

# Compact Cylinder: Large Bore Size Double Acting, Single Rod

## CQ2 Series

∅125, ∅140, ∅160, ∅180, ∅200

### 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 CQ2" on page 846.

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 page 845 for standard strokes.

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) CDQ2B140-30DCZ

Made to Order  
Refer to page 845 for details.

Number of auto switches

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

Auto switch

**Nil** Without auto switch

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

**Z** ∅125 to ∅200 4 surfaces

Body option

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

Cushion

**C** Rubber bumper

### Applicable Auto Switches

Refer to pages 1575 to 1701 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	—	M9NV	M9N	●	●	●	○	—	○	Relay, PLC
				3-wire (PNP)			M9PV	M9P	●	●	●	○	—		
				2-wire			M9BV	M9B	●	●	●	○	—		
	3-wire (NPN)			M9NWW			M9NW	●	●	●	○	—			
	3-wire (PNP)			M9PWW			M9PW	●	●	●	○	—			
	2-wire			M9BWW			M9BW	●	●	●	○	—			
	Water resistant (2-color indicator)	Grommet	Yes	3-wire (NPN)	24 V	—	M9NAV*1	M9NA*1	●	●	●	○	—	○	
				3-wire (PNP)			M9PAV*1	M9PA*1	●	●	●	○	—		
				2-wire			M9BAV*1	M9BA*1	●	●	●	○	—		
Reed auto switch	—	Grommet	No	3-wire (NPN equivalent)	24 V	—	A96V	A96	●	—	—	—	—	○	—
				12 V			A93V*2	A93	●	●	●	—	—	—	
				5 V, 12 V			A90V	A90	●	—	●	—	—	—	—

\*1 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.

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
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 970.

\* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

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

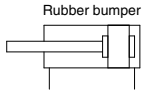
## Specifications



Bore size (mm)	125	140	160	180	200
<b>Action</b>	Double acting, Single rod				
<b>Fluid</b>	Air				
<b>Proof pressure</b>	1.5 MPa			1.05 MPa	
<b>Maximum operating pressure</b>	1.0 MPa			0.7 MPa	
<b>Minimum operating pressure</b>	0.05 MPa				
<b>Ambient and fluid temperature</b>	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)				
<b>Lubrication</b>	Not required (Non-lube)				
<b>Piston speed</b>	50 to 500 mm/s			20 to 400 mm/s	
<b>Allowable kinetic energy (J)</b>	7.4	9.8	12.4		
<b>Stroke length tolerance</b>	+1.4 mm (Note) 0				

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

### Symbol



**Made to Order: Individual Specifications**  
(For details, refer to page 975.)

Symbol	Specifications
-X271	Fluororubber seals, ø125 to ø160 only

### Made to Order

[Click here for details](#)

Symbol	Specifications
-XA□	Change of rod end shape
-XB10	Intermediate stroke (Exclusive body type)
-XC85	Grease for food processing equipment

## 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. 844)	Suffix "-XB10" to the end of standard model number. (P. 844)
Description	Strokes in 5 mm increments are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm increments are available by using an exclusive body with the specified stroke.
Stroke range	5 to 295	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 964 to 970 for the specifications of cylinders with autoswitches.

- 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.

**CUJ**

**CU**

**CQS**

**JCQ**

**CQ2**

**RQ**

**CQM**

**CQU**

**MU**

**D-□**

**-X□**

Technical  
Data

# CQ2 Series

## 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)												(kg)	
	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)												(kg)	
	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

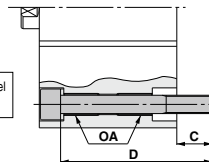
## Mounting Bolt for CQ2B

Mounting method: Mounting bolt for through-hole mounting of the C(D)Q2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M12 x 100L 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.

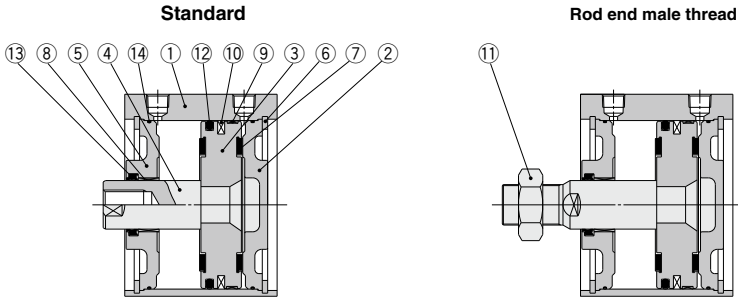
Material: Chromium molybdenum steel  
 Surface treatment: Zinc chromated



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

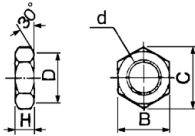
No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Head cover	Carbon steel	Nickel plated
3	Piston	Aluminum alloy	
4	Piston rod	Carbon steel	Hard chrome plated
5	Rod cover	Carbon steel	Nickel plated
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper	Urethane	
8	Bushing	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.

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

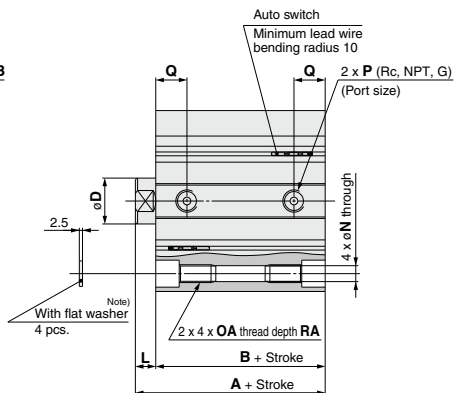
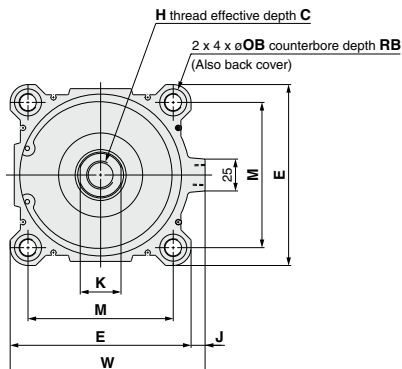
# CQ2 Series

## Dimensions

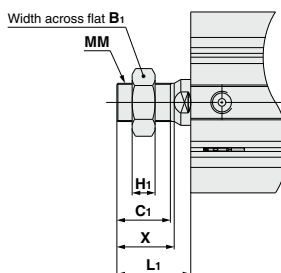
### Ø125 to Ø160

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 <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	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.

