F79F/F7NT/D-A7□/A80/A7□H A80H/A73C/A80C/A79W**	**D-P3DW**
Bore size (mm)	**ø32 to ø100**		
Auto switch mounting bracket part no.		BQ5-032	BQ6-032S
Auto switch mounting bracket fitting parts lineup/Weight		● Auto switch fixing screw (M2.5 x 10 L) ● Auto switch mounting screw (M3 x 8 L) ● Auto switch spacer ● Auto switch mounting nut Weight: 3.5 g When requesting the enclosure of the auto switch mounting brackets (2 pcs.) with the cylinder for shipment, add "-BQ" to the end of the cylinder model number. Standard model no. + **BQ** Example) CDQ2B32-30DZ-**BQ**	● Hexagon socket head cap screw (M 2.5 x 6 L) ● Auto switch mounting bracket (nut) Weight: 5 g
Auto switch mounting surface	Surfaces with auto switch mounting slot 	A/B/C side except port side 	Surfaces with auto switch mounting slot 
Mounting of auto switch	 ● When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter. **Tightening torque for auto switch mounting screw** (N·m) Auto switch model / Tightening torque **D-M9□(V), D-M9□W(V), D-M9□A(V)**: 0.05 to 0.15 **D-A9□(V)**: 0.10 to 0.20	①Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. ②With the lower tapered part of the auto switch spacer facing the outside of the cylinder tube, line up the M2.5 through hole with the M2.5 female thread of the auto switch mounting nut. ③Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole. ④Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer. ⑤Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to 0.45 N·m. ⑥Confirm where the mounting position is, and tighten the auto switch fixing screw (M2.5) to fix the auto switch mounting nut. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m. ⑦The detection position can be changed under the conditions in step ⑤. 	①Fix the auto switch and the auto switch mounting bracket temporarily by tightening the hexagon socket head cap screw (M2.5 x 9.5 L) attached to the auto switch 1 to 2 turns. ②Insert the temporarily tightened mounting bracket into the mating groove of the cylinder tube, and slide the auto switch onto the cylinder tube through the groove. To insert the auto switch onto the cylinder/actuator through the groove, first hold the back of the auto switch (lead wire side) and the back of the auto switch mounting bracket together. ③Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 6 L, M2.5 x 9.5 L).∗ ④If the detecting position is changed, go back to step ②. ∗ The hexagon socket head cap screw (M2.5 x 6 L) is used to fix the mounting bracket and cylinder tube. This enables the replacement of the auto switch without adjusting the auto switch position. Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch. Note 2) The tightening torque of the hexagon socket head cap screw (M2.5 x 6 L, M2.5 x 9.5 L) must be 0.2 to 0.3 N·m. Note 3) Tighten the hexagon socket head cap screws evenly. 

Note) Auto switch mounting bracket and auto switch are enclosed with the cylinder for shipment.
The auto switch mounting bracket for the D-F7BA(V) type uses the BQ5-032 with the normal specifications (iron screw).

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features	Applicable bore size
Reed	D-A72	Grommet (Perpendicular)	—	ø32 to ø100
	D-A73		—	
	D-A80		Without indicator light	
	D-A79W		Diagnostic indication (2-color indication)	
	D-A73C	Connector (Perpendicular)	—	
	D-A80C		Without indicator light	
	D-A72H	Grommet (In-line)	—	
	D-A73H/A76H		—	
	D-A80H		Without indicator light	
Solid state	D-F7NV/F7PV/F7BV	Grommet (Perpendicular)	—	
	D-F7NWV/F7BWV		Diagnostic indication (2-color indication)	
	D-F7BAV		Water resistant (2-color indication)	
	D-J79C	Connector (Perpendicular)	—	
	D-F79/F7P/J79	Grommet (In-line)	—	
	D-F79W/F7PW/J79W		Diagnostic indication (2-color indication)	
	D-F7BA		Water resistant (2-color indication)	
	D-F79F		With diagnostic output (2-color indication)	
	D-F7NT		With timer	

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Trimmer auto switch (D-F7K) and heat resistant solid state auto switch (D-F7NJ) are not available.

Low Speed Cylinders

Series *CJ2X-Z/CM2X-Z/CQSX/CQ2X/CUX*

Series	Action	Bore size (mm)	Minimum operating speed (mm/s)	Page
CJ2X-Z 	Double acting	10, 16	1	1182
CM2X-Z 		20, 25, 32, 40	0.5	1196
CQSX 		12, 16	1	1216
		20, 25	0.5	
CQ2X 		32, 40, 50, 63, 80, 100	0.5	1225
CUX 		10, 16	1	1240
		20, 25, 32	0.5	

Clean Series

Air Cylinders
Series 10-/11-CM2X-Z
Page 1214


Compact Cylinders
Series 10-/11-CQSX
Page 1224


Compact Cylinders
Series 10-/11-CQ2X
Page 1239


Low Speed Cylinder
Double Acting, Single Rod
Series CJ2X
ø10, ø16

How to Order

Mounting

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

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

Bore size

10	10 mm
16	16 mm

Cylinder standard stroke (mm)
Refer to "Standard Strokes" on page 1183.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint
T	Rod end cap (Flat type)
U	Rod end cap (Round type)

∗ Rod end bracket is shipped together with the product, but not assembled.
∗ A knuckle joint pin is not provided with the single knuckle joint.

CJ2X B 16 − 60 Z − V

With auto switch **CDJ2X B 16 − 60 Z − N W − M9BW − B**

With auto switch (Built-in magnet)

Low speed cylinder

Head cover port location

Nil	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.

Pivot bracket

Nil	None
N	Pivot bracket is shipped together with the product.

∗ Only for CJ2D (double clevis)
∗ Pivot bracket is shipped together with the product, but not assembled.

Auto switch

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

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 1194 for auto switch mounting brackets.

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Band mounting, Perpendicular	Band mounting, In-line	Rail mounting, Perpendicular	Rail mounting, In-line	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V,12 V	—	M9NV	M9N	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	M9PV	M9P	●	●	●	○	—	○		
				2-wire	12 V		M9BV	M9B	M9BV	M9B	●	●	●	○	—	○	—	
		Connector					—	H7C	J79C	—	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V,12 V		M9NWV	M9NW	M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V,12 V		M9NAV**	M9NA**	M9NAV**	M9NA**	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV**	M9PA**	M9PAV**	M9PA**	○	○	●	○	—	○		
				2-wire	12 V		M9BAV**	M9BA**	M9BAV**	M9BA**	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			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	—
				2-wire	24 V	—	—	—	A72	A72H	●	—	●	—	—	—	—	Relay, PLC
						200 V	—	—	A72	A72H	●	—	●	—	—	—	—	
						12 V	100 V	A93V	A93	A93V	A93	●	—	●	●	—	—	
			No				100 V or less	A90V	A90	A90V	A90	●	—	●	—	—	—	IC circuit
			Yes				—	C73C	A73C	—	●	—	●	●	●	—	—	
		Connector	No				24 V or less	—	C80C	A80C	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	Yes		—	—	—	—	A79W	—	●	—	●	—	—	—	—	

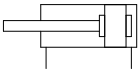
∗∗ Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Since there are other applicable auto switches than listed above, refer to page 1195 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ 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.)

Symbol

Double acting, Single rod, Rubber bumper



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		1 to 300 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	0.06	

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).

Standard Strokes

Bore size (mm)	Standard stroke (mm)	Maximum manufacturable stroke (mm)
10	15, 30, 45, 60, 75, 100, 125, 150	400
16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200	400

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

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Mounting and Accessories/For details, refer to page 1189.

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

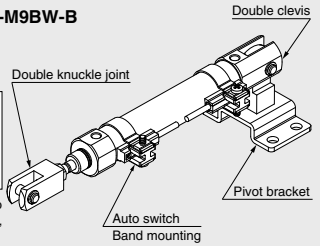
Mounting		Basic	Foot	Flange	Double* clevis
Standard	Mounting nut	●	●	●	—
	Rod end nut	●	●	●	●
	Clevis pin	—	—	—	●
Option	Single knuckle joint	○	○	○	○
	Double knuckle joint*	○	○	○	○
	Rod end cap (Flat/Round type)	○	○	○	○
	T-bracket	—	—	—	○

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

Ordering Example of Cylinder Assembly

Cylinder model: **CDJ2XD16-60Z-NW-M9BW-B**

Mounting **D: Double clevis**
Pivot bracket **N: Yes**
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.
Auto switch mounting B: Band mounting



* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

⚠Precautions

Be sure to read before handling. Refer to page 1574 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

1. 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.
2. 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

3. 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 ø10, use ultra thin pliers.
4. 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.

Weights

(g)

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.

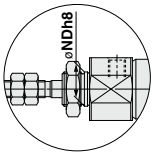
Calculation: Example) **CJ2XL10-45Z**
- Basic weight·····22 (ø10)
- Additional weight·····4/15 stroke
- Cylinder stroke·····45 stroke
- Mounting bracket weight·····8 (Axial foot)

22 + 4/15 x 45 + 8 = **42 g**

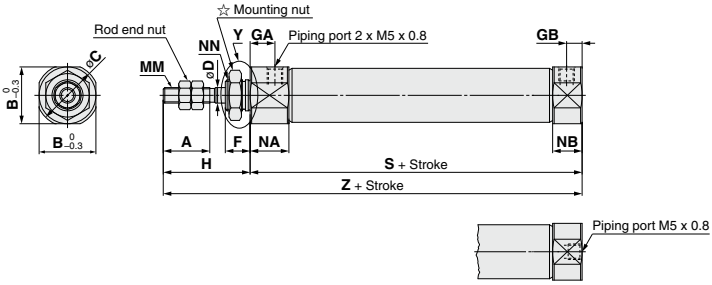
Dimensions

Basic (B)

CJ2XB **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.

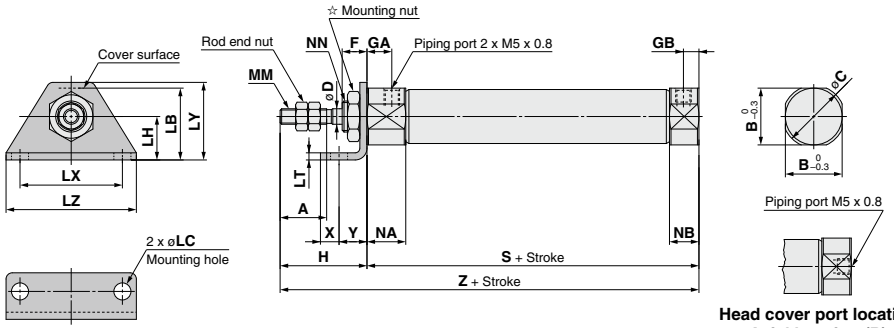
☆ Refer to page 1189 for details of the mounting nut.

(mm)

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)

CJ2XL **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 1189 for details of the mounting nut.

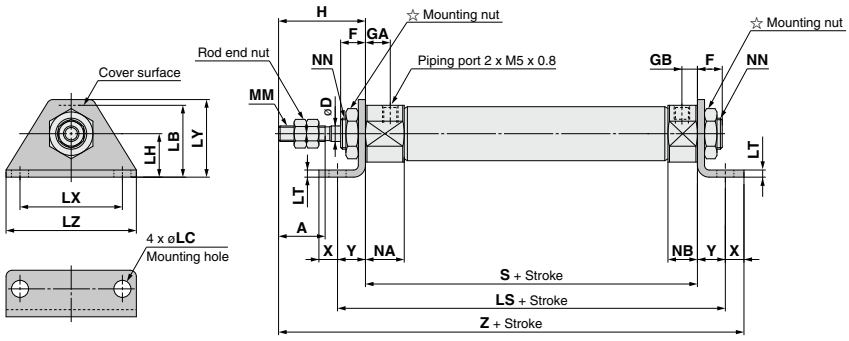
(mm)

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

Dimensions

Double foot (M)

CJ2XM Bore size – Stroke Z



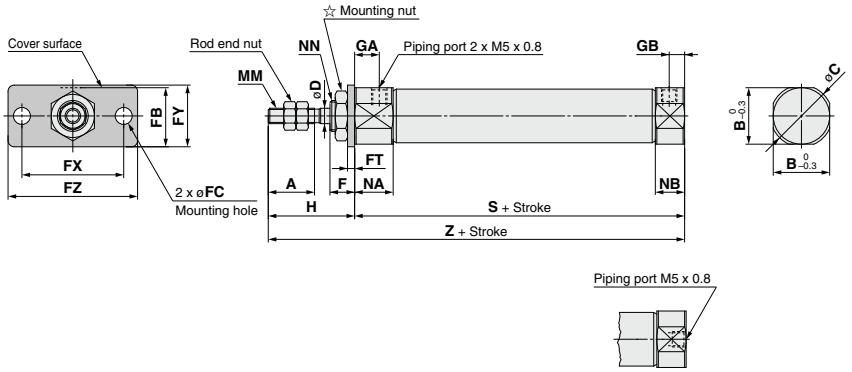
☆ Refer to page 1189 for details of the mounting nut.

(mm)

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)

CJ2XF Bore size – Stroke Head cover port location Z



Head cover port location
Axial location (R)

☆ Refer to page 1189 for details of the mounting nut.

∗ The overall cylinder length does not change.

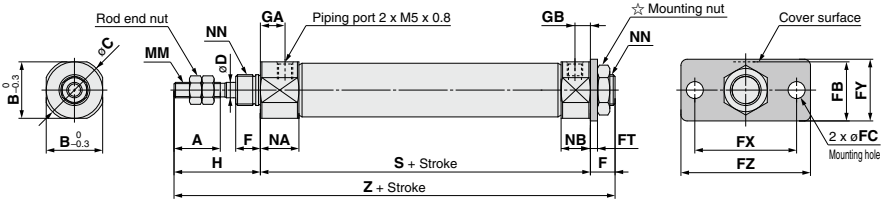
(mm)

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)

CJ2XG Bore size – Stroke Z



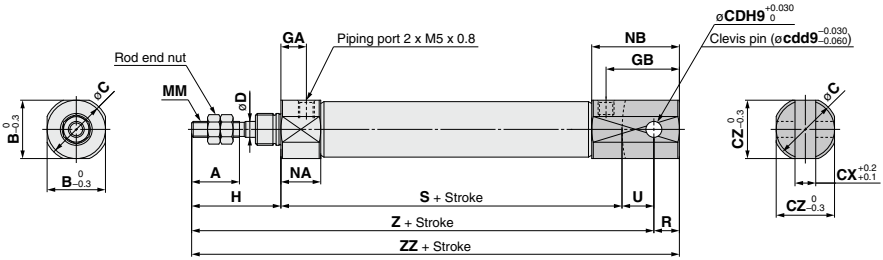
☆ Refer to page 1189 for details of the mounting nut.

(mm)

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)

CJ2XD Bore size – Stroke Z



∗ A clevis pin and retaining rings are included.

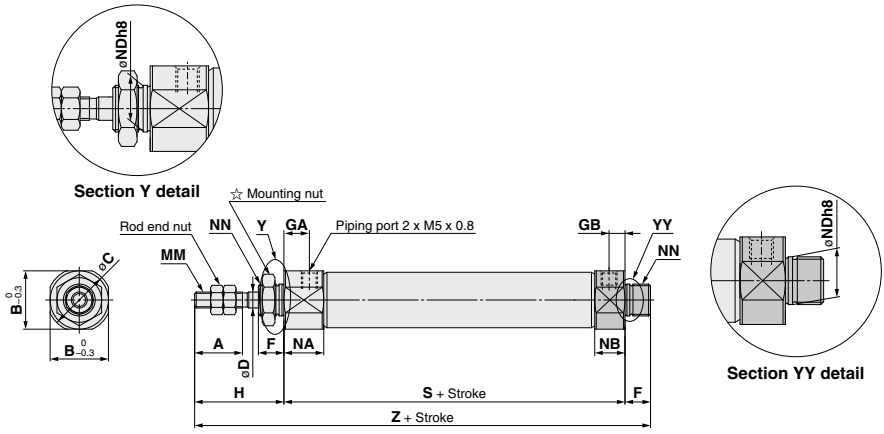
(mm)

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

Dimensions

Double-side bossed (E)

CJ2XE Bore size – Stroke Z



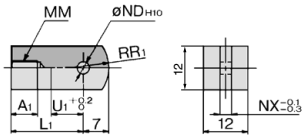
☆ Refer to page 1189 for details of the mounting nut.

(mm)

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	82
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	83

Dimensions of Accessories

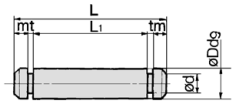
Single Knuckle Joint



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

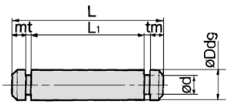


Material: Stainless steel

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

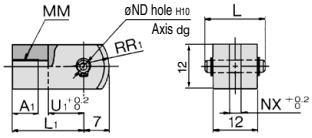


Material: Stainless steel

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 ø10, a clevis pin is diverted.
∗ Retaining rings are included with a knuckle pin.

Double Knuckle Joint



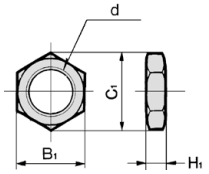
Material: Rolled steel

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.

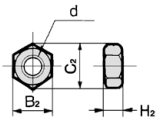
Mounting Nut



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

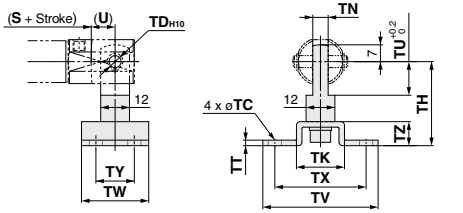
Rod End Nut



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

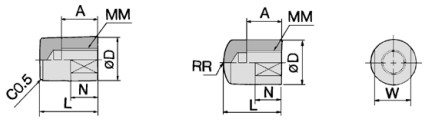


Part no.	Applicable bore size	TC	TD_{H10}	TH	TK	TN	TT	TU	TV	TW	TX	TY	TZ
CJ-T010C	**10**	4.5	$3.3^{+0.048}_{0}$	29	18	3.1	2	9	40	22	32	12	8
CJ-T016C	**16**	5.5	$5^{+0.048}_{0}$	35	20	6.4	2.3	14	48	28	38	16	10

∗ 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 1187.

Rod End Cap

Flat type/CJ-CF□□□ **Round type/CJ-CR□□□**



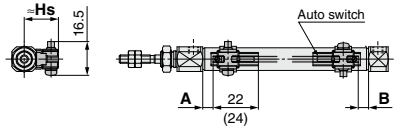
Material: Polyacetal

Part no.		Applicable bore size	A	D	L	MM	N	R	W
Flat type	Round type								
CJ-CF010	**CJ-CR010**	**10**	8	10	13	M4 x 0.7	6	10	8
CJ-CF016	**CJ-CR016**	**16**	10	12	15	M5 x 0.8	7	12	10

Auto Switch Mounting

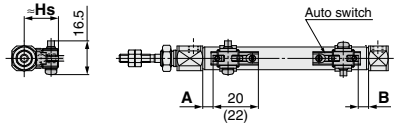
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Solid state auto switch
<Band mounting>
D-M9□
D-M9□W
D-M9□A



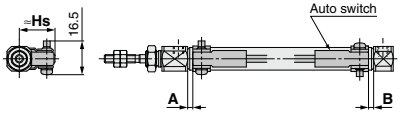
( ): Dimension of the D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□MV
D-M9□AV



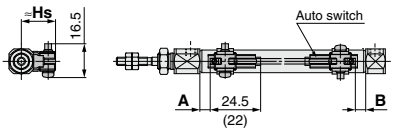
( ): Dimension of the D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-H7□
D-H7□W
D-H7BA
D-H7NF
D-H7C



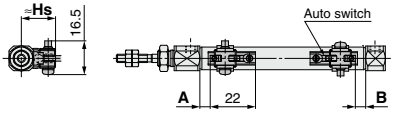
Reed auto switch
<Band mounting>

D-A9□



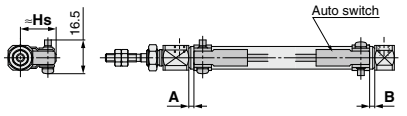
( ): Dimension of the D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V



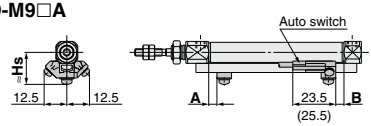
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80
D-C73C□/C80C



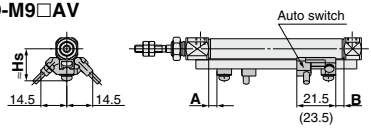
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Rail mounting>
D-M9□
D-M9□W
D-M9□A



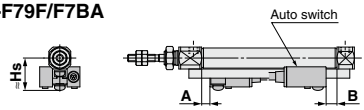
( ): Dimension of the D-M9□A

D-M9□V
D-M9□WV
D-M9□AV

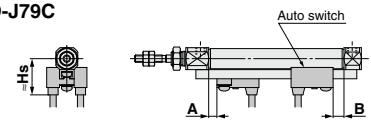


( ): Dimension of the D-M9□AV

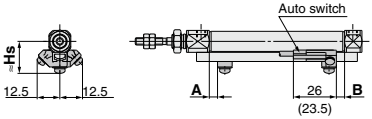
D-F7□/J79
D-F7□W/J79W
D-F79F/F7BA



D-F7□V/F7□WV
D-F7BAV
D-J79C

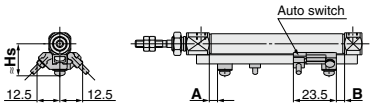


<Rail mounting>
D-A9□

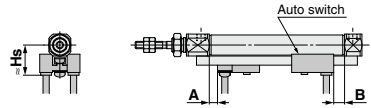


( ): Dimension of the D-A96

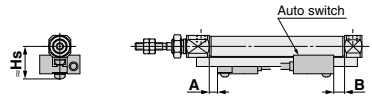
D-A9□V



D-A7□/A80
D-A73C/A80C
D-A79W



D-A7□H/A80H



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	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	
	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 / Bore size	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	
	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 / Bore size	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
	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 / Bore size	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
	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

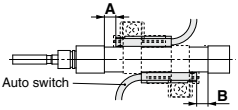
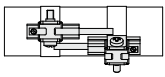
Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch mounting	Auto switch model	Number of auto switches				
		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)
	 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 1192.	 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.
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.

