# Low Speed Cylinders

# CJ2X/CM2X/CQSX/CQ2X/CUX Series

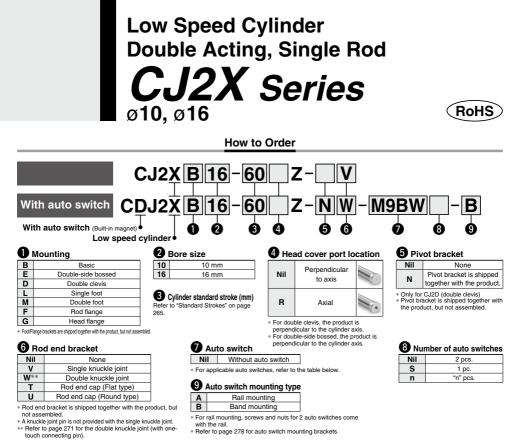
Series	Action	Bore size (mm)	Minimum operating speed (mm/s)	Page
CJ2X		10, 16	1	264
CM2X-Z1		20, 25, 32, 40	0.5	279-1
CM2X	Double	20, 25, 32, 40	0.5	280
CQSX	acting	12, 16	1	000
		20, 25	0.5	299
CQ2X		32, 40, 50, 63, 80, 100	0.5	308
CUX		10, 16	1	202
all is a state		20, 25, 32	0.5	323

# **Clean Series**



Refer to the Web Catalog for low-speed rotary actuators





#### Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

		Electrical	ight	Wiring		Load vo	oltage		Auto swit	ch model		Lea	d wir	e ler	ngth	(m)	Pre-wired	Anni	
Туре	Special function	entry	Indicatorlight	(Output)		DC	AC	Band m	ounting	Rail mo	ounting	0.5	1	3	5	None	connector		cable ad
		onay	lpdi	(Output)		DC		Perpendicular	In-line	Perpendicular	In-line	(Nil)	(M)	(L)	(Z)	(N)	CONTICCTO	10	au
				3-wire (NPN)		5 V.12 V		M9NV	M9N	M9NV	M9N	•	•	•	0	—	0	IC circuit	
ج ا		Grommet		3-wire (PNP)	]	5 V, 12 V		M9PV	M9P	M9PV	M9P	•	•	٠	0	-	0	IC CIICUIL	
switch				2-wire		12 V		M9BV	M9B	M9BV	M9B	•	•	٠	0	-	0		
		Connector	]	2-wire	J	12 V		—	H7C	J79C	—	•	-	•	•	•	—	_	
auto	Discussion in disation			3-wire (NPN)	]	5 V,12 V		M9NWV	M9NW	M9NWV	M9NW	•	•	•	0	-	0	IC circuit	
	Diagnostic indication (2-color indicator)		Yes	3-wire (PNP)	24 V	5 V, 12 V	_	M9PWV	M9PW	M9PWV	M9PW	•	•	٠	0	—	0	IC CIICUIL	Relay, PLC
state				2-wire	]	12 V		M9BWV	M9BW	M9BWV	M9BW	•	•	•	0	-	0	-	] ' ' '
	Water resistant	Grommet		3-wire (NPN)	1	5 V.12 V		M9NAV*1	M9NA*1	M9NAV*1	M9NA*1	0	0	٠	0	—	0	IC circuit	1
Solid	(2-color indicator)			3-wire (PNP)	]	5 V, 12 V		M9PAV*1	M9PA*1	M9PAV*1	M9PA*1	0	0	•	0	—	0	IC CIICUIL	
Ň	(2-color indicator)			2-wire	1	12 V		M9BAV*1	M9BA*1	M9BAV*1	M9BA*1	0	0	٠	0	—	0	-	1
	With diagnostic output (2-color indicator)	1		4-wire (NPN)	]	5 V,12 V		—	H7NF	-	F79F	•	—	٠	0	—	0	IC circuit	]
switch				3-wire (NPN equivalent)	_	5 V	-	A96V	A96	A96V	A96			•	•	-	0	IC circuit	-
Ň			Yes		1	_	200 V	—	_	A72	A72H	•	-	٠	-	-	-		
		Grommet					100 V	A93V	A93	A93V	A93	•	•	٠	•	_	O*2	1 -	
auto			No				100 V or less	A90V	A90	A90V	A90	•	•	•	•	—	O*2	IC circuit	Relay,
p			Yes	2-wire	24 V	12 V	_	_	C73C	A73C	_	•	_	٠	•	•	-	_	PLC
Reed		Connector	No				24 V or less	_	C80C	A80C	_	•	-	•	•	•	-	IC circuit	1
-	Diagnostic indication (2-color indicator)	Grommet	Yes			_	_	—	_	A79W	_	•	-	•	-	-	-	_	1

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

\*2 The load voltage used is 24 VDC

\* Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW

1 m ..... M (Example) M9NWM

3 m ······ L (Example) M9NWL 5 m ..... 7

(Example) M9NWZ None ...... N (Example) H7CN

\* Since there are other applicable auto switches than listed above, refer to page 279 for details. \* Auto switches marked with "O" 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



#### Bore size (mm) 10 16 Action Double acting, Single rod Fluid Air Proof pressure 1.05 MPa Maximum operating pressure 0.7 MPa Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing) Ambient and fluid temperature Cushion Rubber bumper (Standard equipment) Lubrication Not required (Non-lube) Stroke length tolerance Piston speed 1 to 300 mm/s ø10 0.035 J Allowable kinetic energy 0.090 J ø16

# Minimum Operating Pressure

		Unit: MPa
Bore size (mm)	10	16
Minimum operating pressure	0.1	06

# **Standard Strokes**

Specifications

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

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" in the Web Catalog.

#### Mounting and Accessories/For details about accessories, refer to page 271.

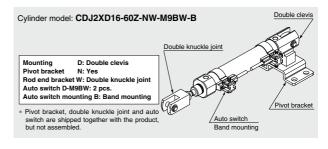
	<ul> <li>Mounted on the product</li> </ul>	. ⊖…Please or	der these sepa	arately. △…Ore	der separately.
	Mounting	Basic	Foot	Flange	Double <sup>*1</sup> clevis
ard	Mounting nut	•	•	•	—
Standard	Rod end nut	•	•	•	•
Sta	Clevis pin	—	—	—	•
	Single knuckle joint	0	0	0	0
5	Double knuckle joint*1	0	0	0	0
Option	Double knuckle joint (With one-touch connecting pin)	Δ	Δ	Δ	Δ
ΙŌ	Rod end cap (Flat/Round type)	0	0	0	0
	T-bracket	_	_	_	0

\*1 A pin and retaining rings are included with double clevis and/or double knuckle joint.

\*2 Stainless steel mounting brackets and accessories are also available.

Refer to page 272 for details.

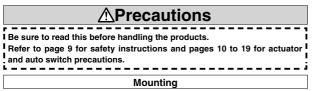
# **Ordering Example of Cylinder Assembly**



# Mounting Brackets/Part No.

Mounting bracket	Bore siz	ze (mm)
would in your acket	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).



# **∆**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

 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
De sie unsielet	Basic	22	46
Basic weight (When the stroke	Axial piping	22	46
(when the stroke is zero)	Double clevis (including clevis pin)	24	54
13 2010)	Head-side bossed	23	48
Additional weight	per 15 mm of stroke	4	7
	Single foot	8	25
Mounting bracket	Double foot	16	50
weight	Rod flange	5	13
	Head flange	5	13
	Single knuckle joint	17	23
	Double knuckle joint (including knuckle pin)	25	21
	Double knuckle joint (With one-touch connecting pin)	26	22
Accessories	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

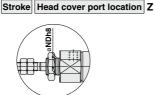
Cylinder stroke
 Mounting bracket weight------8 (Axial foot)

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

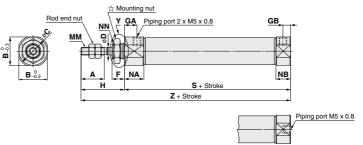
### Dimensions

Basic (B)

CJ2XB Bore size



Section Y detail



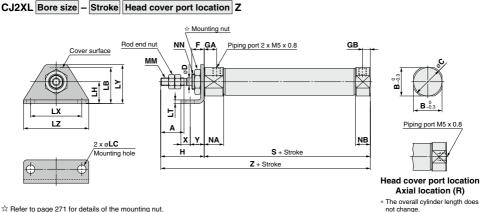
#### Head cover port location Axial location (R)

\* The overall cylinder length does not change.

A Refer to page 271 for details of the mounting nut.

A field to pag	0 27 1 10	in dotaile			g nat.										(mm)
Bore size	Α	В	С	D	F	GA	GB	н	MM	NA	NB	NDh8	NN	S	Z
10	15	12	14	4	8	8	5	28	M4 x 0.7	12.5	9.5	8_0.022	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_0.022	M10 x 1.0	47	75

# Single foot (L)



not change.

I	Bore size	Α	в	С	D	F	GA	GB	н	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	S	Х	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
Ī	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

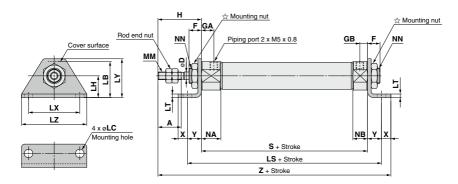
(mm)

# CJ2X Series

### Dimensions

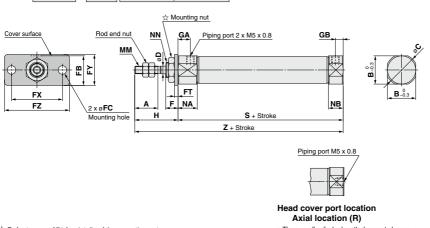
## Double foot (M)

CJ2XM Bore size - Stroke Z



☆ Refer to pag	$ m \gtrsim$ Refer to page 271 for details of the mounting nut. (mi															(mm)						
Bore size	Α	D	F	GA	GB	н	LB	LC	LH	LS	LT	LX	LY	LZ	MM	NA	NB	NN	S	х	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

A Refer to page 271 for details of the mounting nut.

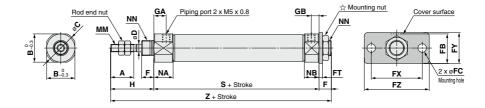
\* The overall cylinder length does not change.

	(r															(mm)				
Bore size	Α	В	С	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	н	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

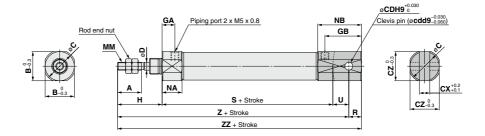


#### A Refer to page 271 for details of the mounting nut.

																				(mm)
Bore size	Α	В	С	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	н	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.

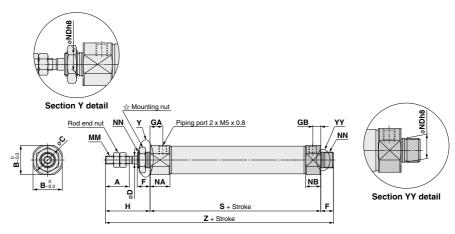
																		(mm)
Bore size	Α	В	С	CD(cd)	СХ	cz	D	GA	GB	н	MM	NA	NB	R	S	U	Z	ZZ
10	15	12	14	3.3	3.2	12	4	8	18	28	M4 x 0.7	12.5	22.5	5	46	8	82	87
16	15	18.3	20	5	6.5	18.3	5	8	23	28	M5 x 0.8	12.5	27.5	8	47	10	85	93

# CJ2X Series

### Dimensions

Double-side bossed (E)



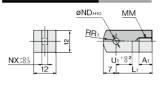


 $\precsim$  Refer to page 271 for details of the mounting nut.

															(mm)
Bore size	Α	В	С	D	F	GA	GB	н	MM	NA	NB	NDh8	NN	S	z
10	15	12	14	4	8	8	5	28	M4 x 0.7	12.5	9.5	8_0.022	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 <sub>-0.022</sub>	M10 x 1.0	47	83

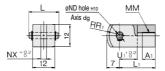
# CJ2X Series Dimensions of Accessories (Options)

### Single Knuckle Joint Material: Rolled steel



							(	mm)
Part no.								
I-J010C								
I-J016C	16	8	25	M5 x 0.8	5 <sup>+0.048</sup>	6.4	12	14

### Double Knuckle Joint Material: Rolled steel

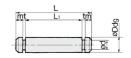


								(mm)
Part no.	Applicable bore size	<b>A</b> 1	I	L	L	.1		мм
Y-J010C	10	8	15	5.2	2	1	M	4 x 0.7
Y-J016C	16	11	16	6.6	2	1	M	5 x 0.8
Part no.	ND <sub>d9</sub>	ND <sub>H</sub>	10	Ν	х	F	1	U1
Y-J010C	3.3-0.030	3.3 <sup>+0.0</sup>	048	3.	2	8	3	10
Y-J016C	5-0.030	5 <sup>+0.04</sup>	8	6.	5	1	2	10

\* A knuckle pin and retaining rings are included.

Knuckle Pin

Material: Stainless steel



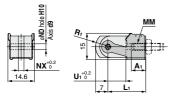
								(mm)
Part no.								
CD-J010	10							
IY-J015	16	5-0.030	4.8	16.6	12.2	1.5	0.7	Type C 5
-								

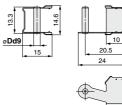
\* For ø10, a clevis pin is diverted.

One-touch Connecting Pin for Double Knuckle Joint Material: Stainless steel

\* Retaining rings are included with a knuckle pin.

# Double Knuckle Joint (With One-touch Connecting Pin)







									(mm)
Part no.	Applicable bore size	<b>A</b> 1	L1	ММ	NDd9	NDH10	NX	R1	U1
Y-J10	10	8	21	M4 x 0.7	3.3-0.030	3.3 <sup>+0.048</sup>	3.2	8	10
Y-J16	16	11	21	M5 x 0.8	5 <sup>-0.030</sup> -0.060	5 <sup>+0.048</sup>	6.5	12	10
					-	-			

		(mm)
Part no.	Applicable bore size	Dd9
IY-J10	10	3.3-0.030
IY-J16	16	5 <sup>-0.030</sup> -0.060
	-	0.060

					(mm)
Part no.	Applicable bore size	B1	<b>C</b> 1	d	Hı
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

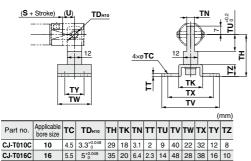


					(mm)
Part no.	Applicable bore size	B2	C2	d	H2
NTJ-010C	10	7	8.1	M4 x 0.7	3.2
NTJ-015C	16	8	9.2	M5 x 0.8	4
		-			



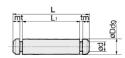
# CJ2X Series

# Pivot Bracket (T-bracket)



**Clevis Pin** 

Material: Stainless steel



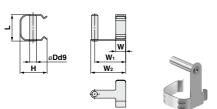
								(mm)	
Part no.									
CD-J010	10	3.3-0.030	3	15.2	12.2	1.2	0.3	Type C 3.2	
CD-Z015	16	5 <sup>-0.030</sup> -0.060	4.8	22.7	18.3	1.5	0.7	Type C 5	
Detaile is a single set in studied with a standard									

\* Retaining rings are included with a clevis pin.

\* 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 269.

#### **One-touch Connecting Pin for Double Clevis** Material: Stainless steel



							(mm)			
Part no.	Applica bore si	ble ze		Dd9	н	L	w			
CD-J10	10		3	3 <sup>-0.030</sup> -0.060	13.4	13.2	4			
CD-J16	16		Ę	5-0.030 -0.060	18.2	19.5	5			
Part no.	<b>W</b> 1	N	12		N	ote				
CD-J10	12	1	5	ournot be mounted on symbols with an easilion,						
CD-J16	15	1	18 or rail mounting type auto switches.							

\* Please pay attention to the applicable cylinder.

# **Rod End Cap**

#### Flat type/CJ-CF

# Round type/CJ-CR



MM ð

	¥.	
	(	mm)
Ν	R	w

A

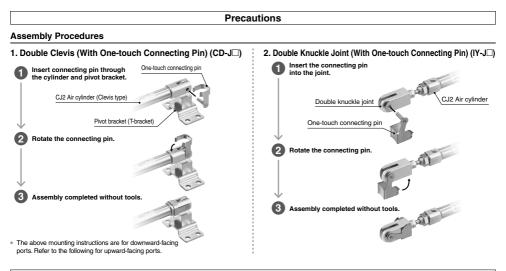
Material: Polyacetal

			(mm									
	Part no.		Α	D		ММ	N	ь	w			
Flat type	Round type	bore size	A					<b>n</b>	vv			
CJ-CF010	CJ-CR010	10	8	10	13	M4 x 0.7	6	10	8			
CJ-CF016	CJ-CF016 CJ-CR016		10	12	15	M5 x 0.8	7	12	10			

### Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

Ра	rt No. (Di	mensions:	Same as st	andard type	e)		
E	Bore size (mm)	Foot	Flange	Single knuckle joint	Double knuckle joint*	Mounting nut	Rod end nut
	10	_	—	I-J010SUS	Y-J010SUS	—	NTJ-010SUS
	16	CJ-L016SUS	CJ-F016SUS	I-J016SUS	Y-J016SUS	SNJ-016SUS	NTJ-015SUS

\* A knuckle pin and retaining rings are shipped together.



#### How to Mount the Double Clevis (With One-touch Connecting Pin)

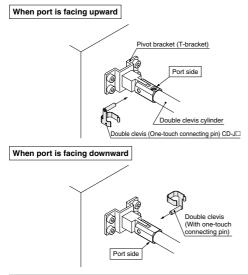
When connecting a double clevis cylinder to a pivot bracket (T-bracket), it is recommended that the pivot bracket (T-bracket) and the cylinder be connected with the one-touch connecting pin first, before fastening the pivot bracket.

When connecting the cylinder after the pivot bracket (T-bracket) has been fastened, mount the cylinder according to the following procedure.

# ▲Warning

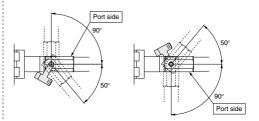
For assembling the clevis type to the pivot bracket, refer to the figure below.

1. Insert the double clevis (One-touch connecting pin) from the direction in the figure.

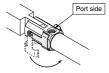


# Marning

\* Perform the mounting within the following range.



2. Push the one-touch connecting pin into the cylinder body (Double clevis) until it clicks and is firmly fastened.

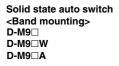


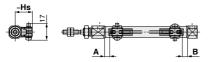
\* Attach the double knuckle joint within 180° (±90° from center). Other mounting methods are the same as the above.



# CJ2X Series Auto Switch Mounting

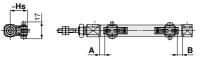
# Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height





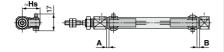
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.





