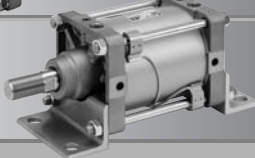


Smooth Cylinder/Low Speed Cylinder

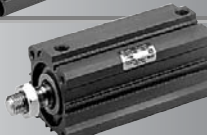
Series C□Y/C□X

Series Variations

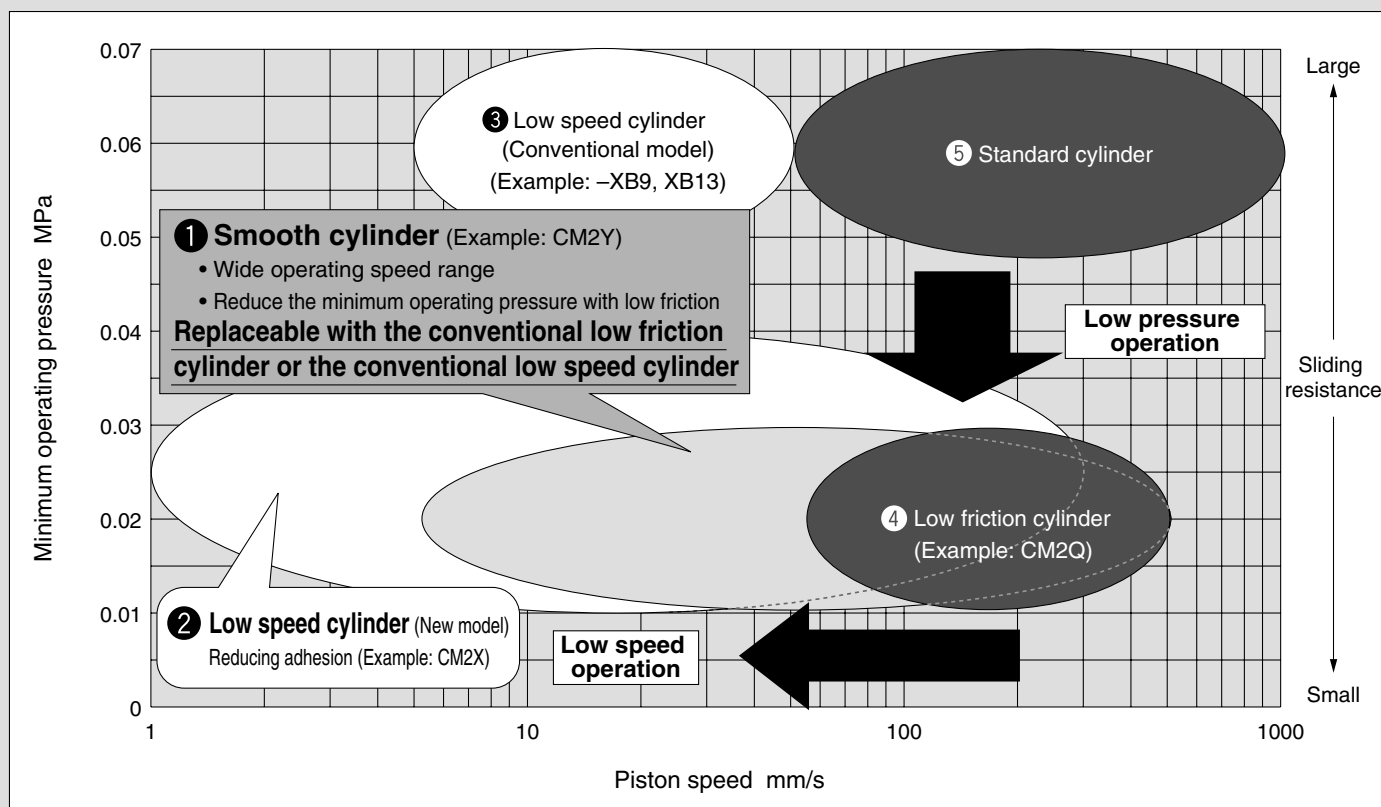
Smooth Cylinder CQSY/CQ2Y/CM2Y/CG1Y/CA2Y/CS2YP. 1047

Series	Action	Bore size (mm)	Minimum operating pressure (MPa)	Page
CQSY 	Double acting	12, 16	0.03	P. 1048
CQ2Y 		20, 25	0.02	
CM2Y 		32, 40	0.02	P. 1056
CG1Y 		50, 63, 80, 100	0.01	
CA2Y 		20, 25, 32, 40	0.02	P. 1069
CS2Y 		20, 25, 32, 40	0.02	
		50, 63, 80, 100	0.01	P. 1083
		40	0.02	
		50, 63, 80, 100	0.01	P. 1094
		125, 140, 160	0.005	
				P. 1108-1

Low Speed Cylinder CJ2X/CUX/CQSX/CQ2X/CM2XP. 1111

Series	Action	Bore size (mm)	Minimum operating speed (mm/s)	Page
CJ2X 	Double acting	10, 16	1	P. 1114
CUX 		10, 16	1	P. 1124
CQSX 		20, 25, 32	0.5	
CQ2X 		12, 16	1	P. 1129
CM2X 		20, 25	0.5	
		32, 40, 50, 63, 80, 100	0.5	P. 1136
		20, 25, 32, 40	0.5	P. 1148

Smooth Cylinder/Low Speed Cylinder



1 Smooth cylinder

- Low speed operation (from 5 mm/s)
- Low pressure operation
- Pressure on both sides
- Pressing force control
- Balance control of winders, etc.
- General low-speed operating applications
- Tension control

2 Low speed cylinder (New model)

- Low speed operation (from 1 mm/s)
- Low pressure operation
- Pressure on both sides
- Reducing adhesion
- Load transfer without a lateral load (Lightweight trays, etc.)
- Transfer with less adhesion (Wafers, etc.)
- Higher-accuracy pressing force control

3 Low speed cylinder (Conventional model)

- Low speed operation

4 Low friction cylinder

- Low pressure operation
- Pressure on a single side

5 Standard non-lube cylinder

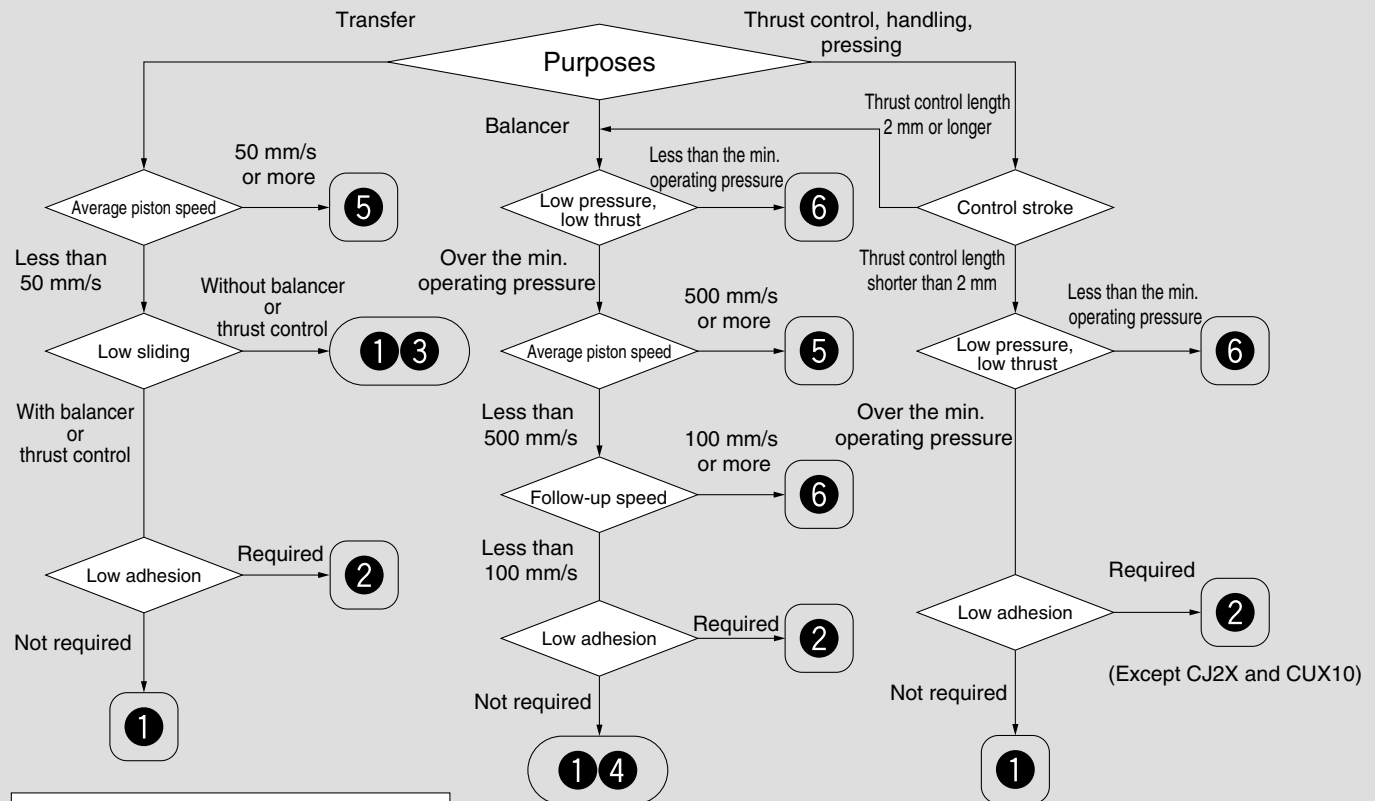
- General applications

Superiority in low speed/low friction

Function	1 Smooth cylinder	2 Low speed cylinder (New model)	3 Low speed cylinder (Conventional model)	4 Low friction cylinder	5 Standard non-lube cylinder
① Low pressure operation	◎	CJ2X, CUX10 : x Others : ◎	△	◎	△
② Low speed operation	○	◎	○	△	△
③ Reducing adhesion	○	◎	○	△	△
④ Reducing protrusion	○	◎	○	△	△
⑤ Pressing force control	◎	CJ2X, CUX10 : x Others : ◎	○	△	△
⑥ Low sliding	◎	◎	○	◎	△

◎: Excellent ○: Good △: Usable x: Handle with caution

Selection Procedures



- ① Consider using the smooth cylinder.
- ② Consider using the low speed cylinder (new model).
- ③ Consider using the low speed cylinder (conventional model).
- ④ Consider using the low friction cylinder
- ⑤ Consider using the standard non-lube cylinder
- ⑥ Consult with SMC.

Glossary explanation

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

Applicable Model/Size

Type	① Smooth cylinder	② Low speed cylinder (New model)	③ Low speed cylinder (Conventional model)	④ Low friction cylinder	Representative model
Compact	●	●	●		CQS
	●	●	●		CQ2
Round	●	●	●	*	CM2
	●		●	*	CG1
Tie-rod			●	●	MB
	●			*	CA2
	●			**	CS1
					CS2
Small		●	●	●	CJ2
Free mount		●	●		CU

●: Standard

*: ① Change this to a smooth cylinder.

** : ① Change this to a smooth cylinder (CS2).

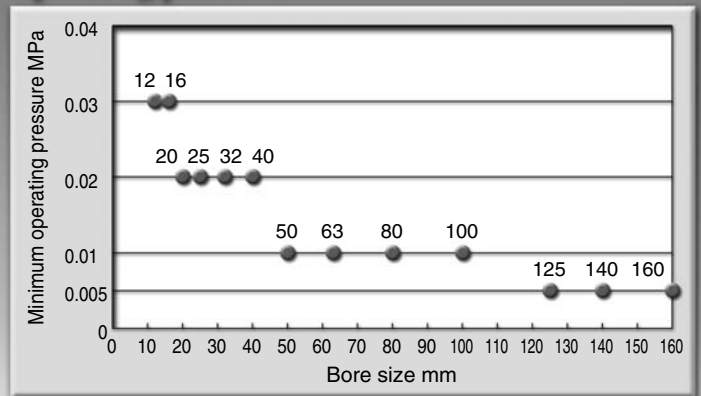
Bore size (mm)	① Smooth cylinder						② Low speed cylinder (New model)					
	Compact		Round		Tie-rod		Compact		Round	Small	Free mount	
ø10										●	●	
ø12	●						●					
ø16	●						●			●		
ø20	●		●	●			●		●		●	
ø25	●		●	●			●		●		●	
ø32		●	●	●				●	●		●	
ø40		●	●	●	●			●	●			
ø50		●		●	●			●				
ø63		●		●	●			●				
ø80		●		●	●			●				
ø100		●		●	●			●				
ø125						●						
ø140						●						
ø160						●						
Model	CQSY	CQ2Y	CM2Y	CG1Y	CA2Y	CS2Y	CQSX	CQ2X	CM2X	CJ2X	CUX	
	P. 1048	P. 1056	P. 1069	P. 1083	P. 1094	P. 1108-1	P. 1129	P. 1136	P. 1148	P. 1114	P. 1124	

Smooth Cylinder

Series CQSY/CQ2Y/CM2Y/CG1Y/CA2Y/CS2Y
 ø12 to ø25 ø32 to ø100 ø20 to ø40 ø20 to ø100 ø40 to ø100 ø125 to ø160



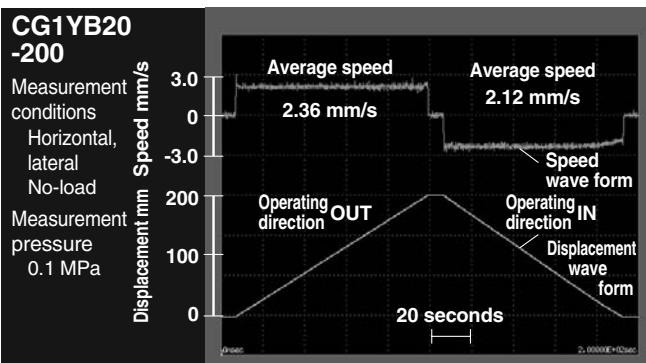
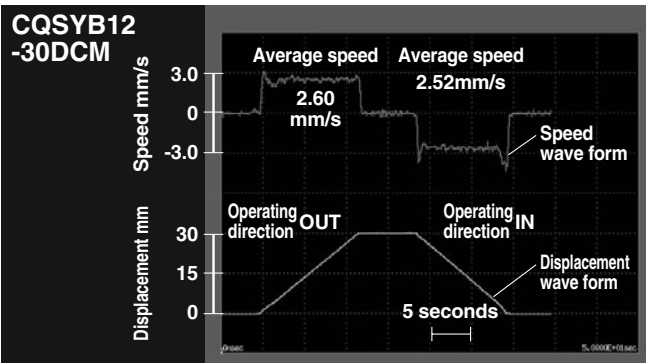
Minimum operating pressure 0.005 to 0.03 MPa



(Measurement based on JIS B8377)

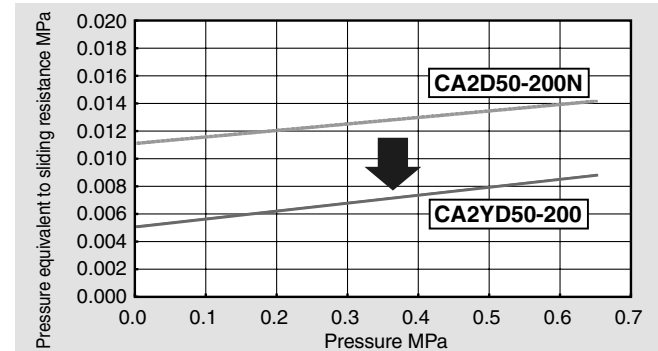
Stable operation possible even at a low speed of 5 mm/s
(Measurement based on JIS B 8377)

Smooth operation with less sticking and slipping



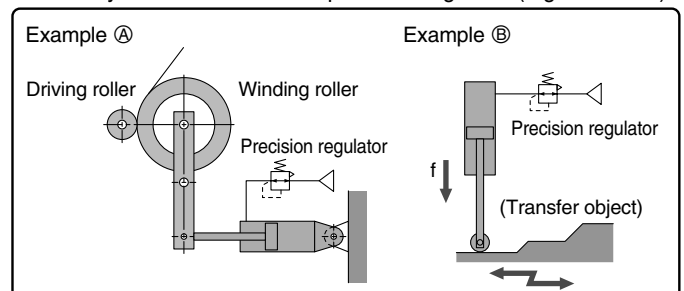
Sliding resistance

Bi-directional low-friction operation possible.
 Pressure can be controlled regardless of its direction.



Application Example

Smooth cylinder combined with precision regulator (e.g. Series IR)



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual

-X□

Smooth Cylinder

Series CQSY

ø12, ø16, ø20, ø25

How to Order

CQSY B 20 - 30 D C

With auto switch **CDQSY B 20 - 30 D C - M9BW**

With auto switch
(Built-in magnet)

Mounting style

B	Through-hole/Both ends tapped (Standard)
L	Foot style
F	Rod side flange style
G	Head side flange style
D	Double clevis style

* Mounting brackets are not mounted and are supplied loose at the time of shipment.

Bore size

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

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 1049.

Auto switch

Nil	Without auto switch
-----	---------------------

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

Bumper/Rod end thread

C	Rubber bumper & Rod end female thread
CM	Rubber bumper & Rod end male thread

Action

D	Double acting
---	---------------

Number of auto switches

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

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

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire (m)				Pre-wired connector	Applicable load			
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC	
	3-wire (PNP)			12 V		M9PV		M9P	●	●	●	○	○	—			
	2-wire			5 V, 12 V		M9BV		M9B	●	●	●	○	○				
	Diagnostic indication (2-color)			3-wire (NPN)	24 V	5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit		
				3-wire (PNP)		5 V, 12 V		M9PWV	M9PW	●	●	●	○	○			—
	Water resistant (2-color indication)			2-wire	12 V	M9BWV		M9BW	●	●	●	○	○	IC circuit			
				3-wire (NPN)	5 V, 12 V	M9NAV***		M9NA***	○	○	●	○	○		—		
				3-wire (PNP)	5 V, 12 V	M9PAV***		M9PA***	○	○	●	○	○				—
				2-wire	12 V	M9BAV***		M9BA***	○	○	●	○	○				
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—	—		P3DW**	●	—	●	●	○				
Reed switch	—	Grommet	Yes	3-wire (Equiv. NPN)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—	
				2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	—	Relay, PLC
							100V or less	A90V	A90	●	—	●	—	—	IC circuit		

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

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX

* O: Manufactured upon receipt of order.

** D-P3DW is compatible with ø25.

It is mounted away from the port side to avoid interference with fittings.

* In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 1055.

* Refer to pages 1784 and 1785 for details of auto switches with a pre-wired connector. For D-P3DW, refer to pages 1773-1 and 1773-2.

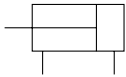
* Auto switches are not mounted and are supplied loose at the time of shipment.

Note) Please also confirm whether the selected auto switch can be mounted at the desired position. Auto switches of models D-A9V, M9V, M9WV and M9AVL may not be mounted on the side with ports due to the cylinder stroke or the size of the fittings.

Specifications

Bore size (mm)	12	16	20	25
Type	Pneumatic (Non-lube)			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.05 MPa			
Maximum operating pressure	0.7 MPa			
Ambient and fluid temperature	Without auto switch -10 to 70°C (with no freezing)			
	With auto switch -10 to 60°C (with no freezing)			
Cushion	Rubber bumper			
Rod end thread	Female thread			
Stroke length tolerance	+1.0 mm (Note) 0			
Mounting	Through-hole/Both ends tapped common			
Operating piston speed	5 to 500 mm/s			
Allowable leakage rate	0.5 l/min (ANR) or less			

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

JIS Symbol**Minimum Operating Pressure**

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

Standard Stroke

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

Replacement Parts: Seal Kit

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

When only grease for maintenance is necessary, please order by the following part numbers.

Grease pack part no.: **GR-L-005** (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Theoretical Output

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

Intermediate Stroke

Method		Installation of spacer on standard stroke body.	
Model no.		Refer to page 1048 for standard model no.	
Standard stroke	Method	Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders.	
	Stroke range	Bore size (mm)	Stroke range (mm)
		12, 16	1 to 29
		20, 25	1 to 49
Example		Part no.: CQSYB25-47DC CQSYB25-50DC with 3 mm width spacer inside. B dimension is 77.5 mm. Calculation:ø25, B dimension 27.5 mm (without auto switch) 27.5 (B dimension) + 50 (st) = 77.5 (mm)	

REA**REB****REC****C□Y****C□X****MQ****RHC****RZQ****D-□****-X□**Individual
-X□

REA
REB
REC
C□Y
C□X
MQ
RHC
RZQ

D-□
-X□
Individual -X□

Series CQSY

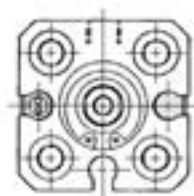
Dimensions/ø12 to ø25

Basic style

(Through-hole/Both ends tapped):

CQSYB/CDQSYB

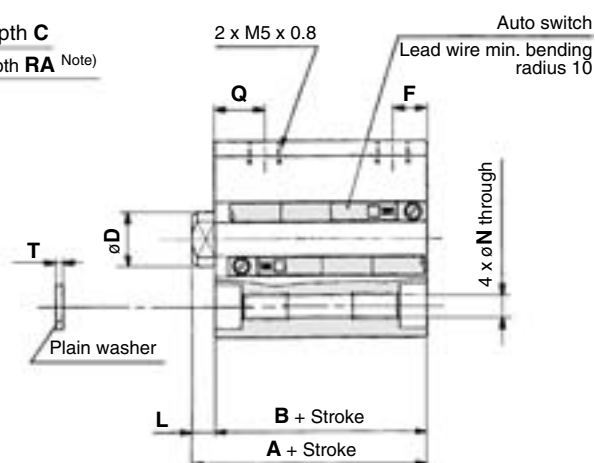
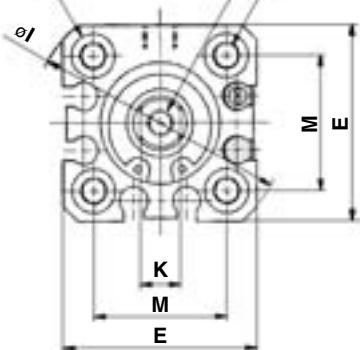
ø12



ø16

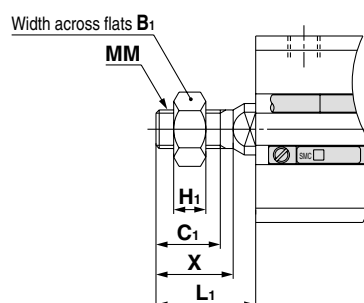
2 x 4 x øOB
counterbore depth RB

H thread effective depth C
2 x 4 x OA effective depth RA (Note)



ø20, ø25

Rod end male thread



Rod End Male Thread

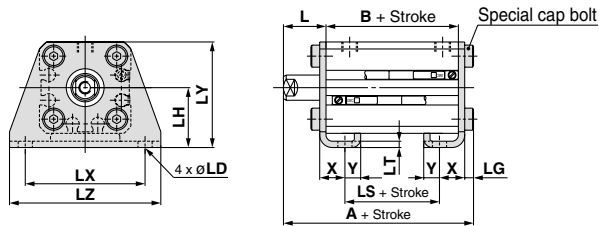
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

Basic Style

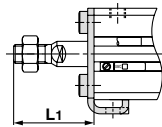
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
		A	B	A	B																
12	5 to 30	25.5	22	30.5	27	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	8	29	5	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	9	9	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	11	10	7	1

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

Foot style: CQSYL/CDQSYL



Rod end male thread



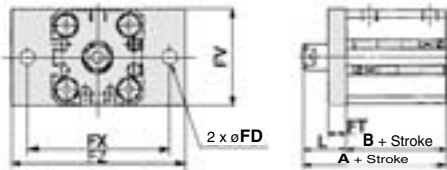
Foot Style

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

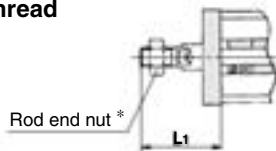
Bore size (mm)	L	L ₁	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface material: Nickel plated

Rod side flange style: CQSYF/CDQSYF



Rod end male thread



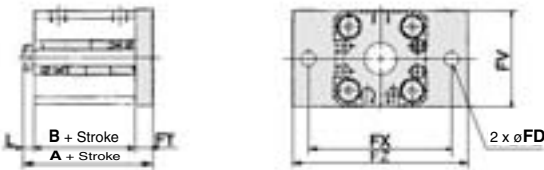
Rod Side Flange Style

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

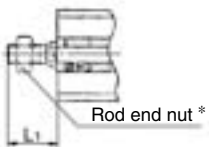
Bore size (mm)	FD	FT	FV	FX	FZ	L	L ₁
12	4.5	5.5	25	45	55	13.5	24
16	4.5	5.5	30	45	55	13.5	25.5
20	6.6	8	39	48	60	14.5	28.5
25	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface material: Nickel plated

Head side flange style: CQSYG/CDQSYG



Rod end male thread



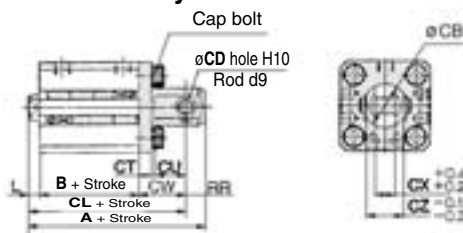
Head Side Flange Style

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

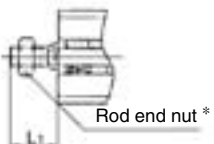
Bore size (mm)	FD	FT	FV	FX	FZ	L	L ₁
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	8	39	48	60	4.5	18.5
25	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface material: Nickel plated

Double clevis style: CQSYD/CDQSYD



Rod end male thread



Double Clevis Style

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

Bore size (mm)	CB	CD	CT	CU	CW	CX	CZ	L	L ₁	RR
12	12	5	4	7	14	5	10	3.5	14	6
16	14	5	4	10	15	6.5	12	3.5	15.5	6
20	20	8	5	12	18	8	16	4.5	18.5	9
25	24	10	5	14	20	10	20	5	22.5	10

Double clevis bracket material: Carbon steel
Surface material: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 1142.

Series CQSY

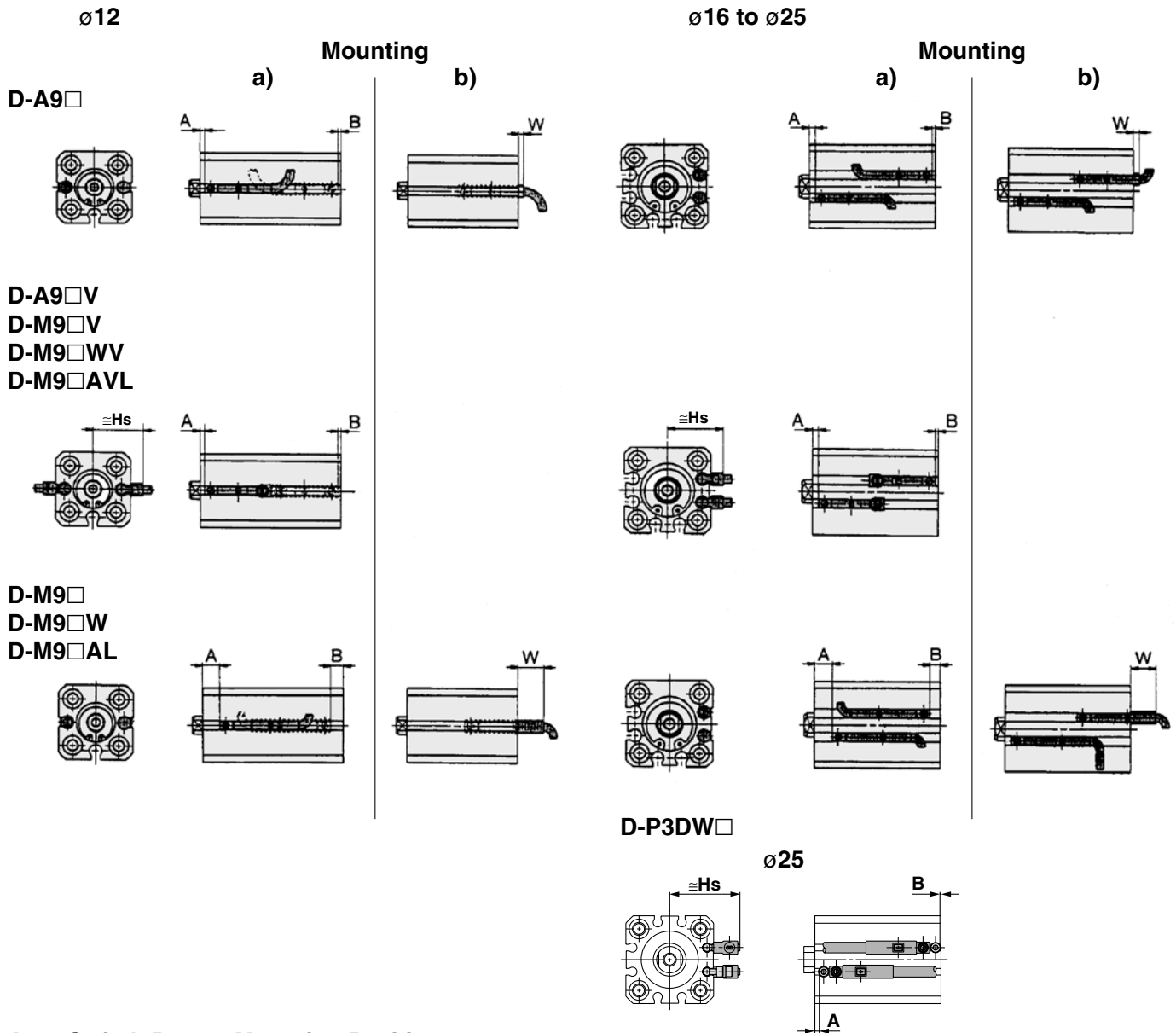
Minimum Auto Switch Mounting Stroke

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

Note 1) Consult with SMC for shorter stroke length other than indicated in the table.

Note 2) ø25 is only applicable for D-P3DW□.

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height



Auto Switch Proper Mounting Position

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



Note 1) []: Denotes the values of D-A93.

Note 2) Adjust the auto switch after confirming the operating conditions in the actual setting.

Note 3) The product is shipped out of the factory in installation state "a". To change the electrical entry direction of the switch on the head, refer to installation state "b".

Note 4) Negative figures for W indicate an auto switch is mounted inward from the edge of the cylinder body.

Operating Range

Auto switch model	(mm)			
	Bore size (mm)			
	12	16	20	25
D-A9□/A9□V	6	7.5	10	10
D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	3	3.5	5.5	4.5
D-P3DW□	—	—	—	5.5

* Since this is a guideline including hysteresis, not meant to be guaranteed.
(assuming approximately $\pm 30\%$ dispersion.)

There may be the case it will vary substantially depending on an ambient environment.

Besides the models listed in How to Order, the following auto switches are applicable.

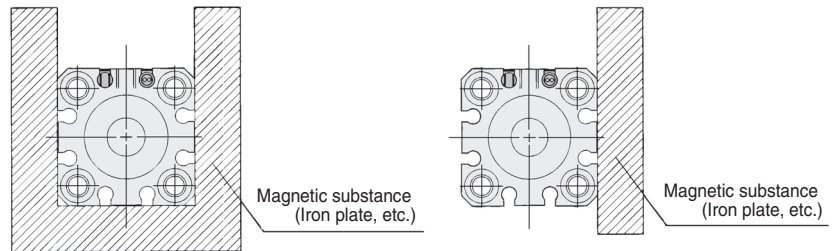
- * For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1784 and 1785 for details.
- * Normally closed (NC = b contact), solid state auto switch (D-F9G/F9H type) are also available. For details, refer to page 1746.

⚠ Precautions

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

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



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Smooth Cylinder

Series CQ2Y

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CQ2Y B 32 - 30 D C

With auto switch **CDQ2Y B 32 - 30 D C - M9BW**

Mounting style

B	Through-hole (Standard)
A	Both ends tapped
L	Foot style
F	Rod side flange style
G	Head side flange style
D	Double clevis style

* Mounting brackets are not mounted and are supplied loose at the time of shipment.

Bore size

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

Thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Standard Stroke" on next page.

Action

D	Double acting
---	---------------

Cushion

C	Rubber bumper
---	---------------

Number of auto switches

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

Auto switch

Nil	Without auto switch
-----	---------------------

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

Body option

Nil	Standard (Rod end female thread)
M	Rod end male thread

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

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire (m)					Pre-wired connector	Applicable load			
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit		
		3-wire (PNP)		12 V		M9PV		M9P	●	●	●	○	—	○				
	Connector	2-wire		12 V		M9BV		M9B	●	●	●	○	—	○	—			
				3-wire (NPN)		5 V, 12 V		M9NWV	M9NW	●	●	●	○	—		○		
	Diagnostic indication (2-color)	Grommet		3-wire (PNP)	12 V	M9PWV	M9PW	●	●	●	○	—	○	IC circuit				
				2-wire	12 V	M9BWV	M9BW	●	●	●	○	—	○					
				Water resistant (2-color indication)	Grommet	3-wire (NPN)	5 V, 12 V	M9NAV**	M9NA**	○	○	●	○	—	○	IC circuit		
						3-wire (PNP)	12 V	M9PAV**	M9PA**	○	○	●	○	—	○			
	With diagnostic output (2-color)	Grommet		2-wire	12 V	M9BAV**	M9BA**	○	○	●	○	—	○	—				
				4-wire	5 V, 12 V	—	F79F	●	—	●	○	—	○					
	Magnetic field resistant (2-color)	Grommet		2-wire (Non-polar)	—	—	P3DW	●	—	●	●	—	○	—				
				—	—	—	P4DW	—	—	●	●	—	○					
Reed switch	—	Grommet	Yes	3-wire (Equiv. NPN)	24 V	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	
				—		200 V		A72	A72H	●	—	●	—	—	—			
		Connector		2-wire		12 V		100 V or less	A93V	A93	●	—	●	—	—	—		—
						5 V, 12 V		100 V or less	A90V	A90	●	—	●	—	—	—		
	Diagnostic indication (2-color)	Grommet		12 V	—	A73C	—	●	—	●	●	●	—	—	—			
				5 V, 12 V	24 V or less	A80C	—	●	—	●	●	●	—	—				
	—	Grommet		Yes	—	—	A79W	—	●	—	●	—	—	—	—			

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

* Lead wire length symbols: 0.5 m Nil (Example) M9NW * O: Manufactured upon receipt of order.
1 m M (Example) M9NWM * D-P4DWL is available for ø40 to ø100.
3 m L (Example) M9NWL * Only D-P4DW is assembled at the time of shipment.
5 m Z (Example) M9NWZ
None N (Example) J79CN

* In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 1068.

* Refer to pages 1784 and 1785 for details of auto switches with a pre-wired connector. For D-P3DW□, refer to pages 1773-1 and 1773-2.

* When D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types with ø32 to ø50 are mounted on a side other than the port side, order auto switch mounting brackets separately. Refer to page 1067 for details.

* Auto switches are not mounted and are supplied loose at the time of shipment.

Specifications

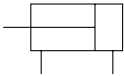
Bore size (mm)	32	40	50	63	80	100
Type	Pneumatic (Non-lube)					
Fluid	Air					
Proof pressure	1.05 MPa					
Maximum operating pressure	0.7 MPa					
Ambient and fluid temperature	Without auto switch -10 to 70°C (with no freezing)					
	With auto switch -10 to 60°C (with no freezing)					
Cushion	Rubber bumper (Standard)					
Rod end thread	Female thread					
Stroke length tolerance	+1.0 mm (Note) 0					
Mounting	Through-hole					
Operating piston speed range	5 to 500 mm/s					
Allowable leakage rate	0.5 ℓ/min (ANR) or less					

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

Minimum Operating Pressure

Unit: MPa

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

JIS Symbol**Standard Stroke**

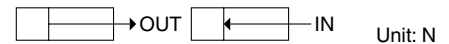
Bore size (mm)	Standard stroke (mm)
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63, 80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

Replacement Parts: Seal Kit

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

When only grease for maintenance is necessary, please order by the following part numbers.

Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Theoretical Output

Unit: N

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

Intermediate Stroke

Method		Installation of spacer on standard stroke body.	
Model no.		Refer to page 1056 for standard model no.	
Standard stroke	Method	Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders.	
	Stroke range	Bore size (mm)	Stroke range (mm)
		32 to 100	1 to 99
Example		Part no.: CQ2YB50-57DC CQ2YB50-75DC with 18 mm width spacer inside. B dimension is 125.5 mm. Calculation: $\phi 50$, B dimension 50.5 mm (without switch) $50.5 \text{ (B dimension)} + 75 \text{ (st)} = 125.5 \text{ (mm)}$	

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

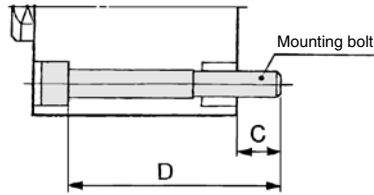
Series CQ2Y

Mounting Bolt

Mounting method: Mounting bolt for through-hole mounting style of CQ2YB is available as an option.

Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M5x40L 2 pcs.



Mounting Bolt for CQ2YB without Auto Switch

Cylinder model	C	D	Mounting bolt part no.
CQ2YB32- 5DC	9	40	CQ-M5 x 40L
- 10DC		45	x 45L
- 15DC		50	x 50L
- 20DC		55	x 55L
- 25DC		60	x 60L
- 30DC		65	x 65L
- 35DC		70	x 70L
- 40DC		75	x 75L
- 45DC		80	x 80L
- 50DC		85	x 85L
- 75DC		120	x 120L
-100DC		145	x 145L
CQ2YB40- 5DC	7.5	45	CQ-M5x 45L
- 10DC		50	x 50L
- 15DC		55	x 55L
- 20DC		60	x 60L
- 25DC		65	x 65L
- 30DC		70	x 70L
- 35DC		75	x 75L
- 40DC		80	x 80L
- 45DC		85	x 85L
- 50DC		90	x 90L
- 75DC		125	x 125L
-100DC		150	x 150L
CQ2YB50- 10DC	12.5	55	CQ-M6 x 55L
- 15DC		60	x 60L
- 20DC		65	x 65L
- 25DC		70	x 70L
- 30DC		75	x 75L
- 35DC		80	x 80L
- 40DC		85	x 85L
- 45DC		90	x 90L
- 50DC		95	x 95L
- 75DC		130	x 130L
-100DC		155	x 155L

Cylinder model	C	D	Mounting bolt part no.
CQ2YB63- 10DC	14.5	60	CQ-M8 x 60L
- 15DC		65	x 65L
- 20DC		70	x 70L
- 25DC		75	x 75L
- 30DC		80	x 80L
- 35DC		85	x 85L
- 40DC		90	x 90L
- 45DC		95	x 95L
- 50DC		100	x 100L
- 75DC		135	x 135L
-100DC		160	x 160L
CQ2YB80- 10DC	15	65	CQ-M10 x 65L
- 15DC		70	x 70L
- 20DC		75	x 75L
- 25DC		80	x 80L
- 30DC		85	x 85L
- 35DC		90	x 90L
- 40DC		95	x 95L
- 45DC		100	x 100L
- 50DC		105	x 105L
- 75DC		140	x 140L
-100DC		165	x 165L
CQ2YB100- 10DC	15.5	75	CQ-M10 x 75L
- 15DC		80	x 80L
- 20DC		85	x 85L
- 25DC		90	x 90L
- 30DC		95	x 95L
- 35DC		100	x100L
- 40DC		105	x 105L
- 45DC		110	x 110L
- 50DC		115	x 115L
- 75DC		150	x 150L
-100DC		175	x 175L

Material: Chromium molybdenum steel
Surface material: Zinc chromated

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

Cylinder model	C	D	Mounting bolt part no.
CDQ2YB32- 5	9	50	CQ-M5 x 50L
- 10		55	x 55L
- 15		60	x 60L
- 20		65	x 65L
- 25		70	x 70L
- 30		75	x 75L
- 35		80	x 80L
- 40		85	x 85L
- 45		90	x 90L
- 50		95	x 95L
- 75		120	x 120L
-100		145	x 145L
CDQ2YB40- 5	7.5	55	CQ-M5 x 55L
- 10		60	x 60L
- 15		65	x 65L
- 20		70	x 70L
- 25		75	x 75L
- 30		80	x 80L
- 35		85	x 85L
- 40		90	x 90L
- 45		95	x 95L
- 50		100	x 100L
- 75		125	x 125L
-100		150	x 150L
CDQ2YB50- 10	12.5	65	CQ-M6 x 65L
- 15		70	x 70L
- 20		75	x 75L
- 25		80	x 80L
- 30		85	x 85L
- 35		90	x 90L
- 40		95	x 95L
- 45		100	x 100L
- 50		105	x 105L
- 75		130	x 130L
-100		155	x 155L

Cylinder model	C	D	Mounting bolt part no.
CDQ2YB63- 10	14.5	70	CQ-M8 x 70L
- 15		75	x 75L
- 20		80	x 80L
- 25		85	x 85L
- 30		90	x 90L
- 35		95	x 95L
- 40		100	x 100L
- 45		105	x 105L
- 50		110	x 110L
- 75		135	x 135L
-100		160	x 160L
CDQ2YB80- 10	15	75	CQ-M10 x 75L
- 15		80	x 80L
- 20		85	x 85L
- 25		90	x 90L
- 30		95	x 95L
- 35		100	x 100L
- 40		105	x 105L
- 45		110	x 110L
- 50		115	x 115L
- 75		140	x 140L
-100		165	x 165L
CDQ2YB100- 10	15.5	85	CQ-M10 x 85L
- 15		90	x 90L
- 20		95	x 95L
- 25		100	x 100L
- 30		105	x 105L
- 35		110	x 110L
- 40		115	x 115L
- 45		120	x 120L
- 50		125	x 125L
- 75		150	x 150L
-100		175	x 175L

Material: Chromium molybdenum steel
Surface material: Zinc chromated

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CQ2Y

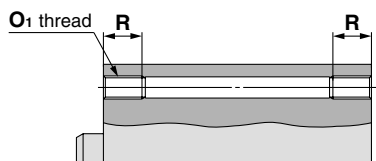
ø32 to ø50

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

Through-hole: CQ2YB/CDQ2YB

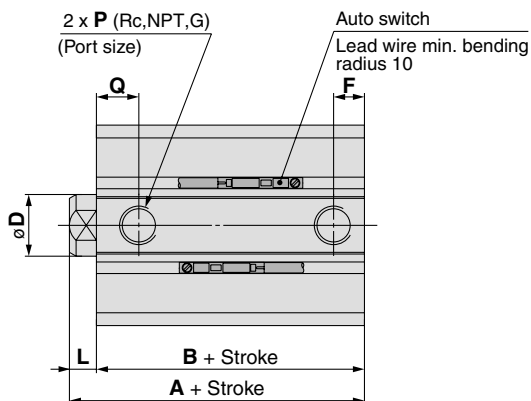
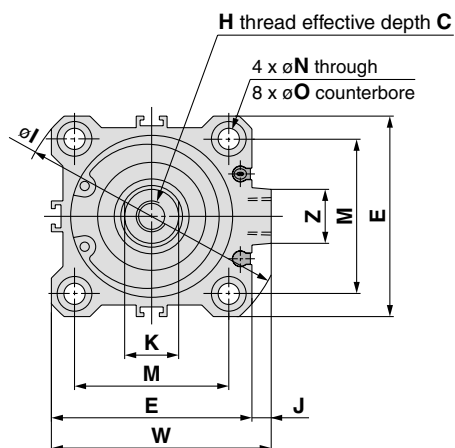
Both ends tapped style: CQ2YA/CDQ2YA

CDQ2YA

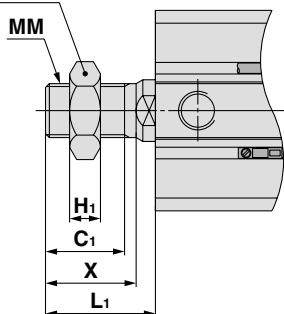


Both Ends Tapped (mm)

Bore size (mm)	O1	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14



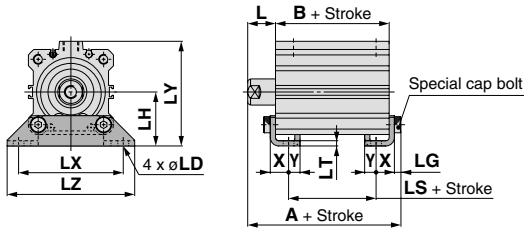
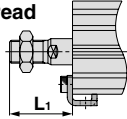
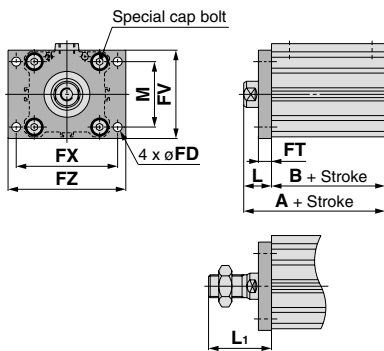
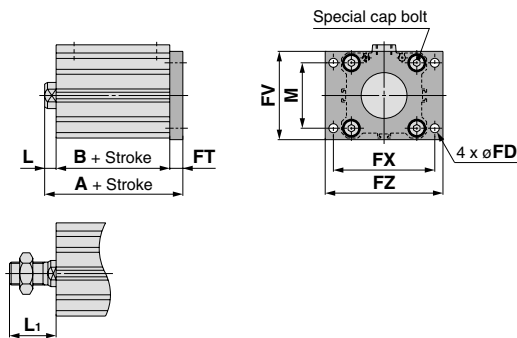
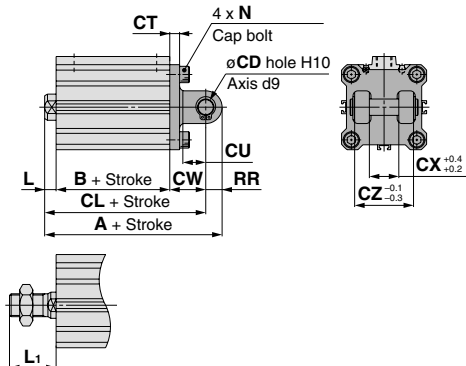
Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B																
32	5 to 50	40	33	50	43	13	16	45	7.5	M8 x 1.25	60	4.5	14	7	34	5.5	9 depth 7	1/8	10.5	49.5	14
	75, 100	50	43	50	43	13	16	45	7.5	M8 x 1.25	60	4.5	14	7	34	5.5	9 depth 7	1/8	10.5	49.5	14
40	5 to 50	46.5	39.5	56.5	49.5	13	16	52	8	M8 x 1.25	69	5	14	7	40	5.5	9 depth 7	1/8	11	57	14
	75, 100	56.5	49.5	56.5	49.5	13	16	52	8	M8 x 1.25	69	5	14	7	40	5.5	9 depth 7	1/8	11	57	14
50	10 to 50	48.5	40.5	58.5	50.5	15	20	64	10.5	M10 x 1.5	86	7	17	8	50	6.6	11 depth 8	1/4	10.5	71	19
	75, 100	58.5	50.5	58.5	50.5	15	20	64	10.5	M10 x 1.5	86	7	17	8	50	6.6	11 depth 8	1/4	10.5	71	19

Foot style: CQ2YL/CDQ2YL

Rod end male thread

Rod side flange style: CQ2YF/CDQ2YF

Head side flange style: CQ2YG/CDQ2YG

Double clevis style: CQ2YD/CDQ2YD

Foot Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	LD
		A	B	LS	A	B	LS			
32	5 to 50	57.2	33	17	67.2	43	27	17	38.5	6.6
	75, 100	67.2	43	27						
40	5 to 50	63.7	39.5	23.5	73.7	49.5	33.5	17	38.5	6.6
	75, 100	73.7	49.5	33.5						
50	10 to 50	66.7	40.5	17.5	76.7	50.5	27.5	18	43.5	9
	75, 100	76.7	50.5	27.5						

Foot bracket material: Carbon steel
Surface material: Nickel plated (mm)

Rod Side Flange Style

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

Flange bracket material: Carbon steel
Surface material: Nickel plated

Head Side Flange Style

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		L	L ₁
		A	B	A	B		
32	5 to 50	48		58		7	28.5
	75, 100	58					
40	5 to 50	54.5		64.5		7	28.5
	75, 100	64.5					
50	10 to 50	57.5		67.5		8	33.5
	75, 100	67.5					

(* Dimensions except A, L and L₁ are the same as rod side flange style.)
Flange bracket material: Carbon steel
Surface material: Nickel plated

Double Clevis Style

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

Double clevis bracket material: Cast iron
Surface treatment: Painted

* For details about the rod end nut and accessory brackets, refer to page 1142.
* Double clevis pins and retaining rings are included.

