

Compact Cylinder: Large Bore Size Double Acting, Single Rod Series CQ2

ø125, ø140, ø160, ø180, ø200

How to Order

Without auto switch CQ2B 125 - 30 DC Z -

With auto switch CDQ2B 125 - 30 DC Z - M9BW -

With auto switch
(Built-in magnet)

Mounting
B Through-hole/Both ends tapped common (Standard)
* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQ2B" on page 59.

Bore size

125	125 mm
140	140 mm
160	160 mm
180	180 mm
200	200 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to the next page for standard strokes.

Action
D Double acting

Auto switch
Nil Without auto switch
* Refer to the below table for applicable auto switches.

Auto switch mounting groove
Z ø125 to ø200 4 surfaces

Body option

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

Cushion
C Rubber bumper

Made to Order
Refer to the next page for details.

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) CDQ2B140-30DCZ

Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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)	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	●	●	●	○	—	○					
	Diagnostic indication (2-color indication)			3-wire (NPN)				24 V	5 V, 12 V	—	M9NVV	M9NW	●	●	●	○		—	○	IC circuit
				3-wire (PNP)							M9PWV	M9PW	●	●	●	○		—	○	
				2-wire							M9BWW	M9BW	●	●	●	○		—	○	
	Water resistant (2-color indication)			3-wire (NPN)				24 V	5 V, 12 V	—	M9NAV**	M9NA**	○	○	●	○		—	○	IC circuit
				3-wire (PNP)							M9PAV**	M9PA**	○	○	●	○		—	○	
				2-wire							M9BAV**	M9BA**	○	○	●	○		—	○	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	Relay, PLC			
				2-wire				24 V	12 V	100 V	A93V	A93	●	—	●	—		—	—	
			No	2-wire	24 V	5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	—		IC circuit		

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

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

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

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

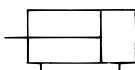
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

Compact Cylinder: Large Bore Size Double Acting, Single Rod *Series CQ2*

Specifications



JIS Symbol
Double acting,
Single rod



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

Symbol	Specifications
-XA□	Change of rod end shape
-XB10	Intermediate stroke (Exclusive body type)
-X271	Fluororubber seals, ø125 to ø160 only

Bore size (mm)	125	140	160	180	200
Action	Double acting, Single rod				
Fluid	Air				
Proof pressure	1.5 MPa			1.05 MPa	
Maximum operating pressure	1.0 MPa			0.7 MPa	
Minimum operating pressure	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			20 to 400 mm/s	
Allowable kinetic energy (J)	7.4	9.8	12.4		
Stroke length tolerance	+1.4 mm Note) 0				

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

Standard Strokes

Bore size (mm)	Standard stroke (mm)
125, 140, 160 180, 200	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300

Manufacture of Intermediate Strokes

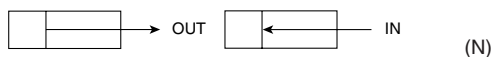
Type	A spacer is installed in the standard stroke body.		Exclusive body (-XB10)	
Part no.	Refer to "How to Order" for the standard model number. (P. 57)		Suffix "-XB10" to the end of standard model number. (P. 57)	
Description	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.		Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.	
Stroke range	Bore size	Stroke range	Bore size	Stroke range
	125 to 200	5 to 295	125 to 200	11 to 299
Example	Part no.: CQ2B160-165DCZ CQ2B160-175DCZ with 10 mm width spacer inside The B dimension is 266 mm.		Part no.: CQ2B160-165DCZ-XB10 Makes 165 mm stroke tube. The B dimension is 256 mm.	

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.

Series CQ2

Theoretical Output



Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
125	IN	3376	5627	7878
	OUT	3682	6136	8590
140	IN	4313	7188	10063
	OUT	4618	7697	10776
160	IN	5655	9425	13195
	OUT	6032	10053	14074
180	IN	7257	12095	16933
	OUT	7634	12724	17813
200	IN	9048	15080	21112
	OUT	9425	15708	21991

Weight

Without Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.24	5.48	5.71	5.94	6.18	6.76	7.35	7.93	8.52	9.10	9.69	10.86	12.03
140	6.19	6.44	6.71	6.98	7.25	7.90	8.57	9.23	9.90	10.56	11.23	12.55	13.88
160	8.57	8.88	9.20	9.52	9.84	10.64	11.44	12.25	13.05	13.85	14.65	16.26	17.85
180	11.54	11.92	12.31	12.70	13.09	14.05	15.03	16.00	16.97	17.93	18.90	20.84	22.78
200	14.56	15.07	15.49	15.92	16.34	17.41	18.47	19.54	20.60	21.67	22.82	24.85	26.99

With Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.30	5.54	5.77	6.01	6.24	6.83	7.40	7.99	8.58	9.16	9.75	10.92	12.09
140	6.26	6.51	6.78	7.05	7.32	7.97	8.64	9.30	9.97	10.63	11.30	12.62	13.95
160	8.65	8.96	9.28	9.60	9.92	10.72	11.52	12.33	13.13	13.93	14.73	16.34	17.93
180	11.62	12.00	12.39	12.78	13.17	14.13	15.11	16.08	17.05	18.01	18.98	20.92	22.86
200	14.64	15.15	15.57	16.00	16.42	17.49	18.55	19.62	20.68	21.75	22.90	24.93	27.07

Additional Weight

Bore size (mm)		125	140	160	180	200
Rod end male thread	Male thread	0.31	0.31	0.48		
	Nut	0.16	0.16	0.26		

Calculation: (Example) **CDQ2B125-30DCMZ**

- Basic weight: CDQ2B125-30DCZ..... 5.77 kg
- Additional weight: Rod end male thread... 0.47 kg

6.24 kg

Mounting Bolt for CQ2B

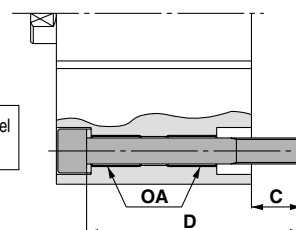
Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M12x100L 4 pcs.

Note 1) To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.

Note 2) For mounting bolts for the stroke length exceeding 100 mm, use the OA screw provided on the cylinder tube to secure the cylinder.

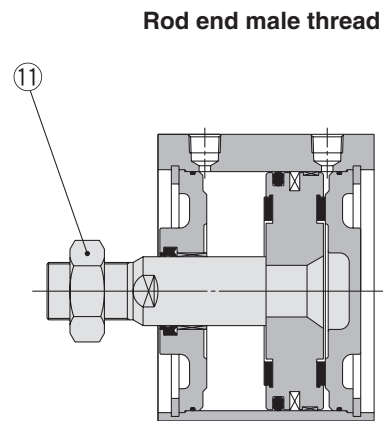
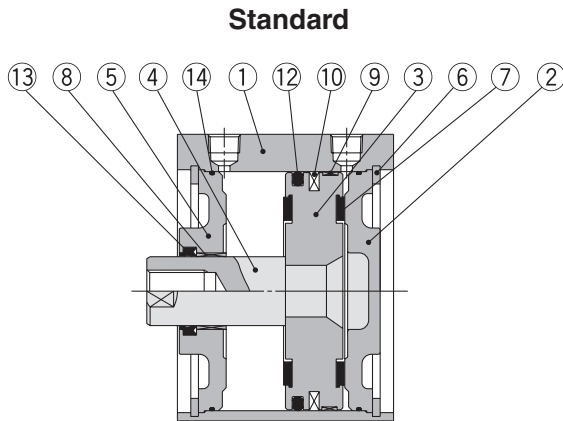
Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
C□Q2B125/140-10DCZ	22.9	100	CQ-M12 x 100L
-20DCZ		110	x 110L
-30DCZ		120	x 120L
-40DCZ		130	x 130L
-50DCZ		140	x 140L
-75DCZ		165	x 165L
-100DCZ		190	x 190L
C□Q2B160-10DCZ	27.7	110	CQ-M14 x 110L
-20DCZ		120	x 120L
-30DCZ		130	x 130L
-40DCZ		140	x 140L
-50DCZ		150	x 150L
-75DCZ		175	x 175L
-100DCZ		200	x 200L

Cylinder model	C	D	Mounting bolt part no.
C□Q2B180-10DCZ	36	125	CQ-M18 x 125L
-20DCZ		135	x 135L
-30DCZ		145	x 145L
-40DCZ		155	x 155L
-50DCZ		165	x 165L
-75DCZ		190	x 190L
-100DCZ		215	x 215L
C□Q2B200-10DCZ	39	135	CQ-M18 x 135L
-20DCZ		145	x 145L
-30DCZ		155	x 155L
-40DCZ		165	x 165L
-50DCZ		175	x 175L
-75DCZ		200	x 200L
-100DCZ		225	x 225L

Construction



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Head cover	Carbon steel	Nickel plated
3	Piston	Aluminum alloy	Chromated
4	Piston rod	Carbon steel	Hard chrome plated
5	Rod cover	Carbon steel	Nickel plated
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper	Urethane	
8	Bushing	Bearing alloy	
9	Wear ring	Resin	
10	Magnet	—	For CDQ2B□ only
11	Rod end nut	Carbon steel	Nickel plated
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Tube gasket	NBR	

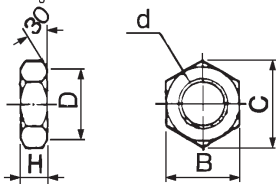
Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
125	CQ2B125-PS	Kits include items ⑫, ⑬, ⑭ from the table.
140	CQ2B140-PS	
160	CQ2B160-PS	
180	CQ2B180-PS	
200	CQ2B200-PS	

* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.
* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

Rod End Nut



Material: Carbon steel
Surface treatment: Nickel plated

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, 180, 200	M36 x 1.5	21	55	63.5	53

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 a 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.

