

Compact Cylinder: Standard Double Acting, Single Rod

Series CQ2

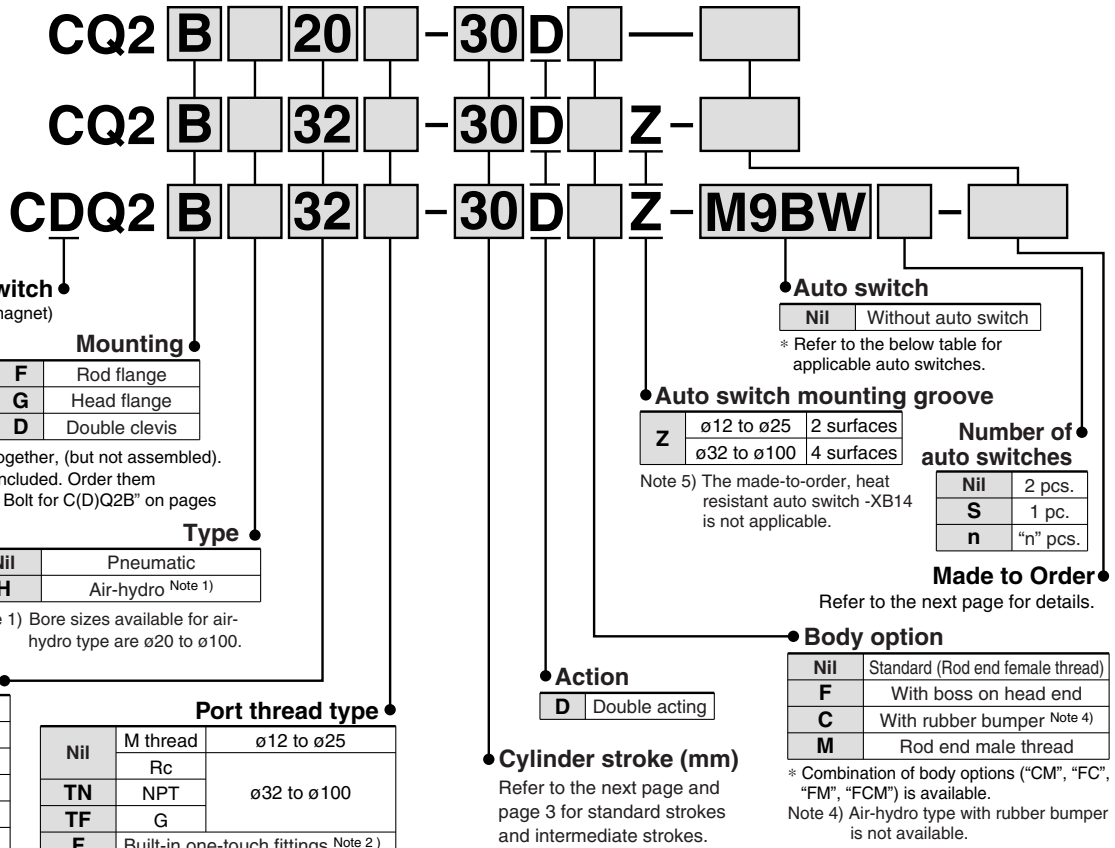
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch
ø12 to ø25

Without auto switch
ø32 to ø100

With 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) CDQ2L32-25DZ

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.
Applicable Auto Switches/Refer to the individual catalog (ES20-201) for the D-P3DW type.

Applicable Auto Switch Selection Chart for the individual catalog (2020-2021) for the E-702W type																				
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)	None (N)							
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC			
	3-wire (PNP)			M9PV				M9P	●	●	●	○	—	○						
	2-wire			M9BV				M9B	●	●	●	○	—	○						
	3-wire (NPN)			5 V, 12 V				M9NVW	M9NW	●	●	●	○	—	○	IC circuit				
	3-wire (PNP)							M9PWV	M9PW	●	●	●	○	—	○					
	2-wire							M9BWV	M9BW	●	●	●	○	—	○					
	3-wire (NPN)			5 V, 12 V				M9NAV**	M9NA**	○	○	●	○	—	○	IC circuit				
	3-wire (PNP)							M9PAV**	M9PA**	○	○	●	○	—	○					
	2-wire							M9BAV**	M9BA**	○	○	●	○	—	○					
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)				—	—	—	P3DW	●	—	●	●	—		○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V 12 V	100 V	A96V	A96	●	—	●	—	—	—	IC circuit	—			
				2-wire				A93V	A93	●	—	●	—	—	—	—	—	—	IC circuit	Relay, PLC
				2-wire				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.
If water resistance is needed, we recommend water resistant cylinders be used. (Page 156)

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
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.
* The D-P3DW□ type is available from ø32 to ø100 only.