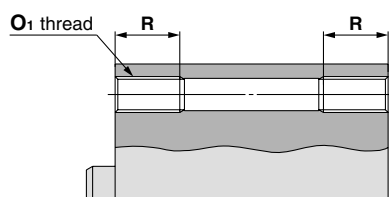
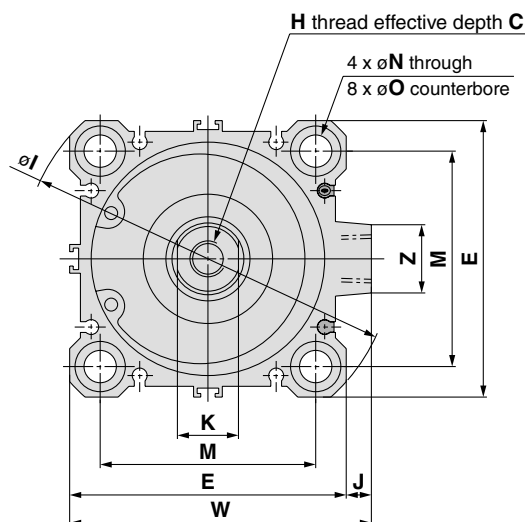
Series CQ2Y

ø63 to ø100

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

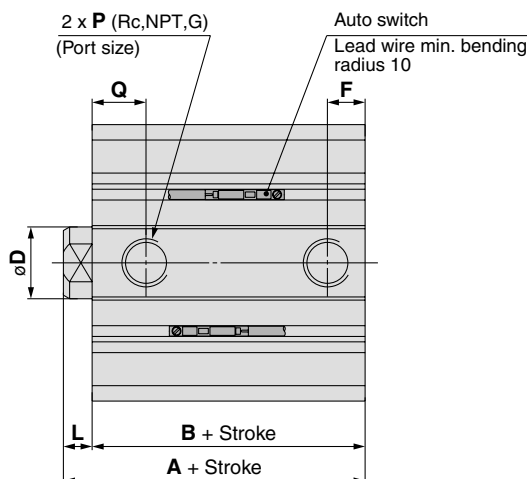
Through-hole: CQ2YB/CDQ2YB

Both ends tapped style: CQ2YA/CDQ2YA

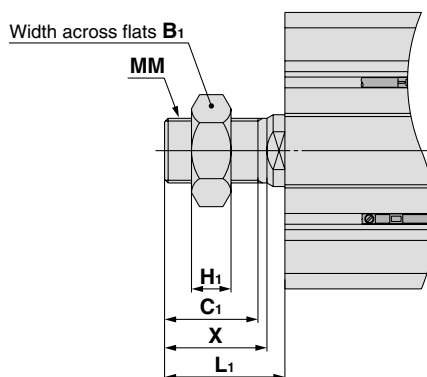


Both Ends Tapped (mm)

Bore size (mm)	O ₁	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22



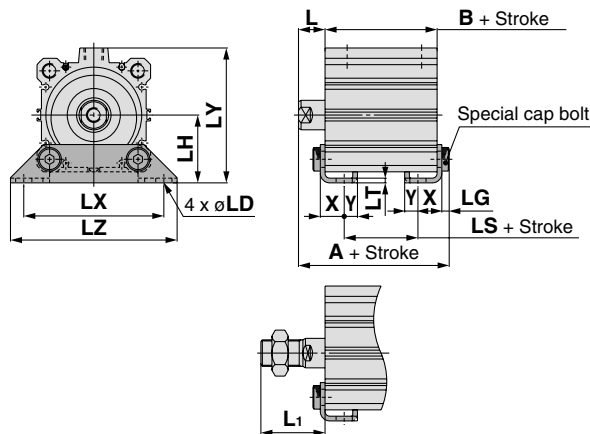
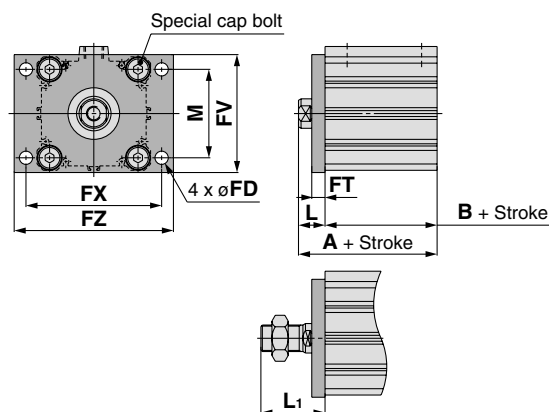
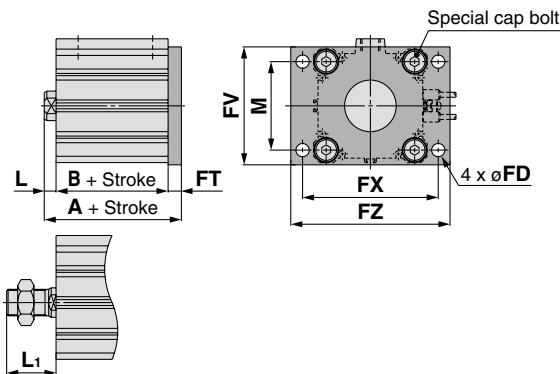
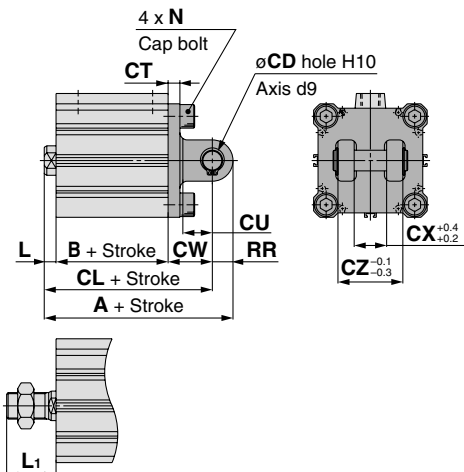
Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B																
63	10 to 50	54	46	64	56	15	20	77	10.5	M10 x 1.5	103	7	17	8	60	9	14 depth 10.5	1/4	15	84	19
	75, 100	64	56																		
80	10 to 50	63.5	53.5	73.5	63.5	21	25	98	12.5	M16 x 2.0	132	6	22	10	77	11	17.5 depth 13.5	3/8	16	104	26
	75, 100	73.5	63.5																		
100	10 to 50	75	63	85	73	27	30	117	13	M20 x 2.5	156	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	123.5	26
	75, 100	85	73																		

Foot style: CQ2YL/CDQ2YL

Rod side flange style: CQ2YF/CDQ2YF

Head side flange style: CQ2YG/CDQ2YG

Double clevis style: CQ2YD/CDQ2YD

Foot Style

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	LD
		A	B	LS	A	B	LS			
63	10 to 50	72.2	46	20	82.2	56	30	18	43.5	11
	75, 100	82.2	56	30						
80	10 to 50	85	53.5	23.5	95	63.5	33.5	20	53.5	13
	75, 100	95	63.5	33.5						
100	10 to 50	98	63	29	108	73	39	22	53.5	13
	75, 100	108	73	39						

Foot bracket material: Carbon steel
Surface material: Nickel plated

Rod Side Flange Style

(mm)

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

Flange bracket material: Carbon steel
Surface material: Nickel plated

Head Side Flange Style

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	L	L ₁
		A	B			
63	10 to 50	63		73	8	33.5
	75, 100	73				
80	10 to 50	74.5		84.5	10	43.5
	75, 100	84.5				
100	10 to 50	86		96	12	43.5
	75, 100	96				

(* Dimensions except A, L and L₁ are the same as rod side flange style.)
Flange bracket material: Carbon steel
Surface material: Nickel plated

Double Clevis Style

(mm)

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

Double clevis bracket material: Cast iron
Surface treatment: Painted

* For details about the rod end nut and accessory brackets, refer to page 1142.
* Double clevis pins and retaining rings are included.

Series CQ2Y

Mass/Without Auto Switch

(g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
32	142	163	184	204	225	246	267	287	308	329	482	587
40	224	247	270	293	316	339	362	386	409	432	616	736
50	—	400	436	472	508	545	581	617	653	690	982	1170
63	—	589	630	671	712	753	794	835	876	916	1264	1475
80	—	1079	1147	1215	1282	1350	1418	1486	1554	1622	2194	2528
100	—	1863	1953	2044	2135	2226	2316	2407	2498	2589	3393	3853

Standard stroke

Calculation: (Example) **CQ2YD32-20DCM**

• Basic mass: CQ2YB32-20DC204 g

• Additional mass: Both ends tapped style..... 6 g

Rod end male thread..... 43 g

Double clevis style151 g

404 g

Mass/With Auto Switch (Built-in magnet)

(g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
32	201	222	243	263	284	305	326	346	367	388	493	598
40	300	323	347	370	393	416	439	462	485	508	628	748
50	—	518	554	590	626	663	699	735	771	808	996	1184
63	—	748	788	829	870	911	952	993	1034	1075	1286	1497
80	—	1340	1408	1476	1543	1611	1679	1747	1815	1883	2217	2552
100	—	2242	2333	2424	2514	2605	2696	2787	2877	2968	3428	3888

Additional Mass

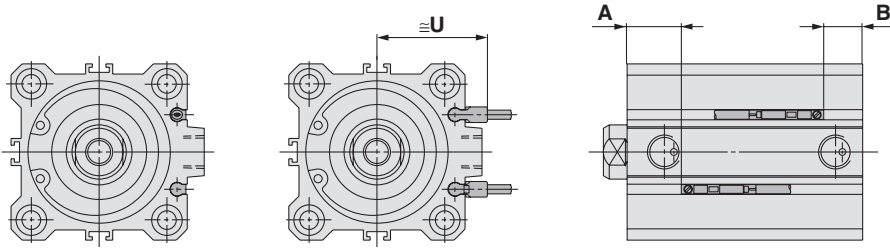
(g)

Bore size (mm)		32	40	50	63	80	100
Both ends tapped style		6	6	6	19	45	45
Rod end male thread	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot style (Including mounting bolt)		143	155	243	324	696	1062
Rod side flange style (Including mounting bolt)		180	214	373	559	1056	1365
Head side flange style (Including mounting bolt)		165	198	348	534	1017	1309
Double clevis style (Including pin, retaining ring, bolt)		151	196	393	554	1109	1887

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

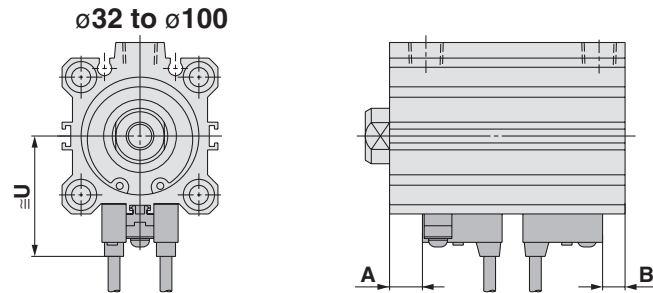
ø32 to ø100

D-A9□
 D-M9□
 D-M9□W
 D-M9□AL
 D-A9□V
 D-M9□V
 D-M9□WV
 D-M9□AVL



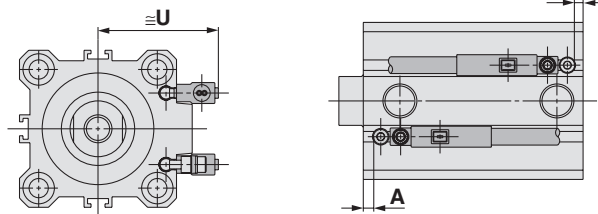
D-A7□
 D-A80
 D-A7□H
 D-A80H
 D-F7□
 D-J79
 D-F7□W
 D-J79W
 D-F79F

D-F7NTL
 D-A73C
 D-A80C
 D-J79C
 D-A79W
 D-F7□WV
 D-F7□V



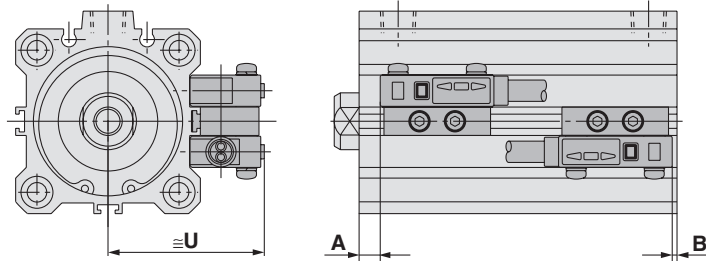
D-P3DW□

ø32 to ø100



D-P4DWL

ø40 to ø100

**Auto Switch Proper Mounting Position**

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV		D-F7NTL		D-A79W		D-P3DW□		D-P4DWL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	14	9	18	13	15	10	15.5	10.5	20.5	15.5	12.5	7.5	8.5	4	—	—
40	17.5	12	21.5	16	18.5	13	19	13.5	24	18.5	16	10.5	12	6.5	14.5	9
50	15	15.5	19	19.5	16	16.5	16.5	17	21.5	22	13.5	14	9.5	9.5	12	12.5
63	17.5	18.5	21.5	22.5	18.5	19.5	19	20	24	25	16	17	12	12.5	14.5	15.5
80	20.5	23	24.5	27	21.5	24	22	24.5	27	29.5	19	21.5	15	17	17.5	20
100	23.5	29.5	27.5	33.5	24.5	30.5	25	31	30	36	22	28	18	24	20.5	26.5

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

Auto Switch Mounting Height

(mm)

Auto switch model	D-A9□V	D-M9□V D-M9□WV D-M9□AVL	D-A7□ D-A80	D-A7□H D-A80H D-F7□ D-J79	D-F7□W D-J79W D-F79F D-F7NTL	D-A73C D-A80C	D-F7□V D-F7□WV	D-J79C	D-A79W	D-P3DW□	D-P4DWL
	U	U	U	U	U	U	U	U	U	U	U
32	27	29	31.5	32.5	38.5	35	38	34	34.5	—	—
40	30.5	32.5	35	36	42	38.5	41.5	37.5	38	44	44
50	36.5	38.5	41	42	48	44.5	47.5	43.5	44	50	50
63	40	42	47.5	48.5	54.5	51	54	50	47.5	56.5	56.5
80	50	52	57.5	58.5	64.5	61	64	60	57.5	66.5	66.5
100	60	62	67.5	68.5	74.5	71	74	70	67.5	76.5	76.5

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CQ2Y

Minimum Auto Switch Mounting Stroke

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□AVL D-F7□WV	D-M9□ D-M9□W D-M9□AL D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F79F D-F7NTL	D-P3DW□	D-P4DWL
1 pc.	5	5	10	10	15	15	20	15	15
2 pcs.	5	10	10	15	15	20	20	15	15

(mm)

Operating Range

Auto switch model	Bore size (mm)					
	32	40	50	63	80	100
D-A9□(V)	9.5	9.5	9.5	11.5	9	11.5
D-M9□(V) D-M9□W(V) D-M9□A(V)L	6	5.5	6.5	7.5	7.5	8.5
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-F7NTL D-F79F	6	6	6	6.5	6.5	7
D-P3DW□	6.5	6.5	5.5	7.5	7	8.5
D-P4DWL	—	5	5	5	5	5.5

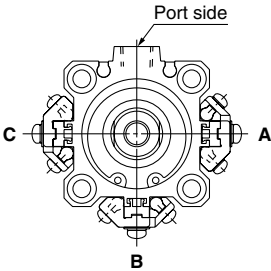
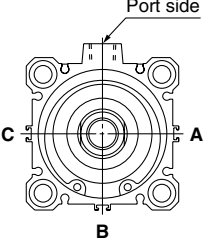
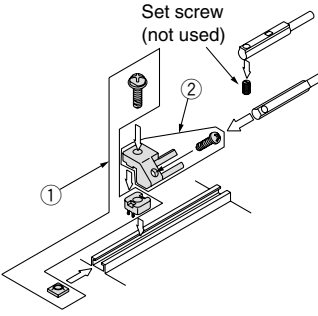
* Since this is a guideline including hysteresis, not meant to be guaranteed.

(assuming approximately ±30% dispersion.)

There may be the case it will vary substantially depending on an ambient environment.

* Auto switch mounting brackets BQ2-012 are not used for sizes over ø32 of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types. The above values indicate the operating range when mounted with the conventional auto switch installation groove.

Auto Switch Mounting Bracket/Part No.

Auto switch mounting surface	Bore size (mm)		
	32, 40, 50		63, 80, 100
			
Auto switch model	Auto switch mounting surface		Auto switch mounting surface
	Port side	A, B, C	Port, A, B, C side
D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL	No auto switch mounting bracket necessary.	①BQ-2 ②BQ2-012 Two types of auto switch mounting bracket are used as a set. 	No auto switch mounting bracket necessary.

Note 1) For CDQ2Y□32 to 50, when mounting compact auto switches on one of the three sides other than the port side (above A, B, C side) in the figure above, a separate auto switch mounting bracket is necessary as shown in the table above, so please order one separately from the cylinder.
 (The same is true when mounting compact auto switches with the auto switch mounting rail, not using the compact auto switch mounting groove, for CDQ2Y□63 to 100.)

Example

CDQ2YB32-100DM-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)	
	32	40 to 100
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/F7NTL		BQ-2
D-P3DW□		BQ6-032S
D-P4DWL	—	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 D-P4DWL are assembled at the time of shipment.

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Applicable cylinder bore size	Mass (g)
BQ-2	ø32 to ø100	1.5
BQ6-032S	ø32 to ø100	5
BQP1-050	ø40 to ø100	16

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CQ2Y

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.
For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features	Applicable bore size
Reed	D-A73	Grommet (Perpendicular)	—	ø32 to ø100
	D-A80		Without indicator light	
	D-A73H, A76H	Grommet (In-line)	—	
	D-A80H		Without indicator light	
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	ø32 to ø100
	D-F7NWV, F7BWV		Diagnostic indication (2-color indication)	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication)	
	D-F7NTL		With timer	
	D-P5DWL		Magnetic field resistant (2-color indication)	ø40 to ø100

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 and 1785.

* Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page 1746.

Smooth Cylinder

Series CM2Y

ø20, ø25, ø32, ø40

How to Order

CM2Y **L** **40** **-150-**

With auto switch **CDM2Y** **L** **40** **-150-** **M9BW**

With auto switch
(Built-in magnet)

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
U	Rod side trunnion style
T	Head side trunnion style
E	Integral clevis style
BZ	Boss-cut basic style
FZ	Boss-cut rod side flange style
UZ	Boss-cut rod side trunnion style

Bore size

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

Thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 1070.

Number of auto switches

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

Auto switch

Nil	Without auto switch
------------	---------------------

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

Made to Order
For details, refer to page 1070.

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

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Product Data Sheet - Solid State Switches																	
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire (m)					Pre-wired connector	Applicable load			
					DC	AC		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC	
				3-wire (PNP)		12 V		M9P	●	●	●	○	—	○			
		Connector	2-wire	5 V, 12 V		M9B		●	●	●	○	—	○				
			2-wire	12 V		H7C		●	—	●	●	●	—				
	Diagnostic indication (2-color)	Grommet	Yes	3-wire (NPN)		5 V, 12 V		G39A	—	—	—	—	●	—	—		IC circuit
				3-wire (PNP)		12 V		K39A	—	—	—	—	●	—	—		
				2-wire		5 V, 12 V		M9NW	●	●	●	○	—	○	IC circuit		
				2-wire		12 V		M9PW	●	●	●	○	—	○	—		
	With diagnostic output (2-color)	Grommet	Yes	4-wire (NPN)		5 V, 12 V		M9BW	●	●	●	○	—	○	—		
	H7NF			●		—		●	○	—	○	IC circuit					
Reed switch	—	Grommet	Yes	3-wire (Equiv. NPN)	24 V	5 V	12 V	A96	●	—	●	—	—	—	IC circuit	—	
			No	2-wire		100 V		A93	●	—	●	—	—	—	—		
			Yes			100 V or less		A90	●	—	●	—	—	—	IC circuit		
			No			100 V, 200 V		B54	●	—	●	●	—	—	—		
		No	200 V or less			B64		●	—	●	—	—	—				
		Connector	Yes	—		C73C		●	—	●	●	●	—	IC circuit			
			No	24 V or less		C80C		●	—	●	●	●	—				
		Terminal conduit	Yes			—		A33A	—	—	—	—	●	—	—	PLC	
						100 V, 200 V		A34A	—	—	—	—	●	—			
		DIN terminal	Yes			—		A44A	—	—	—	—	●	—	—	Relay, PLC	
						—		B59W	●	—	●	—	—	—			
		Diagnostic indication (2-color)	Grommet	Yes		—		—	—	—	—	—	—	—	—	—	—

* Lead wire length symbols: 0.5 m Nil (Example) M9NW * ○: Manufactured upon receipt of order.
 1 m M (Example) M9NWM * D-A9□V□/M9□V□/M9□WV□/M9□A(V)L types cannot be mounted.
 3 m L (Example) M9NWL * Do not add the suffix (N) indicating "no lead wire" to the part numbers of models D-A3□A,
 5 m Z (Example) M9NWZ A44A, G39A and K39A.
 None N (Example) H7CN

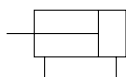
* In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 1082.
 * Refer to pages 1784 and 1785 for details of auto switches with a pre-wired connector.
 * D-A9□/M9□/□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)
 * D-C7□□/C80□/H7□□ auto switches are assembled at the time of shipment.

Series CM2Y



JIS Symbol

Double acting: Single rod



Integral clevis



Made to Order

(For details, refer to pages 1836, 1851 to 1954.)

Symbol	Specifications
—XA□	Change of rod end shape
—XC3	Special port location
—XC6	Made of stainless steel
—XC9	Adjustable stroke cylinder/adjustable retraction type
—XC13	Auto switch rail mounting style
—XC20	Head cover axial port

⚠ Precautions

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Handling Precautions

⚠ Warning

1. Do not rotate the cover

- When installing a cylinder or screwing a fitting into the port, the coupling portion of the cover may be damaged if the cover rotates.

⚠ 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.

Replacement Part: Rod Seal

Bore size (mm)	Part no.
20	PDU-8Z
25	PDU-10Z
32	PDU-12LZ
40	PDU-14LZ

Grease Pack for Maintenance

When only grease for maintenance is necessary, please order by the following part numbers.

Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	20	25	32	40
Action	Double acting, Single rod			
Piston speed	5 to 500 mm/s			
Fluid	Air			
Proof pressure	1.05 MPa			
Maximum operating pressure	0.7 MPa			
Ambient and fluid temperature	Without auto switch -10 to 70°C (with no freezing) With auto switch -10 to 60°C (with no freezing)			
Lubrication	Non-lube			
Stroke length tolerance	$^{+1.4}_{0}$ mm			
Cushion	Rubber bumper			
Allowable leakage rate	0.5 ℓ/min (ANR) or less			

Minimum Operating Pressure

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

Unit: MPa

Mounting Bracket Part No.

Mounting bracket	Minimum order	Bore size (mm)				Description (when ordering a minimum number)
		20	25	32	40	
Axial foot*	2	CM-L020B	CM-L032B	CM-L040B		Foot 2 pcs., Mounting nut 1 pc.
Flange	1	CM-F020B	CM-F032B	CM-F040B		Flange 1 pc.
Single clevis**	1	CM-C020B	CM-C032B	CM-C040B		Single clevis 1 pc., Liner 3 pcs.
Double clevis (with pin) **, ***	1	CM-D020B	CM-D032B	CM-D040B		Double clevis 1 pc., Liner 3 pcs., Clevis pin 1 pc., Retaining ring 2 pcs.
Trunnion (with nut)	1	CM-T020B	CM-T032B	CM-T040B		Trunnion 1 pc., Trunnion nut 1 pc.

* When ordering foot brackets, order 2 pieces per cylinder unit.

** Three liners are included in the clevis bracket for adjusting an angle when mounting it.

*** Clevis pins and retaining rings (cotter pins for ø40) are included.

Mounting Bracket and Accessory

Accessory	Standard			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Note 3) Double knuckle joint	Note 4) Clevis bracket
Basic style	● (1 pc.)	●	—	●	●	—
Axial foot style	● (2)	●	—	●	●	—
Rod side flange style	● (1)	●	—	●	●	—
Head side flange style	● (1)	●	—	●	●	—
Integral clevis style	— Note 1)	●	—	●	●	●
Single clevis style	— Note 1)	●	—	●	●	—
Double clevis style Note 3)	— Note 1)	●	● Note 5)	●	●	—
Rod side trunnion style	● (1) Note 2)	●	—	●	●	—
Head side trunnion style	● (1) Note 2)	●	—	●	●	—
Boss-cut basic style	● (1)	●	—	●	●	—
Boss-cut flange style	● (1)	●	—	●	●	—
Boss-cut trunnion style	● (1)	●	—	●	●	—



Note 1) Mounting nuts are not attached to the integral clevis, single clevis and double clevis types.

Note 2) Trunnion nuts are mounted on the rod side trunnion style and head side trunnion style.

Note 3) Pins and retaining rings (cotter pins in case of ø40) are packed with the double clevis and double knuckle joint styles.

Note 4) Pins and retaining rings are packed with clevis brackets.

Note 5) Retaining rings (cotter pins for ø40) are included in clevis pins.

Standard Stroke

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



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

Note 2) As the stroke increases, more sliding resistance may result due to the deflection of the piston rod and other factors. Take measures such as the installation of a guide.



Mass

(kg)

Bore size (mm)		20	25	32	40
Basic mass	Basic style	0.14	0.21	0.28	0.56
	Axial foot style	0.29	0.37	0.44	0.83
	Flange style	0.20	0.30	0.37	0.68
	Clevis integrated style	0.12	0.19	0.27	0.52
	Single clevis style	0.18	0.25	0.32	0.65
	Double clevis style	0.19	0.27	0.33	0.69
	Trunnion style	0.18	0.28	0.34	0.66
	Boss-cut basic style	0.13	0.19	0.26	0.53
	Boss-cut flange style	0.19	0.28	0.35	0.65
	Boss-cut trunnion style	0.17	0.26	0.32	0.63
Additional mass per each 50 mm of stroke		0.04	0.06	0.08	0.13
Option bracket	Clevis bracket (With pin)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) **CM2YL32-100**

- Basic mass.....0.44 (Foot style, ø32)
 - Additional mass.....0.08/50 stroke
 - Cylinder stroke.....100 stroke
- $$0.44 + 0.08 \times 100/50 = 0.60 \text{ kg}$$

Low Friction Cylinder MountingCM2Y Mounting style Bore size - Stroke - **X1854**

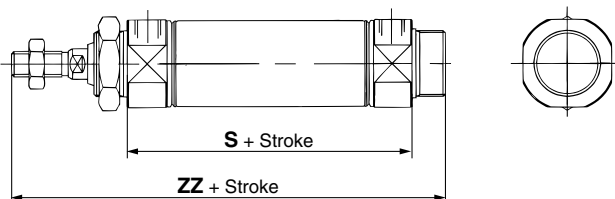
Same mounting specification as CM2Q

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

Specifications

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

* Low friction operates in dual directions.

Dimensions

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

* Add 3 mm to S and ZZ dimensions of the double acting, single rod type on pages 1072 to 1076 for the dimensions for each mounting bracket other than the basic style.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

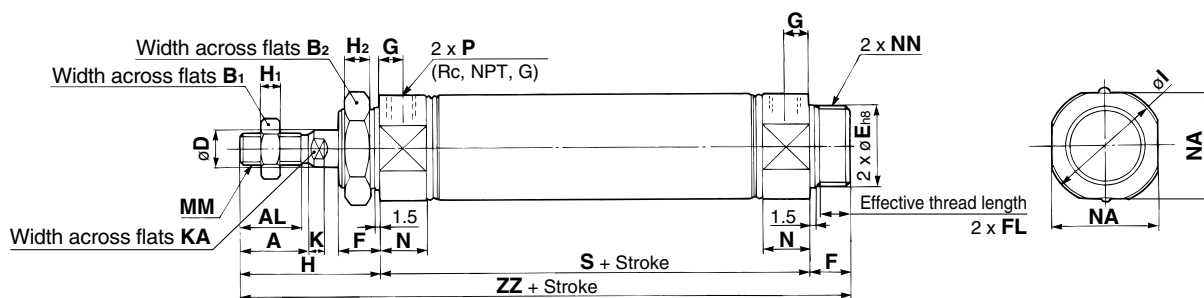
-X□

Individual
-X□

Series CM2Y

Basic Style (B)

CM2YB Bore size — Stroke



Boss-cut



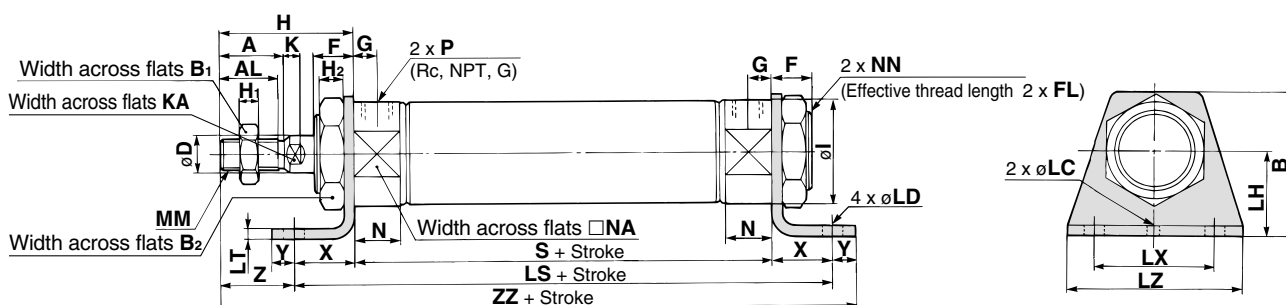
Bore size (mm)	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	H ₂	I	K	KA	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	32 ⁰ _{0.039}	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	154

Boss-cut (mm)

Bore size (mm)	ZZ
20	103
25	107
32	109
40	138

Axial Foot Style (L)

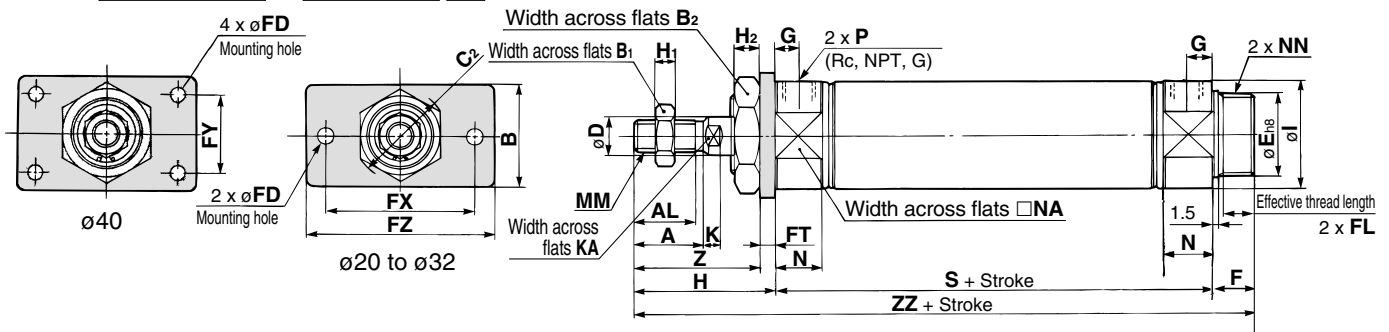
CM2YL Bore size — Stroke



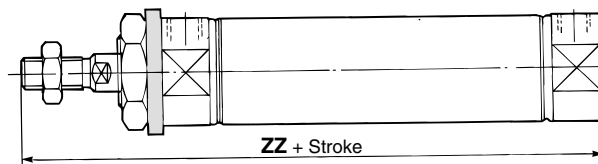
Bore size (mm)	A	AL	B	B ₁	B ₂	D	F	FL	G	H	H ₁	H ₂	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	N	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	15	24	M20 x 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	15	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	15	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	21.5	42.5	M32 x 2	1/4	88	23	10	27	171

Rod Side Flange Style (F)

CM2YF Bore size — Stroke



Boss-cut style



Bore size (mm)	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I	K	KA	MM	N	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	45	154

Boss-cut Style (mm)

Bore size (mm)	ZZ
20	103
25	107
32	109
40	138

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

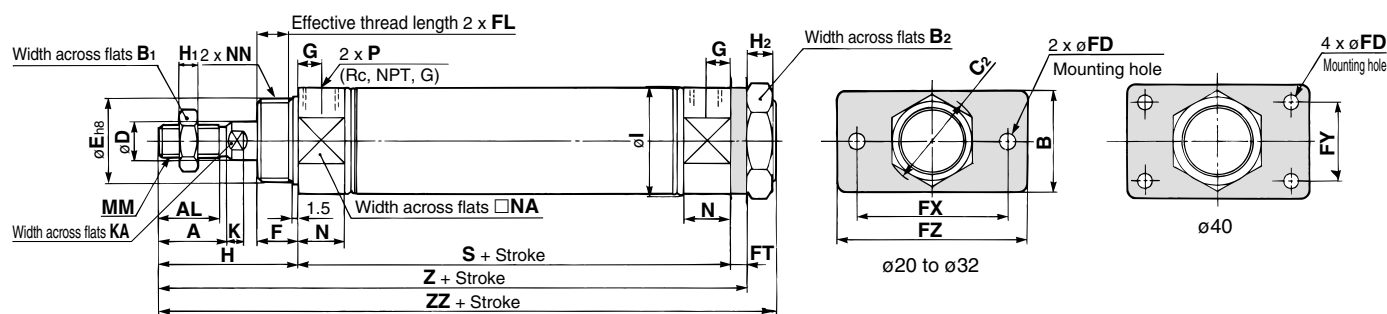
-X□

Individual
-X□

Series CM2Y

Head Side Flange Style (G)

CM2YG Bore size — Stroke

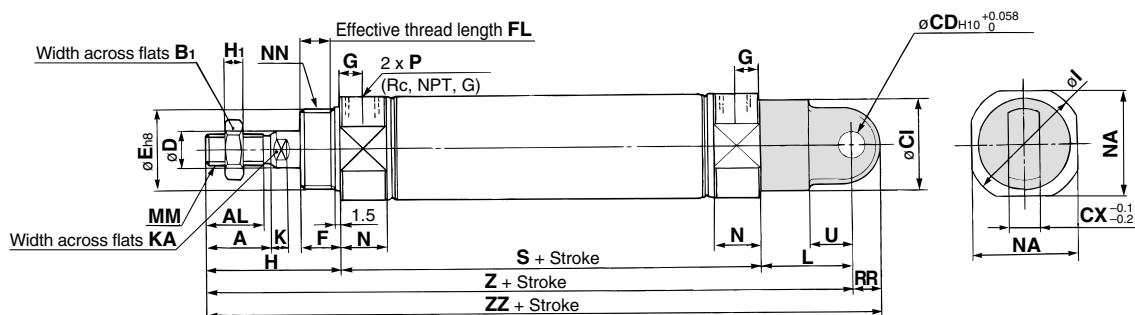


Bore size (mm)	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10	46.5

Bore size (mm)	K	KA	MM	N	NA	NN	P	S	Z	ZZ
20	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	62	107	116
25	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	62	111	120
32	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	113	122
40	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	143	154

Single Clevis Style (C)

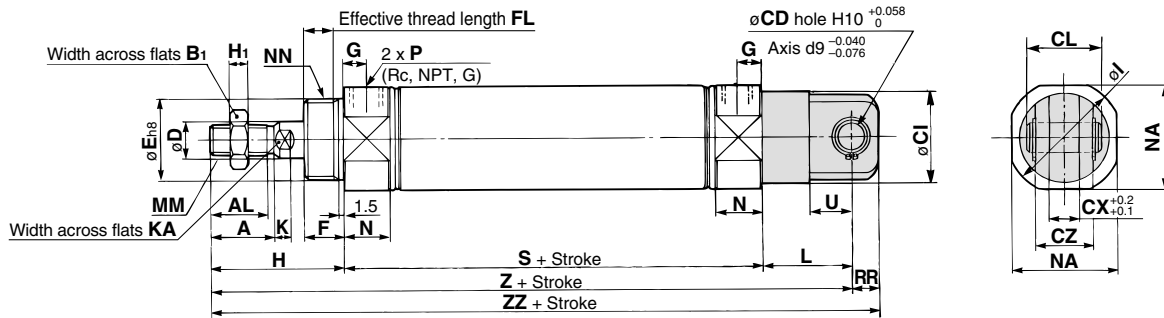
CM2YC Bore size — Stroke



Bore size (mm)	A	AL	B ₁	CI	CD	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	N	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	24	9	10	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	38	10	15	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	88	18	177	188

Double Clevis Style (D)

CM2YD Bore size — Stroke

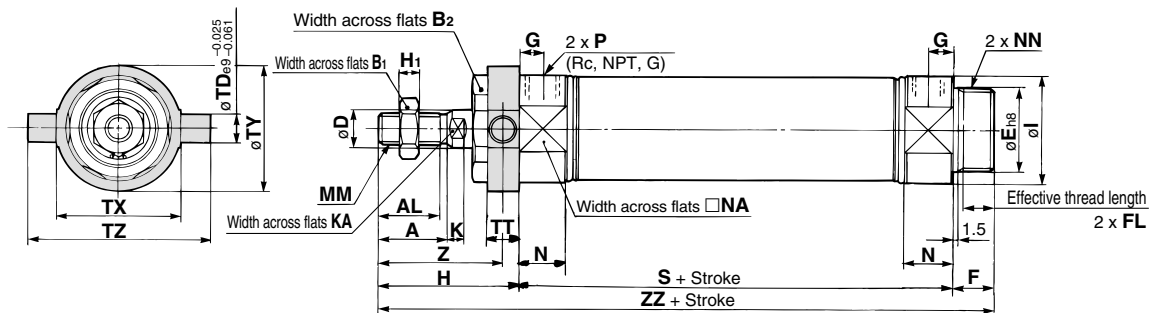
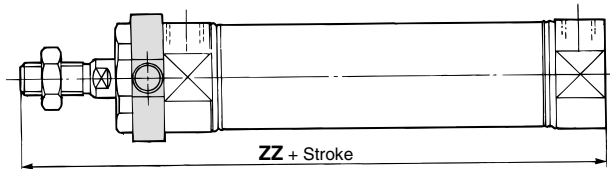


Bore size (mm)	A	AL	B ₁	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	N	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	9	24	25	10	19	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	9	30	25	10	19	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	9	30	25	10	19	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	10	38	41.2	15	30	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	88	18	177	188

* Clevis pin and snap ring (cotter pin for bore size ø40) are shipped together.

Rod Side Trunnion Style (U)

CM2YU Bore size — Stroke

**Boss-cut style**

Bore size (mm)	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	N	NA	NN	P
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4

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

Boss-cut Style (mm)

Bore size (mm)	ZZ
20	103
25	107
32	109
40	138

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

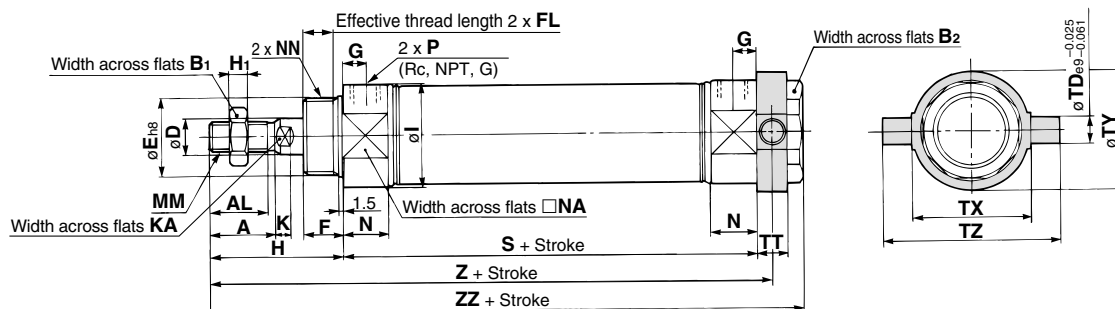
-X□

Individual
-X□

Series CM2Y

Head Side Trunnion Style (T)

CM2YT Bore size — Stroke

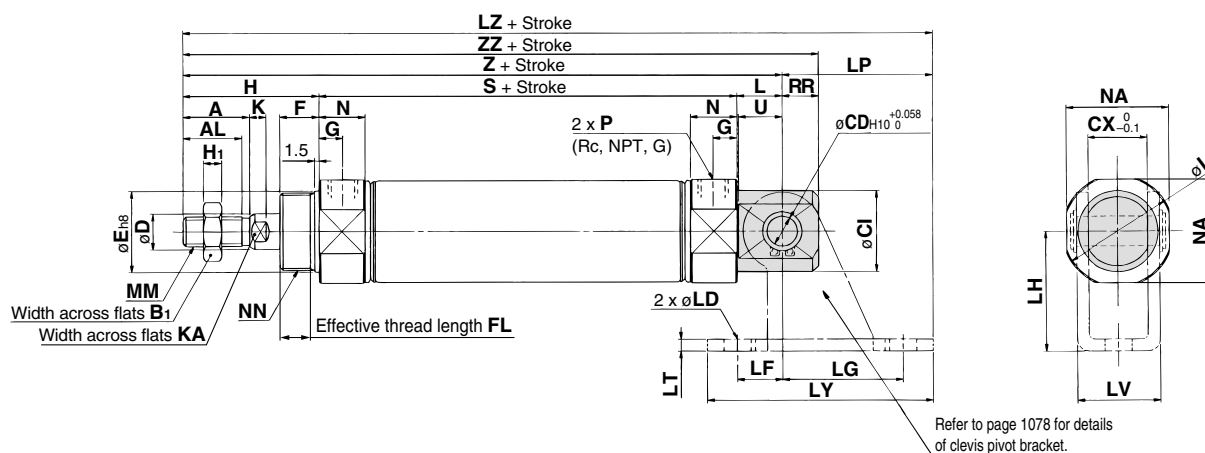


Bore size (mm)	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	N	NA	NN	P
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4

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

Clevis Integrated Style (E)

CM2YE Bore size — Stroke



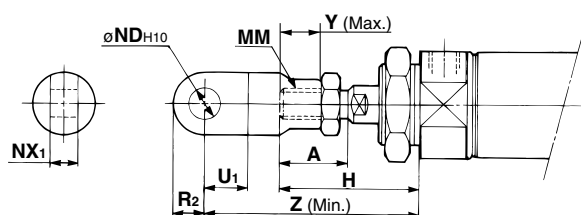
Bore size (mm)	A	AL	B ₁	CD	CI	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	N	NA	NN
20	18	15.5	13	8	20	12	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	12	M8 x 1.25	15	24	M20 x 1.5
25	22	19.5	17	8	22	12	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	12	M10 x 1.25	15	30	M26 x 1.5
32	22	19.5	17	10	27	20	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	15	M10 x 1.25	15	34.5	M26 x 1.5
40	24	21	22	10	33	20	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	21.5	42.5	M32 x 2

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

Accessory Bracket Dimensions

Single Knuckle Joint

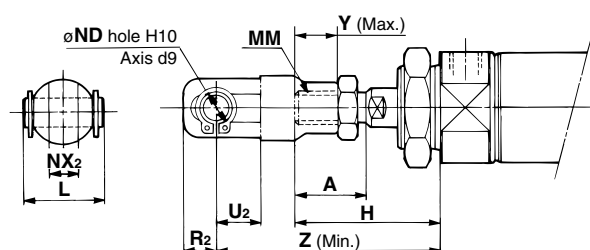
(mm)



Bore size	A	H	MM	ND _{H10}	NX ₁	U ₁	R ₂	Y	Z
20	18	41	M8 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	14	10	11	66
25, 32	22	45	M10 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	14	10	14	69
40	24	50	M14 x 1.5	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.2}	20	14	13	92

Double Knuckle Joint

(mm)



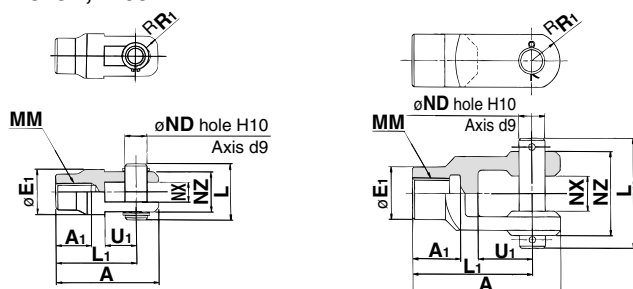
Bore size	A	H	L	MM	ND	NX ₂	R ₂	U ₂	Y	Z
20	18	41	25	M8 x 1.25	9	9 ^{+0.2 +0.1}	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	9 ^{+0.2 +0.1}	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	16 ^{+0.3 +0.1}	13	25	13	92

Double Knuckle Joint

(mm)

Y-020B, Y-032B Material: Rolled steel

Y-040B Material: Cast iron



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

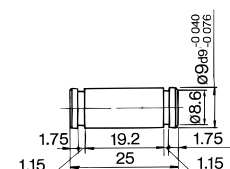
* Clevis pin and retaining ring (cotter pin for $\varnothing 40$) are attached.

Double Clevis Pin/Material: Carbon steel

(mm)

Bore size: ø20, ø25, ø32

CDP-1

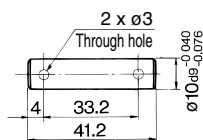


Retaining ring: Type C9 for axis

* Retaining rings (cotter pins for ø40) are included.

Bore size: ø40

CDP-2



Cotter pin
ø3 x 18ℓ

Single Knuckle Joint

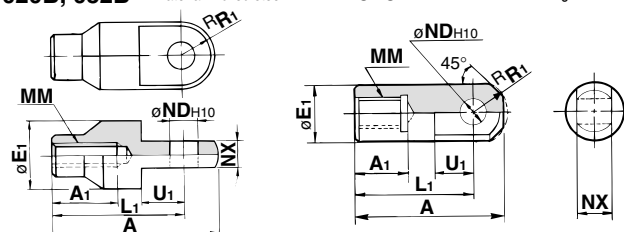
(mm)

I-020B, 032B

Material: Rolled steel

I-040B

Material: Free cutting sulfur steel



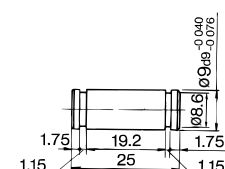
Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	ND _{H10}	NX	R ₁	U ₁
I-020B	20	46	16	20	36	M8 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-032B	25, 32	48	18	20	38	M10 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-040B	40	69	22	24	55	M14 x 1.5	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.2}	15.5	20

Double Knuckle Pin

(mm)

Bore size: ø20, ø25, ø32

CDP-1

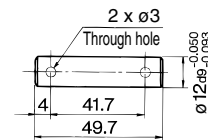


Retaining ring: Type C9 for axis

* Retaining rings (cotter pins for ø40) are included.

Bore size: ø40

CDP-3

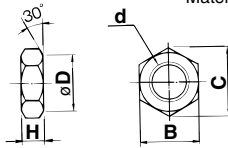


Cotter pin
ø3 x 18ℓ

Series CM2Y

Rod End Nut (mm)

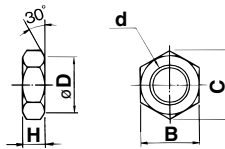
Material: Carbon steel



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

Mounting Nut (mm)

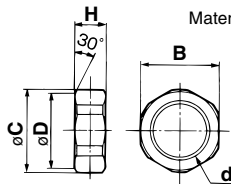
Material: Carbon steel



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

Trunnion Nut (mm)

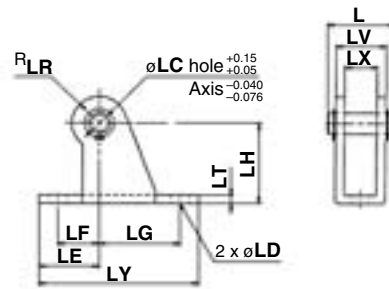
Material: Carbon steel



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

Clevis Pivot Bracket (For CM2E) (mm)

Material: Rolled steel plate



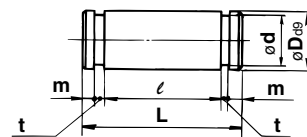
Part no.	Applicable bore size (mm)	L	LC	LD	LE	LF	LG	LH	LR	LT	LX	LY	LV	Applicable pin part no.
CM-E020B	20, 25	24.5	8	6.8	22	15	30	30	10	3.2	12	59	18.4	CD-S02
CM-E032B	32, 40	34	10	9	25	15	40	40	13	4	20	75	28	CD-S03

Note 1) Clevis bracket pins and retaining rings are included.

Note 2) It cannot be used for single clevis style (CM2C) and double clevis style (CM2D).

Clevis Pin (For CM2E) (mm)

Material: Carbon steel



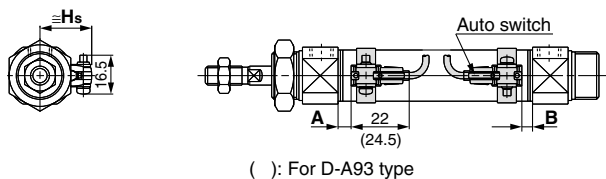
Part no.	Applicable bore size (mm)	Dd9	d	L	ℓ	m	t	Applicable retaining ring part no.
CD-S02	20, 25	8 ^{+0.040} _{-0.076}	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	32, 40	10 ^{+0.040} _{-0.076}	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

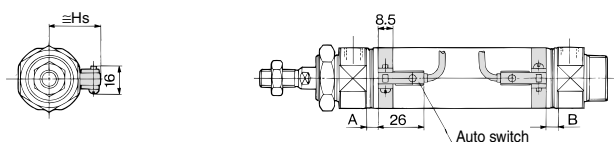
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Reed auto switch

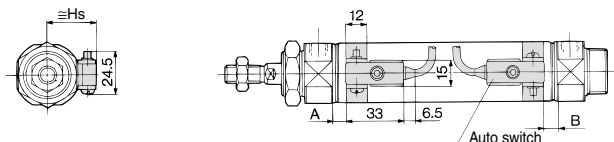
D-A9□



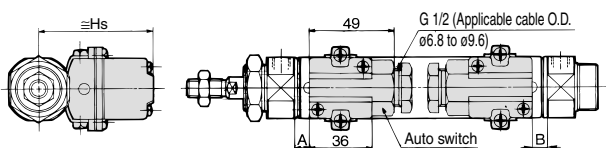
D-C7/C8



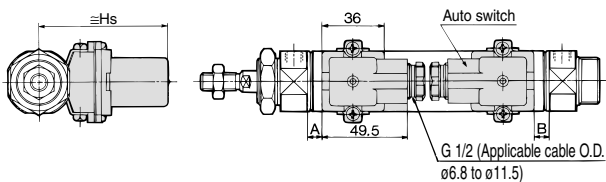
D-B5/B6/B59W



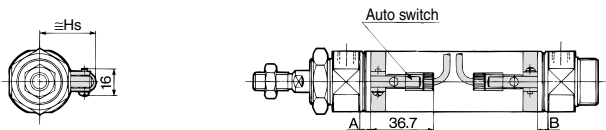
D-A33A/A34A



D-A44A



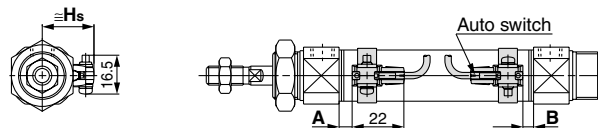
D-C73C/C80C



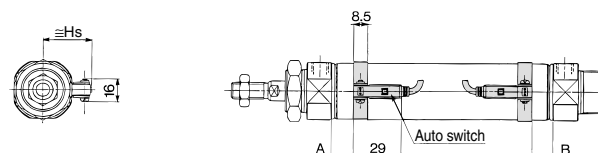
Solid state auto switch

D-M9□

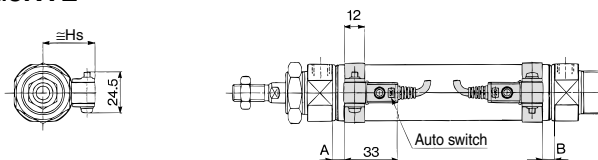
D-M9□W



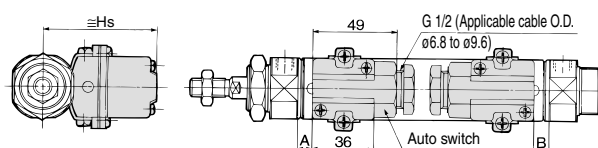
D-H7□/H7□W/H7NF



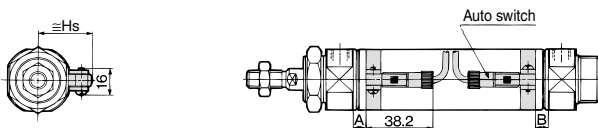
D-G5NTL



D-G39A/K39A



D-H7C



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CM2Y

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

Auto switch model Bore size (mm)	D-A9□		D-M9□ D-M9□W		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7□ D-H7C D-H7□W D-H7NF		D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	6.5	5.5	10.5	9.5	1	0	7	6	4	3	0.5	0	6	5	2.5	1.5
25	6.5	5.5	10.5	9.5	1	0	7	6	4	3	0.5	0	6	5	2.5	1.5
32	7.5	6.5	11.5	10.5	2	1	8	7	5	4	1.5	0.5	7	6	3.5	2.5
40	13.5	11.5	17.5	15.5	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 conditions in the actual setting.