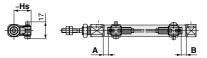
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-H7□ D-H7□W D-H7BA D-H7NF D-H7C



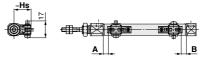
Reed auto switch <Band mounting>

**D-A9**□



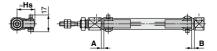
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



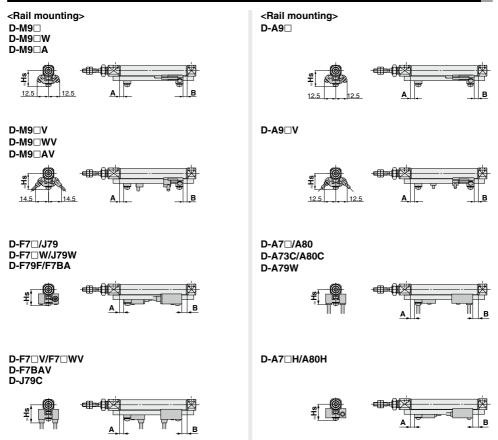


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-C7□/C80 D-C73C□/C80C



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



# CJ2X Series

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

Auto Switch	Proper	Mountin	g Positi	on				(mm)			
Auto switch				Band mounting							
model	D-M D-M D-M D-M D-M		D-A D-A		D-C7□ D-C80 D-C73C D-C73C D-C80C		D-H7□ D-H7C D-H7NF D-H7□W D-H7BA				
Bore size	A	В	Α	В	Α	В	A	В			
10	(5) 6 (5) 6		(1) 2	(1) 2	2.5	2.5	1.5	1.5			
16	(5.5) 6.5	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	Rail mounting											
model			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 W/F7 WV D-F79F D-J79C D-F78A D-F7BAV		'NT	D-A79W	
Bore size	Α	В	Α	В	Α	В	A	В	A	В	Α	В
10	4.5			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

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

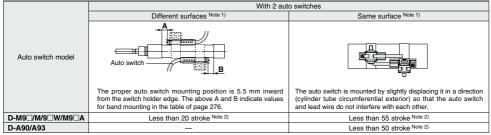
(mm)

						(mm)
Auto switch			Rail m	ounting		
model	D-M9 D-M9 V D-M9 W D-M9 A D-M9 A D-M9 A V D-A9 D-A9 V	D-M9=\V D-M9=\V D-M9=\V D-M9=\V D-M9=\V D-M9=\A D-M9=\A D-A9-\V D-A9-\V D-A9-\V		D-F7⊡V D-F7⊡WV D-F7BAV	D-J79C	D-A79W
Bore size	Hs	Hs	Hs	Hs	Hs	Hs
10	17.5	17.5	23.5	20	23	19
16	21	20.5	26.5	23	26	22

# Minimum Stroke for Auto Switch Mounting

						(mm)
Auto ouriteb				Number of	auto switches	
	Auto switch model	With 1 pc.	With 2	2 pcs.	With n pcs. (n: Numl	ber of auto switches)
Auto switch mounting Band mounting		with t pc.	Different surfaces	Same surface	Different surfaces	Same surface
	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)
Band mounting	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)
	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)
Rail mounting	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 2) Minimum stroke for auto switch mounting in types other than those mentioned in Note 1.

Note 1) Auto switch mounting

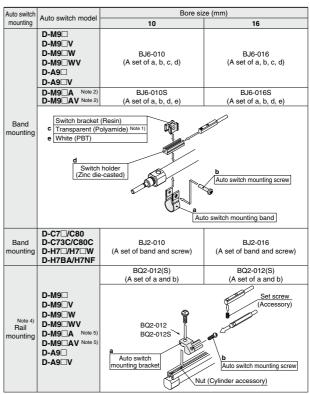
# CJ2X Series

# **Operating Range**

			(mm	
	Auto switch model	Bore	size	
	Auto switch model	10	16	
tting	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	2.5	3	
our	D-A9	6	7	
18	D-C7□/C80/C73C/C80C	7	7	
Band mounting	D-H7□/H7□W D-H7BA/H7NF	4	4	
	D-H7C	8	9	
	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3	3.5	
p	D-A9□/A9□V	6	6.5	
mounting	D-A7⊟/A80/A7H/A80H D-A73C/A80C	8	9	
Bail	D-A79W	11	13	
æ	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.



- Note 1) As the switch bracket is made of polyamide, its performance may be affected by chemicals such as alcohol, chloroform, methylamines, hydrochloric acid, and sulfuric acid, so it cannot be used in environments where these chemicals come into contact with the product.
- 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-M9DA(V), order the BQ2-012S, which uses stainless steel mounting screws.

#### Band Mounting Brackets Set Part No.

Set part no.	Contents					
BJ2-□□□	<ul> <li>Auto switch mounting band (a)</li> <li>Auto switch mounting screw (b)</li> </ul>					
BJ4-1	Switch bracket (White/PBT) (e)     Switch holder (d)					
BJ5-1	Switch bracket (Transparent/Polyamide) (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 page 1440 for details on the BBA4.

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



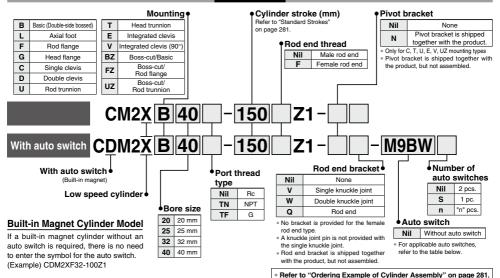
# Auto Switch Mounting CJ2X Series

Sold state R R Reed	Mounting	Model	Electrical entry	Features
	Daniel an annahire a	D-H7A1/H7A2/H7B		_
	Band mounting	D-H7NW/H7PW/H7BW	Cremmet (In line)	Diagnostic indication (2-color indicator
0.11.1.1.1.1		D-F79/F7P/J79	Grommet (In-line)	_
Sold state	Dell menutine	D-F79W/F7PW/J79W		Diagnostic indication (2-color indicator
	Rail mounting	D-F7NV/F7PV/F7BV	Cremmet (Demendieuler)	—
		D-F7NWV/F7BWV	Grommet (Perpendicular)	Diagnostic indication (2-color indicator
	Band mounting	D-C73/C76		—
	Band mounting	D-C80	Grommet (In-line)	Without indicator light
Deed		D-A73H/A76H	Groninet (in-line)	—
Reed	Deilmeunting	D-A80H		Without indicator light
	Rail mounting	D-A73	Cremmet (Demendieuler)	—
		D-A80	Grommet (Perpendicular)	Without indicator light

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

### How to Order

RoHS



#### Applicable Auto Switches/Refer to the Web Catalog for further information on auto switches.

		Electrical	Indicator light	Wiring		Load volt	age	Auto swit	ch modol	Lead	wire	length	n [m]	Pre-wired							
Туре	Special function	entry	ator	(Output)	,	oc				0.5	1	3	5	connector	Applica	ble load					
		entry	12	(Output)			70	Perpendicular	In-line	(Nil)	(M)	(L)	(Z)	Connector							
÷				3-wire (NPN)		5 V. 12 V		M9NV	M9N	•	•	•	0	0	IC circuit						
switch		Grommet		3-wire (PNP)		5 V, 12 V		M9PV	M9P	•	•	•	0	0							
sv				2-wire		12 V 5 V, 12 V	12 V	M9BV	M9B	•	•	٠	0	0	-						
auto	Diagnostic		] _	3-wire (NPN)			EV 10 V	EV 10 V	5 V 12 V		M9NWV	M9NW	•	•	•	0	0	IC circuit	Deleu		
	indication		l e	3-wire (PNP)	24 V	5 V, 12 V		M9PWV	M9PW	•	•	•	0	0		Relay, PLC					
state	(2-color indicator) Grommet	1	2-wire		12 V		M9BWV	M9BW	•	•	٠	0	0	-	FLO						
s	10/		Giomine	3-wire (NPN)		5 V. 12 V		M9NAV*1	M9NA*1	0	0	•	0	0	IC circuit						
Solid	Water resistant (2-color indicator)			3-wire (PNP)		5 V, 12 V		M9PAV*1	M9PA*1	0	0	•	0	0							
Ň	(2-color indicator)			2-wire		12 V		M9BAV*1	M9BA*1	0	0	٠	0	0	—						
eed auto switch		0	/es	3-wire (NPN equivalent)	-	5 V	-	A96V	A96	•	-	•	-	-	IC circuit	-					
Reed		Grommet						1	Quuiro	24 V	12 V	100 V	A93V*2	A93	•	•	٠	•	_	—	Relay,
۳ ۳			ž	2-wire 24	24 V	12 V	100 V or less	A90V	A90	•	-	٠	-		IC circuit	PLC					

\*1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance

A water-resistant type cylinder is recommended for use in an environment which requires water resistance.

\*2 The 1 m lead wire is only applicable to the D-A93.

*	Lead wire	length symbo	ls: 0.5 m	Nil	(Example) M9NW

- (Example) M9NWL 3 m ..... L 5 m ······ Z (Example) M9NWZ

\* Since there are applicable auto switches other than those listed above, refer to page 279-18 for details \* For details on auto switches with pre-wired connectors, refer to the Web Catalog.

The D-A9 M9 at switch mounting brackets are assembled before shipment.)

\* Solid state auto switches marked with a "O" are produced upon receipt of order.





# Specifications

Bore size (mm)	20	25	32	40						
Туре	Pneumatic									
Action		Double acting	g, Single rod							
Fluid		A	ir							
Proof pressure	1.5 MPa									
Maximum operating pressure		1.0 1	MPa							
Minimum operating pressure		0.025								
Ambient and fluid temperature	Without au With au	to switch: -10° to switch: -10°	°C to 70°C (No °C to 60°C	freezing)						
Cushion	Rubber bumper									
Lubrication	Not required (Non-lube)									
Stroke length tolerance	tolerance +1.4 mm									

#### Symbol

Double acting, Single rod, Rubber bumper



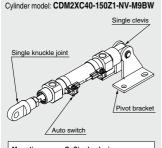
# Standard Strokes

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

Note 1) Manufacture of intermediate strokes in 1 mm increments 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" in the Web Catalog.

## Ordering Example of Cylinder Assembly



 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.

# **Piston Speed**

Bore size (mm)		20	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						
Allowable kinetic energy (J)	(Female thread)	0.11	0.18	0.29	0.52						

# Mounting Brackets/Part No.

Mounting bracket	Min.	E	Bore siz	Contents (for minimum					
Woulding bracket	order q'ty	20	25 32		40	order quantity)			
Axial foot*1	2	CM-L020B	CM-L032B		CM-L032B CM-L040B		32B CM-L040B 2 foots, 1 mounting r		
Flange	1	CM-F020B	CM-F032B		CM-F032B		CM-F040B	1 flange	
Single clevis*2	1	CM-C020B	CM-C	032B	CM-C040B	1 single clevis, 3 liners			
Double clevis (with pin)*2	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-T032B		CM-T040B	1 trunnion, 1 trunnion nut	

\*1 Order 2 foots per cylinder

\*2 3 liners are included with a clevis bracket for adjusting the mounting angle.

\*3 A clevis pin and retaining rings (split pins for ø40) are included.

\*4 Stainless steel mounting brackets and accessories are also available. Refer to page 292 for details.

### Mounting and Accessories/For details about accessories, refer to pages 291 to 293.

Accessories	Sta	andard		Option						
Mounting	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint		Rod end	Clevis pivot bracket	Pivot bracket	Note 7) Pivot bracket pin	
Basic (Double-side bossed)	• (1 pc.)	•	_	•	•	•	—			
Axial foot	• (2)	•	—	•	•	•	-			
Rod flange	• (1)	•	—	•	٠	•	—	—	—	
Head flange	• (1)	•	_	•	٠	•	—	1		
Integrated clevis	Note 1)	•	—	•	٠	•	٠	1		
Single clevis	Note 1)	•	—	•	٠	٠	-	٠	٠	
Double clevis Note 3)	Note 1)	•	Note 5)	•	٠	•	—	—	—	
Rod trunnion	<ul> <li>(1) Note 2)</li> </ul>	•	_	•	٠	•	—	•		
Head trunnion	• (1) Note 2)	•	—	•	٠	٠	-	•	_	
Boss-cut/Basic	• (1)	•	_	•	٠	•	—			
Boss-cut/Flange	• (1)	•	—	•	•	٠	-	—	-	
Boss-cut/Trunnion	• (1) Note 2)	•	—	•	۲	•	—			

Note 1) Mounting nuts are not attached to the integrated 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 class 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.



# **A Precautions**

Be sure to read this before handling the products.

For safety instructions as well as actuator and auto switch precautions, refer to the "Handling Precautions for SMC

- Products" and the "Operation Manual" on the SMC website: https://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.

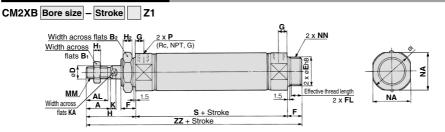
Bore size (mm)	Kit no.	Contents		
20	CM2X20-PS			
25	CM2X25-PS	Rod seal 1 pc.		
32	CM2X32-PS	Grease pack (10 g) 1 pc.		
40	CM2X40-PS			

#### 2. Grease pack

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

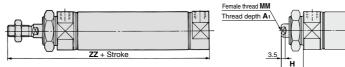
Grease pack part number: GR-L-005 (5 g) GR-L-010 (10 g) GR-L-150 (150 g)

# Basic (Double-side Bossed) (B)



#### Boss-cut

#### Female rod end



 ZZ -	- Stroke
ZZ +	<ul> <li>Stroke</li> </ul>

																					(mm)
Bore size	Α	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	FL	G	н	Hı	H <sub>2</sub>	Ι	к	KA	MM	NA	NN	Р	S	ZZ
20	18	15.5	13	26	8	20_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_0.033	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_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_0.039	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

ema	le	R	ЪС	Е
-----	----	---	----	---

Female Rod End (mm)										
Bore size	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						

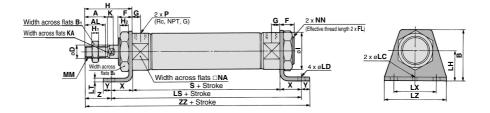
\* When female thread is used, use a thin wrench when tightening the piston rod.

\* 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.

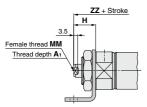
# CM2X Series

# Axial Foot (L)

CM2XL Bore size - Stroke Z1



#### Female rod end



Bore size	Α	AL	в	B1	B <sub>2</sub>	D	F	FL	G	н	Ηı	H <sub>2</sub>	Т	κ	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	NN	Р	s	х	Y	Ζ	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

(mm)

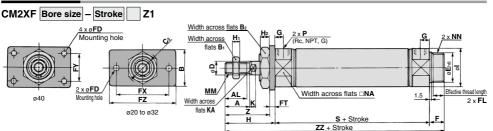
\* Mounting bracket is shipped together with the product.

Female Rod E	End			(mm)
Bore size	<b>A</b> 1	н	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

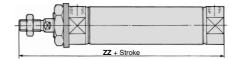
\* When female thread is used, use a thin wrench when tightening the piston rod.

\* 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.

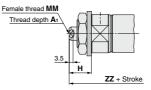
# Rod Flange (F)



Boss-cut



#### Female rod end



Bore size	Α	AL	в	B1	B <sub>2</sub>	<b>C</b> <sub>2</sub>	D	E	F	FL	FD	FT	FX	FY	FΖ	G	н	Ηı	H <sub>2</sub>	Т	к	KA	MM	NA	NN	Ρ	s	Ζ	ZZ
20	18	15.5	34	13	26	30	8	20-0.033	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	26-0.033	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_0.033	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	32-0.039	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	<b>A</b> 1	н	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								

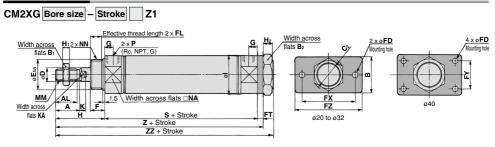
\* When female thread is used, use a thin wrench when tightening the piston rod.

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.

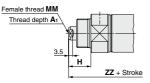
(mm)

# CM2X Series

# Head Flange (G)



#### Female rod end



																				(mm)
Bore size	Α	AL	в	B1	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FL	FD	FT	FX	FY	FZ	G	н	Hı	H <sub>2</sub>	1
20	18	15.5	34	13	26	30	8	20-0.033	13	10.5	7	4	60	-	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	26_0.033	13	10.5	7	4	60	-	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	26_0.033	13	10.5	7	4	60	-	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	32_0.039	16	13.5	7	5	66	36	82	11	50	8	10	46.5

									(mm)
Bore size	К	KA	MM	NA	NN	Р	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.

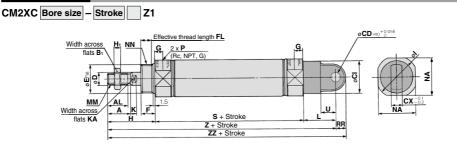
Female F	lod End
----------	---------

Female Rod End (mm)												
Bore size	<b>A</b> 1	н	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								

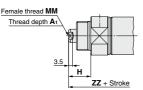
\* When female thread is used, use a thin wrench when tightening the piston rod.

\* 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)



#### Female rod end



Female Rod End (mm												
Bore size	<b>A</b> 1	н	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								

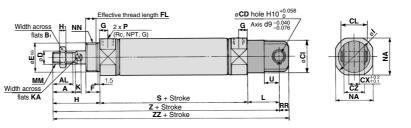
\* When female thread is used, use a thin wrench when tightening the piston rod.

 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.

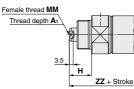
Bore size	Α	AL	B1	CI	CD	СХ	D	E	F	FL	G	н	Hı	Т	к	KA	L	MM	NA	NN	Ρ	RR	s	U	Ζ	ZZ
20	18	15.5	13	24	9	10	8	20-0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26_0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26-0.033	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	32-0.039	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 Z1



#### Female rod end



Female Rod End (mm)											
Bore size	<b>A</b> 1	н	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.

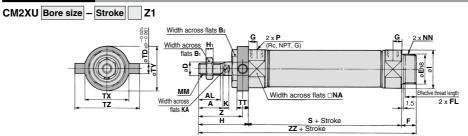
When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece. (mm)

Bore size	Α	AL	B1	CD	CI	CL	сх	cz	D	Е	F	FL	G	н	Hı	I	к	KA	L	MM	NA	NN	Р	RR	s	U	z	ZZ
20	18	15.5	13	9	24	25	10	19	8	20-0.033	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_0.033	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	26-0.033	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	32-0.039	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
																	1			I was had a first on out of		and the stress from	- 10		a la la			- 41

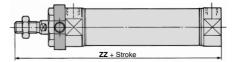
\* A clevis pin and retaining rings (split pins for ø40) are shipped together.