* There are other applicable auto switches other than the listed above. For details, refer to page 175.

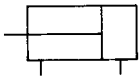
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

Compact Cylinder: Standard Double Acting, Single Rod **Series CQ2**



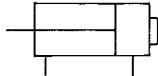
JIS Symbol

Double acting,
Single rod



Symbol

With boss on
head end



Made to Order

(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XA□	Special rod end shape
-XB6	Heat resistant cylinder (-10 to 150°C) w/o auto switch only
-XB7	Cold resistant cylinder (-40 to 70°C) w/o auto switch only
-XB9	Low-speed cylinder (10 to 50 mm/s)
-XB10	Intermediate stroke (Exclusive body type)
-XB10A	Intermediate stroke (Spacer-installed type)
-XB11	Long stroke (Air-hydro type only)
-XB13	Low-speed cylinder (5 to 50 mm/s)
-XB14	Cylinder with heat resistant auto switch ø16 to ø63 only
-XC4	With heavy-duty scraper, ø20 to ø100 only
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod
-XC11	Dual stroke cylinder/Single rod
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304
-XC35	With coil scraper, ø32 to ø100 only
-XC36	With boss on rod end
-X144	Special port location, with auto switch ø12 to ø25 only
-X202	Full length dimension is the same as Series CQ1, Except ø16, ø25.
-X203	L dimension from rod cover is the same as Series CQ1, ø20, ø32 only.
-X271	Fluororubber seals
-X525	Long stroke of adjustable extension stroke cylinder (-XC8)
-X526	Long stroke of adjustable retraction stroke cylinder (-XC9)
-X636	Long stroke of dual stroke single rod cylinder
-X1876	Cylinder tube: With concave boss on head end

Note) -XB14: The body shape is the same as the existing product.

Refer to pages 169 to 175 for the specifications of cylinders with auto switches.

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

Specifications

Pneumatic type

Bore size (mm)		12	16	20	25	32	40	50	63	80	100
Action		Double acting, Single rod									
Fluid		Air									
Proof pressure		1.5 MPa									
Maximum operating pressure		1.0 MPa									
Minimum operating pressure		0.07 MPa		0.05 MPa							
Ambient and fluid temperature		Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)									
Lubrication		Not required (Non-lube)									
Piston speed		50 to 500 mm/s									
Allowable kinetic energy (J)	Standard	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
	With rubber bumper	0.043	0.075	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54
Stroke length tolerance		+1.0 mm (Note) 0									

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

Air-hydro type

Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting, Single rod							
Fluid	Turbine oil ^{Note)}							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.18 MPa			0.1 MPa				
Ambient and fluid temperature	5 to 60°C							
Piston speed	5 to 50 mm/s							
Cushion	None							
Stroke length tolerance	+1.0 mm 0							

Note) Refer to "Handling Precautions for SMC Products" (M-E03-3) for Actuator Precautions (5).

Standard Strokes

Pneumatic type

Bore size	Standard stroke (mm)
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50 to 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

- For long strokes exceeding the standard stroke range, refer to page 69.
- For intermediate strokes, refer to page 3.

Air-hydro type

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

Mounting Brackets/Part No.

Bore size (mm)	Model	Foot (Note 1)	Flange	Double clevis
12	Without switch	CQ2□□-□D	CQ-F012	CQ-D012
	With switch	CQ2□□-□DZ		
16	Without switch	CQ2□□-□D	CQ-F016	CQ-D016
	With switch	CQ2□□-□DZ		
20	Without switch	CQ2□□-□D	CQ-F020	CQ-D020
	With switch	CQ2□□-□DZ		
25	Without switch	CQ2□□-□D	CQ-F025	CQ-D025
	With switch	CQ2□□-□DZ		
32	CQ2□□-□DZ	CQ-L032	CQ-F032	CQ-D032
40	CQ2□□-□DZ	CQ-L040	CQ-F040	CQ-D040
50	CQ2□□-□DZ	CQ-L050	CQ-F050	CQ-D050
63	CQ2□□-□DZ	CQ-L063	CQ-F063	CQ-D063
80	CQ2□□-□DZ	CQ-L080	CQ-F080	CQ-D080
100	CQ2□□-□DZ	CQ-L100	CQ-F100	CQ-D100

Note 1) When ordering a foot bracket, the required quantity will be different depending on the bore size.