Auto Switch Mounting Height

(mm)

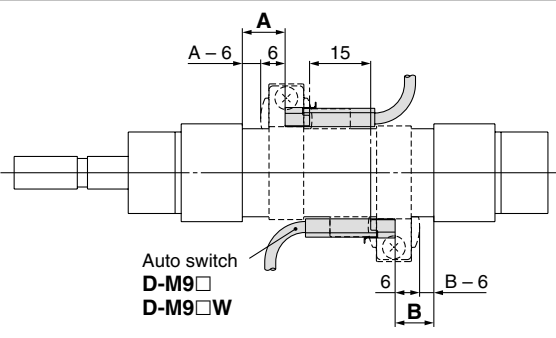
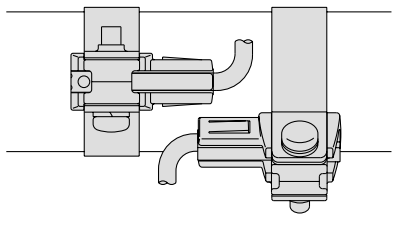
Auto switch model Bore size (mm)	D-A9□ D-M9□ D-M9□W	D-B5□ D-B64 D-B59W D-G5NTL D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C	D-A3□A D-G39A D-K39A	D-A44A
	Hs	Hs	Hs	Hs	Hs	Hs
20	22	25.5	22.5	25	60	69.5
25	24.5	28	25	27.5	62.5	72
32	28	31.5	28.5	31	66	75.5
40	32	35.5	32.5	35	70	79.5

Minimum Auto Switch Mounting Stroke

n: No. of auto switch (mm)

Auto switch model	No. of auto switch mounted				
	1 pc.	2 pcs.		n pcs.	
		Different surfaces	Same surface	Different surfaces	Same surface
D-A9□ D-M9□ D-M9□W	10	15 Note 1)	45 Note 1)	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	45 + 45 (n-2)
D-C7□ D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	50 + 45 (n-2)
D-H7□ D-H7□W D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	60 + 45 (n-2)
D-C73C D-C80C D-H7C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	65 + 50 (n-2)
D-B5□/B64 D-G5NTL	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55 (n-2)
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55(n-2)
D-A3□A/G39A D-K39A/A44A	10	35	100	35 + 30(n-2)	100 + 100 (n-2)

Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

Auto switch model	With 2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
	 The proper auto switch mounting position is 6 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-A93	—	45 to less than 50 stroke
D-M9□ D-M9□W	15 to less than 20 stroke	45 to less than 55 stroke

Operating Range

(mm)

Auto switch model	Bore size (mm)			
	20	25	32	40
D-A9□	6	6	6	6
D-M9□ D-M9□W	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
D-B59W	12	12	13	13
D-H7□/H7□W D-G5NTL/H7NF	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A	8	9	9	9

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

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

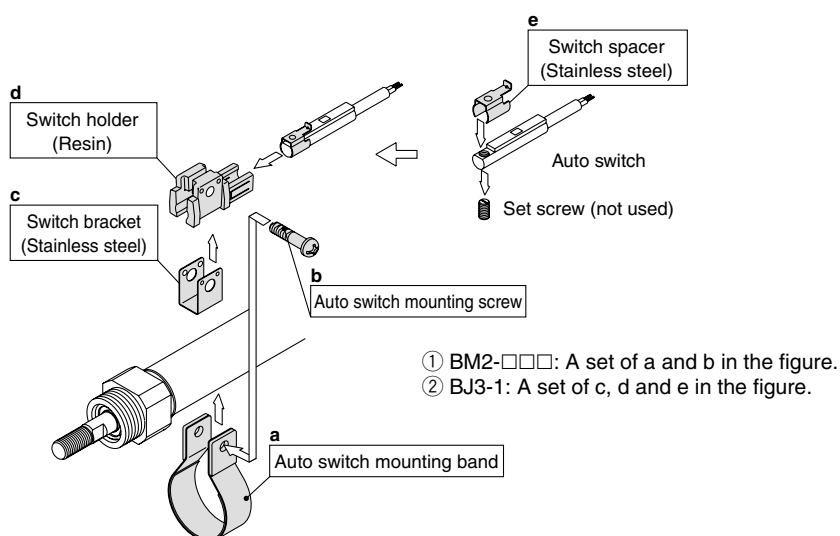
-X□

Individual
-X□

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-A9□ D-M9□ D-M9□W	Note) ①BM2-020 ②BJ3-1	Note) ①BM2-025 ②BJ3-1	Note) ①BM2-032 ②BJ3-1	Note) ①BM2-040 ②BJ3-1
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-B59W D-G5NTL	BA2-020	BA2-025	BA2-032	BA2-040
D-A3□A/A44A D-G39A/K39A	BM3-020	BM3-025	BM3-032	BM3-040

Note) Two kinds of auto switch mounting brackets are used as a set.



Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features
Reed	D-B53, C73, C76	Grommet (In-line)	—
	D-C80		Without indicator light
Solid state	D-H7A1, H7A2, H7B		—
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)
	D-G5NTL		With timer

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 and 1785.

* Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page 1746.

* Wide range detection type, solid state auto switches (D-G5NBL type) are also available. Refer to page 1776 for details.

Smooth Cylinder

Series CG1Y

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

How to Order

CG1Y **L** **25** **-** **100** **-**

With auto switch **CDG1Y** **L** **25** **-** **100** **-** **M9BW** **-**

With auto switch
(Built-in magnet)

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
U *	Rod side trunnion style
T *	Head side trunnion style
D	Clevis style

* Not available at ø80 and ø100.
Note) Mounting brackets are not mounted and are supplied loose at the time of shipment.

Bore size

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

Port thread type

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

Auto switch
Nil Without auto switch

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

Made to Order
For details, refer to page 1084.

Number of auto switches

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

Cylinder stroke (mm)
Refer to "Standard Stroke" on next page.

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

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Applicable Auto Switch Model/Notes refer to pages 1716 to 1821 for further information on auto switches.																			
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire (m)					Pre-wired connector	Applicable load				
					DC	AC	Applicable bore size ø20 to ø63 ø80, ø100		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)						
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9N	—	●	●	●	○	—	○	IC circuit	Relay, PLC			
				3-wire (PNP)			G59	●	—	●	○	—	○						
	Connector	2-wire		12 V	M9P		—	●	●	●	○	—	○	—					
					G5P		●	—	●	○	—	○							
	Diagnostic indication (2-color)	Grommet		3-wire (NPN)	24 V		5 V, 12 V	M9B	—	●	●	●	○	—	○		IC circuit		
								H7C	—	●	—	●	●	●	—				
				3-wire (PNP)	M9NW		—	●	●	●	○	—	○	—					
					G59W		●	—	●	○	—	○							
				2-wire	12 V		M9PW	—	●	●	●	○	—	○	—				
							G5PW	●	—	●	○	—	○						
	Water resistant (2-color)	Grommet		4-wire(NPN)	5 V, 12 V		M9BW	—	●	●	●	○	—	○	IC circuit				
							K59W	●	—	●	○	—	○						
With diagnostic output (2-color)	Grommet	4-wire(NPN)	5 V, 12 V	H7BA**	G5BA**		—	—	●	○	—	○	IC circuit						
				H7NF	G59F		●	—	●	○	—	○							
Reed switch	—	Grommet	Yes	3-wire (Equiv. NPN)	—		5 V	—	A96	—	●	—	●	—	—		—	IC circuit	—
				2-wire	24 V		12 V	100 V	A93	—	●	—	●	—	—		—	—	—
								100 V or less	A90	—	●	—	●	—	—		—	—	—
								100 V, 200 V	B54		●	—	●	●	—		—	—	—
		200 V or less						B64		●	—	●	—	—	—		—		
		Connector		2-wire	12 V		—	C73C	—	●	—	●	●	●	—			—	IC circuit
	24 V or less						C80C	—	●	—	●	●	●	—	—				
	Diagnostic indication (2-color)	Grommet		Yes	—		—	B59W		●	—	●	—	—	—	—	—		

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

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWLZ
None N (Example) H7CN

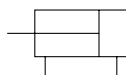
* O: Manufactured upon receipt of order.
* D-A9□V/M9□V/M9□WV/M9□A(V)L types cannot be mounted.

* In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 1093.
* Refer to pages 1784 and 1785 for details of auto switches with a pre-wired connector.
* D-A9□/M9□/M9□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

Series CG1Y



JIS Symbol



Made to Order

(For details, refer to pages 1836, 1882 and 1917.)

Symbol	Specifications
—XA□	Change of rod end shape
—XC6	Made of stainless steel
—XC20	Head cover axial port

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
20	CG1Y20-PS	Piston seal 1 pc.
25	CG1Y25-PS	Rod seal 1 pc.
32	CG1Y32-PS	Tube gasket 2 pcs.
40	CG1Y40-PS	Grease pack (10 g) 1 pc.

When only grease for maintenance is necessary, please order by the following part numbers.

Grease pack part no.: **GR-L-005** (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting, Single rod							
Type	Non-lube							
Fluid	Air							
Proof pressure	1.05 MPa							
Maximum operating pressure	0.7 MPa							
Ambient and fluid temperature	Without auto switch -10 to 70°C (with no freezing)							
	With auto switch -10 to 60°C (with no freezing)							
Operating piston speed	5 to 500 mm/s							
Stroke length tolerance	Up to 300 st + 1.4 ₀ mm							
Cushion	Rubber bumper							
Mounting	Basic, Axial foot, Rod side flange, Head side flange, Rod side trunnion, Head side trunnion, Clevis (in case of 90° change in port location)							
Allowable leakage rate	0.5 ℓ/min (ANR) or less							



* Rod side trunnion and head side trunnion styles are not available at ø80 and ø100.

Minimum Operating Pressure

Unit: MPa

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

Standard Stroke

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



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

Note 2) Please consult with SMC for strokes outside the above ranges.

Note 3) As the stroke increases, more sliding resistance may result due to the deflection of the piston rod and other factors. Take measures such as the installation of a guide.

Mounting Bracket Part No.

Mounting bracket	Min. order	Bore size (mm)								Description
		20	25	32	40	50	63	80	100	
Foot	2 ^{Note)}	CG-L020	CG-L025	CG-L032	CG-L040	CG-L050	CG-L063	CG-L080	CG-L100	Foot x 2, Bracket mounting bolt x 8
Flange	1	CG-F020	CG-F025	CG-F032	CG-F040	CG-F050	CG-F063	CG-F080	CG-F100	Flange x 1, Bracket mounting bolt x 4
Trunnion pin	1	CG-T020	CG-T025	CG-T032	CG-T040	CG-T050	CG-T063	—	—	Trunnion pin x 2, Trunnion pivot bracket x 2, Flat washer x 2
Clevis	1	CG-D020	CG-D025	CG-D032	CG-D040	CG-D050	CG-D063	CG-D080	CG-D100	Clevis x 1, Bracket mounting bolt x 4, Clevis pin x 1, Retaining ring x 2
Pivot bracket	1	CG-020-24A	CG-025-24A	CG-032-24A	CG-040-24A	CG-050-24A	CG-063-24A	CG-080-24A	CG-100-24A	Pivot bracket x 1

Note) Order two foot brackets per cylinder.

Mass

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

Calculation: (Example) **CG1YL20-100**
(Foot style, ø20, 100 st)

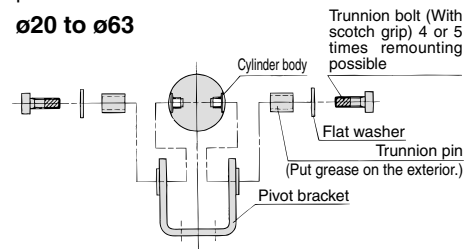
- Basic mass..... 0.22 (Foot, ø20)
- Additional mass..... 0.05/50 stroke
- Cylinder stroke..... 100 stroke
- $0.22 + 0.05 \times 100/50 = 0.32$ kg

Mounting Procedure

Mounting procedure for trunnion

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

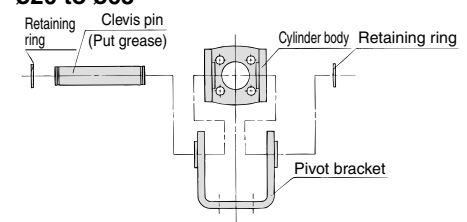
ø20 to ø63



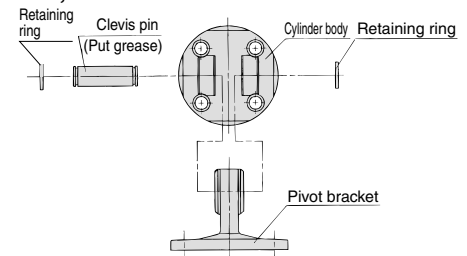
Mounting procedure for clevis

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

ø20 to ø63



ø80, ø100



⚠ Precautions

- Be sure to read before handling.
- Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Operating Precautions

⚠ Warning

1. Operate within the specified cylinder speed.
Otherwise, cylinder and seal damage may occur.
2. When operating a cylinder as a single side fixed (Basic/flange style), a bending moment generated at the stroke end due to vibration will be applied to the cylinder, which may damage it. In such cases, install a bracket to prevent vibration or lower the piston speed until the cylinder does not vibrate at the stroke end.

⚠ Caution

1. Tighten clevis bracket mounting bolts with the proper tightening torque shown listed below.
ø20: 1.5 N·m, ø25 to 32: 2.9 N·m, ø40: 4.9 N·m,
ø50: 11.8 N·m, ø63 to 80: 24.5 N·m, ø100: 42.2 N·m

Disassembly/Replacement

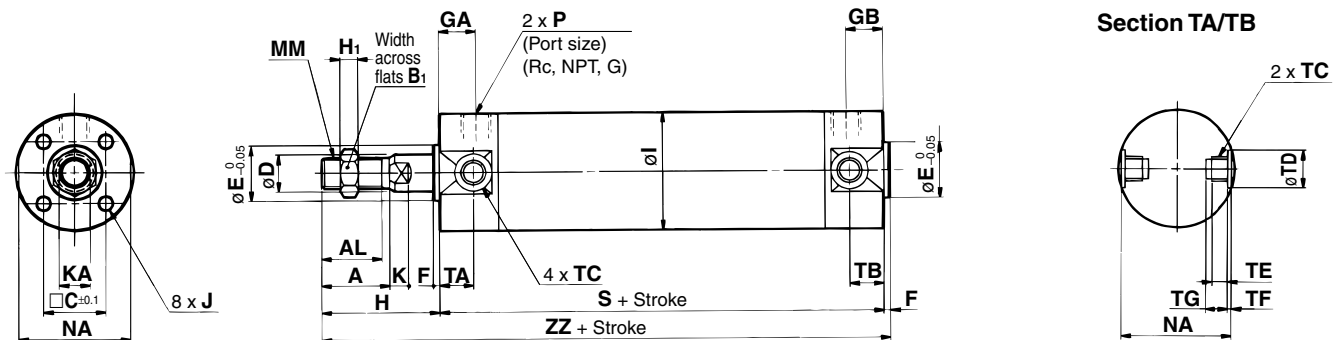
⚠ Caution

1. Do not replace the bushings.
The bushings are press-fit. To replace them, they must be replaced together with the cover assembly.
2. To replace a seal, apply grease to the new seal before installing it.
If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.
3. Those with a bore of ø50 or more cannot be disassembled.
When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

Series CG1Y

Dimensions: ø20 to ø100

Basic style: CG1YB



Section TA/TB

(mm)

Bore size (mm)	TC*	TDH9	TE	TF	TG
20	M5 x 0.8	8 ^{+0.08} ₀	4	0.5	5.5
25	M6 x 0.75	10 ^{+0.08} ₀	5	1	6.5
32	M8 x 1.0	12 ^{+0.08} ₀	5.5	1	7.5
40	M10 x 1.25	14 ^{+0.08} ₀	6	1.25	8.5
50	M12 x 1.25	16 ^{+0.08} ₀	7.5	2	10
63	M14 x 1.5	18 ^{+0.08} ₀	11.5	3	14.5

* Trunnion mounting taps for the width across flats NA are not attached to ø80 and ø100 types.

(mm)

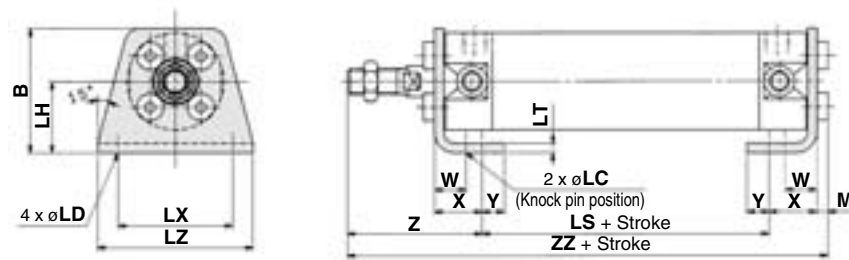
Bore size (mm)	Stroke range (mm)	A	AL	B1	C	D	E	F	H	H1	I	J	K	KA	MM	NA
20	Up to 200	18	15.5	13	14	8	12	2	35	5	26	M4 x 0.7 depth 7	5	6	M8 x 1.25	24
25	Up to 300	22	19.5	17	16.5	10	14	2	40	6	31	M5 x 0.8 depth 7.5	5.5	8	M10 x 1.25	29
32	Up to 300	22	19.5	17	20	12	18	2	40	6	38	M5 x 0.8 depth 8	5.5	10	M10 x 1.25	35.5
40	Up to 300	30	27	19	26	16	25	2	50	8	47	M6 x 1 depth 12	6	14	M14 x 1.5	44
50	Up to 300	35	32	27	32	20	30	2	58	11	58	M8 x 1.25 depth 16	7	18	M18 x 1.5	55
63	Up to 300	35	32	27	38	20	32	2	58	11	72	M10 x 1.5 depth 16	7	18	M18 x 1.5	69
80	Up to 300	40	37	32	50	25	40	3	71	13	89	M10 x 1.5 depth 22	10	22	M22 x 1.5	80
100	Up to 300	40	37	41	60	30	50	3	71	16	110	M12 x 1.75 depth 22	10	26	M26 x 1.5	100

(mm)

Bore size (mm)	Stroke range (mm)	S	TA	TB	ZZ	Rc, NPT port			G port		
						GA	GB	P	GA	GB	P
20	Up to 200	77	11	11	114	12	12	1/8	12	12	M5 x 0.8
25	Up to 300	77	11	11	119	12	12	1/8	12	12	M5 x 0.8
32	Up to 300	79	11	11	121	12	12	1/8	10	10	1/8
40	Up to 300	87	12	12	139	13	13	1/8	10	10	1/8
50	Up to 300	102	13	13	162	14	14	1/4	12	12	1/4
63	Up to 300	102	13	13	162	14	14	1/4	12	12	1/4
80	Up to 300	122	—	—	196	20	20	3/8	17	17	3/8
100	Up to 300	122	—	—	196	20	20	1/2	17	17	1/2

With Mounting Bracket

Axial foot style: CG1YL

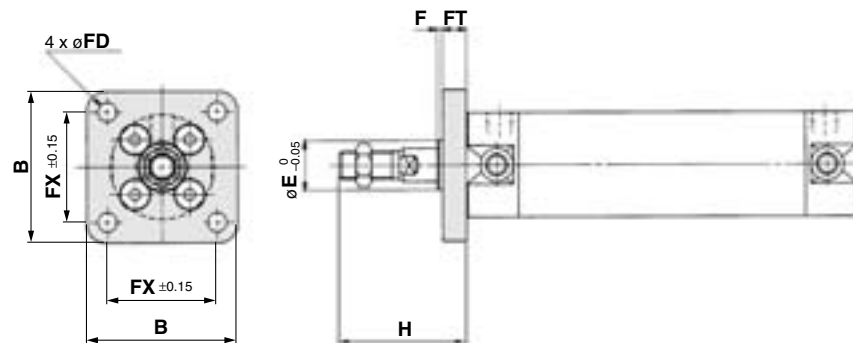


Axial Foot Style

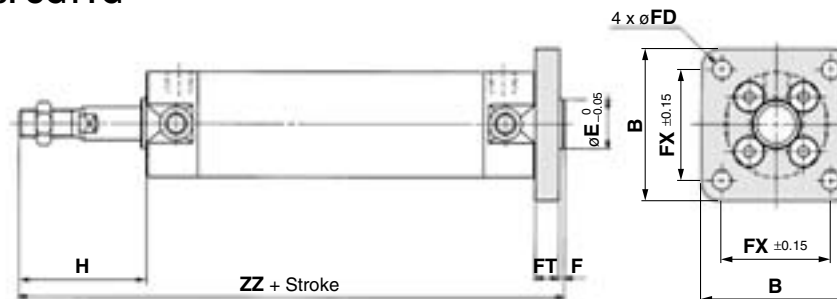
Bore size (mm)	B	LC	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ
20	34	4	6	20	53	3	32	44	3	10	15	7	47	118
25	38.5	4	6	22	53	3	36	49	3.5	10	15	7	52	123.5
32	45	4	7	25	53	3	44	58	3.5	10	16	8	53	125.5
40	54.5	4	7	30	60	3	54	71	4	10	16.5	8.5	63.5	144
50	70.5	5	10	40	67	4.5	66	86	5	17.5	22	11	75.5	169.5
63	82.5	5	12	45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

* Other dimensions are the same as basic style.

Rod side flange style: CG1YF



Head side flange style: CG1YG



Flange Style

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

Note) End boss is machined on the flange for øE.

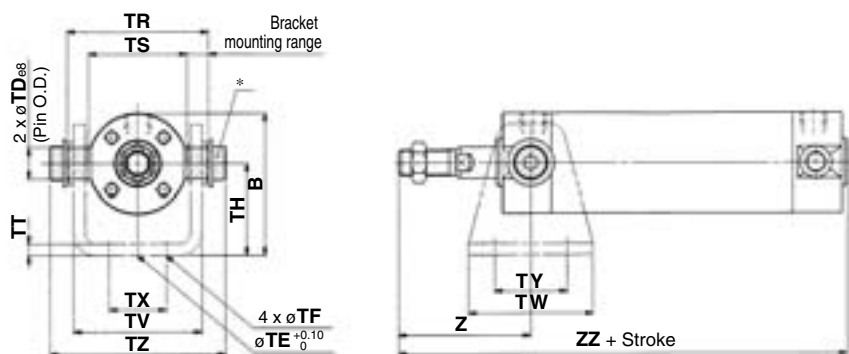
* Other dimensions are the same as basic style.

REA
REB
REC
C□Y
C□X
MQ
RHC
RZQ
D-□
-X□
Individual
-X□

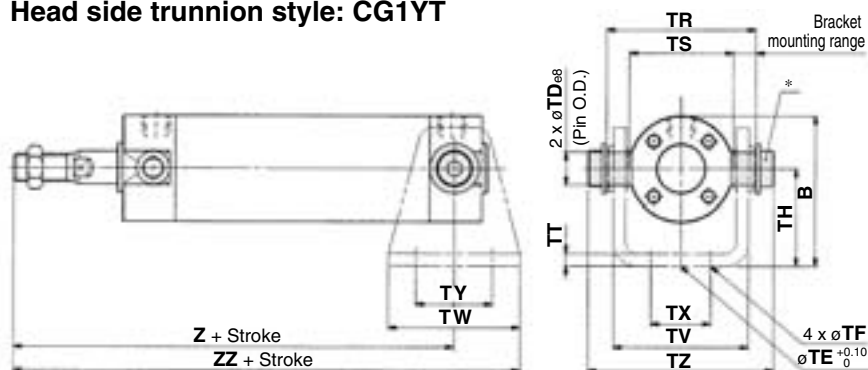
Series CG1Y

With Mounting Bracket

Rod side trunnion style: CG1YU



Head side trunnion style: CG1YT



Trunnion Style

(mm)

Bore size (mm)	B	TDe8	TE	TF	TH	TR	TS	TT	TV
20	38	8 ^{-0.025} _{-0.047}	10	5.5	25	39	28	3.2	(35.8)
25	45.5	10 ^{-0.025} _{-0.047}	10	5.5	30	43	33	3.2	(39.8)
32	54	12 ^{-0.032} _{-0.059}	10	6.6	35	54.5	40	4.5	(49.4)
40	63.5	14 ^{-0.032} _{-0.059}	10	6.6	40	65.5	49	4.5	(58.4)
50	79	16 ^{-0.032} _{-0.059}	20	9	50	80	60	6	(72.4)
63	96	18 ^{-0.032} _{-0.059}	20	11	60	9	74	8	(90.4)

Bore size (mm)	TW	TX	TY	TZ	Rod side			Head side	
					Z			Z	ZZ
20	42	16	28	47.6	46			101	122
25	42	20	28	53	51			106	127
32	48	22	28	67.7	51			108	132
40	56	30	30	78.7	62			125	153
50	64	36	36	98.6	71			147	179
63	74	46	46	119.2	71			147	184

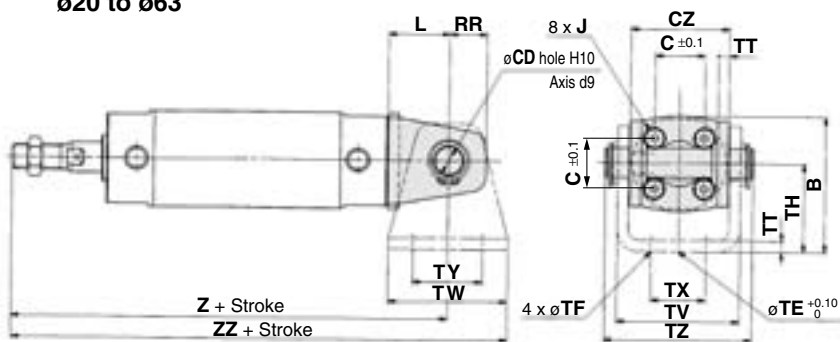
* Consists of pin, flat washer and hexagon socket head cap bolt.

Note) Refer to page 1089 for pivot bracket.

* Other dimensions are the same as basic style.

Clevis style: CG1YD

ø20 to ø63



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

Clevis Style

(mm)

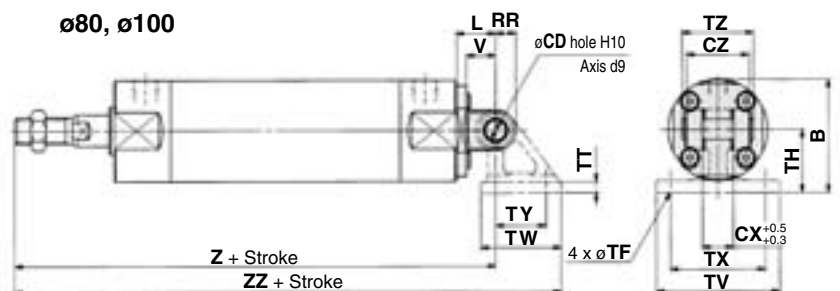
Bore size (mm)	B	CD	CX	CZ	L	RR	V	TE	TF	TH
20	38	8	—	29	14	11	—	10	5.5	25
25	45.5	10	—	33	16	13	—	10	5.5	30
32	54	12	—	40	20	15	—	10	6.6	35
40	63.5	14	—	49	22	18	—	10	6.6	40
50	79	16	—	60	25	20	—	20	9	50
63	96	18	—	74	30	22	—	20	11	60
80	99.5	18	28	56	35	18	26	—	11	55
100	120	22	32	64	43	22	32	—	13.5	65

Bore size (mm)	TT	TV	TW	TX	TY	TZ	Z	ZZ	Applicable pin part no.
20	3.2	(35.8)	42	16	28	43.4	126	147	CD-G02
25	3.2	(39.8)	42	20	28	48	133	154	CD-G25
32	4.5	(49.4)	48	22	28	59.4	139	163	CD-G03
40	4.5	(58.4)	56	30	30	71.4	159	187	CD-G04
50	6	(72.4)	64	36	36	86	185	217	CD-G05
63	8	(90.4)	74	46	46	105.4	190	227	CD-G06
80	11	110	72	85	45	64	228	286.5	IY-G08
100	12	130	93	100	60	72	236	312.5	IY-G10

Note) Refer to page 1089 for pivot bracket.

* Other dimensions are the same as basic style.

ø80, ø100



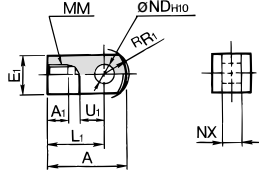
* Clevis pin and retaining ring are attached for the clevis style.

Accessory Bracket Dimensions

Single Knuckle Joint

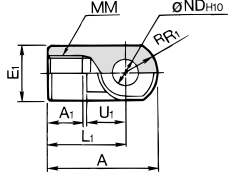
I-G02/G03

Material: Rolled steel



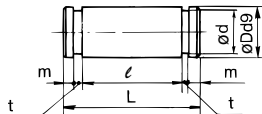
I-G04/G05/G08/G10

Material: Cast iron



Part no.	Applicable bore (mm)	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND _{H10}	NX
I-G02	20	34	8.5	16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}
I-G03	25, 32	41	10.5	20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{-0.2} _{-0.4}
I-G04	40	42	14	22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}
I-G05	50, 63	56	18	28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{-0.3} _{-0.5}
I-G08	80	71	21	38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{-0.3} _{-0.5}
I-G10	100	79	21	44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{-0.3} _{-0.5}

Knuckle Pin

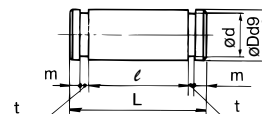


Material: Carbon steel

Part no.	Applicable bore (mm)	Dd ₉	L	d	ℓ	m	t	Applicable retaining ring
IY-G02	20	8 ^{-0.040} _{-0.076}	21	7.6	16.2	1.5	0.9	Type C 8 for axis
IY-G03	25, 32	10 ^{-0.040} _{-0.076}	25.6	9.6	20.2	1.55	1.15	Type C 10 for axis
IY-G04	40	10 ^{-0.040} _{-0.076}	41.6	9.6	36.2	1.55	1.15	Type C 10 for axis
IY-G05	50, 63	14 ^{-0.050} _{-0.093}	50.6	13.4	44.2	2.05	1.15	Type C 14 for axis
IY-G08	80	18 ^{-0.050} _{-0.093}	64	17	56.2	2.55	1.35	Type C 18 for axis
IY-G10	100	22 ^{-0.065} _{-0.117}	72	21	64.2	2.55	1.35	Type C 22 for axis

* Retaining rings are shipped together.

Clevis Pin



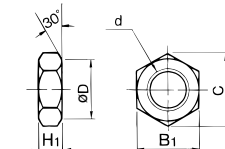
Material: Carbon steel

Part no.	Applicable bore (mm)	Dd ₉	L	d	ℓ	m	t	Applicable retaining ring
CD-G02	20	8 ^{-0.040} _{-0.076}	43.4	7.6	38.6	1.5	0.9	Type C 8 for axis
CD-G25	25	10 ^{-0.040} _{-0.076}	48	9.6	42.6	1.55	1.15	Type C 10 for axis
CD-G03	32	12 ^{-0.050} _{-0.093}	59.4	11.5	54	1.55	1.15	Type C 12 for axis
CD-G04	40	14 ^{-0.050} _{-0.093}	71.4	13.4	65	2.05	1.15	Type C 14 for axis
CD-G05	50	16 ^{-0.050} _{-0.093}	86	15.2	79.6	2.05	1.15	Type C 16 for axis
CD-G06	63	18 ^{-0.050} _{-0.093}	105.4	17	97.8	2.45	1.35	Type C 18 for axis

* Retaining rings are shipped together.

* Clevis pin and knuckle pin are common for bore size ø80 and ø100.

Rod End Nut



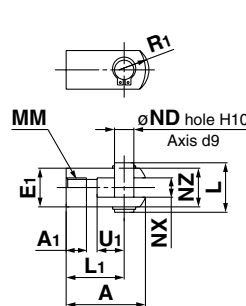
Material: Rolled steel

Part no.	Applicable bore (mm)	d	H ₁	B ₁	C	D
NT-02	20	M8 x 1.25	5	13	(15)	12.5
NT-03	25, 32	M10 x 1.25	6	17	(19.6)	16.5
NT-G04	40	M14 x 1.5	8	19	(21.9)	18
NT-05	50, 63	M18 x 1.5	11	27	(31.2)	26
NT-08	80	M22 x 1.5	13	32	(37.0)	31
NT-10	100	M26 x 1.5	16	41	(47.3)	39

Double Knuckle Joint

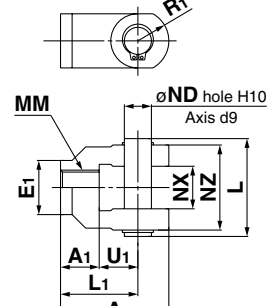
Y-G02/G03

Material: Rolled steel



Y-G04/G05/G08/G10

Material: Cast iron



Part no.	Applicable bore (mm)	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND	NX	NZ	L	Applicable pin part no.
Y-G02	20	34	8.5	16	25	M8 x 1.25	10.3	11.5	8	8 ^{+0.4} _{+0.2}	16	21	IY-G02
Y-G03	25, 32	41	10.5	20	30	M10 x 1.25	12.8	14	10	10 ^{+0.4} _{+0.2}	20	25.6	IY-G03
Y-G04	40	42	16	22	30	M14 x 1.5	12	14	10	18 ^{+0.5} _{+0.3}	36	41.6	IY-G04
Y-G05	50, 63	56	20	28	40	M18 x 1.5	16	20	14	22 ^{+0.5} _{+0.3}	44	50.6	IY-G05
Y-G08	80	71	23	38	50	M22 x 1.5	21	27	18	28 ^{+0.5} _{+0.3}	56	64	IY-G08
Y-G10	100	79	24	44	55	M26 x 1.5	24	31	22	32 ^{+0.5} _{+0.3}	64	72	IY-G10

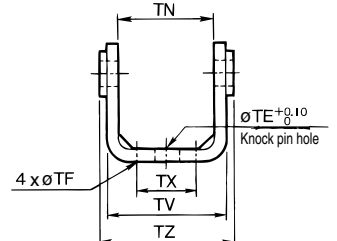
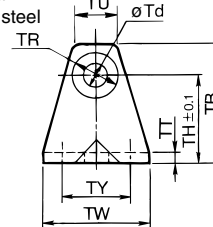
* Knuckle pin and retaining ring are shipped together.

Pivot Bracket (Order separately)

ø20 to ø63

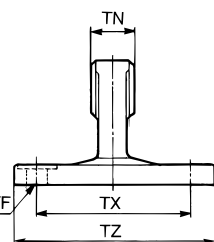
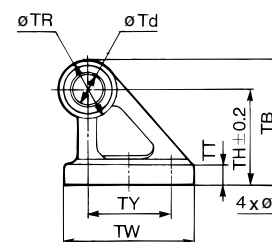
Material:

Rolled steel



ø80, ø100

Material: Cast iron



Part no.	Applicable bore (mm)	TB	Td	TE	TF	TH	TN	TR	TT
CG-020-24A	20	36	8	10	5.5	25	(29.3)	13	3.2
CG-025-24A	25	43	10	10	5.5	30	(33.1)	15	3.2
CG-032-24A	32	50	12	10	6.6	35	(40.4)	17	4.5
CG-040-24A	40	58	14	10	6.6	40	(49.2)	21	4.5
CG-050-24A	50	70	16	20	9	50	(60.4)	24	6
CG-063-24A	63	82	18	20	11	60	(74.6)	26	8
CG-080-24A	80	73	18	—	11	55	28 ^{-0.1} _{-0.3}	36	11
CG-100-24A	100	90	22	—	13.5	65	32 ^{-0.1} _{-0.3}	50	12

Part no.	Applicable bore (mm)	TU	TV	TW	TX	TY	TZ	Applicable pin O.D.
CG-020-24A	20	(18.1)	(35.8)	42	16	28	38.3	8d ₉ ^{-0.040} _{-0.076}
CG-025-24A	25	(20.7)	(39.8)	42	20	28	42.1	10d ₉ ^{-0.040} _{-0.076}
CG-032-24A	32	(23.6)	(49.4)	48	22	28	53.8	12d ₉ ^{-0.050} _{-0.093}
CG-040-24A	40	(27.3)	(58.4)	56	30	30	64.6	14d ₉ ^{-0.050} _{-0.093}
CG-050-24A	50	(29.7)	(72.4)	64	36	36	79.2	16d ₉ ^{-0.050} _{-0.093}
CG-063-24A	63	(34.3)	(90.4)	74	46	46	97.2	18d ₉ ^{-0.050} _{-0.093}
CG-080-24A	80	—	—	72	85	45	110	18d ₉ ^{-0.050} _{-0.093}
CG-100-24A	100	—	—	93	100	60	130	22d ₉ ^{-0.065} _{-0.117}

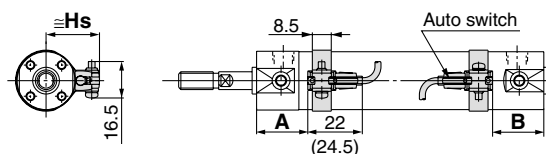
Series CG1Y

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Reed auto switch

D-A9□

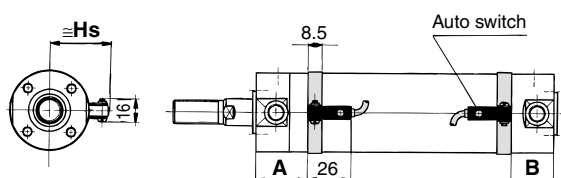
ø20 to ø63



(): For D-A93 type

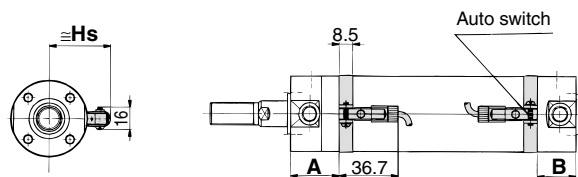
D-C7, C8

ø20 to ø63



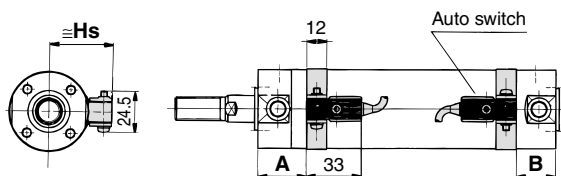
D-C73C, C80C

ø20 to ø63



D-B5, B6, B59W

ø20 to ø100

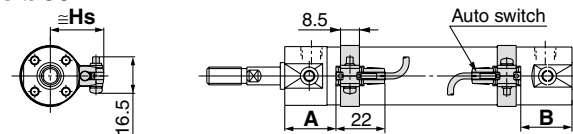


Solid state auto switch

D-M9□

D-M9□W

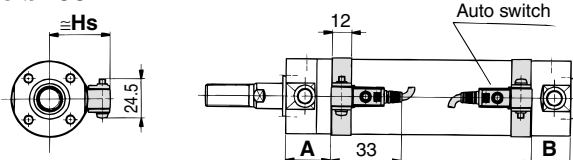
ø20 to ø63



D-G5, K5, G5□W

D-K59W, D-G59F, D-G5NTL

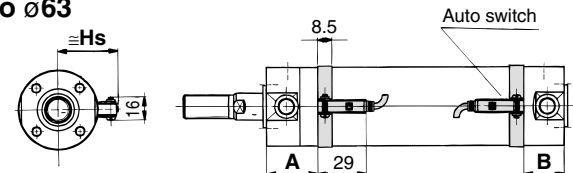
ø20 to ø100



D-H7□, H7□W

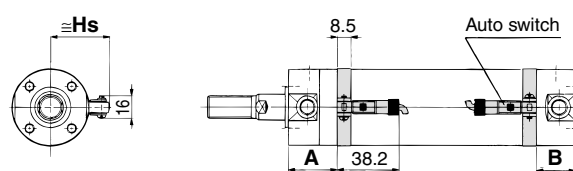
D-H7NF

ø20 to ø63



D-H7C

ø20 to ø63



Auto Switch Proper Mounting Position

(mm)

Auto switch model	D-A9□		D-M9□ D-M9□W		D-C7/C8 D-C73C D-C80C		D-B5 D-B6		D-B59W		D-H7□ D-H7C D-H7□W D-H7NF		D-G5□W D-K59W D-G59F D-G5 D-K5 D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	29	28	33	32	29.5	28.5	23.5	22.5	26.5	25.5	28.5	27.5	25	24
25	29	28	33	32	29.5	28.5	23.5	22.5	26.5	25.5	28.5	27.5	25	24
32	30	29	34	33	30.5	29.5	24.5	23.5	27.5	26.5	29.5	28.5	26	25
40	35	32	39	36	35.5	32.5	29.5	26.5	32	29.5	34.5	31.5	31	28
50	42	40	46	44	42.5	40.5	36.5	34.5	39.5	37.5	41.5	39.5	38	36
63	42	40	46	44	42.5	40.5	36.5	34.5	39.5	37.5	41.5	39.5	38	36
80	—	—	—	—	—	—	46.5	44.5	49.5	47.5	—	—	48	46
100	—	—	—	—	—	—	46.5	44.5	49.5	47.5	—	—	48	46

Auto Switch Mounting Height

(mm)

Auto switch model	D-A9□ D-M9□ D-M9□W	D-C7/C8 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C	D-B5/B6 D-B59W D-K59W D-G5NTL D-G5/K5 D-G59F D-G5□W D-H7C
	Hs	Hs	Hs	Hs
20	24	24.5	27	27.5
25	26.5	27	29.5	30
32	30	30.5	33	33.5
40	34.5	35	37.5	38
50	40	40.5	43	43.5
63	47	47.5	50	50.5
80	—	—	—	59
100	—	—	—	69.5

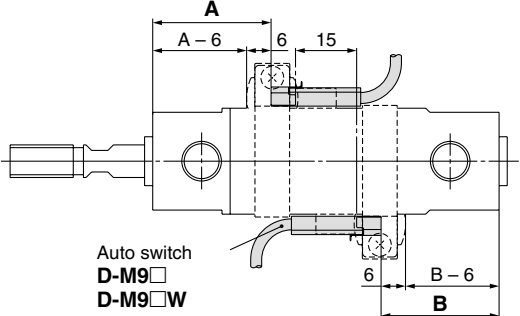
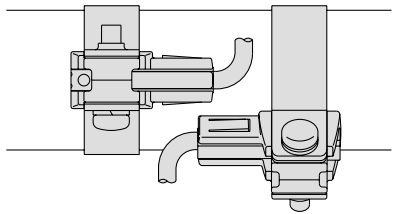
Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Minimum Auto Switch Mounting Stroke

(mm)

Auto switch model	No. of auto switch mounted				
	1 pc.	2 pcs.		n pcs.	
		Different surfaces	Same surface	Different surfaces	Same surface
D-A9 D-M9 D-M9W	10	15 Note 1)	45 Note 1)	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	45 + 45 (n-2)
D-C7 D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	50 + 45 (n-2)
D-H7 D-H7W D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	60 + 45 (n-2)
D-C73C D-C80C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	65 + 50 (n-2)
D-B5 D-B64 D-G5 D-K59	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55(n-2)
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55(n-2)

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
	 Auto switch D-M9 D-M9W The proper auto switch mounting position is 6 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-A93	—	Less than 50 strokes Note 2)
D-M9 D-M9W	Less than 20 strokes Note 2)	Less than 55 strokes Note 2)

Note 2) Minimum stroke for mounting auto switches in the other mounting styles mentioned in note 1.

REA**REB****REC****CY****CX****MQ****RHC****RZQ****D-****-X**Individual
-X

Series CG1Y

Operating Range

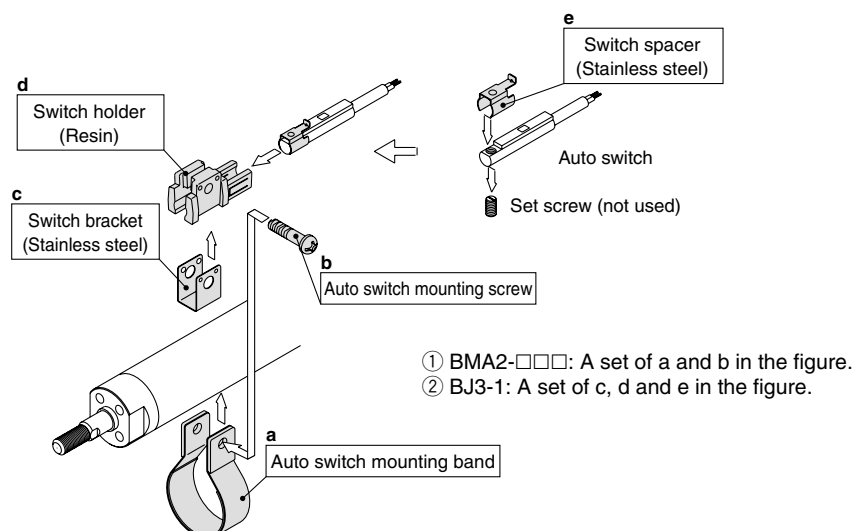
Auto switch model	Bore size (mm)							
	20	25	32	40	50	63	80	100
D-A9□	7	6	8	8	8	9	—	—
D-M9□ D-M9□W	4.5	5	4.5	5.5	5	5.5	—	—
D-C7/C80 D-C73C/C80C	8	10	9	10	10	11	—	—
D-B5□/B64	8	10	9	10	10	11	11	11
D-B59W	13	13	14	14	14	17	16	18
D-H7□/H7□W D-H7NF	4	4	4.5	5	6	6.5	—	—
D-H7C	7	8.5	9	10	9.5	10.5	—	—
D-G5□/G5□W/G59F D-G5BAL/K59/K59W	4	4	4.5	5	6	6.5	6.5	7
D-G5NTL	4	4	4.5	5	6	6.5	6.5	7
D-G5NBL	35	40	40	45	45	45	45	50

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

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)							
	20	25	32	40	50	63	80	100
D-A9□ D-M9□ D-M9□W	Note) ① BMA2-020 ② BJ3-1	Note) ① BMA2-025 ② BJ3-1	Note) ① BMA2-032 ② BJ3-1	Note) ① BMA2-040 ② BJ3-1	Note) ① BMA2-050 ② BJ3-1	Note) ① BMA2-063 ② BJ3-1	—	—
D-C7□/C80 D-C73C D-C80C D-H7□ D-H7□W D-H7NF	BMA2-020	BMA2-025	BMA2-032	BMA2-040	BMA2-050	BMA2-063	—	—
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NTL D-G5NBL	BA-01	BA-02	BA-32	BA-04	BA-05	BA-06	BA-08	BA-10

Note) Two kinds of auto switch mounting brackets are used as a set.



Cylinder Bracket by Stroke/Auto Switch Mounting Surface

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

(mm)

No. of auto switches	Basic style, Foot style, Flange style, Clevis style			Trunnion style		
	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)	1 (Rod cover side)	2 (Different surfaces)	2 (Same surface)
Switch mounting surface	Port surface 	Port surface 	Port surface 			
Switch type						
D-A9 D-M9 D-M9W	10 st or more	15 to 44st	45 st or more	10 st or more	15 to 44 st	45 st or more
D-C7/C8	10 st or more	15 to 49st	50 st or more	10 st or more	15 to 49 st	50 st or more
D-H7 D-H7W D-H7NF	10 st or more	15 to 59st	60 st or more	10 st or more	15 to 59 st	60 st or more
D-C73C/C80C/H7C	10 st or more	15 to 64st	65 st or more	10 st or more	15 to 64 st	65 st or more
D-B5/B6/G5/K5 D-G5W/K59W D-G59F/G5NTL	10 st or more	15 to 74st	75 st or more	10 st or more	15 to 74 st	75 st or more
D-B59W	15 st or more	20 to 74st	75 st or more	15 st or more	20 to 74 st	75 st or more

* Trunnion style is not available for bore sizes ø80 and ø100.

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted.
For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features	Applicable bore size
Reed	D-C73, C76	Grommet (In-line)	—	ø20 to ø63
	D-C80		Without indicator light	
	D-B53		—	ø20 to ø100
Solid state	D-H7A1, H7A2, H7B		—	ø20 to ø63
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)	
	D-G5NTL		With timer	ø20 to ø100

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 to 1785.

* Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page 1746.

* Wide range detection type, solid state auto switches (D-G5NBL type) are also available. Refer to page 1776 for details.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Smooth Cylinder

Series CA2Y

ø40, ø50, ø63, ø80, ø100

How to Order

CA2Y **L** **40** **-** **150** **-**

With auto switch **CDA2Y** **L** **40** **-** **150** **-** **M9BW**

With auto switch
(Built-in magnet)

Mounting style

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

Bore size

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

Thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 1095.

Auto switch

Nil	Without auto switch
-----	---------------------

Number of auto switches

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

Made to Order
For details, refer to page 1095.

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

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

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

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

Consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW * O: Manufactured upon receipt of order.
1 m M (Example) M9NWM * D-A9□/A9□V types cannot be mounted on ø50.
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ

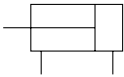
* In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 1108.

* Refer to pages 1784 and 1785 for details of auto switches with a pre-wired connector. For D-P3DW□, refer to pages 1773-1 and 1773-2.

* D-A9□/M9□□□/P3DW□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped for D-A9□ and M9□□□.)



JIS Symbol



Made to Order

(For details, refer to pages 1829 to 1954.)

Symbol	Specifications
—XA□	Change of rod end shape
—XC6	Made of stainless steel
—XC7	Tie-rod, cushion valve and tie-rod nut made of stainless steel
—XC9	Adjustable stroke cylinder/adjustable retraction type
—XC14	Change of trunnion bracket mounting position
—XC15	Change of tie-rod length
—XC27	Double clevis and double knuckle joint pins made of stainless steel
—XC28	Compact flange made of SS400
—XC29	Double knuckle joint with spring pin
—XC30	Rod side trunnion
—XC65	-XC6 + -XC7

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
40	CA2Y40-PS	Rod seal 1 pc.
50	CA2Y50-PS	Piston seal 1 pc.
63	CA2Y63-PS	Cylinder tube gasket 2 pcs.
80	CA2Y80-PS	Grease pack (10 g) 1 pc.
100	CA2Y100-PS	

When only grease for maintenance is necessary, please order by the following part numbers.

Grease pack part no.: GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

Bore size (mm)	40	50	63	80	100
Action	Double acting				
Operating piston speed	5 to 500 mm/s				
Fluid	Air				
Proof pressure	1.05 MPa				
Maximum operating pressure	0.7 MPa				
Ambient and fluid temperature	Without auto switch -10 to 70°C (with no freezing)				
	With auto switch -10 to 60°C (with no freezing)				
Cushion	None				
Lubrication	Not required (Non-lube)				
Mounting	Basic, Axial foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion				
Allowable leakage rate	0.5 ℓ/min (ANR)				

Minimum Operating Pressure

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

Standard Stroke

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



Note 1) Intermediate strokes not listed above are also available.

Please consult with SMC for strokes outside the above ranges.

Note 2) As the stroke increases, more sliding resistance may result due to the deflection of the piston rod and other factors. Take measures such as the installation of a guide.

Accessory

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

REA
REB
REC
C□Y
C□X
MQ
RHC
RZQ
D-□
-X□
**Individual
-X□**

Series CA2Y

Mass

(kg)

Bore size (mm)		40	50	63	80	100
Basic mass	Basic style	0.89	1.36	2.00	3.48	4.87
	Axial foot style	1.08	1.58	2.34	4.15	5.86
	Flange style	1.26	1.81	2.79	4.93	6.79
	Single clevis style	1.12	1.70	2.63	4.59	6.65
	Double clevis style	1.16	1.79	2.79	4.88	7.17
	Trunnion style	1.25	1.84	2.80	5.03	7.15
Additional mass per each 50 mm of stroke		0.22	0.28	0.37	0.52	0.65
Accessory	Single knuckle	0.23	0.26	0.26	0.60	0.83
	Double knuckle (With pin)	0.37	0.43	0.43	0.87	1.27

Calculation: (Example) **CA2YL40-100**/Axial foot

- Basic mass.....1.08 kg
 - Additional mass.....0.22/50 stroke
 - Cylinder stroke.....100 stroke
- $$1.08 + 0.22 \times 100/50 = 1.52 \text{ kg}$$

Low Friction Cylinder Mounting (Accessory)

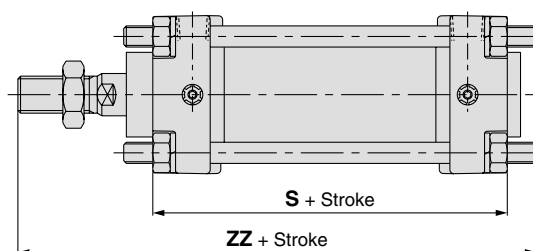
CDA2Y Mounting style Bore size - Stroke - **X1854**

Same mounting specification as CDA2Q

In order to adjust the mounting dimensions of the low friction cylinder (CDA2Q), extend the longitudinal dimension (S, ZZ) by 10 mm.

* Cylinders without a built-in magnet can be interchangeable.