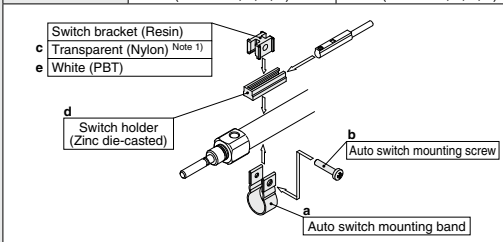
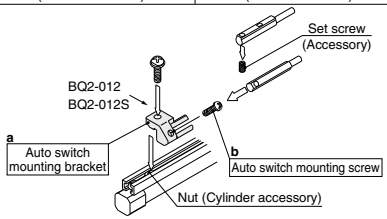
Operating Range

(mm)

	Auto switch model	Bore size 10	Bore size 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	3.5
	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	Bore size (mm) 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 Note 2) **D-M9□AV** Note 2)	BJ6-010S (A set of a, b, d, e)	BJ6-016S (A set of a, b, d, e)
			
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)
Note 4) Rail mounting	**D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A** Note 5) **D-M9□AV** Note 5) **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-□□□	• Auto switch mounting band (a) • Auto switch mounting screw (b)
BJ4-1	• Switch bracket (White/PBT) (e) • Switch holder (d)
BJ5-1	• 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 WEB catalog** or Best Pneumatics No. 3 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 WEB catalog** or Best Pneumatics No.3 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-color indication)
	Rail mounting	D-F79/F7P/J79		—
		D-F79W/F7PW/J79W		Diagnostic indication (2-color indication)
		D-F7NV/F7PV/F7BV	Grommet (Perpendicular)	—
		D-F7NWV/F7BWV		Diagnostic indication (2-color 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
		D-A73	Grommet (Perpendicular)	—
		D-A80		Without indicator light

* With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Low Speed Cylinder
Double Acting, Single Rod
Series CM2X
ø20, ø25, ø32, ø40

How to Order

Mounting

B	Basic (Double-side bossed)
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
U	Rod trunnion

T	Head trunnion
E	Integral clevis
V	Integral clevis (90°)
BZ	Boss-cut/Basic
FZ	Boss-cut/ Rod flange
UZ	Boss-cut/ Rod trunnion

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1197.

Rod end thread

Nil	Male rod end
F	Female rod end

Pivot bracket

Nil	None
N	Pivot bracket is shipped together with the product.

∗ Only for C, T, U, E, V, UZ mounting types
∗ Pivot bracket is shipped together with the product, but not assembled.

Made to Order
Refer to page 1197 for details.

	Model													
	CM2X	B	40		–	150		Z	–			–		
With auto switch	CDM2X	B	40		–	150		Z	–			–	M9BW		–	

With auto switch
(Built-in magnet)

Low speed cylinder

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

∗ No bracket is provided for the female rod end type.
∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 1197.**

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDM2XF32-100Z

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V,12 V	—	M9NV	M9N	●	—	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	●	—	●	○	—	○		
				2-wire	12 V		M9BV	M9B	●	—	●	○	—	○	—	
		Connector					—	H7C	●	—	●	●	●	—		
		Terminal conduit		3-wire (NPN)	5 V,12 V		—	G39A	—	—	—	—	●	—	IC circuit	
				2-wire	12 V		—	K39A	—	—	—	—	●	—	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)	5 V,12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V,12 V		M9NAV***	M9NA***	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○	—	○		
				2-wire	12 V		M9BAV***	M9BA***	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)	5 V,12 V		—	H7NF	●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	●	—	●	—	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V	●	—	●	●	—	—	—	Relay, PLC
			Yes				100 V or less	A90V	●	—	●	—	—	—	IC circuit	
			No				100 V, 200 V	—	B54	●	—	●	●	—	—	
			Yes				200 V or less	—	B64	●	—	●	—	—	—	
		Connector	No				—	—	C73C	●	—	●	●	●	—	
			Yes				24 V or less	—	C80C	●	—	●	●	●	—	IC circuit
		Terminal conduit	Yes			12 V	—	—	A33A	—	—	—	—	●	—	PLC
		DIN terminal					100 V, 200 V	—	A34A	—	—	—	—	●	—	—	Relay, PLC
								—	A44A	—	—	—	—	●	—	
	Diagnostic indication (2-color indication)	Grommet			—	—	—	B59W	●	—	●	—	—	—		

∗∗∗ 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.

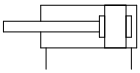
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ Do not indicate suffix "N" for no lead wire on the D-A3□A/A44A/G39A/K39A models.

∗ Since there are other applicable auto switches than listed above, refer to page 1213 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)
∗ The D-C7□□/C80□/H7□□ auto switches are assembled before shipment.

Symbol

Double acting, Single rod, Rubber bumper



Specifications

Bore size (mm)	20	25	32	40
Type	Pneumatic			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 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			
Lubrication	Not required (Non-lube)			
Stroke length tolerance	$^{+1.4\ mm}_{0}$			

Standard Strokes

Bore size (mm)	Standard stroke (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300
25	
32	
40	

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

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages of the Best Pneumatics No. 2 or **the WEB catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

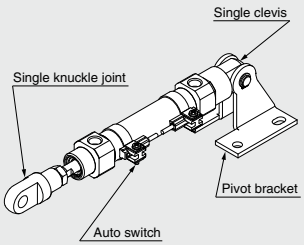
Made to Order

Made to Order
(For details, refer to pages 1247 to 1264.)

Symbol	Specifications
-XC3	Special port location
-XC52	Mounting nut with set screw

Ordering Example of Cylinder Assembly

Cylinder model: **CDM2XC40-150Z-NV-M9BW**



Mounting C: Single clevis
Pivot bracket N: Yes
Rod end bracket V: Single knuckle joint
Auto switch D-M9BW: 2 pcs.

∗ Pivot bracket, single knuckle joint and auto switch are shipped together with the product, but not assembled.

∗ Pivot bracket is only applicable to mounting C, T, U, E, V and UZ.

∗ No rod end bracket is provided for the female rod end type.

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	20	25	32	40
Minimum operating pressure	0.025			

Piston Speed

Bore size (mm)		20	25	32	40
Piston speed (mm/s)		0.5 to 300			
Allowable kinetic energy (J)	(Male thread)	0.27	0.4	0.65	1.2
	(Female thread)	0.11	0.18	0.29	0.52

Mounting Brackets/Part No.

Mounting bracket	Min. order q'ty	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Axial foot∗	2	CM-L020B	CM-L032B		CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Single clevis∗∗	1	CM-C020B	CM-C032B		CM-C040B	1 single clevis, 3 liners
Double clevis (with pin)∗∗∗	1	CM-D020B	CM-D032B		CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Trunnion (with nut)	1	CM-T020B	CM-T032B		CM-T040B	1 trunnion, 1 trunnion nut

∗ Order 2 foots per cylinder.
∗∗ 3 liners are included with a clevis bracket for adjusting the mounting angle.
∗∗∗ A clevis pin and retaining rings (split pins for ø40) are included.

Mounting and Accessories

Accessories / Mounting	Standard			Option				
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint Note 3)	Clevis pivot bracket Note 4)	Pivot bracket Note 6)	Pivot bracket pin Note 7)
Basic (Double-side bossed)	● (1 pc.)	●	—	●	●	—		
Axial foot	● (2)	●	—	●	●	—		
Rod flange	● (1)	●	—	●	●	—	—	—
Head flange	● (1)	●	—	●	●	—		
Integral clevis	— Note 1)	●	—	●	●	●		
Single clevis	— Note 1)	●	—	●	●	—	●	●
Double clevis Note 3)	— Note 1)	●	● Note 5)	●	●	—	—	—
Rod trunnion	● (1) Note 2)	●	—	●	●	—	●	—
Head trunnion	● (1) Note 2)	●	—	●	●	—		
Boss-cut/Basic	● (1)	●	—	●	●	—		
Boss-cut/Flange	● (1)	●	—	●	●	—	—	—
Boss-cut/Trunnion	● (1) Note 2)	●	—	●	●	—		

Note 1) Mounting nuts are not attached to the integral clevis, single clevis and double clevis types.
Note 2) Trunnion nuts are mounted on the rod trunnion and head trunnion types.
Note 3) A pin and retaining rings (split pins for ø40) are included with the double clevis and double knuckle joint types.
Note 4) A pin and retaining rings are included with the clevis pivot bracket.
Note 5) Retaining rings (split pins for ø40) are included with the clevis pin.
Note 6) A pin and retaining rings are included with the pivot bracket.
Note 7) Retaining rings are included with the pivot bracket pin.

⚠ Precautions

Be sure to read before handling.
Refer to page 1574 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

Operating Precautions

⚠ Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠ Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a retaining ring.

When replacing rod seals and removing and mounting a retaining ring, use a proper tool (retaining ring plier: tool for installing a type C retaining ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier. Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

3. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

4. The oil stuck to the cylinder is grease.

5. The base oil of grease may seep out.

The base oil of grease in the cylinder may seep out of the tube, cover, crimped part or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

Maintenance

⚠ Caution

1. Replacement parts/Seal kit

Order it in accordance with the bore size.

Bore size (mm)	Kit no.	Contents
20	CM2X20-PS	Rod seal 1 pc. Grease pack (10 g) 1 pc.
25	CM2X25-PS	
32	CM2X32-PS	
40	CM2X40-PS	

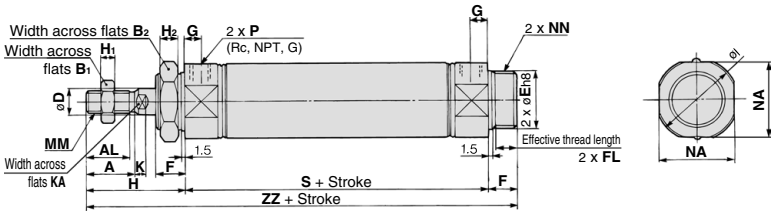
2. Grease pack

When maintenance requires only grease, use the following part numbers to order.

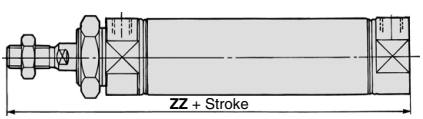
Grease pack part number:
GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Basic (Double-side Bossed) (B)

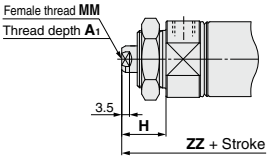
CM2XB Bore size – Stroke ☐ **Z**



Boss-cut



Female rod end



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	154

Boss-cut (mm)

Bore size	ZZ
20	103
25	107
32	109
40	138

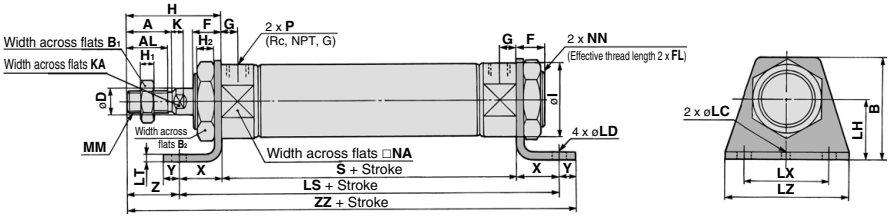
Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

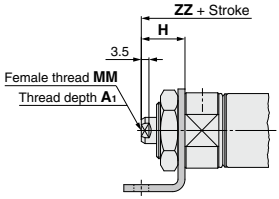
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Axial Foot (L)

CM2XL Bore size – Stroke ☐ **Z**



Female rod end



(mm)

Bore size	A	AL	B	B1	B2	D	F	FL	G	H	H1	H2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	M20 x 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	M26 x 1.5	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	10.5	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	M26 x 1.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	13.5	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	M32 x 2	1/4	88	23	10	27	171

∗ Mounting bracket is shipped together with the product.

Female Rod End

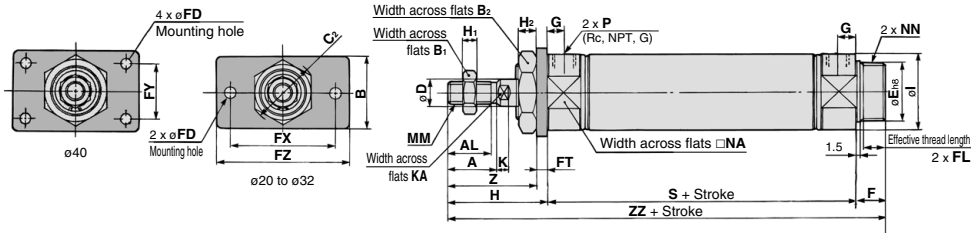
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	110
25	8	20	M5 x 0.8	110
32	12	20	M6 x 1	112
40	13	21	M8 x 1.25	142

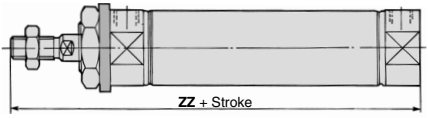
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Rod Flange (F)

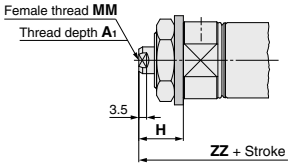
CM2XF **Bore size** – **Stroke** □ **Z**



Boss-cut



Female rod end



(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	154

Boss-cut (mm)

Bore size	ZZ
20	103
25	107
32	109
40	138

Female Rod End (mm)

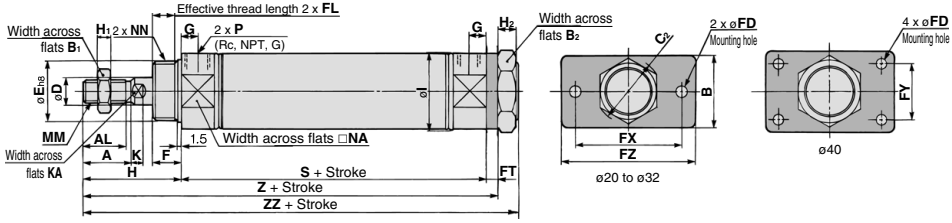
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

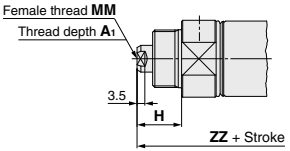
∗ Mounting bracket is shipped together with the product.

Head Flange (G)

CM2XG Bore size – Stroke Z



Female rod end



(mm)

Bore size	A	AL	B	B_1	B_2	C_2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H_1	H_2	I
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5

(mm)

Bore size	K	KA	MM	NA	NN	P	S	Z	ZZ
20	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	107	116
25	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	111	120
32	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	113	122
40	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	143	154

∗ Mounting bracket is shipped together with the product.

Female Rod End

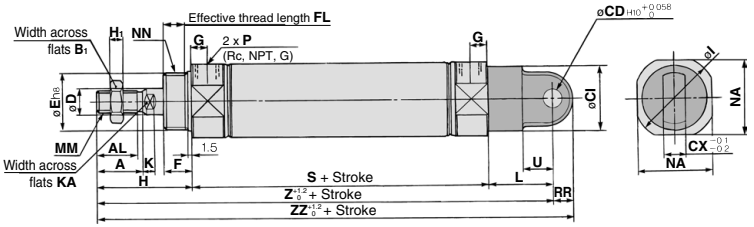
(mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

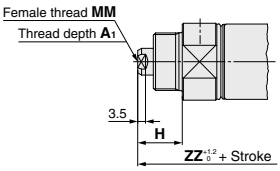
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Single Clevis (C)

CM2XC **Bore size** – **Stroke** ☐ **Z**



Female rod end



Female Rod End (mm)

Bore size	A_1	H	MM	(ZZ)
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

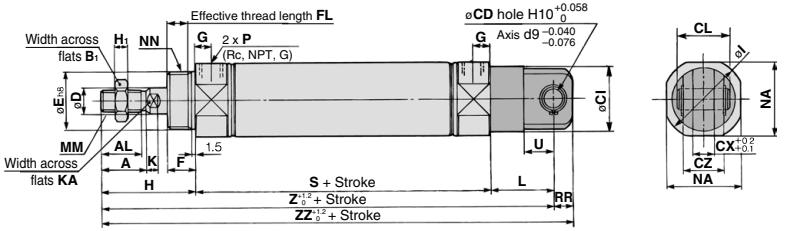
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

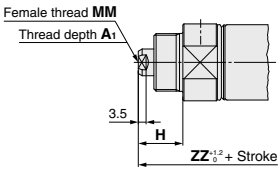
Bore size	A	AL	B_1	CI	CD	CX	D	E	F	FL	G	H	H_1	I	K	KA	L	MM	NA	NN	P	RR	S	U	(Z)	(ZZ)
20	18	15.5	13	24	9	10	8	20 0 −0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26 0 −0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26 0 −0.033	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	38	10	15	14	32 0 −0.039	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

Double Clevis (D)

CM2XD **Bore size** – **Stroke** ☐ **Z**



Female rod end



Female Rod End (mm)

Bore size	A_1	H	MM	(ZZ)
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

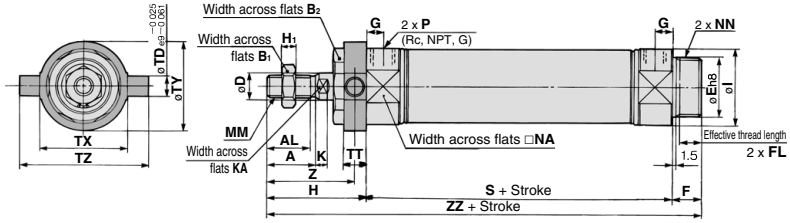
(mm)

Bore size	A	AL	B_1	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H_1	I	K	KA	L	MM	NA	NN	P	RR	S	U	(Z)	(ZZ)
20	18	15.5	13	9	24	25	10	19	8	20 0 −0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	9	30	25	10	19	10	26 0 −0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	9	30	25	10	19	12	26 0 −0.033	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	10	38	41.2	15	30	14	32 0 −0.039	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

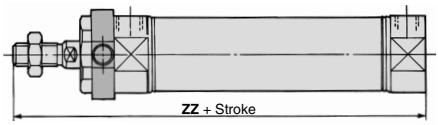
∗ A clevis pin and retaining rings (split pins for ø40) are shipped together.

Rod Trunnion (U)

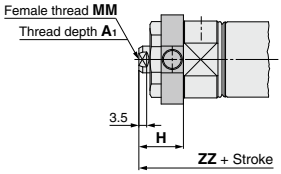
CM2XU Bore size – Stroke ☐ **Z**



Boss-cut



Female rod end



∗ Mounting bracket is shipped together with the product.

(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	I	K	KA	MM	NA	NN	P
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

(mm)

Bore size	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	36	116
25	62	9	10	40	40	60	40	120
32	64	9	10	40	40	60	40	122
40	88	10	11	53	53	77	44.5	154

Boss-cut (mm)

Bore size	ZZ
20	103
25	107
32	109
40	138

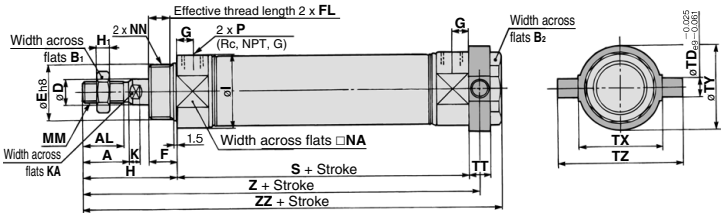
Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

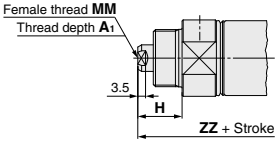
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Head Trunnion (T)

CM2XT **Bore size** – **Stroke** ☐ **Z**



Female rod end



∗ Mounting bracket is shipped together with the product.

(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	I	K	KA	MM	NA	NN	P
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

(mm)

Bore size	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	108	118
25	62	9	10	40	40	60	112	122
32	64	9	10	40	40	60	114	124
40	88	10	11	53	53	77	143.5	154

Female Rod End

(mm)

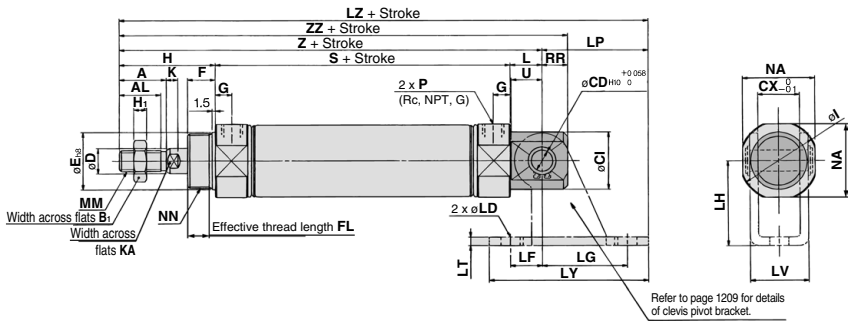
Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	97
25	8	20	M5 x 0.8	97
32	12	20	M6 x 1	99
40	13	21	M8 x 1.25	125

∗ When female thread is used, use a thin wrench when tightening the piston rod.

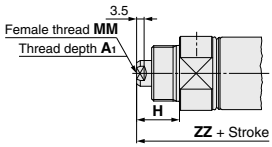
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Integral Clevis (E)

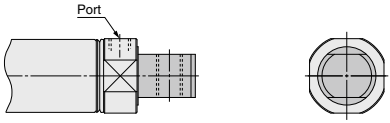
CM2XE Bore size – Stroke ☐ **Z**



Female rod end



Integral clevis (90°) (V)



∗ The outer dimensions are the same as those for the integral clevis (**E**).

(mm)

Bore size	A	AL	B1	CD	CI	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN
20	18	15.5	13	8	20	12	8	20 $^{0}_{-0.033}$	13	10.5	8	41	5	28	5	6	12	M8 x 1.25	24	M20 x 1.5
25	22	19.5	17	8	22	12	10	26 $^{0}_{-0.033}$	13	10.5	8	45	6	33.5	5.5	8	12	M10 x 1.25	30	M26 x 1.5
32	22	19.5	17	10	27	20	12	26 $^{0}_{-0.033}$	13	10.5	8	45	6	37.5	5.5	10	15	M10 x 1.25	34.5	M26 x 1.5
40	24	21	22	10	33	20	14	32 $^{0}_{-0.039}$	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	42.5	M32 x 2

(mm)

Bore size	P	RR	S	U	Z	ZZ
20	1/8	9	62	11.5	115	124
25	1/8	9	62	11.5	119	128
32	1/8	12	64	14.5	124	136
40	1/4	12	88	14.5	153	165

Female Rod End

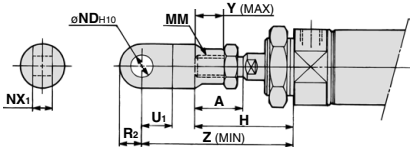
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	103
25	8	20	M5 x 0.8	103
32	12	20	M6 x 1	111
40	13	21	M8 x 1.25	136

∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Series ***CM2X***
Dimensions of Accessories

With Single Knuckle Joint

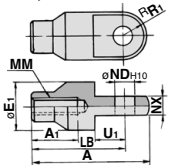


(mm)

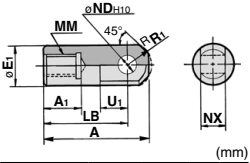
Bore size	A	H	MM	NDH10	NX1	U1	R2	Y	Z
20	18	41	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	11	66
25, 32	22	45	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	14	69
40	24	50	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	20	14	13	92

Single Knuckle Joint

I-020B, 032B Material: Carbon steel



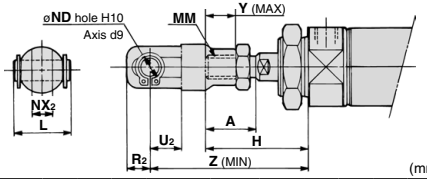
I-040B Material: Free-cutting steel



(mm)

Part no.	Applicable bore size	A	A1	E1	LB	MM	NDH10	NX	R1	U1
I-020B	**20**	46	16	20	36	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-032B	**25, 32**	48	18	20	38	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-040B	**40**	69	22	24	55	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	15.5	20

With Double Knuckle Joint

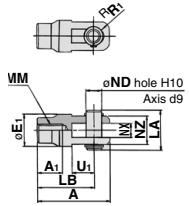


(mm)

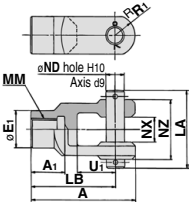
Bore size	A	H	L	MM	ND	NX2	R2	U2	Y	Z
20	18	41	25	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	13	25	13	92

Double Knuckle Joint

Y-020B, 032B Material: Carbon steel



Y-040B Material: Cast iron



(mm)

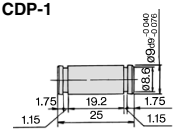
Part no.	Applicable bore size	A	A1	E1	LA	LB	MM	ND	NX	NZ	R1	U1	Included pin part number	Retaining ring Split pin size
Y-020B	**20**	46	16	20	25	36	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-032B	**25, 32**	48	18	20	25	38	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-040B	**40**	68	22	24	49.7	55	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	38	13	25	CDP-3	ø3 x 18 L

∗ A knuckle pin and retaining rings (split pins for ø40) are included.