Copper and Fluorine-free Series (For CRT Manufacturing Process)

20-C□Q2B Bore size — Stroke **DC(M)Z**

• Copper and fluorine-free series

• $\phi 125, \phi 140, \phi 160, \phi 180, \phi 200$

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

Specifications

Bore size (mm)	125	140	160	180	200
Action	Double acting, Single rod				
Proof pressure	1.5 MPa			1.05 MPa	
Max. operating pressure	1.0 MPa			0.7MPa	
Cushion	Rubber bumper				
Piston speed	50 to 500 mm/s			20 to 400 mm/s	
Mounting	Through-hole/Both ends tapped				

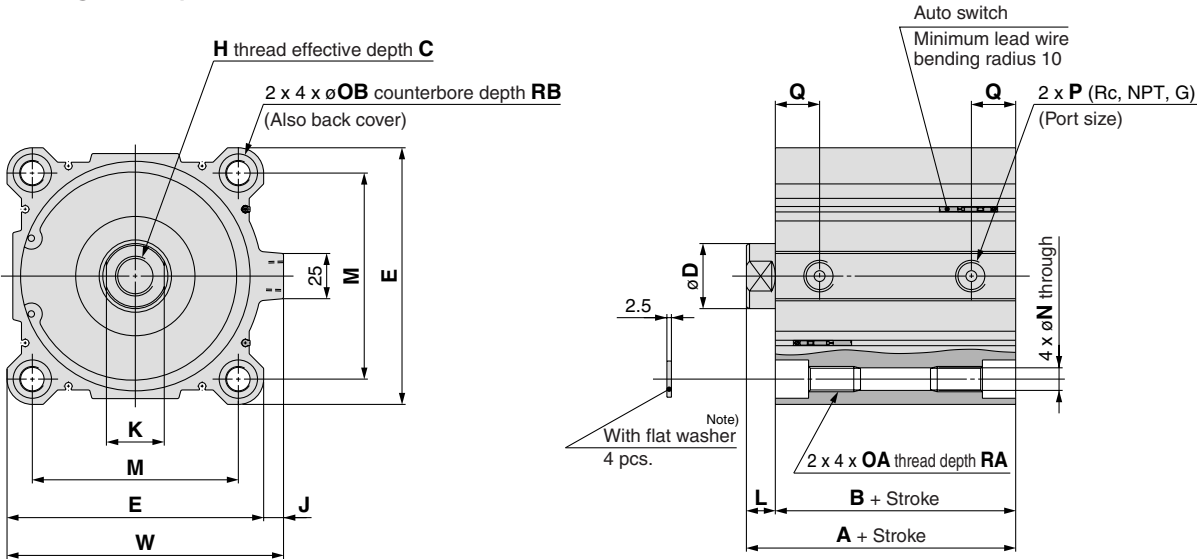
Series
CQ2

Dimensions

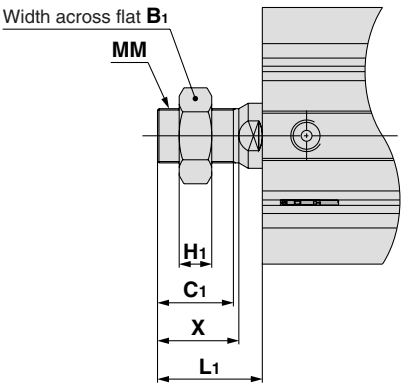
125 to 160

Standard (Through-hole):
C□Q2B

The dimensions are the same with or without an auto switch.



Rod end male thread



Rod End Male Thread

(mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
125	46	42	18	58	M30 x 1.5	45
140	46	42	18	58	M30 x 1.5	45
160	55	47	21	64	M36 x 1.5	50

Bore size (mm)	Standard stroke	A	B	C	D	E	H	J	K	L	M	N	OA	OB	P	Q	RA	RB	W
125	10, 20, 30, 40, 50	99	83	30	36	142	M22 x 2.5	11	32	16	114	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	153
140	75, 100, 125, 150	99	83	30	36	158	M22 x 2.5	10	32	16	128	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	168
160	175, 200, 250, 300	108	91	33	40	178	M24 x 3	10	36	17	144	14.5	M16 x 2	24.2	3/8	27.5	28	21.2	188