# CM2X Series

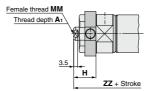
# Rod Trunnion (U)



Boss-cut



### Female rod end



\* Mounting bracket is shipped together with the product.

																		(mm)
Bore size	Α	AL	B1	B <sub>2</sub>	D	E	F	FL	G	н	H <sub>1</sub>	I	к	KA	ММ	NA	NN	Р
20	18	15.5	13	26	8	20_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	26-0.033	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	26-0.033	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_0.039	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	Π	ΤХ	ΤY	ΤZ	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

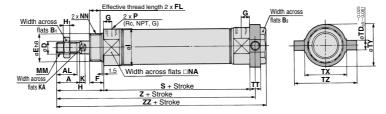
Female Roo	l Enc	1		(mm)
Bore size	<b>A</b> 1	н	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

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

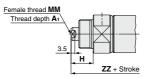
\* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

# Head Trunnion (T)

CM2XT Bore size - Stroke Z1



#### Female rod end



\* Mounting bracket is shipped together with the product.

																		(mm)
Bore size	Α	AL	Bı	B <sub>2</sub>	D	E	F	FL	G	н	H <sub>1</sub>	1	К	KA	ММ	NA	NN	Р
20	18	15.5	13	26	8	20_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	26-0.033	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	26-0.033	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_0.039	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	ТΧ	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	<b>A</b> 1	н	ММ	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

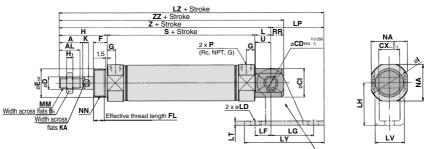
 $\ast\,$  When female thread is used, use a thin wrench when tightening the piston rod.

\* 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.

# CM2X Series

# Integrated Clevis (E)

CM2XE Bore size - Stroke Z1

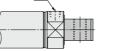


Refer to page 293 for details of clevis pivot bracket.

#### Female rod end

# Female thread MM Thread depth Ar H ZZ + Stroke

# Integrated clevis (90°) (V)





\* The outer dimensions are the same as those for the integrated clevis (E).

(mm)

Bore size	Α	AL	B1	CD	CI	СХ	D	E	F	FL	G	н	H <sub>1</sub>	Ι	к	KA	L	MM	NA	NN
20	18	15.5	13	8	20	12	8	20_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	26-0.033	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	26-0.033	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_0.039	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	42.5	M32 x 2

						(mm)
Bore size	Р	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

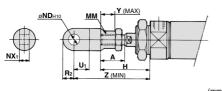
Female Rod I	End			(mm)
Bore size	<b>A</b> 1	н	MM	ZZ
20	8	20	M4 x 0.7	103
25	8	20	M5 x 0.8	103
32	12	20	M6 x 1	111
40	13	21	M8 x 1.25	136

\* 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.

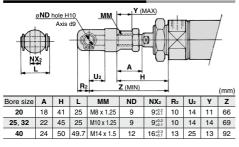
# CM2X Series **Dimensions of Accessories**

# With Single Knuckle Joint



									(11111)
Bore size	Α	н	MM	ND <sub>H10</sub>	NX <sub>1</sub>	U1	R <sub>2</sub>	Y	Z
20	18	41	M8 x 1.25	9+0.058	9 <sup>-0.1</sup>	14	10	11	66
25, 32	22	45	M10 x 1.25	9 <sup>+0.058</sup>	9 <sup>-0.1</sup> -0.2	14	10	14	69
40	24	50	M14 x 1.5	12 <sup>+0.070</sup>	16 <sup>-0.1</sup>	20	14	13	92

# With Double Knuckle Joint



# **Double Knuckle Joint**

Y-020B, 03	32B Material	: Carbo	on stee	I.	۲·	-0408	Material: Ca	st iron							
	e te se														
		s d9		øEi	M			T							
Part no.	Applicable	A	<b>A</b> 1	E1	LA	LB	MM	ND	NX	NZ	R <sub>1</sub>	U1	Included pin part number	(mm)	
Y-020B	bore size 20	46	16	20	25	36	M8 x 1.25	9	9 <sup>+0.2</sup>	18	5	14	CDP-1	Split pin Size Type C 9 for axis	
Y-032B	25, 32	48	18	20	25	38	M10 x 1.25	9	9 <sup>+0.2</sup>	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 <sup>+0.3</sup>	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





Retaining ring: Type C9 for axis

\* Retaining rings (split pins for ø40) are included.

# Single Knuckle Joint

MM								Free-cut		
	Annlicable		-	-						mm)
Part no.	bore size	Α	<b>A</b> 1	E1	LB	MM	NDH10	NX	R <sub>1</sub>	U1
I-020B	20	46	16	20	36	M8 x 1.25	9+0.058	9-0.1	10	14
I-032B	25, 32	48	18	20	38	M10 x 1.25	9 <sup>+0.058</sup>	9 <sup>-0.1</sup>	10	14
I-040B	40	69	22	24	55	M14 x 1.5	12 <sup>+0.070</sup>	16 <sup>-0.1</sup>	15.5	20

Bore size/ø20, ø25, ø32	Bore size/ø40				
CDP-1	CDP-3				
1.75 1.15 1.15	2 x ø3 Through hole 888 4 41.7 4 49.7				
Retaining ring: Type C9 for axis	Split pin: ø3 x 18 L				

Double Knuckle Pin/Material: Carbon steel

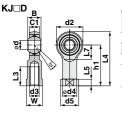
\* Retaining rings (split pins for ø40) are included.

(mm)

(mm)

# CM2X Series

### Rod End

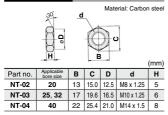


															[	mm]		
Part no.	Material	Applicable bore size	dH7	d3	<b>B</b> <sup>+0</sup> <sub>-0.12</sub>	C1	d2	d4	d5	h1	L3min	L4	L5	L7	w	α°	Allowable radial static load [KN]	Weight [kg]
KJ8D	Carbon steel	20	8	M8 x 1.25	12	9	24	12.5	16	36	16	48	5	13	14	14	12	0.05
KJ10D	Carbon steel	25, 32	10	M10 x 1.25	14	10.5	28	15	19	43	20	57	6.5	15	17	13	14	0.07
KJ14D	Carbon steel	40	14	M14 x 1.5	19	13.5	36	20	25	57	25	75	8	19	22	15	36	0.16

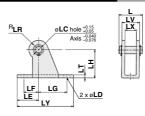
The allowable radial load shows the allowable value of a single rod end. When the rod end is used for connecting to a cylinder, the allowable radial load conforms to the cylinder specifications.

### \* Refer to the Web Catalog for specifications and precautions.

# Rod End Nut



# Clevis Pivot Bracket (For CM2XE(V))



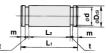
Material: Carbon steel

														(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

		(mr
m	t	Included

								(mm)
Part no.	Applicable bore size	Dd9	d	Lı	L2	m	t	Included retaining ring
CD-S02	20, 25	8-0.040	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	32, 40	10-0.040	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

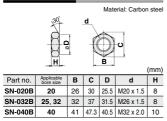
### Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

#### Part No. (Dimensions: Same as standard type)

Bore size (mm)	Foot	Flange	Single knuckle joint	Double knuckle joint*	Mounting nut	Rod end nut
20	CM-L020B-XB12	CM-F020BSUS	I-020BSUS	Y-020BSUS	SN-020BSUS	NT-02SUS
25, 32	CM-L032B-XB12	CM-F032BSUS	I-032BSUS	Y-032BSUS	SN-032BSUS	NT-03SUS
40	CM-L040B-XB12	CM-F040BSUS	I-040BSUS	Y-040BSUS	SN-040BSUS	NT-04SUS

\* A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

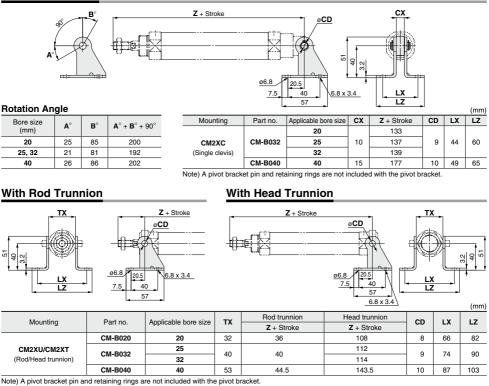
# Mounting Nut



## **Trunnion Nut**

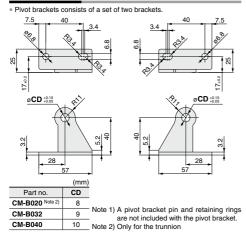
	°C P	H. 30° 7	Ċ	в.	erial: Carbor	
Part no.	Applicable bore size	в	С	D	d	(mm) H
TN-020B	20	26	28	25.5	M20 x 1.5	10
TN-032B	25, 32	32	34	31.5	M26 x 1.5	10
TN-040B	40	41	45	40.5	M32 x 2	10

# With Single Clevis

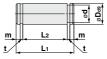


## **Pivot Bracket**

9



# **Pivot Bracket Pin (For CM2XC)**



								(mm)
Applicable bore size	Part no.	D <sub>d9</sub>	d	L1	L2	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	9.6	34	29	1.35	1.15	Type C 10 for axis

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

# CM2X Series D-M9 D-A9 **Auto Switch Mounting**

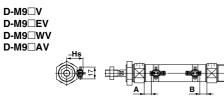
# Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height

#### Solid state auto switch

**D-M9**□ D-M9□E D-M9 W D-M9



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



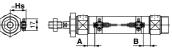
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

### Applicable Cylinders: Standard Type

Applicable C	ylinders: Standa	ard Type		[mm]			
Auto switch model		Ê(V) W(V)	D-A9□(V)				
Bore size	Α	В	Α	В			
20	11	9.5	7	5.5			
25	10	10	6	6			
32	11.5	10.5	7.5	6.5			
40	17.5	15.5	13.5	11.5			

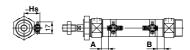
\* Adjust the auto switch after confirming the operating conditions in the actual setting.

# Reed auto switch D-A9



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.

Auto Switch Mou	Auto Switch Mounting Height [mm]								
Auto switch model	D-M9=(V) D-M9=E(V) D-M9=W(V) D-M9=A(V) D-A9=(V)								
Bore size	Hs								
20	24.5								
25	27								
32	30.5								
40	34.5								

# Minimum Stroke for Auto Switch Mounting

A	O 11 - 1	<b>O 1 1 1 1 1</b>	<b>T</b>
Applicable	Cylinders:	Standard	Ivpe

Applicable Cylinders: Standard Type n: Number of auto switches [mm]									
	Number of auto switches								
Auto switch model	Mah 1 mm	With	2 pcs.	With	n pcs.				
	With 1 pc.	Different surfaces	Same surface	Different surfaces	Same surface				
D-M9□ D-M9□E	5	15*1	40*1	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	55 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊡W	10	15*1	40*1	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	55 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊡A	10	15*1	40*1	$25 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*3	60 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-A9□	5	15	30*1	$15 + 35 \frac{(n-2)}{2}$ $(n = 2, 4, 6)^{*3}$	50 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊟V D-M9⊟EV	5	15*1	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6)*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)*3	25 + 35 (n - 2) (n = 2, 3, 4, 5…)				
D-M9⊟WV D-M9⊡AV	10	15*1	35	$20 + 35 \frac{(n-2)}{2}$ $(n = 2, 4, 6)^{*3}$	35 + 35 (n - 2) (n = 2, 3, 4, 5…)				

\*3 When "n" is an odd number, an even number that is one larger than the odd number is to be used for the calculation.

#### \*1 Auto switch mounting

	With 2 aut	o switches
	Different surfaces	Same surface
Auto switch model	A 15 35 15 15 15 15 15 15 15 15 15 1	The auto switch is mounted by slightly displacing it in a
	face of the switch holder.	direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-M9□(V) D-M9□E(V) D-M9□W(V)	15 to 20 mm stroke*2	40 to 55 mm stroke <sup>*2</sup>
D-M9□A(V)	15 to 25 mm stroke*2	40 to 60 mm stroke*2
D-A9□(V)	—	30 to 50 mm stroke*2

\*2 Minimum stroke for auto switch mounting in types other than those mentioned in \*1

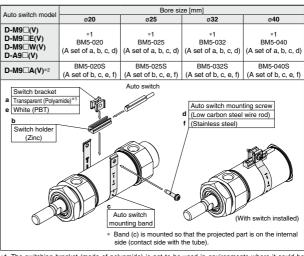
# CM2X Series

# **Operating Range**

				[mm]		
Auto switch model	Bore size					
Auto switch model	20	25	32	40		
D-A9□(V)	6	6	6	6		
D-M9□(V) D-M9□E(V) D-M9□W(V) D-M9□A(V)	3	3	4	3.5		

Values which include hysteresis are for reference 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 Nos.



\*1 The switching bracket (made of polyamide) is not to be used in environments where it could be exposed to chemicals (In particular, alcohol, chloroform, methylamine, hydrochloric acid, and sulphuric acid, etc.), as they may affect the performance.

\*2 When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

#### Band Mounting Brackets Set Part Nos.

Set part no.	Contents
BJ4-1	Switch bracket (White/PBT) (e)     Switch holder (b)
BJ5-1	Switch bracket (Transparent/Polyamide) (a)     Switch holder (b)

#### CM2 Series D-H7/G5/G39A/K39A D-C7/C8/B5/B6/B59W/A3 A/A44A **Auto Switch Mounting** Other than the applicable auto switches listed in "How to Order," the following auto switches are also mountable. I Refer to the Web Catalog for detailed specifications. I. Type Model Electrical entry Features I D-H7A1, H7A2, H7B I D-H7NW, H7PW, H7BW Diagnostic indication (2-color indicator) I D-H7NF Grommet (In-line) With diagnostic output (2-color indicator) I Solid state D-H7BA Water resistant (2-color indicator) D-G5NT With timer I D-G39A, K39A I Terminal conduit

Grommet (In-line)

Terminal conduit

DIN terminal

D-C73, C76, B53, B54

With pre-wired connector is also available for solid state auto switches. For details, refer to the Web Catalog.

\* Normally closed (NC = b contact) solid state auto switches (D-M9 E(V)) are also available. For details, refer to the Web Catalog.

D-C80, B64

D-A33A, A34A

D-B59W

D-A44A

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Auto Switch Proper Mounting Position (Detec	tion at stroke end) and Mounting Height
Solid state auto switch	Reed auto switch
D-H7□/H7□W/H7NF/H7BA	D-C7/C8
D-G5NT	D-B5/B6/B59W
D-G39A/K39A	D-A33A/A34A
	D-A44A

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Without indicator light

Diagnostic indication (2-color indicator)

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

[mm]

#### Applicable Cylinders: Standard Type

Auto switch model	D-K3 D-A3	D-G39A D-K39A D-A3⊡A D-A44A		D-H7 D-H7 W D-H7BA D-H7NF		35NT D-C7□/C80		D-B D-B		D-B	59W	
Bore size	A	В	Α	В	Α	В	Α	В	A	В	Α	В
20	1	0	6.5	5	3	1.5	7.5	6	1.5	0	4	3
25	0	0	5.5	5.5	2	2	6.5	6.5	0.5	0.5	3.5	3.5
32	1.5	0.5	7	6	3.5	2.5	8	7	2	1	5	4
40	7.5	5.5	13	11	9.5	7.5	14	12	8	6	11	9
* Adjust the	auto	switch	after c	onfirm	ing the	oners	ating co	nditio	ns in th	ne actu	al sotti	ina

Auto Switch Mounting Height									
Auto switch	D-H7□ D-H7□W	D-B5							
	D-H7UW	D-B5	D-G39A						

D-B64

D-B59W

D-G5NT

Hs

25.5

28

31.5

35.5

D-K39A

D-A3 A

Hs

62.5

60

66

70

D-H7BA

D-H7NF

D-C7

D-C80

Hs

24.5

30.5

34.5

27

Bore size

20

25

32

40

[mm]

D-A44A

Hs

69.5

79.5

n: Number of auto switches [mm]

72 75.5

l	40	7.5	5.5	13	11	9.5	7.5	14	12	8	6	11	9
1	<ul> <li>Adjust th</li> </ul>	e auto	switch	after c	onfirm	ing the	opera	ating co	ondition	ns in th	ne actu	al sett	ing.

# Minimum Stroke for Auto Switch Mounting

### Applicable Cylinders: Standard Type

ppicable Cymraers. Standard Type									
Number of auto switches									
Auto switch model	Auto switch model		2 pcs.	With n pcs.					
	With 1 pc.	Different surfaces	Same surface	Different surfaces	Same surface				
D-C7□ D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6)*1	50 + 45 (n-2) (n = 2, 3, 4, 5…)				
D-H7□ D-H7□W D-H7BA D-H7BA D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2} \\ (n = 2, 4, 6 \cdots)^{*1}$	60 + 45 (n-2) (n = 2, 3, 4, 5…)				
D-G5NT D-B5⊡/B64	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6)*1	75 + 55 (n-2) (n = 2, 3, 4, 5…)				
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6)*1	75 + 55 (n-2) (n = 2, 3, 4, 5…)				
D-G39A D-K39A D-A3⊟A D-A44A	10	35	100	35 + 30 (n-2) (n = 2, 3, 4, 5…)	100 + 100 (n-2) (n = 2, 3, 4, 5…)				

\*1 When "n" is an odd number, an even number that is one larger than the odd number is to be used for the calculation.

# **Operating Range**

				[mm]
Auto switch model		Bore	size	
Auto switch model	20	25	32	40
D-C7□/C80	7	8	8	8
D-B5□/B64 D-A3□A/A44A	8	8	9	9
D-B59W	12	12	13	13
D-H7□/H7□W/H7BA D-G5NT/H7NF	4	4	4.5	5
D-G39A/K39A	8	9	9	9

\* Values which include hysteresis are for reference 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 Nos.