Double Clevis Pin/Material: Carbon steel (mm)

Bore size/ø20, ø25, ø32

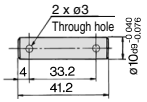
CDP-1



Retaining ring: Type C9 for axis

Bore size/ø40

CDP-2



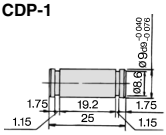
Split pin: ø3 x 18 L

∗ Retaining rings (split pins for ø40) are included.

Double Knuckle Pin/Material: Carbon steel (mm)

Bore size/ø20, ø25, ø32

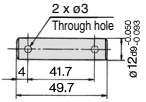
CDP-1



Retaining ring: Type C9 for axis

Bore size/ø40

CDP-3

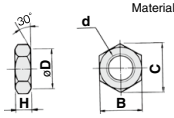


Split pin: ø3 x 18 L

∗ Retaining rings (split pins for ø40) are included.

Rod End Nut

Material: Carbon steel

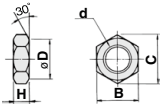


(mm)

Part no.	Applicable bore size	B	C	D	d	H
NT-02	**20**	13	15.0	12.5	M8 x 1.25	5
NT-03	**25**, **32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8

Mounting Nut

Material: Carbon steel

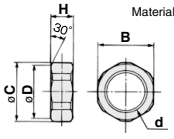


(mm)

Part no.	Applicable bore size	B	C	D	d	H
SN-020B	**20**	26	30	25.5	M20 x 1.5	8
SN-032B	**25**, **32**	32	37	31.5	M26 x 1.5	8
SN-040B	**40**	41	47.3	40.5	M32 x 2.0	10

Trunnion Nut

Material: Carbon steel

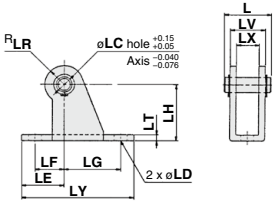


(mm)

Part no.	Applicable bore size	B	C	D	d	H
TN-020B	**20**	26	28	25.5	M20 x 1.5	10
TN-032B	**25**, **32**	32	34	31.5	M26 x 1.5	10
TN-040B	**40**	41	45	40.5	M32 x 2	10

Clevis Pivot Bracket (For CM2XE(V))

Material: Carbon steel



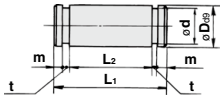
(mm)

Part no.	Applicable bore size	L	LC	LD	LE	LF	LG	LH	LR	LT	LX	LY	LV	Included pin part no.
CM-E020B	**20**, **25**	24.5	8	6.8	22	15	30	30	10	3.2	12	59	18.4	CD-S02
CM-E032B	**32**, **40**	34	10	9	25	15	40	40	13	4	20	75	28	CD-S03

Note 1) A clevis pivot bracket pin and retaining rings are included.
Note 2) It cannot be used for the single clevis (CM2XC) and the double clevis (CM2XD).

Clevis Pivot Bracket Pin (For CM2XE(V))

Material: Carbon steel



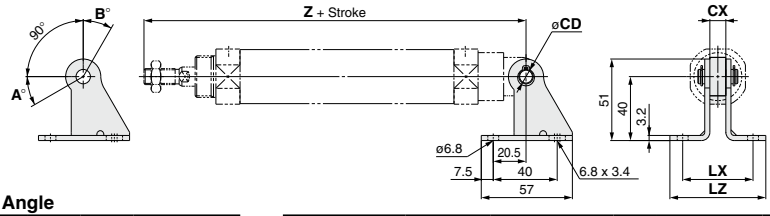
(mm)

Part no.	Applicable bore size	D_{d9}	d	L_1	L_2	m	t	Included retaining ring
CD-S02	**20**, **25**	$8^{-0.040}_{-0.076}$	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	**32**, **40**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

Refer to the Best Pneumatics No. 3 (-XB12: External stainless steel cylinder) for stainless steel mounting brackets and accessories (some are not applicable.).

With Single Clevis



Rotation Angle

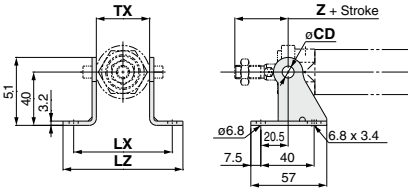
Bore size (mm)	A°	B°	A° + B° + 90°
20	25	85	200
25, 32	21	81	192
40	26	86	202

(mm)

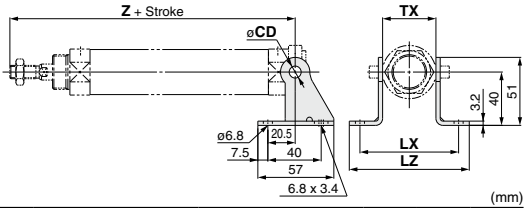
Mounting	Part no.	Applicable bore size	CX	Z + Stroke	CD	LX	LZ
CM2XC (Single clevis)	**CM-B032**	**20**	10	133	9	44	60
		25		137			
		32		139			
	CM-B040	**40**	15	177	10	49	65

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

With Rod Trunnion



With Head Trunnion



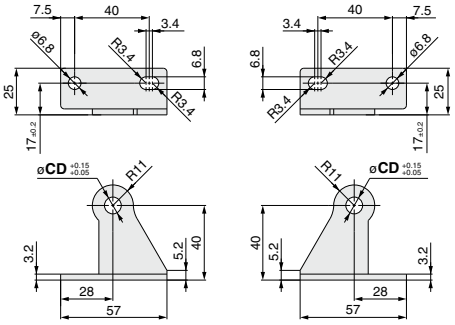
(mm)

Mounting	Part no.	Applicable bore size	TX	Rod trunnion Z + Stroke	Head trunnion Z + Stroke	CD	LX	LZ
CM2XU/CM2XT (Rod/Head trunnion)	**CM-B020**	**20**	32	36	108	8	66	82
	CM-B032	**25**	40	40	112	9	74	90
		32			114			
	CM-B040	**40**	53	44.5	143.5	10	87	103

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

Pivot Bracket

∗ Pivot brackets consists of a set of two brackets.

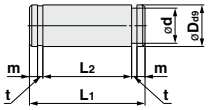


(mm)

Part no.	CD
CM-B020 Note 2)	8
CM-B032	9
CM-B040	10

Note 1) A pivot bracket pin and retaining rings are not included with the pivot bracket.
Note 2) Only for the trunnion

Pivot Bracket Pin (For CM2XC)



(mm)

Applicable bore size	Part no.	$D_{-0.040}^{-0.076}$	d	L1	L2	m	t	Included retaining ring
20 to 32	**CDP-1**	$9_{-0.076}^{-0.040}$	8.6	25	19.2	1.75	1.15	Type C 9 for axis
40	**CD-S03**	$10_{-0.076}^{-0.040}$	9.6	34	29	1.35	1.15	Type C 10 for axis

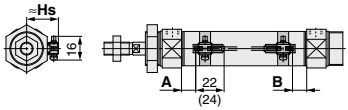
Note) Retaining rings are included with the pivot bracket pin.

Auto Switch Mounting

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

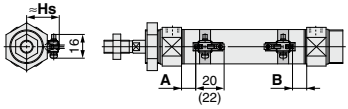
Solid state auto switch

D-M9□
D-M9□W
D-M9□A



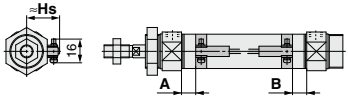
( ): Dimension of the D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□WV
D-M9□AV

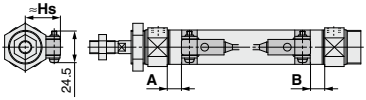


( ): Dimension of the D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

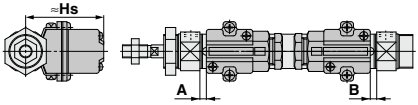
D-H7□/H7□W/H7NF/H7BA/H7C



D-G5NT

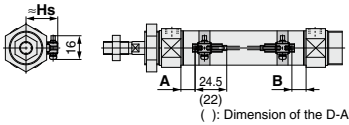


D-G39A/K39A



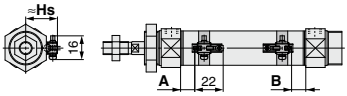
Reed auto switch

D-A9□



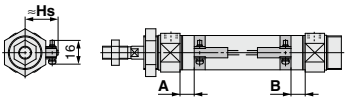
( ): Dimension of the D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

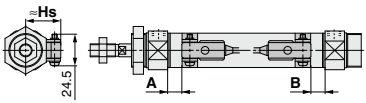


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

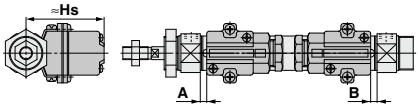
D-C7/C8/C73C/C80C



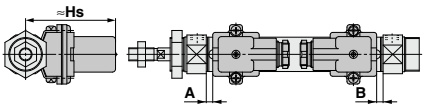
D-B5/B6/B59W



D-A33A/A34A



D-A44A



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□(V) D-M9□W(V) D-M9□A(V)		D-A9□(V)		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7□ D-H7C D-H7□W D-H7NF		D-G5NT	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	11	9.5	7	5.5	1	0	7	6	4	3	0.5	0	6	5	2.5	1.5
25	10	10	6	6	1	0	7	6	4	3	0.5	0	6	5	2.5	1.5
32	11.5	10.5	7.5	6.5	2	1	8	7	5	4	1.5	0.5	7	6	3.5	2.5
40	17.5	15.5	13.5	11.5	7	6	13	12	10	9	6.5	5.5	12	11	8.5	7.5

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

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-M9□V D-M9□WV D-M9□AV D-A9□V	D-B5□ D-B64 D-B59W D-G5NT D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C	D-A3□A D-G39A D-K39A	D-A44A
	Hs	Hs	Hs	Hs	Hs	Hs
20	23.5	25.5	22.5	25	60	69.5
25	26	28	25	27.5	62.5	72
32	29.5	31.5	28.5	31	66	75.5
40	33.5	35.5	32.5	35	70	79.5

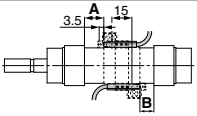
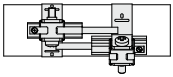
Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches				
	With 1 pc.	With 2 pcs.		With n pcs. (n: Number of auto switches)	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	5	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-M9□W	10	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-M9□A	10	25	40 Note 1)	$25 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	60 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-A9□	5	15	30	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	50 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-M9□V	5	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-A9□V	5	15	25	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	25 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-M9□WV **D-M9□AV**	10	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5…)
D-C7□ **D-C80**	10	15	50	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	50 + 45 (n – 2) (n = 2, 3, 4, 5…)
D-H7□ **D-H7□W** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	60 + 45 (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)	65 + 50 (n – 2) (n = 2, 3, 4, 5…)
D-B5□/B64 **D-G5NT**	10	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5…)
D-B59W	15	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6…) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5…)
D-A3□A/G39A **D-K39A/A44A**	10	35	100	35 + 30 (n – 2) (n = 2, 3, 4, 5…)	100 + 100 (n – 2) (n = 2, 3, 4, 5…)

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 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 The proper auto switch mounting position is 3.5 mm inward from the switch holder edge.	 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.
D-M9□ **D-M9□W**	Less than 20 stroke Note 2)	Less than 55 stroke Note 2)
D-M9□A	Less than 25 stroke	Less than 60 stroke Note 2)
D-A9□	—	Less than 50 stroke Note 2)

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

Operating Range

(mm)

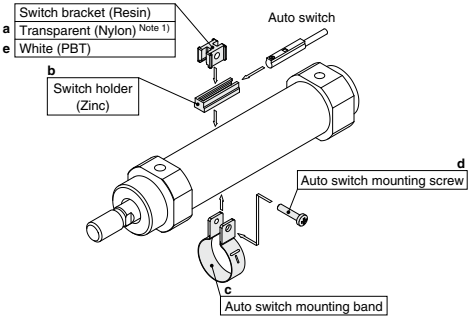
Auto switch model	Bore size			
	20	**25**	**32**	**40**
D-A9□(V)	6	6	6	6
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	3.5	3	3.5	3
D-C7□/C80 **D-C73C/C80C**	7	8	8	8
D-B5□/B64 **D-A3□A/A44A**	8	8	9	9

(mm)

Auto switch model	Bore size			
	20	**25**	**32**	**40**
D-B59W	12	12	13	13
D-H7□/H7□W **D-G5NT/H7NF**	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A	8	9	9	9

∗ 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 model	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-M9□(V) **D-M9□W(V)** **D-A9□(V)**	BM5-020 (A set of a, b, c, d)	BM5-025 (A set of a, b, c, d)	BM5-032 (A set of a, b, c, d)	BM5-040 (A set of a, b, c, d)
D-M9□A(V)	BM5-020S (A set of b, c, d, e)	BM5-025S (A set of b, c, d, e)	BM5-032S (A set of b, c, d, e)	BM5-040S (A set of b, c, d, e)
				
D-C7□/C80 **D-C73C/C80C** **D-H7□** **D-H7□W** **D-H7NF**	BM2-020A (A set of band and screw)	BM2-025A (A set of band and screw)	BM2-032A (A set of band and screw)	BM2-040A (A set of band and screw)
D-H7BA	BM2-020AS (A set of band and screw)	BM2-025AS (A set of band and screw)	BM2-032AS (A set of band and screw)	BM2-040AS (A set of band and screw)
D-B5□/B64 **D-B59W** **D-G5NT** **D-G5NB**	BA2-020 (A set of band and screw)	BA2-025 (A set of band and screw)	BA2-032 (A set of band and screw)	BA2-040 (A set of band and screw)
D-A3□A/A44A Note 3) **D-G39A/K39A**	BM3-020 (A set of band and screw)	BM3-025 (A set of band and screw)	BM3-032 (A set of band and screw)	BM3-040 (A set of band and screw)

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) The D-A3□A/A44A/G39A/K39A cannot be mounted on the CDM2□P series centralized piping type.

Band Mounting Brackets Set Part No.

Set part no.	Contents
BM2-□□□A(S) ∗ **S**: Stainless steel screw	•Auto switch mounting band (c) •Auto switch mounting screw (d)
BJ4-1	•Switch bracket (White/PBT) (e) •Switch holder (b)
BJ5-1	•Switch bracket (Transparent/Nylon) (a) •Switch holder (b)

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features
Reed	D-B53/C73/C76	Grommet (In-line)	—
	D-C80		Without indicator light
Solid state	D-H7A1/H7A2/H7B		—
	D-H7NW/H7PW/H7BW		Diagnostic indication (2-color indication)
	D-G5NT		With timer

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Wide range detection type, solid state auto switch (D-G5NB) is also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

How to Order

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.
Since the external dimensions and applicable auto switches are the same as standard type, refer to the WEB catalog or "Pneumatic Clean Series" catalog.

10 – C(D)M2X L 40 – 150 Z – M9BW

Clean series

10	Relief type
11	Vacuum type

With auto switch (Built-in magnet)

Low speed cylinder

Mounting

B	Basic
L	Axial foot
F	Rod flange
G	Head flange
BZ	Boss-cut/Basic
FZ	Boss-cut/ Rod flange

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

Clean series	Bore size (mm)	Standard stroke (mm)
10- (Relief type)	20	25, 50, 75, 100, 125, 150, 200, 250, 300
	25	
	32	
	40	
11- (Vacuum type)	20	
	25	
	32	
	40	

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

Rod end thread

Nil	Male rod end
F	Female rod end

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ For applicable auto switches, refer to page 1196.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Specifications

Bore size (mm)	10- (Relief type)				11- (Vacuum type)			
	20	25	32	40	20	25	32	40
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.035 MPa				0.025 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							
Piston speed	1 to 200 mm/s				0.5 to 200 mm/s			
Piston rod size	ø8	ø10	ø12	ø14	ø8	ø10	ø12	ø14
Rod end thread	M8 x 1.25	M10 x 1.25		M14 x 1.5	M8 x 1.25	M10 x 1.25		M14 x 1.5
Stroke tolerance	$^{+1.4}_{0}$ mm							
Port size	1/8			1/4	1/8			1/4
Vacuum port, Relief port	M5 x 0.8							

⚠ Precautions

Be sure to read before handling.
Refer to page 1574 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
For the precautions in clean environments, refer to the WEB catalog or "Pneumatic Clean Series" catalog.

Operating Precautions

⚠Warning

1. Do not rotate the cover.
· When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover rotated.

⚠Caution

1. Be careful of the retaining ring to pop out.
· When replacing the rod seal, be careful of the retaining ring not to pop out while removing it.

Maintenance

⚠Caution

1. Grease pack
· When maintenance requires only grease, use the following part number to order.
Grease pack part number:
GR-X-005 (5 g)

Low Speed Cylinder
Double Acting, Single Rod
Series CQSX
ø12, ø16, ø20, ø25

How to Order

CQSX **B** **20** – **30** **D** □

With auto switch CDQSX **B** **20** – **30** **D** □ – **M9BW** □

With auto switch (Built-in magnet)

Low speed cylinder

Mounting

B	Through-hole/Both ends tapped common (Standard)
L	Foot [Note]
LC	Compact foot
F	Rod flange
G	Head flange
D	Double clevis

∗ Mounting bracket is shipped together with the product, (but not assembled).

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm

Cylinder stroke (mm)

Bore size	Standard stroke
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50

• Manufacturing of intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. The overall length of cylinder will be the same as the standard stroke with a longer one.
Example) 3 mm width spacer is installed in the standard cylinder CQSXB25-50D to make the CQSXB25-47D.

Action

D	Double acting

Cushion/Rod end thread

Nil	Standard (Female rod end)
C	With rubber bumper
M	Male rod end

∗ Combination above is possible.

Auto switch

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSXL25-30D

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto 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		**M9NWV**	**M9NW**	●	●	●	○	○	IC circuit	
				3-wire (PNP)				**M9PWV**	**M9PW**	●	●	●	○	○		
				2-wire		12 V		**M9BWV**	**M9BW**	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		**M9NAV*****	**M9NA*****	○	○	●	○	○	IC circuit	
				3-wire (PNP)				**M9PAV*****	**M9PA*****	○	○	●	○	○		
				2-wire		12 V		**M9BAV*****	**M9BA*****	○	○	●	○	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		—	**P3DW****	●	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	—	●	●	—	—	Relay, PLC
							100 V or less	**A90V**	**A90**	●	—	●	—	—	IC circuit	

∗∗∗ 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 ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

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

∗∗ The D-P3DW□ is only compatible with ø25. It is mounted away from the port side to avoid interference with fittings.

∗ Since there are other applicable auto switches than listed, refer to page 1223 for details.

∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3. For the D-P3DW□, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Auto switches are shipped together, (but not assembled).

Note) The D-A9□V/M9□V/M9□WV/M9□AV auto switches may not be mounted on the port side depending on the cylinder stroke or fitting size for piping. Please consult with SMC separately.

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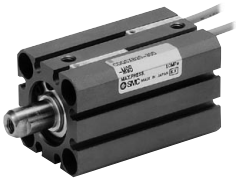
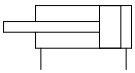
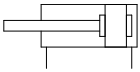


Symbol

Single rod, Without cushion



Single rod, Rubber bumper



⚠Precautions

Be sure to read before handling. Refer to page 1574 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

Retaining Ring Installation/Removal

⚠Caution

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).

2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Maintenance

⚠Caution

1. Replacement parts/Seal kit

Order it in accordance with the bore size.

Bore size (mm)	Kit no.	Contents
12	CQSX12-PS	Piston seal: 1 pc. Rod seal: 1 pc. Tube gasket: 1 pc. Grease pack (10 g): 1 pc.
16	CQSX16-PS	
20	CQSX20-PS	
25	CQSX25-PS	

2. Grease pack

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number:

GR-L-005 (5 g)

GR-L-010 (10 g)

GR-L-150 (150 g)

Specifications

Bore size (mm)	12	16	20	25
Type	Pneumatic (Non-lube)			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Ambient and fluid temperature	Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)			
Cushion	None, Rubber bumper			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0\ \text{Note)}}_{0}$			
Piston speed	ø12, ø16: 1 to 300 mm/s ø20, ø25: 0.5 to 300 mm/s			

Note) Stroke length tolerance does not include the amount of bumper change.

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	12	16	20	25
Minimum operating pressure	0.03	0.03	0.025	0.025

Mounting Brackets/Part No.

Bore size (mm)	Foot Note 1)	Compact foot	Flange	Double clevis
12	CQS-L012	CQS-LC012	CQS-F012	CQS-D012
16	CQS-L016	CQS-LC016	CQS-F016	CQS-D016
20	CQS-L020	CQS-LC020	CQS-F020	CQS-D020
25	CQS-L025	CQS-LC025	CQS-F025	CQS-D025

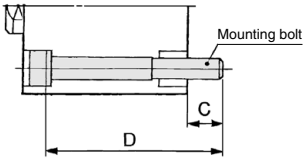
Note 1) Order two foots per cylinder.

Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange: Body mounting bolt
Double clevis: Clevis pin, Type C retaining ring for shaft, Body mounting bolt

Mounting Bolt for CQSX/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of the CQSXB is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3X25L 4 pcs.



Note) The appropriate flat washer must be used for through-hole mounting.