Dimensions

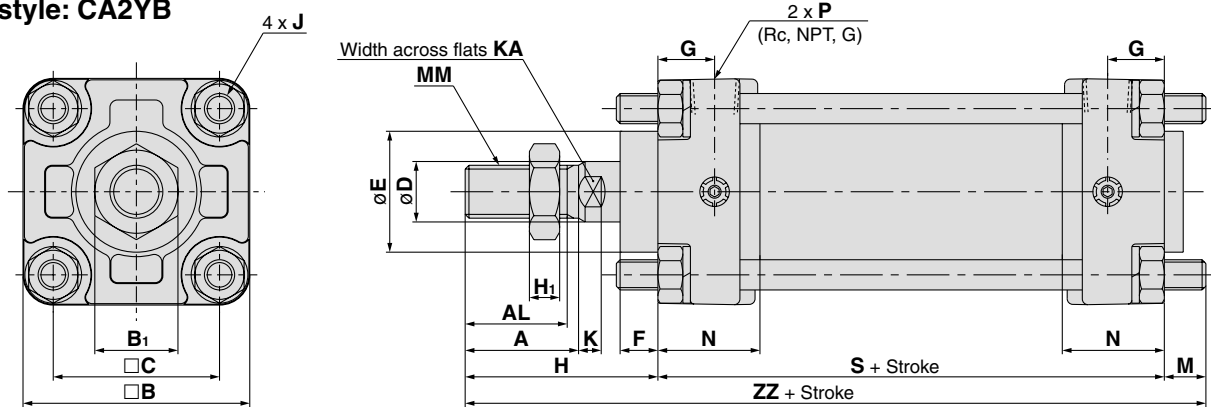


Bore size (mm)	S	ZZ
40	94	156
50	100	169
63	108	180
80	126	214
100	136	225

* Add 10 mm to S and ZZ dimensions of the double acting, single rod type on pages 1097 to 1101 for the dimensions for each mounting bracket other than the basic style.

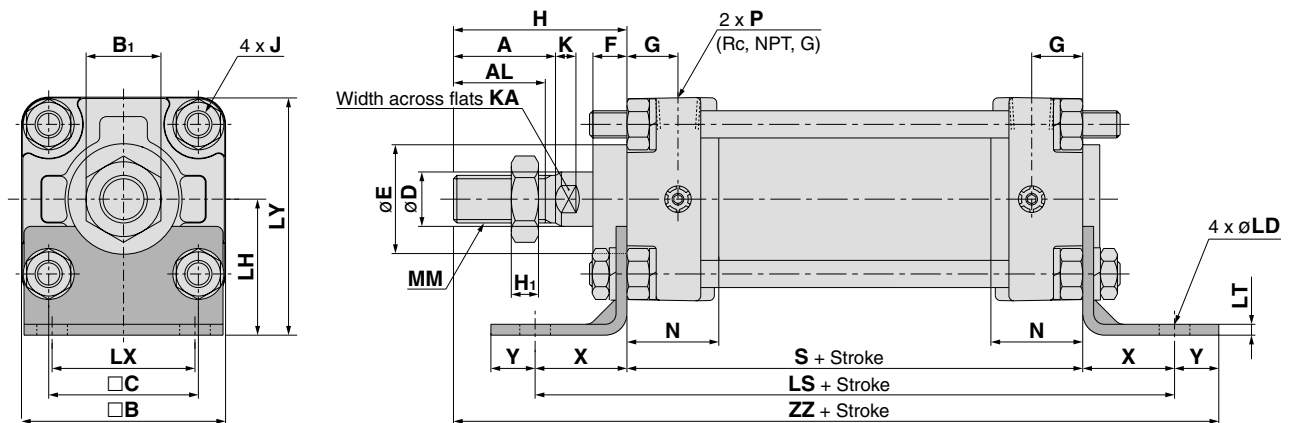
Dimensions: ø40 to ø100

Basic style: CA2YB



Bore size (mm)	Stroke range	A	AL	□B	B ₁	□C	D	E	F	G	H	H ₁	J	K	KA	M	MM	N	P	S	ZZ
40	Up to 500	30	27	60	22	44	16	32	10	15	51	8	M8 x 1.25	6	14	11	M14 x 1.5	27	1/4	84	146
50	Up to 600	35	32	70	27	52	20	40	10	17	58	11	M8 x 1.25	7	18	11	M18 x 1.5	30	3/8	90	159
63	Up to 600	35	32	85	27	64	20	40	10	17	58	11	M10 x 1.25	7	18	14	M18 x 1.5	31	3/8	98	170
80	Up to 700	40	37	102	32	78	25	52	14	21	71	13	M12 x 1.75	10	22	17	M22 x 1.5	37	1/2	116	204
100	Up to 700	40	37	116	41	92	30	52	14	21	72	16	M12 x 1.75	10	26	17	M26 x 1.5	40	1/2	126	215

Axial foot: CA2YL



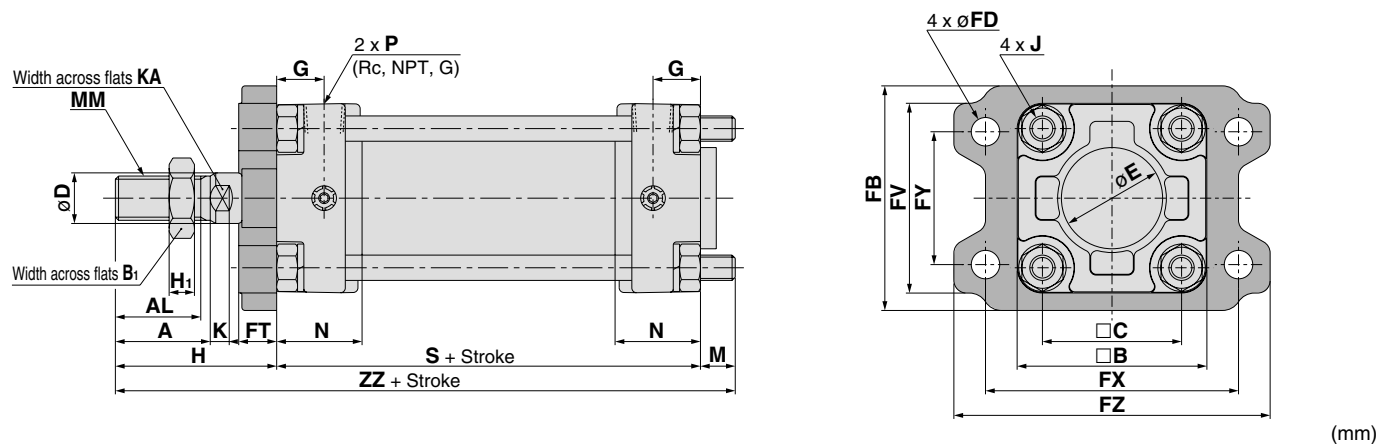
Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	LD	LH	LS	LT	LX	LY
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	9.0	40	138	3.2	42	70
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	9.0	45	144	3.2	50	80
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	11.5	50	166	3.2	59	93
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	13.5	65	204	4.5	76	116
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	13.5	75	212	6.0	92	133

Bore size (mm)	MM	N	P	S	X	Y	H	ZZ
40	M14 x 1.5	27	1/4	84	27	13	51	175
50	M18 x 1.5	30	3/8	90	27	13	58	188
63	M18 x 1.5	31	3/8	98	34	16	58	206
80	M22 x 1.5	37	1/2	116	44	16	71	247
100	M26 x 1.5	40	1/2	126	43	17	72	258

REA
REB
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C□Y
C□X
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RHC
RZQ
D-□
-X□
**Individual
-X□**

Series CA2Y

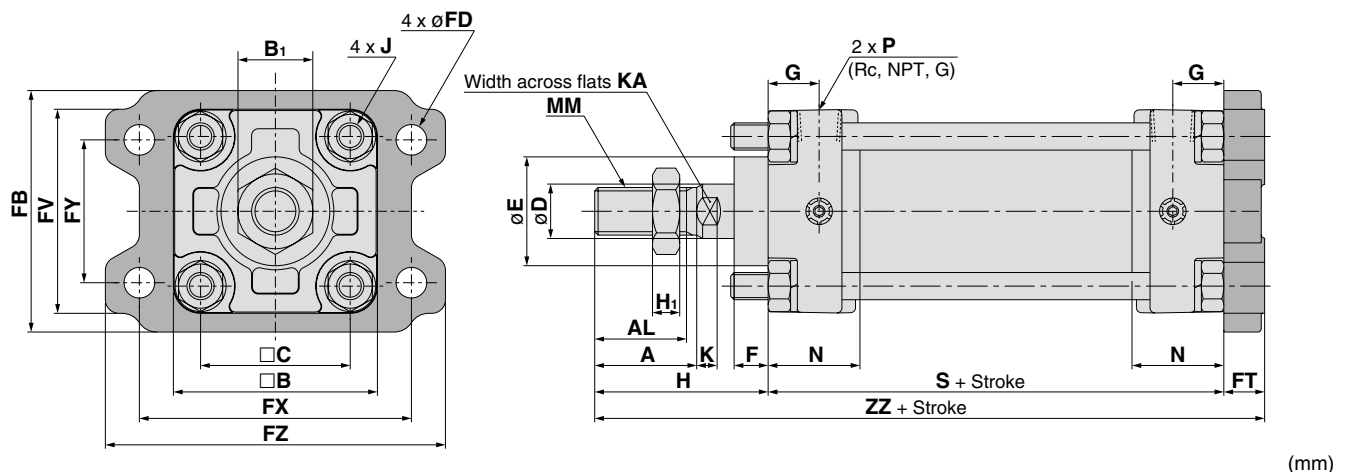
Rod Side Flange Style: CA2YF



Bore size (mm)	A	AL	FB	B	B ₁	C	D	E	FV	FD	FT	FX	FY	FZ	G	H ₁	J	K	KA	M	MM
40	30	27	71	60	22	44	16	32	60	9.0	12	80	42	100	15	8	M8 x 1.25	6	14	11	M14 x 1.5
50	35	32	81	70	27	52	20	40	70	9.0	12	90	50	110	17	11	M8 x 1.25	7	18	11	M18 x 1.5
63	35	32	101	85	27	64	20	40	86	11.5	15	105	59	130	17	11	M10 x 1.25	7	18	14	M18 x 1.5
80	40	37	119	102	32	78	25	52	102	13.5	18	130	76	160	21	13	M12 x 1.75	10	22	17	M22 x 1.5
100	40	37	133	116	41	92	30	52	116	13.5	18	150	92	180	21	16	M12 x 1.75	10	26	17	M26 x 1.5

Bore size (mm)	N	P	S	H	ZZ
40	27	1/4	84	51	146
50	30	3/8	90	58	159
63	31	3/8	98	58	170
80	37	1/2	116	71	204
100	40	1/2	126	72	215

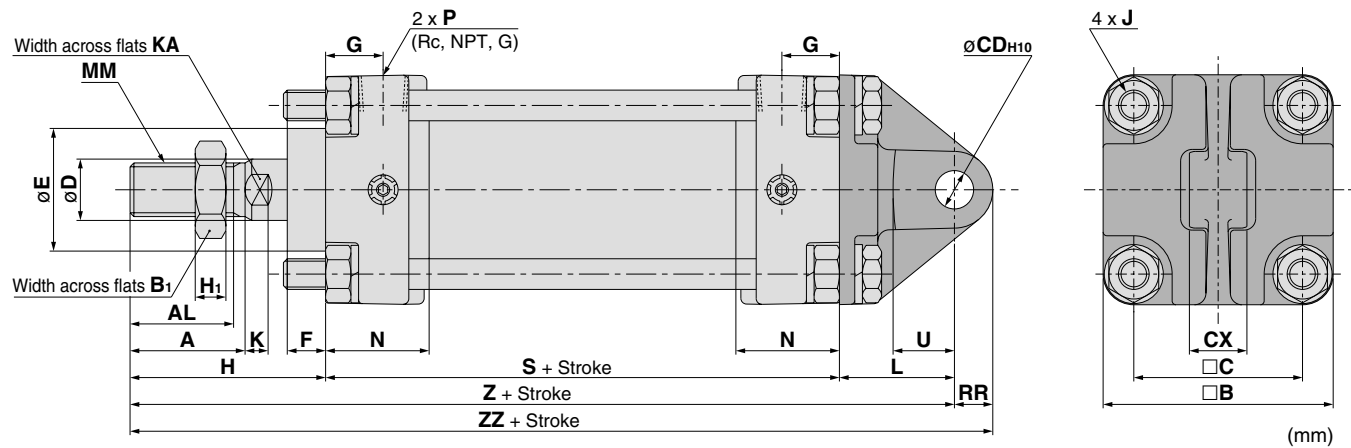
Head Side Flange Style: CA2YG



Bore size (mm)	A	AL	FB	B	B ₁	C	D	E	F	FV	FD	FT	FX	FY	FZ	G	H ₁	J	K	KA
40	30	27	71	60	22	44	16	32	10	60	9.0	12	80	42	100	15	8	M8 x 1.25	6	14
50	35	32	81	70	27	52	20	40	10	70	9.0	12	90	50	110	17	11	M8 x 1.25	7	18
63	35	32	101	85	27	64	20	40	10	86	11.5	15	105	59	130	17	11	M10 x 1.25	7	18
80	40	37	119	102	32	78	25	52	14	102	13.5	18	130	76	160	21	13	M12 x 1.75	10	22
100	40	37	133	116	41	92	30	52	14	116	13.5	18	150	92	180	21	16	M12 x 1.75	10	26

Bore size (mm)	MM	N	P	S	H	ZZ
40	M14 x 1.5	27	1/4	84	51	147
50	M18 x 1.5	30	3/8	90	58	160
63	M18 x 1.5	31	3/8	98	58	171
80	M22 x 1.5	37	1/2	116	71	205
100	M26 x 1.5	40	1/2	126	72	216

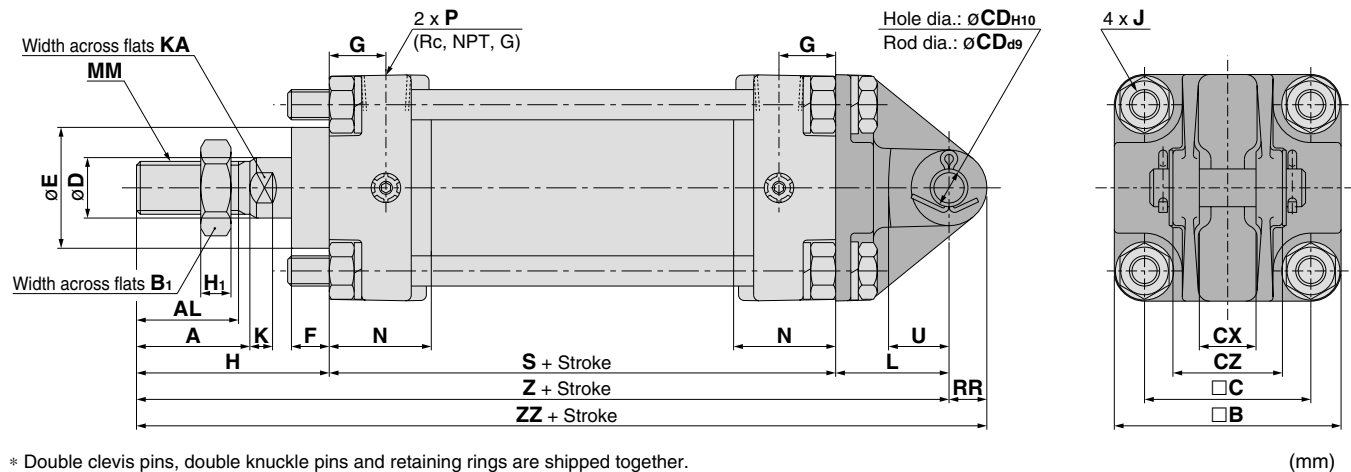
Single Clevis Style: CA2YC



Bore size (mm)	A	AL	B	B ₁	C	CD ^{H10}	CX	D	E	F	G	H ₁	J	K	KA	L	MM
40	30	27	60	22	44	10 ^{+0.058} ₀	15.0 ^{-0.1} _{-0.3}	16	32	10	15	8	M8 x 1.25	6	14	30	M14 x 1.5
50	35	32	70	27	52	12 ^{+0.070} ₀	18.0 ^{-0.1} _{-0.3}	20	40	10	17	11	M8 x 1.25	7	18	35	M18 x 1.5
63	35	32	85	27	64	16 ^{+0.070} ₀	25.0 ^{-0.1} _{-0.3}	20	40	10	17	11	M10 x 1.25	7	18	40	M18 x 1.5
80	40	37	102	32	78	20 ^{+0.084} ₀	31.5 ^{-0.1} _{-0.3}	25	52	14	21	13	M12 x 1.75	10	22	48	M22 x 1.5
100	40	37	116	41	92	25 ^{+0.084} ₀	35.5 ^{-0.1} _{-0.3}	30	52	14	21	16	M12 x 1.75	10	26	58	M26 x 1.5

Bore size (mm)	N	P	RR	S	U	H	Z	ZZ
40	27	1/4	10	84	16	51	165	175
50	30	3/8	12	90	19	58	183	195
63	31	3/8	16	98	23	58	196	212
80	37	1/2	20	116	28	71	235	255
100	40	1/2	25	126	36	72	256	281

Double Clevis Style: CA2YD



* Double clevis pins, double knuckle pins and retaining rings are shipped together.

Bore size (mm)	A	AL	B	B ₁	C	CD	CX	CZ	D	E	F	G	H ₁	J	K	KA	L	MM
40	30	27	60	22	44	10 ^{+0.058} ₀	15.0 ^{+0.3} _{+0.1}	29.5	16	32	10	15	8	M8 x 1.25	6	14	30	M14 x 1.5
50	35	32	70	27	52	12 ^{+0.070} ₀	18.0 ^{+0.3} _{+0.1}	38	20	40	10	17	11	M8 x 1.25	7	18	35	M18 x 1.5
63	35	32	85	27	64	16 ^{+0.070} ₀	25.0 ^{+0.3} _{+0.1}	49	20	40	10	17	11	M10 x 1.25	7	18	40	M18 x 1.5
80	40	37	102	32	78	20 ^{+0.084} ₀	31.5 ^{+0.3} _{+0.1}	61	25	52	14	21	13	M12 x 1.75	10	22	48	M22 x 1.5
100	40	37	116	41	92	25 ^{+0.084} ₀	35.5 ^{+0.3} _{+0.1}	64	30	52	14	21	16	M12 x 1.75	10	26	58	M26 x 1.5

Bore size (mm)	N	P	RR	S	U	H	Z	ZZ
40	27	1/4	10	84	16	51	165	175
50	30	3/8	12	90	19	58	183	195
63	31	3/8	16	98	23	58	196	212
80	37	1/2	20	116	28	71	235	255
100	40	1/2	25	126	36	72	256	281

* Clevis pins, flat washers and cotter pins are included.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

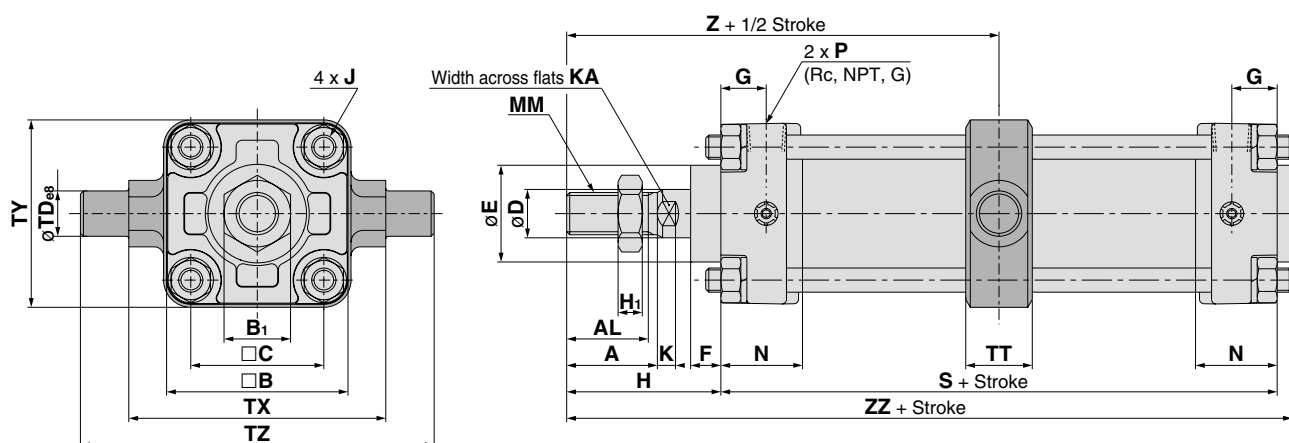
D-□

-X□

Individual
-X□

Series CA2Y

Center Trunnion Style: CA2YT



(mm)

Bore size (mm)	A	AL	B	B ₁	C	D	E	F	G	H ₁	J	K	KA	MM	N	P	S	TDe8
40	30	27	60	22	44	16	32	10	15	8	M8 x 1.25	6	14	M14 x 1.5	27	1/4	84	15 ^{+0.032} _{-0.059}
50	35	32	70	27	52	20	40	10	17	11	M8 x 1.25	7	18	M18 x 1.5	30	3/8	90	15 ^{+0.032} _{-0.059}
63	35	32	85	27	64	20	40	10	17	11	M10 x 1.25	7	18	M18 x 1.5	31	3/8	98	18 ^{+0.032} _{-0.059}
80	40	37	102	32	78	25	52	14	21	13	M12 x 1.75	10	22	M22 x 1.5	37	1/2	116	25 ^{+0.040} _{-0.073}
100	40	37	116	41	92	30	52	14	21	16	M12 x 1.75	10	26	M26 x 1.5	40	1/2	126	25 ^{+0.040} _{-0.073}

Bore size (mm)	TT	TX	TY	TZ	H	Z	ZZ
40	22	85	62	117	51	93	140
50	22	95	74	127	58	103	154
63	28	110	90	148	58	107	162
80	34	140	110	192	71	129	194
100	40	162	130	214	72	135	206

* Do not disassemble the trunnion style. It is extremely difficult to align the axial center of the trunnion with the axial center of the cylinder. Thus, if this style of cylinder is disassembled and reassembled, it is likely that the required dimensional accuracy cannot be attained, which may cause malfunction.

Trunnion and Double Clevis Mounting Bracket

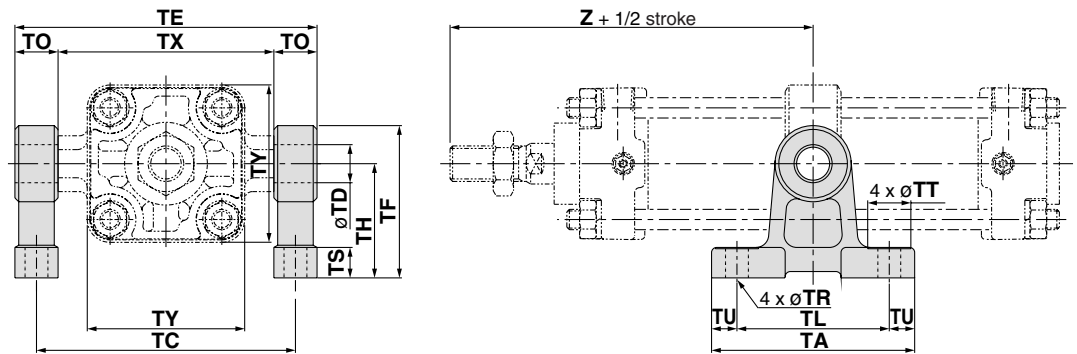
- Strength is the same as cylinder brackets.

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

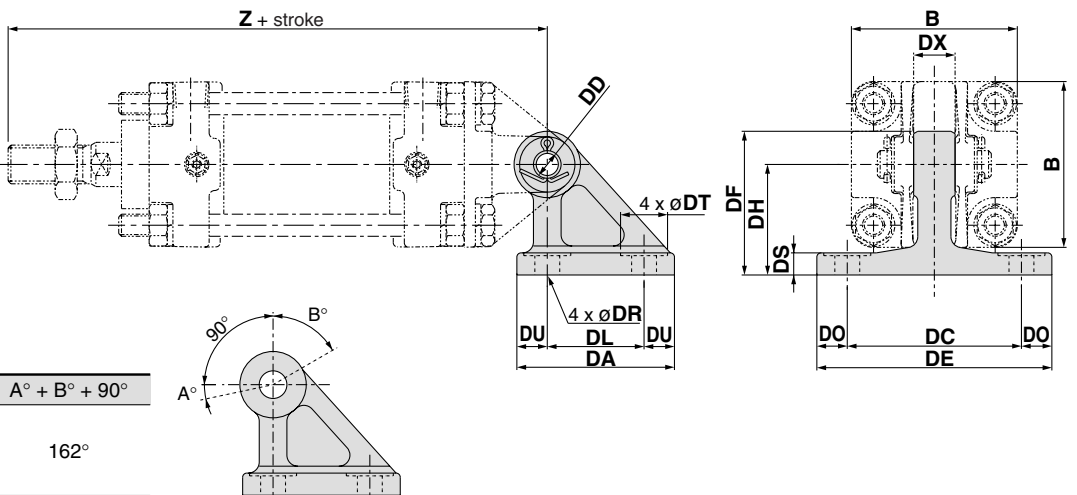
Note) 1. The above brackets cannot be specified in the part number of the cylinder.
 2. They must be ordered separately from the cylinder.
 3. When the trunnion brackets are specified, two pieces should be ordered for each cylinder.

Trunnion bracket**Material: Cast iron**

* This assembly drawing is provided as a reference.
 The trunnion bracket must be ordered separately.



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

Double clevis bracket**Material: Cast iron****Rotation**

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

Note) This assembly drawing is provided as a reference. The trunnion bracket must be ordered separately.

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

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

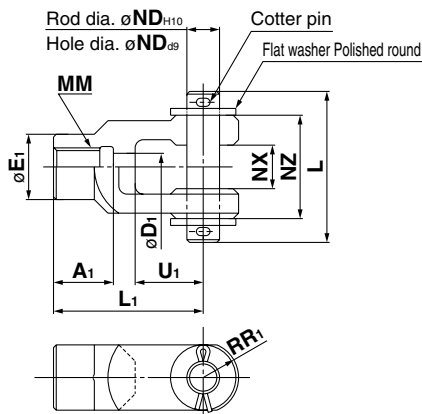
-X□

Individual
-X□

Series CA2Y

Accessory Dimensions

Y Type Double Knuckle Joint

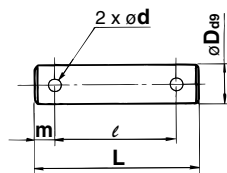


Material: Cast iron

Part no.	Applicable bore size (mm)	(mm)											Cotter pin size	Flat washer size
		A1	E1	D1	L1	MM	RR1	U1	ND	NX	NZ	L		
Y-04D	40	22	24	10	55	M14 x 1.5	13	25	12	16 ^{+0.3} _{+0.1}	38	55.5	ø3 x 18ℓ	Polished round 12
Y-05D	50, 63	27	28	14	60	M18 x 1.5	15	27	12	16 ^{+0.3} _{+0.1}	38	55.5	ø3 x 18ℓ	Polished round 12
Y-08D	80	37	36	18	71	M22 x 1.5	19	28	18	28 ^{+0.3} _{+0.1}	55	76.5	ø4 x 25ℓ	Polished round 18
Y-10D	100	37	40	21	83	M26 x 1.5	21	38	20	30 ^{+0.3} _{+0.1}	61	83	ø4 x 30ℓ	Polished round 20

* Knuckle pin, cotter pin and flat washer are included.

Clevis Pin/Knuckle Pin

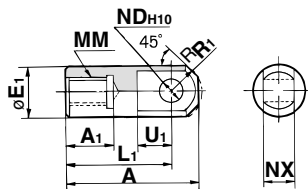


Material: Carbon steel

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

* Cotter pin and flat washer are included.

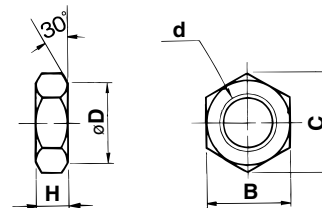
I Type Single Knuckle Joint



Material: Free cutting sulfur steel

Part no.	Applicable bore size (mm)	(mm)							
		A	A1	E1	L1	MM	R1	U1	ND _{H10}
I-04A	40	69	22	24	55	M14 x 1.5	15.5	20	12 ^{+0.070} ₀
I-05A	50, 63	74	27	28	60	M18 x 1.5	15.5	20	12 ^{+0.070} ₀
I-08A	80	91	37	36	71	M22 x 1.5	22.5	26	18 ^{+0.070} ₀
I-10A	100	105	37	40	83	M26 x 1.5	24.5	28	20 ^{+0.084} ₀

Rod End Nut (Standard option)



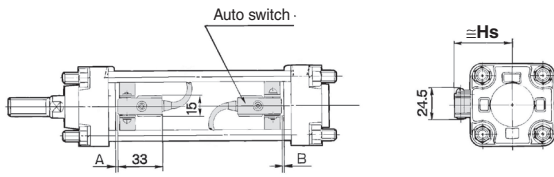
Material: Rolled steel

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

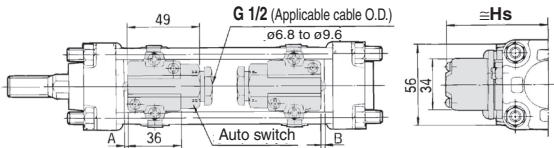
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

<Band mount type>

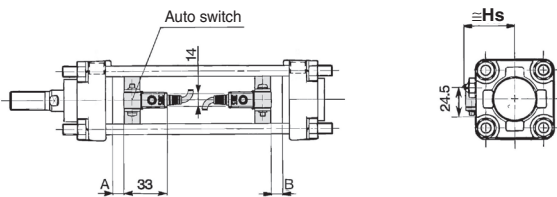
D-B5□/B64/B59W



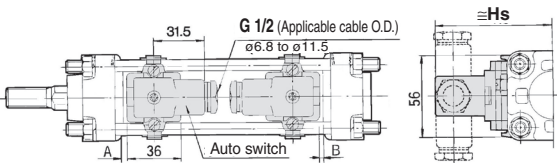
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D-G39/K39



D-G5□/K59
D-G5□W/K59W
D-G59F/G5NTL

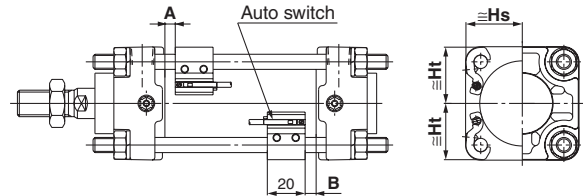


D-A44

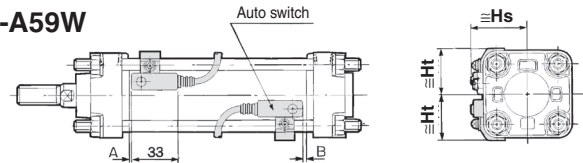


<Tie-rod mount type>

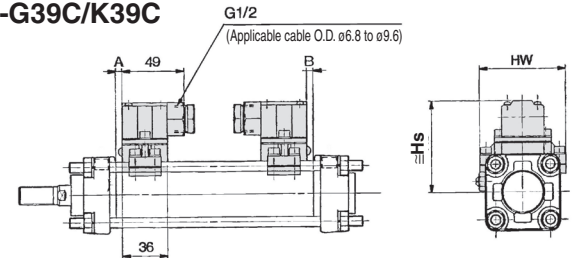
D-A9□/A9□V
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□AL/M9□AVL
D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV



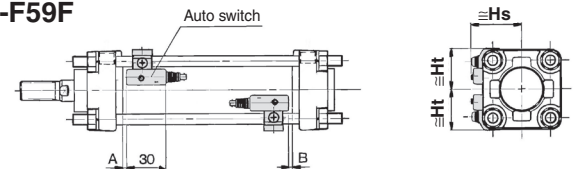
D-A5□/A6□
D-A59W



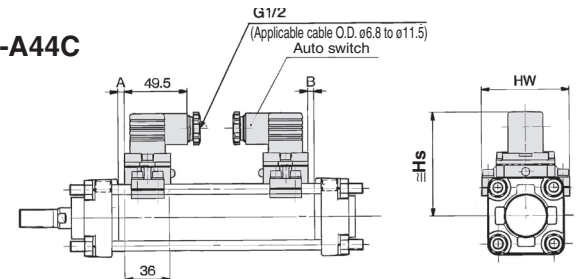
D-A3□C
D-G39C/K39C



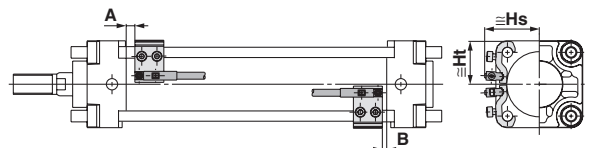
D-F5□/J5□
D-F5NTL
D-F5□W/J59W
D-F59F



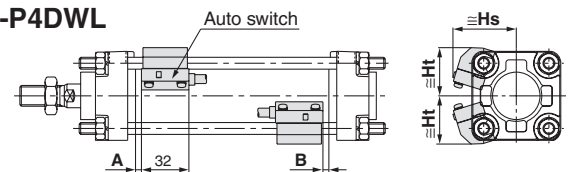
D-A44C



D-P3DW□



D-P4DWL



REA

REB

REC

☒ Y

☐ X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CA2Y

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

Auto switch model	Note 2) D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-B59W D-Z7□ D-Z80 D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV		D-P3DW□		D-P4DWL		D-A5□ D-A6□ D-A3□ D-A3□C D-A44 D-A44C D-G39 D-G39C D-K39 D-K39C		D-B5□ D-B64		D-F5□ D-J5□ D-F59F D-F5□W D-J59W		D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G59F		D-A59W		D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	6	4	10	8	3.5	1.5	6	3	3	1	0	0	0.5	0	6.5	4.5	2	0	4	2	11.5	9.5
50	—	—	10	8	3.5	1.5	5.5	3.5	3	1	0	0	0.5	0	6.5	4.5	2	0	4	2	11.5	9.5
63	8.5	7.5	12.5	11.5	6	5	3	1.5	5.5	4	2.5	1.5	3	2	9	8	4.5	3.5	6.5	5.5	14	13
80	12	10	16	14	9.5	7.5	6	4.5	9	7	6	4	6.5	4.5	4.5	12.5	8	6	10	8	17.5	15.5
100	13.5	12.5	17.5	16.5	11	10	8	6.5	10.5	9	7.5	6.5	8	7	14	13	9.5	8.5	11.5	10.5	19	18

Note 1) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model	Note 2) D-A9□ D-M9□ D-M9□W D-M9□AL		Note 2) D-A9□V		D-M9□V D-M9□WV D-M9□AVL		D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV		D-P3DW□		D-P4DWL		D-B5□ D-B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G59F	D-A3□ D-G39 D-K39	D-A44	D-A5□ D-A6□ D-A59W		D-F5□ D-J59 D-F5□W D-J59W D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw
40	30	30	31	30	34	30	30	30	30	30	38	30	42.5	33	37	71.5	81.5	38.5	31.5	38	31.5	73	69	81	69
50	34	34	—	—	38	34	34	34	34	34	42	34	46.5	37.5	42	76.5	86.5	42	35.5	42	35.5	78.5	77	86.5	77
63	41	41	41.5	41	44	41	41	41	41	41	49	41	52	43	49	83.5	93.5	46.5	43	47	43	85.5	91	93.5	91
80	49.5	49	50	49	52.5	49	49.5	49	49.5	49	56	49	58.5	51.5	57.5	92	102	53.5	51	53.5	51	94	107	102	107
100	56.5	56	58.5	56	61	56	56.5	55.5	57.5	55.5	65	56	66	58.5	68	102.5	112.5	61.5	57.5	61	57.5	104	121	112	121

Note 2) D-A9□/A9□V types cannot be mounted on ø50.

Minimum Auto Switch Mounting Stroke

(mm)								
Auto switch model	Number of auto switch		Brackets other than center trunnion	Center trunnion				
				ø40	ø50	ø63	ø80	ø100
D-A9□	2 (Different surfaces and same surface) With 1		15	75	—	80	85	90
	n		$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-A9□V	2 (Different surfaces and same surface) With 1		10	50	—	55	60	65
	n		$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□ D-M9□W D-M9□AL	2 (Different surfaces and same surface) With 1		15	80		85	90	95
	n		$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□V D-M9□WV D-M9□AVL	2 (Different surfaces and same surface) With 1		10	55		60	65	70
	n		$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-A5□/A6 D-F5□/J5 D-F5□W/J59W D-F59F	2 (Different surfaces and same surface) With 1		15	90		100	110	120
	n (Same surface)		$15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-A59W	2 (Different surfaces and same surface)		20	90		100	110	120
	n (Same surface)		$20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
	1		15	90		100	110	120
D-F5NTL	2 (Different surfaces and same surface) With 1		25	110		120	130	140
	n (Same surface)		$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$130 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$140 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G59F D-G5NTL	With 2	Different surfaces	15	90		100	110	
		Same surface	75					
	With n	Different surfaces	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8, ...)	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16, ...)		$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16, ...)	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4, ...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)		$100 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)	
	1		10	90		100	110	
D-B59W	With 2	Different surfaces	20	90		100	110	
		Same surface	75					
	With n	Different surfaces	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8, ...)	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16, ...)		$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16, ...)	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16, ...)	
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4, ...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)		$100 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)	
	1		15	90		100	110	
D-A3□ D-G39 D-K39	With 2	Different surfaces	35	75		80	90	
		Same surface	100	100		100	100	
	With n	Different surfaces	$35 + 30 (n-2)$ (n = 2, 3, 4, ...)	$75 + 30 (n-2)$ (n = 2, 4, 6, 8, ...)		$80 + 30 (n-2)$ (n = 2, 4, 6, 8, ...)	$90 + 30 (n-2)$ (n = 2, 4, 6, 8, ...)	
		Same surface	$100 + 100 (n-2)$ (n = 2, 3, 4, ...)	$100 + 100 (n-2)$ (n = 2, 4, 6, 8, ...)		$100 + 100 (n-2)$ (n = 2, 4, 6, 8, ...)	$100 + 100 (n-2)$ (n = 2, 4, 6, 8, ...)	
	1		10	75		80	90	
D-A44	With 2	Different surfaces	35	75		80	90	
		Same surface	55					
	With n	Different surfaces	$35 + 30 (n-2)$ (n = 2, 3, 4, ...)	$75 + 30 (n-2)$ (n = 2, 4, 6, 8, ...)		$80 + 30 (n-2)$ (n = 2, 4, 6, 8, ...)	$90 + 30 (n-2)$ (n = 2, 4, 6, 8, ...)	
		Same surface	$55 + 50 (n-2)$ (n = 2, 3, 4, ...)	$75 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)		$80 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8, ...)	
	1		10	75		80	90	

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Minimum Auto Switch Mounting Stroke

								(mm)
Auto switch model	Number of auto switch		Brackets other than center trunnion	Center trunnion				
				ø40	ø50	ø63	ø80	ø100
D-A3□C D-G39C D-K39C	With 2	Different surfaces	20	75		80	90	
		Same surface	100	100		100	100	
	With n	Different surfaces	$20 + 35(n - 2)$ (n = 2, 3, 4, ...)	$75 + 35(n - 2)$ (n = 2, 4, 6, 8, ...)		$80 + 35(n - 2)$ (n = 2, 4, 6, 8, ...)	$90 + 35(n - 2)$ (n = 2, 4, 6, 8, ...)	
		Same surface	$100 + 100(n - 2)$ (n = 2, 3, 4, 5...)	$100 + 100(n - 2)$ (n = 2, 4, 6, 8, ...)				
	1		10	75		80	90	
D-A44C	With 2	Different surfaces	20	75		80	90	
		Same surface	55					
	With n	Different surfaces	$20 + 35(n - 2)$ (n = 2, 3, 4, ...)	$75 + 35(n - 2)$ (n = 2, 4, 6, 8, ...)		$80 + 35(n - 2)$ (n = 2, 4, 6, 8, ...)	$90 + 35(n - 2)$ (n = 2, 4, 6, 8, ...)	
		Same surface	$55 + 50(n - 2)$ (n = 2, 3, 4, ...)	$75 + 50(n - 2)$ (n = 2, 4, 6, 8, ...)		$80 + 50(n - 2)$ (n = 2, 4, 6, 8, ...)	$90 + 50(n - 2)$ (n = 2, 4, 6, 8, ...)	
	1		10	75		80	90	
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	2 (Different surfaces and same surface) With 1		15	80	85	90	95	105
	n		$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-Y69□/Y7PV D-Y7□WV	2 (Different surfaces and same surface) With 1		10	65		75	80	90
	n		$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-P3DW□	2 (Different surfaces and same surface) With 1		15	85				
	n		$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$85 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)				
D-P4DWL	2 (Different surfaces and same surface) With 1		15	120	130	140		
	n		$15 + 65 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$120 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$130 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$140 + 65 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)		

Operating Range

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A9□/A9□V	7	—	9	9	9
D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	4.5	5	5.5	5	6
D-Z7□/Z80	8.5	7.5	9.5	9.5	10.5
D-A3□/A44 D-A3□C/A44C	9	10	11	11	11
D-A5□/A6□					
D-B5□/B64					
D-A59W	13	13	14	14	15
D-B59W	14	14	17	16	18
D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV	8	7	5.5	6.5	6.5

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-F5□/J5□/F5□W D-J59W D-F5NTL/F59F	4	4	4.5	4.5	4.5
D-G5□/K59/G5□W D-K59W D-G5NTL/G59F	5	6	6.5	6.5	7
D-G39/K39 D-G39C/K39C	9	9	10	10	11
D-P3DW□	4.5	5	6	5.5	6
D-P4DWL	4	4	4.5	4	4.5

* Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately ±30% dispersion.)

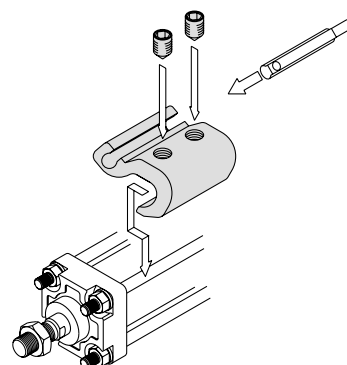
There may be the case it will vary substantially depending on an ambient environment.

Note) D-A9□/A9□V types cannot be mounted on ø50.

Auto Switch Mounting Bracket/Part No.

<Tie-rod mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	BA7-040	BA7-040	BA7-063	BA7-080	BA7-080
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F59F/F5NTL	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□C/A44C D-G39C/K39C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080
D-P3DW□	BMB9-050S	BMB9-050S	BA9T-063S	BA9T-080S	BA9T-080S
D-P4DWL	BAP2-040	BAP2-040	BAP2-063	BAP2-080	BAP2-080



• Mounting example of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L

<Band mounting>

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A3□/A44 D-G39/K39	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G59F D-G5NTL	BA-04	BA-05	BA-06	BA-08	BA-10

* Auto switch mounting brackets are included in D-A3□C/A44C/G39C/K39C types. Indicate as follows depending on the cylinder size when ordering.

(Example) ø40: D-A3□C-4, ø50: D-A3□C-5, ø63: D-A3□C-6, ø80: D-A3□C-8, ø100: D-A3□C-10

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CA2Y

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features	Applicable bore size
Reed	D-A93V, A96V	Grommet (Perpendicular)	—	ø40, ø63, ø80, ø100
	D-A90V		Without indicator light	
	D-A53, A56, B53, Z73, Z76	Grommet (In-line)	—	ø40 to ø100
	D-A67, Z80		Without indicator light	
Solid state	D-M9NV, M9PV, M9BV	Grommet (Perpendicular)	—	ø40 to ø100
	D-Y69A, Y69B, Y7PV			
	D-M9NWV, M9PWV, M9BWV		Diagnostic indication (2-color indication)	
	D-Y7NWV, Y7PWV, Y7BWV			
	D-M9NAVL, M9PAVL, M9BAVL			
	D-Y59A, Y59B, Y7P	Grommet (In-line)	—	
	D-F59, F5P, J59			
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color indication)	
	D-F59W, F5PW, J59W			
	D-F5NTL, G5NTL		With timer	
	D-P5DWL		Magnetic field resistant (2-color indication)	

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 and 1785.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H types) are also available. Refer to pages 1746 and 1748 for details.

* Wide range detection type, solid state auto switches (D-G5NBL type) are also available. Refer to page 1776 for details.

Smooth Cylinder

Series CS2Y

ø125, ø140, ø160

How to Order

CS2 Y L 160 - 300

With auto switch CDS2 Y L 160 - 300 - M9BW

With auto switch (Built-in magnet)

Smooth Cylinder

Mounting

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

Bore size

125	125 mm
140	140 mm
160	160 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Number of auto switches

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

Made to Order
For details, refer to the next page.

Auto switch

Nil	Without auto switch
-----	---------------------

* Refer to the table below for the applicable auto switch model.

Suffix for cylinder

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

Cylinder stroke (mm)
Refer to the next page for the "Maximum Stroke" table.

Built-in Magnet Cylinder Model

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

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

Applicable Auto Switches / For detailed auto switch specifications, refer to Best Pneumatics No. 2.

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

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

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX

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

* Since there are applicable auto switches other than listed, refer to page 1108-13 for details.

* For details about auto switches with pre-wired connector, refer to Best Pneumatics No. 2.

* D-A9□, M9□, M9□W, M9□AL are shipped together (but not assembled). (Only auto switch mounting bracket is assembled at the time of shipment.)



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual

-X□

Series CS2Y

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

Low sliding resistance

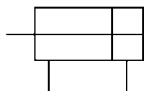
Min. operating pressure — 0.005 MPa

Auto switch mounting is possible



JIS Symbol

Double acting



Made to Order specifications
(For details, refer to Series CS2 Catalog (CAT.ES20-196).)

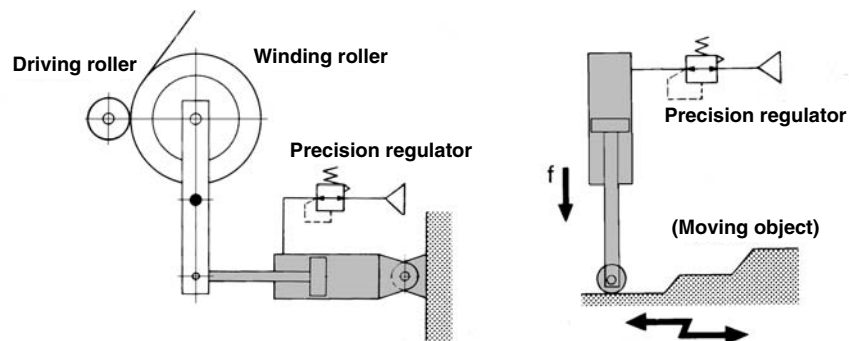
Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port position
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC26	Double clevis pin/Double knuckle pin with split pin and flat washer
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC30	Rod side trunnion mounted on the front of the rod cover
-XC68	Made of stainless steel (With hard chrome plated piston rod)
-XC86	With rod end bracket

For the specifications of cylinders with auto switch, please refer to pages 1108-11 to 1108-13.

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

Application Example

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



Specifications

Bore size (mm)	125	140	160
Action	Double acting, Single rod		
Direction of low friction	Both directions		
Fluid	Air		
Proof pressure	1.05 MPa		
Maximum operating pressure	0.7 MPa		
Minimum operating pressure	0.005 MPa*		
Ambient and fluid temperature	Without auto switch	0 to 70°C (No freezing)	
	With auto switch	0 to 60°C (No freezing)	
Allowable leakage	Less than 0.5 ℓ/min (ANR)		
Cushion	Without cushion** (manufacturable with cushion)		
Lubrication	Not required (Non-lube)		
Mounting	Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion		

* If a cushion is used, this value will not include the operating pressure within the cushion stroke.
* If an air cushion is not used, set the energy at the stroke end to 0.36J or less.

Maximum Stroke

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

Accessory

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

Mounting Bracket Part No.

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

* Order two foot brackets per cylinder.

** When ordering the double clevis style, the clevis pin and 2 split pins are included as accessories.

Rod Boot Material

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

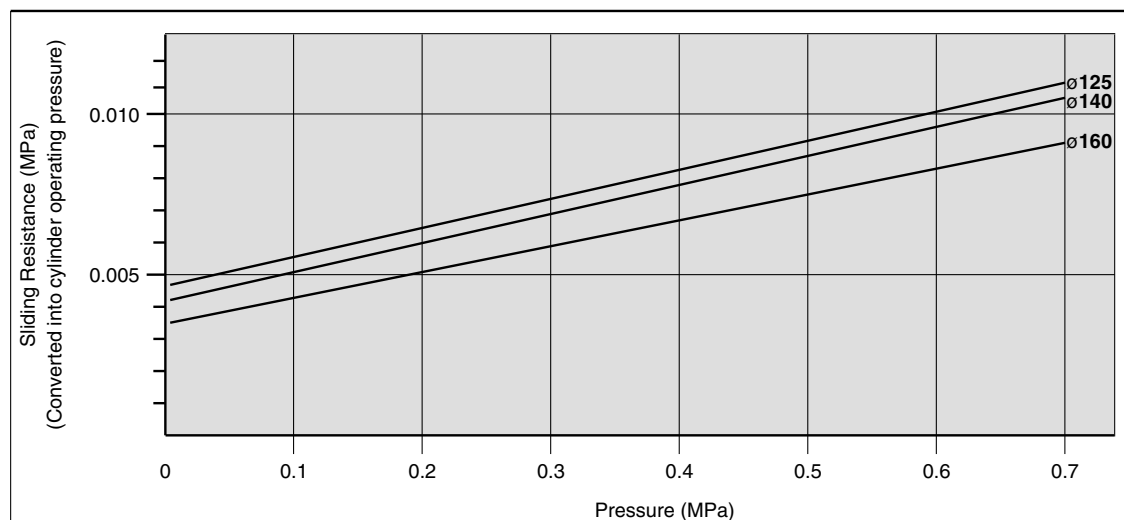
* Maximum ambient temperature for the rod boot itself.

Weight

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

Calculation: (Example) **CS2Y160-500**

- Basic weight 12.45 (kg)
- Additional weight 2.23 (kg/100 mm)
- Cylinder stroke 500 (mm)
- $12.45 + 2.23 \times 500/100 = 23.60$ (kg)

Sliding Resistance

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

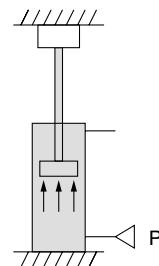
Relation between Cylinder Size and Maximum Stroke

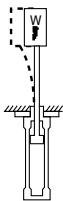
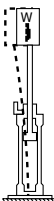
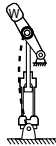
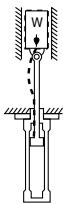
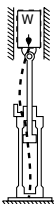
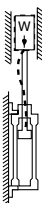
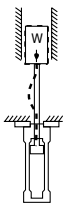
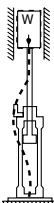
The below table shows the applicable maximum stroke (in cm units), found by calculation assuming the case where the force generated by the cylinder itself acts as buckling force on the piston rod, or piston rod and cylinder tube.

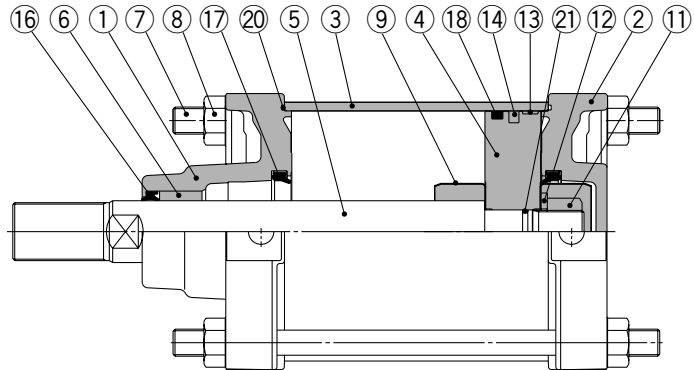
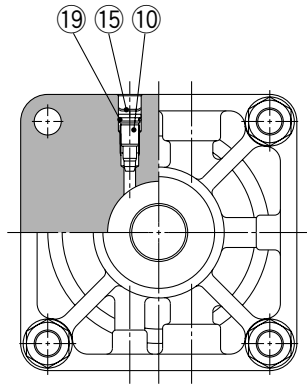
Therefore, it is possible to find the applicable maximum stroke for each cylinder size using the relationship between the size of the operating pressure and the cylinder support type, regardless of the load ratio.