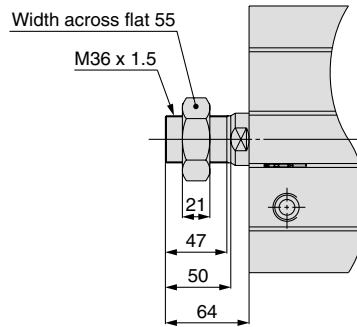
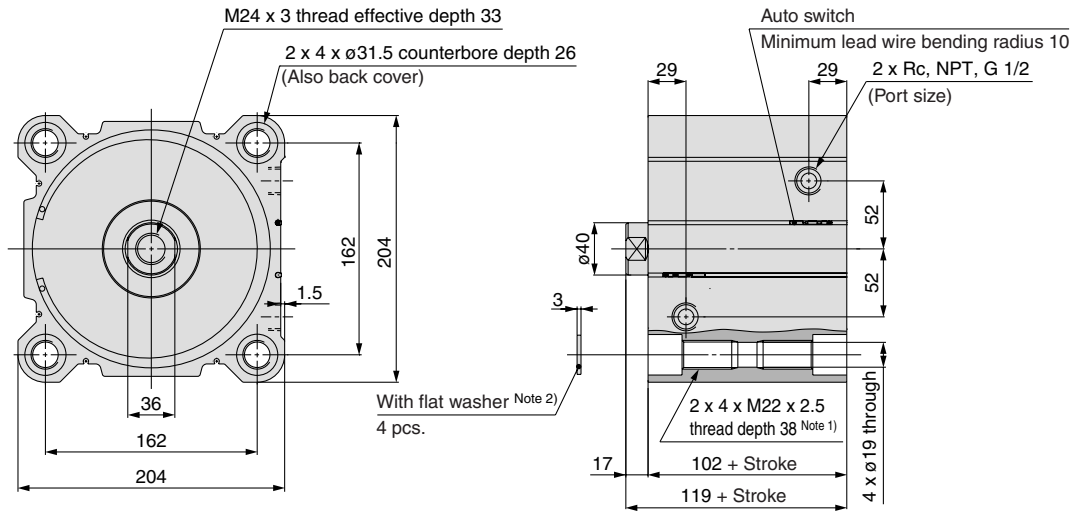
Note) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Dimensions

Ø180, Ø200

Ø180

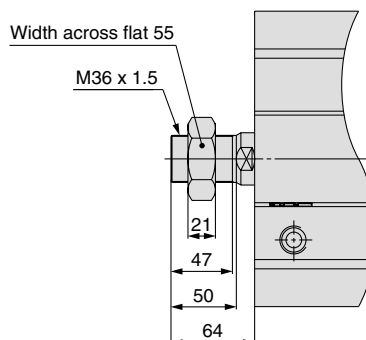
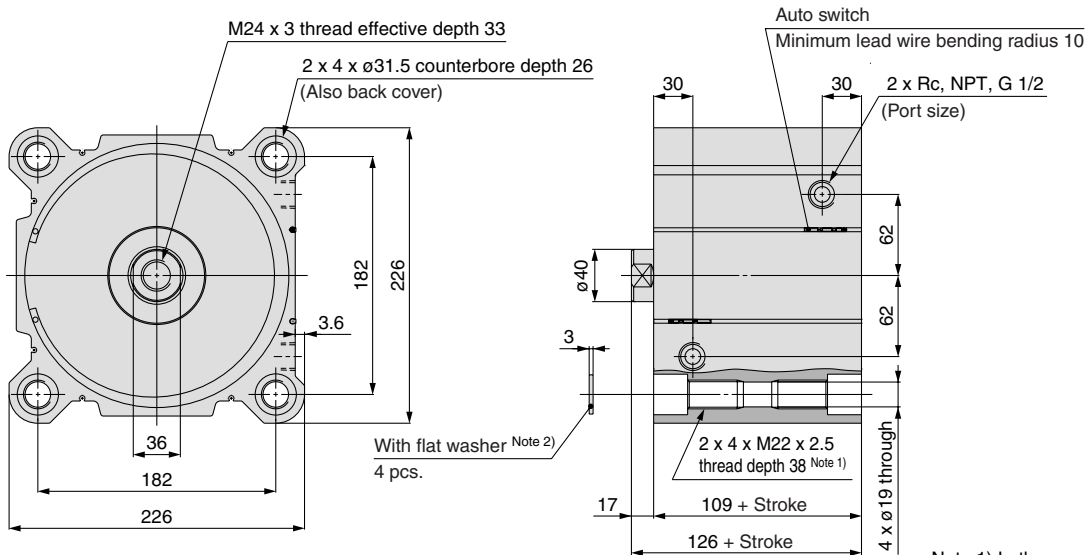
The dimensions are the same with or without an auto switch.



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Ø200



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.