Cylinder model	C	D	Mounting bolt part no.
CQSXB12-5D	6.5	25	CQ-M3X25L
10D		30	X30L
15D		35	X35L
20D		40	X40L
25D		45	X45L
30D		50	X50L
CQSXB16-5D	6.5	25	CQ-M3X25L
10D		30	X30L
15D		35	X35L
20D		40	X40L
25D		45	X45L
30D		50	X50L
CQSXB20-5D	6.5	25	CQ-M5X25L
10D		30	X30L
15D		35	X35L
20D		40	X40L
25D		45	X45L

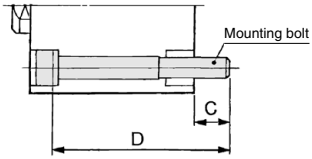
Cylinder model	C	D	Mounting bolt part no.
CQSXB20-30D	6.5	50	CQ-M5X50L
35D		55	X55L
40D		60	X60L
45D		65	X65L
50D		70	X70L
CQSXB25-5D	8.5	30	CQ-M5X30L
10D		35	X35L
15D		40	X40L
20D		45	X45L
25D		50	X50L
30D		55	X55L
35D		60	X60L
40D		65	X65L
45D		70	X70L
50D		75	X75L

Material: Chromium molybdenum steel
Surface material: Zinc chromated

Mounting Bolt for CDQSX/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of the CDQSXB is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3X30L 4 pcs.



Note) The appropriate flat washer must be used for through-hole mounting.

Cylinder model	C	D	Mounting bolt part no.
CDQSXB12-5D	6.5	30	CQ-M3X30L
10D		35	X35L
15D		40	X40L
20D		45	X45L
25D		50	X50L
30D		55	X55L
CDQSXB16-5D	6.5	30	CQ-M3X30L
10D		35	X35L
15D		40	X40L
20D		45	X45L
25D		50	X50L
30D		55	X55L
CDQSXB20-5D	6.5	35	CQ-M5X35L
10D		40	X40L
15D		45	X45L
20D		50	X50L
25D		55	X55L

Cylinder model	C	D	Mounting bolt part no.
CDQSXB20-30D	6.5	60	CQ-M5X60L
35D		65	X65L
40D		70	X70L
45D		75	X75L
50D		80	X80L
CDQSXB25-5D	8.5	40	CQ-M5X40L
10D		45	X45L
15D		50	X50L
20D		55	X55L
25D		60	X60L
30D		65	X65L
35D		70	X70L
40D		75	X75L
45D		80	X80L
50D		85	X85L

Material: Chromium molybdenum steel
Surface material: Zinc chromated

Accessories

For accessory bracket for the CQS series, refer to page 1233, since it is commonly used with the CQ2 series.

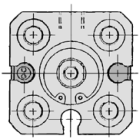
- **Single knuckle joint**
- **Knuckle pin**
- **Double knuckle joint**
- **Rod end nut**

Dimensions: ø12 to ø25

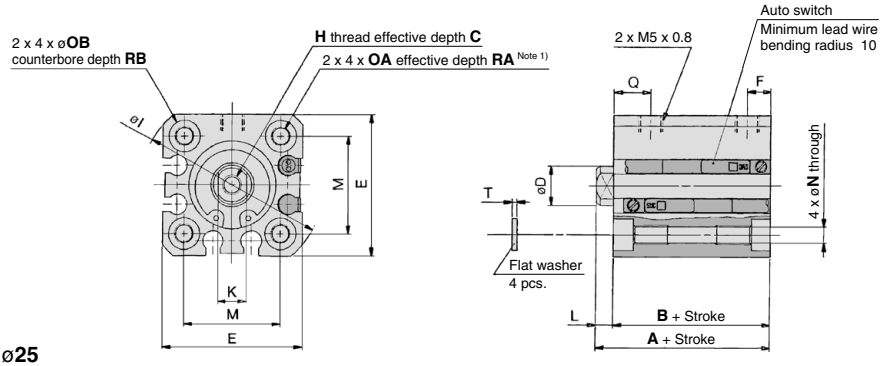
∗ For the auto switch mounting position and its mounting height, refer to page 1222.

Standard (Through-hole/Both ends tapped common): CQSXB/CDQSXB

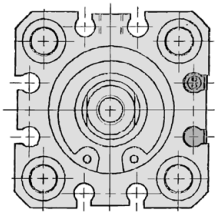
ø12



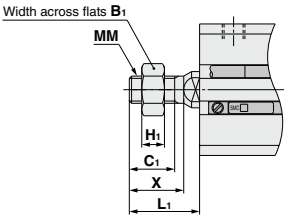
ø16



ø20, ø25



Male rod end



Male Rod End (mm)

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

· How to calculate the length with intermediate stroke
Spacer installation type ··· The dimensions will be identical to those of the nearest long stroke.

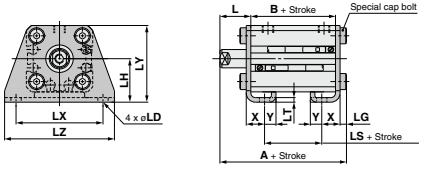
Standard (mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
		A	B	A	B																
12	5 to 30	20.5	17	25.5	22	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	20.5	17	25.5	22	8	8	29	5	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	24	19.5	34	29.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	9	9	10	7	1
25	5 to 50	27.5	22.5	37.5	32.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	11	10	7	1

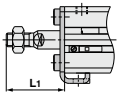
Note 1) Threaded through-hole is used for the standard of ø12 and ø16 with a 5 mm stroke and ø20 with 5 to 15 mm strokes and ø25 with 5 and 10 mm strokes and ø20 with auto switch built-in magnet with a 5 mm stroke.
Note 2) Rubber bumper type has the same dimensions as those indicated above.
∗ For details about the rod end nut and accessory brackets, refer to page 1233.

Dimensions: ø12 to ø25

Foot: CQSXL/CDQSXL



Male rod end



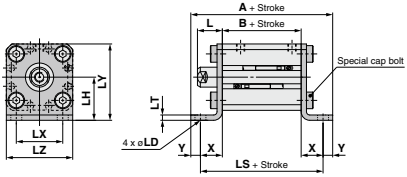
Foot (mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1
12	5 to 30	35.3	17	5	40.3	22	10	13.5	24
16	5 to 30	35.3	17	5	40.3	22	10	13.5	25.5
20	5 to 50	41.2	19.5	7.5	51.2	29.5	17.5	14.5	28.5
25	5 to 50	44.7	22.5	7.5	54.7	32.5	17.5	15	32.5

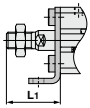
Bore size (mm)	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	4.5	2.8	17	2	34	29.5	44	8	4.5
16	4.5	2.8	19	2	38	33.5	48	8	5
20	6.6	4	24	3.2	48	42	62	9.2	5.8
25	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQSXLC/CDQSXLC



Male rod end



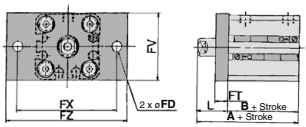
Compact Foot (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1
12	5 to 30	44.6	17	35.6	49.6	22	40.6	13.5	24
16	5 to 30	45.6	17	35.6	50.6	22	40.6	13.5	25.5
20	5 to 50	57.5	19.5	45.9	67.5	29.5	55.9	14.5	28.5
25	5 to 50	60.5	22.5	48.9	70.5	32.5	58.9	15	32.5

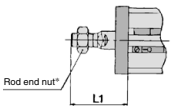
Bore size (mm)	LD	LH	LT	LX	LY	LZ	X	Y
12	4.5	17	2	15.5	29.5	25	9.3	4.5
16	4.5	19	2	20	33.5	29	9.3	5
20	6.6	24	3.2	25.5	42	36	13.2	5.8
25	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQSXF/CDQSXF



Male rod end



Rod Flange (mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch A	B	With auto switch A	B	FD	FT	FV	FX
12	5 to 30	30.5	17	35.5	22	4.5	5.5	25	45
16	5 to 30	30.5	17	35.5	22	4.5	5.5	30	45
20	5 to 50	34	19.5	44	29.5	6.6	8	39	48
25	5 to 50	37.5	22.5	47.5	32.5	6.6	8	42	52

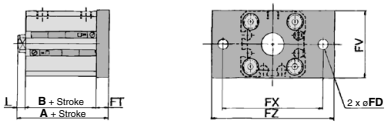
Bore size (mm)	FZ	L	L1
12	55	13.5	24
16	55	13.5	25.5
20	60	14.5	28.5
25	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

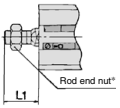
∗ For details about the rod end nut and accessory brackets, refer to page 1233.

Dimensions: ø12 to ø25

Head flange: CQSXG/CDQSXG



Male rod end



Head Flange

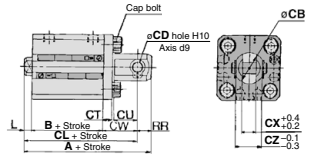
(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch		With auto switch	
		A	B	A	B
12	5 to 30	26	17	31	22
16	5 to 30	26	17	31	22
20	5 to 50	32	19.5	42	29.5
25	5 to 50	35.5	22.5	45.5	32.5

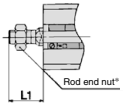
Bore size (mm)	FD	FT	FV	FX	FZ	L	L_1
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	8	39	48	60	4.5	18.5
25	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

Double clevis: CQSXD/CDQSXD



Male rod end



Double Clevis

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
12	5 to 30	40.5	17	34.5	45.5	22	39.5
16	5 to 30	41.5	17	35.5	46.5	22	40.5
20	5 to 50	51	19.5	42	61	29.5	52
25	5 to 50	57.5	22.5	47.5	67.5	32.5	57.5

Bore size (mm)	CB	CD	CT	CU	CW	CX	CZ	L	L_1	RR
12	12	5	4	7	14	5	10	3.5	14	6
16	14	5	4	10	15	6.5	12	3.5	15.5	6
20	20	8	5	12	18	8	16	4.5	18.5	9
25	24	10	5	14	20	10	20	5	22.5	10

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plating

* For details about the rod end nut and accessory brackets, refer to page 1233.

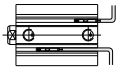
Auto Switch Mounting

Minimum Stroke for Auto Switch Mounting

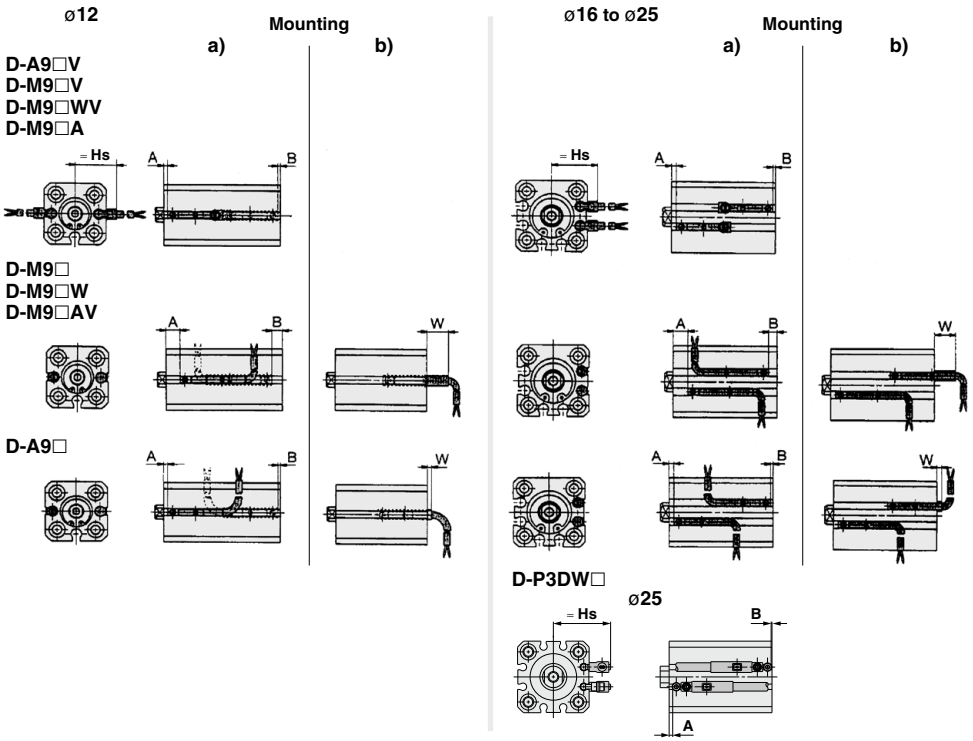
(mm)

Number of auto switches	D-M9□V	D-A9□V	D-M9□WV D-M9□AV	D-A9□	D-M9□W D-M9□A	D-M9□	D-P3DW Note 1)
With 1 pc.	5	5	10	10(5)	15(10)	15(5)	15
With 2 pcs.	5	10	10	10	15(10)	15(5)	15

Note 1) ø25 is only applicable for the D-P3DW.
Note 2) The dimensions stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure on the right.) Order auto switches separately.



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



Auto Switch Proper Mounting Position

(mm)

Bore size \ Auto switch model	D-M9□/M9□W			D-M9□A			D-M9□V/M9□WV D-M9□AV			D-A9□			D-A9□V			D-P3DW		
	A	B	W	A	B	W	A	B	Hs	A	B	W	A	B	Hs	A	B	Hs
12	5.5	3.5	5.5	5.5	3.5	7.5	5.5	4.5	19.5	1.5	0	[1.5]4	1.5	0	17	—	—	—
16	6	4	6	6	4	8	6	4	21.5	2	0	[2]4.5	2	0	19	—	—	—
20	10	7.5	2.5	10	7.5	4.5	10	7.5	25	6	3.5	[–1.5]1	6	3.5	22.5	—	—	—
25	11	9.5	0.5	11	9.5	2.5	11	9.5	27	7	5.5	[–3.5]–1	7	5.5	24.5	1.5	0	32

[ ]: Denotes the dimensions of the D-A96.
Note 1) Adjust the auto switch after confirming the operating condition in the actual setting.
Note 2) The product is shipped out of the factory in installation state "a)". To change the electrical entry direction of the switch on the head, refer to installation state "b)".
Note 3) Negative figures for W indicate an auto switch is mounted inward from the edge of the cylinder body.

Operating Range

(mm)

Auto switch model	Bore size			
	12	16	20	25
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3	4	5.5	4.5
D-A9□/A9□V	6	7.5	10	10
D-P3DW	—	—	—	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.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

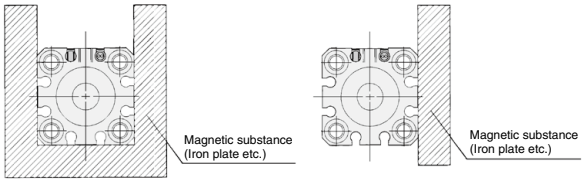
∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

⚠Precautions

Be sure to read before handling.
Refer to page 1574 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

• If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the figure on the right (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable. Therefore, please consult with SMC for this type of application.



How to Order

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room. Since the external dimensions and applicable auto switches are the same as standard type, refer to the WEB catalog or "Pneumatic Clean Series" catalog.

10 – C(D)QSX B 20 – 30 D – M9BW

Clean series

10	Relief type
11	Vacuum type

With auto switch (Built-in magnet)

Low speed cylinder

Mounting

B	Through-hole/Both ends tapped (Standard)

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm

Cylinder stroke (mm)

Bore size	Standard stroke
12, 16	5, 10, 15, 20, 25, 30
20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
25	

• Manufacturing of intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. The overall length of cylinder will be the same as the standard stroke with a longer one.
Example) 3 mm width spacer is installed in the standard cylinder 10-CQSXB25-50D to make the 10-CQSXB25-47D.

Action

D	Double acting

Rod end thread

Nil	Standard (Female rod end)
M	Male rod end

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ For applicable auto switches, refer to page 1216.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Specifications

Bore size (mm)		10- (Relief type)				11- (Vacuum type)			
		12	16	20	25	12	16	20	25
Fluid		Air				Air			
Proof pressure		1.5 MPa				1.5 MPa			
Maximum operating pressure		1.0 MPa				1.0 MPa			
Minimum operating pressure		0.04 MPa		0.035 MPa		0.03 MPa		0.025 MPa	
Ambient and fluid temperature		Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C				Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C			
Piston speed		1 to 200 mm/s				1 to 200 mm/s		0.5 to 200 mm/s	
Piston rod size		ø6	ø8	ø10	ø12	ø6	ø8	ø10	ø12
Rod end thread	**Female thread**	M3 x 0.5	M4 x 0.7	M5 x 0.8	M6 x 1.0	M3 x 0.5	M4 x 0.7	M5 x 0.8	M6 x 1.0
	Male thread	M5 x 0.8	M6 x 1.0	M8 x 1.25	M10 x 1.25	M5 x 0.8	M6 x 1.0	M8 x 1.25	M10 x 1.25
Stroke tolerance		$^{+1.0}_{0}$ mm				$^{+1.0}_{0}$ mm			
Port size		M5 x 0.8				M5 x 0.8			
Vacuum port, Relief port		M5 x 0.8				M5 x 0.8			

⚠Precautions

Be sure to read before handling.
Refer to page 1574 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
For the precautions in clean environments, refer to the WEB catalog or "Pneumatic Clean Series" catalog.

Operating Precautions

⚠Warning

1. Do not rotate the cover.
· When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover rotated.

⚠Caution

1. Be careful of the retaining ring to pop out.
· When replacing the rod seal, be careful of the retaining ring not to pop out while removing it.

Maintenance

⚠Caution

1. Grease pack
· When maintenance requires only grease, use the following part number to order.
Grease pack part number:
GR-X-005 (5 g)

Low Speed Cylinder: Standard Type
Double Acting, Single Rod

Series CQ2X

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

	CQ2X	B	40		–	30	D														
With auto switch	CDQ2X	B	40		–	30	D		–	M9BW											

With auto switch (Built-in magnet)

Low speed cylinder

Mounting

B	Through-hole (Standard)	F	Rod flange
A	Both ends tapped	G	Head flange
L	Foot Note)	D	Double clevis
LC	Compact foot		

∗ Mounting bracket is shipped together with the product, (but not assembled).

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	Rc	ø32 to ø100
TN	NPT	
TF	G	

∗ Without auto switch, ø32, 5 strokes: M thread
The symbol is Nil when ordering the M thread.

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 1226.

Action

D	Double acting

Cushion/Rod end thread

Nil	Standard (Female rod end)
C	With rubber bumper
M	Male rod end

∗ Combination above is possible.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2XL32-50D

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	●	●	●	○	—	○		
				2-wire	12 V		M9BV	M9B	●	●	●	○	—	○	—	
		Connector					J79C	—	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV***	M9NA***	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV***	M9PA***	○	○	●	○	—	○		
				2-wire	12 V		M9BAV***	M9BA***	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire	5 V, 12 V		—	F79F	●	—	●	○	—	○	IC circuit	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—		—	P3DW	●	—	●	●	—	○	—	
							—	P4DW**	—	—	●	●	—	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—
				2-wire		—	200 V	A72	A72H	●	—	●	—	—	—	—	Relay, PLC
					24 V	12 V	100 V	A93V	A93	●	—	●	●	—	—		
			No			5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	
		Connector	Yes			12 V	—	A73C	—	●	—	●	●	●	—	—	
			No			5 V, 12 V	24 V or less	A80C	—	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	Yes			—	—	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 ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) J79CN

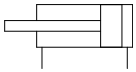
∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗∗ The D-P4DW is compatible with ø40 to ø100.
∗∗ Only the D-P4DW is assembled at the time of shipment.

∗ Since there are other applicable auto switches than listed, refer to page 1238 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3. For the D-P3DW, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ When the D-A9□(V)/M9□(V)/M9W□(V)/M9□A(V) with ø32 to ø50 are mounted on a side other than the port side, order auto switch mounting brackets separately. Refer to page 1237 for details.
∗ Auto switches are shipped together, (but not assembled).

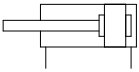
SMC

Symbol

Single rod,
Without cushion



Single rod,
Rubber bumper



⚠Precautions

Be sure to read before handling. Refer to page 1574 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

Retaining Ring Installation/Removal

⚠Caution

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Pneumatic Circuit

1. Pressure supplied to cylinder should be set affordably. When the operating pressure is low, low speed operation may not be stable depending on a load condition. Besides, the maximum speed may be restricted depending on a pneumatic circuit, or operating pressure.

Maintenance

⚠Caution

1. Replacement parts/Seal kit

Order it in accordance with the bore size.

Bore size (mm)	Kit no.	Contents	
32	CQ2X32-PS	Piston seal:	1 pc.
40	CQ2X40-PS	Rod seal:	1 pc.
50	CQSX50-PS	Gasket:	1 pc.
63	CQ2X63-PS	Grease pack (10 g):	1 pc.
80	CQ2X80-PS		
100	CQ2X100-PS		

2. Grease pack

When maintenance requires only grease, use the following part numbers to order.

Grease pack part number:
GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	32	40	50	63	80	100
Type	Pneumatic (Non-lube)					
Fluid	Air					
Proof pressure	1.5 MPa					
Maximum operating pressure	1.0 MPa					
Ambient and fluid temperature	Without auto switch: −10°C to 70°C With auto switch: −10°C to 60°C (No freezing)					
Cushion	None, Rubber bumper					
Rod end thread	Female thread					
Stroke length tolerance	$^{+1.0\ \text{mm Note)}}_{0}$					
Mounting	Through-hole					
Piston speed	0.5 to 300 mm/s					

Note) Stroke length tolerance does not include the amount of bumper change.

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	32	40	50	63	80	100
Minimum operating pressure	0.025		0.01			

Standard Strokes

Bore size (mm)	Standard stroke (mm)
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63 80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

• Manufacturing of intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. But, as for ø40 to ø100 with bumper, please consult with SMC separately.
Example) 18 mm width spacer is installed in the standard cylinder CQ2XB40-75D to make the CQ2XB40-57D.

Mounting Brackets/Part No.

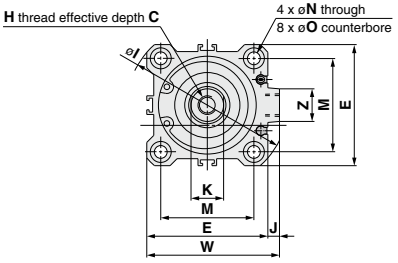
Bore size (mm)	Foot Note 1)	Compact foot	Flange	Double clevis Note 3)
32	CQ-L032	CQ-LC032	CQ-F032	CQ-D032
40	CQ-L040	CQ-LC040	CQ-F040	CQ-D040
50	CQ-L050	CQ-LC050	CQ-F050	CQ-D050
63	CQ-L063	CQ-LC063	CQ-F063	CQ-D063
80	CQ-L080	CQ-LC080	CQ-F080	CQ-D080
100	CQ-L100	CQ-LC100	CQ-F100	CQ-D100

Note 1) Order two foots per cylinder.
Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for shaft, Body mounting bolt
Note 3) A clevis pin and retaining rings are included with the double clevis.