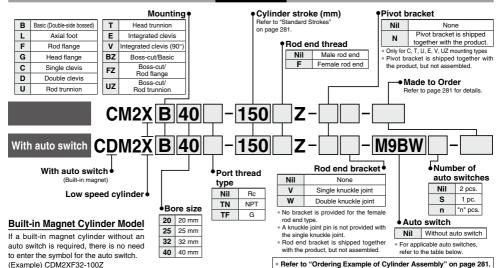
Auto switch model	Bore size [mm]							
Auto switch model	ø <b>20</b>	ø <b>25</b>	ø <b>32</b>	ø <b>40</b>				
D-H7□ D-H7□W D-H7NF D-C7□/C80	BM2-020A	BM2-025A BM2-032A		BM2-040A				
D-H7BA	BM2-020AS	BM2-025AS	BM2-032AS	BM2-040AS				
D-B5□/B64 D-B59W D-G5NT	BA2-020	BA2-025	BA2-032	BA2-040				
D-A3⊟A/A44A D-G39A/K39A	BM3-020	BM3-025	BM3-032	BM3-040				

**⊘**SMC

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

### How to Order

RoHS



Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches

		Electrical	ight	14/1-11-1		Load volt	age	Auto swit	ch model	Lea	d wir	e ler	ngth (	(m)	Denuised				
Туре	Special function	entry	Indicator light	Wiring (Output)	I	DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)			Pre-wired connector	Applica	Applicable load		
				3-wire (NPN)	5 V 12	5 V.12 V		M9NV	M9N	•	—	٠	0	—	0	IC circuit			
		Grommet		3-wire (PNP)		J V, 12 V		M9PV	M9P	•	—	٠	0	—	0	io circuit			
달				2-wire		12 V		M9BV	M9B	•	—	٠	0	—	0				
switch		Connector		-				_	H7C	•	—	٠	•	٠	—				
		Terminal		3-wire (NPN)		5 V,12 V		_	G39A	-	—	—	-	٠	—	IC circuit			
auto		conduit		2-wire		12 V		_	K39A	-	—	—	-	٠	—	—	Relay,		
a	Diagnostic indication		/es	3-wire (NPN)	24 V	5 V,12 V	-	M9NWV	M9NW	•	•	٠	0	—	0	IC circuit			
state	(2-color indicator)		ſ.	3-wire (PNP)				M9PWV	M9PW	•	•	٠	0	—	0	io circuit	110		
st				2-wire		12 V		M9BWV	M9BW	•	•	٠	0	—	0	—			
id	Water resistant	Grommet		3-wire (NPN)		5 V,12 V		M9NAV*1	M9NA*1	0	0	٠	0	—	0	IC circuit			
Solid	(2-color indicator)			3-wire (PNP)				M9PAV*1	M9PA*1	0	0	٠	0	—	0	io circuit			
	, ,			2-wire		12 V	-	M9BAV*1	M9BA*1	0	0	٠	0	—	0	—			
	With diagnostic output (2-color indicator)			4-wire (NPN)		5 V,12 V		_	H7NF	•	—	٠	0	—	0	IC circuit			
			es	3-wire (NPN equivalent)	-	5 V	—	A96V	A96	•	•	۰	•	—	0	IC circuit	—		
_			×				100 V	A93V	A93	•	•	٠	•	—	0*2	_			
년 년		Grommet	ž			12 V	100 V or less	A90V	A90	•	•	٠	•	—	0*2	IC circuit			
switch			No Yes No				100 V, 200 V	—	B54	•	—	٠	•	—	-		Relay,		
s			ž				200 V or less	—	B64	•	—	٠	-	—	-	-	PLC		
auto		Connector	No Yes	2-wire	24 V		_	—	C73C	•	—	٠	•	•	-				
a		Connector	ž	2 1110	24 4		24 V or less	—	C80C	•	—	٠	•	•	-	IC circuit			
Reed		Terminal				12 V	—	—	A33A	-	-	—	-	•	—		PLC		
R		conduit	es				100 V, 200 V	—	A34A	-	-	—	-	•	—	_	Relay,		
		DIN terminal	$\succ$					—	A44A	-	-	—	-	•	—		PLC		
	Diagnostic indication (2-color indicator)	Grommet				-	_	_	B59W		-	٠	-	—	—		1.20		

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance

\*2 The load voltage used is 24 VDC

\* 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 297 for details.

\* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411. \* The D-A900/M9000 auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

\* The D-C700/C800/H700 auto switches are assembled before shipment.



\* Auto switches marked with "O" are produced upon receipt of order.

\* Do not indicate suffix "N" for no lead wire on the D-A3 A/A44A/G39A/K39A models



### Symbol

Double acting, Single rod, Rubber bumper



### Standard Strokes

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

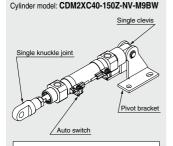
Note 1) Manufacture of intermediate strokes in 1 mm

increments 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" in 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 Click here for details	
Symbol	Specifications	

Symbol	Specifications
-XC3	Special port location
-XC52	Mounting nut with set screw

### Ordering Example of Cylinder Assembly



### C: Single clevis Mounting 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.

### Specifications

Bore size (mm)	20	25	32	40					
· · · ·	Pneumatic								
Туре									
Action		Double actin	g, Single rod						
Fluid		A	ir						
Proof pressure 1.5 MPa									
Maximum operating pressure	1.0 MPa								
Ambient and fluid temperature	Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C								
Cushion	Rubber bumper								
Lubrication	Not required (Non-lube)								
Stroke length tolerance	+1.4 mm 0								

### 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	5)	0.5 to 300							
Allewskie kinetie energy ( I)	(Male thread)	0.27	0.4	0.65	1.2				
Allowable kinetic energy (J)	(Female thread)	0.11	0.18	0.29	0.52				

### Mounting Brackets/Part No.

Mounting brookst	Min.	В	ore siz	e (mr	Contents (for minimum	
Mounting bracket	order q'ty	20	25 32 40		40	order quantity)
Axial foot*1	2	CM-L020B	CM-L	032B	CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Single clevis*2	1	CM-C020B	CM-C	032B	CM-C040B	1 single clevis, 3 liners
Double clevis (with pin)*2	1	CM-D020B	CM-D	032B	CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Trunnion (with nut)	1	CM-T020B	CM-T	032B	CM-T040B	1 trunnion, 1 trunnion nut

\*1 Order 2 foots per cylinder.

\*2 3 liners are included with a clevis bracket for adjusting the mounting angle.

\*3 A clevis pin and retaining rings (split pins for ø40) are included.

\*4 Stainless steel mounting brackets and accessories are also available. Refer to page 292 for details.

### Mounting and Accessories/For details about accessories, refer to pages 291 to 293.

Accessories	S	tandard		Option							
Mounting	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint	Clevis pivot bracket	Pivot bracket	Pivot bracket pin			
Basic (Double-side bossed)	• (1 pc.)	•	_	•	•	_					
Axial foot	• (2)	•	_	•	•	—	1				
Rod flange	• (1)	•	_	•	•	_	_	_			
Head flange	• (1)	•	—	•	•	—	]				
Integrated clevis	- Note 1)	•	—	•	•	•	]				
Single clevis	- Note 1)	•	_	•	•	_	•	•			
Double clevis Note 3)	- Note 1)	•	Note 5)	•	•	—	—	—			
Rod trunnion	<ul> <li>(1) Note 2)</li> </ul>	•	—	•	•	—					
Head trunnion	<ul> <li>(1) Note 2)</li> </ul>	•	_	•	•	_	•	-			
Boss-cut/Basic	• (1)	•	_	•	•	_					
Boss-cut/Flange	• (1)	•		•	•	—	—	-			
Boss-cut/Trunnion	• (1) Note 2)	•	—	•	•	_					

Note 1) Mounting nuts are not attached to the integrated 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.



## **A Precautions**

Be sure to read this before handling the products.

Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

### **Operating Precautions**

## **M**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.

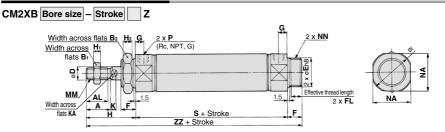
Bore size (mm)	Kit no.	Contents					
20	CM2X20-PS						
25	CM2X25-PS	Rod seal 1 pc.					
32	CM2X32-PS	Grease pack (10 g) 1 pc.					
40	CM2X40-PS	diodeo paol (10 g) 1 po.					

### 2. Grease pack

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

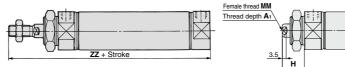
Grease pack part number: GR-L-005 (5 g) GR-L-010 (10 g) GR-L-150 (150 g)

### Basic (Double-side Bossed) (B)



### Boss-cut

### Female rod end



-	ZZ	+	Stro	ke

																					(11111)
Bore size	Α	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	FL	G	н	Hı	H <sub>2</sub>	Ι	к	KA	MM	NA	NN	Р	S	ZZ
20	18	15.5	13	26	8	20_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_0.033	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_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_0.039	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						

ema	le	R	ЪС	Е
-----	----	---	----	---

Female Rod End (mm)												
Bore size	<b>A</b> 1	н	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								

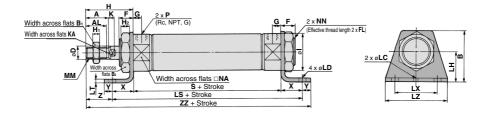
\* When female thread is used, use a thin wrench when tightening the piston rod.

\* 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.

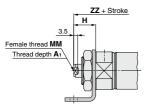
## CM2X Series

### Axial Foot (L)

CM2XL Bore size – Stroke Z



### Female rod end



Bore size	Α	AL	в	B <sub>1</sub>	B <sub>2</sub>	D	F	FL	G	н	H1	H <sub>2</sub>	Т	κ	KA	LC	LD	LH	LS	LT	LX	LΖ	MM	NA	NN	Р	S	X	Υ	Ζ	ΖZ
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

(mm)

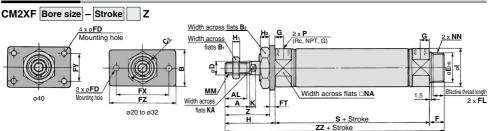
\* Mounting bracket is shipped together with the product.

Female Rod E	End			(mm)
Bore size	<b>A</b> 1	н	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

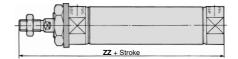
\* When female thread is used, use a thin wrench when tightening the piston rod.

\* 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.

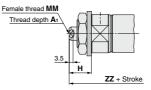
### Rod Flange (F)



Boss-cut



### Female rod end



Bore size	Α	AL	в	B1	B <sub>2</sub>	<b>C</b> <sub>2</sub>	D	E	F	FL	FD	FT	FX	FY	FΖ	G	н	Ηı	H <sub>2</sub>	Т	к	KA	MM	NA	NN	Ρ	s	Ζ	ZZ
20	18	15.5	34	13	26	30	8	20-0.033	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	26-0.033	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_0.033	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	32-0.039	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	<b>A</b> 1	н	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								

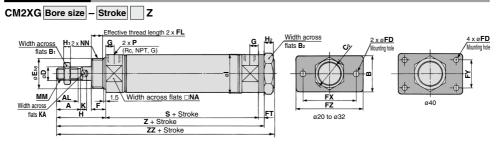
\* When female thread is used, use a thin wrench when tightening the piston rod.

 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.

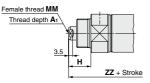
(mm)

## CM2X Series

### Head Flange (G)



### Female rod end



																				(mm)
Bore size	Α	AL	в	B1	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FL	FD	FT	FX	FY	FZ	G	н	Hı	H <sub>2</sub>	1
20	18	15.5	34	13	26	30	8	20-0.033	13	10.5	7	4	60	-	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	26_0.033	13	10.5	7	4	60	-	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	26_0.033	13	10.5	7	4	60	-	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	32_0.039	16	13.5	7	5	66	36	82	11	50	8	10	46.5

									(mm)
Bore size	К	KA	MM	NA	NN	Р	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.

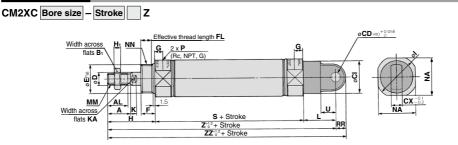
Female F	lod End
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Female Rod End (mm)												
Bore size	<b>A</b> 1	н	MM	ZZ								
20	8	20	M4 x 0.7	95								
25	8	20	M5 x 0.8	95								
32	12	20	M6 x 1	97								
40	13	21	M8 x 1.25	125								

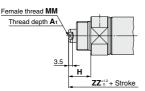
\* When female thread is used, use a thin wrench when tightening the piston rod.

\* 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)



### Female rod end



Female Rod I	End			(mm)
Bore size	<b>A</b> 1	н	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

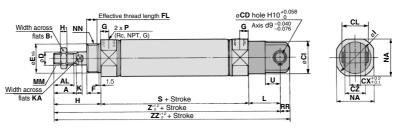
\* When female thread is used, use a thin wrench when tightening the piston rod.

 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.

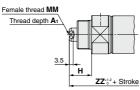
Bore size	Α	AL	B1	СІ	CD	СХ	D	E	F	FL	G	н	Hı	Т	κ	KA	L	MM	NA	NN	Ρ	RR	S	U	( <b>Z</b> )	(ZZ)
20	18	15.5	13	24	9	10	8	20-0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26_0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26-0.033	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	32-0.039	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 I	End			(mm)
Bore size	<b>A</b> 1	н	ММ	(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.

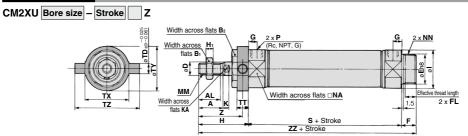
When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece. (mm)

Bore size	Α	AL	B1	CD	CI	CL	СХ	cz	D	Е	F	FL	G	н	Hı	I	к	KA	L	MM	NA	NN	Р	RR	s	U	( <b>Z</b> )	(ZZ)
20	18	15.5	13	9	24	25	10	19	8	20-0.033	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_0.033	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	26-0.033	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	32-0.039	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
																					,		10					

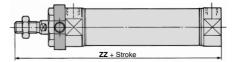
\* A clevis pin and retaining rings (split pins for ø40) are shipped together. 287

## CM2X Series

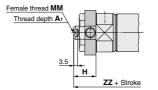
### Rod Trunnion (U)



Boss-cut



### Female rod end



\* Mounting bracket is shipped together with the product.

																		(mm)
Bore size	Α	AL	B1	B <sub>2</sub>	D	E	F	FL	G	н	H1	I	к	KA	ММ	NA	NN	Р
20	18	15.5	13	26	8	20_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	26-0.033	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	26-0.033	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_0.039	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	Π	ΤХ	TY	ΤZ	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

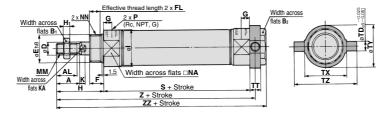
Female Roo	l Enc	1		(mm)
Bore size	<b>A</b> 1	н	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

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

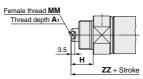
\* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

### Head Trunnion (T)

CM2XT Bore size – Stroke Z



### Female rod end



\* Mounting bracket is shipped together with the product.

																		(mm)
Bore size	Α	AL	Bı	B <sub>2</sub>	D	E	F	FL	G	н	H <sub>1</sub>	1	К	KA	ММ	NA	NN	Р
20	18	15.5	13	26	8	20_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	26-0.033	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	26-0.033	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_0.039	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	ТΧ	TY	ΤZ	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	<b>A</b> 1	н	ММ	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

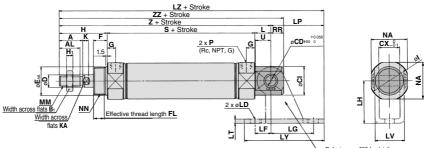
 $\ast\,$  When female thread is used, use a thin wrench when tightening the piston rod.

\* 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.

## CM2X Series

### Integrated Clevis (E)

CM2XE Bore size - Stroke Z



Refer to page 293 for details of clevis pivot bracket.

### Female rod end

## Female thread MM Thread depth At H Thread thread

# 

Integrated clevis (90°) (V)



\* The outer dimensions are the same as those for the integrated clevis (E).

(mm)

Bore size	Α	AL	B1	CD	CI	СХ	D	E	F	FL	G	н	H <sub>1</sub>	Ι	к	KA	L	MM	NA	NN
20	18	15.5	13	8	20	12	8	20_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	26-0.033	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	26-0.033	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_0.039	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	42.5	M32 x 2

						(mm)
Bore size	Р	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

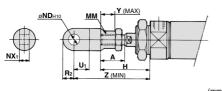
Female Rod End (m												
Bore size	<b>A</b> 1	н	MM	ZZ								
20	8	20	M4 x 0.7	103								
25	8	20	M5 x 0.8	103								
32	12	20	M6 x 1	111								
40	13	21	M8 x 1.25	136								

\* 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.

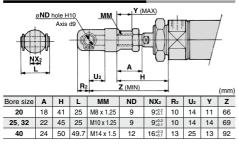
# CM2X Series **Dimensions of Accessories**

### With Single Knuckle Joint



									(11111)
Bore size	Α	н	MM	ND <sub>H10</sub>	NX <sub>1</sub>	U1	R <sub>2</sub>	Y	Z
20	18	41	M8 x 1.25	9 <sup>+0.058</sup>	9 <sup>-0.1</sup>	14	10	11	66
25, 32	22	45	M10 x 1.25	9 <sup>+0.058</sup>	9 <sup>-0.1</sup> -0.2	14	10	14	69
40	24	50	M14 x 1.5	12 <sup>+0.070</sup>	16 <sup>-0.1</sup>	20	14	13	92

### With Double Knuckle Joint



### **Double Knuckle Joint**

Y-020B, 03	32B Material	: Carbo	on stee	I I	Y-040B Material: Cast iron									
	CHRI.													
		s d9		°E1 M	M	D hole I Axis		A						(mm)
Part no.	Part no. Applicable A A A E LA LB MM ND NX NZ R1 U1 Included pin F part number S													Retaining ring size
Y-020B	20	46	16	20					CDP-1	Type C 9 for axis				
Y-032B 25, 32 48 18 20 25 3							M10 x 1.25	9	9 <sup>+0.2</sup> +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 <sup>+0.3</sup>	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





Bore size/ø40

Retaining ring: Type C9 for axis

\* Retaining rings (split pins for ø40) are included.

### Single Knuckle Joint

I-020B, (			RI	on ste	el	I-040B	NDH10	Free-cut	ing st			
		1.	)XN			-	<u>U1</u> A		<u>X</u>	(mm)		
Part no. Applicable A A A1 E1 LB MM NDH10 NX R1 U												
I-020B	20	9 <sup>+0.058</sup>	9 <sup>-0.1</sup>	10	14							
I-032B	25, 32	48	18	20	38	M10 x 1.25	9 <sup>+0.058</sup>	9 <sup>-0.1</sup> -0.2	10	14		
I-040B	40	69	22	24	55	M14 x 1.5	12 <sup>+0.070</sup>	16-0.1	15.5	20		

### Bore size/ø20, ø25, ø32 Bore size/ø40 CDP-3 CDP-1 2 x ø3 Through hole 88 12<sub>db</sub> 0 41.7 10 1 1.15 25 49.7 1.15

Double Knuckle Pin/Material: Carbon steel

Split pin: ø3 x 18 L

(mm)

\* Retaining rings (split pins for ø40) are included.