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



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

Construction**Component Parts**

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

* For types with built-in magnet or with auto switch.

** Used with cushion only.

Replacement Parts: Seal kit.

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

* Seal kit does not include a grease pack.

Order with the following part number when only the grease pack is needed.

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

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

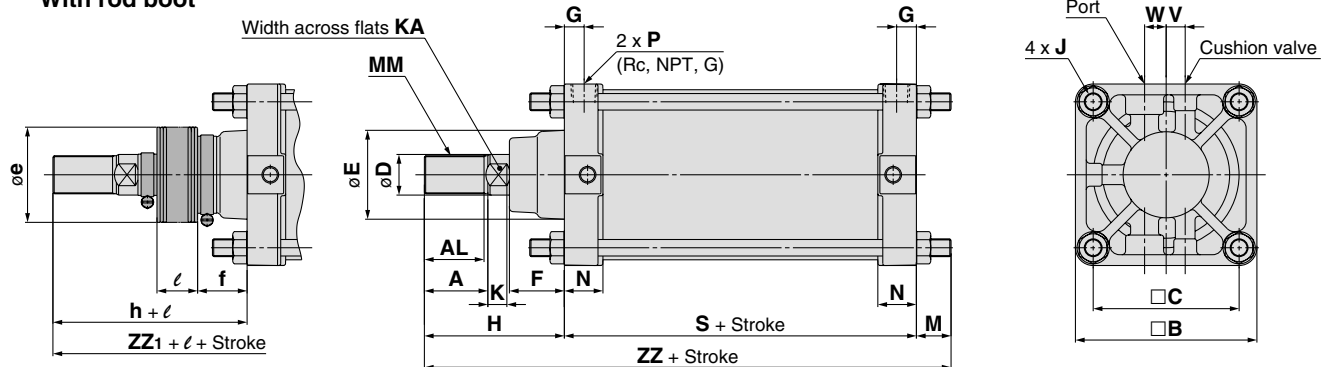
Individual
-X□

Series CS2Y

Dimensions

Basic: CS2YB

With rod boot



(mm)

Bore size (mm)	Stroke range (mm)	A	AL	□B	□C	D	E	F	G	J	V	W	K	KA	M	MM
125	Up to 1000	50	47	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	27	M30 x 1.5
140	Up to 1000	50	47	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	27	M30 x 1.5
160	Up to 1200	56	53	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	30.5	M36 x 1.5

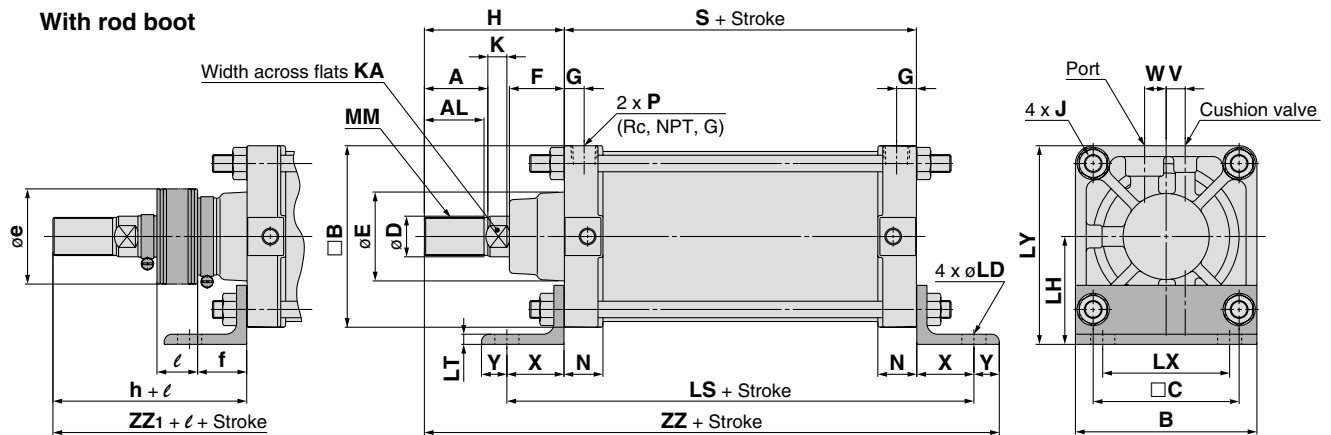
(mm)

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

* The minimum stroke with rod boot is 30 mm or more.
 ** For auto switch mounting position and its mounting height, refer to page 1108-11.
 *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 1108-12.

Foot: CS2YL

With rod boot



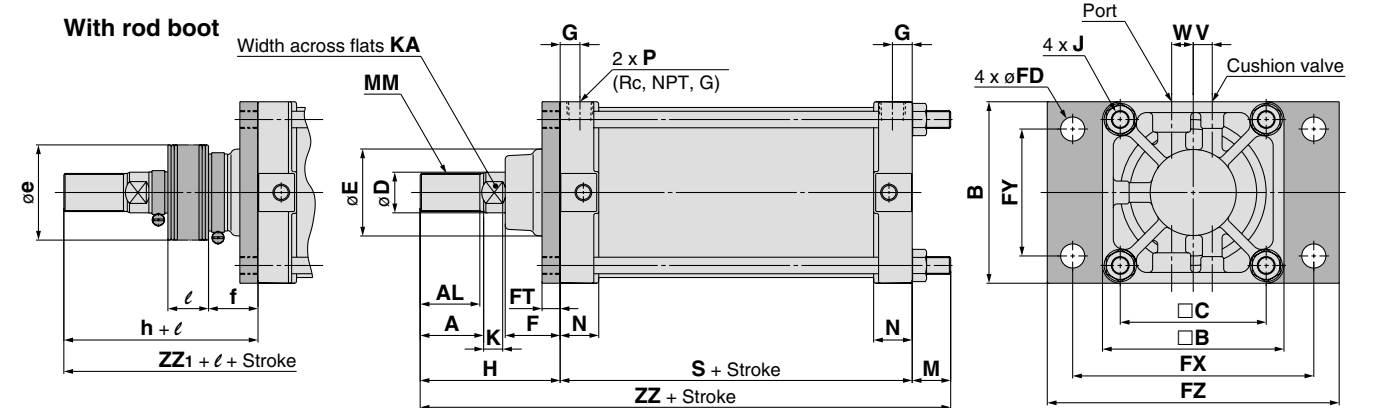
(mm)

Bore size (mm)	Stroke range (mm)	A	AL	□B	B	□C	D	E	F	G	J	V	W	K	KA	LD	LH	LS
125	Up to 1600	50	47	143	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	19	85	188
140	Up to 1600	50	47	157	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	19	100	188
160	Up to 1600	56	53	177	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	19	106	206

(mm)

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

* The minimum stroke with rod boot is 30 mm or more.
 ** For auto switch mounting position and its mounting height, refer to page 1108-11.
 *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 1108-12.

Dimensions**Rod flange: CS2YF**

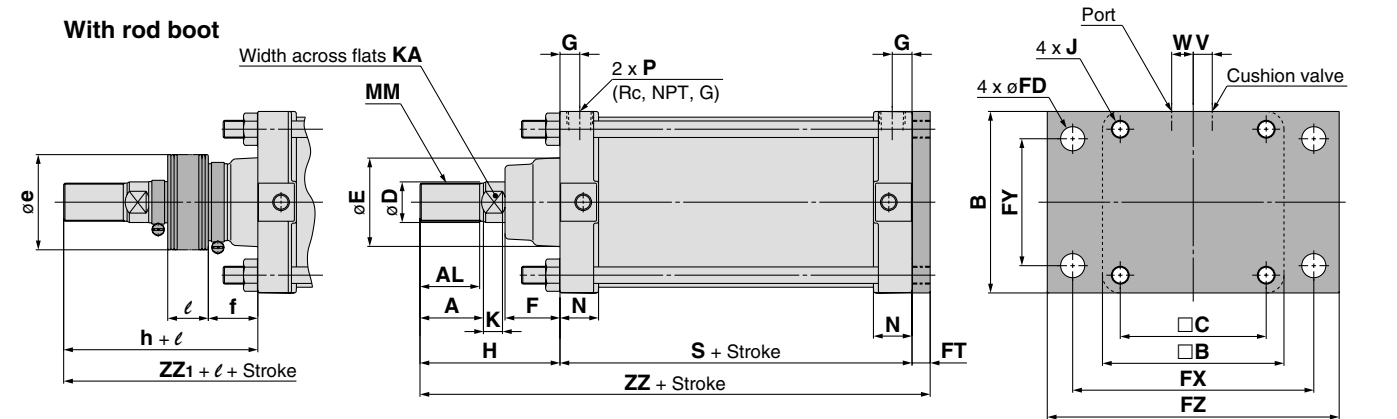
Bore size (mm)	Stroke range (mm)	A	AL	□B	B	□C	D	E	F	FD	FT	FX	FY	FZ	G	J	V
125	Up to 1600	50	47	143	145	115	32	71	43	19	14	190	100	230	15	M14 x 1.5	15
140	Up to 1600	50	47	157	160	128	32	71	43	19	20	212	112	255	15	M14 x 1.5	15
160	Up to 1600	56	53	177	180	144	38	78.5	42	19	20	236	118	275	18	M16 x 1.5	15

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

* The minimum stroke with rod boot is 30 mm or more.

** For auto switch mounting position and its mounting height, refer to page 1108-11.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 1108-12.

Head flange: CS2YG

Bore size (mm)	Stroke range (mm)	A	AL	□B	B	□C	D	E	F	FD	FT	FX	FY	FZ	G	J	V
125	Up to 1000	50	47	143	145	115	32	71	43	19	14	190	100	230	15	M14 x 1.5	15
140	Up to 1000	50	47	157	160	128	32	71	43	19	20	212	112	255	15	M14 x 1.5	15
160	Up to 1200	56	53	177	180	144	38	78.5	42	19	20	236	118	275	18	M16 x 1.5	15

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

* The minimum stroke with rod boot is 30 mm or more.

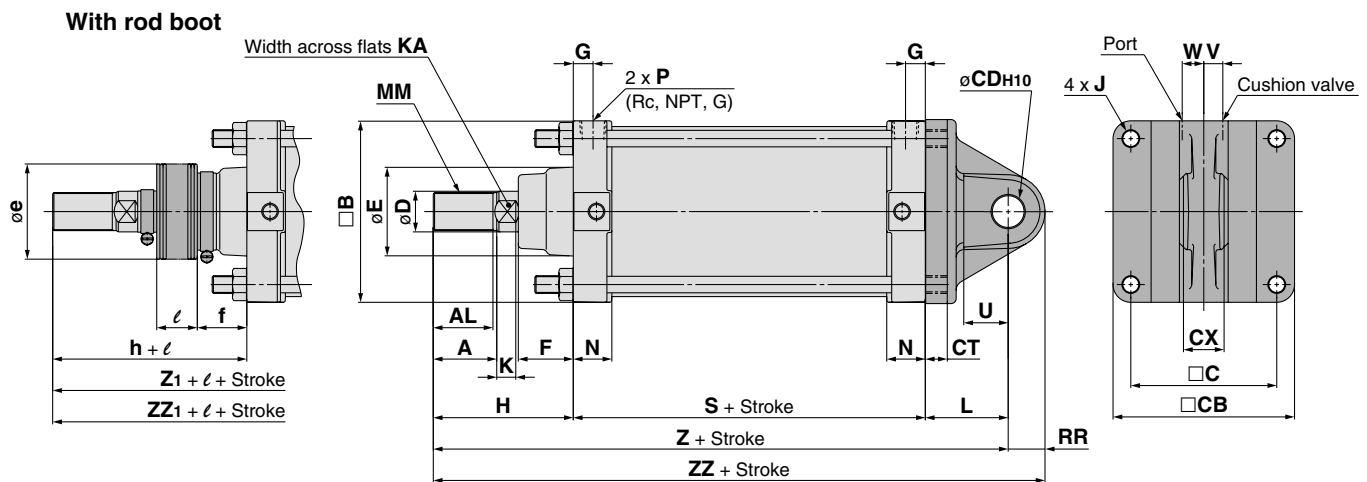
** For auto switch mounting position and its mounting height, refer to page 1108-11.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 1108-12.

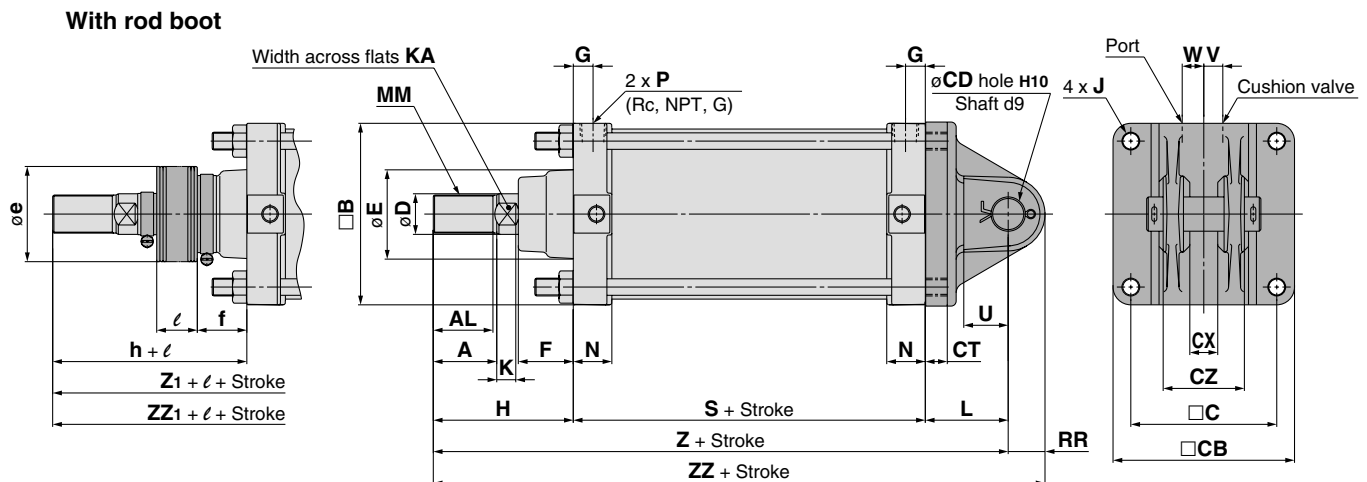
Series CS2Y

Dimensions

Single clevis: CS2YC



Double clevis: CS2YD



Bore size (mm)	Stroke range (mm)	A	AL	□B	□C	□CB	CDH10	CT	Single clevis			D	E	F	G	J	V	W
									CX	CX	CZ							
125	Up to 1000	50	47	143	115	145	25 ^{+0.084} ₀	17	32 ^{-0.1} _{-0.3}	32 ^{+0.3} _{-0.1}	64 ⁰ _{-0.2}	32	71	43	15	M14 x 1.5	15	17
140	Up to 1000	50	47	157	128	160	28 ^{+0.084} ₀	17	36 ^{-0.1} _{-0.3}	36 ^{+0.3} _{-0.1}	72 ⁰ _{-0.2}	32	71	43	15	M14 x 1.5	15	17
160	Up to 1200	56	53	177	144	180	32 ^{+0.100} ₀	20	40 ^{-0.1} _{-0.3}	40 ^{+0.3} _{-0.1}	80 ⁰ _{-0.2}	38	78.5	42	18	M16 x 1.5	15	20

(mm)																		
Bore size (mm)	K	KA	L	MM	N	P	S	U	RR	Without rod boot			With rod boot					
										H	Z	ZZ	e	f	h	ℓ	Z ₁	ZZ ₁
125	15	27	65	M30 x 1.5	30.5	1/2	98	35	29	110	273	302	75	40	133	½ stroke	296	325
140	15	27	75	M30 x 1.5	30.5	1/2	98	40	32	110	283	315	75	40	133	½ stroke	306	338
160	17	34	80	M36 x 1.5	34.5	3/4	106	45	36	120	306	342	75	40	141	½ stroke	327	363

* The minimum stroke with rod boot is 30 mm or more.

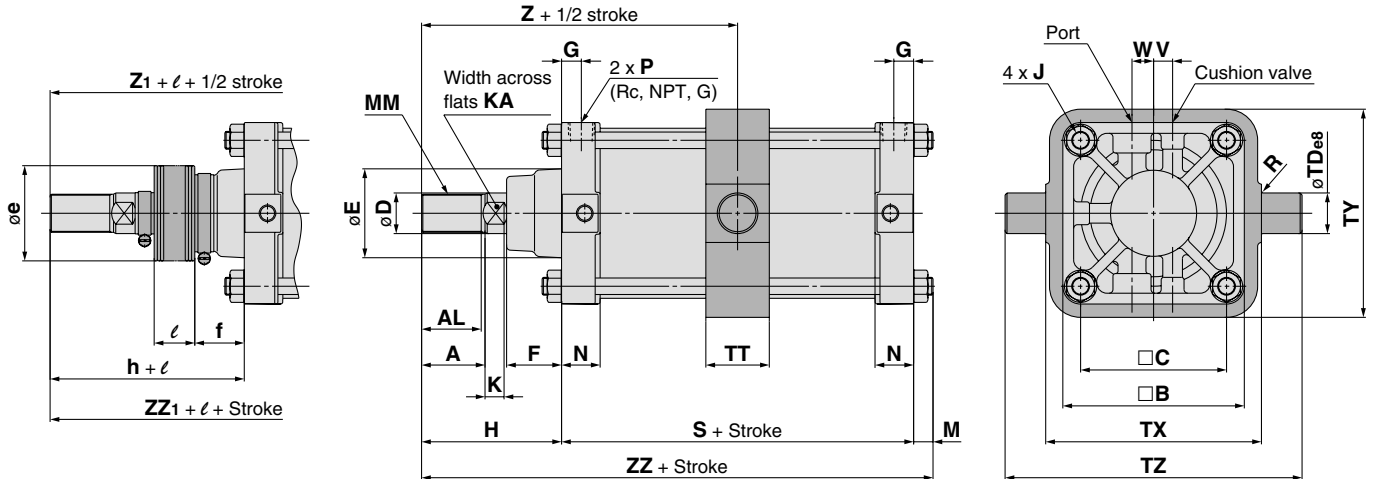
** For auto switch mounting position and its mounting height, refer to page 1108-11.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 1108-12.

Dimensions

Center trunnion: CS2YT

With rod boot



(mm)																	
Bore size (mm)	Stroke range (mm)	A	AL	□B	□C	D	E	F	G	J	V	W	K	KA	M	MM	N
125	25 to 1000	50	47	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	13	M30 x 1.5	30.5
140	30 to 1000	50	47	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	13	M30 x 1.5	30.5
160	35 to 1200	56	53	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	15	M36 x 1.5	34.5

(mm)																		
Bore size (mm)	P	R	S	TD _{e8}	TT	TX	TY	TZ	Without rod boot			With rod boot						
									H	Z	ZZ	e	f	h	ℓ	Z ₁	ZZ ₁	
125	1/2	1	98	32 ^{-0.050} _{-0.089}	50	170	164	234	110	159	221	75	40	133	⅓ stroke		182	244
140	1/2	1.5	98	36 ^{-0.050} _{-0.089}	55	190	184	262	110	159	221	75	40	133	⅓ stroke		182	244
160	3/4	1.5	106	40 ^{-0.050} _{-0.089}	60	212	204	292	120	173	241	75	40	141	⅓ stroke		194	262

* The minimum stroke with rod boot is 30 mm or more for ø125, ø140 and 35 mm or more for ø160.

** For auto switch mounting position and its mounting height, refer to page 1108-11.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 1108-12.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

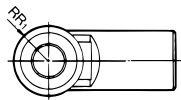
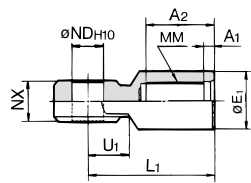
D-□

-X□

Individual
-X□

Smooth Cylinder / Series CS2Y Accessory Bracket

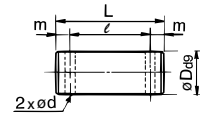
I Type Single Knuckle Joint*



Material: Cast iron

Part no.	Applicable bore size (mm)	A1	A2	E1	L1	MM	NDH10	NX	RR1	U1
I-12A	125	8	54	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{-0.1} _{-0.3}	27	33
I-14A	140	8	54	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{-0.1} _{-0.3}	30	39
I-16A	160	8	60	55	110	M36 x 1.5	32 ^{+0.1} ₀	40 ^{-0.1} _{-0.3}	34	39

Knuckle Pin / Clevis Pin

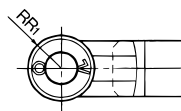
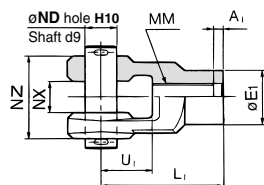


Material: Carbon steel

Part no.	Applicable bore size (mm)	Dd9	L	ℓ	m	d (Drill through)	Applicable split pin
IY-12	125	25 ^{-0.065} _{-0.117}	79.5	69.5	5	4	ø4 x 40
IY-14	140	28 ^{-0.065} _{-0.117}	86.5	76.5	5	4	ø4 x 40
IY-16	160	32 ^{-0.080} _{-0.142}	94.5	84.5	5	4	ø4 x 40

* Split pin is included.

Y Type Double Knuckle Joint*

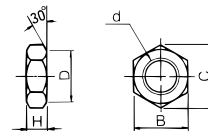


Material: Cast iron

Part no.	Applicable bore size (mm)	A1	E1	L1	MM	NDH10	NX	NZ	RR1	U1
Y-12A	125	8	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{+0.3} _{+0.1}	64 ^{-0.1} _{-0.3}	27	42
Y-14A	140	8	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{+0.3} _{+0.1}	72 ^{-0.1} _{-0.3}	30	47
Y-16A	160	8	55	110	M36 x 1.5	32 ^{+0.1} ₀	40 ^{+0.3} _{+0.1}	80 ^{-0.1} _{-0.3}	34	46

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

Rod End Nut

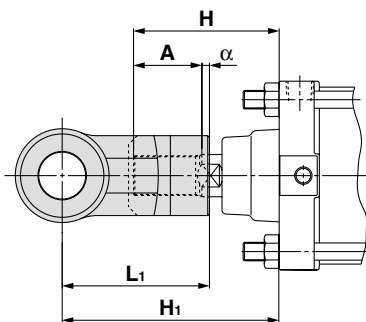


Material: Rolled steel

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

● "Made to order" with rod end bracket (-XC86) is available when ordering cylinders and accessories together. Please refer to Series CS2 Catalog (CAT.ES20-196) for details.

Single/Double Knuckle Joint



Symbol	H	A	α	L1	H1	Applicable knuckle joint part number	
Bore size (mm)						I type single knuckle	Y type double knuckle
125	110	50	3.5	100	156.5	I-12A	Y-12A
140	110	50	3.5	105	161.5	I-14A	Y-14A
160	120	56	3.5	110	170.5	I-16A	Y-16A

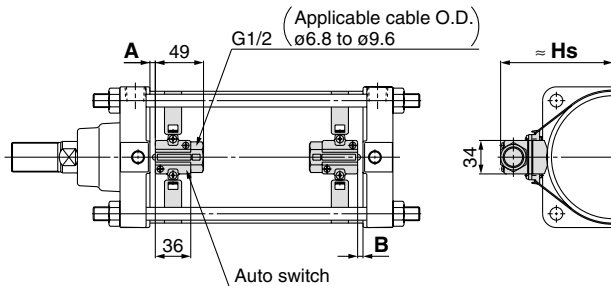
A, H Dimensions when Mounting a Single/Double Knuckle Joint together with a Rod End Nut

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

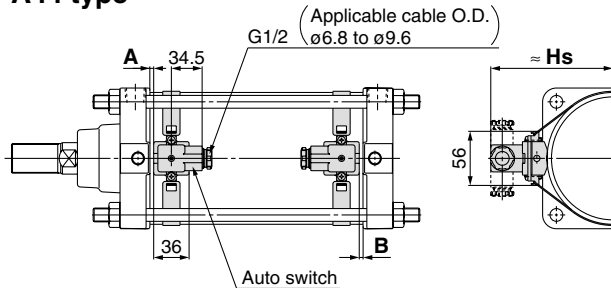
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-A3□ type
D-G3/K3 type



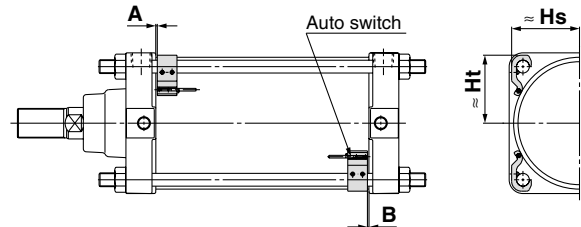
D-A44 type



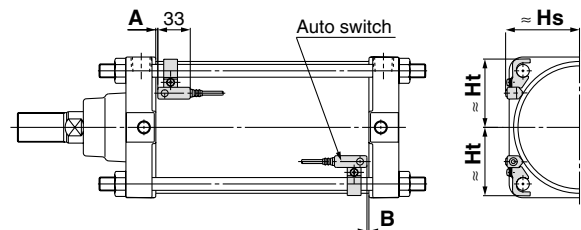
* The indicator light faces the inside.

<Tie-rod mounting>

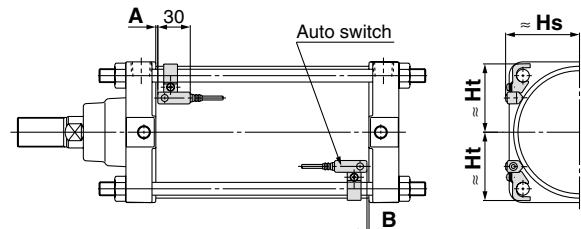
D-A9□/A9□V type D-Z7□/Z80 type
D-M9□/M9□V type D-Y59□/Y69□/Y7P/Y7PV type
D-M9□W/M9□WV type D-Y7□W/Y7□WV type
D-M9□AL/M9□AVL type D-Y7BAL type



D-A5□/A6□ type



D-F5□/J5□/D-F5NTL type
D-F5BAL/F59F type
D-F5□W/J59W type

**Auto Switch Proper Mounting Position**

Auto switch model	(mm)													
	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL		D-A5□ D-A6□ D-A3□ D-A44 D-G39 D-K39		D-A59W		D-F5□W D-J59W D-F5BAL D-F5□ D-J5□ D-F59F		D-F5NTL	
Bore size	A	B	A	B	A	B	A	B	A	B	A	B	A	B
125	9	8	13	12	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5
140	9	8	13	12	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5
160	9	8	13	12	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5

* Provided as guidelines for auto switch proper mounting position (detection at stroke end). When setting an auto switch, confirm the operation and adjust its mounting position.

Auto Switch Mounting Height

Auto switch model	(mm)													
	D-A9□ D-A9□V D-M9□ D-M9□W D-M9□AL		D-M9□V D-M9□WV D-M9□AVL		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BAL		D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F5□W D-J59W D-F5BAL D-F59F D-F5NTL	
Bore size	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Ht
125	69	69.5	71.5	69.5	69	69.5	116	126	75.5	69.5	74.5	70		
140	76	76	77.5	76	76	76	124	134	81	76.5	80	76.5		
160	85	85	86	85	85	85	134.5	144.5	89	87.5	88	87.5		

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual

-X□

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion		
			ø125	ø140	ø160
D-A9□	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	15	100	105	110
	With n pcs.	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-A9□V	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	10	75	80	85
	With n pcs.	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□ D-M9□W	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	15	105	110	115
	With n pcs.	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□V D-M9□WV	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	10	80	85	90
	With n pcs.	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□AL	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	20	115	120	
	With n pcs.	$20 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$120 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
D-M9□AVL	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	15	90	95	
	With n pcs.	$15 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$95 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W D-J59W D-F5BAL D-F59F	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	25	125	135	
	With n pcs. (Same surface)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$125 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$135 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
D-F5NTL	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	35	145	155	
	With n pcs. (Same surface)	$35 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$145 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$155 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
D-A3□ D-G39 D-K39	With 2 pcs.	Different surfaces	35	110	
		Same surface	100		
	With n pcs.	Different surfaces	$35 + 30(n-2)$	$110 + 30(n-2)$ (n = 2, 4, 6, 8...)	
		Same surface	$100 + 100(n-2)$	$110 + 100(n-2)$ (n = 2, 4, 6, 8...)	
D-A44	With 2 pcs.	With 1 pc.	15	110	
		Different surfaces	35	110	
		Same surface	55		
	With n pcs.	Different surfaces	$35 + 30(n-2)$	$110 + 30(n-2)$ (n = 2, 4, 6, 8...)	
		Same surface	$55 + 55(n-2)$	$110 + 50(n-2)$ (n = 2, 4, 6, 8...)	
	With 1 pc.		15	110	
D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	15	105	110	115
	With n pcs.	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-Y69□ D-Y7PV D-Y7□WV	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	10	90	95	100
	With n pcs.	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$95 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$100 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-Y7BAL	With 2 pcs. (Different surfaces, Same surface), With 1 pc.	20	115	120	125
	With n pcs.	$20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$115 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$120 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$125 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)

Operating Range

Auto switch model	Bore size (mm)		
	125	140	160
D-A9□/A9□V	12	12.5	11.5
D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	6	6.5	6.5
D-Z7□/Z80	14	14.5	13
D-A3□/A44 D-A5□/A6□	10	10	10
D-A59W	17	17	17
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL	12	13	7
D-F5□/J5□/F5□W D-J59W/F5BAL D-F5NTL/F59F	5	5	5.5
D-G39/K39	11	11	10

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

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)		
	ø125	ø140	ø160
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	BS5-125	BS5-125	BS5-160
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5NTL D-F5□W/J59W D-F5BAL/F59F	BT-12	BT-12	BT-16
D-A3□/A44 D-G39/K39	BS1-125	BS1-140	BS1-160
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL	BS4-125	BS4-125	BS4-160

[Mounting screws set made of stainless steel]

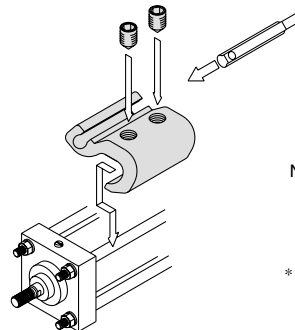
The following set of mounting screws made of stainless steel (including set screws) is also available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

BBA1: For D-A5, A6, F5, J5 type

"D-F5BAL" auto switch is set on the cylinder with the stainless steel screws above when shipped.

When only an auto switch is shipped independently, "BBA1" screws are attached.

Note) When using the D-M9□AL/M9□AVL or Y7BAL model, do not use the steel set screw which is included with the auto switch mounting bracket in the above table (BS5-□□□, BS4-□□□). Please separately prepare the stainless steel screw set (BBA1), and select and use the M4 x 8L stainless steel set screw included in BBA1.



Note 1) Refer to Best Pneumatics No. 2 for the details of BBA1 screws.

* Shows an example of mounting the D-A9□(V), M9□(V), M9□W(V), M9□A(V)L model.

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to Best Pneumatics No. 2.

Type	Model	Electrical entry (Direction)	Features
Reed auto switch	D-A90V	Grommet (Perpendicular)	Without indicator light
	D-A93V, A96V		
	D-Z73, Z76	Grommet (in-line)	—
	D-A53, A56		
	D-A67		Without indicator light
	D-Z80		
Solid state auto switch	D-F59, F5P, J59	Grommet (in-line)	—
	D-Y59A, Y59B, Y7P		
	D-F59W, F5PW, J59W		2-color indication
	D-Y7NW, Y7PW, Y7BW		Water resistant (2-color indication)
	D-F5BAL, Y7BAL		With timer
	D-F5NTL		
	D-M9NV, M9PV, M9BV	Grommet (Perpendicular)	—
	D-Y69A, Y69B, Y7PV		
	D-M9NWV, M9PWV, M9BWV		2-color indication
	D-Y7NWV, Y7PWV, Y7BWV		
	D-M9NAVL, M9PAVL, M9BAVL		Water resistant (2-color indication)

* With pre-wired connector is available for solid state auto switches. For details, refer to Best Pneumatics No. 2.

* Normally closed (NC = b contact), solid state switches (D-F9G, F9H, Y7G, Y7H type) are also available. For details, refer to Best Pneumatics No. 2.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□



Smooth Cylinder Specific Product Precautions 1

Be sure to read before handling.

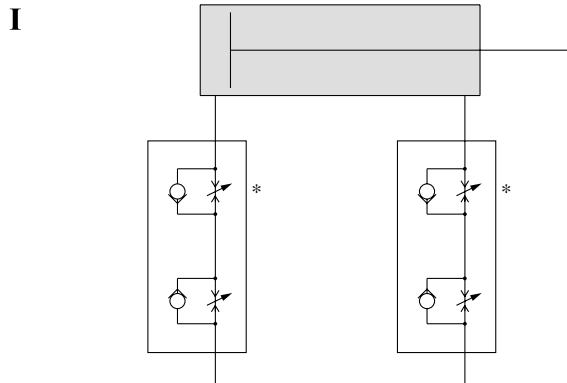
Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Recommended Pneumatic Circuit

Refer to the diagrams below when controlling speed with the smooth cylinder.

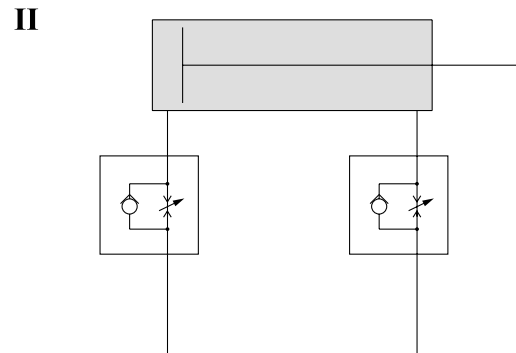
Warning

Horizontal operation (Speed control)



Dual speed controller

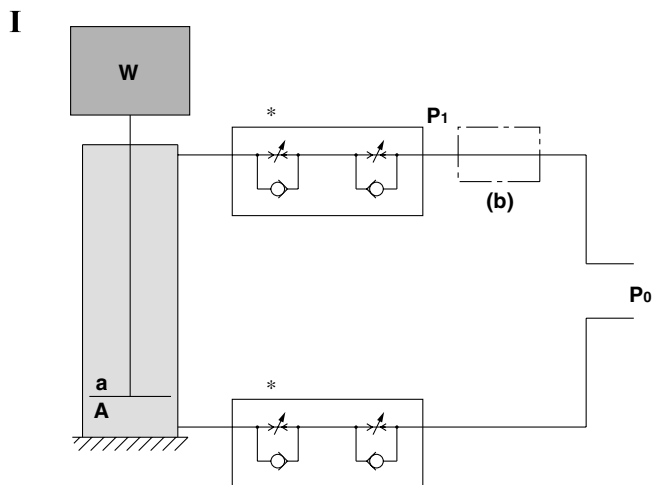
Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip. More stable low speed operation can be achieved than meter-in circuit alone.



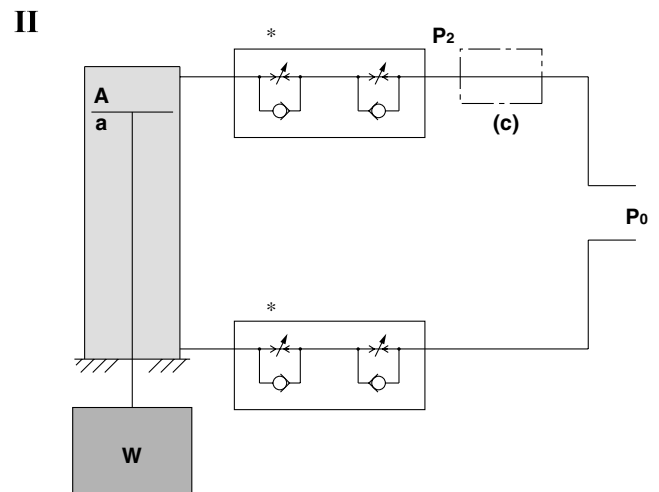
Meter-in speed controller

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

Vertical operation (Speed control)



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



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

W: Load (N) P_0 : Operating pressure (MPa) P_1, P_2 : Reduced pressure (MPa) a : Rod side piston area (mm²) A : Head side piston area (mm²)

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□



Smooth Cylinder Specific Product Precautions 2

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Lubricant

Caution

1. Operate without lubrication.

Lubrication may cause malfunction.

2. Do not use grease not specified by SMC.

Using grease other than that specified may cause malfunction.

- 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 off grease from the sliding part of the air cylinder.

Wiping grease from the sliding part of the air cylinder forcefully may cause malfunction.

Air Source

Caution

1. Take measure to prevent pressure fluctuations.

Pressure fluctuations may cause malfunction.

Low Speed Cylinder

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

ø10, ø16 ø10 to ø32 ø12 to ø25 ø32 to ø100 ø20 to ø40

Air Cylinder Series **CJ2X**



Bore size (mm)	Minimum operating pressure (MPa)	Minimum operating piston speed (mm/s)
10, 16	0.06	1

Page

1114

Free Mount Cylinder Series **CUX**



Bore size (mm)	Minimum operating pressure (MPa)	Minimum operating piston speed (mm/s)
10, 16	0.06	1
20, 25, 32	0.05	0.5

1124

Compact Cylinder Series **CQSX**



Bore size (mm)	Minimum operating pressure (MPa)	Minimum operating piston speed (mm/s)
12, 16	0.03	1
20, 25	0.025	0.5

1129

Compact Cylinder Series **CQ2X**



Bore size (mm)	Minimum operating pressure (MPa)	Minimum operating piston speed (mm/s)
32, 40	0.025	0.5
50, 63, 80, 100	0.01	0.5

1136

Air Cylinder Series **CM2X**



Bore size (mm)	Minimum operating pressure (MPa)	Minimum operating piston speed (mm/s)
20, 25, 32, 40	0.025	0.5

1148

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

Clean Series

Compact Cylinder Series **10-/11-CQSX**



Compact Cylinder Series **10-/11-CQ2X**



Air Cylinder Series **10-/11-CM2X**



D-□

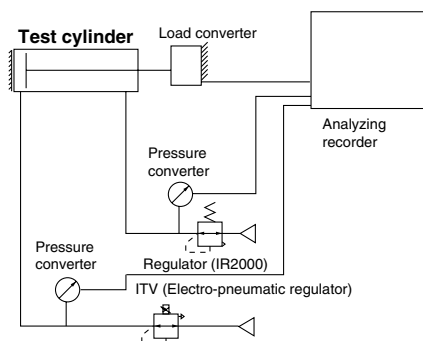
-X□

Individual
-X□

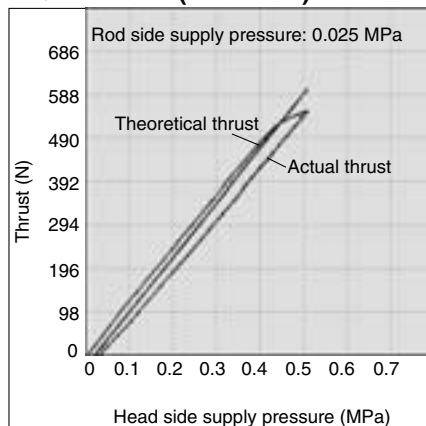
Low Speed Cylinder

Improved low friction characteristics (CM2X, CQSX, CQ2X)
 Minimum operating pressure is reduced in half (compared to previous version).
 Stabilization of thrust has been realized.

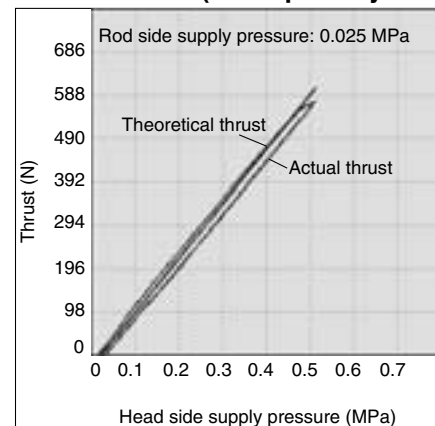
Measurement circuit of cylinder output relative to supply pressure



CQ2B40-75D (Standard)

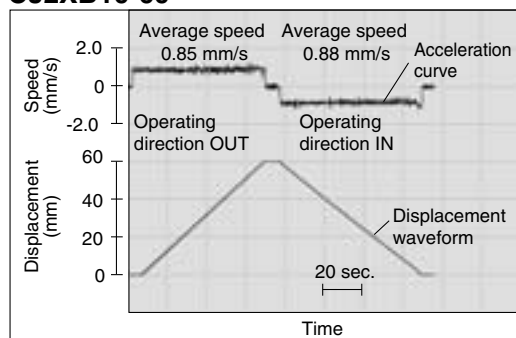


CQ2XB40-75D (Low speed cylinder)

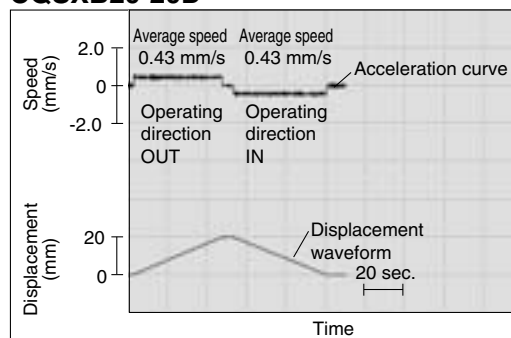


Stable low speed operation even at 0.5 mm/s (1 mm/s for $\phi 16$ or smaller) is achieved.
 Operates smoothly with minimal stick-slip.

CJ2XB10-60



CQSXB20-20D



Note 1) Average speed is what the stroke is divided by piston rod's transit time.
 Note 2) The OUT operating direction is considered to be positive with regard to speed.

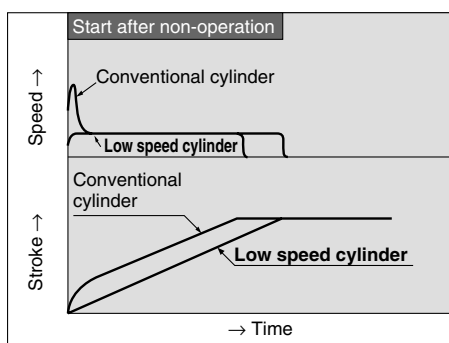
Data conditions

- Working fluid Air
- Mounting orientation Horizontal no-load
- Operating pressure 0.35 MPa
- Operating circuit Meter-in

Possible to transfer a workpiece which hates shocks at lower speeds.

Smooth start with a little ejection even after being rendered for hours.

The dimensions of all models are the same as those of standard cylinders.



Clean room specification has been added. (10-/11-CQSX, CQ2X, CM2X)

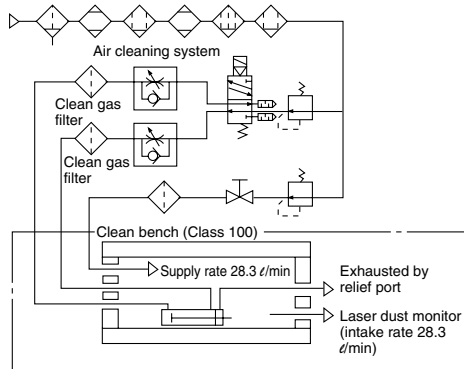
Particulate generation data for microspeed cylinder with clean room specifications are measured using the following test method.

[Example of test method]

The test sample is in place in an acrylic chamber. The chamber is set up on a Class 100 clean bench. The solenoid valve is operated while supplying a volume of clean air equal to the intake volume of a laser dust monitor (28.3 ℓ /min). The amount of particle generation is measured for a specific number of operating cycles.

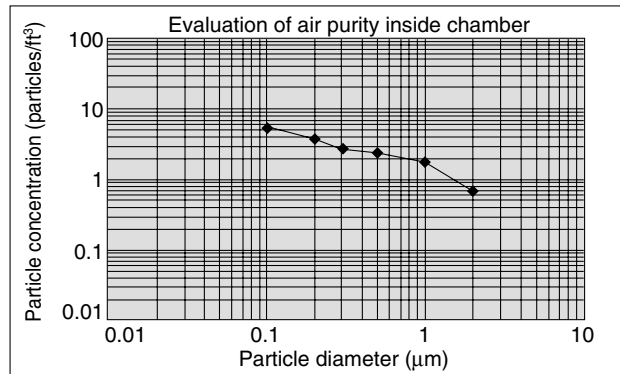
Measuring Conditions

Chamber volume	15 ℓ
Purity of air supplied to chamber	Same quality as supply air
Laser dust monitor	Hitachi Electronics Engineering Corporation TS-6200 Min. measurable particle dia.: 0.1 μm Intake rate: 28.3 ℓ /min
Laser dust monitor setting conditions	Sampling time: 5 min Interval time: 55 min
Cylinder operating conditions	Operating frequency: 30 cpm Average piston speed: 100 mm/s Mounting: Horizontal no-load Supply pressure: 0.5 MPa

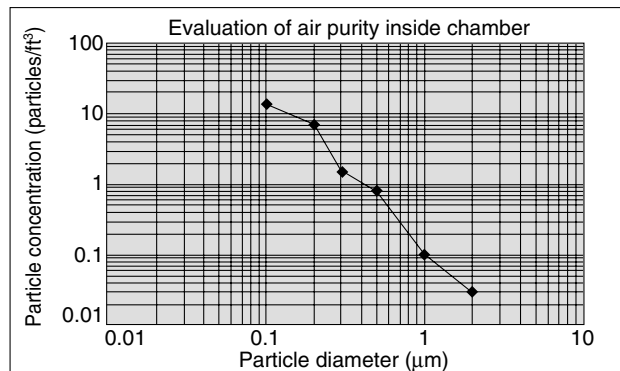


Particle generation measuring circuit

10-CQSXB20-50D



10-CM2XB20-50



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

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

How to Order

Bore size

10	10 mm
16	16 mm

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
D	Double clevis style

Standard stroke (mm)

ø10	15, 30, 45, 60, 75, 100, 125, 150
ø16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

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

Built-in Magnet Cylinder Model

Suffix the symbol “-A” (Rail mounting style) or “-B” (Band mounting style) to the end of part number for cylinder with auto switch.

Example	Rail mounting style	CDJ2XB10-45-A
	Band mounting style	CDJ2XB16-60-B

* For the rail mounting type, screws and nuts for two auto switches are included in the rail.

With auto switch

CJ2X L 16 - 60

With auto switch (Built-in magnet)

CDJ2X L 16 - 60 - M9BW

Low speed cylinder

Port location on head cover

Bore size (mm)	ø10, ø16
Symbol	Nil
Nil	Perpendicular to axis
R	Axial direction

* For configuration, refer to page 1115.

Auto switch

Nil	Without auto switch
-----	---------------------

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	“n” pcs.

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

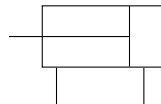
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model			Lead wire length (m)					Pre-wired connector	Applicable load			
					DC	AC	Band mounting	Rail mounting		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9N	—	—	●	●	●	○	—	○	IC circuit	Relay, PLC		
				3-wire (PNP)			—	F7NV	F79	●	—	●	○	—	○				
		Connector		2-wire			12 V	M9P	—	—	●	●	●	○	—			○	—
				2-wire				12 V	M9B	—	—	●	●	●	○			—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V		H7C	J79C	—	●	—	●	●	●	—	—		IC circuit	
				3-wire (PNP)			M9NW	—	—	●	●	●	○	—	○				
				3-wire (PNP)			M9PW	—	—	●	●	●	○	—	○				
				2-wire			12V	M9BW	—	—	●	●	●	○	—	○			—
				2-wire	12V		—	F7BWV	J79W	●	—	●	○	—	○	—			
				With diagnostic output (2-color indication)	4-wire (NPN)		5 V, 12 V	H7NF	—	F79F	●	—	●	○	—	○		IC circuit	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96	—	A76H	●	—	●	—	—	—	IC circuit	Relay, PLC	
				2-wire	—	200 V	—	A72	A72H	●	—	●	—	—	—	—			
		Connector			24 V	12 V	100 V	—	A73	A73H	●	—	●	●	—	—	—		
							100 V or less	A93	—	—	●	—	●	—	—	—	—		
	—						C73C	A73C	—	●	—	●	●	●	—	—			
	24 V or less			C80C			A80C	—	●	—	●	●	●	—	—				
	Diagnostic indication (2-color indication)	Grommet		Yes	—	—	—	A79W	—	—	●	—	●	—	—	—	—		

- * Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX
- * Since there are other applicable auto switches than listed, refer to page 1123 for details.
* For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
* For the band mounting type, D-A9□V□/M9□V□/M9□WV□/M9□A(V)L types cannot be mounted.
- * Solid state auto switches marked with “○” are produced upon receipt of order.
* D-A9□/M9□/M9□W/A7□□/A80□/F7□□/J7□□ auto switches are shipped together (not assembled). (When D-A9□/M9□/M9□W are specified, only auto switch mounting brackets are assembled before shipped.)
* D-C7□□/C80□/H7□□ auto switches are assembled at the time of shipment.
* Order auto switch mounting brackets separately when D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types are mounted with a rail. Refer to page 1123 for details.
** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.



JIS Symbol

Double acting, Single rod



⚠ Precautions

Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining but 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.
- Proper tightening torque for mounting thread should be within the range specified. 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, such as Super Tool Corp., CSM-07A.
- For the auto switch mounting rail, do not remove the pre-equipped rail. Since the mounting thread is drilled through inside a the cylinder, it will result in air leakage.

Operating Precautions

⚠ Warning

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

⚠ Caution

- For Series CJ2X, 0.1 N_l/min is the values at maximum in terms of its construction and there is internal leakage (ANR).

Specifications

Bore size (mm)		10	16
Action		Double acting, Single rod	
Fluid		Air	
Proof pressure		1.05 MPa	
Maximum operating pressure		0.7 MPa	
Minimum operating pressure		0.06 MPa	
Ambient and fluid temperature		Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)	
Cushion		Rubber bumper (Standard equipment)	
Lubrication		Not required (Non-lube)	
Stroke length tolerance		+1.0 0	
Piston speed		1 to 300 mm/s	
Allowable kinetic energy	ø10	0.035 J	
	ø16	0.090 J	

Standard Stroke

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

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

Mounting Style and Accessory

Mounting		Basic style	Axial foot style	Rod side flange style	Double* clevis style
Standard equipment	Mounting nut	●	●	●	—
	Rod end nut	●	●	●	●
	Clevis pin	—	—	—	●
Option	Single knuckle joint	●	●	●	●
	Double knuckle joint*	●	●	●	●
	T-bracket	—	—	—	●

* Pin and retaining ring are shipped together with double clevis and double knuckle joint.

Port Location on Head Cover

For basic style, the port position in a head cover is available either perpendicular to the axis or in-line with the cylinder axis.



Axial direction

Perpendicular

Mounting Bracket Part No.