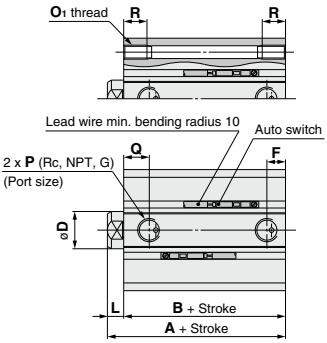
Bore Size

ø32 to ø50

Standard (Through-hole) CQ2XB/ CDQ2XB



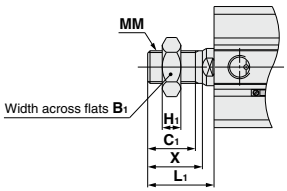
Both ends tapped: CQ2XA/CDQ2XA



Both Ends Tapped (mm)

Bore size (mm)	O_1	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

Male rod end



Male Rod End (mm)

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

Standard For the auto switch mounting position and its mounting height, refer to page 1235. (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch					With auto switch					C	D	E	H	I	J	K	L	M
		A	B	F	P	Q	A	B	F	P	Q									
32	5	30	23	5.5	M5 x 0.8	11.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	60	4.5	14	7	34
	10 to 50			7.5	1/8	10.5														
	75, 100	40	33																	
40	5 to 50	36.5	29.5	8	1/8	11	46.5	39.5	8	1/8	11	13	16	52	M8 x 1.25	69	5	14	7	40
	75, 100	46.5	39.5																	
50	10 to 50	38.5	30.5	10.5	1/4	10.5	48.5	40.5	10.5	1/4	10.5	15	20	64	M10 x 1.5	86	7	17	8	50
	75, 100	48.5	40.5																	

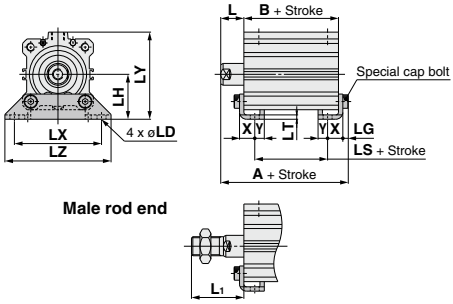
Bore size (mm)	N	O	S	U	W	Z
32	5.5	9 depth 7	58.5	31.5	49.5	14
40	5.5	9 depth 7	66	35	57	14
50	6.6	11 depth 8	80	41	71	19

Note 1) Dimensions for rubber bumper are same as the standard type above.
∗ For details about the rod end nut and accessory brackets, refer to page 1233.
Note 2) Refer to page 1226 for calculation of the longitudinal dimension of the intermediate strokes since there is the spacer-installed type.

Bore Size

ø32 to ø50

Foot: CQ2XL/CDQ2XL



Foot

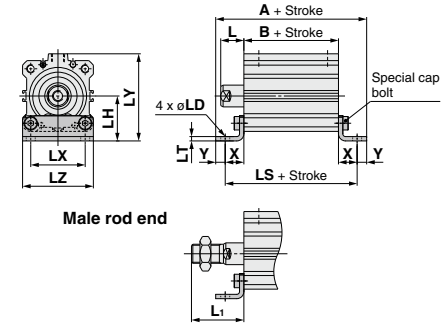
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
32	5 to 50	47.2	23	7	57.2	33	17	17	38.5	6.6
	75, 100	57.2	33	17						
40	5 to 50	53.7	29.5	13.5	63.7	39.5	23.5	17	38.5	6.6
	75, 100	63.7	39.5	23.5						
50	10 to 50	56.7	30.5	7.5	66.7	40.5	17.5	18	43.5	9
	75, 100	66.7	40.5	17.5						

Bore size (mm)	Stroke range (mm)	LG	LH	LT	LX	LY	LZ	X	Y
32	5 to 50	4	30	3.2	57	57	71	11.2	5.8
	75, 100								
40	5 to 50	4	33	3.2	64	64	78	11.2	7
	75, 100								
50	10 to 50	5	39	3.2	79	78	95	14.7	8
	75, 100								

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQ2XLC/CDQ2XLC



Compact Foot

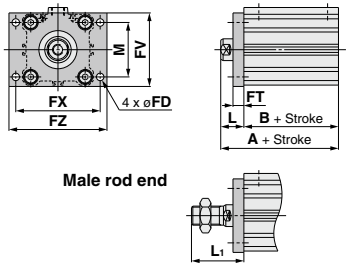
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
32	5 to 50	62	23	50.4	72	33	60.4	17	38.5	6.6
	75, 100	72	33	60.4						
40	5 to 50	70.9	29.5	56.9	80.9	39.5	66.9	17	38.5	6.6
	75, 100	80.9	39.5	66.9						
50	10 to 50	79.9	30.5	63.9	89.9	40.5	73.9	18	43.5	9
	75, 100	89.9	40.5	73.9						

Bore size (mm)	Stroke range (mm)	LH	LT	LX	LY	LZ	X	Y
32	5 to 50	30	3.2	34	57	45	13.7	5.8
	75, 100							
40	5 to 50	33	3.2	40	64	52	13.7	7
	75, 100							
50	10 to 50	39	3.2	50	78	64	16.7	8
	75, 100							

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQ2XF/CDQ2XF



Rod Flange

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	With auto switch A	B	FD	FT	FV	FX	FZ
32	5 to 50	40	23	50	33	5.5	8	48	56	65
	75, 100	50	33							
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	72
	75, 100	56.5	39.5							
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89
	75, 100	58.5	40.5							

Bore size (mm)	Stroke range (mm)	L	L1	M
32	5 to 50	17	38.5	34
	75, 100			
40	5 to 50	17	38.5	40
	75, 100			
50	10 to 50	18	43.5	50
	75, 100			

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

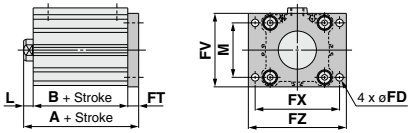
∗ For details about the rod end nut and accessory brackets, refer to page 1233.

Air Cylinders
CJ2
CM2
CG1
MB
CA2
CQ2 CQS
Lube-retainer
JA
MXH
MXQ
MGP
C□Y C□X
CK□1
C(L)K□
C(L)KU
CKQ
CKZ2N
WRF
INDEX

Bore Size

ø32 to ø50

Head flange: CQ2XG/CDQ2XG



Male rod end

Applicable to { **Head flange** / **Double clevis**

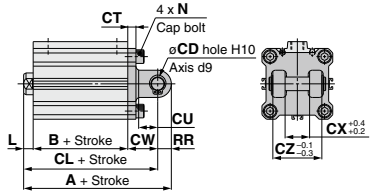
Head Flange

(mm)

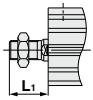
Bore size (mm)	Stroke range (mm)	Without auto switch A	With auto switch A	L	L1
32	5 to 50	38	48	7	28.5
	75, 100	48			
40	5 to 50	44.5	54.5	7	28.5
	75, 100	54.5			
50	10 to 50	47.5	57.5	8	33.5
	75, 100	57.5			

Flange bracket material: Carbon steel
Surface treatment: Nickel plating
(∗ Dimensions except A, L and L1 are the same as rod flange type.)

Double clevis: CQ2XD/CDQ2XD



Male rod end



Double Clevis

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	CL	With auto switch A	B	CL	CD	CT	CU
32	5 to 50	60	23	50	70	33	60	10	5	14
	75, 100	70	33	60						
40	5 to 50	68.5	29.5	58.5	78.5	39.5	68.5	10	6	14
	75, 100	78.5	39.5	68.5						
50	10 to 50	80.5	30.5	66.5	90.5	40.5	76.5	14	7	20
	75, 100	90.5	40.5	76.5						

Bore size (mm)	Stroke range (mm)	CW	CX	CZ	L	L1	N	RR
32	5 to 50	20	18	36	7	28.5	M6 x 1.0	10
	75, 100							
40	5 to 50	22	18	36	7	28.5	M6 x 1.0	10
	75, 100							
50	10 to 50	28	22	44	8	33.5	M8 x 1.25	14
	75, 100							

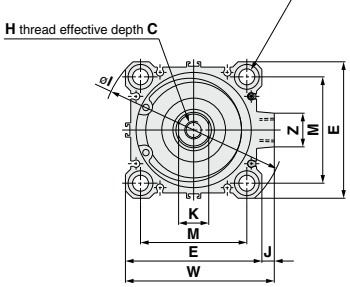
Double clevis bracket material: Cast iron
Surface treatment: Painted

∗ For details about the rod end nut and accessory brackets, refer to page 1233.
∗∗ A double clevis pin and retaining rings are included.

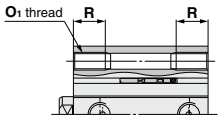
Bore Size

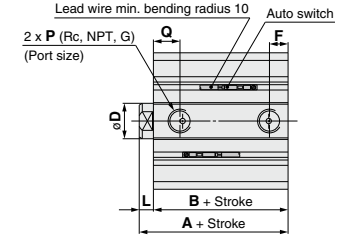
ø63 to ø100

Standard (Through-hole)



Both ends tapped: CQ2XA/CDQ2XA

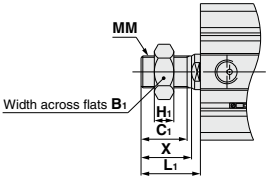




Both Ends Tapped (mm)

Bore size (mm)	O_1	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

Male rod end



Male Rod End (mm)

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

Standard For the auto switch mounting position and its mounting height, refer to page 1235. (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	J	K	L	M	N	O	P	Q	S
		A	B	A	B															
63	10 to 50	44	36	54	46	15	20	77	10.5	M10 x 1.5	103	7	17	8	60	9	14 depth 10.5	1/4	15	93
	75, 100	54	46																	
80	10 to 50	53.5	43.5	63.5	53.5	21	25	98	12.5	M16 x 2.0	132	6	22	10	77	11	17.5 depth 13.5	3/8	16	112.5
	75, 100	63.5	53.5																	
100	10 to 50	65	53	75	63	27	30	117	13	M20 x 2.5	156	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	132.5
	75, 100	75	63																	

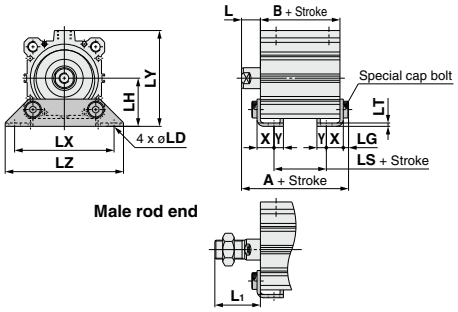
Bore size (mm)	U	W	Z
63	47.5	84	19
80	57.5	104	26
100	67.5	123.5	26

Note 1) Dimensions for rubber bumper are same as the standard type above.
∗ For details about the rod end nut and accessory brackets, refer to page 1233.
Note 2) Refer to "Standard Strokes" on page 1226 for calculation of the longitudinal dimension of the intermediate strokes.

Bore Size

ø63 to ø100

Foot: CQ2XL/CDQ2XL



Foot

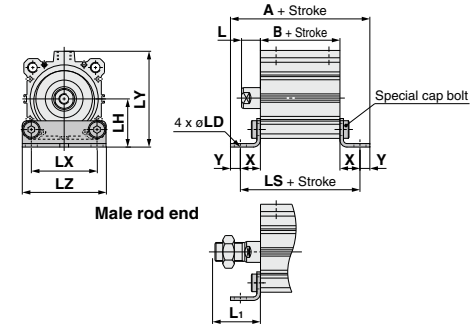
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD	LG	LH	LT
63	10 to 50	62.2	36	10	72.2	46	20	18	43.5	11	5	46	3.2
	75, 100	72.2	46	20									
80	10 to 50	75	43.5	13.5	85	53.5	23.5	20	53.5	13	7	59	4.5
	75, 100	85	53.5	23.5									
100	10 to 50	88	53	19	98	63	29	22	53.5	13	7	71	6
	75, 100	98	63	29									

Bore size (mm)	Stroke range (mm)	LX	LY	LZ	X	Y
63	10 to 50	95	91.5	113	16.2	9
	75, 100					
80	10 to 50	118	114	140	19.5	11
	75, 100					
100	10 to 50	137	136	162	23	12.5
	75, 100					

Foot bracket material: Carbon steel
Surface treatment: Nickel plating

Compact foot: CQ2XLC/CDQ2XLC



Compact Foot

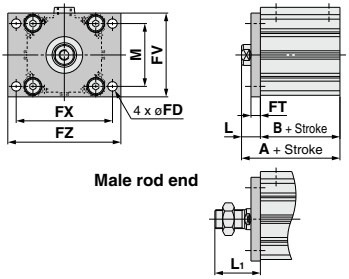
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	LS	With auto switch A	B	LS	L	L1	LD
63	10 to 50	90.4	36	72.4	100.4	46	82.4	18	43.5	11
	75, 100	100.4	46	82.4						
80	10 to 50	110.5	43.5	88.5	120.5	53.5	98.5	20	53.5	13
	75, 100	120.5	53.5	98.5						
100	10 to 50	126	53	101	136	63	111	22	53.5	13
	75, 100	136	63	111						

Bore size (mm)	Stroke range (mm)	LH	LT	LX	LY	LZ	X	Y
63	10 to 50	46	3.2	60	91.5	77	18.2	9
	75, 100							
80	10 to 50	59	4.5	77	114	98	22.5	11
	75, 100							
100	10 to 50	71	6	94	136	117	24	12.5
	75, 100							

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod flange: CQ2XF/CDQ2XF



Rod Flange

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	With auto switch A	B	FD	FT	FV	FX	FZ	L	L1	M
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46										
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	134	20	53.5	77
	75, 100	73.5	53.5										
100	10 to 50	75	53	85	63	11	11	117	136	154	22	53.5	94
	75, 100	85	63										

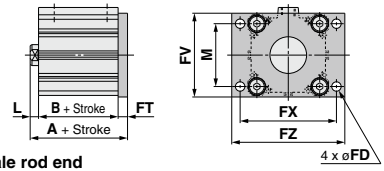
Flange bracket material: Carbon steel
Surface treatment: Nickel plating

∗ For details about the rod end nut and accessory brackets, refer to page 1233.

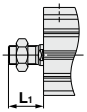
Bore Size

ø63 to ø100

Head flange: CQ2XG/CDQ2XG



Male rod end



Head Flange

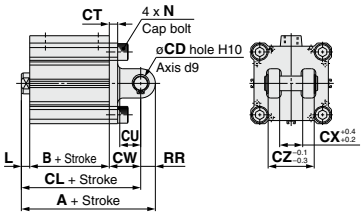
(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	With auto switch A	L	L1
63	10 to 50	53	63	8	33.5
	75, 100	63			
80	10 to 50	64.5	74.5	10	43.5
	75, 100	74.5			
100	10 to 50	76	86	12	43.5
	75, 100	86			

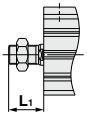
Flange bracket material: Carbon steel
Surface treatment: Nickel plating

(∗ Dimensions except A, L and L1 are the same as rod flange type.)

Double clevis: CQ2XD/CDQ2XD



Male rod end



Double Clevis

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	B	CL	With auto switch A	B	CL	CD	CT	CU	CW	CX
63	10 to 50	88	36	74	98	46	84	14	8	20	30	22
	75, 100	98	46	84								
80	10 to 50	109.5	43.5	91.5	119.5	53.5	101.5	18	10	27	38	28
	75, 100	119.5	53.5	101.5								
100	10 to 50	132	53	110	142	63	120	22	13	31	45	32
	75, 100	142	63	120								

Bore size (mm)	Stroke range (mm)	CZ	L	L1	N	RR
63	10 to 50	44	8	33.5	M10 x 1.5	14
	75, 100					
80	10 to 50	56	10	43.5	M12 x 1.75	18
	75, 100					
100	10 to 50	64	12	43.5	M12 x 1.75	22
	75, 100					

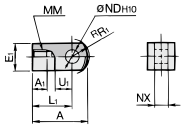
Double clevis bracket material: Cast iron
Surface treatment: Painted

∗ For details about the rod end nut and accessory brackets, refer to page 1233.
∗ A double clevis pin and retaining rings are included.

Dimensions of Accessories

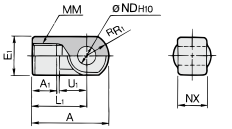
Single Knuckle Joint

For I-G012, I-Z015A
I-G02, I-G03



Material: Carbon steel
Surface treatment: Nickel plating

For I-G04, I-G05
I-G08, I-G10



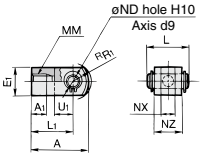
Material: Cast iron
Surface treatment: Nickel plating

(mm)

Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	$^{R}R_1$	U_1	ND_{H10}	NX
I-G04	**32, 40**	42	14	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{-0.3}_{-0.5}$
I-G05	**50, 63**	56	18	ø28	40	M18 x 1.5	16	20	$14^{+0.070}_{0}$	$22^{-0.3}_{-0.5}$
I-G08	**80**	71	21	ø38	50	M22 x 1.5	21	27	$18^{+0.070}_{0}$	$28^{-0.3}_{-0.5}$
I-G10	**100**	79	21	ø44	55	M26 x 1.5	24	31	$22^{+0.084}_{0}$	$32^{-0.3}_{-0.5}$

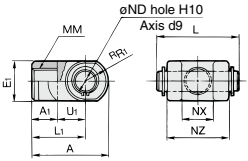
Double Knuckle Joint

For Y-G012, Y-Z015A
Y-G02, Y-G03



Material: Carbon steel
Surface treatment: Nickel plating

For Y-G04, Y-G05
Y-G08, Y-G10



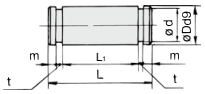
Material: Cast iron
Surface treatment: Nickel plating

(mm)

Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	$^{R}R_1$	U_1	ND_{H10}	NX	NZ	L	Applicable pin part no.
Y-G04	**32, 40**	42	16	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{+0.5}_{+0.3}$	36	41.6	IY-G04
Y-G05	**50, 63**	56	20	ø28	40	M18 x 1.5	16	20	$14^{+0.070}_{0}$	$22^{+0.5}_{+0.3}$	44	50.6	IY-G05
Y-G08	**80**	71	23	ø38	50	M22 x 1.5	21	27	$18^{+0.070}_{0}$	$28^{+0.5}_{+0.3}$	56	64	IY-G08
Y-G10	**100**	79	24	ø44	55	M26 x 1.5	24	31	$22^{+0.084}_{0}$	$32^{+0.5}_{+0.3}$	64	72	IY-G10

∗ A knuckle pin and retaining rings are included.

Knuckle Pin (Common with double clevis pin)



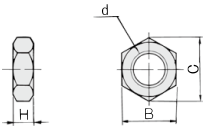
Material: Carbon steel

(mm)

Part no.	Applicable bore size (mm)	Dd9	L	d	L_1	m	t	Applicable retaining ring
IY-G04	**32, 40**	$10^{-0.040}_{-0.076}$	41.6	9.6	36.2	1.55	1.15	Type C 10 for axis
IY-G05	**50, 63**	$14^{-0.050}_{-0.093}$	50.6	13.4	44.2	2.05	1.15	Type C 14 for axis
IY-G08	**80**	$18^{-0.050}_{-0.093}$	64	17	56.2	2.55	1.35	Type C 18 for axis
IY-G10	**100**	$22^{-0.065}_{-0.117}$	72	21	64.2	2.55	1.35	Type C 22 for axis

∗ Type C retaining rings for axis are included.

Rod End Nut

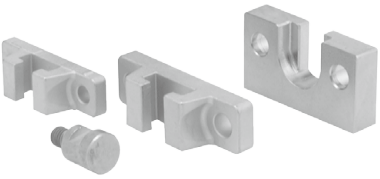


Material: Carbon steel
Surface treatment: Nickel plating

(mm)

Part no.	Applicable bore size (mm)	d	H	B	C
NT-04	**32, 40**	M14 x 1.5	8	22	25.4
NT-05	**50, 63**	M18 x 1.5	11	27	31.2
NT-08	**80**	M22 x 1.5	13	32	37.0
NT-10	**100**	M26 x 1.5	16	41	47.3

Simple Joint: ø32 to ø100



Joint and Mounting Bracket (Type A, Type B) Part No.

YA – **03**

Applicable air cylinder bore

03	For ø32, ø40
05	For ø50, ø63
08	For ø80
10	For ø100

Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket
YU	Joint

Allowable Eccentricity

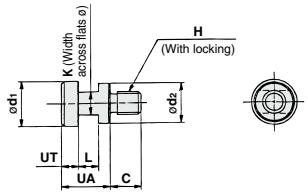
(mm)

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Eccentricity tolerance	±1				±1.5	±2
Backlash	0.5					

<Ordering>
• Joints are not included with the A or B type mounting brackets. Order them separately.
(Example)
Bore size ø40 Part no.
• Type A mounting bracket part no.·····YA-03
• Joint·····YU-03

Joint and Mounting Bracket (Type A, Type B) Part No.