Retaining ring: Type C9 for axis



Split pin: ø3 x 18 L

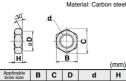
(mm)

## CM2X Series

### Rod End Nut

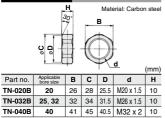
	De De	_d		)	erial: Carbor	(mm)
Part no.	Applicable bore size	В	С	D	d	H
NT-02	20	13	15.0	12.5	M8 x 1.25	5
NT-03	25, 32	17	19.6	16.5	M10 x 1.25	6
NT-04	40	22	25.4	21.0	M14 x 1.5	8

### Mounting Nut

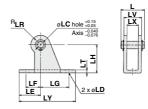


Part no.	Applicable bore size	в	С	D	d	н
SN-020B	20	26	30	25.5	M20 x 1.5	8
SN-032B	25, 32	32	37	31.5	M26 x 1.5	8
SN-040B	40	41	47.3	40.5	M32 x 2.0	10

### **Trunnion Nut**



### Clevis Pivot Bracket (For CM2XE(V))

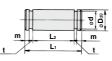


Part no.	Applicable bore size	L	LC	LD	LE	LF	LG	LH	LR	LT	LX	LY	LV	Included pin part no.
CM-E020B	20, 25	24.5	8	6.8	22	15	30	30	10	3.2	12	59	18.4	CD-S02
CM-E032B	32, 40	34	10	9	25	15	40	40	13	4	20	75	28	CD-S03

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

Material: Carbon steel

(mm)

								(mm)
Part no.	Applicable bore size	Dd9	d	Lı	L2	m	t	Included retaining ring
CD-S02	20, 25	8-0.040	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	32, 40	10-0.040	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

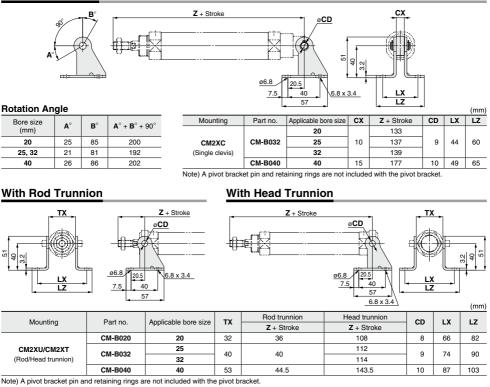
### Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

### Part No. (Dimensions: Same as standard type) Bore size Single Double Rod Mounting Foot Flange (mm) knuckle joint knuckle joint nut end nut 20 CM-L020BSUS CM-F020BSUS I-020BSUS Y-020BSUS SN-020BSUS NT-02SUS 25, 32 CM-L032BSUS CM-F032BSUS I-032BSUS Y-032BSUS SN-032BSUS NT-03SUS 40 CM-L040BSUS CM-F040BSUS I-040BSUS Y-040BSUS SN-040BSUS NT-04SUS

\* A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

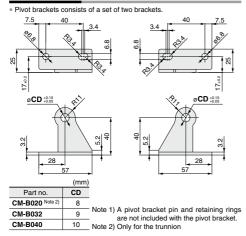


### With Single Clevis

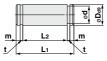


### **Pivot Bracket**

9



### **Pivot Bracket Pin (For CM2XC)**

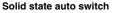


								(mm)
Applicable bore size	Part no.	D <sub>d9</sub>	d	L1	L2	m	t	Included retaining ring
20 to 32	CDP-1	9 <sup>-0.040</sup> -0.076	8.6	25	19.2	1.75	1.15	Type C 9 for axis
40	CD-S03	10-0.040	9.6	34	29	1.35	1.15	Type C 10 for axis

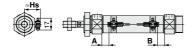
Note) Retaining rings are included with the pivot bracket pin.

# CM2X Series Auto Switch Mounting

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

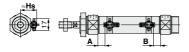


D-M9□ D-M9□W D-M9□A



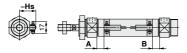
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



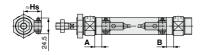


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

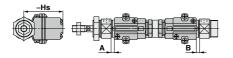
### D-H7□/H7□W/H7NF/H7BA/H7C



### D-G5NT

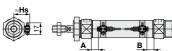


### D-G39A/K39A



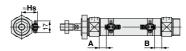






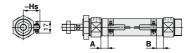
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

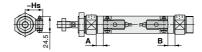


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

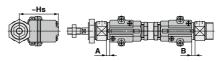
### D-C7/C8/C73C/C80C



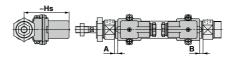
### D-B5/B6/B59W



### D-A33A/A34A



### D-A44A



(----)

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

Auto Sw		roper mounting Position (mm)															
Auto switch model	D-M9	⊐Ŵ(V)	D-A9	ı⊡(V)	D-E D-E	35⊡ 864	D-C D-C	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	
Bore size	Α	В	A	В	Α	В	A	В	A	В	Α	В	Α	В	Α	В	
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

Auto Sw	itch Moun	ting Heigh	nt			(mm)	
Auto switch model		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	
Bore size	Hs	Hs	Hs Hs		Hs	Hs	
20	23.5	25.5	22.5	25	60	69.5	
25	26 28 25		25	27.5	62.5	72	
32	29.5 31.5 28.5		28.5	31	66	75.5	
40	33.5	35.5	32.5	35	70	79.5	

## CM2X Series

### Minimum Stroke for Auto Switch Mounting

					(mm)			
			Number of auto switches					
Auto switch model	With 1 pc.	With	2 pcs.	With n pcs. (n: Number of auto switches)				
	wiai i po.	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	5 15		$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6) Note 3)	50 + 35 (n - 2) (n = 2, 3, 4, 5)			
D-M9⊡V	<b>9⊡V</b> 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) <sup>Note 3)</sup>	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) <sup>Note 3)</sup>	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) <sup>Note 3)</sup>	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) <sup>Note 3)</sup>	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) <sup>Note 3)</sup>	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

	With 2 aut	o switches
	Different surfaces	Same surface
Auto switch model	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 types other than those in Note 1.

### **Operating Range**

				(mm)			
Auto switch model	Bore size						
Auto switch model	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							
Auto switch model	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.

		Bore siz	ze (mm)		
Auto switch model	ø <b>20</b>	ø <b>25</b>	ø <b>32</b>	ø <b>40</b>	
D-M9□(V) D-M9□W(V) D-A9□(V)	Note 1) BM5-020 (A set of a, b, c, d)	Note 1) BM5-025 (A set of a, b, c, d)	Note 1) BM5-032 (A set of a, b, c, d)	Note 1) BM5-040 (A set of a, b, c, d)	
D-M9□A(V) Note 2)	BM5-020S (A set of b, c, e, f)	BM5-025S (A set of b, c, e, f)	BM5-032S (A set of b, c, e, f)	BM5-040S (A set of b, c, e, f)	
Switch bracket a Transparent (Polyamide) e White (PBT) b Switch holder (Zinc)		f	Auto switch mountin (Low carbon steel v (Stainless steel)	h switch installed)	
D-H7□ D-H7□W D-H7NF D-C7□/C80 D-C73C/C80C	BM2-020A (A set of c and d)	BM2-025A (A set of c and d)	BM2-032A (A set of c and d)	BM2-040A (A set of c and d)	
D-H7BA	BM2-020AS (A set of c and f)	BM2-025AS (A set of c and f)	BM2-032AS (A set of c and f)	BM2-040AS (A set of c and f)	
D-B5□/B64 D-B59W D-G5NT	BA2-020 (A set of c and d)	BA2-025 (A set of c and d)	BA2-032 (A set of c and d)	BA2-040 (A set of c and d)	
D-A3□A/A44A D-G39A/K39A	BM3-020 (A set of c and d)	BM3-025 (A set of c and d)	BM3-032 (A set of c and d)	BM3-040 (A set of c and d)	

Note 1) As the switch bracket is made of polyamide, its performance may be affected by chemicals such as alcohol, chloroform, methylamines, hydrochloric acid, and sulfuric acid, so it cannot be used in environments where these chemicals come into contact with the product.

Note 2) When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

### Band Mounting Brackets Set Part No.

Set part no.	Contents
BJ4-1	<ul> <li>Switch bracket (White/PBT) (e)</li> <li>Switch holder (b)</li> </ul>
BJ5-1	Switch bracket (Transparent/Polyamide) (a)     Switch holder (b)

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

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

Туре	Model	Electrical entry	Features		
Beed	D-B53/C73/C76		-		
Reed	D-C80	7	Without indicator light		
	D-H7A1/H7A2/H7B	Grommet (In-line)	_		
Solid state	D-H7NW/H7PW/H7BW	7	Diagnostic indication (2-color indicator)		
	D-G5NT	7	With timer		

\* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1410 and 1411.

\* Normally closed (NC = b contact) solid state auto switches (D-M9[E(V)) are also available. For details, refer to page 1360.

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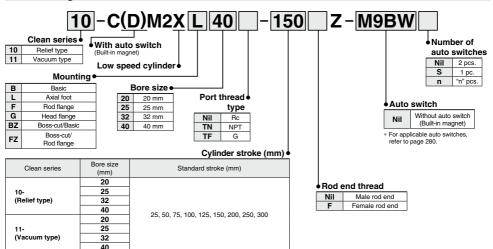
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## 10-,11-CM2X Series

How to Order



The type which is applicable for using inside the clean room graded ISO Class 4 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**.



\* Manufacture of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)

### Specifications

Bore size		10- (Rel	ief type)		11- (Vacuum type)				
(mm)	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 20	0 mm/s			0.5 to 20	00 mm/s		
Piston rod size	ø8	ø10	ø12	ø14	ø8	ø10	ø12	ø14	
Rod end thread	M8 x 1.25	M8 x 1.25 M10 x 1.25 M14 x 1			M8 x 1.25 M10 x 1.25 M14 x 1.5				
Stroke tolerance	+1.4 mm					-			
Port size	1/8 1/4 1/8 1/4						1/4		
Vacuum port, Relief port	M5 x 0.8								

## **A Precautions**

Be sure to read this before handling the products.

- Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.
- For the precautions in clean environments, refer to the Web Catalog.

### **Operating Precautions**

### ∆Warning

н

### 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

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### 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

 Grease pack

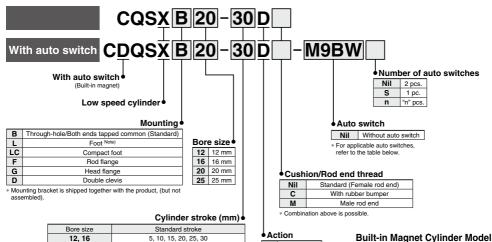
 When maintenance requires only grease, use the following part number to order.

Grease pack part number: GR-X-005 (5 g)

### ∕ SMC

# Low Speed Cylinder **Double Acting, Single Rod** CQSX Series ø12, ø16, ø20, ø25

### How to Order



20.25 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 · Manufacturing of intermediate stroke

Intermediate strokes in 1 mm increments 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.

### Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

			ight			Load volta	age	Auto swit	ch model	Lead w	ire le	ngth	(m)				
Туре	Special function	Electrical entry	Indicator light	Wiring (Output)	D	DC AC		Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applical	ble load	
				3-wire (NPN)		5 V, 12 V	EV. 10.V		M9N	٠	٠	•	0	0	IC circuit		
				3-wire (PNP)		5 V, 12 V		M9PV	M9P	٠	•	٠	0	0	IC CICUIL		
_				2-wire	12 V	24 V 5 V, 12 V -		M9BV	M9B	•	•	٠	0	0	—	1	
Solid state auto switch	<b>D</b>	1		3-wire (NPN)					M9NWV	M9NW	•	•	٠	0	0	IC circuit	
sta	Diagnostic indication (2-color indicator)	Grommet	Yes	3-wire (PNP)	24 V				M9PWV	M9PW	•	•	٠	0	0	10 circuit	Relay,
₽ő	(2 00/01 11/0/02/01)	Citominer	100	2-wire	24 V			M9BWV	M9BW	•	•	•	0	0	—	PLĆ	
ar S				3-wire (NPN)			5 V 12 V		M9NAV*1	M9NA*1	0	0	٠	0	0	IC circuit	
	Water resistant (2-color indicator)			3-wire (PNP)			v, 12 v	M9PAV*1	M9PA*1	0	0	٠	0	0			
	(2 00/01 11/0/02/01)			2-wire		12 V		M9BAV*1	M9BA*1	0	0	•	0	0			
	Magnetic field resistant (2-color indicator)			2-wire (Non-polar)		—		—	P3DWA**	•	-	٠	•	0	_		
Reed auto switch		Grommet	Yes	3-wire (NPN equivalent)	_	5 V	-	A96V	A96	٠	•	•	•	0	IC circuit	—	
to a		Gronmet		2-wire	24 V	12 V	100 V	A93V	A93	•	•	٠	٠	0*2	—	Relay,	
au			No	2-wile	24 V	12 V	100 V or less	A90V	A90	•	•	٠	٠	0*2	IC circuit	PLĆ	

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

\*2 The load voltage used is 24 VDC.

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW (Example) M9NWM 1 m ..... M

3 m ..... L (Example) M9NWL \* Auto switches marked with "O" are produced upon receipt of order. \*\* The D-P3DWA□ is only compatible with ø25 It is mounted away from the port side to avoid interference with fittings.

D Double acting

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

5 m ······ Z (Example) M9NWZ

\* Since there are other applicable auto switches than listed, refer to page 306 for details

\* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.

Auto switches are shipped together, (but not assembled).

Note) The D-A9 UV/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.



## CQSX Series



Symbol

Single rod, Without cushion



Single rod, Rubber bumper





. . . . . . . . . . . F 1 Be sure to read this before handling н

I

- I the products.
- L Refer to page 9 for safety instruc- I I
- tions and pages 10 to 19 for actuator
- and auto switch precautions. \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

### **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.

Mainter	nance
---------	-------

### ▲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.
16	CQSX16-PS	Rod seal: 1 pc.
20	CQSX20-PS	Tube gasket: 1 pc.
25	CQSX25-PS	Grease pack (10 g): 1 pc.

### 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							
Туре		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, Rub	ber bumper								
Rod end thread		Female	thread								
Stroke length tolerance		+1.0	Note)								
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.

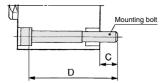
Note 2) Parts belonging to each bracket are as follows. Foot, Compact foot, Flange: Body mounting bolt Double clevis: Clevis pin, Type C retaining ring for shaft, Body mounting bolt

### Mounting Bolt for CQSX/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting type 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	С	D	Mounting bolt part no.
CQSXB12-5D		25	CQ-M3X25L
10D		30	X30L
15D	6.5	35	X35L
20D	0.5	40	X40L
25D		45	X45L
30D		50	X50L
CQSXB16-5D		25	CQ-M3X25L
10D	6.5	30	X30L
15D		35	X35L
20D		40	X40L
25D		45	X45L
30D		50	X50L
CQSXB20-5D		25	CQ-M5X25L
10D		30	X30L
15D	6.5	35	X35L
20D		40	X40L
25D		45	X45L

Cylinder model	С	D	Mounting bolt part no.
CQSXB20-30D		50	CQ-M5X50L
35D		55	X55L
40D	6.5	60	X60L
45D	1	65	X65L
50D	1	70	X70L
CQSXB25-5D		30	CQ-M5X30L
10D		35	X35L
15D	1	40	X40L
20D	1	45	X45L
25D	8.5	50	X50L
30D	8.5	55	X55L
35D	1	60	X60L
40D	]	65	X65L
45D		70	X70L
50D		75	X75L

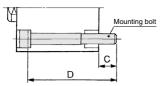
Material: Chromium molvbdenum steel Surface material: Zinc chromated

### Mounting Bolt for CDQSX/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting type 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	С	D	Mounting bolt part no.	Cylinder model	С	D	Mounting bolt part no.
CDQSXB12-5D		30	CQ-M3X30L	CDQSXB20-30D		60	CQ-M5X60L
10D		35	X35L	35D		65	X65L
15D	6.5	40	X40L	40D	6.5	70	X70L
20D	6.5	45	X45L	45D		75	X75L
25D		50	X50L	50D		80	X80L
30D		55	X55L	CDQSXB25-5D		40	CQ-M5X40L
CDQSXB16-5D		30	CQ-M3X30L	10D		45	X45L
10D		35	X35L	15D		50	X50L
15D	6.5	40	X40L	20D		55	X55L
20D	6.5	45	X45L	25D	8.5	60	X60L
25D		50	X50L	30D	8.5	65	X65L
30D		55	X55L	35D		70	X70L
CDQSXB20-5D		35	CQ-M5X35L	40D		75	X75L
10D		40	X40L	45D		80	X80L
15D	6.5	45	X45L	50D		85	X85L
20D		50	X50L	Material: C	hromi	um me	blybdenum steel
25D		55	X55L	Surface material: Zinc chromated			

### Accessories

For accessory bracket for the CQS series, refer to page 316, since it is commonly used with the CQ2 series.

<ul> <li>Single knuckle joint</li> </ul>	<ul> <li>Knuckle pin</li> </ul>
--	---------------------------------

 Double knuckle joint Rod end nut

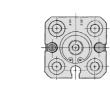
## **CQSX** Series

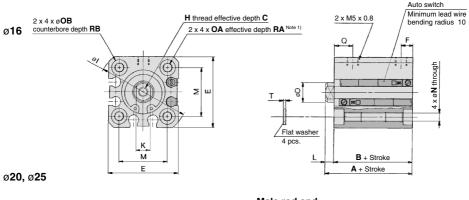
### Dimensions: ø12 to ø25

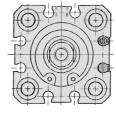
\* For the auto switch mounting position and its mounting height, refer to page 305.

### Standard (Through-hole/Both ends tapped common): CQSXB/CDQSXB

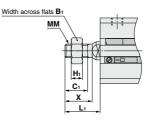








### Male rod end



Male Rod End														
Bore size (mm)	B1	C1	H1	L1	ММ	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								

(mm)

Standard

Dore size	Standard stroke	Without a	uto switch	With aut	o switch	с	D	Е	-	н		v		м	N	OA	ов	a	RA	RB	-
(mm)	(mm)	Α	в	Α	в	C	U	-	г	п	•	ĸ	L	IVI	IN	UA		Q	nA	nD	
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 316.

Spacer installation type ... The dimensions will be identical to those of the nearest long stroke.