Mounting bracket	Bore size (mm)	
	10	16
Foot bracket	CJ-L010B	CJ-L016B
Flange bracket	CJ-F010B	CJ-F016B
T-bracket*	CJ-T010B	CJ-T016B

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

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

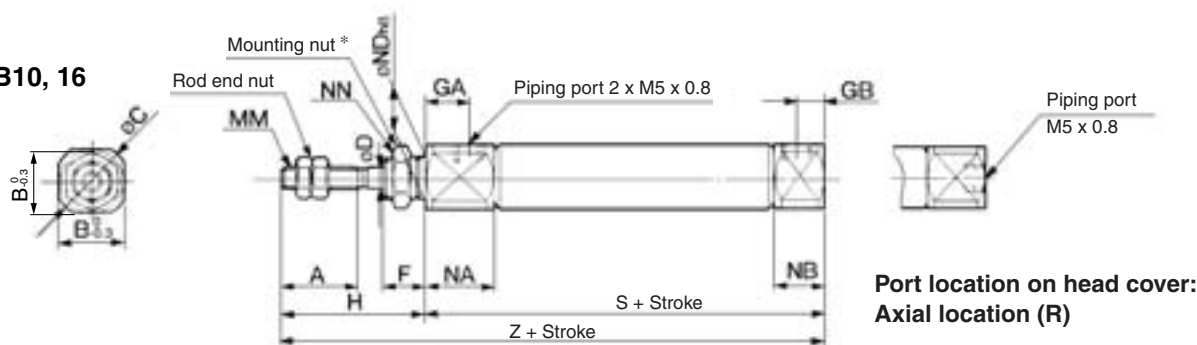
Individual
-X□

Series CJ2X

Basic Style (B)

CJ2XB Bore size – Stroke Port location on head cover

CJ2XB10, 16



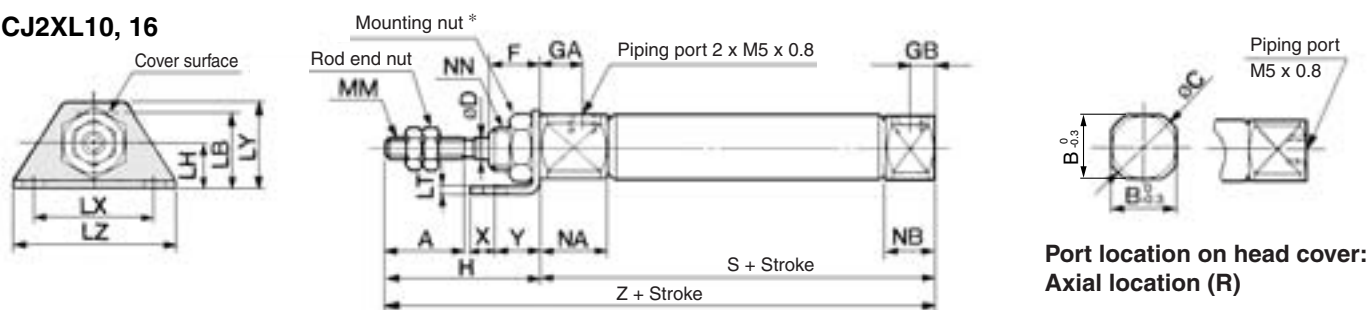
* For details of the mounting nut, refer to page 1118.

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

Axial Foot Style (L)

CJ2XL Bore size – Stroke Port location on head cover

CJ2XL10, 16



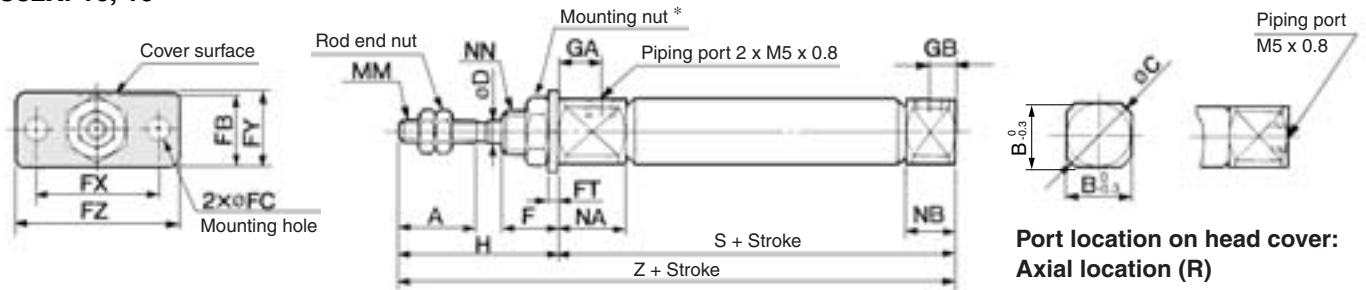
* For details of the mounting nut, refer to page 1118.

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

Rod Side Flange Style (F)

CJ2XF Bore size – Stroke Port location on head cover

CJ2XF10, 16

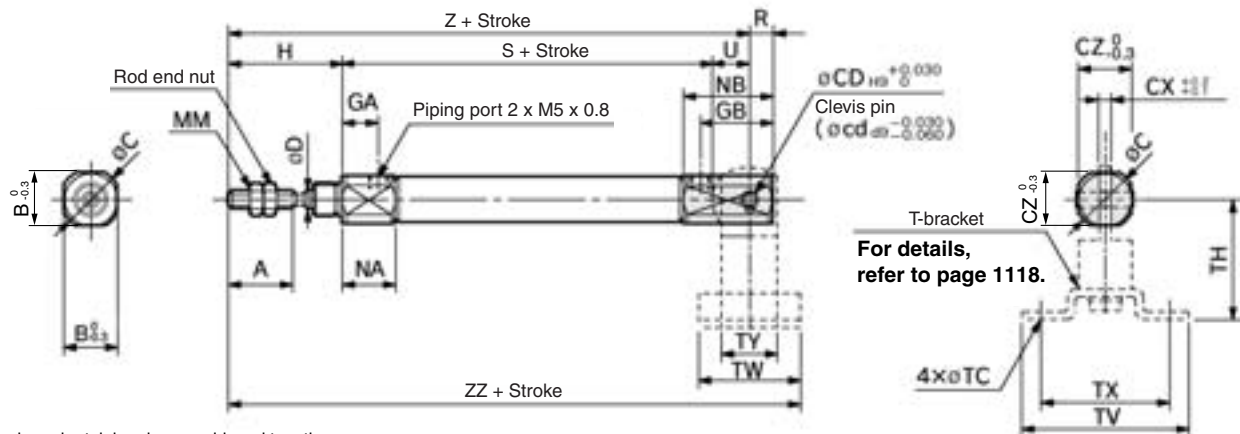


* For details of the mounting nut, refer to page 1118.

Bore size (mm)	A	B	C	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	H	MM	NA	NB	NN	S	T	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

Double Clevis Style (D)

CJ2XD Bore size – Stroke



* Clevis pin and retaining ring are shipped together.

Bore size (mm)	A	B	C	CD (cd)	CX	CZ	D	GA	GB	H	MM	NA	NB	R	S	U	Z	ZZ
10	15	12	14	3.3	3.2	12	4	8	18	28	M4 x 0.7	12.5	22.5	5	46	8	82	93
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	99

T-bracket Dimensions

Bore size (mm)	TC	TH	TV	TW	TX	TY
10	4.5	29	40	22	32	12
16	5.5	35	48	28	38	16

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

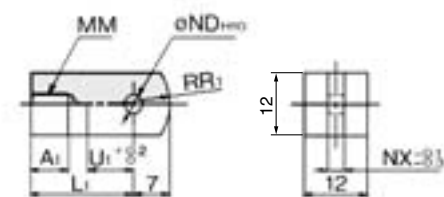
-X□

Individual
-X□

Accessory Bracket Dimensions

(mm)

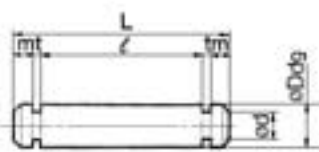
Single Knuckle Joint



Material: Rolled steel

Part no.	Applicable bore	A ₁	L ₁	MM	ND ^{H10}	NX	R ₁	U ₁
I-J010B	10	8	21	M4 x 0.7	3.3 ^{+0.048} ₀	3.1	8	9
I-J016B	16	8	25	M5 x 0.8	5 ^{+0.048} ₀	6.4	12	14

Clevis Pin

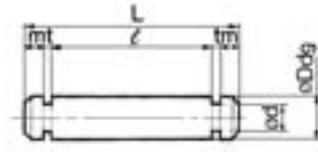


Material: Stainless steel

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

* Retaining rings are packaged with clevis pins.

Knuckle Pin



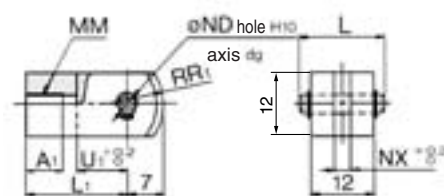
Material: Stainless steel

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

* For size ø10, clevis pin is diverted.

* Retaining rings are packaged with knuckle pins.

Double Knuckle Joint



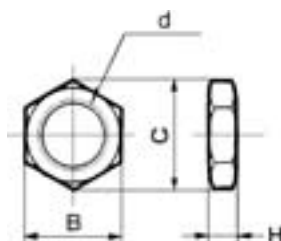
Material: Rolled steel

Part no.	Applicable bore	A ₁	L	L ₁	MM
Y-J010B	10	8	15.2	21	M4 x 0.7
Y-J016B	16	11	16.6	21	M5 x 0.8

Part no.	ND ₉	ND ^{H10}	NX	R ₁	U ₁
Y-J010B	3.3 ^{-0.030} _{-0.060}	3.3 ^{+0.048} ₀	3.2	8	10
Y-J016B	5 ^{-0.030} _{-0.060}	5 ^{+0.048} ₀	6.5	12	10

* Knuckle pin and retaining ring are shipped together.

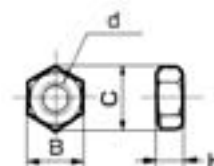
Mounting Nut



Material: Brass

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

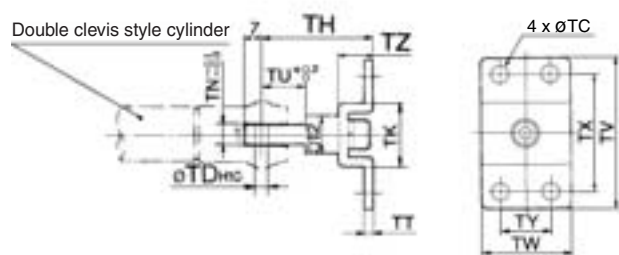
Rod End Nut



Material: Iron

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

T-bracket



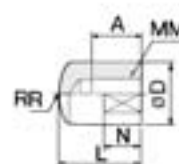
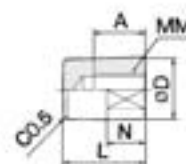
Part no.	Applicable bore	TC	TD ^{H10}	TH	TK	TN	TT	TU	TV	TW	TX	TY	TZ
CJ-T010B	10	4.5	3.3 ^{+0.048} ₀	29	18	3.1	2	9	40	22	32	12	8
CJ-T016B	16	5.5	5 ^{+0.048} ₀	35	20	6.4	2.3	14	48	28	38	16	10

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

Rod End Cap

Flat type/CJ-CF□□□

Round type/CJ-CR□□□



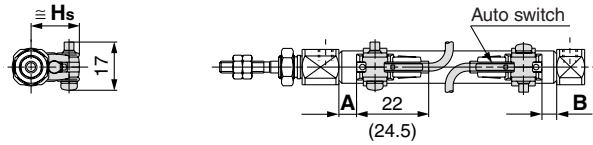
Material: Polyacetal

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

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

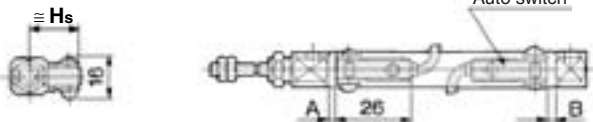
Reed auto switch <Band mounting style>

D-A9□

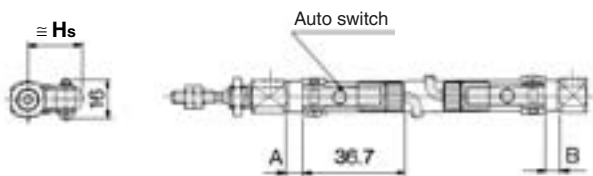


(): For D-A93 type

D-C7□/C80



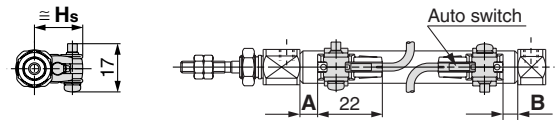
D-C73C□/C80C



Solid state auto switch <Band mounting style>

D-M9□

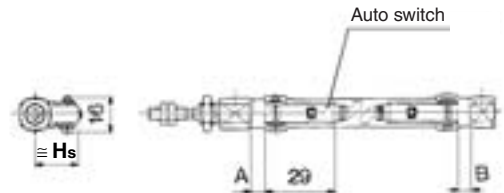
D-M9□W



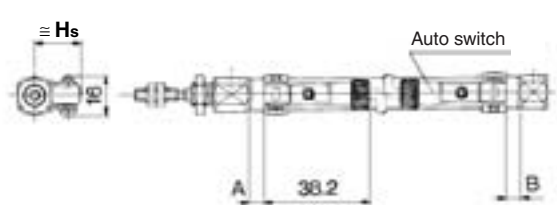
D-H7□

D-H7□W

D-H7NF



D-H7C



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

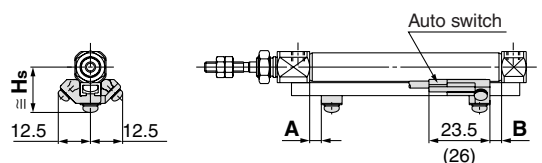
-X□

Individual
-X□

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

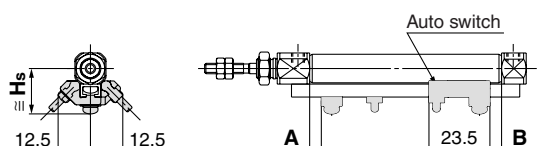
Reed auto switch <Band mounting style>

D-A9□

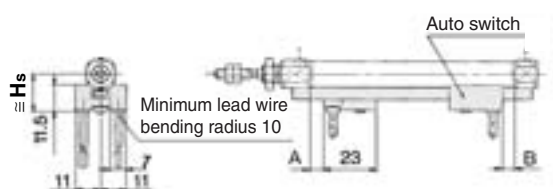


(): For D-A93 type

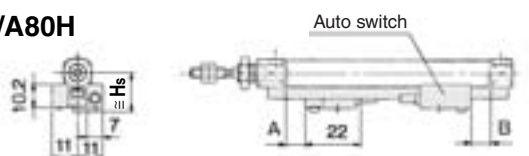
D-A9□V



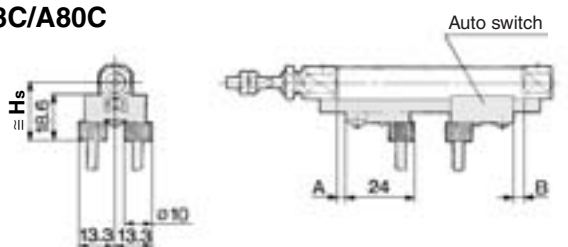
D-A7□/A80



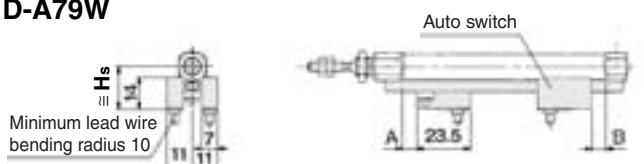
D-A7□H/A80H



D-A73C/A80C



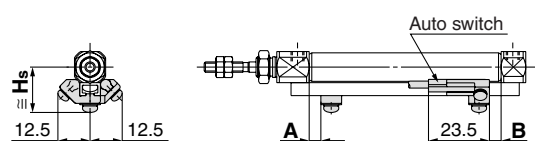
D-A79W



Solid state auto switch <Band mounting style>

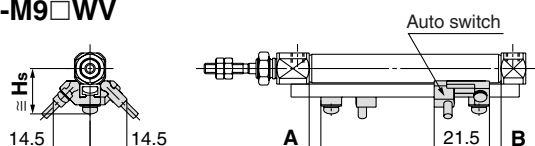
D-M9□

D-M9□W



D-M9□V

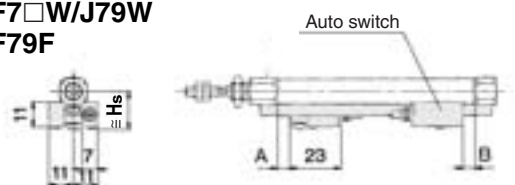
D-M9□WV



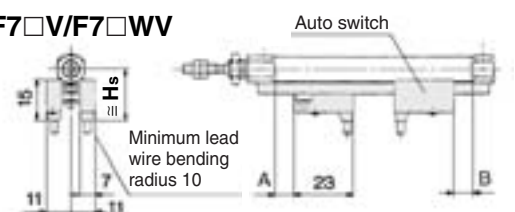
D-F7□/J79

D-F7□W/J79W

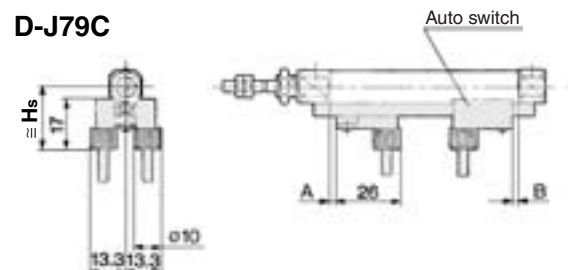
D-F79F



D-F7□V/F7□WV



D-J79C



Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

Auto switch model	Band mounting								Rail mounting											
	D-A9□		D-M9□ D-M9□W		D-C7□ D-C80 D-C73C D-C80C		D-H7□ D-H7C D-H7NF D-H7□W		D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV		D-A7□ D-A80		D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F D-J79C		D-F7NTL		D-A79W	
Bore size (mm)	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
10	2	2	6	6	2.5	2.5	1.5	1.5	0.5	0.5	4.5	4.5	3	3	3.5	3.5	8.5	8.5	0.5	0.5
16	2.5	2.5	6.5	6.5	3	3	2	2	1	1	5	5	3.5	3.5	4	4	9	9	1	1

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

Auto Switch Mounting Height

(mm)

Auto switch model	Band mounting				Rail mounting						
	D-A9□ D-M9□ D-M9□W	D-C7□ D-C80 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C	D-H7C	D-A7□ D-A80	D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV	D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F79F D-F7NTL	D-A73C D-A80C	D-F7□V D-F7□WV	D-J79C	D-A79W
Bore size (mm)	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs
10	16.5	17	19.5	20	16.5	17.5	17.5	23.5	20	23	19
16	20	20.5	23	23.5	19.5	21	20.5	26.5	23	26	22

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

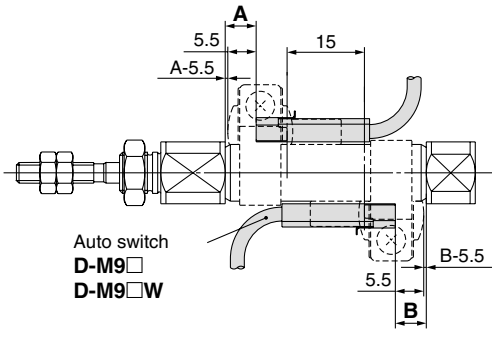
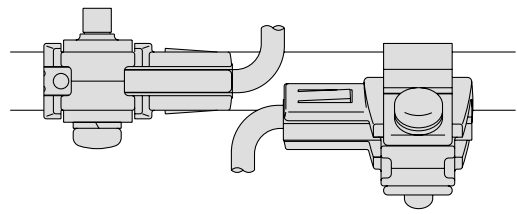
Individual
-X□

Minimum Auto Switch Mounting Stroke

(mm)

Auto switch mounting	Auto switch model	No. of auto switch mounted				
		1 pc.	2 pcs.		n pcs. (n: No. of auto switch)	
			Different surfaces	Same surface	Different surfaces	Same surface
Band mounting	D-A9□ D-M9□ D-M9□W	10	15 ^{Note 1)}	45 ^{Note 1)}	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6…)	45 + 15 (n-2)
	D-C7□ D-C80	10	15	50	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6…)	50 + 20 (n-2)
	D-H7□/H7□W D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6…)	60 + 22.5 (n-2)
	D-C73C D-C80C D-H7C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6…)	50 + 27.5 (n-2)
Rail mounting	D-M9□V	5	—	5	—	10 + 10 (n-2) (n = 4, 6…)
	D-A9□V	5	—	10	—	10 + 15 (n-2) (n = 4, 6…)
	D-M9□ D-A9□	10	—	10	—	15 + 15 (n-2) (n = 4, 6…)
	D-M9□WV	10	—	15	—	15 + 15 (n-2) (n = 4, 6…)
	D-M9□W	15	—	15	—	20 + 15 (n-2) (n = 4, 6…)
	D-A7□/A80 D-A7□H/A80H D-A73C/A80C	5	—	10	—	15 + 10 (n-2) (n = 4, 6…)
	D-A7□H D-A80H	5	—	10	—	15 + 15 (n-2) (n = 4, 6…)
	D-A79W	10	—	15	—	10 + 15 (n-2) (n = 4, 6…)
	D-F7□ D-J79	5	—	5	—	15 + 15 (n-2) (n = 4, 6…)
	D-F7□V D-J79C	5	—	5	—	10 + 10 (n-2) (n = 4, 6…)
	D-F7□W/J79W D-F79F D-F7NTL	10	—	15	—	15 + 20 (n-2) (n = 4, 6…)
	D-F7□WV	10	—	15	—	10 + 15 (n-2) (n = 4, 6…)

Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

Auto switch model	With 2 auto switches	
	Different surfaces ^{Note 1)}	Same surface ^{Note 1)}
	 The proper auto switch mounting position is 5.5 mm inward from the switch holder edge.	 The 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-A93	—	45 to less than 50 stroke
D-M9□ D-M9□W	15 to less than 20 stroke	45 to less than 55 stroke

Operating Range

Auto switch model		(mm)	
		Bore size (mm)	
Band mounting	D-A9□	6	7
	D-M9□ D-M9□W	2.5	3
	D-C7□/C80/C73C/C80C	7	7
	D-H7□/H7□W D-H7NF	4	4
	D-H7C	8	9
	D-A9□/A9□V	6	6.5
Rail mounting	D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	3	3.5
	D-A7□/A80/A7H/A80H D-A73C/A80C	8	9
	D-A79W	11	13
	D-F7□/J79/F7□W/J79W D-F7□V/F7□WV/F79F D-J79C D-F7NTL	5	5

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

Auto Switch Mounting Bracket/Part No.

Auto switch mounting	Auto switch model	Bore size	
		ø10	ø16
Band mounting	D-A9□ D-M9□ D-M9□W	Note 1), Note 2) ① BJ2-010 ② BJ3-1	Note 1), Note 2) ① BJ2-016 ② BJ3-1
		① BJ2-□□□: A set of a and b in the figure. ② BJ3-1: A set of c, d and e in the figure.	
Rail mounting	D-C7□/C80 D-C73C/C80C D-H7□/H7□W D-H7NF	BJ2-010	BJ2-016
		Note 3) BQ2-012	Note 3) BQ2-012
Rail mounting	D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		

Note 1) Two kinds of auto switch mounting brackets are used as a set.

Note 2) Auto switch mounting brackets are shipped together with cylinders.

Note 3) When mounting a compact auto switch on the ø10 or ø16 rail mounting type, order auto switch mounting bracket shown in the table above. Order it separately from the cylinder.

Example

CDJ2BX10-60-A 1 unit

D-M9BWV 2 pcs.

BQ2-012 2 pcs.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features
Reed	D-C73, C76	Grommet (in-line)	—
	D-C80		Without indicator light
Solid state	D-H7A1, H7A2, H7B		—
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 to 1785.

* Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual

-X□

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

How to Order

CUX 10 - 30 D

With auto switch CDUX 10 - 30 D - M9BW

With auto switch
(Built-in magnet)

Low speed cylinder

Bore size

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

Port thread type

Symbol	Type	Bore size
Nil	M5 x 0.8	ø10, ø16, ø20, ø25
	Rc 1/8	ø32
TN	NPT 1/8	ø32
TF	G 1/8	ø32

Standard stroke (mm)

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

Action

D	Double acting
---	---------------

Auto switch

Nil	Without auto switch
-----	---------------------

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

Number of auto switches

Nil	2 pcs.
S	1 pc.

Built-in Magnet Cylinder Model

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

(Example) CDUX20-25D

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
	3-wire (PNP)			M9PV				M9P	●	●	●	○	○			
	2-wire			M9BV				M9B	●	●	●	○	○			
	3-wire (NPN)			M9N WV				M9N W	●	●	●	○	○			
	3-wire (PNP)			M9P WV				M9P W	●	●	●	○	○			
	2-wire			M9B WV				M9B W	●	●	●	○	○			
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
				No	2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—
			100 V or less					A90V	A90	●	—	●	—	—	—	

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

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

* Since there are other applicable auto switches than listed, refer to page 1128 for details.

* For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.

* Auto switches are shipped together (not assembled).

Specifications

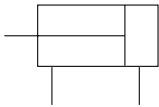


Bore size (mm)	10	16	20	25	32
Fluid	Air				
Proof pressure	1.05 MPa				
Maximum operating pressure	0.7 MPa				
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)				
Lubrication	Not required (Non-lube)				
Piston speed	ø10, ø16: 1 to 300 mm/s ø20 to ø32: 0.5 to 300 mm/s				
Cushion	Rubber bumper on both ends				
Rod end thread	Male thread				
Stroke length tolerance	+1.0 (Note) 0				
Mounting	Basic style				

(Note) Tolerance $^{+1.0}_0$

JIS Symbol

Double acting, Single rod



Minimum Operating Pressure

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

Standard Stroke

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

⚠ Precautions

- Be sure to read before handling.
- Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Mounting

⚠ Caution

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

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

Operating Precautions

⚠ Warning

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

⚠ Caution

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

Maintenance

⚠ Caution

1. Replacement parts/Seal kit

Order it in accordance with the bore size.

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

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

2. Grease pack

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

Grease pack part no.:

GR-L-005 (5 g)

GR-L-010 (10 g)

GR-L-150 (150 g)

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

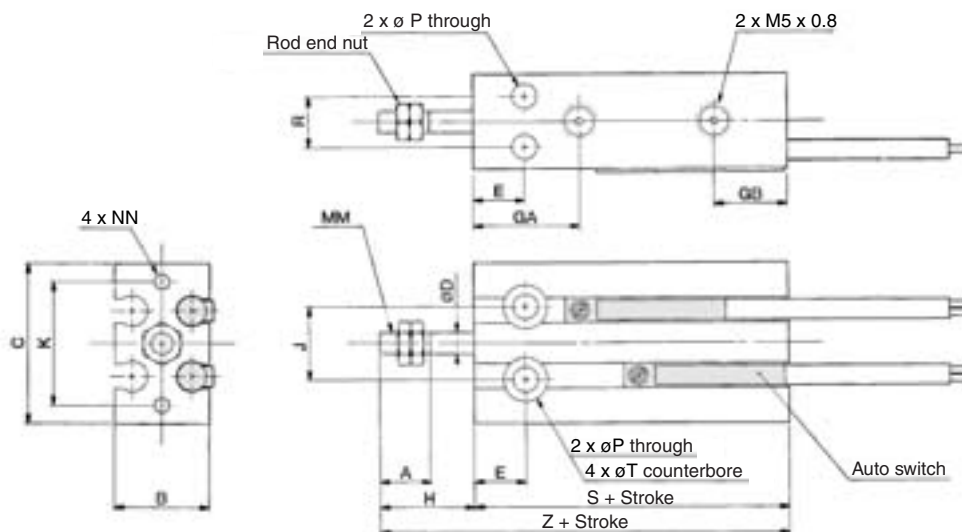
-X□

Individual
-X□

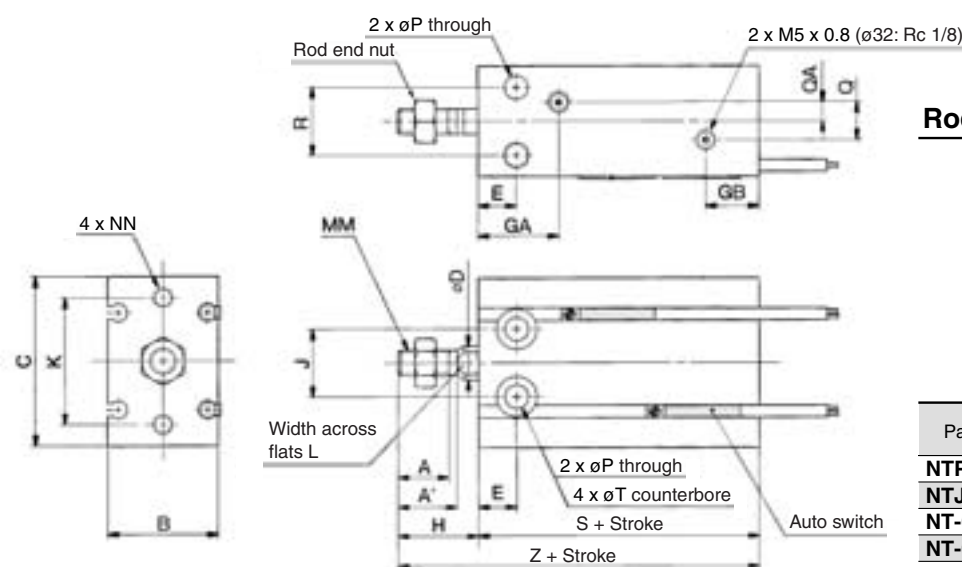
Series CUX

Dimensions: Double Acting, Single Rod

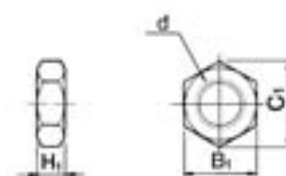
ø10



ø16 to ø32



Rod End Nut/Accessory



Material: Carbon steel

Part no.	Applicable bore (mm)	d	H ₁	B ₁	C ₁
NTP-010	10	M4 x 0.7	2.4	7	8.1
NTJ-015A	16	M5 x 0.8	4	8	9.2
NT-015A	20	M6 x 1.0	5	10	11.5
NT-02	25	M8 x 1.25	5	13	15.0
NT-03	32	M10 x 1.25	6	17	19.6

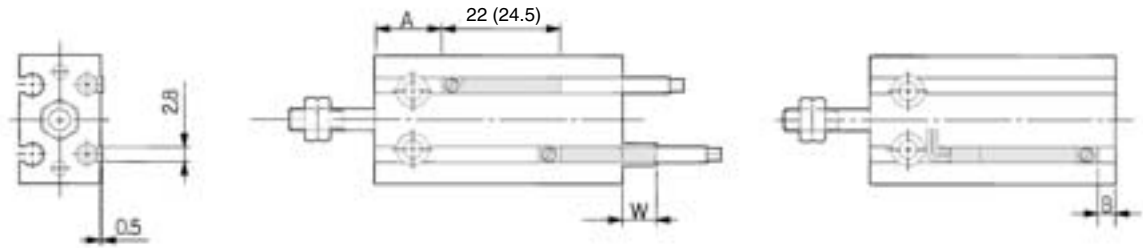
(mm)																	
Bore size (mm)	A	A'	B	C	D	E	GA	GB	H	J	K	L	MM	NN	P	Q	QA
10	10	—	15	24	4	7	16.5	10	16	11	18	—	M4 x 0.7	M3 x 0.5 depth 5	3.2	—	—
16	11	12.5	20	32	6	7	16.5 ^{Note}	11.5	16	14	25	5	M5 x 0.8	M4 x 0.7 depth 6	4.5	4	2
20	12	14	26	40	8	9	19	12.5	19	16	30	6	M6 x 1.0	M5 x 0.8 depth 8	5.5	9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

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

Note) 5 stroke (CUX16-5D): 14.5 mm

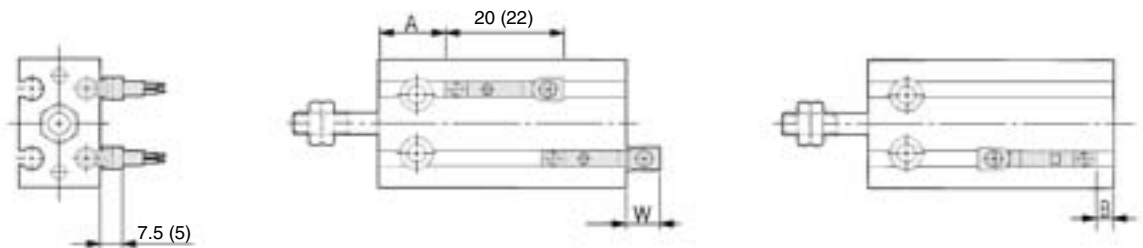
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

D-A9□
D-M9□
D-M9□W



(): Denotes the values of D-A93.

D-A9□ V
D-M9□ V
D-M9□ WV



(): Denotes the values of D-A9□V.

CDU Double Acting, Single Rod

(mm)

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



Note 1) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

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 switch will not turn OFF or 2 switches will turn ON simultaneously due to their movement range. Therefore, set the position approximately 1 to 4 mm outward from the values given in the table above. Then, perform an operation inspection to make sure that the switches operate normally (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).

Note 4) () in column W is the dimensions of D-A93.

Operating Range

(mm)

Auto switch model	Bore size (mm)				
	10	16	20	25	32
D-A9□, A9□V	6	9	11	12.5	14
D-M9□, M9□V D-M9□W, M9□WV	4	5.5	7	7	7.5

* Since this is a guideline including hysteresis, not meant to be guaranteed.
(assuming approximately ±30% dispersion.)

There may be the case it will vary substantially depending on an ambient environment.

REA

REB

REC

C□Y

C□X

MQ

RHC

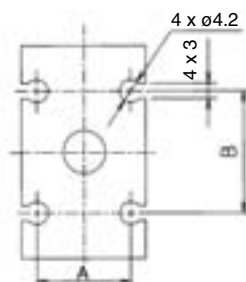
RZQ

D-□

-X□

Individual
-X□

Auto Switch Groove



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

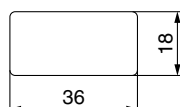
Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.

* Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page 1746.

Caution on Proximity Installation

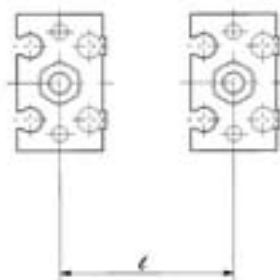
When free mounting cylinders equipped with auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimensions shown in the table. Therefore, make sure to provide a greater clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shielding plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) Auto switches may malfunction if a shield plate is not used.

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.



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

Low Speed Cylinder Double Acting, Single Rod Series CQSX

ø12, ø16, ø20, ø25

How to Order

With auto switch **CQSX** **B** **20** - **30** **D** **□**

With auto switch **CDQSX** **B** **20** - **30** **D** **□** - **M9BW** **□**

With auto switch
(Built-in magnet)

Low speed cylinder

Mounting style

B	Through-hole/ Both ends tapped common (Standard)
L	Foot style
F	Rod side flange style
G	Head side flange style
D	Double clevis style

* Mounting brackets are shipped together (not assembled).

Bore size

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

Standard stroke (mm)

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

* Manufacturing of intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. The overall length of cylinder will be the same as the standard stroke with a longer one.
Example) 3 mm width spacer is installed in the standard cylinder CQSXB25-50D to make CQSXB25-47D.

Number of auto switches

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

Auto switch

Nil	Without auto switch
------------	---------------------

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

Cushion/Rod end thread

Nil	Standard (Rod end female thread)
C	With rubber bumper
M	Rod end male thread

* Combination above is possible.

Action

D	Double acting
----------	---------------

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSXL25-30D

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire (m)				Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
	Diagnostic indication (2-color)			3-wire (PNP)		12 V		M9PV	M9P	●	●	●	○	○		
				2-wire		12 V		M9BV	M9B	●	●	●	○	○		
				3-wire (NPN)	5 V, 12 V	M9NWV		M9NW	●	●	●	○	○	IC circuit		
				3-wire (PNP)	12 V	M9PWV		M9PW	●	●	●	○	○			
	Water resistant (2-color indication)			2-wire	12 V	M9BWV		M9BW	●	●	●	○	○	—		
				3-wire (NPN)	5 V, 12 V	M9NAV***		M9NA***	○	○	●	○	○	IC circuit		
				3-wire (PNP)	12 V	M9PAV***		M9PA***	○	○	●	○	○			
				Magnetic field resistant (2-color indication)	2-wire	12 V		M9BAV***	M9BA***	○	○	●	○	○	—	
	2-wire (Non-polar)				—	—		P3DW**	●	—	●	●	○			
Reed switch	—	Grommet	Yes	3-wire (Equiv. NPN)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
				No	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	
			100V or less				A90V	A90	●	—	●	—	—	—	IC circuit	

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

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWLZ

* Solid state auto switches marked with "○" are produced upon receipt of order.
** D-P3DW□ is compatible with ø25.
It is mounted away from the port side to avoid interference with fittings.

* Since there are other applicable auto switches than listed, refer to page 1135 for details.

* For details about auto switches with pre-wired connector, refer to pages 1784 and 1785. For D-P3DW□, refer to pages 1773-1 and 1773-2.

* Auto switches are shipped together (not assembled).

Note) D-A9□V/M9□V/M9□WV/M9□AVL auto switches may not be mounted depending on the cylinder stroke or fitting size for piping. Consult with SMC separately.



Specifications

Bore size (mm)	12	16	20	25
Type	Pneumatic (Non-lube)			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)			
Rubber bumper	None			
Rod end thread	Female thread			
Stroke length tolerance	+1.0 (Note) 0			
Mounting	Through-hole/Both ends tapped common			
Piston speed	ø12, ø16: 1 to 300 mm/s ø20, ø25: 0.5 to 300 mm/s			

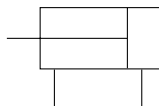
Note) Stroke length tolerance does not include the amount of bumper change.

Minimum Operating Pressure

Bore size (mm)	12	16	20	25
Min. operating pressure (MPa)	0.03	0.03	0.025	0.025

JIS Symbol

Double acting, Single rod



Body Option

Description	Application
Rod end male thread	Available for all standard models of double acting, single rod.
Rubber bumper	

⚠ Precautions

- Be sure to read before handling.
- Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 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).
- Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Maintenance

⚠ Caution

1. Replacement parts/Seal kit

Order it in accordance with the bore size.

Bore size (mm)	Kit no.	Contents
12	CQSX12-PS	Piston seal: 1 pc.
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 no.:

GR-L-005 (5 g)

GR-L-010 (10 g)

GR-L-150 (150 g)

Mounting Bracket Part No.

Bore size (mm)	Foot ⁽¹⁾	Flange	Double clevis
12	CQS-L012	CQS-F012	CQS-D012
16	CQS-L016	CQS-F016	CQS-D016
20	CQS-L020	CQS-F020	CQS-D020
25	CQS-L025	CQS-F025	CQS-D025

Note 1) When ordering foot bracket, order 2 pieces per cylinder.

Note 2) Parts belonging to each bracket are as follows.

Foot or Flange: Body mounting bolts

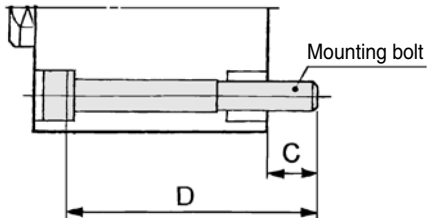
Double clevis: Clevis pin, Type C retaining ring for shaft, Body mounting bolts

Mounting Bolt for CQSX/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of 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-M3x25 L 4 pcs.



Note 1) The appropriate plain washer must be used for through-hole mounting.

Note 2) Please contact SMC for details concerning the mounting bolts to be used with $\phi 12$ and $\phi 16$ that exceed 30 mm strokes, or $\phi 20$ and $\phi 25$ that exceed 50 mm strokes.

Cylinder model	C	D	Mounting bolt part no.
CQSXB12-5D		25	CQ-M3 x 25 L
10D	6.5	30	x 30 L
15D		35	x 35 L
20D		40	x 40 L
25D		45	x 45 L
30D		50	x 50 L
CQSXB16-5D		25	CQ-M3 x 25 L
10D	6.5	30	x 30 L
15D		35	x 35 L
20D		40	x 40 L
25D		45	x 45 L
30D		50	x 50 L
CQSXB20-5D		25	CQ-M5 x 25 L
10D	6.5	30	x 30 L
15D		35	x 35 L
20D		40	x 40 L
25D		45	x 45 L

Cylinder model	C	D	Mounting bolt part no.
CQSXB20-30D		50	CQ-M5 x 50 L
35D	6.5	55	x 55 L
40D		60	x 60 L
45D		65	x 65 L
50D		70	x 70 L
CQSXB25-5D		30	CQ-M5 x 30 L
10D	8.5	35	x 35 L
15D		40	x 40 L
20D		45	x 45 L
25D		50	x 50 L
30D		55	x 55 L
35D		60	x 60 L
40D		65	x 65 L
45D		70	x 70 L
50D		75	x 75 L

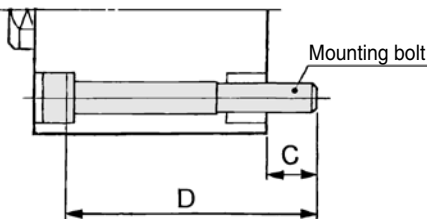
Material: Chromium molybdenum steel
Surface material: Zinc chromated

Mounting Bolt for CDQSX/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of 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-M3x30 L 4 pcs.



Note 1) The appropriate plain washer must be used for through-hole mounting.

Note 2) Please contact SMC for details concerning the mounting bolts to be used with $\phi 12$ and $\phi 16$ that exceed 30 mm strokes, or $\phi 20$ and $\phi 25$ that exceed 50 mm strokes.

Cylinder model	C	D	Mounting bolt part no.
CDQSXB12-5D		30	CQ-M3 x 30 L
10D	6.5	35	x 35 L
15D		40	x 40 L
20D		45	x 45 L
25D		50	x 50 L
30D		55	x 55 L
CDQSXB16-5D		30	CQ-M3 x 30 L
10D	6.5	35	x 35 L
15D		40	x 40 L
20D		45	x 45 L
25D		50	x 50 L
30D		55	x 55 L
CDQSXB20-5D		35	CQ-M5 x 35 L
10D	6.5	40	x 40 L
15D		45	x 45 L
20D		50	x 50 L
25D		55	x 55 L

Cylinder model	C	D	Mounting bolt part no.
CDQSXB20-30D		60	CQ-M5 x 60 L
35D	6.5	65	x 65 L
40D		70	x 70 L
45D		75	x 75 L
50D		80	x 80 L
CDQSXB25-5D		40	CQ-M5 x 40 L
10D	8.5	45	x 45 L
15D		50	x 50 L
20D		55	x 55 L
25D		60	x 60 L
30D		65	x 65 L
35D		70	x 70 L
40D		75	x 75 L
45D		80	x 80 L
50D		85	x 85 L

Material: Chromium molybdenum steel
Surface material: Zinc chromated

Accessory

For accessory bracket for Series CQS, refer to page 1142, since it is commonly used with Series CQ2.

- Single knuckle joint
- Pin for knuckle
- Double knuckle joint
- Rod end nut

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

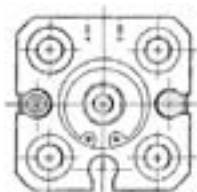
Series CQSX

Dimensions: ø12 to ø25

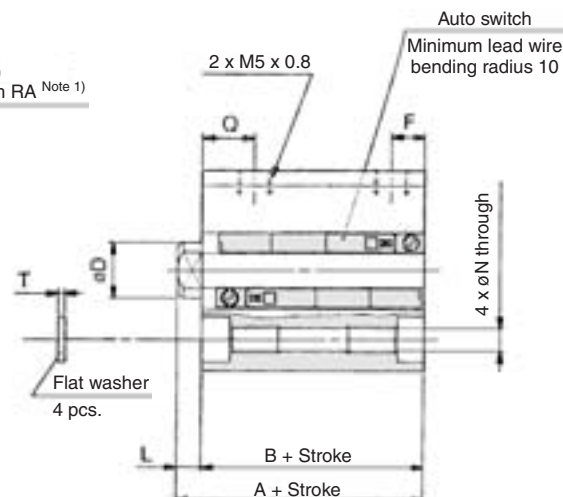
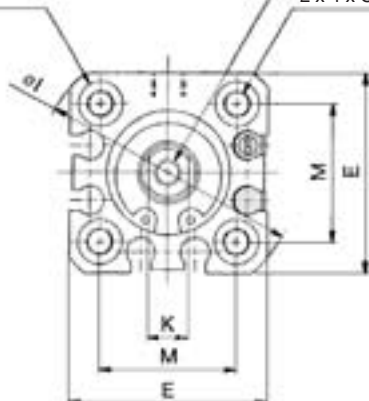
* For the auto switch mounting position and its mounting height, refer to page 1134.

Basic style (Through-hole/Both ends tapped common): CQSXB/CDQSXB

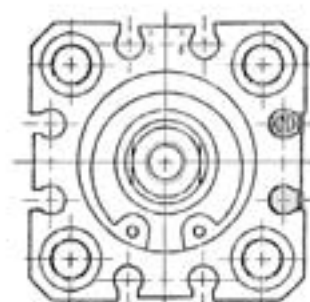
ø12



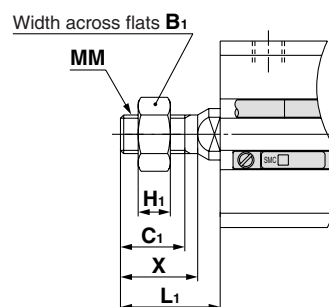
ø16 2 x 4 x øOB counterbore depth RB
H thread effective depth C
2 x 4 x OA effective depth RA ^{Note 1)}



ø20, ø25



Rod end male thread



Rod End Male Thread

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

• Length with intermediate stroke
Spacer ... The dimensions will be identical to those of the nearest long stroke.

Basic Style

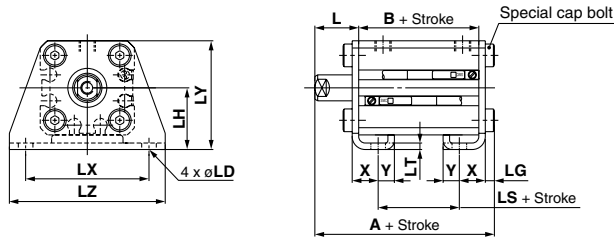
Bore size (mm)		Without auto switch				With auto switch				C	D	E	H	I	K	M	N	OA	OB	Q	RA	RB	T
		A	B	F	L	A	B	F	L														
12	5 to 30	20.5	17	5	3.5	25.5	22	5	3.5	6	6	25	M3 x 0.5	32	5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	20.5	17	5	3.5	25.5	22	5	3.5	8	8	29	M4 x 0.7	38	6	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	24	19.5	5.5	4.5	34	29.5	5.5	4.5	7	10	36	M5 x 0.8	47	8	25.5	5.4	M6 x 1.0	9	9	10	7	1
25	5 to 50	27.5	22.5	5.5	5	37.5	32.5	5.5	5	12	12	40	M6 x 1.0	52	10	28	5.4	M6 x 1.0	9	11	10	7	1

Note 1) For the following bore/stroke sizes through-hole is threaded over the entire length: Basic style ø12 and ø16; 5 stroke, ø20; 5 to 15 stroke, ø25; 5 to 10 stroke, ø20 with auto switch built-in magnet; 5 stroke.

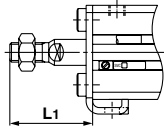
Note 2) Rubber bumper type has the same dimensions as those indicated above.

* For details about the rod end nut and accessory brackets, refer to page 1142.

Foot style: CQSXL/CDQSXL



Rod end male thread



Foot Style

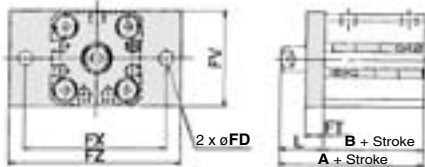
Bore size (mm)	Standard stroke (mm)	Without auto switch			With auto switch			L	L1
		A	B	LS	A	B	LS		
12	5 to 30	35.3	17	5	40.3	22	10	13.5	24
16	5 to 30	35.3	17	5	40.3	22	10	13.5	25.5
20	5 to 50	41.2	19.5	7.5	51.2	29.5	17.5	14.5	28.5
25	5 to 50	44.7	22.5	7.5	54.7	32.5	17.5	15	32.5

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

Foot bracket material: Carbon steel

Surface material: Nickel plated

Rod side flange style: CQSXF/CDQSXF



Rod end male thread



Rod Side Flange Style

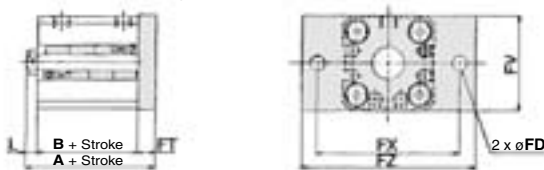
Bore size (mm)	Standard stroke (mm)	Without auto switch		With auto switch		FD	FT	FV	FX
		A	B	A	B				
12	5 to 30	30.5	17	35.5	22	4.5	5.5	25	45
16	5 to 30	30.5	17	35.5	22	4.5	5.5	30	45
20	5 to 50	34	19.5	44	29.5	6.6	8	39	48
25	5 to 50	37.5	22.5	47.5	32.5	6.6	8	42	52

Bore size (mm)	FZ	L	L1
12	55	13.5	24
16	55	13.5	25.5
20	60	14.5	28.5
25	64	15	32.5

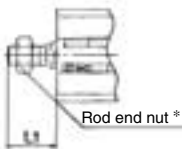
Flange bracket material: Carbon steel

Surface material: Nickel plated

Head side flange style: CQSXG/CDQSXG



Rod end male thread



Head Side Flange Style

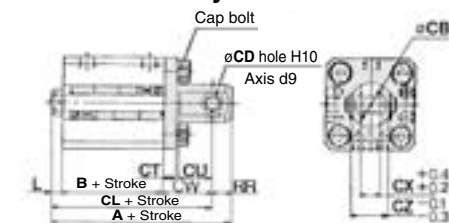
Bore size (mm)	Standard stroke (mm)	Without auto switch				With auto switch			
		A	B	L	L1	A	B	L	L1
12	5 to 30	26	17	3.5	14	31	22	3.5	14
16	5 to 30	26	17	3.5	15.5	31	22	3.5	15.5
20	5 to 50	32	19.5	4.5	18.5	42	29.5	4.5	18.5
25	5 to 50	35.5	22.5	5	22.5	45.5	32.5	5	22.5

Bore size (mm)	FD	FT	FV	FX	FZ
12	4.5	5.5	25	45	55
16	4.5	5.5	30	45	55
20	6.6	8	39	48	60
25	6.6	8	42	52	64

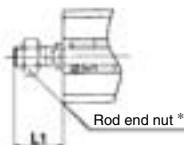
Flange bracket material: Carbon steel

Surface material: Nickel plated

Double clevis style: CQSXD/CDQSXD



Rod end male thread



Double Clevis Style

Bore size (mm)	Standard stroke (mm)	Without auto switch					With auto switch				
		A	B	CL	L	L1	A	B	CL	L	L1
12	5 to 30	40.5	17	34.5	3.5	14	45.5	22	39.5	3.5	14
16	5 to 30	41.5	17	35.5	3.5	15.5	46.5	22	40.5	3.5	15.5
20	5 to 50	51	19.5	42	4.5	18.5	61	29.5	52	4.5	18.5
25	5 to 50	57.5	22.5	47.5	5	22.5	67.5	32.5	57.5	5	22.5

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

Double clevis bracket material: Carbon steel

Surface material: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 1142.