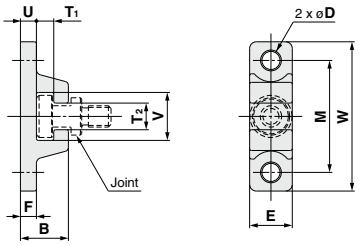
Bore size (mm)	Joint part no.	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10



Material: Chromium molybdenum steel (Nickel plating)

Part no.	Applicable bore size (mm)	UA	C	d_1	d_2	H	K	L	UT	Weight (g)
YU-03	**32, 40**	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	**50, 63**	17	13	19.8	18	M10 x 1.5	10	7	6	40
YU-08	**80**	22	20	24.8	23	M16 x 2	13	9	8	90
YU-10	**100**	26	26	29.8	28	M20 x 2.5	14	11	10	160

Type A Mounting Bracket



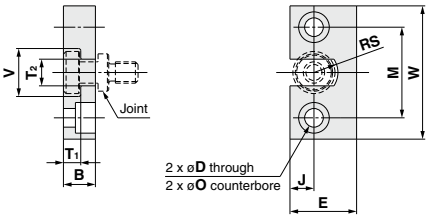
Material: Chromium molybdenum steel (Nickel plating)

(mm)

Part no.	Bore size (mm)	B	D	E	F	M	T_1	T_2
YA-03	**32, 40**	18	6.8	16	6	42	6.5	10
YA-05	**50, 63**	20	9	20	8	50	6.5	12
YA-08	**80**	26	11	25	10	62	8.5	16
YA-10	**100**	31	14	30	12	76	10.5	18

Part no.	Bore size (mm)	U	V	W	Weight (g)
YA-03	**32, 40**	6	18	56	55
YA-05	**50, 63**	8	22	67	100
YA-08	**80**	10	28	83	195
YA-10	**100**	12	36	100	340

Type B Mounting Bracket



Material: Stainless steel

(mm)

Part no.	Bore size (mm)	B	D	E	J	M	øO
YB-03	**32, 40**	12	7	25	9	34	11.5 depth 7.5
YB-05	**50, 63**	12	9	32	11	42	14.5 depth 8.5
YB-08	**80**	16	11	38	13	52	18 depth 12
YB-10	**100**	19	14	50	17	62	21 depth 14

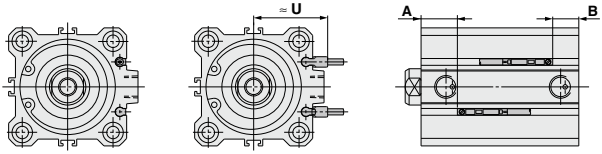
Part no.	Bore size (mm)	T_1	T_2	V	W	RS	Weight (g)
YB-03	**32, 40**	6.5	10	18	50	9	80
YB-05	**50, 63**	6.5	12	22	60	11	120
YB-08	**80**	8.5	16	28	75	14	230
YB-10	**100**	10.5	18	36	90	18	455

Auto Switch Mounting

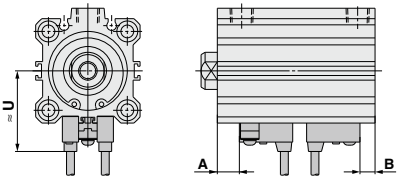
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

ø32 to ø100

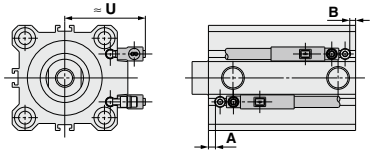
D-M9□ **D-M9□V**
D-M9□W **D-M9□WV**
D-M9□A **D-M9□AV**
D-A9□ **D-A9□V**



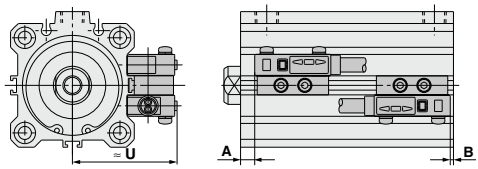
D-A7□ **D-F79F** **ø32 to ø100**
D-A80 **D-F7NT**
D-A7□H **D-A73C**
D-A80H **D-A80C**
D-F7□ **D-J79C**
D-J79 **D-A79W**
D-F7□W **D-F7□WV**
D-J79W **D-F7□V**



D-P3DW **ø32 to ø100**



D-P4DW **ø40 to ø100**



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV		D-F7NT		D-A79W		D-P3DW		D-P4DW	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	12	9	8	5	9	6	9.5	6.5	14.5	11.5	6.5	3.5	2.5	0	—	—
40	16	11.5	12	7.5	13	8.5	13.5	9	18.5	14	10.5	6	6.5	2	9	4.5
50	14	14.5	10	10.5	11	11.5	11.5	12	16.5	17	8.5	9	4.5	4.5	7	7.5
63	16.5	17.5	12.5	13.5	13.5	14.5	14	15	19	20	11	12	7	7.5	9.5	10.5
80	19.5	22	15.5	18	16.5	19	17	19.5	22	24.5	14	16.5	10	12	12.5	15
100	24	27	20	23	21	24	21.5	24.5	26.5	29.5	18.5	21.5	14.5	17.5	17	20

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

Auto Switch Mounting Height

(mm)

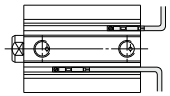
Auto switch model / Bore size	D-M9□V D-M9□WV D-M9□AV	D-A9□V	D-A7□ D-A80	D-A7□H D-A80H D-F7□/D-J79 D-F7□W D-J79W D-F79F D-F7NT	D-A73C D-A80C	D-F7□V D-F7□WV	D-J79C	D-A79W	D-P3DW	D-P4DW
	U	U	U	U	U	U	U	U	U	U
32	29	27	31.5	32.5	38.5	35	38	34	34.5	—
40	32.5	30.5	35	36	42	38.5	41.5	37.5	38	44
50	38.5	36.5	41	42	48	44.5	47.5	43.5	44	50
63	42	40	47.5	48.5	54.5	51	54	50	47.5	56.5
80	52	50	57.5	58.5	64.5	61	64	60	57.5	66.5
100	62	60	67.5	68.5	74.5	71	74	70	67.5	76.5

Minimum Stroke for Auto Switch Mounting

(mm)

Number of auto switches	D-M9□V D-F7□V D-J79C	D-A9□V D-A7□ D-A80 D-A73C D-A80C	D-A9□	D-M9□WV D-M9□AV D-F7□WV	D-M9□ D-F7□ D-J79	D-M9□W D-M9□A	D-A7□H D-A80H	D-A79W	D-F7□W D-J79W D-F79F D-F7NT	D-P3DW	D-P4DW
With 1 pc.	5	5	10 (5)	10	15 (5)	15 (10)	15 (5)	15	20 (10)	15	15
With 2 pcs.	5	10	10	15	15 (5)	15	15 (10)	20	20 (15)	15	15

Note) The dimensions stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure below.)
Order auto switches and auto switch mounting brackets separately.



Operating Range

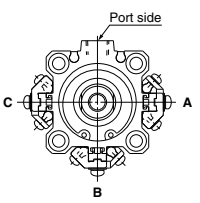
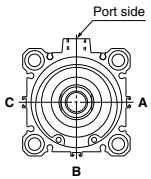
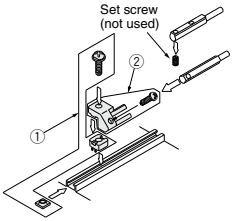
(mm)

Auto switch model	Bore size					
	32	40	50	63	80	100
D-M9□(V) D-M9□W(V) D-M9□A(V)	6	5.5	6.5	7.5	7.5	8.5
D-A9□(V)	9.5	9.5	9.5	11.5	9	11.5
D-A7□(H)(C) D-A80□(H)(C)	12	11	10	12	12	13
D-A79W	13	14	14	16	15	17
D-F7□(V) D-J79(C) D-F7□W(V) D-F7NT D-F79F	6	6	6	6.5	6.5	7
D-P3DW	6.5	6.5	5.5	7.5	7	8.5
D-P4DW	—	5	5	5	5	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.
∗ The auto switch mounting bracket BQ2-012 is not used for ø32 or more with the D-M9□(V)/M9□W(V)/M9□A(V)/A9□(V) types. The above values indicate the operating range when mounted with the conventional auto switch installation groove.

Auto Switch Mounting Brackets/Part No.

<table>
<tr><td rowspan="3">Auto switch mounting surface

Auto switch model</td><td colspan="2">Bore size (mm)</td></tr>
<tr><td colspan="2">ø32, ø40, ø50</td><td>ø63, ø80, ø100</td></tr>
<tr><td colspan="2"> 
</td><td> 
</td></tr>
<tr><td></td><td colspan="2">Auto switch mounting surface</td><td>Auto switch mounting surface</td></tr>
<tr><td></td><td>Port side</td><td>A, B, C side</td><td>Port, A, B, C side</td></tr>
<tr><td>D-M9□
D-M9□V
D-M9□W
D-M9□WV
D-M9□A
D-M9□AV
D-A9□
D-A9□V</td><td>No auto switch mounting bracket necessary.</td><td>①BQ-2
②BQ2-012
Two types of auto switch mounting bracket are used as a set.
 
</td><td>No auto switch mounting bracket necessary.</td></tr>
</table>

Note 1) For the CDQ2□32 to 50, when a compact auto switch is mounted on the three sides (A, B and C above) other than the port side of bore sizes ø32 to ø50, the auto switch mounting brackets above are required. Order them separately from cylinders. (It is the same as when mounting compact cylinders with an auto switch mounting rail, but not with a compact auto switch installation groove for the CDQ2□63 to 100.)
Example
CDQ2XB32-100DM-M9BW·····1 unit
BQ-2·····2 pcs.
BQ2-012·····2 pcs.

Note 2) When the cylinder is shipped, an auto switch mounting bracket and auto switch are included in the shipment.

Auto switch model	Bore size (mm)	
	ø32	ø40 to ø100
D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-A79W D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F79F/F7NT	BQ-2	
D-P3DW	BQ6-032S	
D-P4DW	—	BQP1-050

Note) When the cylinder is shipped, an auto switch mounting bracket and auto switch are included in the shipment. However, ø40 to ø100 with the D-P4DW are assembled at the time of shipment.

Auto Switch Mounting Bracket Weight

Auto switch mounting bracket part no.	Applicable cylinder bore size	Weight (g)
BQ-2	ø32 to ø100	1.5
BQ6-032S	ø32 to ø100	5
BQP1-050	ø40 to ø100	16

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

Refer to **the WEB catalog** or Best Pneumatics No. 3 for the detailed specifications.

Type	Model	Electrical entry	Features	Applicable bore size
Reed	D-A73	Grommet (Perpendicular)	—	ø32 to ø100
	D-A80		Without indicator light	
	D-A73H/A76H	Grommet (In-line)	—	
	D-A80H		Without indicator light	
Solid state	D-F7NV/F7PV/F7BV	Grommet (Perpendicular)	—	ø32 to ø100
	D-F7NWV/F7BWV		Diagnostic indication (2-color indication)	
	D-F79/F7P/J79	Grommet (In-line)	—	
	D-F79W/F7PW/J79W		Diagnostic indication (2-color indication)	
	D-F7NT		With timer	
	D-P5DW		Magnetic field resistant (2-color indication)	ø40 to ø100

* With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.
* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

Series 10-,11-CQ2X

How to Order

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room. Since the external dimensions and applicable auto switches are the same as standard type, refer to the WEB catalog or "Pneumatic Clean Series" catalog.

10 – C(D)Q2XB 40 □ – 30 D □ – J79W □

Clean series

10	Relief type
11	Vacuum type

With auto switch (Built-in magnet)

Low speed cylinder

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm

Port thread type

Nil	Rc	ø32 to ø100
TN	NPT	
TF	G	

∗ Without auto switch, ø32, 5 strokes: M thread

Cylinder stroke (mm)

Bore size	Standard stroke
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

• Manufacturing of intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. But, as for ø40 with bumper, please consult with SMC separately.
Example) 18 mm width spacer is installed in the standard cylinder 10-CQ2XB40-75D to make the 10-CQ2XB40-57D.

Action

D	Double acting

Rod end thread

Nil	Standard (Female rod end)
M	Male rod end

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ For applicable auto switches, refer to page 1225.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Specifications

Bore size (mm)		10- (Relief type)				11- (Vacuum type)			
		32	40	50	63	32	40	50	63
Fluid		Air				Air			
Proof pressure		1.5 MPa				1.5 MPa			
Maximum operating pressure		1.0 MPa				1.0 MPa			
Minimum operating pressure		0.035 MPa		0.03 MPa		0.025 MPa		0.02 MPa	
Ambient and fluid temperature		Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C				Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C			
Piston speed		1 to 200 mm/s				0.5 to 200 mm/s			
Piston rod size		ø16		ø20		ø16		ø20	
Rod end thread	Female thread	M8 x 1.25		M10 x 1.5		M8 x 1.25		M10 x 1.5	
	Male thread	M14 x 1.5		M18 x 1.5		M14 x 1.5		M18 x 1.5	
Stroke tolerance		$^{+1.0}_{0}$ mm				$^{+1.0}_{0}$ mm			
Port size		M5 x 0.8, 1/8 Note)		1/4		M5 x 0.8, 1/8 Note)		1/4	
Vacuum port, Relief port		M5 x 0.8				M5 x 0.8			

Note) Only 5 stroke comes with M5 x 0.8 in the case of no auto switch on ø32.

⚠Precautions

Be sure to read before handling.
Refer to page 1574 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
For the precautions in clean environments, refer to the WEB catalog or "Pneumatic Clean Series" catalog.

Operating Precautions

⚠Warning

1. Do not rotate the cover.
· When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover rotated.

⚠Caution

1. Be careful of the retaining ring to pop out.
· When replacing the rod seal, be careful of the retaining ring not to pop out while removing it.

Maintenance

⚠Caution

1. Grease pack
· When maintenance requires only grease, use the following part number to order.
Grease pack part number:
GR-X-005 (5 g)

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

How to Order

	CUX	10	□	–	30	D			
With auto switch	CDUX	10	□	–	30	D	– M9BW	□	

With auto switch (Built-in magnet)

Low speed cylinder

Bore size

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

Port thread type

Symbol	Type	Bore size
Nil	M5 x 0.8	ø10, ø16, ø20, ø25
	Rc1/8	ø32
TN	NPT1/8	ø32
TF	G1/8	ø32

Cylinder 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 applicable auto switches, refer to the table below.

Number of auto switches

Nil	2 pcs.
S	1 pc.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDUX20-25D

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto 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		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	○		
				2-wire		12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NAV**	M9NA**	○	○	●	○	○	IC circuit	
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	○		
				2-wire		12 V		M9BAV**	M9BA**	○	○	●	○	○	—	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	●	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

∗∗ 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 ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

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

∗ Since there are other applicable auto switches than listed, refer to page 1244 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Auto switches are shipped together, (but not assembled).

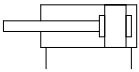
Specifications

Bore size (mm)	10	16	20	25	32
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)				
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				
Stroke length tolerance	$^{+1.0}_{0}$ Note)				
Mounting	Basic				

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

Symbol

Double acting, Single rod, Rubber bumper



Minimum Operating Pressure

Unit: MPa

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

Standard Strokes

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.
Refer to page 1574 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

1. Tightening the cylinder beyond the range of the indicated torque (shown in the table below) may affect operation. Apply a 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 the CUX10 by meter-out at a low speed operation.

⚠Caution

1. For the CUX10, up to 0.1 N L/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.

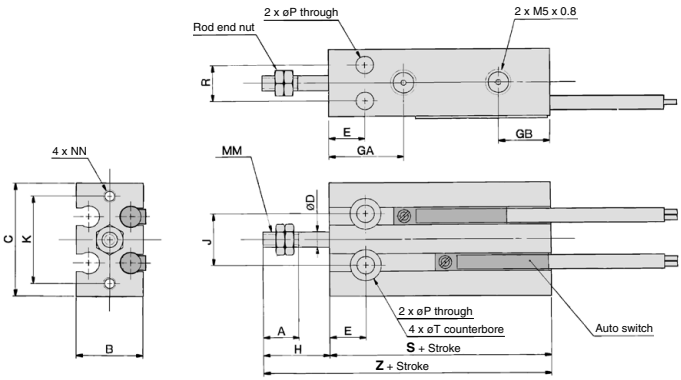
Bore size (mm)	Kit no.	Contents	
16	CUX16-PS	Piston seal:	1 pc.
20	CUX20-PS	Rod seal:	1 pc.
25	CUX25-PS	Gasket:	1 pc.
32	CUX32-PS	Grease pack (10 g):	1 pc.

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

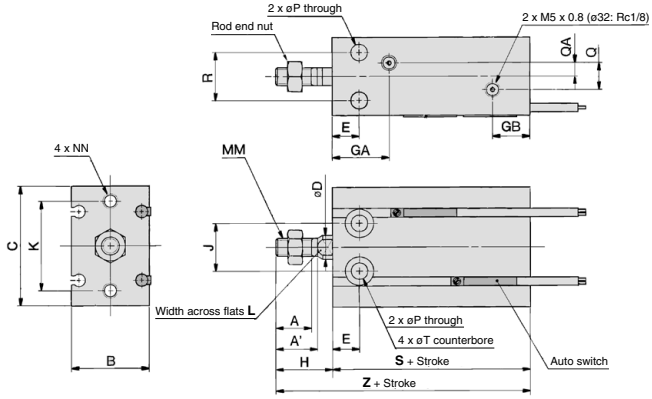
2. Grease pack
When maintenance requires only grease, use the following part numbers to order.
Grease pack part number:
GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Dimensions: Double Acting, Single Rod

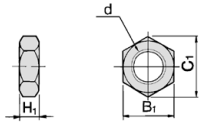
ø10



ø16 to ø32



Rod End Nut/Accessories



Material: Carbon steel

Part no.	Applicable bore size (mm)	d	H_1	B_1	C_1
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

(mm)

Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA
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

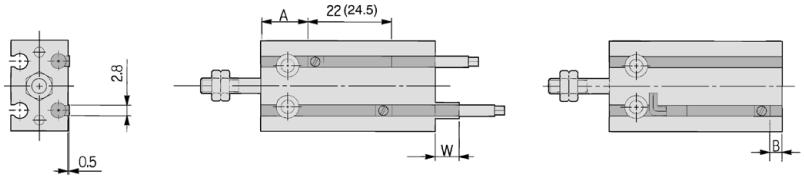
Bore size (mm)	R	T	Without auto switch		With auto switch	
			S	Z	S	Z
10	9	6 depth 5	36	52	36	52
16	12	7.6 depth 6.5	30	46	40	56
20	16	9.3 depth 8	36	55	46	65
25	20	9.3 depth 9	40	63	50	73
32	24	11 depth 11.5	42	69	52	79

Note) 5 stroke (CUX16-5D): 14.5 mm

Auto Switch Mounting

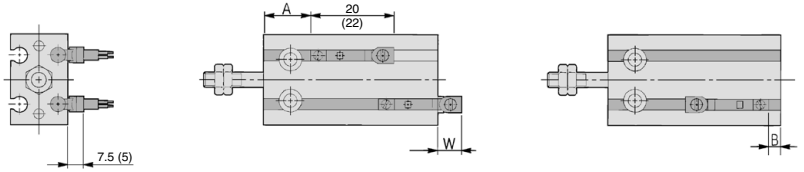
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

D-M9□
D-M9□W
D-M9□A
D-A9□



( ): Dimension of the D-A93

D-M9□V
D-M9□WV
D-M9□AV
D-A9□V



( ): Dimension of the D-A9□V

CDUX Double Acting, Single Rod

(mm)

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

Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. Adjust the auto switch after confirming the operating condition in the actual setting.
Note 2) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 3) In the case of the 5 stroke or the 10 stroke, there are times in which the auto switch will not turn OFF or 2 auto 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 auto switches operate normally (if 1 auto switch is used, make sure that it turns ON and OFF properly; if 2 auto switches are used, make sure that both auto switches turn ON).
Note 4) ( ) in column W is the dimensions of the D-A96.

Operating Range

(mm)

Auto switch model	Bore size				
	10	**16**	**20**	**25**	**32**
D-M9□, M9□V **D-M9□W, M9□WV** **D-M9□A, M9□AV**	4	5.5	7	7	7.5
D-A9□, A9□V	6	9	11	12.5	14

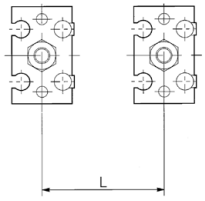
∗ Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

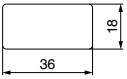
Caution on Proximity Installation

When free mounting cylinders equipped with 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 shielding plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) Auto switches may malfunction if a shield plate is not used.



Bore size (mm)	Mounting pitch L (mm)
10	30
16	33
20	40
25	46
32	56

Dimensions of shielding plate (MU-S025) that is sold separately are indicated as reference.



Material: Ferrite stainless steel, Thickness: 0.3 mm
Since the back side is treated with adhesive, it is possible to attach to the cylinder.

Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 1

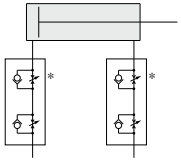
Be sure to read before handling. Refer to page 1574 for Safety Instructions. For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smcworld.com

Recommended Pneumatic Circuit

⚠ Warning

Horizontal Operation

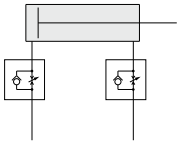
I



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.

II

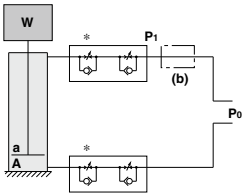


Meter-in speed controller

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

Vertical Operation

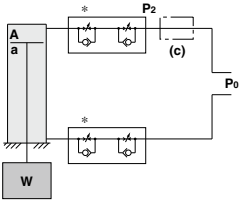
I



(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 + P0a > P0A**,
adjust **P1** to make **W + P1a = P0A**.

II



(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 **P2** to make **W + P2A = P0a**.

W: Load (N) **P0**: Operating pressure (MPa) **P1, P2**: Reduced pressure (MPa) **a**: Rod side piston area (mm^2) **A**: Head side piston area (mm^2)

⚠ Warning

Since the low speed cylinder **C□UX10** is subject to internal leakage due to its construction, the speed may not be fully controlled with the meter-out controller (*) during low speed operation.

Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 2

Be sure to read before handling. Refer to page 1574 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

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 (mm^2)}
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 1245.

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 (mm^2)}
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.
Grease

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.

Simple Specials/Made to Order

Made to Order

Please contact SMC for detailed specifications, delivery and prices.

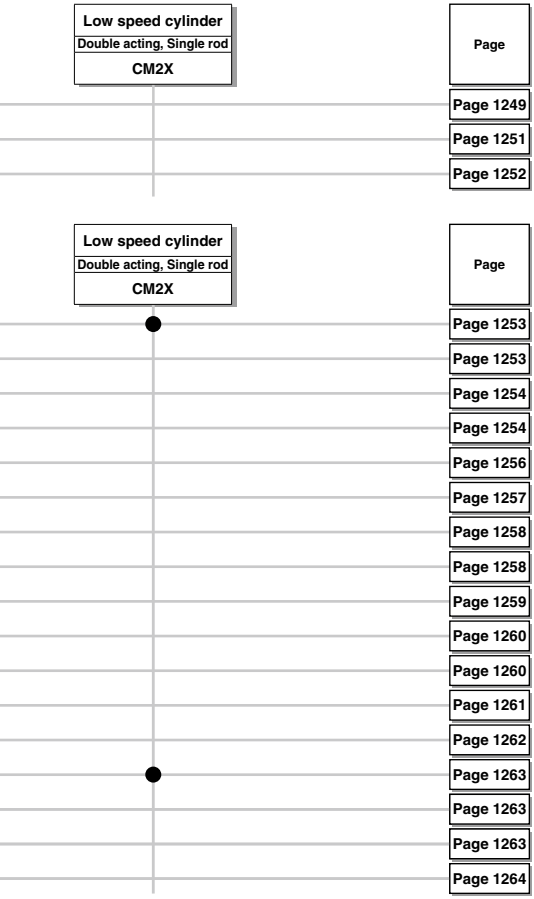
■ Simple Specials

The following special specifications can be ordered as a simplified Made-to-Order.
There is a specification sheet available on paper and CD-ROM. Please contact your SMC sales representatives if necessary.