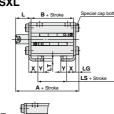
· How to calculate the length with intermediate stroke

### Dimensions: Ø12 to Ø25

### Foot: CQSXL/CDQSXL



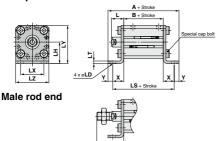
Male rod end



Foot (mm) With auto switch Bore size Standard stroke Without auto switch L L1 (mm) (mm) А в LS Α в LS 12 5 to 30 35.3 17 5 40.3 22 10 13.5 24 16 5 to 30 35.3 17 40.3 22 10 13.5 25.5 5 17.5 20 5 to 50 41.2 19.5 7.5 51.2 29.5 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 LD LG LΖ х Y IН ιт ιx IY (mm) 28 4.5 12 4.5 17 2 34 29.5 44 8 4.5 2.8 33.5 48 5 19 2 38 16 8 20 6.6 4 24 3.2 48 42 62 9.2 5.8 25 6.6 4 26 32 52 46 10.7 58 66 Foot bracket material: Carbon steel

Surface treatment: Nickel plating

### Compact foot: CQSXLC/CDQSXLC

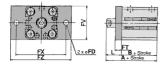


Compact Foot													
Bore size	Stroke range	Witho	ut auto	switch	With	auto s		Lı					
(mm)	(mm)	Α	В	LS	Α	в	LS	-	E1				
12	5 to 30	44.6	17	35.6	49.6	22	40.6	13.5	24				
16	5 to 30	45.6	17	35.6	50.6	22	40.6	13.5	25.5				
20	5 to 50	57.5	19.5	45.9	67.5	29.5	55.9	14.5	28.5				
25	5 to 50	60.5	22.5	48.9	70.5	32.5	58.9	15	32.5				
Poro oizo		Ì						•					

Bore size (mm)	LD	LH	LT	LX	LY	LZ	х	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

16

	3-									(1111)
Bore size	Standar	d stroke	Without a	uto switch	witch With auto switch			FT	FV	FX
(mm)	(m	m)	Α	В	Α	в	FD	FI	FV	FA
12	5 tc	5 to 30		17	35.5	22	4.5	5.5	25	45
16	5 tc	5 to 30 3		17	35.5	22	4.5	5.5	30	45
20	5 to	5 to 50		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	FZ L								
12	55	13.5	24							

 20
 60
 14.5
 28.5

 25
 64
 15
 32.5

 Flange bracket material: Carbon steel

13.5 25.5

55

Surface treatment: Nickel plating

\* For details about the rod end nut and accessory brackets, refer to page 316.



(mm)

## **CQSX** Series

### Dimensions: ø12 to ø25

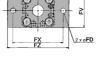
### Head flange: CQSXG/CDQSXG





### Male rod end

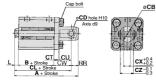




Head Fla	nge					(mm)	
Bore size	Standar	d stroke	Without a	uto switch	With aut		
(mm)	(m	m)	Α	в	Α	в	
12	5 to 30		26	17	31	22	
16	5 tc	30	26	17	31	22	
20	5 tc	50	32	19.5	42	29.5	
25	5 tc	5 to 50		22.5	45.5	32.5	
Bore size (mm)	FD	FT	FV	FX	FZ	L	Lı
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	6.6 8		48	60	4.5	18.5
25	6.6 8			52	64	5	22.5
				acket m			

teel bra ket materi Surface treatment: Nickel plating

### Double clevis: CQSXD/CDQSXD



### Male rod end



Double C	levis	;						(mm)		
Bore size	Standar	d stroke	Withou	ut auto	switch	With	auto s			
(mm)	(m	ım)	Α	В	CL	Α	В	CL		
12	5 tc	30	40.5	17	34.5	45.5	22	39.5		
16	5 tc	o 30	41.5	17	35.5	46.5	22	40.5		
20	5 tc	o 50	51	19.5	42	61	29.5	52		
25	5 tc	o 50	57.5	22.5	47.5	67.5	32.5	57.5		
Bore size (mm)	СВ	CD	ст	си	cw	сх	cz	L	Lı	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
				Do	uble cle	evis bra	acket m	aterial	: Carbo	n steel

Surface treatment: Nickel plating

\* For details about the rod end nut and accessory brackets, refer to page 316.

### Simple Joint (CQSX): Ø12 to Ø25

### Joint/Mounting Bracket (Type A/B) Part Nos.

Bore size [mm]	Joint	Type A mounting bracket	Type B mounting bracket
12	YU-012	YA-012	YB-012
16	YU-016	YA-016	YB-016
20	YU-020	YA-020	YB-020
25	YU-025	YA-025	YB-025

<Ordering>

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

Part no.

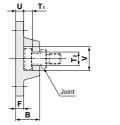
(Example)

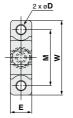
- Bore size ø12
- Type A mounting bracket.....YA-012
- •Joint.....YU-012

### Allowable Eccentricity

Bore size [mm]	12	16	20	25					
Eccentricity tolerance		±C	).5						
Axial direction backlash		0.5							

### Type A Mounting Bracket





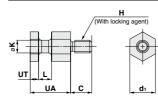
[mm]

Material: Chromium molybdenum steel (Nickel plating) [mm]

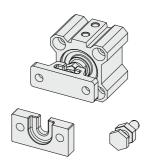
Bore size [mm]	Part no.	в	D	Е	F	М	T1	T2
12	YA-012	8	3.5	10	3	20	2.5	4
16	YA-016	8	3.5	10	3	24	2.5	5
20	YA-020	12	4.5	13	5	30	3.5	6
25	YA-025	12.5	5.5	15	5	33	3.5	7

Bore size [mm]	Part no.	U	v	w	Weight [g]
12	YA-012	3	8.5	30	9
16	YA-016	3	11	34	11
20	YA-020	5	13.5	42	27
25	YA-025	5	16.5	45	34

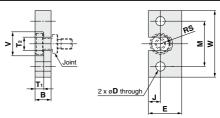
### Joint



								- (	[mm]
Bore size [mm]	Part no.	UA	с	d₁	н	к	L	UT	Weight [g]
12	YU-012	9.5	5	6	M3 x 0.5	3	3	2	2
16	YU-016	9.5	7	8	M4 x 0.7	4	3	2	4
20	YU-020	11.5	6	10	M5 x 0.8	5	4	3	7
25	YU-025	12	11	12	M6 x 1.0	6	4.5	3	11



### Type B Mounting Bracket



Material: Stainless steel

							[mm]
Bore size [mm]	Part no.	в	D	Е	J	м	<b>T</b> 1
12	YB-012	5	3.5	14	5	17	2.5
16	YB-016	5	3.5	16	6	20	2.5
20	YB-020	7	4.5	18	7	25.5	3.5
25	YB-025	7.5	5.5	20	8	28	3.5
Bore size [mm]	Part no.	T2	v	w	RS	Weig	ht [g]
12	YB-012	4	8.6	25	2	1	1
16	YB-016	5	11	29	2.5	1	5
20	YB-020	6	13.6	36	3	2	8
25	YB-025	7	16.6	40	3.5	3	6

Material: Chromium molybdenum steel (Nickel plating)

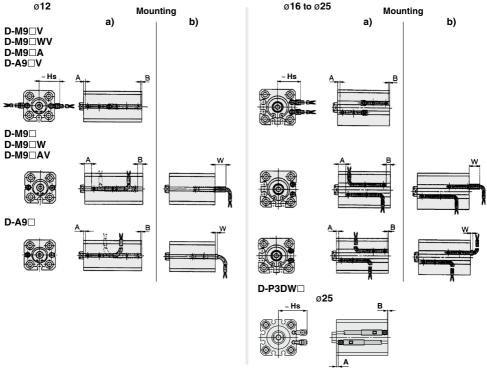
**⊘**SMC

# **CQSX** Series **Auto Switch Mounting**

### Minimum Stroke for Auto Switch Mounting

	Imber of auto switches         D-M9_V         D-A9_V         D-M9_WV D-M9_AV         D-A9_O         D-M9_W D-M9_A         D-M9_W         D-M9_W <th< th=""></th<>													
Number of auto switches	1 pc.     5     5       2 pcs.     5     10       imensions stated in () shows the minimum stroke for th disurface of the cylinder body and hinder the lead wire		D-A9□		D-M9□	D-P3DWA Note 1)								
With 1 pc.	5	5	10	10 (5)	15 (10)	15 (5)	15							
With 2 pcs.			10	10	15 (10)	15 (5)	15							
Note 1) ø25 is only applicable for the D-P3DWA. 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

Auto switch model	model D-M9_/M9_W			D-M9□A			D-M9⊡V/M9⊡WV D-M9⊡AV			D-A9□		D-A9⊡V			D-P3DWA			
Bore size	Α	В	W	Α	В	W	Α	В	Hs	Α	В	W	Α	В	Hs	Α	В	Hs
12	5.5	3.5	5.5	5.5	3.5	7.5	5.5	4.5	19.5	1.5	0	4	1.5	0	17	-	—	-
16	6	4	6	6	4	8	6	4	21.5	2	0	4.5	2	0	19	_	—	—
20	10	7.5	2.5	10	7.5	4.5	10	7.5	25	6	3.5	1	6	3.5	22.5		_	-
25	11	9.5	0.5	11	9.5	2.5	11	9.5	27	7	5.5	-1	7	5.5	24.5	6.5	5	33

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.



(mm)

## **CQSX** Series

### **Operating Range**

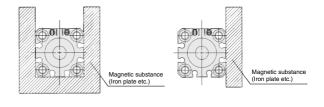
				(mm)
Auto switch model		Bore	size	
Auto switch model	12	16	20	25
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3	4	5.5	4.5
D-A9□/A9□V	6	7.5	10	10
D-P3DWA	—	—	—	6

\* 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.

### **∆**Caution

### Avoid proximity to magnetic objects

 If the cylinder is used in an application in which a magnetic object is in close proximity to the cylinder, as shown in the figures on the right (even if only one of the sides is in close proximity), the operation of auto switches could become unstable. Therefore, make sure that steel plates and other magnetic objects are placed at least 20 mm away from the cylinder tube surface. (This excludes when a flange or foot bracket is used to mount the cylinder to a magnetic object.)



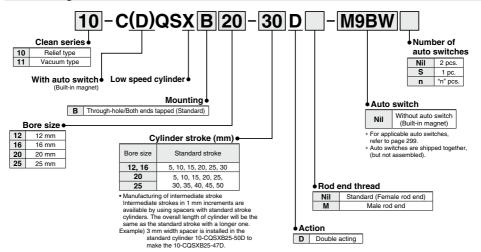


## Clean Series Low Speed Cylinder 10-,11-CQSX Series

How to Order



The type which is applicable for using inside the clean room graded ISO Class 4 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**.



### Specifications

Dere eize	(mm)		10- (Rel	ief type)			11- (Vacu	ium type)		
Bore size	e (mm)	12	16	20	25	12	16	20	25	
Fluid			Α	dir	·		A	ir		
Proof pressure			1.5	MPa			1.5	MPa		
Maximum operat	ing pressure		1.0	MPa		1.0 MPa				
Minimum operati	ng pressure	0.04	0.04 MPa 0.035 MPa 0.03 MPa 0.025 MPa						5 MPa	
Ambient and fluid	d temperature		thout auto swite With auto swite			Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C				
Piston speed			1 to 20	0 mm/s		1 to 20	0 mm/s	0.5 to 2	00 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	
Hou enu inteau	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 mm				+1.0 mm				
Port size			M5 :	x 0.8		M5 x 0.8				
Vacuum port, Re	lief port		M5 :	x 0.8		M5 x 0.8				
vacuum port, ne			IVIO .	x 0.0		M5 X U.8				

## **▲**Precautions

Be sure to read this before handling the products.

- Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.
- For the precautions in clean environments, refer to the Web 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

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

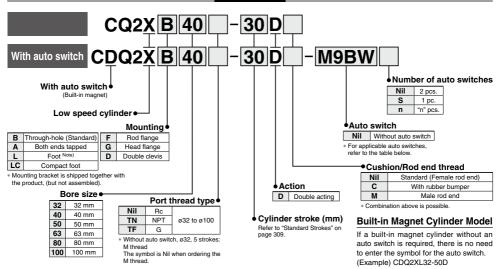
Grease pack part number:

### GR-X-005 (5 g)



# Low Speed Cylinder: Standard Type **Double Acting, Single Rod** CQ2X Series ø32, ø40, ø50, ø63, ø80, ø100

How to Order



Applicable Auto Switches/Refer to pages 1341 to 1435 for further information on auto switches.

		-	light		L	oad volta	age	Auto swit	tch model	Lea	d wir	e ler	ngth	(m)			
Туре	Special function	Electrical entry	Indicator light	Wiring (Output)	DC		AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
				3-wire (NPN)		5 V,		M9NV	M9N	•	٠	٠	0	-	0	IC circuit	
		Grommet		3-wire (PNP)		12 V		M9PV	M9P	٠	٠	٠	0	—	0		
÷				2-wire		1011		M9BV	M9B	٠	٠	٠	0	—	0	_	]
switch		Connector				12V		J79C	_	٠	—	٠	٠	٠	_		
	Diagnostic indication				5 V,		M9NWV	M9NW	•	٠	٠	0	-	0	IC circuit		
auto	(2-color indicator)		3-wire (PNP)	12 V		M9PWV	M9PW	٠	•	٠	0	-	0	IC CIICUII	Delau		
8	(		Yes		24 V	12 V	-	M9BWV	M9BW	٠	•	٠	0	-	0	_	Relay, PLC
state	(2-color indicator)			3-wire (NPN)		5 V, 12 V		M9NAV*1	M9NA*1	0	0	٠	0	-	0	IC circuit	
Solid st		Grommet		3-wire (PNP)		J V, 12 V		M9PAV*1	M9PA*1	0	0	٠	0	-	0	IC CIICUII	
				2-wire		12 V		M9BAV*1	M9BA*1	0	$\circ$	•	0	—	0	—	
S	With diagnostic output (2-color indicator)			4-wire		5 V, 12 V		-	F79F	٠	—	٠	0	—	0	IC circuit	]
	Magnetic field resistant			2-wire		_		—	P3DWA	•	—	•	•	—	0	_	
	(2-color indicator)			(Non-polar)		_		—	P4DW**	—	—	٠	٠	—	0	_	
switch			Yes	3-wire (NPN equivalent)	_	5 V	-	A96V	A96	•	•	•	•	-	0	IC circuit	-
N.		Grommet	res			-	200 V	A72	A72H	٠	—	•	_	—	-		
ő						12 V	100 V	A93V	A93	•	٠	•	•	-	0*2	-	
auto			No	2-wire		5 V, 12 V	100 V or less	A90V	A90	٠	٠	•	•	-	0*2	IC circuit	Relay,
g	Con	Connector	Yes	_∠-wire	24 V	12 V	_	A73C	_	•	—	•	•	٠	-	_	PLĆ
Reed			No			5 V, 12 V	24 V or less	A80C	—	٠	-	٠	•	٠	-	IC circuit	]
	Diagnostic indication (2-color indicator)	Grommet	Yes			_	_	A79W	_	•	-	٠	-	-	-	_	]

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

\*2 The load voltage used is 24 VDC.

- \* 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

\* Since there are other applicable auto switches than listed, refer to page 321 for details

\* For details about auto switches with pre-wired connector, refer to pages 1410 and 1411

\* When the D-A9\_(V)/M9\_(V)/M9\_W(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 320 for details. Auto switches are shipped together, (but not assembled)

\* Auto switches marked with "O" 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.



### Low Speed Cylinder: Standard Type Double Acting, Single Rod CQ2X Series

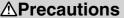


### Symbol

Single rod, Without cushion







Be sure to read this before handling the products. Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

### **Retaining Ring Installation/Removal**

### ▲Caution

- 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 is placed firmly into the groove of rod cover before supplying air at the time of installment.

### **Pneumatic Circuit**

 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

### 

### 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	Tiston seal.	r po.
50	CQSX50-PS	Rod seal:	1 pc.
63	CQ2X63-PS	Gasket:	1 pc.
80	CQ2X80-PS		
100	CQ2X100-PS	Grease pack (10 g):	1 pc.

### 2. Grease pack

When maintenance requires only grease, use the following part numbers to order. Grease pack part number:

Grease pack part 1 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				
Туре			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 (No freezing) With auto switch: -10°C to 60°C									
Cushion		I	None, Rub	ber bumpe	r					
Rod end thread			Female	thread						
Stroke length tolerance			+1.0 m 0	m Note)						
Mounting	Through-hole									
Piston speed			0.5 to 3	00 mm/s						

lote) 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			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 in 1 mm increments are available by using spacers with standard stroke cylinders. Example) 18 mm width spacer is installed in the standard cylinder CQ2XB40-57D to make the CQ2XB40-57D.

.....

### Mounting Brackets/Part No.

Foot Note 1)	Compact foot	Flange	Double clevis Note 3)
CQ-L032	CQ-LC032	CQ-F032	CQ-D032
CQ-L040	CQ-LC040	CQ-F040	CQ-D040
CQ-L050	CQ-LC050	CQ-F050	CQ-D050
CQ-L063	CQ-LC063	CQ-F063	CQ-D063
CQ-L080	CQ-LC080	CQ-F080	CQ-D080
100 CQ-L100		CQ-F100	CQ-D100
	CQ-L032 CQ-L040 CQ-L050 CQ-L063 CQ-L080	CQ-L032         CQ-LC032           CQ-L040         CQ-LC040           CQ-L050         CQ-LC050           CQ-L063         CQ-LC063           CQ-L080         CQ-LC080	CQ-L032         CQ-LC032         CQ-F032           CQ-L040         CQ-LC040         CQ-F040           CQ-L050         CQ-LC050         CQ-F050           CQ-L063         CQ-LC063         CQ-F063           CQ-L080         CQ-LC080         CQ-F080

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.

### Accessory

For details about the single knuckle joint, double knuckle joint, knuckle pin, and rod end nut, refer to page 316.

\* Stainless steel mounting brackets and accessories are also available.