Series CQSX

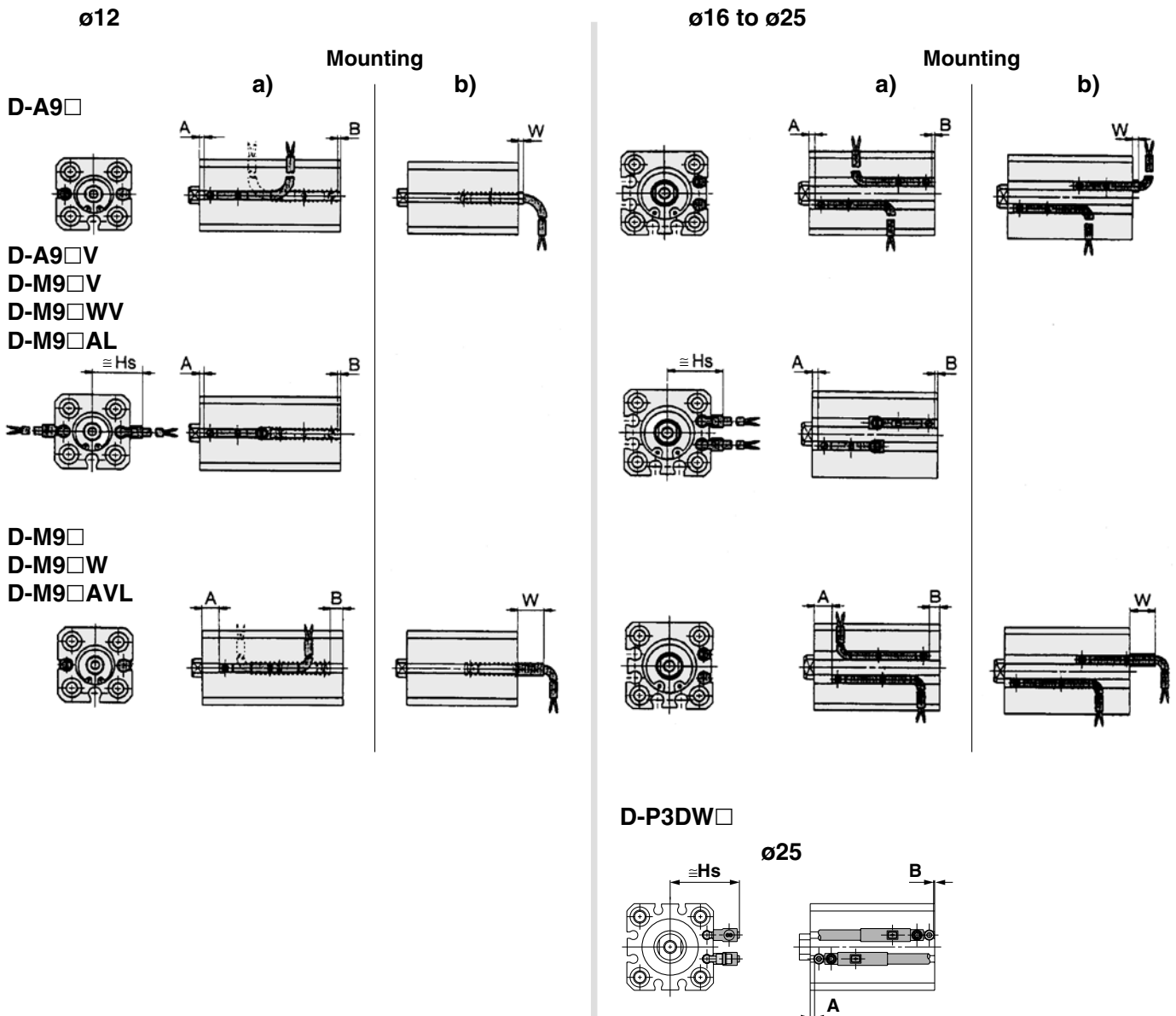
Minimum Auto Switch Mounting Stroke

Qty. of auto switches mounted	(mm)				
	D-M9□V	D-A9□V	D-A9□ D-M9□WV D-M9□AVL	D-M9□ D-M9□W D-M9□AL	D-P3DW□ Note 2)
1 pc.	5	5	10 Note 1)	15 Note 1)	15
2 pcs.	5	10	10	15 Note 1)	15

Note 1) Consult with SMC for shorter stroke length other than indicated in the table.

Note 2) ø25 is only applicable for D-P3DW□.

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height



Auto Switch Proper Mounting Position

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

[]: Denotes the values of D-A93.

Note 1) Adjust the auto switch after confirming the operating conditions in the actual setting.

Note 2) The product is shipped out of the factory in installation state "a)". To change the electrical entry direction of the switch on the head, refer to installation state "b)".

Note 3) Negative figures for W indicate an auto switch is mounted inward from the edge of the cylinder body.

Operating Range

Auto switch model	(mm)			
	Bore size			
	12	16	20	25
D-A9□/A9□V	6	7.5	10	10
D-M9□/M9□V	3	4	5.5	4.5
D-M9□W/M9□WV				
D-M9□AL/M9□AVL				
D-P3DW□	—	—	—	5.5

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

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.

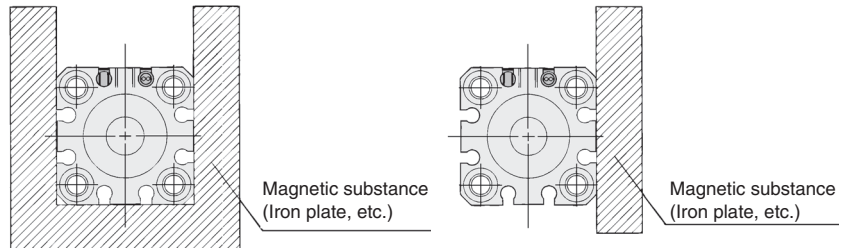
- * With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 to 1785.
- * Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page 1746.

⚠ Precautions

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

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



REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

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

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CQ2X B 40 - 30 D

With auto switch
CDQ2X B 40 - 30 D - M9BW

With auto switch (Built-in magnet)

Low speed cylinder

Mounting style

B Through-hole (Standard)	F Rod side flange style
A Both ends tapped style	G Head side flange style
L Foot style	D Double clevis style

* Mounting brackets are shipped together (not assembled).

Bore size

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

Port thread type

Nil	Rc	ø32 to ø100
TN	NPT	
TF	G	

* Without auto switch, ø32, 5 strokes:
M thread
The symbol is Nil when ordering the M thread.

Action

D	Double acting
----------	---------------

Standard stroke (mm)
Refer to "Standard Stroke" on page 1137.

Number of auto switches

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

Auto switch

Nil	Without auto switch
------------	---------------------

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

Cushion/Rod end thread

Nil	Standard (Rod end female thread)
C	With rubber bumper
M	Rod end male thread

* Combination above is possible.

Built-in Magnet Cylinder Model

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

(Example) CDQ2XL32-50D

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Applicable Auto Switch Models to be Used for Further Information on Auto Switches: Pages 17-18 to 18-21																	
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire (m)					Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V,	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
		3-wire (PNP)		12 V		M9PV		M9P	●	●	●	○	—	○			
		Connector		2-wire		12 V		M9BV	M9B	●	●	●	○	—	○		
						J79C		—	●	—	●	●	●	—	—		
	Diagnostic indication (2-color)	Grommet		3-wire (NPN)	5 V,	M9NWV		M9NW	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)	12 V	M9PWV		M9PW	●	●	●	○	—	○			
	Water resistant (2-color indication)			2-wire	12 V	M9BWV		M9BW	●	●	●	●	—	○	—		
				3-wire (NPN)	5 V,	M9NAV**		M9NA**	○	○	●	○	—	○	IC circuit		
				3-wire (PNP)	12 V	M9PAV**		M9PA**	○	○	●	○	—	○			
				With diagnostic output (2-color)	2-wire	12 V		M9BAV**	M9BA**	○	○	●	○	—	○	—	
	4-wire				5 V, 12 V	—		F79F	●	—	●	○	—	○	IC circuit		
	Magnetic field resistant (2-color)			2-wire (Non-polar)	—	—		P3DW	●	—	●	●	—	○	—		
						—		P4DW	—	—	●	●	—	○	—		
	Reed switch			—	Grommet	Yes		3-wire (Equiv. NPN)	—	5 V	—	A96V	A96	●	—	●	
—		200 V	A72				A72H			●		—	●	—	—	—	
12 V		100 V	A93V				A93			●		—	●	—	—	—	
5 V, 12 V		100 V or less	A90V				A90			●		—	●	—	—	—	
Connector		2-wire	12 V		—		A73C	—	●	—	●	●	●	—	—		
			5 V, 12 V		24 V or less		A80C	—	●	—	●	●	●	—	IC circuit		
			—		—		A79W	—	●	—	●	—	—	—			
			Diagnostic indication (2-color)		Grommet		Yes	—	—	—	—	—	—	—	—	—	

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

Consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ
None N (Example) J79CN

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

* D-P4DWL is compatible with ø40 to ø100.

* Only D-P4DW is assembled at the time of shipment.

* Since there are other applicable auto switches than listed, refer to page 1147 for details.

* For details about auto switches with pre-wired connector, refer to pages 1784 and 1785. For D-P3DW□, refer to pages 1773-1 and 1773-2.

* When D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types with ø32 to ø50 are mounted on a side other than the port side, order auto switch mounting brackets separately. Refer to page 1146 for details.

* Auto switches are shipped together (not assembled).

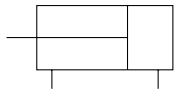
Low Speed Cylinder: Standard Type Double Acting, Single Rod **Series CQ2X**

Specifications



JIS Symbol

Double acting, Single rod



Bore size (mm)	32	40	50	63	80	100
Type	Pneumatic (Non-lube)					
Fluid	Air					
Proof pressure	1.5 MPa					
Maximum operating pressure	1.0 MPa					
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)					
Rubber bumper	None					
Rod end thread	Female thread					
Stroke length tolerance	+1.0 mm (Note) 0					
Mounting	Through-hole					
Piston speed	0.5 to 300 mm/s					

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

Minimum Operating Pressure

Bore size (mm)	32	40	50	63	80	100
Min. operating pressure (MPa)	0.025			0.01		

Standard Stroke

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

• Manufacturing of Intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. But, as for ø40 to ø100 with damper, please consult with SMC separately.
Example) 18 mm width spacer is installed in the standard cylinder CQ2XB40-75D to make CQ2XB40-57D.

⚠ Precautions

- Be sure to read before handling.
- Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 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).
- Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Pneumatic Circuit

- Pressure supplied to cylinder should be set affordably. When the operating pressure is low, low speed operation may not be stable depending on a load condition. Besides, the maximum speed may be restricted depending on a pneumatic circuit, or operating pressure.

Maintenance

⚠ Caution

1. Replacement parts/Seal kit

Order it in accordance with the bore size.

Bore size (mm)	Kit no.	Contents
32	CQ2X32-PS	Piston seal: 1 pc.
40	CQ2X40-PS	Rod seal: 1 pc.
50	CQ2X50-PS	Gasket: 1 pc.
63	CQ2X63-PS	Grease pack (10 g): 1 pc.
80	CQ2X80-PS	
100	CQ2X100-PS	

2. Grease pack

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

Grease pack part no.:

GR-L-005 (5 g)

GR-L-010 (10 g)

GR-L-150 (150 g)

Mounting Bracket Part No.

Bore size (mm)	Foot ⁽¹⁾	Flange	Double clevis ⁽³⁾
32	CQ-L032	CQ-F032	CQ-D032
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

Note 1) When ordering foot bracket, order 2 pieces per cylinder.

Note 2) Parts belonging to each bracket are as follows.

Foot or Flange: Body mounting bolts
Double clevis: Clevis pin, Type C retaining ring for shaft, Body mounting bolts

Note 3) For double clevis style, clevis pin and retaining ring are shipped together.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual

-X□

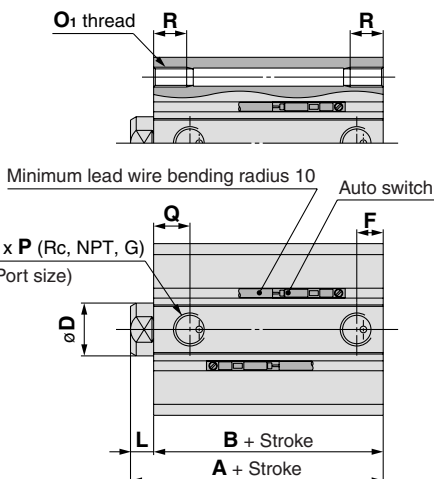
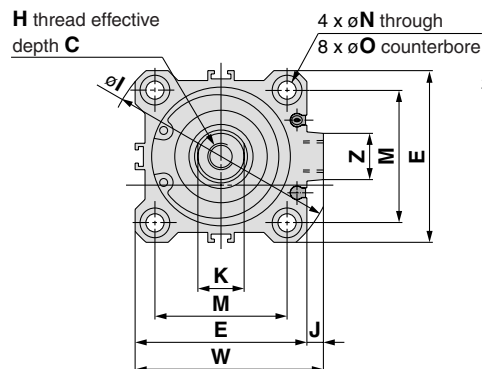
Series CQ2X

Bore size

ø32 to ø50

Both ends tapped style: CQ2XA/CDQ2XA

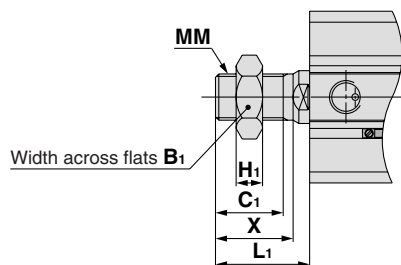
Basic style (Through hole type): CQ2XB/CDQ2XB



Both ends tapped

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

Rod end male thread



Rod End Male Thread

(mm)							
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X	
32	22	20.5	8	28.5	M14 x 1.5	23.5	
40	22	20.5	8	28.5	M14 x 1.5	23.5	
50	27	26	11	33.5	M18 x 1.5	28.5	

Basic Style

For the auto switch mounting position and its mounting height, refer to page 1144.

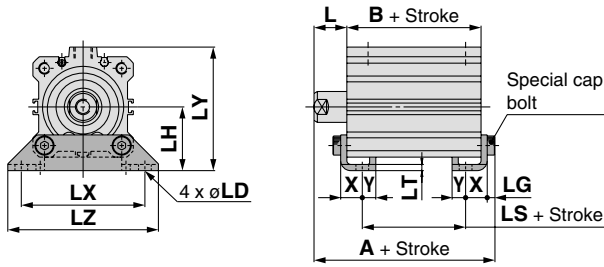
Bore size (mm)	Stroke range (mm)	Without auto switch					With auto switch					C	D	E	H	I	J	K	L	M
		A	B	F	P	Q	A	B	F	P	Q									
32	5																			
	10 to 50	30	23	5.5	M5 x 0.8	11.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	60	4.5	14	7	34
	75, 100	40	33	7.5	1/8	10.5														
40	5 to 50	36.5	29.5	8	1/8	11	46.5	39.5	8	1/8	11	13	16	52	M8 x 1.25	69	5	14	7	40
	75, 100	46.5	39.5																	
	10 to 50	38.5	30.5	10.5	1/4	10.5	48.5	40.5	10.5	1/4	10.5	15	20	64	M10 x 1.5	86	7	17	8	50
50	75, 100	48.5	40.5																	

Bore size (mm)	N	O	S	U	W	Z
32	5.5	9 depth 7	58.5	31.5	49.5	14
40	5.5	9 depth 7	66	35	57	14
50	6.6	11 depth 8	80	41	71	19

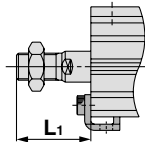


Note 1) Dimensions for rubber bumper are same as the standard style above.
 * For details about the rod end nut and accessory brackets, refer to page 1142.
 Note 2) Refer to page 1137 for calculation of the longitudinal dimension of the intermediate strokes since there is the spacer-installed type.

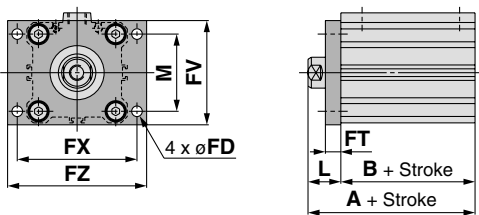
Foot style: CQ2XL/CDQ2XL



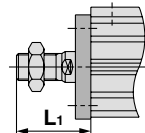
Rod end male thread



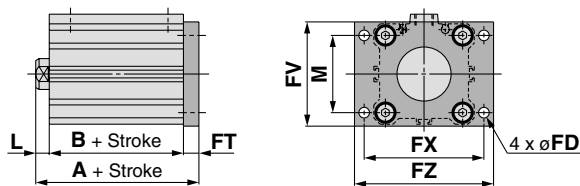
Rod side flange style: CQ2XF/CDQ2XF



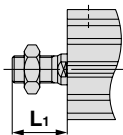
Rod end male thread



Head side flange style: CQ2XG/CDQ2XG

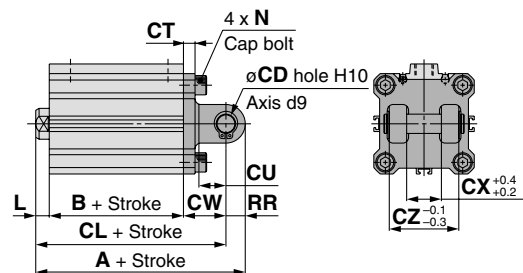


Rod end male thread

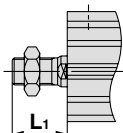


Applicable to { Head side flange style
Double clevis style

Double clevis style: CQ2XD/CDQ2XD



Rod end male thread



Foot Style

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch			With auto switch			L	L1	LD
		A	B	LS	A	B	LS			
32	5 to 50	47.2	23	7	57.2	33	17	17	38.5	6.6
	75, 100	57.2	33	17						
40	5 to 50	53.7	29.5	13.5	63.7	39.5	23.5	17	38.5	6.6
	75, 100	63.7	39.5	23.5						
50	10 to 50	56.7	30.5	7.5	66.7	40.5	17.5	18	43.5	9
	75, 100	66.7	40.5	17.5						

Foot bracket material: Carbon steel

Surface material: Nickel plated

Rod Side Flange Style

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ
		A	B	A	B					
32	5 to 50	40	23	50	33	5.5	8	48	56	65
	75, 100	50	33							
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	72
	75, 100	56.5	39.5							
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89
	75, 100	58.5	40.5							

Foot bracket material: Carbon steel

Surface material: Nickel plated

Head Side Flange Style

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch	With auto switch	L	L1
		A	A		
32	5 to 50	38	48	7	28.5
	75, 100	48			
40	5 to 50	44.5	54.5	7	28.5
	75, 100	54.5			
50	10 to 50	47.5	57.5	8	33.5
	75, 100	57.5			

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

Foot bracket material: Carbon steel

Surface material: Nickel plated

Double Clevis Style

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch			With auto switch			CD	CT	CU
		A	B	CL	A	B	CL			
32	5 to 50	60	23	50	70	33	60	10	5	14
	75, 100	70	33	60						
40	5 to 50	68.5	29.5	58.5	78.5	39.5	68.5	10	6	14
	75, 100	78.5	39.5	68.5						
50	10 to 50	80.5	30.5	66.5	90.5	40.5	76.5	14	7	20
	75, 100	90.5	40.5	76.5						

Double clevis bracket material: Carbon steel
Surface treatment: Painted

* For details about the rod end nut and accessory brackets, refer to page 1142.

* Clevis pin and retaining ring are shipped together.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Series CQ2X

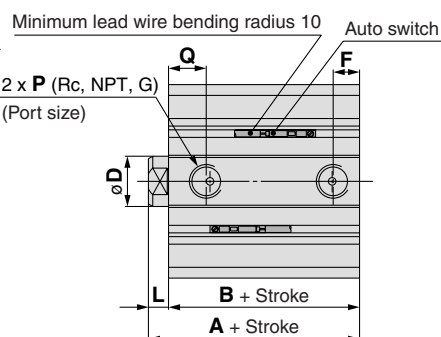
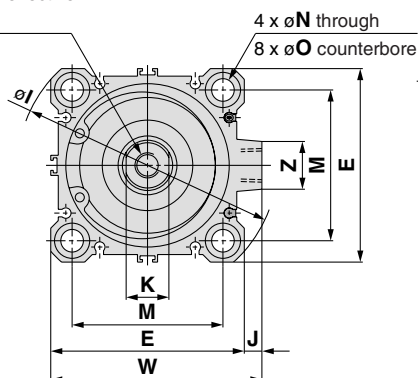
Bore size

ø63 to ø100

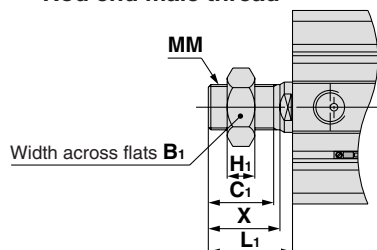
Both ends tapped style: CQ2XA/CDQ2XA

Basic style (Through hole type):

H thread effective depth C



Rod end male thread



Both ends tapped

(mm)		
Bore size (mm)	O ₁	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

Both ends tapped

(mm)							
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X	
63	27	26	11	33.5	M18 x 1.5	28.5	
80	32	32.5	13	43.5	M22 x 1.5	35.5	
100	41	32.5	16	43.5	M26 x 1.5	35.5	

Basic Style For the auto switch mounting position and its mounting height, refer to page 1144.

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	I	J	K	L	M	N	O	P	Q	S
		A	B	A	B															
63	10 to 50	44	36	54	46	15	20	77	10.5	M10 x 1.5	103	7	17	8	60	9	14 depth 10.5	1/4	15	93
	75, 100	54	46	54	46	15	20	77	10.5	M10 x 1.5	103	7	17	8	60	9	14 depth 10.5	1/4	15	93
80	10 to 50	53.5	43.5	63.5	53.5	21	25	98	12.5	M16 x 2.0	132	6	22	10	77	11	17.5 depth 13.5	3/8	16	112.5
	75, 100	63.5	53.5	63.5	53.5	21	25	98	12.5	M16 x 2.0	132	6	22	10	77	11	17.5 depth 13.5	3/8	16	112.5
100	10 to 50	65	53	75	63	27	30	117	13	M20 x 2.5	156	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	132.5
	75, 100	75	63	75	63	27	30	117	13	M20 x 2.5	156	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	132.5

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

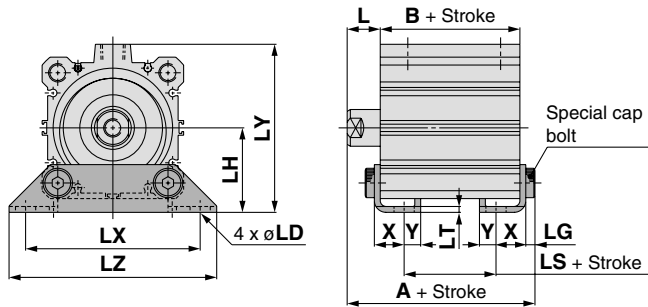


Note 1) Dimensions for rubber bumper are same as the standard style above.

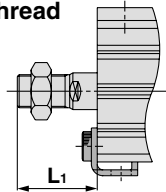
* For details about the rod end nut and accessory brackets, refer to page 1142.

Note 2) Refer to the Stroke Table on page 1137 for calculation of the longitudinal dimension of the intermediate strokes.

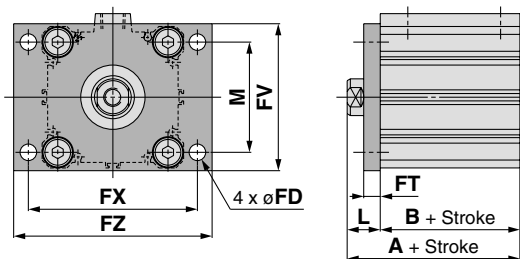
Foot style: CQ2XL/CDQ2XL



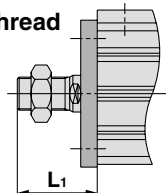
Rod end male thread



Rod side flange style: CQ2XF/CDQ2XF



Rod end male thread



Foot Style

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch			With auto switch			L	L ₁	LD	LG	LH	LT
		A	B	LS	A	B	LS						
63	10 to 50	62.2	36	10	72.2	46	20	18	43.5	11	5	46	3.2
	75, 100	72.2	46	20									
80	10 to 50	75	43.5	13.5	85	53.5	23.5	20	53.5	13	7	59	4.5
	75, 100	85	53.5	23.5									
100	10 to 50	88	53	19	98	63	29	22	53.5	13	7	71	6
	75, 100	98	63	29									

Foot bracket material: Carbon steel
Surface material: Nickel plated

Bore size (mm)	Standard stroke (mm)	LX	LY	LZ	X	Y
63	10 to 50	95	91.5	113	16.2	9
	75, 100					
80	10 to 50	118	114	140	19.5	11
	75, 100					
100	10 to 50	137	136	162	23	12.5
	75, 100					

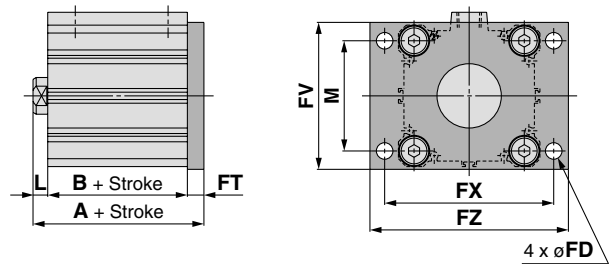
Rod Side Flange Style

(mm)

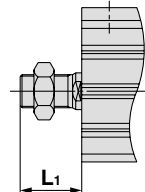
Bore size (mm)	Standard stroke (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L ₁	M
		A	B	A	B								
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46										
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	134	20	53.5	77
	75, 100	73.5	53.5										
100	10 to 50	75	53	85	63	11	11	117	136	154	22	53.5	94
	75, 100	85	63										

Foot bracket material: Carbon steel
Surface material: Nickel plated

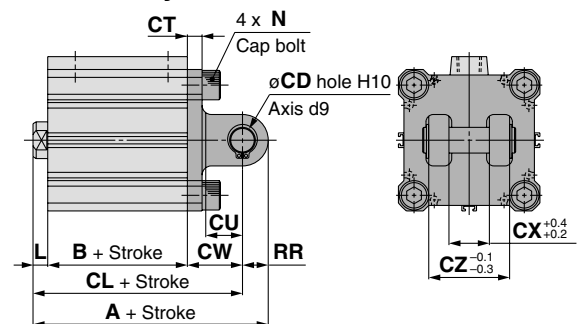
Head side flange style: CQ2XG/CDQ2XG



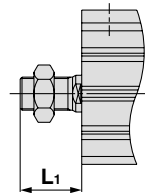
Rod end male thread



Double clevis style: CQ2XD/CDQ2XD



Rod end male thread



Head Side Flange Style

(mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch	With auto switch	L	L ₁
		A	A		
63	10 to 50	53	63	8	33.5
	75, 100	63			
80	10 to 50	64.5	74.5	10	43.5
	75, 100	74.5			
100	10 to 50	76	86	12	43.5
	75, 100	86			

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

Double Clevis Style

Foot bracket material: Carbon steel
Surface material: Nickel plated (mm)

Bore size (mm)	Standard stroke (mm)	Without auto switch			With auto switch			CD	CT	CU	CW	CX
		A	B	CL	A	B	CL					
63	10 to 50	88	36	74	98	46	84	14	8	20	30	22
	75, 100	98	46	84								
80	10 to 50	109.5	43.5	91.5	119.5	53.5	101.5	18	10	27	38	28
	75, 100	119.5	53.5	101.5								
100	10 to 50	132	53	110	142	63	120	22	13	31	45	32
	75, 100	142	63	120								

Double clevis bracket material:
Cast iron
Surface treatment: Painted

Bore size (mm)	Standard stroke (mm)	CZ	L	L ₁	N	RR
63	10 to 50	44	8	33.5	M10 x 1.5	14
	75, 100					
80	10 to 50	56	10	43.5	M12 x 1.75	18
	75, 100					
100	10 to 50	64	12	43.5	M12 x 1.75	22
	75, 100					

* For details about the rod end nut and accessory brackets, refer to page 1142.
* Clevis pin and retaining ring are shipped together.

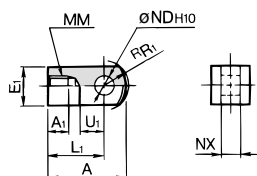
Series CQ2X

Accessory Bracket

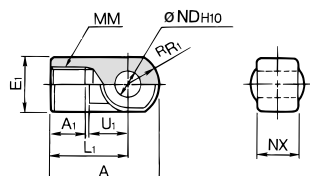
Single Knuckle Joint

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

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



Material: Carbon steel
Surface material: Nickel plated



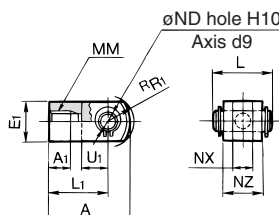
Material: Cast iron
Surface material: Nickel plated
(mm)

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	^R R ₁	U ₁	ND _{H10}	NX
I-G04	32, 40	42	14	ø22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}
I-G05	50, 63	56	18	ø28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{-0.3} _{-0.5}
I-G08	80	71	21	ø38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{-0.3} _{-0.5}
I-G10	100	79	21	ø44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{-0.3} _{-0.5}

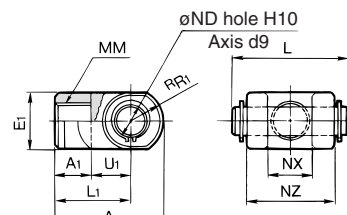
Double Knuckle Joint

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

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



Material: Carbon steel
Surface material: Nickel plated

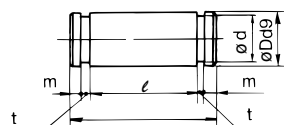


Material: Cast iron
Surface material: Nickel plated
(mm)

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	^R R ₁	U ₁	ND _{H10}	NX	NZ	L	Applicable pin part no.
Y-G04	32, 40	42	16	ø22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{+0.5} _{+0.3}	36	41.6	IY-G04
Y-G05	50, 63	56	20	ø28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{+0.5} _{+0.3}	44	50.6	IY-G05
Y-G08	80	71	23	ø38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{+0.5} _{+0.3}	56	64	IY-G08
Y-G10	100	79	24	ø44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{+0.5} _{+0.3}	64	72	IY-G10

* Knuckle pin and retaining ring are included.

Knuckle Pin (Common with double clevis pin)

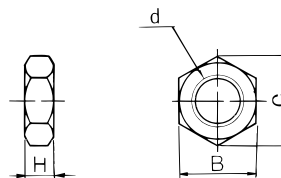


Material: Carbon steel
(mm)

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

* Type C retaining rings for axis are included.

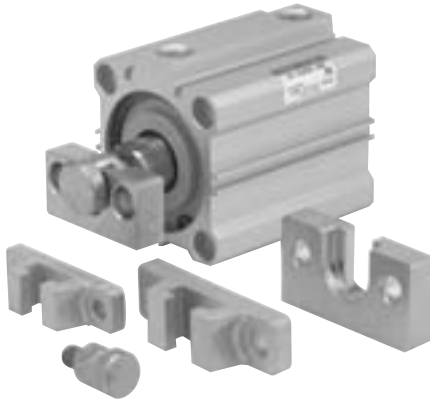
Rod End Nut



Material: Carbon steel
Surface material: Nickel plated
(mm)

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

Simple Joint: $\phi 32$ to $\phi 100$



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

YA — **03**

• Mounting bracket

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

• Applicable air cylinder bore

03	For $\phi 32$, $\phi 40$
05	For $\phi 50$, $\phi 63$
08	For $\phi 80$
10	For $\phi 100$

Allowable Eccentricity (mm)

Bore size	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Eccentricity tolerance	± 1				± 1.5	± 2
Backlash	0.5					

<Ordering>

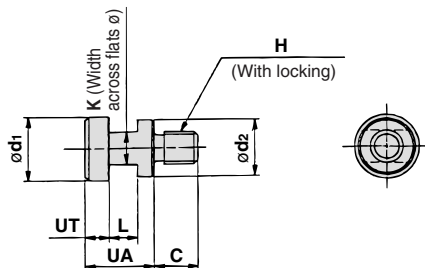
- Joints are not included with the A or B type mounting brackets.
- Order them separately.

(Example)

- Bore size $\phi 40$ Part no.
- Type A mounting bracket part no. YA-03
- Joint YU-03

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

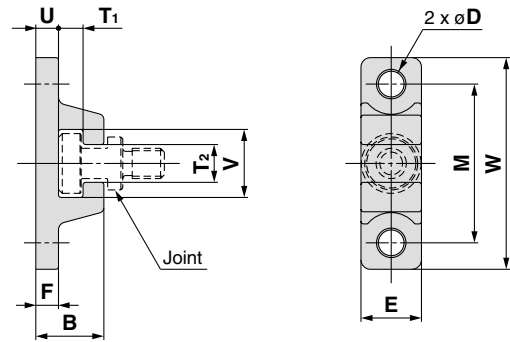
Bore size (mm)	Joint part no.	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10



Material: Chromium molybdenum steel (Nickel plated)

Part no.	Applicable bore size (mm)	UA	C	d ₁	d ₂	H	K	L	UT	Weight (g)
YU-03	32, 40	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	50, 63	17	13	19.8	18	M10 x 1.5	10	7	6	40
YU-08	80	22	20	24.8	23	M16 x 2	13	9	8	90
YU-10	100	26	26	29.8	28	M20 x 2.5	14	11	10	160

Type A Mounting Bracket

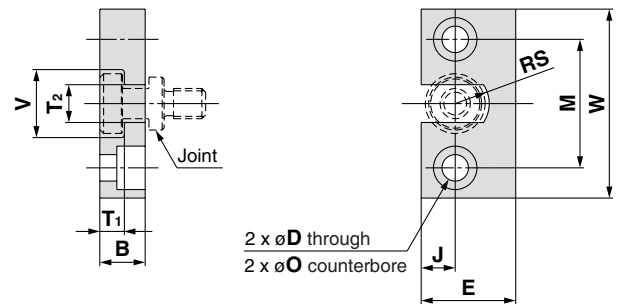


Material: Chromium molybdenum steel (Nickel plated)
(mm)

Part no.	Bore size (mm)	B	D	E	F	M	T ₁	T ₂
YA-03	32,40	18	6.8	16	6	42	6.5	10
YA-05	50,63	20	9	20	8	50	6.5	12
YA-08	80	26	11	25	10	62	8.5	16
YA-10	100	31	14	30	12	76	10.5	18

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

Type B Mounting Bracket



Material: Stainless steel
(mm)

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

Part no.	Bore size (mm)	T ₁	T ₂	V	W	RS	Weight (g)
YB-03	32, 40	6.5	10	18	50	9	80
YB-05	50, 63	6.5	12	22	60	11	120
YB-08	80	8.5	16	28	75	14	230
YB-10	100	10.5	18	36	90	18	455

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

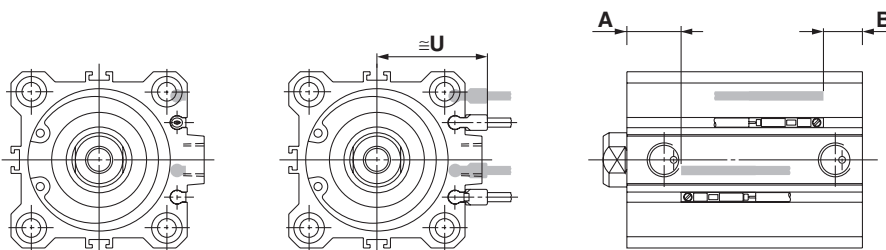
Individual
-X□

Series CQ2X

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

ø32 to ø100

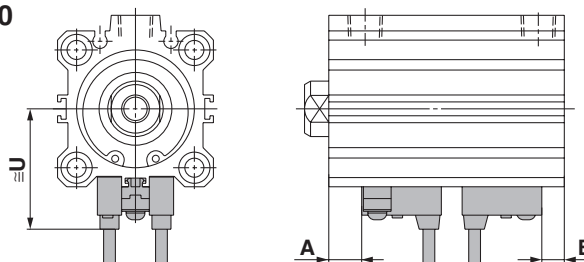
D-A9□
D-M9□
D-M9□W
D-M9□AL
D-A9□V
D-M9□V
D-M9□WV
D-M9□AVL



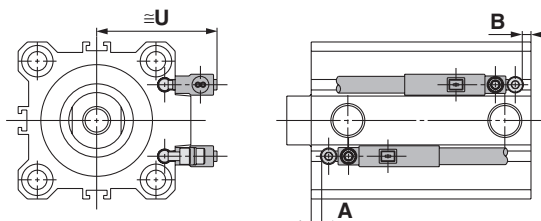
D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□V
D-J79W
D-F79F

D-F7NTL
D-A73C
D-A80C
D-J79C
D-A79W
D-F7□WV
D-F7□V

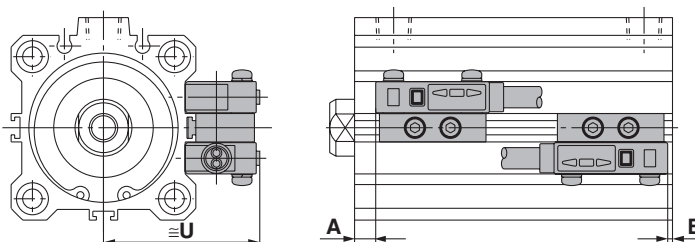
ø32 to ø100



D-P3DW□ ø32 to ø100



D-P4DWL ø40 to ø100



Auto Switch Proper Mounting Position

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV		D-F7NTL		D-A79W		D-P3DW□		D-P4DWL		(mm)
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
32	8	5	12	9	9	6	9.5	6.5	14.5	11.5	6.5	3.5	2.5	0	—	—	
40	12	7.5	16	11.5	13	8.5	13.5	9	18.5	14	10.5	6	6.5	2	9	4.5	
50	10	10.5	14	14.5	11	11.5	11.5	12	16.5	17	8.5	9	4.5	4.5	7	7.5	
63	12.5	13.5	16.5	17.5	13.5	14.5	14	15	19	20	11	12	7	7.5	9.5	10.5	
80	15.5	18	19.5	22	16.5	19	17	19.5	22	24.5	14	16.5	10	12	12.5	15	
100	20	23	24	27	21	24	21.5	24.5	26.5	29.5	18.5	21.5	14.5	17.5	17	20	

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

Auto Switch Mounting Height

Auto switch model	D-A9□V		D-M9□V D-M9□WV D-M9□AVL		D-A7□ D-A80		D-A7□H D-A80H D-F7□/D-J79 D-F7□W D-J79W D-F79F D-F7NTL		D-A73C D-A80C		D-F7□V D-F7□WV		D-J79C		D-A79W		D-P3DW□		D-P4DWL	
	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	
Bore size	32	27	29	31.5	32.5	38.5	35	38	34	34.5	—									
	40	30.5	32.5	35	36	42	38.5	41.5	37.5	38	44									
	50	36.5	38.5	41	42	48	44.5	47.5	43.5	44	50									
	63	40	42	47.5	48.5	54.5	51	54	50	47.5	56.5									
	80	50	52	57.5	58.5	64.5	61	64	60	57.5	66.5									
	100	60	62	67.5	68.5	74.5	71	74	70	67.5	76.5									

Minimum Auto Switch Mounting Stroke

(mm)

No. of auto switches mounted	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□AVL D-F7□WV	D-M9□ D-M9□W D-M9□AL D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F79F D-F7NTL	D-P3DW□	D-P4PW
1 pc.	5	5	10	10	15	15	20	15	15
2 pcs.	5	10	10	15	15	20	20	15	15

Operating Range

(mm)

Auto switch model	Bore size					
	32	40	50	63	80	100
D-A9□ (V)	9.5	9.5	9.5	11.5	9	11.5
D-M9□ (V) D-M9□W (V) D-M9□A (V) L	6	5.5	6.5	7.5	7.5	8.5
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-F7NTL D-F79F	6	6	6	6.5	6.5	7
D-P3DW□	6.5	6.5	5.5	7.5	7	8.5
D-P4DWL	—	5	5	5	5	5.5

- * Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.
- * Auto switch mounting brackets BQ2-012 are not used for sizes over ø32 of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types. The above values indicate the operating range when mounted with the conventional auto switch installation groove.

REA

REB

REC

C□Y

C□X

MQ

RHC

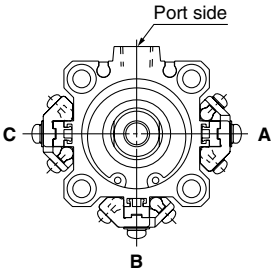
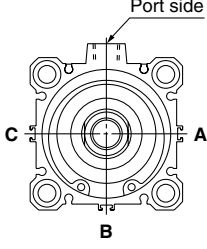
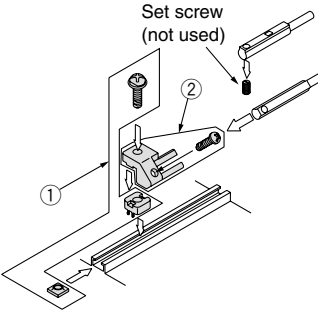
RZQ

D-□

-X□

Individual
-X□

Auto Switch Mounting Bracket/Part No.

Auto switch mounting surface	Bore size (mm)		
	ø32, ø40, ø50		ø63, ø80, ø100
			
Auto switch model	Auto switch mounting surface		Auto switch mounting surface
	Port side	A, B, C side	Port, A, B, C side
D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL	No auto switch mounting bracket necessary.	①BQ-2 ②BQ2-012 Two types of auto switch mounting bracket are used as a set. 	No auto switch mounting bracket necessary.

Note 1) For CDQ2□32 to 50, when a compact auto switch is mounted on the three sides (A, B and C above) other than the port side of bore sizes ø32 to ø50, the auto switch mounting brackets above are required. Order them separately from cylinders. (It is the same as when mounting compact cylinders with an auto switch mounting rail, but not with a compact auto switch installation groove for CDQ2□63 to 100.)

Example

CDQ2XB32-100DM-M9BW.....1 unit

BQ-2.....2 pcs.

BQ2-012.....2 pcs.

Note 2) When the cylinder is shipped, an auto switch mounting bracket and auto switch are included in the shipment.

Auto switch model	Bore size (mm)	
	ø32	ø40 to ø100
D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-A79W D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F79F/F7NTL		BQ-2
D-P3DW□		BQ6-032S
D-P4DWL	—	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 D-P4DWL are assembled at the time of shipment.

Auto Switch Mounting Bracket Mass

Auto switch mounting bracket part no.	Applicable cylinder bore size	Mass (g)
BQ-2	ø32 to ø100	1.5
BQ6-032S	ø32 to ø100	5
BQP1-050	ø40 to ø100	16

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

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.
For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features	Applicable bore size
Reed	D-A73	Grommet (Perpendicular)	—	ø32 to ø100
	D-A80		Without indicator light	
	D-A73H, A76H	Grommet (in-line)	—	
	D-A80H		Without indicator light	
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	ø32 to ø100
	D-F7NWV, F7BWV		Diagnostic indication (2-color indication)	
	D-F79, F7P, J79	Grommet (in-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication)	
	D-F7NTL		With timer	
	D-P5DWL		Magnetic field resistant (2-color indication)	

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 to 1785.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H types) are also available. Refer to pages 1746 and 1748 for details.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Low Speed Cylinder

Double Acting, Single Rod

Series CM2X

ø20, ø25, ø32, ø40

How to Order

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
U	Rod side trunnion style

T	Head side trunnion style
E	Clevis integrated style
BZ	Boss-cut basic style
FZ	Boss-cut rod side flange style
UZ	Boss-cut rod side trunnion style

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 1149.

With auto switch
With auto switch (Built-in magnet)
Low speed cylinder

CM2X L 40 - 150

CDM2X L 40 - 150 - M9BW

Thread type

Nil	Rc
TN	NPT
TF	G

Number of auto switches

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

Bore size

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

Auto switch

Nil	Without auto switch
-----	---------------------

Built-in Magnet Cylinder Model
If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDM2XF32-100

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

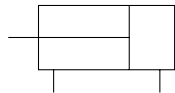
Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Appendix 1: Applicable Load																
Notes: Refer to pages 7-10 to 7-12 for further information on auto switches.																
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire (m)					Pre-wired connector	Applicable load		
					DC	AC		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
		3-wire (PNP)				M9P		●	●	●	○	—	○			
		Connector		2-wire		12 V		M9B	●	●	●	○	—	○		
				Terminal conduit				H7C	●	—	●	●	●	—	—	
	Diagnostic indication (2-color)	Grommet		3-wire (NPN)	5 V, 12 V	G39A	—	—	—	—	●	—	—	IC circuit		
				2-wire	12 V	K39A	—	—	—	—	●	—	—	—		
				3-wire (NPN)	5 V, 12 V	M9NW	●	●	●	○	—	○	IC circuit			
				3-wire (PNP)	12 V	M9PW	●	●	●	○	—	○				
				2-wire	12 V	M9BW	●	●	●	○	—	○		—		
				4-wire (NPN)	5 V, 12 V	H7NF	●	—	●	○	—	○	IC circuit			
With diagnostic output (2-color)																
Reed switch	—	Grommet	Yes	3-wire (Equiv. NPN)	—	5 V	—	A96	●	—	●	—	—	—	IC circuit	Relay, PLC
				2-wire	24 V	12 V	100 V	A93	●	—	●	—	—	—	—	
							100 V or less	A90	●	—	●	—	—	—	IC circuit	
							100 V, 200 V	B54	●	—	●	●	—	—	—	
		200 V or less					B64	●	—	●	—	—	—	—		
		—					C73C	●	—	●	●	●	—	—		
		24 V or less					C80C	●	—	●	●	●	—	IC circuit		
		Connector				—	A33A	—	—	—	—	●	—	—	—	PLC
						100 V, 200 V	A34A	—	—	—	—	●	—			
						Terminal conduit	—	A44A	—	—	—	—	●	—		
		DIN terminal				—	B59W	●	—	●	—	—	—	—		Relay, PLC
	Diagnostic indication (2-color)	Grommet														

- * Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX
None N (Example) H7CN
- * Solid state auto switches marked with "○" are produced upon receipt of order.
* D-A9□V□/M9□V□/M9□WV□/M9□A(V)L types cannot be mounted.
* Do not add the suffix (N) indicating "no lead wire" to the part numbers of models D-A3□A, A44A, G39A and K39A.
- * In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 1161.
* Refer to pages 1784 and 1785 for details of auto switches with a pre-wired connector.
* D-A9□/M9□/M9□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)



JIS Symbol
Double acting
Single rod



Standard Stroke

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

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

⚠ Precautions

Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Operating Precautions

⚠ Warning

- 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

- Be careful of the retaining ring to pop out.**
 - When replacing the rod seal, take care that the retaining ring does not spring out while you are removing it.

Maintenance

⚠ Caution

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

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

- Grease pack**

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

Grease pack part no.:

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

Specifications

Bore size (mm)	20	25	32	40
Type	Pneumatic			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.025 MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)			
Cushion	Rubber bumper			
Lubrication	Not required (Non-lube)			
Stroke length tolerance	+1.4 mm 0			

Piston Speed

Bore size (mm)	20	25	32	40
Piston speed (mm/s)	0.5 to 300			
Allowable kinetic energy (J)	0.27	0.4	0.65	1.2

Mounting Bracket Part No.

Mounting bracket	Minimum order	Bore size (mm)				Description (when ordering a minimum number)
		20	25	32	40	
Axial foot*	2	CM-L020B	CM-L032B	CM-L040B		Foot 2 pcs., Mounting nut 1 pc.
Flange	1	CM-F020B	CM-F032B	CM-F040B		Flange 1 pc.
Single clevis**	1	CM-C020B	CM-C032B	CM-C040B		Single clevis 1 pc., Liner 3 pcs.
Double clevis (with pin) ***	1	CM-D020B	CM-D032B	CM-D040B		Double clevis 1 pc., Liner 3 pcs., Clevis pin 1 pc., Retaining ring 2 pcs.
Trunnion (with nut)	1	CM-T020B	CM-T032B	CM-T040B		Trunnion 1 pc., Trunnion nut 1 pc.

* When ordering foot brackets, order 2 pieces per cylinder unit.

** Three liners are included in the clevis bracket for adjusting an angle when mounting it.

*** Clevis pin and retaining ring (cotter pin for ø40) are shipped together.

Mounting Style and Accessory

	Accessory	Standard equipment			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double ⁽³⁾ knuckle joint	Clevis ⁽⁴⁾ bracket	
Basic style	● (1 pc.)	●	—	●	●	—	
Axial foot style	● (2)	●	—	●	●	—	
Rod side flange style	● (1)	●	—	●	●	—	
Head side flange style	● (1)	●	—	●	●	—	
Clevis integrated style	— Note 1)	●	—	●	●	●	
Single clevis style	— Note 1)	●	—	●	●	—	
Double clevis style ⁽³⁾	— Note 1)	●	● Note 5)	●	●	—	
Rod side trunnion style	● (1) ^{Note 2)}	●	—	●	●	—	
Head side trunnion style	● (1) ^{Note 2)}	●	—	●	●	—	
Boss-cut basic style	● (1)	●	—	●	●	—	
Boss-cut flange style	● (1)	●	—	●	●	—	
Boss-cut trunnion style	● (1)	●	—	●	●	—	

Note 1) Mounting nut is not equipped with clevis integrated style, single clevis style and double clevis style.

Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.

Note 3) Pin and retaining ring are shipped together with double clevis and double knuckle joint. (ø40 is cotter pin.)

Note 4) Pins and retaining rings are packed with clevis brackets.