Symbol	Specifications	Smooth cylinders, Double acting, Single rod					
		CJ2Y	CM2Y	CG1Y	MBY	CA2Y	CS2Y
-XA□	Change of rod end shape	●	●		●	●	●
-XC14	Change of trunnion bracket mounting position				●	●	●
-XC15	Change of tie-rod length					●	●

■ Made to Order

Symbol	Specifications	Smooth cylinders, Double acting, Single rod					
		CJ2Y	CM2Y	CG1Y	MBY	CA2Y	CS2Y
-XC3	Special port location	●	●				●
-XC6	Made of stainless steel		●	●			
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel				●	●	
-XC9	Adjustable stroke cylinder/Adjustable retraction type	●	●				●
-XC10	Dual stroke cylinder/Double rod type		●				●
-XC13	Auto switch rail mounting		●				
-XC20	Head cover axial port		●				
-XC25	No fixed throttle of connection port		●				
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers						●
-XC27	Double clevis and double knuckle joint pins made of stainless steel		●		●	●	●
-XC28	Compact flange made of SS400					●	
-XC29	Double knuckle joint with spring pin		●		●	●	
-XC30	Rod trunnion				●	●	●
-XC52	Mounting nut with set screw		●				
-XC65	Made of stainless steel (Combination of XC7 and XC68)				●	●	
-XC68	Made of stainless steel (with hard chrome plated piston rod)				●	●	●
-XC86	With rod end bracket						●


Low speed cylinder
Double acting, Single rod
CM2X
Page
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Low speed cylinder
Double acting, Single rod
CM2X
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Page 1253
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Series C□Y/C□X
Simple Specials

These changes are dealt with Simple Specials System.

For details, refer to the Simple Specials System in the WEB catalog.
http://www.smcworld.com

1 Change of Rod End Shape

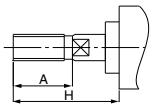
Symbol
-XA0 to XA30

Series	Description	Model	Action	Symbol for change of rod end shape	Note
CJ2-Z	Smooth cylinder	CJ2Y	Double acting, Single rod	XA0, 1, 10, 11	Except pivot bracket and rod end bracket
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	XA0 to 30	Except pivot bracket and rod end bracket
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	XA0 to 30	

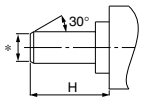
Precautions

1. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
2. Standard dimensions marked with "∗" will be as follows to the rod diameter (D). Enter any special dimension you desire.
   D ≤ 6 → D–1 mm 6 < D ≤ 25 → D–2 mm D > 25 → D–4 mm
3. In the case of double rod type and single acting retraction type, enter the dimensions when the rod is retracted.
4. The XA0 of CJ2Y has no width across flats.

Symbol: A0



Symbol: A1



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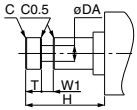

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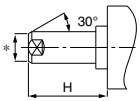

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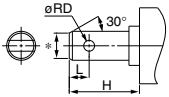
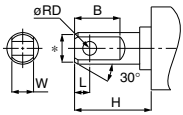


Symbol: A5



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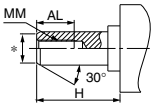
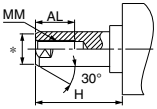


Symbol: A7



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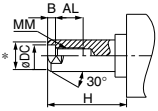
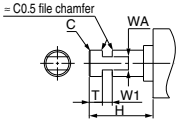


Symbol: A9



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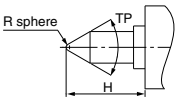

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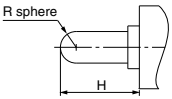

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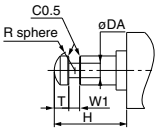

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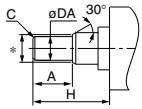

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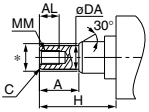

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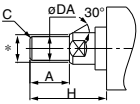
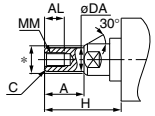


SMC

Symbol: A16



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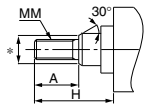

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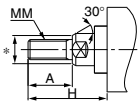

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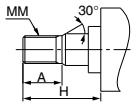

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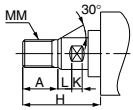

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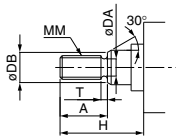

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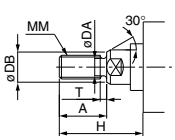

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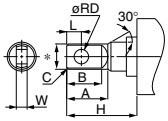

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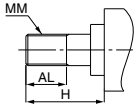
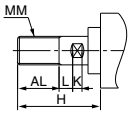
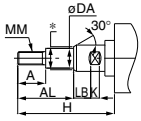


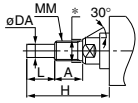
Symbol: A25



Symbol: A26



Symbol: A27



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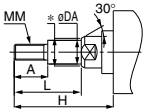
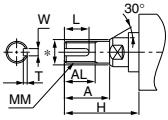
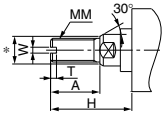


Symbol: A29



Symbol: A30



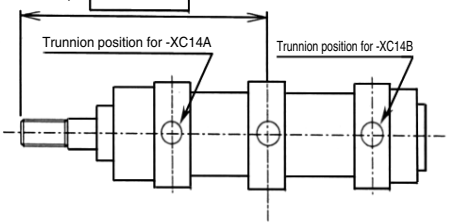
Symbol
-XC14

2 Change of Trunnion Bracket Mounting Position

The position for mounting the trunnion pivot bracket on the cylinder can be moved from the standard mounting position to any desired position.

Series	Description	Model	Action	Note
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

(**Z** + 1/2 Stroke) =



Precautions

1. Specify "Z + 1/2 Stroke" in the case the trunnion bracket position is not -XC14A, B or trunnion is not a center trunnion.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. The possible range of trunnion bracket mounting position is indicated in the table below.
4. Some trunnion mounting positions do not allow auto switch mounting. Please consult with SMC for more information.
5. The CS2 series has a greater range of trunnion bracket mounting positions than the CS1 series, so the value of "Z + 1/2 Stroke" at -XC14A and -XC14B is different.

MBY

(mm)

Symbol / Bore size	**Z** + 1/2 Stroke					
	For **-XC14A**	For **-XC14B**	For **-XC14**		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
32	82.5	95.5 + Stroke	84	94 + Stroke	89 + 1/2 Stroke	2
40	89	97 + Stroke	90	96 + Stroke	93 + 1/2 Stroke	2
50	100.5	109.5 + Stroke	102	108 + Stroke	105 + 1/2 Stroke	2
63	103.5	106.5 + Stroke	105	105 + Stroke	105 + 1/2 Stroke	2
80	127	131 + Stroke	128	130 + Stroke	129 + 1/2 Stroke	2
100	130	128 + Stroke	131	127 + Stroke	129 + 1/2 Stroke	2

CA2Y

(mm)

Symbol / Bore size	**Z** + 1/2 Stroke					
	For **-XC14A**	For **-XC14B**	For **-XC14**		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
40	89	97 + Stroke	89.5	96.5 + Stroke	93 + 1/2 Stroke	1
50	99	107 + Stroke	99.5	106.5 + Stroke	103 + 1/2 Stroke	1
63	103	111 + Stroke	103.5	110.5 + Stroke	107 + 1/2 Stroke	1
80	125	133 + Stroke	125.5	132.5 + Stroke	129 + 1/2 Stroke	1
100	132	138 + Stroke	132.5	137.5 + Stroke	135 + 1/2 Stroke	1

CS2Y

(mm)

Symbol / Bore size	**Z** + 1/2 Stroke					
	For **-XC14A**	For **-XC14B**	For **-XC14**		Reference Standard (Center trunnion)	Minimum stroke
			Minimum	Maximum		
125	165.5	152.5 + Stroke	166	152 + Stroke	159 + 1/2 Stroke	25
140	168	150 + Stroke	168.5	149.5 + Stroke	159 + 1/2 Stroke	30
160	186	160 + Stroke	186.5	159.5 + Stroke	173 + 1/2 Stroke	35

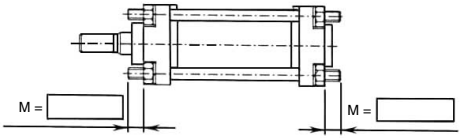
Symbol
-XC15

3 Change of Tie-rod Length

Cylinder with M dimension for tie-rod length changed from the standard length.

Series	Description	Model	Action	Note
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

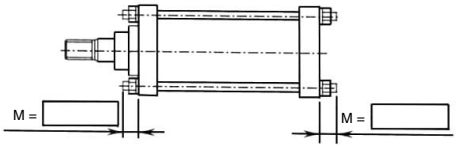
CA2Y



Tie-rod Length Changeable Range (mm)

Bore size	All bore size
M Min.	0
M Max.	300

CS2Y



Tie-rod Length Changeable Range (mm)

Bore size	125		140		160	
Mounting bracket	L	B, F, G, C, D, T	L	B, F, G, C, D, T	L	B, F, G, C, D, T
M Min.	20	12	21	12	23	14
M Max.	270					

Precautions

1. To order, specify the M dimension as well as the part number.
2. SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
3. Tie-rod length changeable range is described in the below.
4. The M dimension of the bracket mounting side of Flange (F, G), Clevis (C, D) types cannot be specified.

Series C□Y/C□X
Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.

Made to Order

1 Special Port Location

Symbol **-XC3**

Compared with the standard type, a cylinder which changes the connection port location of rod/head cover and the location of cushion valve.

Applicable Series

Series	Description	Model	Action	Note
CJ2-Z	Smooth cylinder	CJ2Y	Double acting, Single rod	Rail mounting, Without air cushion
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Without air cushion
	Low speed cylinder	CM2X	Double acting, Single rod	Without air cushion
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

Specifications: Same as standard type

How to Order

CJ2Y / CM2Y / CM2X

Standard model no. – **XC3** **A** **B**

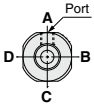
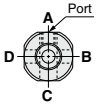
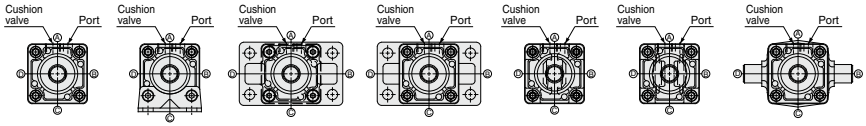
- **XC3**: Special port location
- **A**: Rod port location viewed from the rod side
  * For port location, refer to the following diagrams and show the symbols of A, B, C and D.
- **B**: Head port location viewed from the rod side

CS2Y

Standard model no. – **XC3** **A** **C**

- **XC3**: Special port location
- **A**: Port location viewed from the rod side
  * For port location, refer to the following diagrams and show the symbols of A, B, C and D.
- **C**: Cushion valve location viewed from the rod side

Port Location

Series	Corresponding symbol of mounting bracket (Positional relationship)
CJ2Y CM2Y	 * Viewed from the rod side, the ports are rendered A, B, C, and D, in the clockwise direction.  <Positional relationship between clevis and port> * Viewed from the rod side, with the clevis positioned as shown in the diagram, the ports are rendered A, B, C, and D, in the clockwise direction.
	Positional relationship between port and cushion valve cannot be changed.
CS2Y	 **Basic** **Foot** **Rod flange** **Head flange** **Single clevis** **Double clevis** **Center trunnion**

1. Symbol of position for port and cushion valve has to be looked from the rod side, as figures above. (In the case of standard cylinders, port must be positioned in the upper side.) Define the upper side to be A, and then B, C, and D in a clockwise order.
2. Model of combination between port and cushion valve is applicable only when the position of a port and a cushion valve on the rod cover and the head cover will be changed to the same position against the support bracket, as a rule.
3. -XC3AA is not available in terms of the position between port and cushion valve, since it is available in the standard products.

2 Made of Stainless Steel

Symbol **-XC6**

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	
CG1-Z	Smooth cylinder	CG1Y	Double acting, Single rod	

Specifications

Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than above and external dimensions	Same as standard type

How to Order

Standard model no. – **XC6**

- **XC6**: Made of stainless steel

Symbol
-XC7

3 Tie-rod, Cushion Valve, Tie-rod Nut, etc. Made of Stainless Steel

When using in locations where the rust generation or corrosion likelihood exists, the standard parts material have been partly changed to the stainless steel.

Applicable Series

Series	Description	Model	Action	Note
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	

Specifications

Parts changed to stainless steel	Tie-rod, Tie-rod nut, Mounting bracket nut, Cushion valve, Retaining ring, Washer
Specifications other than above	Same as standard type
Dimensions	Same as standard type

How to Order

Standard model no. – **XC7**

Tie-rod, Cushion valve, Tie-rod nut, etc. made of stainless steel

Symbol
-XC9

4 Adjustable Stroke Cylinder/Adjustable Retraction Type

The retract stroke of the cylinder can be adjusted by the adjusting bolt.

Applicable Series

Series	Description	Model	Action	Note
CJ2-Z	Smooth cylinder	CJ2Y	Double acting, Single rod	Except double-side bossed and clevis types, Without air cushion
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Except clevis and boss-cut types
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	Except head flange and clevis types

Specifications

Series	CJ2Y	CM2Y, CS2Y	
Stroke adjustment symbol	—	A	B
Stroke adjustment range (mm)	0 to 15	0 to 25	0 to 50
Specifications other than above	Same as standard type		

How to Order

CJ2Y Mounting | Bore size – Stroke **Z** – Pivot bracket | Rod end bracket – **XC9**

Adjustable stroke cylinder/Adjustable retraction type

CM2Y Mounting | Bore size – Stroke | Rod end thread **Z** – Pivot bracket | Rod end bracket – Auto switch – **XC9** **A**

Adjustable stroke cylinder/Adjustable retraction type

Stroke adjustment symbol

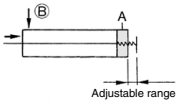
Symbol	Stroke adjustment range
A	0 to 25 mm
B	0 to 50 mm

CS2Y Mounting | Bore size – Stroke | Suffix | Stroke adjustment symbol – **XC9**

(After the stroke is adjusted, with cushion on both sides is altered to single-sided, with cushion.)

Adjustable stroke cylinder/ Adjustable retraction type

Symbol



⚠Caution

Precautions

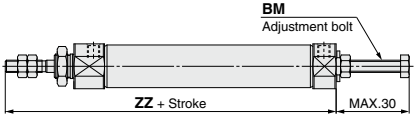
1. When air is supplied to the cylinder, if the stroke adjusting bolt is loosened in excess of the allowable stroke adjustment amount, be aware that the stroke adjusting bolt could fly out or air could be discharged, which could injure personnel or damage the peripheral equipment.
2. Adjust the stroke when the cylinder is not pressurized. If it is adjusted in the pressurized state, the seal of the adjustment section could become deformed, leading to air leakage.

Symbol

4 Adjustable Stroke Cylinder/Adjustable Retraction Type -XC9

Dimensions (Dimensions other than below are the same as standard type.)

CJ2Y

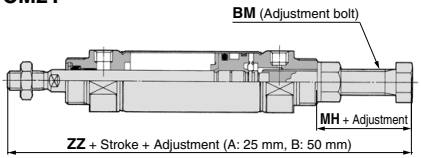


(mm)

Bore size	BM	ZZ
10	M5 x 0.8	74
16	M5 x 0.8	75

∗ Dimensions other than listed above are the same as standard type.

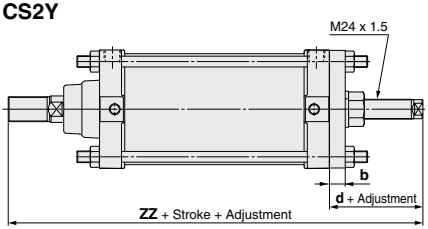
CM2Y

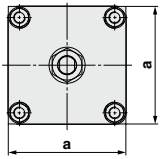


(mm)

Bore size	BM	MH	ZZ
20	M10 x 1.25	26.5	142.5
25	M14 x 1.5	29	149
32	M14 x 1.5	29	151
40	M16 x 1.5	32	186

CS2Y





(mm)

Bore size	a	b	d	ZZ
125	142	19	63	271
140	155	19	63	271
160	174	19	59	285

Symbol
-XC10

5 Dual Stroke Cylinder/Double Rod Type

Two cylinders are constructed as one cylinder in a back-to-back configuration allowing the cylinder stroke to be controlled in three steps.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Except clevis and boss-cut types, pivot bracket, rod end bracket
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	Except clevis and trunnion types

Specifications

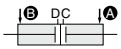
Series	CM2Y	CS2Y	
Bore size (mm)	**20 to 40**	**125, 140**	**160**
Maximum manufacturable stroke (mm)	1000	1000	1200
Specifications other than above	Same as standard type		

How to Order

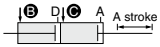
CM2Y [Mounting] [Bore size] – [Stroke A] + [Stroke B] **Z** – **XC10**
Dual stroke cylinder

CS2Y [Mounting] [Bore size] – [Stroke A] [Suffix] + [Stroke B] [Suffix] – **XC10**
Dual stroke cylinder

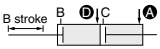
Function



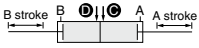
When air pressure is supplied to ports A and B, both A and B strokes retract.



When air pressure is supplied to ports B and C, A out strokes.



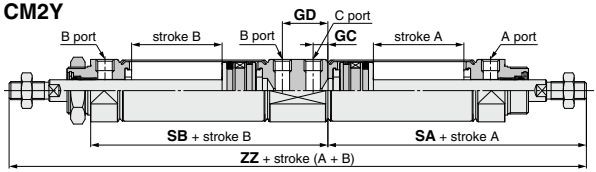
When air pressure is supplied to ports A and D, B out strokes.



When air pressure is supplied to ports C and D, both strokes A and B out strokes.

Dimensions (Dimensions other than below are the same as standard type.)

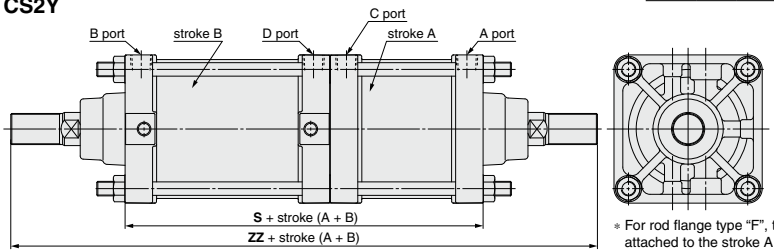
CM2Y



(mm)

Bore size	GC	GD	SA	SB	ZZ
20	7	24	47	78	207
25	7	24	47	78	215
32	7	24	49	80	219
40	10.5	33.5	66.5	110.5	277

CS2Y



(mm)

Bore size	S	ZZ
125	196	416
140	196	416
160	212	452

∗ For rod flange type "F", the flange bracket will be attached to the stroke A side.

Symbol
-XC13

6 Auto Switch Rail Mounting

A cylinder on which a rail is mounted to enable auto switches, in addition to the standard method for mounting auto switches (Band mounting).

Applicable Series

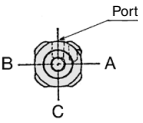
Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CDM2Y	Double acting, Single rod	

How to Order

Standard model no. – **XC13A**

Rail mounting direction

XC13A	Mounted on the right side when viewed from the rod with the ports facing upward.
XC13B	Mounted on the left side when viewed from the rod.
XC13C	Mounted on the underside when viewed from the rod.

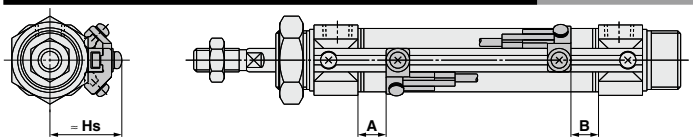


CDM2Y

CDM2Y Applicable Auto Switches

Rail mounting	**Solid state**	D-F7□, D-F7□V, D-F7BA, D-F79F, D-F79W, D-F7□WV, D-J79, D-J79C, D-J79W
	Reed	D-A9□/A9□V, D-A7/A8, D-A7□H/A80H, D-A73C/A80C, D-A79W
Auto switch specifications		Refer to **the WEB catalog** or Best Pneumatics No. 2 for additional information on auto switches.

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



Auto Switch Proper Mounting Position (Detection at stroke end)

(mm)

Auto switch model / Bore size	D-F7□/F79F/F7□V D-J79/J79C D-F7□W/J79W/F7□WV D-F7BA/F7BAV D-A72/A7□H/A80H D-A73C/A80C		D-F7NT		D-A9□ D-A9□V D-A79W		D-A7□ D-A80	
	A	B	A	B	A	B	A	B
20	8.5	7	13.5	12	5.5	4	8	6.5
25	7.5	7.5	12.5	12.5	4.5	4.5	7	7
32	9	8	14	13	6	5	8.5	7.5
40	15	13	20	18	12	10	14.5	12.5

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

Auto Switch Mounting Height

(mm)

D-F7□/F79F D-J79/F7NT D-F7□W/J79W D-F7BA D-A9□/A9□V A7□H/A80H	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W
Hs	**Hs**	**Hs**	**Hs**	**Hs**	**Hs**
23.5	26	29	22.5	29.5	25
26.5	29	32	25.5	32.5	28
30	32.5	35.5	29	35	31.5
34	36.5	39.5	33	40	35.5

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	Number of auto switches		
	With 1 pc.	With 2 pcs. Same surface	With n pcs. (n: Number of auto switches) Same surface
D-F7□V D-J79C	5	5	10 + 10 (n – 2) (n = 4, 6···) Note)
D-F7□ D-J79	5	5	15 + 15 (n – 2) (n = 4, 6···) Note)
D-F7□WV D-F7BAV D-A79W	10	15	10 + 15 (n – 2) (n = 4, 6···) Note)
D-F7□W/J79W D-F7BA D-F79F/F7NT	10	15	15 + 20 (n – 2) (n = 4, 6···) Note)
D-A9□ D-A9□V	5	10	10 + 15 (n – 2) (n = 4, 6···) Note)
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	5	10	15 + 10 (n – 2) (n = 4, 6···) Note)
D-A7□H D-A80H	5	10	15 + 15 (n – 2) (n = 4, 6···) Note)

Note) 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.

Operating Range

(mm)

Auto switch model	Bore size			
	20	**25**	**32**	**40**
D-F7□/F79F/F7□V D-J79/J79C D-F7□W/J79W/F7□WV D-F7BA/F7BAV D-F7NTL	3.5	3.5	4	3.5
D-A9□/D-A9□V	5.5	6	6.5	6.5
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	7.5	8	8.5	8.5
D-A79W	10	10.5	12.5	12.5

∗ 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 model	Bore size (mm)
	ø20 to **ø40**
D-A9□/A9□V	BQ2-012

Note 1) When adding the D-A9□(V), order a set of auto switch mounting brackets BQ-1 and BQ2-012 for the CDQ2 series (ø12 to ø25) separately. When adding the auto switches other than the D-A9□(V) mentioned above and D-F7BA(V), order an auto switch mounting bracket BQ-1 separately.

Note 2) When adding the auto switch D-F7BA(V), order a stainless steel screw set BBA2 separately.