Refer to page 316 for details



## CQ2X Series

## Bore Size ø32 to ø50

### Both ends tapped: CQ2XA/CDQ2XA O1 thread R Both Ends Tapped (mm) Bore size Standard (Through-hole) CQ2XB/ 01 R (mm) Ы CDQ2XB A 32 M6 x 1.0 10 Lead wire min. bending radius 10 40 M6 x 1.0 10 Auto switch 4 x øN through H thread effective depth C 50 M8 x 1.25 14 8 x ØO counterbore F 2 x P (Rc, NPT, G) (Port size) NIZW ő B + Stroke κ A + Stroke М Е w Male rod end MM Male Rod End Width across flats B1 Bore size B1 C1 Hı Lı мм Hı (mm) Cı 32 22 20.5 8 28.5 M14 x 1.5 23.5 х 40 22 20.5 8 28.5 M14 x 1.5 23.5 L 27 26 11 33.5 M18 x 1.5 28.5 50 Ctondord

Standard	For the auto switc	h mou	nting p	positio	n and its mor	unting	height	, reter	to pag	e 318.										(mm)
Bore size	Stroke range		Without auto switch					With	auto s	witch		с	D	Е	н			к		м
(mm)	(mm)	Α	В	F	Р	Q	Α	В	н	Р	Q	C		-	_ <b>n</b>		J	L L		IVI
	5	30	23	5.5	M5 x 0.8	11.5			33 7.5				16				4.5	14		
32	10 to 50	30	23	7.5	1/0	1/8 10.5 4	40	40 33		1/8 10.5	10.5	5 13		45	M8 x 1.25	60			7	34
	75, 100	40	33	7.5	1/8 10.5															
40	5 to 50	36.5	29.5	0	1/8	1/8 11	40 E	39.5	8	1/8	11	13	16	52	M8 x 1.25	69	5	14	7	40
40	75, 100	46.5	39.5	0	1/0		40.5	39.5	0	1/0		13	10	52	WO X 1.25	09	5	14	'	40
50	10 to 50	38.5	30.5	10.5	1/4	10.5	10 5	40.5	40.5	1/4	10.5	15	20	64	M10 x 1.5	86	-	17	8	50
50	75, 100 48.5 40.5 10.5 1/4	1/4	10.5	40.5	40.5	10.5	1/4	10.5	15	20	04	WI 10 X 1.5	00	1		0	50			

N	о	s	U	w	z
5.5	9 depth 7	58.5	31.5	49.5	14
5.5	9 depth 7	66	35	57	14
6.6	11 depth 8	80	41	71	19
	5.5 5.5	5.5         9 depth 7           5.5         9 depth 7	5.5         9 depth 7         58.5           5.5         9 depth 7         66	5.5         9 depth 7         58.5         31.5           5.5         9 depth 7         66         35	5.5         9 depth 7         58.5         31.5         49.5           5.5         9 depth 7         66         35         57

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 316. Note 2) Refer to page 314 for calculation of the longitudinal dimension of the intermediate strokes since there is the spacer-installed type.

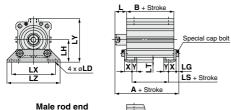
(mm)

х

**SMC** 

## Bore Size Ø**32 to** Ø**50**

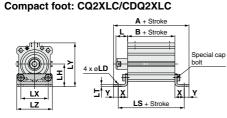
### Foot: CQ2XL/CDQ2XL



Foot (mm) Bore size Without auto switch With auto switch Stroke range L L1 LD (mm) (mm) Α в LS Α в LS 5 to 50 47.2 23 7 32 57.2 33 17 17 38.5 6.6 75, 100 57.2 33 17 5 to 50 53.7 29.5 13.5 40 63.7 39.5 23.5 17 38.5 6.6 75, 100 63.7 39.5 23.5 56.7 30.5 7.5 10 to 50 50 66.7 40.5 17.5 18 43.5 9 75, 100 66.7 40.5 17.5 Bore size Stroke range LG LΖ Y LH LT LX LY х (mm) (mm) 5 to 50 32 4 3.2 71 5.8 30 57 57 11.2 75, 100 5 to 50 40 4 33 32 64 64 78 11.2 7 75, 100 10 to 50 50 5 39 3.2 79 78 95 14.7 8 75, 100

Foot bracket material: Carbon steel

Surface treatment: Nickel plating







Compac	t Foot									(mm)
Bore size	Stroke range	Witho	ut auto	switch	With	auto s	witch	L	Lı	LD
(mm)	(mm)	Α	В	LS	Α	В	LS		L.	LD
32	5 to 50	62	23	50.4	72	33	60.4	17	38.5	
32	75, 100	72	33	60.4	12	33	60.4	17	30.5	6.6
40	5 to 50	70.9	29.5	56.9	80.9	39.5	66.9	17	38.5	6.6
40	75, 100	80.9	39.5	66.9	60.9	39.5	00.9	17	30.5	0.0
50	10 to 50	79.9	30.5	63.9	89.9	40.5	73.9	18	43.5	9
50	75, 100	89.9	40.5	73.9	09.9		13.9		43.5	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	-	
32	75, 100	30	3.2	34	57	45	13.7	5.0		
40	5 to 50	33	3.2	40	64	52	13.7	7		
40	75, 100	33	3.2	40	64	52	13.7			
50	10 to 50	39	3.2	50	78	64	16.7	8	-	
50	75, 100	39	3.2	30	10	04	10.7	•	_	

Compost Foot

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

### Rod flange: CQ2XF/CDQ2XF





Male rod end



Rod Fla	nge								(	mm)
Bore size	Stroke range	Without a	uto switch	With au	to switch	FD	FT	FV	FX	FZ
(mm)	(mm)	Α	В	Α	В			FV	F.A.	F2
32	5 to 50	40	23	50	33	5.5	8	48	56	65
32	75, 100	50	33	50	33		0	40	50	05
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	70
40	75, 100	56.5	39.5	50.5	39.5	5.5	0	54	62	72
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89
50	75, 100	58.5	40.5	50.5	40.5	0.0	9	07	/0	69
Bore size (mm)	Stroke range (mm)	L	Lı	м						
32	5 to 50	17	38.5	34						
32	75, 100	1 17	30.5	34						
40	5 to 50	17	38.5	40						
40	75, 100	1 17	30.5	40						
50	10 to 50	18	43.5	50						
50	75, 100	10	43.5	50						
Flan	Flange bracket material: Carbon steel									

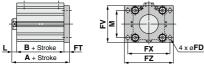
Surface treatment: Nickel plating

\* For details about the rod end nut and accessory brackets, refer to page 316.

# CQ2X Series

# ø**32 to** ø**50**

### Head flange: CQ2XG/CDQ2XG



Male rod end

L

Male rod end



4 x **N** 

CW RR

Cap bolt ø**CD** hole H10 Axis d9

CZ

Double clevis: CQ2XD/CDQ2XD

СТ

B + Stroke

CL + Stroke A + Stroke

	Head Flange										
	Bore size	Stroke range	Without auto switch	With auto switch		L1					
	(mm)	(mm) -	Α	Α	L.						
ļ	32	5 to 50	38	48	7	28.5					
		75, 100	48	40							
	40	5 to 50	44.5	54.5	7	28.5					
		75, 100	54.5	54.5							
	50	10 to 50	47.5	57.5	8	33.5					
		75, 100	57.5	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 (mm)													
Bore size	Stroke range (mm)	Without auto switch			With auto switch			CD	ст	сυ			
(mm)		Α	В	CL	Α	В	CL	CD	U	CU			
32	5 to 50	60	23	50	70	33	60	10	5	14			
32	75, 100	70	33	60									
40	5 to 50	68.5	29.5	58.5	78.5	39.5	68.5	10	6	14			
40	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			
50	75, 100	90.5	40.5	76.5						20			
Bore size (mm)	Stroke range (mm)	cw	сх	cz	L	Lı	1	1	RR				
32	5 to 50	20	18	36	7	28.5	M6 x 1.0		10				
32	75, 100	20							10				
40	5 to 50	22	18	36	7	28.5	M6 x 1.0		10				
40	75, 100								10				
50	10 to 50	28	22	44	8	33.5	M8 x	1.25	14				
30	75, 100								14				

Double clevis bracket material: Cast iron

Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 316.

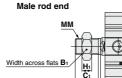
\*\* A double clevis pin and retaining rings are included.

# Bore Size <u>ø63 to ø100</u>

### Both ends tapped: CQ2XA/CDQ2XA

## Both Ends Tapped (mm) 01

-				
	O1 thread R	Bore size (mm)	01	R
		63	M10 x 1.5	18
		80	M12 x 1.75	22
		100	M12 x 1.75	22
Standard (Through-hole) $4 \times 0 N \text{ thr} / 8 \times 0 O \text{ co}$	rough			
H thread effective depth C	Lead wire min. bending radius 10 Auto switch 2 x P (Rc, NPT, G) (Port size)			



Male	Ro	d E	nd		(	mm)
Bore size (mm)	B1	<b>C</b> 1	Hı	L1	мм	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 318. (mr												(mm)							
Bore size	Stroke range	Without a	uto switch	With au	to switch	с	D	Е	F	н			к		м	N	0	Р	Q	s
(mm)	(mm)	Α	В	Α	В			-	F		· ·	J	<b>~</b>	-	IVI		0	F	Q	3
63	10 to 50	44	36	54	46	15	20	77	10.5	M10 x 1.5	102	7	17	8	60	9	14 depth 10.5	1/4	15	93
03	75, 100	54	46	54	40	15	20	1 ''	10.5		103	· '	''	0	00	9	14 deptil 10.5	1/4	15	93
80	10 to 50	53.5	43.5	60 F	53.5	21	25	98	10.5	M16 x 2.0	100	6	22	10	77	11	17.5 depth 13.5	3/8	10	112.5
00	75, 100	63.5	53.5	03.5	33.5	21	25	90	12.5	WI 16 X 2.0	132	0	22		11	'''	17.5 deptri 13.5	3/0	10	112.5
100	10 to 50	65	53	75	63	27	30	117	13	M20 x 2.5	150	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	132.5
100	75, 100	75	63	/5	03	21	30		13	W20 X 2.5	150	0.5	21	12	94	'''	17.5 deptri 13.5	3/0	23	132.5

х

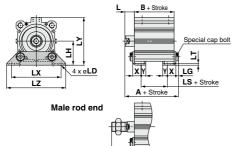
Bore size (mm)	U	w	z
63	47.5	84	19
80	57.5	104	26
100	67.5	123.5	26

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 316. Note 2) Refer to "Standard Strokes" on page 309 for calculation of the longitudinal dimension of the intermediate strokes.

# CQ2X Series

# Bore Size ø63 to ø100

# Foot: CQ2XL/CDQ2XL



Foot													(1	mm)
Bore size (mm)	Stroke range (mm)	With A	out au B		itch .S	With A	auto s B	witch LS	L	Lı	LD	LG	LH	LT
63	10 to 50 75, 100	62.2 72.2	-	_	10 20	72.2	46	20	18	43.5	11	5	46	3.2
80	10 to 50 75, 100	75 85	43.	-	3.5 3.5	85	53.5	23.5	20	53.5	13	7	59	4.5
100	10 to 50 75, 100	88 98	53 63	_	19 29	98	63	29	22	53.5	13	7	71	6
Bore size (mm)	Stroke range (mm)	LX	LY	LZ	x	Y								
63	10 to 50 75, 100	95	91.5	113	16.2	9	-							

10 to 50 80 118 114 140 19.5 11 75, 100 10 to 50 100 137 136 162 23 12.5 75, 100

Foot bracket material: Carbon steel Surface treatment: Nickel plating

#### A + Stroke B + Stroke 3 4 x ø**LD** Y x х Y LX LS + Stroke LZ

Comp	act Foo	t								(mn
Bore size	Stroke range	Witho	ut auto	switch	With	auto s	witch	L	Lı	LD
(mm)	(mm)	Α	В	LS	Α	В	LS	L .	L1	LD
63	10 to 50	90.4	36	72.4	100.4	46	82.4	10	43.5	11
63	75, 100	100.4	46	82.4	100.4	40	02.4	18	43.5	
80	10 to 50	110.5	43.5	88.5	120.5	53.5	98.5	20	53.5	13
80	75, 100	120.5	53.5	98.5	120.5	53.5	90.5	20	53.5	13
100	10 to 50	126	53	101	136	63	111	22	53.5	13
100	75, 100	136	63	111	130	03		22	53.5	13
Bore size (mm)	Stroke range (mm)	LH	LT	LX	LY	LZ	x	Y		
~~	10 to 50	40			04.5	77	40.0	9		
63	75, 100	46	3.2	60	91.5	11	18.2	9		
80	10 to 50	59	4.5	77	114	98	22.5	11		
80	75, 100	59	4.5	11	114	90	22.5			
100	10 to 50	71	6	94	136	117	24	12.5		
100	75, 100	11	0	34	130	117	24	12.5		

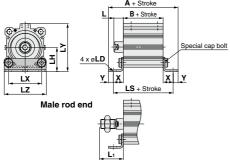
Compact foot bracket material: Carbon steel Surface treatment: Zinc chromated

Rod F	Rod Flange (mm												
Bore size (mm)	Stroke range (mm)	Without a	uto switch B	With aut A	to switch B	FD	FT	F۷	FX	FZ	L	L1	м
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46	04	40			00	52	100	10	40.0	00
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	13/	20	53.5	77
00	75, 100	73.5	53.5	10.0	33.3			33	110	134	20	35.5	<i>''</i>
100	10 to 50	75	53	85	63	11	11	117	126	154	22	53.5	04
100	75, 100	85	63	05	03		11		130	104	22	03.5	94

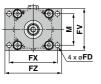
Flange bracket material: Carbon steel Surface treatment: Nickel plating

\* For details about the rod end nut and accessory brackets, refer to page 316.

# Compact foot: CQ2XLC/CDQ2XLC

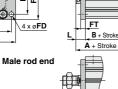


# Rod flange: CQ2XF/CDQ2XF



314

FT B + Stroke A + Stroke

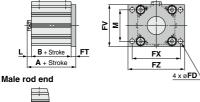




m) )

# Bore Size <u>ø63 to ø100</u>

## Head flange: CQ2XG/CDQ2XG



## Head Flange

Bore size	Stroke range	Without auto switch	With auto switch	1	L1
(mm)	(mm) -	Α	Α	L.	LI
63	10 to 50	53	63	8	33.5
03	75, 100	63	63	0	33.5
80	10 to 50	64.5	74.5	10	43.5
80	75, 100	74.5	74.5	10	43.5
100	10 to 50	76	86	12	43.5
100	75, 100	86	00	12	43.5

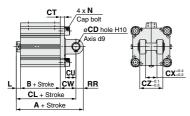
Flange bracket material: Carbon steel Surface treatment: Nickel plating

(mm)

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



## Double clevis: CQ2XD/CDQ2XD



### Male rod end



Doub	Double Clevis (mm)													
Bore size	Stroke range	With	outa	auto			th a	auto s	witch	0	СТ	~	cw	CV
(mm)	(mm)	Α	Т	в	CL	A		в	CL	טטן		CU	CW	C.
63	10 to 50	88	;	36	74	98	,	46	84	14	8	20	30	22
03	75, 100	98		16	84	90	<b>'</b>	40	04	14	0	20	30	22
80	10 to 50	109.	5 4	3.5	91.5	119	-	53.5	101.5	18	10	27	38	28
00	75, 100	119.	5 5	3.5	101.5	119.	.ə	53.5	101.5	10	10	21	30	20
100	10 to 50	132	2 !	53	110	14		63	120	22	13	31	45	32
100	75, 100	142	2 (	63	120	14	2	63	120	22	13	31	45	32
Bore size (mm)	Stroke range (mm)	cz	L	L1	•	ı	R	R						
63	10 to 50 75, 100	44	8	33.	5 M10	x 1.5	1.	4						
80	10 to 50	56	10	40.1	5 M12>	4.75	-	0						
60	75, 100	00	10	43.	2 11/12	1./5	1	0						
100	10 to 50	64	12	421	5 M12>	1 75	2							
100	75 100	04	12	43.3	, 21 MILZ	1./0	<i>2</i> .	۷						

Double clevis bracket material: Cast iron

Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 316.

\* A double clevis pin and retaining rings are included.

75, 100



# CQ2X Series Dimensions of Accessories

## Single Knuckle Joint

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





Material: Cast iron

Material: Carbon steel Surface treatment: Nickel plating

Surface treatment: Nickel plating

For I-G04, I-G05

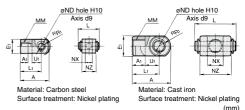
I-G08, I-G10

Part no.	Applicable bore size (mm)	A	<b>A</b> 1	E1	Lı	ММ	<sup>R</sup> R1	U1	ND <sub>H10</sub>	NX
I-G04	32, 40	42	14	ø22	30	M14 x 1.5	12	14	10*0.058	18-03
I-G05	50, 63	56	18	ø28	40	M18 x 1.5	16	20	14 <sup>+0.070</sup>	22-0.3
I-G08	80	71	21	ø38	50	M22 x 1.5	21	27	18 <sup>+0.070</sup>	28-03
I-G10	100	79	21	ø44	55	M26 x 1.5	24	31	22*0.084	32-0.3

## **Double Knuckle Joint**

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

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



													(1111)
Part no.	Applicable bore size (mm)	A	A1	E١	Lı	мм	<sup>₽</sup> R₁	U1	ND <sub>H10</sub>	NX	NZ	L	Applicable pin part no.
Y-G04	32, 40	42	16	ø22	30	M14 x 1.5	12	14	10+0.058	18 <sup>+0.5</sup>	36	41.6	IY-G04
Y-G05	50, 63	56	20	Ø28	40	M18 x 1.5	16	20	14+0.070	22+0.5	44	50.6	IY-G05
Y-G08	80	71	23	Ø38	50	M22 x 1.5	21	27	18+0.070	28+0.5	56	64	IY-G08
Y-G10	100	79	24	Ø44	55	M26 x 1.5	24	31	22+0.084	32+0.5	64	72	IY-G10

\* A knuckle pin and retaining rings are included.

# Rod End Nut

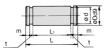


Material: Carbon steel Surface treatment: Nickel plating

(mm)

					()
Part no.	Applicable bore size (mm)	d	н	в	с
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

# Knuckle Pin (Common with double clevis pin)



Material: Carbon steel

								(mm)
Part no.	Applicable bore size (mm)	Dd9	L	d	L1	m	t	Applicable retaining ring
IY-G04	32, 40	10-0.040	41.6	9.6	36.2	1.55	1.15	Type C 10 for axis
IY-G05	50, 63	14-0.050	50.6	13.4	44.2	2.05	1.15	Type C 14 for axis
IY-G08	80	18-0.050	64	17	56.2	2.55	1.35	Type C 18 for axis
IY-G10	100	22-0.065	72	21	64.2	2.55	1.35	Type C 22 for axis

\* Type C retaining rings for axis are included.

## Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

#### Part No. (Dimensions: Same as standard type)

Bore size (mm)	Single knuckle joint	Double knuckle joint*	Rod end nut
32	I-G04SUS	Y-G04SUS	NT-G04SUS
40	1-004303	1-004303	NI-G04303
50	I-G05SUS	Y-G05SUS	NT-05SUS
63	1-005505	1-005505	11-05505
80	I-G08SUS	Y-G08SUS	NT-08SUS
100	I-G10SUS	Y-G10SUS	NT-10SUS

A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

# Simple Joint (CQ2X): ø32 to ø100

## Joint/Mounting Bracket (Type A/B) Part Nos.

Bore size [mm]	Joint	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

<Ordering>

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

(Example)

Bore size ø40 Part no.