Note 5) Retaining rings (cotter pins for ø40) are included in the clevis pins.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

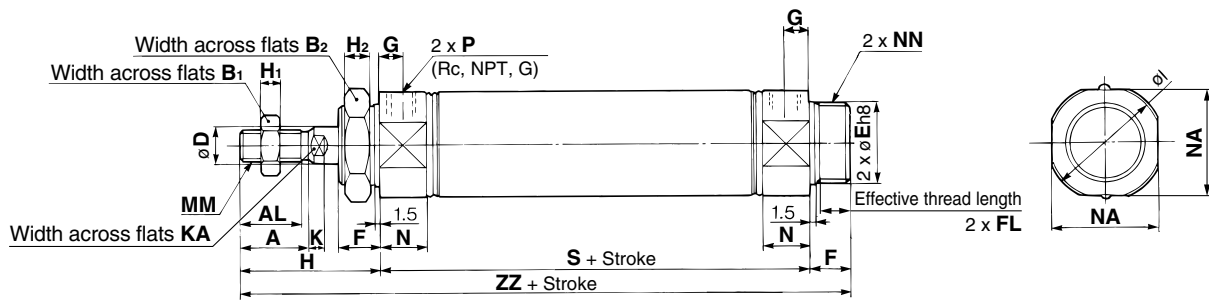
-X□

Individual
-X□

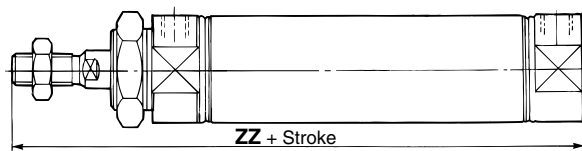
Series CM2X

Basic Style (B)

CM2XB Bore size — Stroke



Boss-cut style



(mm)

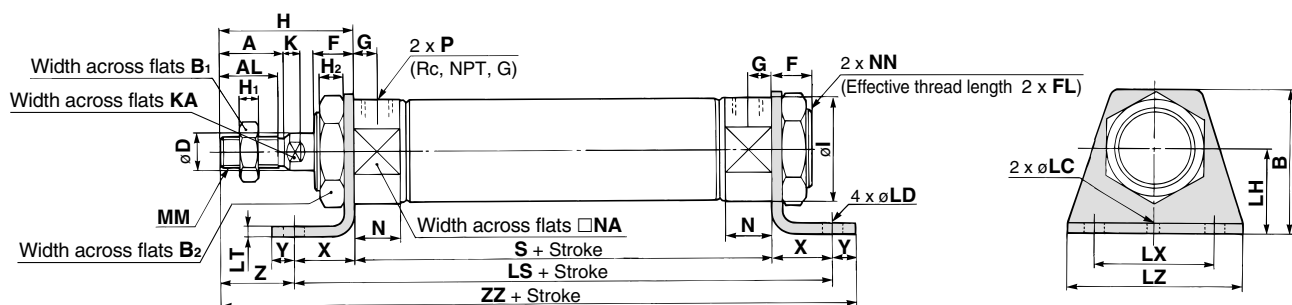
Bore size (mm)	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	H ₂	I	K	KA	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	154

Boss-cut Style (mm)

Bore size (mm)	ZZ
20	103
25	107
32	109
40	138

Axial Foot Style (L)

CM2XL Bore size — Stroke

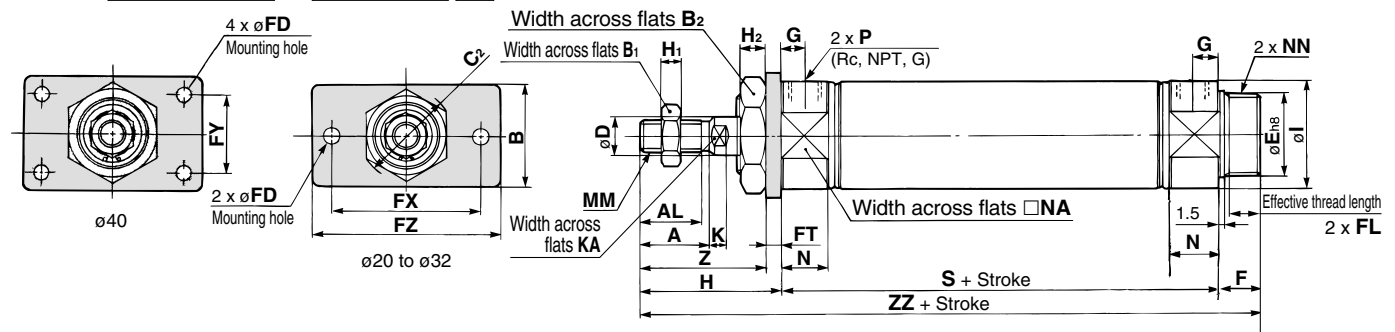


(mm)

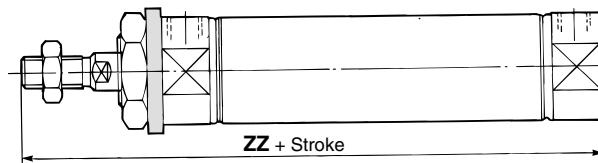
Bore size (mm)	A	AL	B	B ₁	B ₂	D	F	FL	G	H	H ₁	H ₂	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	N	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	15	24	M20 x 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	15	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	15	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	21.5	42.5	M32 x 2	1/4	88	23	10	27	171

Rod Side Flange Style (F)

CM2XF Bore size — Stroke



Boss-cut style



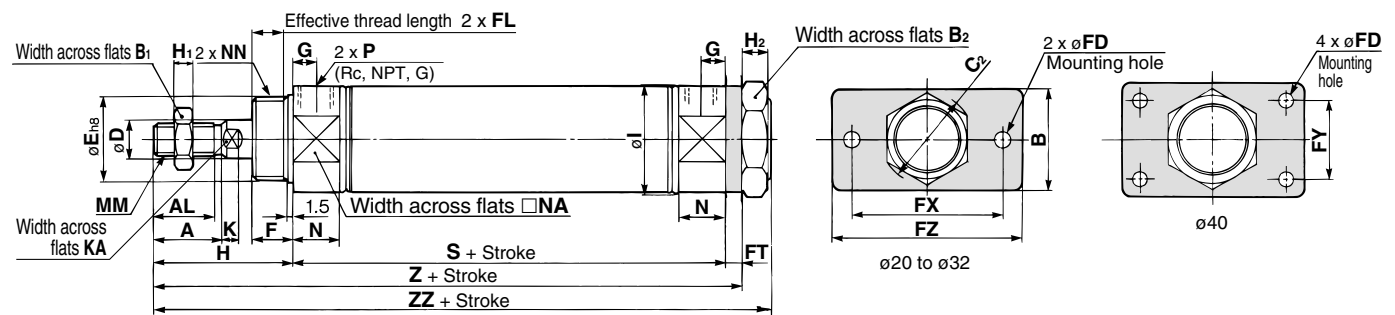
Bore size (mm)	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I	K	KA	MM	N	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	45	154

Boss-cut Style (mm)

Bore size (mm)	ZZ
20	103
25	107
32	109
40	138

Head Side Flange Style (G)

CM2XG Bore size — Stroke



Bore size (mm)	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10	46.5

Bore size (mm)	K	KA	MM	N	NA	NN	P	S	Z	ZZ
20	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	62	107	116
25	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	62	111	120
32	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	113	122
40	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	143	154

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

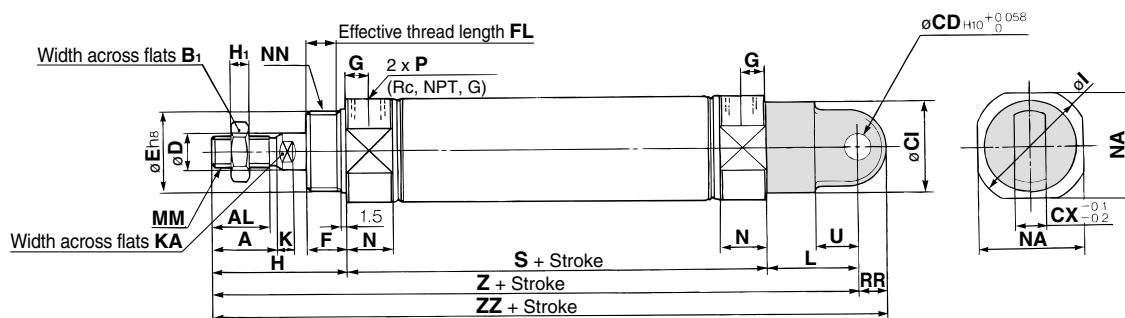
Individual

-X□

Series CM2X

Single Clevis Style (C)

CM2XC Bore size — Stroke

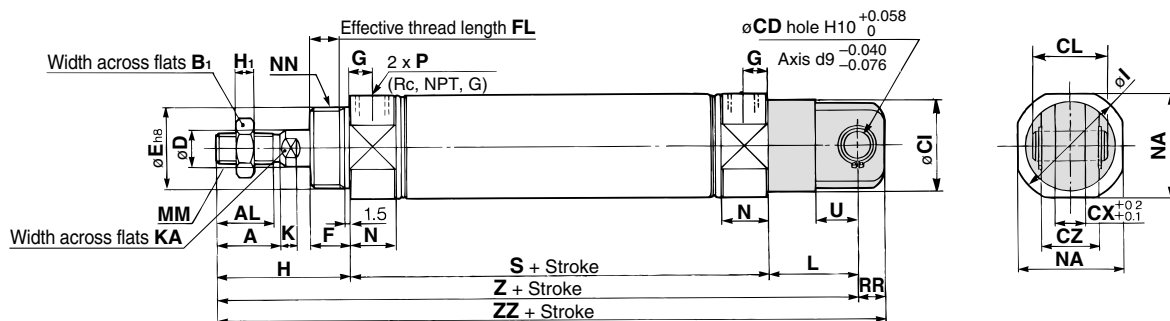


(mm)

Bore size (mm)	A	AL	B ₁	CI	CD	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	N	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	24	9	10	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	38	10	15	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	88	18	177	188

Double Clevis Style (D)

CM2XD Bore size — Stroke



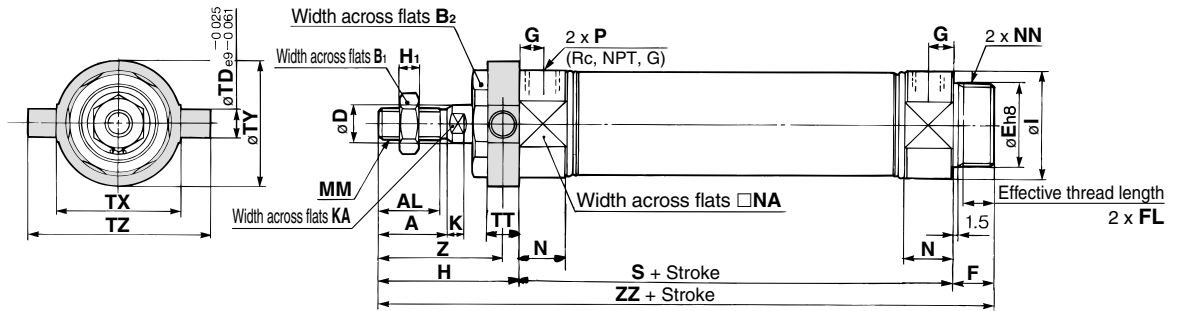
(mm)

Bore size (mm)	A	AL	B ₁	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	N	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	9	24	25	10	19	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	9	30	25	10	19	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	9	30	25	10	19	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	10	38	41.2	15	30	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	88	18	177	188

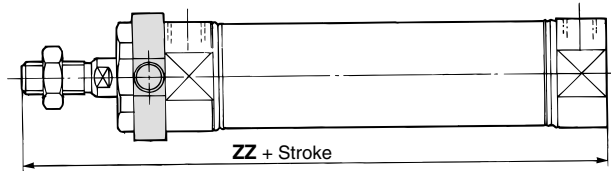
* Clevis pin and retaining ring (cotter pin for bore size ø40) are shipped together.

Rod Side Trunnion Style (U)

CM2XU Bore size — Stroke



Boss-cut style



Bore size (mm)	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	N	NA	NN	P
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4

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

Boss-cut Style (mm)

Bore size (mm)	ZZ
20	103
25	107
32	109
40	138

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

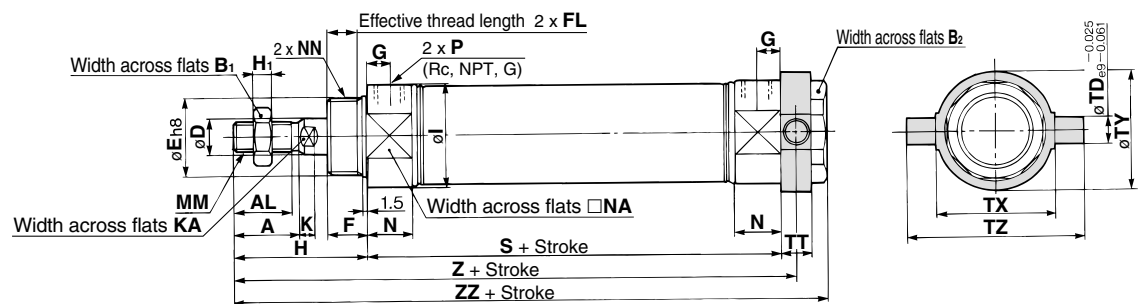
-X□

Individual
-X□

Series CM2X

Head Side Trunnion Style (T)

CM2XT Bore size — Stroke

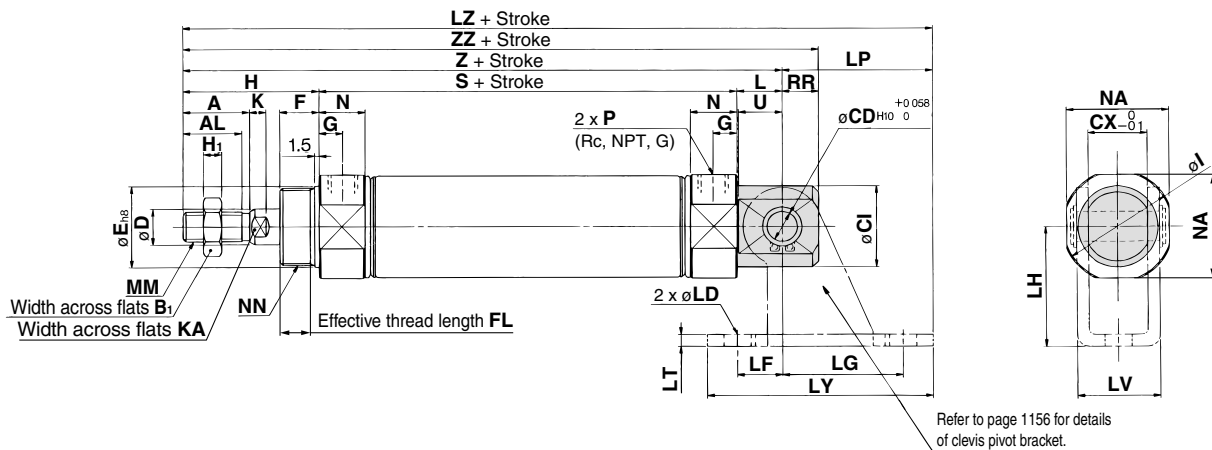


(mm)																			
Bore size (mm)	A	AL	B ₁	B ₂	D	E _{0-0.033}	F	FL	G	H	H ₁	I	K	KA	MM	N	NA	NN	P
20	18	15.5	13	26	8	20 _{0-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 _{0-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 _{0-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 _{0-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4

(mm)							
Bore size (mm)	S	TD	TT	TX	TY	TZ	ZZ
20	62	8	10	32	32	52	108
25	62	9	10	40	40	60	122
32	64	9	10	40	40	60	124
40	88	10	11	53	53	77	143.5

Cleviss Integrated Style (E)

CM2XE	Bore size	Stroke	
100	100	100	
125	125	125	
150	150	150	
175	175	175	
200	200	200	
225	225	225	
250	250	250	
275	275	275	
300	300	300	
325	325	325	
350	350	350	
375	375	375	
400	400	400	
425	425	425	
450	450	450	
475	475	475	
500	500	500	
525	525	525	
550	550	550	
575	575	575	
600	600	600	
625	625	625	
650	650	650	
675	675	675	
700	700	700	
725	725	725	
750	750	750	
775	775	775	
800	800	800	
825	825	825	
850	850	850	
875	875	875	
900	900	900	
925	925	925	
950	950	950	
975	975	975	
1000	1000	1000	



(mm)																					
Bore size (mm)	A	AL	B ₁	CD	CI	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	N	NA	NN
20	18	15.5	13	8	20	12	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	12	M8 x 1.25	15	24	M20 x 1.5
25	22	19.5	17	8	22	12	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	12	M10 x 1.25	15	30	M26 x 1.5
32	22	19.5	17	10	27	20	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	15	M10 x 1.25	15	34.5	M26 x 1.5
40	24	21	22	10	33	20	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	21.5	42.5	M32 x 2

(mm)						
Bore size (mm)	P	RR	S	U	Z	ZZ
20	$\frac{1}{8}$	9	62	11.5	115	124
25	$\frac{1}{8}$	9	62	11.5	119	128
32	$\frac{1}{8}$	12	64	14.5	124	136
40	$\frac{1}{4}$	12	88	14.5	153	165

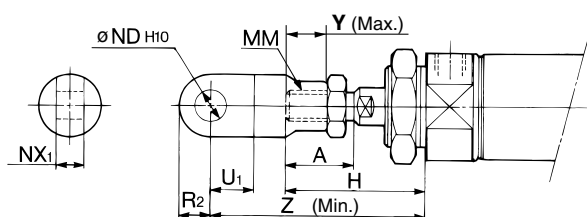
REA
REB
REC
C□Y
C□X
MQ
RHC
RZQ

D-☐
-X☐
Individual
-X☐

Accessory Bracket Dimensions

Single Knuckle Joint

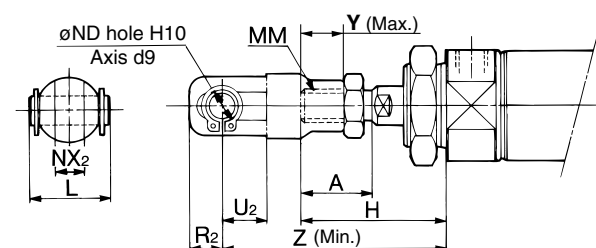
(mm)



Bore size (mm)	A	H	MM	ND _{H10}	NX ₁	U ₁	R ₂	Y	Z
20	18	41	M8 x 1.25	9 ^{+0.058 0}	9 ^{-0.1 -0.2}	14	10	11	66
25, 32	22	45	M10 x 1.25	9 ^{+0.058 0}	14 ^{-0.1 -0.2}	14	10	14	69
40	24	50	M14 x 1.5	12 ^{+0.070 0}	16 ^{-0.1 -0.2}	20	14	13	92

Double Knuckle Joint

(mm)



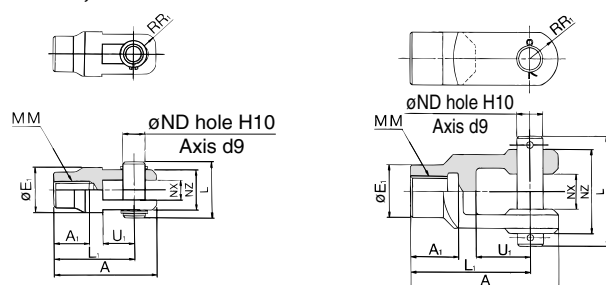
Bore size (mm)	A	H	L	MM	ND	NX ₂	R ₂	U ₂	Y	Z
20	18	41	25	M8 x 1.25	9	9 ^{+0.2 -0.1}	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	9 ^{+0.2 -0.1}	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	16 ^{+0.3 -0.1}	13	25	13	92

Double Knuckle Joint

(mm)

Y-020B, Y-032B Material: Rolled steel

Y-040B Material: Cast iron



Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L	L ₁	MM	ND	NX	NZ	R ₁	U ₁	Applicable pin part number	Retaining ring Cotter pin size
Y-020B	20	46	16	20	25	36	M8 x 1.25	9	9 ^{+0.2 +0.1}	18	5	14	CDP-1	Type C 9 for axis
Y-032B	25, 32	48	18	20	25	38	M10 x 1.25	9	9 ^{+0.2 +0.1}	18	5	14	CDP-1	Type C 9 for axis
Y-040B	40	68	22	24	49.7	55	M14 x 1.5	12	16 ^{+0.3 +0.1}	38	13	25	CDP-3	ø3 x 18

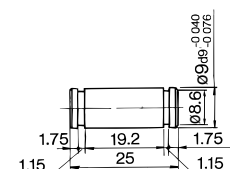
* Clevis pin and retaining ring (cotter pin for $\varnothing 40$) are attached.

Double Clevis Pin

(mm)

Bore size: Ø20, Ø25, Ø32

CDP-1

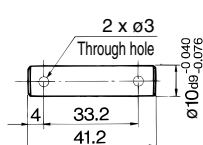


Retaining ring: Type C9 for axis

* Retaining rings (copper pins for ø40) are included.

Bore size: Ø40

CDP-2



Cotter pin
ø3 x 18ℓ

Single Knuckle Joint

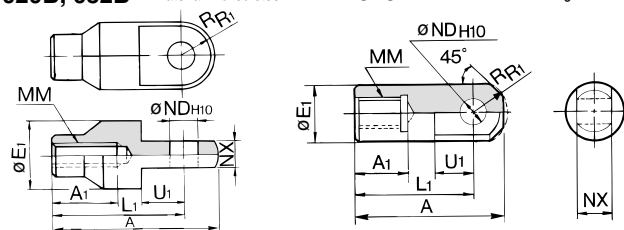
(mm)

I-020B, 032B Material: Rolled steel

Material: Rolled steel

I-040B Material: Free cutting sulfur steel

Material: Free cutting sulfur steel



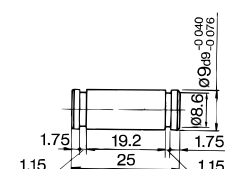
Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	ND _{H10}	NX	R ₁	U ₁
I-020B	20	46	16	20	36	M8 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-032B	25, 32	48	18	20	38	M10 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-040B	40	69	22	24	55	M14 x 1.5	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.2}	15.5	20

Double Knuckle Pin

(mm)

Bore size: ø20, ø25, ø32

CDP-1

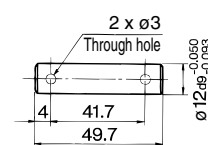


Retaining ring: Type C9 for axis

* Retaining rings (copper pins for ø40) are included.

Bore size: Ø40

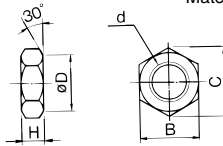
CDP-3



Cotter pin
ø3 x 18ℓ

Rod End Nut (mm)

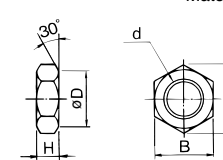
Material: Carbon steel



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

Mounting Nut (mm)

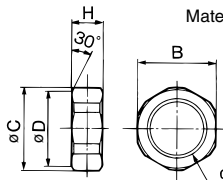
Material: Carbon steel



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

Trunnion Nut (mm)

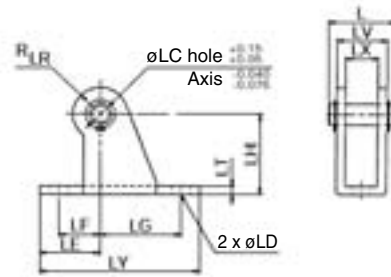
Material: Carbon steel



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

Clevis Pivot Bracket (For CM2XE) (mm)

Material: Rolled steel plate



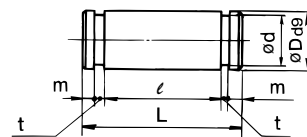
Part no.	Applicable bore size (mm)	L	LC	LD	LE	LF	LG	LH	LR	LT	LX	LY	LV	Applicable pin part no.
CM-E020B	20, 25	24.5	8	6.8	22	15	30	30	10	3.2	12	59	18.4	CD-S02
CM-E032B	32, 40	34	10	9	25	15	40	40	13	4	20	75	28	CD-S03

Note 1) Clevis bracket pins and retaining rings are included.

Note 2) It cannot be used for single clevis style (CM2C) and double clevis style (CM2D).

Clevis Pin (For CM2XE) (mm)

Material: Carbon steel



Part no.	Applicable bore size (mm)	Dd9	d	L	ℓ	m	t	Applicable retaining ring part no.
CD-S02	20, 25	8 ^{+0.040} _{-0.076}	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	32, 40	10 ^{+0.040} _{-0.076}	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

Regarding mounting bracket, accessory made of stainless steel (Some are not available.), refer to page 1864 for -XB12, External stainless steel cylinder.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

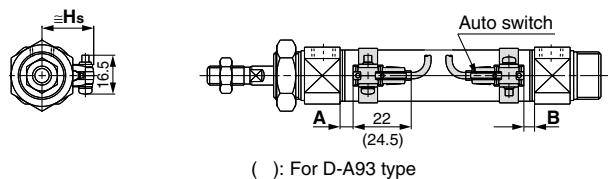
Individual
-X□

Series CM2X

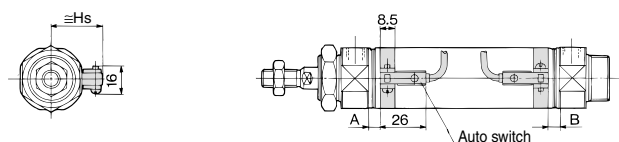
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Reed auto switch

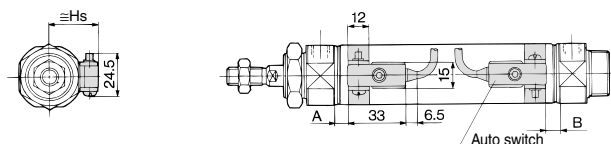
D-A9□



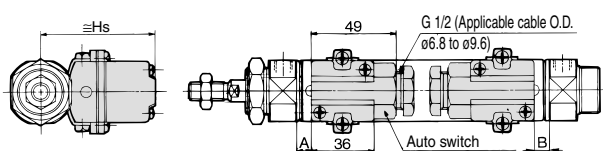
D-C7/C8



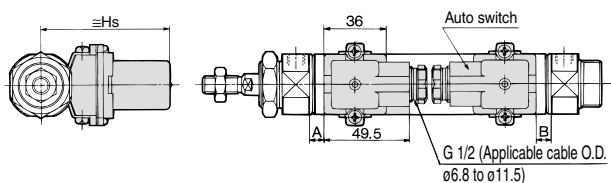
D-B5/B6/B59W



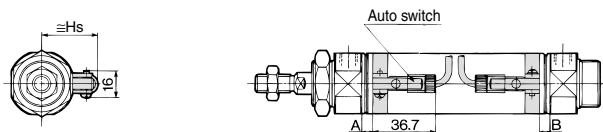
D-A33A/A34A



D-A44A



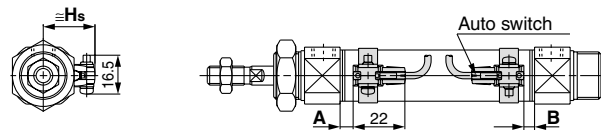
D-C73C/C80C



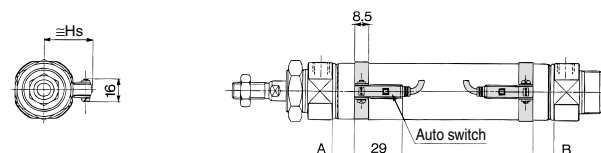
Solid state auto switch

D-M9□

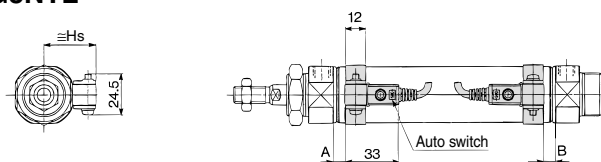
D-M9□W



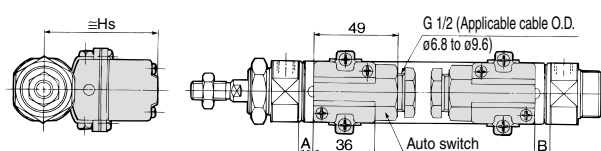
D-H7□/H7□W/H7NF



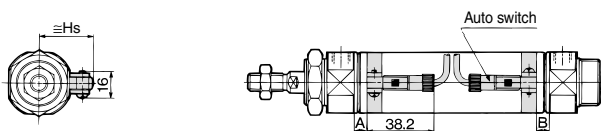
D-G5NTL



D-G39A/K39A



D-H7C



Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

Auto switch model Bore size (mm)	D-A9□		D-M9□ D-M9□W		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7□ D-H7C D-H7□W D-H7NF		D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	6.5	5.5	10.5	9.5	1	0	7	6	4	3	0.5	0	6	5	2.5	1.5
25	6.5	5.5	10.5	9.5	1	0	7	6	4	3	0.5	0	6	5	2.5	1.5
32	7.5	6.5	11.5	10.5	2	1	8	7	5	4	1.5	0.5	7	6	3.5	2.5
40	13.5	11.5	17.5	15.5	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 conditions in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model Bore size (mm)	D-A9□ D-M9□ D-M9□W		D-B5□ D-B64 D-B59W D-G5NTL D-H7C		D-C7□ D-C80 D-H7□ D-H7□W D-H7NF		D-C73C D-C80C		D-A3□A D-G39A D-K39A		D-A44A	
	Hs		Hs		Hs		Hs		Hs		Hs	
20	22		25.5		22.5		25		60		69.5	
25	24.5		28		25		27.5		62.5		72	
32	28		31.5		28.5		31		66		75.5	
40	32		35.5		32.5		35		70		79.5	

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

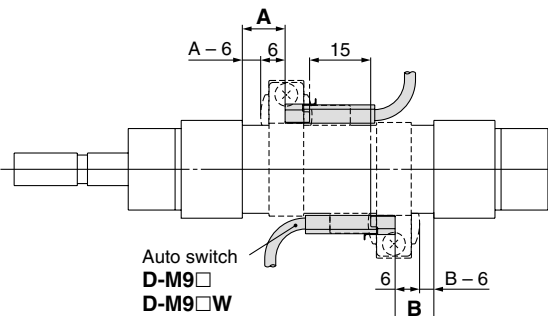
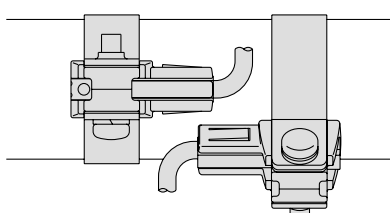
Individual
-X□

Series CM2X

Minimum Auto Switch Mounting Stroke

Auto switch model	No. of auto switch mounted				
	1 pc.	2 pcs.		n pcs.	
		Different surfaces	Same surface	Different surfaces	Same surface
D-A9□ D-M9□ D-M9□W	10	15 Note 1)	45 Note 1)	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	45 + 45 (n-2)
D-C7□ D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	50 + 45 (n-2)
D-H7□ D-H7□W D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	60 + 45 (n-2)
D-C73C D-C80C D-H7C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	65 + 50 (n-2)
D-B5□/B64 D-G5NTL	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55 (n-2)
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55(n-2)
D-A3□A/G39A D-K39A/A44A	10	35	100	35 + 30(n-2)	100 + 100 (n-2)

Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

Auto switch model	With 2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
	 Auto switch D-M9□ D-M9□W The proper auto switch mounting position is 6 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-A93	—	45 to less than 50 stroke
D-M9□ D-M9□W	15 to less than 20 stroke	45 to less than 55 stroke

Operating Range

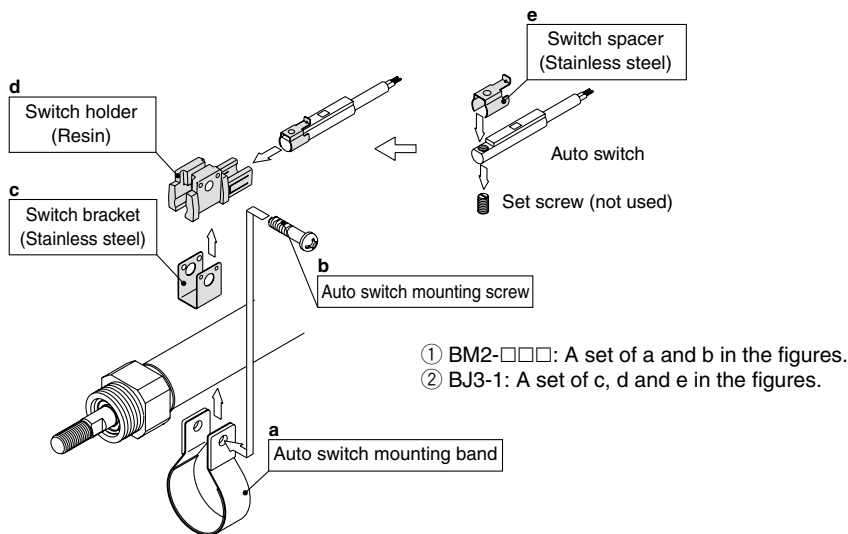
Auto switch model	(mm)			
	Bore size (mm)			
	20	25	32	40
D-A9□	6	6	6	6
D-M9□ D-M9□W	3.5	3	3.5	3
D-C7□/C80 D-C73C/C80C	7	8	8	8
D-B5□/B64 D-A3□A/A44A	8	8	9	9
D-B59W	12	12	13	13
D-H7□/H7□W D-G5NTL/H7NF	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A	8	9	9	9

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

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-A9□ D-M9□ D-M9□W	Note) ①BM2-020 ②BJ3-1	Note) ①BM2-025 ②BJ3-1	Note) ①BM2-032 ②BJ3-1	Note) ①BM2-040 ②BJ3-1
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-B59W D-G5NTL D-G5NBL	BA2-020	BA2-025	BA2-032	BA2-040
D-A3□A/A44A D-G39A/K39A	BM3-020	BM3-025	BM3-032	BM3-040

Note) Two kinds of auto switch mounting brackets are used as a set.



Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.
For detailed specifications, refer to pages 1719 to 1827.

Auto switch type	Model	Electrical entry (Direction)	Features
Reed	D-B53, C73, C76	Grommet (In-line)	—
	D-C80		Without indicator light
Solid state	D-H7A1, H7A2, H7B		—
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color indication)
	D-G5NTL		With timer

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1784 to 1785.

* Normally closed (NC = b contact), solid state auto switches (D-F9G, F9H type) are also available. For details, refer to page 1746.

* Wide range detection type, solid state auto switches (D-G5NBL type) are also available. Refer to page 1776 for details.

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

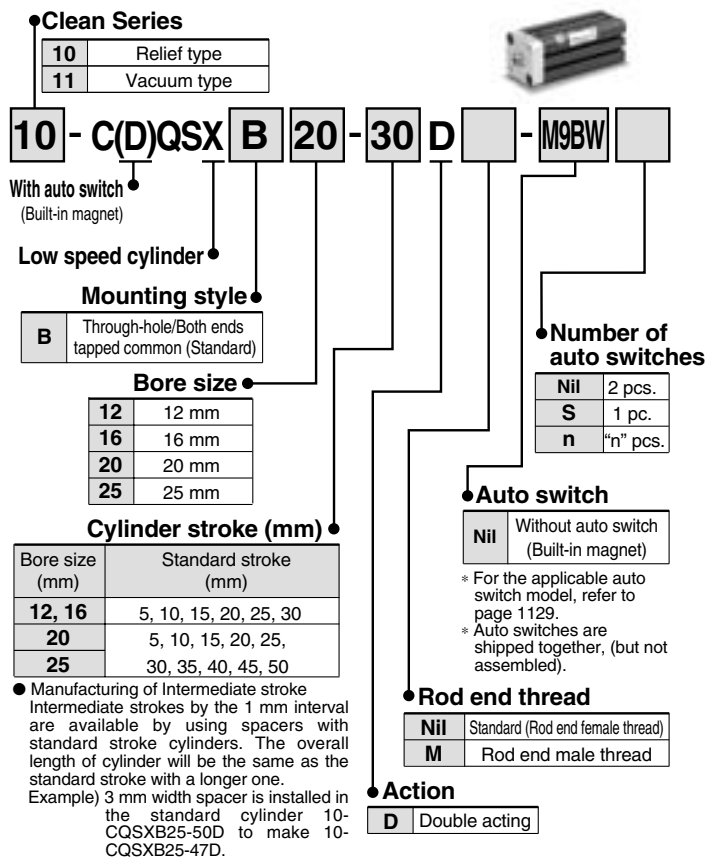
Series 10-, 11-CQSX, CQ2X

Clean Series Low Speed Cylinder Series 10-, 11-

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.
Since the external dimensions and applicable auto switches are the same as standard type, refer to the separate catalog of "Pneumatic Clean Series".

Series 10-, 11-CQSX

How to Order



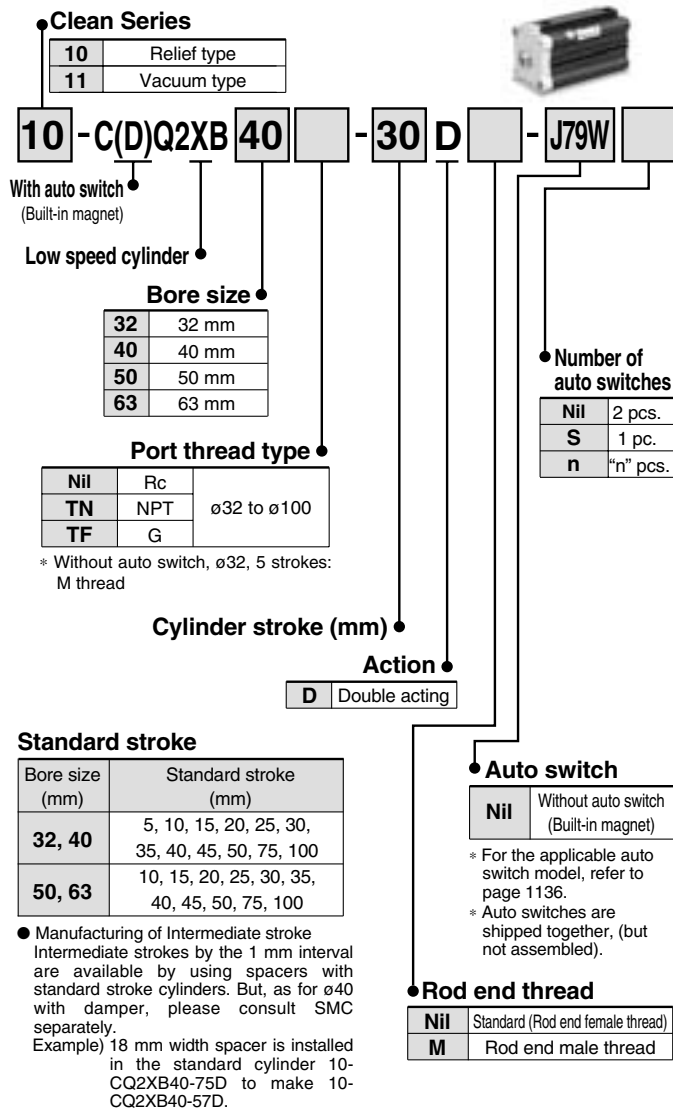
Specifications

Bore size (mm)	10- (Relief type)			
	12	16	20	25
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.04 MPa		0.035 MPa	
Ambient and fluid temperature	Without auto switch: -10 to 70°C With auto switch: -10 to 60°C			
Piston speed	1 to 200 mm/s			
Piston rod size	ø6	ø8	ø10	ø12
Rod end thread	Female thread	M3 x 0.5	M4 x 0.7	M5 x 0.8
	Male thread	M5 x 0.8	M6 x 1.0	M8 x 1.25
Stroke tolerance	+1.0 mm 0			
Port size	M5 x 0.8			
Vacuum port, Relief port	M5 x 0.8			

Bore size (mm)	11- (Vacuum type)			
	12	16	20	25
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.03 MPa		0.025 MPa	
Ambient and fluid temperature	Without auto switch: -10 to 70°C With auto switch: -10 to 60°C			
Piston speed	1 to 200 mm/s			
Piston rod size	ø6	ø8	ø10	ø12
Rod end thread	Female thread	M3 x 0.5	M4 x 0.7	M5 x 0.8
	Male thread	M5 x 0.8	M6 x 1.0	M8 x 1.25
Stroke tolerance	+1.0 mm 0			
Port size	M5 x 0.8			
Vacuum port, Relief port	M5 x 0.8			

Series 10-, 11-CQ2X

How to Order



Standard stroke

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

- Manufacturing of Intermediate stroke
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. But, as for ø40 with damper, please consult SMC separately.
Example) 18 mm width spacer is installed in the standard cylinder 10-CQ2XB40-75D to make 10-CQ2XB40-57D.

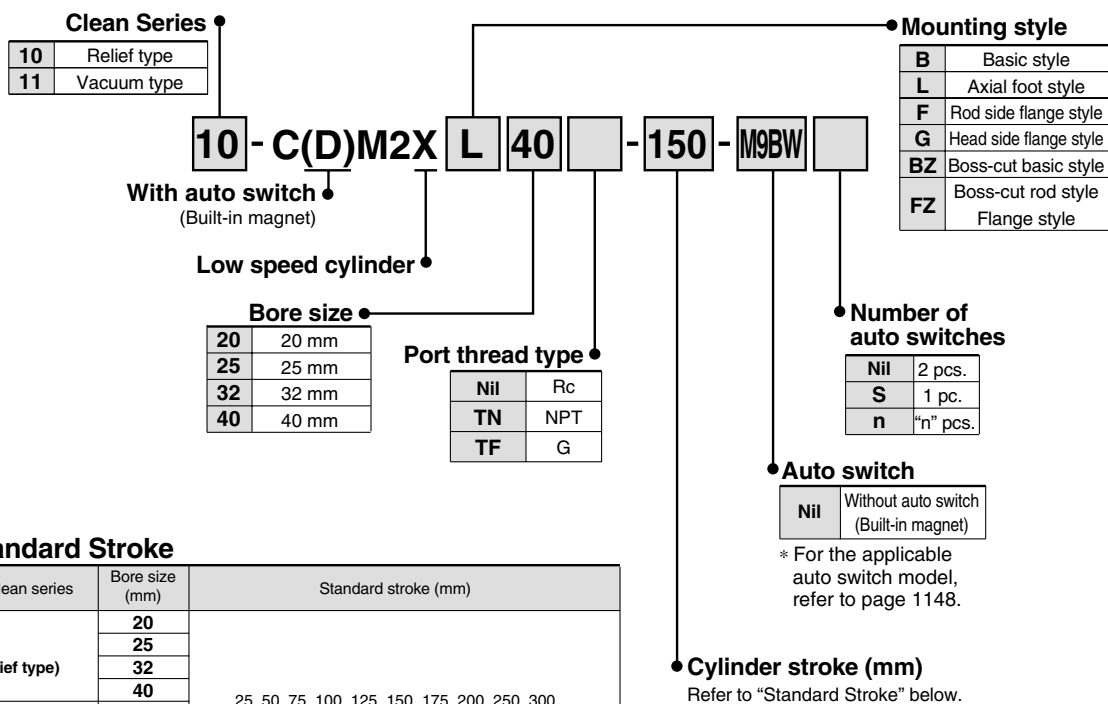
Specifications

Bore size (mm)	10- (Relief type)				11- (Vacuum type)			
	32	40	50	63	32	40	50	63
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.035 MPa	0.03 MPa	0.025 MPa		0.02 MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C With auto switch: -10 to 60°C							
Piston speed	1 to 200 mm/s				0.5 to 200 mm/s			
Piston rod size	ø16	ø20	ø16	ø20	ø16	ø20	ø16	ø20
Rod end thread	Female thread	M8 x 1.25	M10 x 1.5	M8 x 1.25	M10 x 1.5	M8 x 1.25	M10 x 1.5	M18 x 1.5
	Male thread	M14 x 1.5	M18 x 1.5	M14 x 1.5	M18 x 1.5	M14 x 1.5	M18 x 1.5	M18 x 1.5
Stroke tolerance	+1.0 mm 0							
Port size	M5 x 0.8, 1/8 (Note 1)	1/4	M5 x 0.8, 1/8 (Note 1)	1/4				
Vacuum port, Relief port	M5 x 0.8							

Note 1) Only 5 stroke comes with M5 x 0.8 in the case of no auto switch on ø32.

10-, 11- CM2X Series

How to Order



Standard Stroke

Clean series	Bore size (mm)	Standard stroke (mm)
10- (Relief type)	20	25, 50, 75, 100, 125, 150, 175, 200, 250, 300
	25	
	32	
	40	
11- (Vacuum type)	20	25, 50, 75, 100, 125, 150, 175, 200, 250, 300
	25	
	32	
	40	

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

Specifications

Bore size (mm)	10- (Relief type)				11- (Vacuum type)			
	20	25	32	40	20	25	32	40
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.035 MPa				0.025 MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C							
	With auto switch: -10 to 60°C							
Cushion	Rubber bumper							
Piston speed	1 to 200 mm/s				0.5 to 200 mm/s			
Piston rod size	ø8	ø10	ø12	ø14	ø8	ø10	ø12	ø14
Rod end thread	M8 x 1.25	M10 x 1.25		M14 x 1.5	M8 x 1.25	M10 x 1.25		M14 x 1.5
Stroke tolerance	^{+1.4} ₀ mm							
Port size	1/8			1/4	1/8			1/4
Vacuum port, Relief port	M5 x 0.8							

⚠ Precautions

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.
Refer to the Clean Series catalog separately for the precautions in clean environments.

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 snap ring to pop out.

- When replacing the rod seal, take care that the snap ring does not spring out while you are removing it.

Maintenance

⚠ Caution

1. Grease pack

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

Grease pack part no.: GR-X-005 (5 g)

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□

Related Products: Made to Order Specifications: -XB13: Low Speed Cylinder 5 to 50 mm/s (CY1/CY3: 7 to 50 mm/s)



Symbol

Low Speed Cylinder

-XB13

CG1	Standard model no.	— XB13	CY1 CY3	Standard model no.	— XB13
MB	Standard model no.	— XB13	MGP^M_L	Standard model no.	— XB13
Low speed cylinder ●			MGGM	Standard model no.	— XB13
			MGCM	Standard model no.	— XB13
			CX2	Standard model no.	— XB13
			CXW^M_L	Standard model no.	— XB13
			CXS^M_L	Standard model no.	— XB13
			MXH MXU	Standard model no.	— XB13
			CXT^M_L CXSJ^M_L	Standard model no.	— XB13

Note) Operate without lubrication from a pneumatic system lubricator.

Low speed cylinder ●

Specifications

Applicable cylinder	Air cylinder Standard		Magnetically coupled rodless cylinder	Compact guide cylinder	Guide cylinder		Slide unit		Dual rod cylinder		Compact slide		Platform cylinder
					Slide bearing								
Series	CG1	MB	CY ¹ ₃	MGP ^M _L	MGGM	MGCM	CX2	CXW ^M _L	CXSJ ^M _L	CXS ^M _L	MXH	MXU	CXT ^M _L
Action	Double acting, Single rod		Double acting										
Bore size (mm)	20, 25, 32 40, 50, 63 80, 100	32, 40 50, 63 80, 100	CY3B: 6, 10, 15, 20, 25, 32 40, 50, 63 CY1S, CY1L: 6 to 40	12, 16, 20 25, 32, 40 50, 63, 80 100	20, 25, 32 40, 50, 63 80, 100	20, 25 32, 40 50	10, 15 25	10, 16 20, 25 32	6, 10 15, 20 25, 32	6, 10 15, 20 25, 32	6, 10 16, 20	6, 10 16	12, 16 20, 25 32, 40
Piston speed	5 to 50 mm/s		7 to 50 mm/s	5 to 50 mm/s	5 to 50 mm/s								
Cushion	Rubber bumper	Air cushion on both ends	Rubber bumper		Rubber bumper (Basic cylinder)		Shock absorber (CX2: Option)		Rubber bumper				
Auto switch	Mountable												
Mounting	Basic Foot Flange Trunnion Clevis	Basic Foot Flange Clevis Trunnion	Basic Slider	Basic	Basic Front mounting Flange		Basic						
Dimensions	Dimensions and specifications are the same as standard products of double acting.												
Additional specifications													

* No shock absorber is available for the Series MGGM.

Related Products:

Speed Controller for Low Speed Operation

The effective area of controlled flow is approximately 1/10 of the standard type.

These controllers are suitable for controlling the speed of microspeed cylinders.

The dual type speed controller is especially suitable for cylinders with a small bore size.

Elbow/Universal Type



Air Flow/Effective Area

Model		AS12□1FM-M5 AS13□1FM-M5	AS22□1FM-□01 AS23□1FM-□01		AS22□1FM-□02 AS23□1FM-□02		
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8	ø4	ø6	ø8, ø10
	Inch size	ø1/8", ø5/32", ø3/16" ø1/4"	ø1/8", ø5/32"	ø3/16", ø1/4" ø5/16"	ø5/32"	ø3/16"	ø1/4", ø5/16" ø3/8"
Controlled flow	Air flow (l/min (ANR))	7	12		38		
	Effective area (mm ²)	0.1	0.2		0.6		
Free flow	Flow rate (l/min (ANR))	100	180	230	260	390	460
	Effective area (mm ²)	1.5	2.7	3.5	4	6	7

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

In-line Type



Air Flow/Effective Area

Model		AS1001FM	AS2001FM		AS2051FM	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8
	Inch size	ø1/8", ø5/32", ø3/16" ø1/4"	ø5/32"	ø3/16", ø1/4"	ø3/16"	ø1/4", ø5/16"
Controlled flow	Air flow (l/min (ANR))	7	12		38	
	Effective area (mm ²)	0.1	0.2		0.6	
Free flow	Flow rate (l/min (ANR))	100	130	230	290	460
	Effective area (mm ²)	1.5	2	3.5	4.5	7

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

Elbow Type (Metal body)



Air Flow/Effective Area

Model		AS12□0M		AS22□0M-□01		AS22□0M-□02					
Port size		Cylinder side	M5 x 0.8	10-32 UNF	R 1/8	NPT 1/8	R 1/4	NPT 1/4			
		Tube side			Rc 1/8		Rc 1/4				
Controlled flow	Air flow (ℓ/min (ANR))	7			12		38				
	Effective area (mm ²)	0.1			0.2		0.6				
Free flow	Flow rate (ℓ/min (ANR))	105			280		420				
	Effective area (mm ²)	1.6			4.3		6.5				

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

Dual Type



Air Flow/Effective Area

Model		ASD230FM-M5	ASD330FM-□01	ASD430FM-□02	
Tubing O.D.	Metric size	ø4, ø6	ø6, ø8	ø6	ø8, ø10
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø3/16", ø1/4"	—	ø1/4", ø5/16" ø3/8"
Controlled flow (Free flow)	Air flow (l/min (ANR))	7	12	38	
	Effective area (mm ²)	0.1	0.2	0.6	

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

REA

REB

REC

C□Y

C□X

MQ

RHC

RZQ

D-□

-X□

Individual
-X□



Low Speed Cylinder Specific Product Precautions

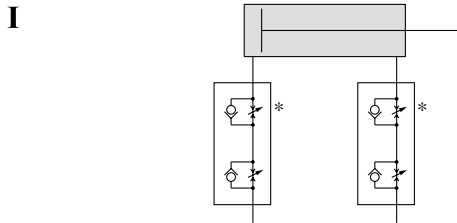
Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Recommended Pneumatic Circuit

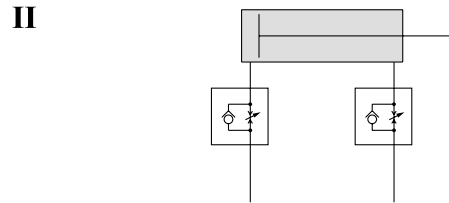
Warning

Horizontal Operation



Dual speed controller

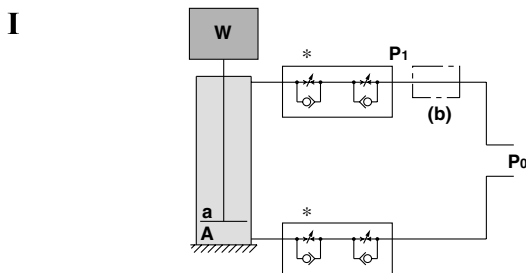
Speed is controlled by meter-out circuit. Using concurrently the meter-in circuit can alleviate the stick-slip. More stable low speed operation can be achieved than meter-in circuit alone.



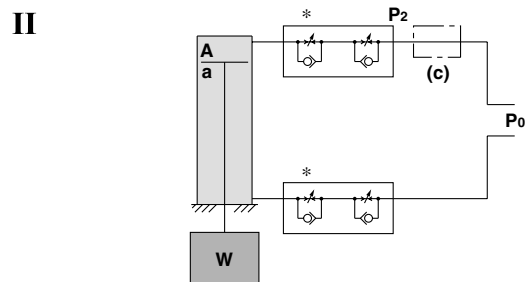
Meter-in speed controller

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

Vertical Operation



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



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

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

Warning

Since C□J2X, C□UX10 are subject to internal leakage due to their construction, the speed may not be fully controlled with the meter-out controller (*) during low speed operation.

Selection

Caution

- 1. Operate within the standard strokes.**
Operating with the stroke exceeding the standard stroke may cause malfunction.
- 2. Provide a construction that does not apply a lateral load to the cylinder.**
Applying a lateral load to the cylinder may cause malfunction.
- 3. Do not use the product at a high frequency.**
Use it at 30 cpm or less as a guideline.
- 4. Do not wipe out the grease in the sliding part of the air cylinder.**
Doing so forcefully may cause malfunction.

Pneumatic Circuit

Caution

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