Symbol
-XC20

7 Head Cover Axial Port

Head side port position is changed to the axial direction.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Except clevis type

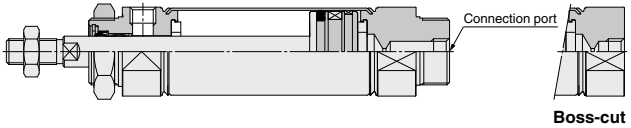
How to Order

Standard model no. – **XC20**

Head cover axial port

Specifications: Same as standard type

Construction (Same dimensions as standard type except port size.)



Boss-cut

Bore size (mm)	Port size
20, 25, 32	Rc 1/8
40	Rc 1/4

Symbol
-XC25

8 No Fixed Throttle of Connection Port

Type with no restrictor on the port, since it's using air-hydro type on the rod cover and the head cover of air cylinder CM2 series.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	

∗ Except with air cushion

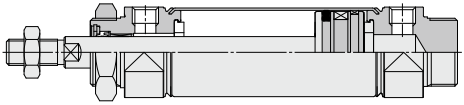
How to Order

Standard model no. – **XC25**

No fixed throttle of connection port

Specifications: Same as standard type

Construction (Dimensions are the same as standard.)



⚠ Caution

1. Use a shock absorber etc.
When the piston speed exceed 750 mm/s, make sure that direct impact does not apply on the cylinder cover by using an external stopper (shock absorber etc).

Symbol

9 With Split Pins for Double Clevis Pin/Double Knuckle Joint Pin and Flat Washers -XC26

Flat washer is added for the double clevis (one of the mounting styles) or double knuckle joint (one of the accessories).

Applicable Series

Series	Description	Model	Action	Note
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

How to Order

• Product

CS2YD | **Standard model no.** | **– XC26**

- **Double clevis type**
- **With clevis pin, split pin and flat washer**

• Parts assembly

CS2 – D 12 – XC26

- **With clevis pin, split pin and flat washer**
- **Bore size**

12	125 mm
14	140 mm
16	160 mm

- **Double clevis**

Y – | **12A, 14A, 16A** | **– XC26**

- **Double knuckle joint**
- **With knuckle joint pin, split pin and flat washer**

IY – | **12, 14, 16** | **– XC26**

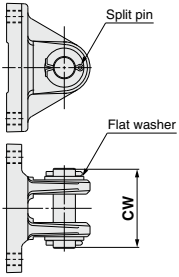
- **Clevis pin Knuckle joint pin**
- **With clevis pin, knuckle joint pin, split pin and flat washer**

Specifications

Mounting	Only double clevis type (D), double knuckle joint
Changed parts	Clevis pin, knuckle joint pin, flat washer
Specifications other than above	Same as standard type

Dimensions (Dimensions other than below are the same as standard type.)

Double clevis

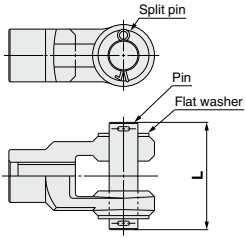


* For mounting bracket, split pin, clevis pin and flat washer are shipped together, (but not assembled).
* Mounting method is the same as standard type.

(mm)

Bore size	**CW**
ø**125**	90
ø**140**	104
ø**160**	113

Double knuckle joint



* For mounting bracket, split pin, knuckle joint pin and flat washer are shipped together, (but not assembled).
* Mounting method is the same as standard type.

(mm)

Bore size	**L**
ø**125**	90
ø**140**	104
ø**160**	113

Symbol
-XC27

10 Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel

To prevent the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the retaining ring has been changed to stainless steel.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Except rod end bracket
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	Except rod end bracket
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	Except rod end bracket
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

Specifications

Mounting	Only double clevis type (D), double knuckle joint
Pin, retaining ring, flat washer and split pin material	Stainless steel 304
Specifications other than above	Same as standard type

How to Order

CM2YD / MBYD / CA2YD / CS2YD – Standard model no. – XC27

- Standard model no.: Double clevis type
- XC27: Double clevis pin made of stainless steel

Knuckle joint

- For CM2Y Y – 020B, 032B, 040B – XC27
- For MBY Y – 03M, 04M, 05M, 06M, 10M – XC27
- For CA2Y Y – 04D, 05D, 08D, 10D – XC27
- For CS2Y Y – 12A, 14A, 16A – XC27

Y: Double knuckle joint
XC27: Double knuckle joint pin made of stainless steel

Clevis pin/Knuckle pin

- For CM2Y CDP – 1, 2 – XC27
- For MBY CD – M03, M05, M08 – XC27
- For CA2Y CDP – 2A, 3A, 4A, 5A, 6A, 7A – XC27
- For CS2Y IY – 12, 14, 16 – XC27

CDP / CD / IY: Clevis pin, Knuckle pin
XC27: Clevis pin, Knuckle pin made of stainless steel

Symbol
-XC28

11 Compact Flange Made of SS400

Width of a flange bracket on the rod and head side has the same dimensions as the cylinder's rod cover to save the mounting space. (Flange shape and FV-dimensions are only different from the standard type.)

Applicable Series

Series	Description	Model	Action	Note
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	

Specifications: Same as standard type

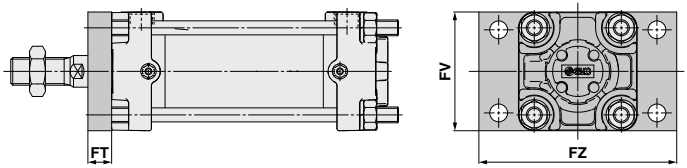
How to Order

CA2Y F – Standard model no. – XC28

- F: Mounting
- Standard model no.
- XC28: Compact flange made of SS400

F	Rod flange
G	Head flange

Dimensions (Dimensions other than below are the same as standard type.)



(mm)

Bore size	FT	FV	FZ
40	12	60	100
50	12	70	110
63	15	85	130
80	18	102	160
100	18	116	180

∗ Other dimensions are the same as flange on the rod side and head side of standard type.
(Figure is the case of flange on the rod side.)

Symbol

12 Double Knuckle Joint with Spring Pin — -XC29

To prevent loosening of the double knuckle joint of standard air cylinder.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	Except rod end bracket
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	Except rod end bracket
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	Except rod end bracket

How to Order

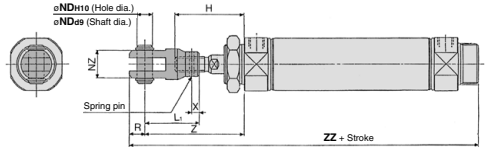
Standard model no. – **XC29**

Double knuckle joint with spring pin

Specifications: Same as standard type

Dimensions (For mounting bracket, pin is shipped together.) (Dimensions other than below are the same as standard type.)

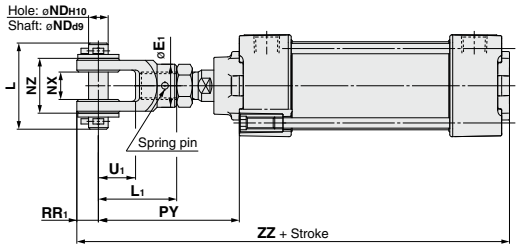
CM2Y



(mm)

Bore size	H	L1	NDH10	NZ	R	X	Z	ZZ	Spring pin
20	41	36	$9^{+0.058}_{0}$	18	10	5	61	146	ø3 x 16L
25	45	38	$9^{+0.058}_{0}$	18	10	5	65	150	ø3 x 16L
32	45	38	$9^{+0.058}_{0}$	18	10	5	65	152	ø3 x 16L
40	50	55	$12^{+0.070}_{0}$	38	13	11	83	200	ø4 x 24L

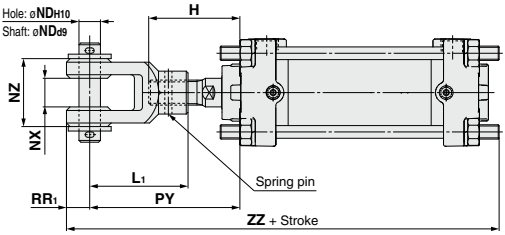
MBY



(mm)

Bore size	øE1	L	L1	øNDd9	øNDH10	NX	NZ	PY	RR1	U1	ZZ
32	20	44	30	$10^{-0.040}_{-0.076}$	$10^{+0.058}_{0}$	$14^{+0.3}_{+0.1}$	$28^{-0.1}_{-0.3}$	63.5	10	16	161.5
40	22	44	40	$10^{-0.040}_{-0.076}$	$10^{+0.058}_{0}$	$14^{+0.3}_{+0.1}$	$28^{-0.1}_{-0.3}$	72	11	19	171
50	28	60	50	$14^{-0.050}_{-0.093}$	$14^{+0.070}_{0}$	$20^{+0.3}_{+0.1}$	$40^{-0.1}_{-0.3}$	87	14	24	199
63	28	60	50	$14^{-0.050}_{-0.093}$	$14^{+0.070}_{0}$	$20^{+0.3}_{+0.1}$	$40^{-0.1}_{-0.3}$	87	14	24	199
80	40	82	65	$22^{-0.065}_{-0.117}$	$22^{+0.084}_{0}$	$30^{+0.3}_{+0.1}$	$60^{-0.1}_{-0.3}$	113	20	34	251
100	40	82	65	$22^{-0.065}_{-0.117}$	$22^{+0.084}_{0}$	$30^{+0.3}_{+0.1}$	$60^{-0.1}_{-0.3}$	116	20	34	254

CA2Y



(mm)

Bore size	H	L1	øNDd9	øNDH10	NX	NZ	PY	RR1	ZZ
40	51	55	$12^{-0.050}_{-0.093}$	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	84	13	192
50	58	60	$12^{-0.050}_{-0.093}$	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	91	15	207
63	58	60	$12^{-0.050}_{-0.093}$	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	91	15	218
80	71	71	$18^{-0.050}_{-0.093}$	$18^{+0.070}_{0}$	$28^{+0.3}_{+0.1}$	55	105	19	257
100	72	83	$20^{-0.065}_{-0.117}$	$20^{+0.084}_{0}$	$30^{+0.3}_{+0.1}$	61	118	21	282

Symbol
-XC30

13 Rod Trunnion

This cylinder shortens the distance between the fulcrum and the rod end by installing a trunnion bracket in front of the rod side cover.

Applicable Series

Series	Description	Model	Action	Note
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

How to Order

MBY
CA2Y T
CS2Y

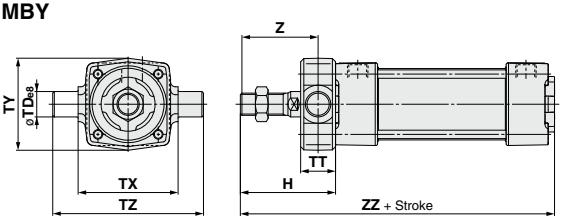
Standard model no. – XC30

Trunnion bracket — Rod trunnion

Specifications: Same as standard type

Dimensions (Dimensions other than below are the same as standard type.)

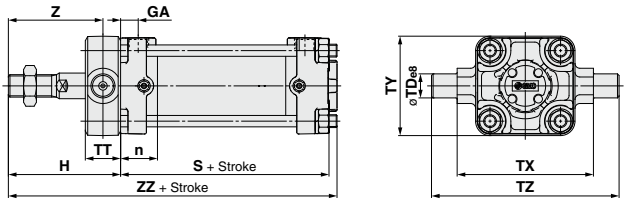
MBY



(mm)

Bore size	H	øTDe8	TT	TX	TY	TZ	Z	ZZ
32	47	$12^{-0.032}_{-0.059}$	17	50	49	74	38.5	135
40	60	$16^{-0.032}_{-0.059}$	22	63	58	95	49	148
50	66	$16^{-0.032}_{-0.059}$	22	75	71	107	55	164
63	72	$20^{-0.040}_{-0.073}$	28	90	87	130	58	170
80	86	$20^{-0.040}_{-0.073}$	34	110	110	150	69	204
100	92	$25^{-0.040}_{-0.073}$	40	132	136	182	72	210

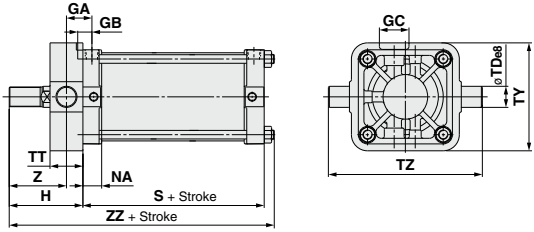
CA2Y



(mm)

Bore size \ Symbol	n	GA	H	S	TDe8	TT	TX	TY	TZ	Z	ZZ
40	23	11	66	80	$15^{-0.032}_{-0.059}$	22	85	62	117	55	151
50	26	13	71	86	$15^{-0.032}_{-0.059}$	22	95	74	127	60	163
63	27	13	79	94	$18^{-0.032}_{-0.059}$	28	110	90	148	65	179
80	32	16	94.5	111	$25^{-0.040}_{-0.073}$	34	140	110	192	77.5	212.5
100	35	16	100	121	$25^{-0.040}_{-0.073}$	40	162	130	214	80	229

CS2Y



(mm)

Bore size	GA	GB	GC	NA	S	TDe8
125	38	23	45	28.5	96	$32^{-0.050}_{-0.089}$
140	40.5	23	45	28.5	96	$36^{-0.050}_{-0.089}$
160	46	26	50	32.5	104	$40^{-0.050}_{-0.089}$

Bore size	TT	TY	TZ	H	Z	ZZ
125	50	164	234	112	87	221
140	55	184	262	112	84.5	221
160	60	204	292	122	92	241

Symbol
-XC52

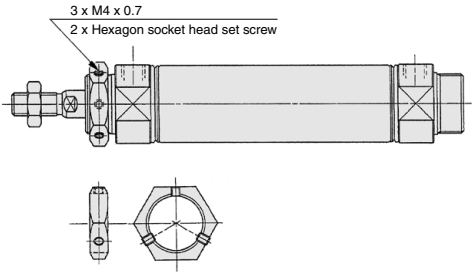
14 Mounting Nut with Set Screw

In order to prevent the mounting nut from being loosen, set screw should be tighten from the two directions to fix the mounting nut.

Applicable Series

Series	Description	Model	Action	Note
CM2-Z	Smooth cylinder	CM2Y	Double acting, Single rod	
	Low speed cylinder	CM2X	Double acting, Single rod	

Dimensions (Dimensions other than below are the same as standard type.)



How to Order

Standard model no. – XC52

Mounting nut with set screw

Specifications: Same as standard type

Symbol
-XC65

15 Made of Stainless Steel (Combination of XC7 and XC68)

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Series	Description	Model	Action	Note
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	

Specifications

Parts changed to stainless steel	Tie-rod, Tie-rod nut, Cushion valve, Piston rod (with hard chrome plated), Rod end nut
Specifications other than above and external dimensions	Same as standard type

How to Order

Standard model no. – XC65

Made of stainless steel
(Combination of XC7 and XC68)

Symbol
-XC68

16 Made of Stainless Steel (With Hard Chrome Plated Piston Rod)

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Series	Description	Model	Action	Note
MB-Z	Smooth cylinder	MBY	Double acting, Single rod	
CA2-Z	Smooth cylinder	CA2Y	Double acting, Single rod	
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

Specifications

Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than above and external dimensions	Same as standard type

Maximum Stroke

(mm)

Model	Double acting, Single rod	Double acting, Single rod with rod boot
CS2Y	1600	1400

How to Order

Standard model no. – XC68

Made of stainless steel
(with hard chrome plated piston rod)

Symbol
-XC86

17 With Rod End Bracket

With rod end bracket type to simplify the order process.

Applicable Series

Series	Description	Model	Action	Note
CS2	Smooth cylinder	CS2Y	Double acting, Single rod	

Note 1) Rod end brackets are shipped together.
Note 2) A pin and two split pins are attached for double knuckle joint.
Note 3) XC86A to C: Standard type, XC86D to F: Standard type except for rod end thread length (A and H dimensions)

How to Order

Standard model no. – **XC86** **A**

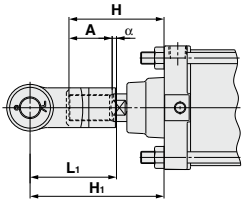
With rod end bracket

Suffix

A	With rod end nut
B	With double knuckle joint
C	With single knuckle joint
D	With double knuckle joint and rod end nut
E	With single knuckle joint and rod end nut
F	With rod end nut (For knuckle joint)

Dimensions (Dimensions other than below are the same as standard type.)

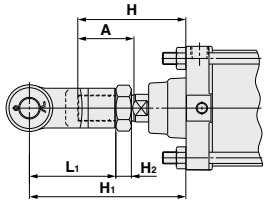
XC86B, XC86C

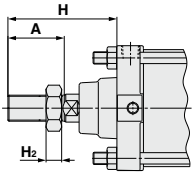


(mm)

Bore size \ Symbol	H	A	α	L1	H1	Applicable knuckle joint part no.	
						I type single knuckle	Y type double knuckle
125	110	50	3.5	100	156.5	**I-12A**	**Y-12A**
140	110	50	3.5	105	161.5	**I-14A**	**Y-14A**
160	120	56	3.5	110	170.5	**I-16A**	**Y-16A**

XC86D, XC86E





(mm)

Bore size \ Symbol	H	A	L1	H1	H2	Applicable knuckle joint part no.		Applicable rod end nut
						I type single knuckle	Y type double knuckle	
125	125	65	100	181	18	**I-12A**	**Y-12A**	**NT-12**
140	125	65	105	186	18	**I-14A**	**Y-14A**	**NT-12**
160	140	76	110	198	21	**I-16A**	**Y-16A**	**NT-16**

Related Products/Made to Order
-XB13: Low Speed Cylinder
5 to 50 mm/s (CY1/CY3: 7 to 50 mm/s)

Made to Order

1 Low Speed Cylinder

Symbol **-XB13**

CG1 — Standard model no. — XB13
Low speed cylinder

CY1 / CY3 — Standard model no. — XB13
MGP$^{M}_{L}$ — Standard model no. — XB13
MGGM — Standard model no. — XB13
MGCM — Standard model no. — XB13
CX2 — Standard model no. — XB13
CXW$^{M}_{L}$ — Standard model no. — XB13
CXS$^{M}_{L}$ — Standard model no. — XB13
MXH — Standard model no. — XB13
CXT$^{M}_{L}$ / CXSJ$^{M}_{L}$ — Standard model no. — XB13
Low speed cylinder

Note 1) Operate without lubrication from a pneumatic system lubricator.

Specifications

Applicable cylinder	Air cylinder Standard	Magnetically coupled rodless cylinder	Compact guide cylinder	Guide cylinder		Slide unit		Dual rod cylinder		Compact slide	Platform cylinder
				<Slide bearing>							
Series	**CG1**	**CY$^{1}_{3}$**	**MGP$^{M}_{L}$**	**MGGM**	**MGCM**	**CX2**	**CXW$^{M}_{L}$**	**CXSJ$^{M}_{L}$**	**CXS$^{M}_{L}$**	**MXH**	**CXT$^{M}_{L}$**
Action	Double acting, Single rod	Double acting									
Bore size (mm)	20, 25, 32 40, 50, 63 80, 100	[CY3B] 6, 10, 15, 20 25, 32, 40 50, 63 [CY1S, CY1L] 6 to 40	12, 16 20, 25 32, 40 50, 63 80, 100	20, 25 32, 40 50, 63 80, 100	20, 25 32, 40 50	10, 15 25	10, 16 20, 25 32	6, 10 15, 20 25, 32	6, 10 15, 20 25, 32	6, 10 16, 20	12, 16 20, 25 32, 40
Piston speed	5 to 50 mm/s	7 to 50 mm/s	5 to 50 mm/s	5 to 50 mm/s							
Cushion	Rubber bumper	Rubber bumper		Rubber bumper (Basic cylinder)		Shock absorber (CX2: Option)		Rubber bumper			
Auto switch	Mountable										
Mounting	Basic Foot Flange Trunnion Clevis	Basic Slider	Basic	Basic Front mounting Flange		Basic					
Dimensions	Dimensions and specifications are the same as standard products of double acting.										
Specifications other than above											

∗ No shock absorber is available for the MGGM series.

Related Products:
Speed Controllers for Low Speed Operation

The effective area of controlled flow is approximately 1/10 of the standard type. These controllers are suitable for controlling the speed of low speed cylinders.
The dual type speed controller is especially suitable for cylinders with a small bore size.

Elbow/Universal Type

Flow Rate and Sonic Conductance

Model		AS12□1FM-M5 AS13□1FM-M5	AS22□1FM-□01 AS23□1FM-□01		AS22□1FM-□02 AS23□1FM-□02		
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8	ø4	ø6	ø8, ø10
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø1/8" ø5/32"	ø3/16" ø1/4" ø5/16"	ø5/32"	ø3/16"	ø1/4" ø5/16" ø3/8"
Controlled flow	Flow rate L/min (ANR)	7	12		38		
	Sonic conductance dm³/(s·bar)	0.1	0.2		0.6		
Free flow	Flow rate L/min (ANR)	100	180	230	260	390	460
	Sonic conductance dm³/(s·bar)	1.5	2.7	3.5	4	6	7

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

In-line Type

Flow Rate and Sonic Conductance

Model		AS1001FM	AS2001FM		AS2051FM	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø5/32"	ø3/16" ø1/4"	ø3/16"	ø1/4" ø5/16"
Controlled flow	Flow rate L/min (ANR)	7	12		38	
	Sonic conductance dm³/(s·bar)	0.1	0.2		0.6	
Free flow	Flow rate L/min (ANR)	100	130	230	290	460
	Sonic conductance dm³/(s·bar)	1.5	2	3.5	4.5	7

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

Elbow Type (Metal body)

Flow Rate and Sonic Conductance

Model		AS12□0M		AS22□0M-□01		AS22□0M-□02	
Port size	Cylinder side	M5 x 0.8	10-32UNF	R1/8	NPT1/8	R1/4	NPT1/4
	Tube side			Rc1/8		Rc1/4	
Controlled flow	Flow rate L/min (ANR)	7		12		38	
	Sonic conductance dm³/(s·bar)	0.1		0.2		0.6	
Free flow	Flow rate L/min (ANR)	105		280		420	
	Sonic conductance dm³/(s·bar)	1.6		4.3		6.5	

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

Dual Type

Flow Rate and Sonic Conductance

Model		ASD230FM-M5	ASD330FM-□01	ASD430FM-□02	
Tubing O.D.	Metric size	ø4, ø6	ø6, ø8	ø6	ø8, ø10
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø3/16", ø1/4"	—	ø1/4" ø5/16" ø3/8"
Controlled flow (Free flow)	Flow rate L/min (ANR)	7	12	38	
	Sonic conductance dm³/(s·bar)	0.1	0.2	0.6	

Note) Supply pressure: 0.5 MPa, Temperature: 20°C