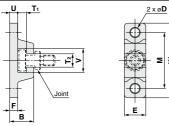
Type A mounting bracket......YA-03

•Joint.....YU-03

#### Allowable Eccentricity

						f
Bore size [mm]	32	40	50	63	80	100
Eccentricity tolerance		±	±1.5	±2		
Axial direction backlash			0	.5		

#### Type A Mounting Bracket



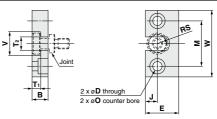
Material: Chromium molybdenum steel (Nickel plating) [mm]

[mm]

≥

Bore size [mm]	Part no.	в	D	E	F	М	<b>T</b> 1	T2
32, 40	YA-03	18	6.8	16	6	42	6.5	10
50, 63	YA-05	20	9	20	8	50	6.5	12
80	YA-08	26	11	25	10	62	8.5	16
100	YA-10	31	14	30	12	76	10.5	18
Bore size [mm]	Part no.	U	v	w	Weig	ht [g]		
32, 40	YA-03	6	18	56	5	5		
50, 63	YA-05	8	22	67	10	00		
80	YA-08	10	28	83	19	95		
100	YA-10	12	36	100	34	10		

## Type B Mounting Bracket

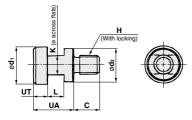


Material: Stainless steel [mm]

Bore size [mm]	Part no.	в	D	Е	J	м	0
32, 40	YB-03	12	7	25	9	34	11.5 depth 7.5
50, 63	YB-05	12	9	32	11	42	14.5 depth 8.5
80	YB-08	16	11	38	13	52	18 depth 12
100	YB-10	19	14	50	17	62	21 depth 14
Bore size [mm]	Part no.	T1	T2	v	w	RS	Weight [g]
	Part no. <b>YB-03</b>	<b>T</b> 1 6.5	<b>T</b> 2	<b>V</b> 18	<b>W</b> 50	<b>RS</b> 9	Weight [g] 80
[mm]				-			
[mm] 32, 40	YB-03	6.5	10	18	50	9	80

### Joint

YU-03, YU-05 YU-08, YU-10



Material: Chromium molybdenum steel (Nickel plating)									
Part no.	UA	с	d۱	d₂	н	к	L	UT	Weight [g]
YU-03	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	17	13	19.8	18	M10 x 1.5	10	7	6	40
YU-08	22	20	24.8	23	M16 x 2	13	9	8	90
YU-10	26	26	29.8	28	M20 x 2.5	14	11	10	160
	YU-03 YU-05 YU-08	YU-03         17           YU-05         17           YU-08         22	YU-03         17         11           YU-05         17         13           YU-08         22         20	YU-03         17         11         15.8           YU-05         17         13         19.8           YU-08         22         20         24.8	YU-03         17         11         15.8         14           YU-05         17         13         19.8         18           YU-08         22         20         24.8         23	YU-03         17         11         15.8         14         M8 x1.25           YU-05         17         13         19.8         18         M10 x1.5           YU-08         22         20         24.8         23         M16 x2	YU-03         17         11         15.8         14         M8 x 1.25         8           YU-05         17         13         19.8         18         M10 x 1.5         10           YU-08         22         20         24.8         23         M16 x 2         13	YU-03         17         11         15.8         14         M8 x 1.25         8         7           YU-05         17         13         19.8         18         M10 x 1.5         10         7           YU-08         22         20         24.8         23         M16 x 2         13         9	YU-03         17         11         15.8         14         M8 x 1.25         8         7         6           YU-05         17         13         19.8         18         M10 x 1.5         10         7         6           YU-08         22         20         24.8         23         M16 x 2         13         9         8

# CQ2X Series Auto Switch Mounting

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

ø32 to ø10	0						+	≈U	н	A			E	3		
D-M9 D-M9 W D-M9 A D-A9	D-M9 D-M9 D-M9 D-A9(	□WV □AV				The second se					¢	H D				
D-A7 D-A80 D-A7 D-A80H D-F7 D-J79 D-F7 W D-J79W	D-1 D-7 D-7 D-7 D-7	F79F F7NT A73C A80C J79C A79W F7⊡W F7⊡W		ø32 to	ø100				A			,	в			
D-P3DWA	ŝ	<b>∂32 to</b>	ø <b>100</b>			دار س			• ]] ]]		)					
D-P4DW Auto Switc		040 to 9		a Posi	tion					A.			}  -0 		<u>B</u>	(mm)
Auto switch model	D-M9 D-M9 D-M9 D-M9 D-M9 D-M9 D-M9	□v □v □w □wv	D-A	-	D-/	473 480		/F7□W	D-F7	'NT	D-A	79W	D-P3	DWA	D-P4	
Bore size	Α	В	Α	В	Α	В	Α	В	Α	В	A	В	Α	В	Α	В
32	12	9	8	5	9	6	9.5	6.5	14.5	11.5	6.5	3.5	7.5	4.5	-	_
40	16	11.5	12	7.5	13	8.5	13.5	9	18.5	14	10.5	6	11.5	7	9	4.5
50	14	14.5	10	10.5	11	11.5	11.5	12	16.5	17	8.5	9	9.5	10	7	7.5
63	16.5	17.5 22	12.5	13.5	13.5	14.5	14	15 19.5	19 22	20	11	12	12 15	13 17.5	9.5	10.5
80	19.5		15.5	18	16.5	19				24.5		16.5			12.5	15
Note 1) Adjust th Note 2) For bore	100         24         27         20         23         21         24         21.5         24.5         26.5         29.5         18.5         21.5         19.5         22.5         17         20           1) Adjust the auto switch after confirming the operating condition in the actual setting.         2) For bore sizes 3/2 to 650, the D-P3DWA is mountable only on the port side.         5         18.5         21.5         19.5         22.5         17         20           to Switch Mounting Height         (mm)															
				-												(II)

Auto switch model		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-P3DWA	D-P4DW
Bore size	U	U	U U	U	U	U	U	U	U	U
32	29	27	31.5	32.5	38.5	35	38	34	35.5	—
40	32.5	30.5	35	36	42	38.5	41.5	37.5	39	44
50	38.5	36.5	41	42	48	44.5	47.5	43.5	45	50
63	42	40	47.5	48.5	54.5	51	54	50	48.5	56.5
80	52	50	57.5	58.5	64.5	61	64	60	58.5	66.5
100	62	60	67.5	68.5	74.5	71	74	70	68.5	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-P3DWA	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 switches and auto switch mounting brackets separately.



# **Operating Range**

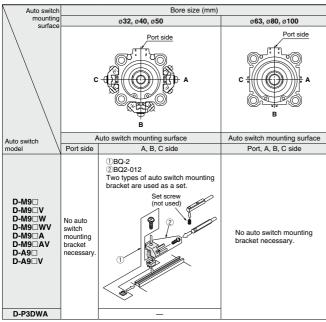
						(mm)
Auto switch model			Bore	size		
Auto switch model	32	40	50	63	80	100
D-M9□(V) D-M9□W(V) D-M9□A(V)	6	5.5	6.5	7.5	7.5	8.5
D-A9□(V)	9.5	9.5	9.5	11.5	9	11.5
D-A7□(H)(C) D-A80□(H)(C)	12	11	10	12	12	13
D-A79W	13	14	14	16	15	17
D-F7□(V) D-J79(C) D-F7□W(V) D-F7NT D-F79F	6	6	6	6.5	6.5	7
D-P3DWA	6	6	7.5	6.5	6.5	7.5
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 current auto switch installation groove.

# CQ2X Series

# Auto Switch Mounting Brackets/Part No.



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 e32 to e50, 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 CDQ2LE63 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)
Auto switch model	ø <b>32</b>	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-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

# Auto Switch Mounting CQ2X Series

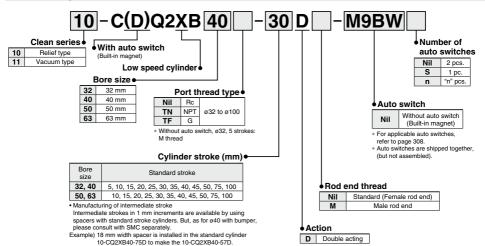
Type	Model	Electrical entry	Features	Applicable bore size	
	D-A73		-	ø32 to ø100	
Deed	D-A80	Grommet (Perpendicular)	Without indicator light		
Reed	D-A73H/A76H		_		
	D-A80H	Grommet (In-line)	Without indicator light		
	D-F7NV/F7PV/F7BV	Cremmet (Demendieuler)	_	-	
	D-F7NWV/F7BWV	Grommet (Perpendicular)	Diagnostic indication (2-color indicator)		
Solid state	D-F79/F7P/J79		_	ø32 to ø100	
Solid state	D-F79W/F7PW/J79W	Crommet (In line)	Diagnostic indication (2-color indicator)		
	D-F7NT	Grommet (In-line)	With timer		
	D-P5DW		Magnetic field resistant (2-color indicator)	ø40 to ø100	

# 10-,11-CQ2X Series



How to Order

The type which is applicable for using inside the clean room graded ISO Class 4 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**.



#### Specifications

Dere eize	(mm)		10- (Rel	ief type)			11- (Vacu	ium type)		
Bore size	e (mm)	32	40	50	63	32	40	50	63	
Fluid			A	dir		Air				
Proof pressure			1.5	MPa			1.5	MPa		
Maximum operat	ing pressure		1.0	MPa		1.0 MPa				
Minimum operati	ng pressure	0.035	MPa	0.03	MPa	0.025 MPa 0.02 MPa				
Ambient and flui	d 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 20	00 mm/s		
Piston rod size		ø	16	ø	20	Ø.	16	Ø	20	
Rod end thread	Female thread	M8 x	1.25	M10	x 1.5	M8 x	1.25	M10 x 1		
Rod end thread	Male thread	M14	x 1.5	M18	x 1.5	M14	x 1.5	M18	x 1.5	
Stroke tolerance			+1.0	mm			+1.0	mm		
Port size		M5 x 0.8	, 1/8 Note)	1	/4	M5 x 0.8, 1/8 Note) 1/4				
Vacuum port, Re	lief 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.

# **APrecautions**

#### Be sure to your this before boundling the products

- Be sure to read this before handling the products.
- Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.
- For the precautions in clean environments, refer to the Web 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

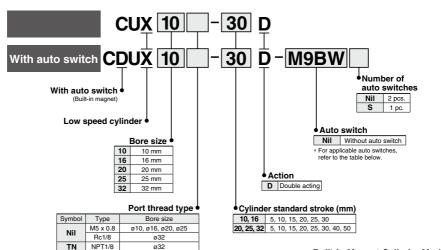
 When maintenance requires only grease, use the following part number to order.

Grease pack part number: GR-X-005 (5 q)



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

How to Order



#### 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 pages 1341 to 1435 for further information on auto switches.

ø32

G1/8

TE

		-	ight		L	oad volta	ge	Auto swit	ch model	Lead	wire I	lengt	n (m)						
Туре	Special function	Electrical entry	Indicator light	Wiring (Output)	D	С	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applica	ble load			
				3-wire (NPN)		5 V. 12 V		M9NV	M9N	•	٠	•	0	0	IC circuit				
				3-wire (PNP)		J V, 12 V		M9PV	M9P		•	•	0	0	io circuit				
e fi				2-wire		12 V		M9BV	M9B	•	•	•	0	0					
Solid state auto switch	Discussion indication			3-wire (NPN)	24 V 5 V, 12 V 12 V	5			M9NWV	M9NW	•	٠	•	0	0	IC circuit	Dalau		
sp	Diagnostic indication (2-color indicator)	Grommet	Yes	3-wire (PNP)		24 V	V ( 12 V	V [ 12 V		M9PWV	M9PW	•	•	•	0	0	IC CITCUIL	Relay, PLC	
등육				2-wire				12 V		M9BWV	M9BW	•	•	•	0	0		. 20	
9 W				3-wire (NPN)				5 V. 12 V	5			EV 10 V		M9NAV*1	M9NA*1	0	0	•	0
	Water resistant (2-color indicator)			3-wire (PNP)		5 V, 12 V	5 V, 12 V	15 V, 12 V		M9PAV*1	M9PA*1	0	0	•	0	0	IC CITCUIL		
				2-wire		12 V		M9BAV*1	M9BA*1	0	0	•	0	0	-				
eed switch		Omment	Yes	3-wire (NPN equivalent)	-	5 V	-	A96V	A96	•	•	•	•	0	IC circuit				
Reed to swit		Grommet		2-wire	24 V	12 V	100 V	A93V	A93	•	•	•	•	O*2	-	Relay,			
auto			No	2-wire	24 V	12 V	100 V or less	A90V	A90	•	٠	•	•	0*2	IC circuit	PLC			

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance

\*2 The load voltage used is 24 VDC.

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW 1 m ..... M (Example) M9NWM

3 m ----- L

\* Auto switches marked with "O" are produced upon receipt of order.

(Example) M9NWL

5 m ······ Z (Example) M9NWZ

\* Since there are other applicable auto switches than listed, refer to page 327 for details

For details about auto switches with pre-wired connector, refer to pages 1410 and 1411.
 Auto switches are shipped together, (but not assembled).

# CUX Series



# 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: $-10^{\circ}$ C to $70^{\circ}$ C (No freezing) With auto switch: $-10^{\circ}$ C to $60^{\circ}$ C								
Lubrication	Not required (Non-lube)								
Piston speed			ø16: 1 to 300 ø32: 0.5 to 30						
Cushion		Rubber	bumper on be	oth ends					
Rod end thread			Male thread						
Stroke length tolerance			+1.0 Note) 0						
Mounting			Basic						

#### Note) Tolerance +1

## **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

# APrecautions

#### \_ \_ \_ \_ \_ \_ \_ \_ Be sure to read this before handling the products.

I Refer to page 9 for safety instructions and pages 10 to 19 for actuator I I and auto switch precautions.

# 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:	
20	CUX20-PS		pc.
25	CUX25-PS		pc.
32	CUX32-PS	Gasket.	r pc.

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

#### 2. Grease pack

Use the following part numbers to order maintenance grease. Grease pack part number:

GR-L-005 (5 q) GR-L-010 (10 q) GR-L-150 (150 g)

## Symbol

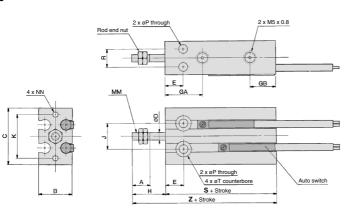
Double acting, Single rod, Rubber bumper



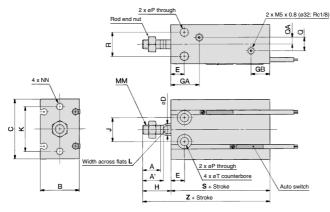


# **Dimensions: Double Acting, Single Rod**

ø**10** 



ø16 to ø32



#### **Rod End Nut/Accessories**

H.



	Material: Carbon ste										
Part no.	Applicable bore size (mm)	d	H1	B1	C1						
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						

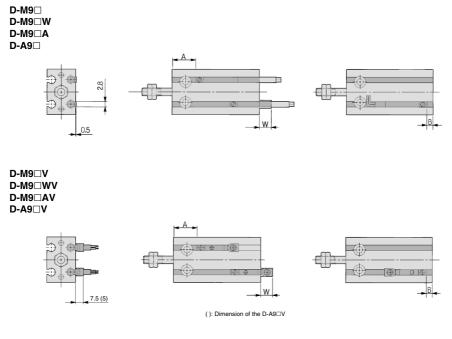
																	(mm)
Bore size (mm)	A	A'	в	с	D	Е	GA	GB	н	J	к	L	мм	NN	Ρ	Q	QA
10	10	—	15	24	4	7	16.5	10	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	
16	11	12.5	20	32	6	7	16.5 Note)	11.5	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2
20	12	14	26	40	8	9	19	12.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9	4.5
25	15.5	18	32	50	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	Bore size Without auto switch With auto switch Note) 5 stroke (CUX16-5D): 14.5 mm																

Bore size	в	<b>.</b>	Without a	uto switch	With auto switch		
(mm)	R	· ·	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	

**SMC** 

# CUX Series Auto Switch Mounting

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



## **CDUX Double Acting, Single Rod**

Bore size	D-M9□, D-M9□W			D-M9□V, D-M9□WV		D-M9□A		D-M9□AV			D-A9□, D-A9□V				
(mm)	A	В	w	A	В	w	A	В	w	A	В	w	Α	В	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 (-1.5)
16	20	8	1.5	20	8	-0.5	20	8	3.5	20	8	1.5	16	4	0.5 (-2)
20	24	10	0	24	10	-2	24	10	2	24	10	0	20	6	-1.5 (-4)
25	26.5	11	-1.5	26.5	11	-3.5	26.5	11	0.5	26.5	11	-1.5	22.5	7	-3 (-5.5)
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	-4 (-6.5)

(mm)

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 normality (if 1 auto switch is used, make sure that it turns ON and OFF property; if 2 auto switches are

used, make sure that both auto switches turn ON). Note 4) The values in ( ) are for the D-A9⊡V.

# **Operating Range**

					(mm)		
Austa australa ana dal	Bore size						
Auto switch model	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.

# Auto Switch Mounting CUX Series

## **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. If the cylinders must be mounted closer than the mounting pitch in the table due to unavoidable circumstances, a magnetic shield must be provided to prevent the cylinders from interfering with each other. Therefore, install a steel plate between the cylinder tubes, or attach a magnetic shielding plate (MU-S025) to the cylinder where it faces the other cylinder's auto switch. Auto switches may malfunction if a magnetic shield is not used.

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.

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-M9 E(V)) are also available. For details, refer to page 1360.



	Bore size (mm)	Mounting pitch L (mm)
	10	30
-	16	33
	20	40
	25	46
	32	56



# Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 1

Be sure to read this before handling the products. Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

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#### **Recommended Pneumatic Circuit**

# **Warning** Horizontal Operation

I

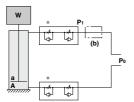
I



#### **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.

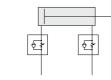
## Vertical Operation



(1) Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip.\*

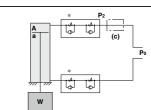
(2) Depending on the size of the load, installing a regulator with check valve at position (b) can reduce lurching during descent and operation delay during ascent. As a guide,

when W + Poa > PoA, adjust P1 to make W + P1a = PoA.



#### Meter-in speed controller

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



- (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) Po: Operating pressure (MPa) P1, P2: Reduced pressure (MPa) a: Rod side piston area (mm<sup>2</sup>) A: Head side piston area (mm<sup>2</sup>)

# \land Warning

Since the low speed cylinder CIIX10 is subject to internal leakage due to its construction, the speed may not be fully controlled with the meterout controller (\*) during low speed operation.



# Smooth Cylinders/Low Speed Cylinders Specific Product Precautions 2

Be sure to read this before handling the products. Refer to page 9 for safety instructions and pages 10 to 19 for actuator and auto switch precautions.

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.

 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.
- 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<sup>2</sup>)}

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

- 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.
- Use a speed controller for low speed operation to easily adjust for low speed operation or a dual speed controller (ASD series) 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 328.

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<sup>2</sup>)} 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.