- ø12 to ø25:
 - Without switch: Order 2 pieces per cylinder.
 - With switch: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)
- ø32 to ø100:
 - 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 rings for axis, Body mounting bolts

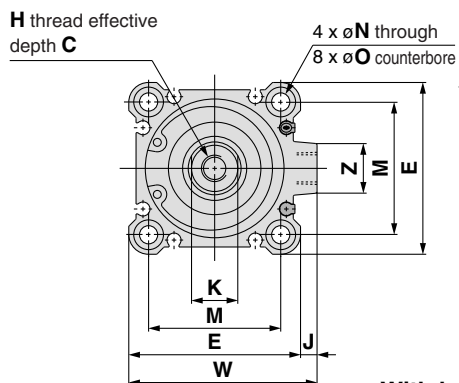
Series CQ2

Dimensions

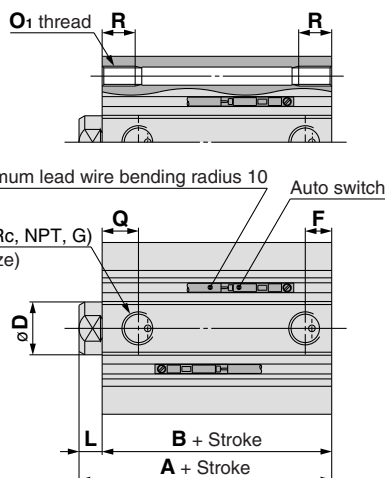
Ø32 to Ø50/With Auto Switch

(In the case of without auto switches, the A, B, F, P and Q dimensions will be only changed. Refer to the dimension table.)

Standard (Through-hole): CQ2B/CDQ2B



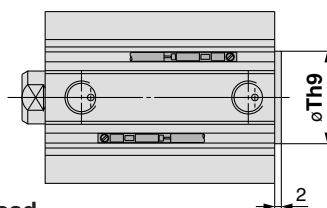
Both ends tapped: CQ2A/CDQ2A



Both Ends Tapped (mm)

Bore size (mm)	O ₁	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

With boss on head end

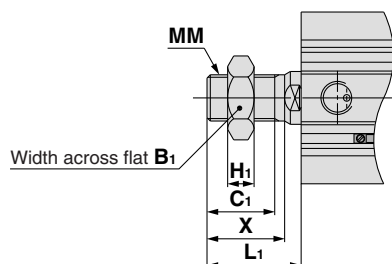


With Boss on Head End (mm)

Bore size (mm)	Th9
32	21 ⁰ _{-0.052}
40	28 ⁰ _{-0.052}
50	35 ⁰ _{-0.062}

Note 1) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

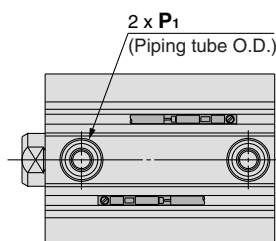
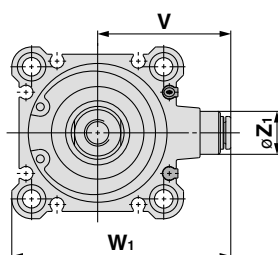
Rod end male thread



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

Built-in one-touch fittings: Ø32 to Ø50



Built-in One-touch Fittings (mm)

Bore size (mm)	Z ₁	P ₁	V	W ₁
32	13	6	36.5	59
40	13	6	40.5	66
50	16	8	50	82

Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	Without auto switch					With auto switch					C	D	E	H	J	K	L	M	N
		A	B	F	P	Q	A	B	F	P	Q									
32	5	30	23	5.5	M5 x 0.8	11.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
	10 to 50	40	33	7.5	1/8	10.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
	75, 100	40	33	7.5	1/8	10.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
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	5	14	7	40	5.5
	75, 100	46.5	39.5	8	1/8	11	46.5	39.5	8	1/8	11	13	16	52	M8 x 1.25	5	14	7	40	5.5
	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	7	17	8	50	6.6
50	75, 100	48.5	40.5	10.5	1/4	10.5	48.5	40.5	10.5	1/4	10.5	15	20	64	M10 x 1.5	7	17	8	50	6.6

Bore size (mm)	O	W	Z
32	9 depth 7	49.5	14
40	9 depth 7	57	15
50	11 depth 8	71	19

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.
* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of intermediate strokes, refer to page 3. The spacer-installed type (Standard, -XB10A) and the exclusive body type (-XB10) are available.