

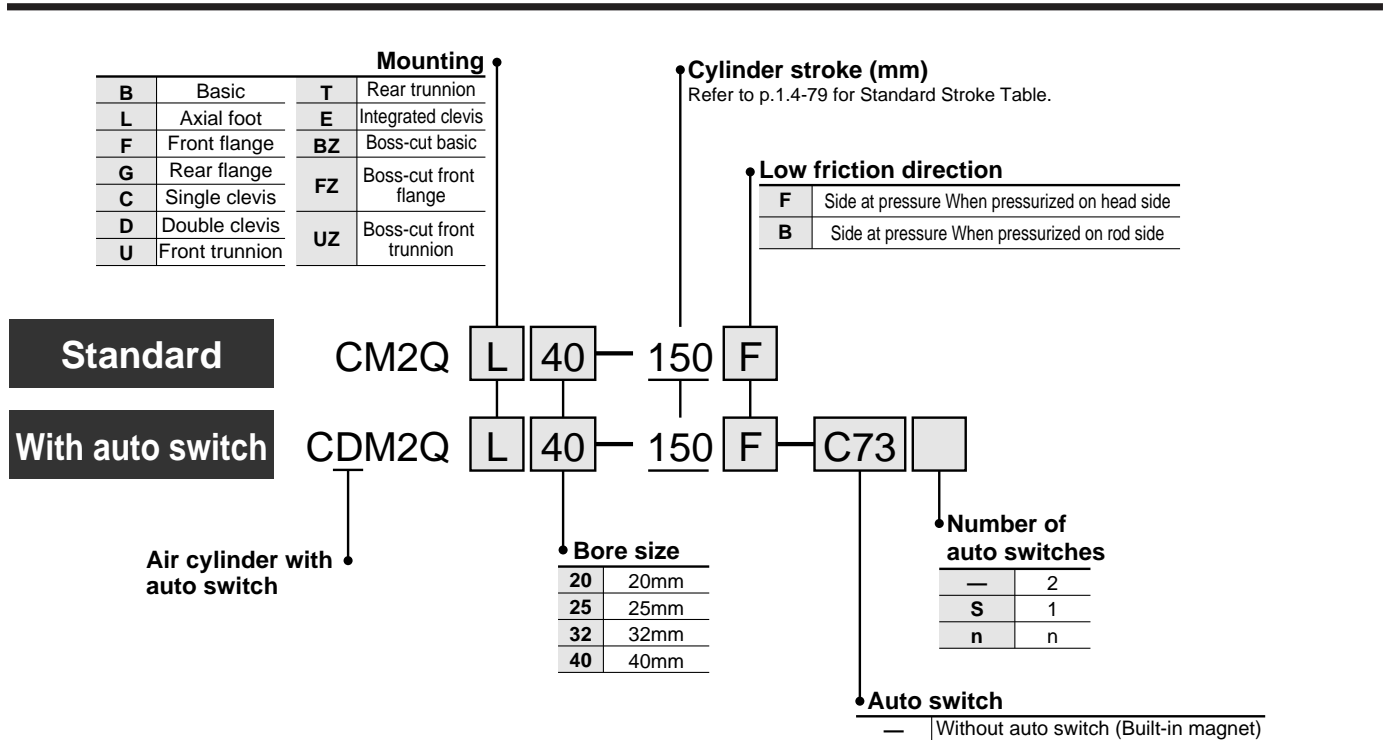
# Low Friction: Double Acting Single Rod

# Series CM2Q



ø20, ø25, ø32, ø40

## How to Order



- CJ1
- CJP
- CJ2
- CM2**
- C85
- CG1
- MB
- C95
- CA1
- CS1

**Auto switch**  
 — Without auto switch (Built-in magnet)  
 \* Refer to the left table for selecting applicable auto switches.

### Applicable Auto Switches/Refer to p.5.3-2 for further information on auto switches.

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch model	Lead wire* (m)				Applicable load			
					DC	AC		0.5 (—)	3 (L)	5 (Z)	None (N)				
Reed switch	—	Grommet	Yes	3 wire (NPN)	24V	—	5V	—	<b>C76</b>	●	●	—	—	IC	
						12V	100V	<b>C73</b>	●	●	●	—	—	Relay PLC	
						5V, 12V	100V or less	<b>C80</b>	●	●	—	—	—	IC	
						12V	—	<b>B53</b>	●	●	●	—	—	PLC	
						12V	100V, 200V	<b>B54</b>	●	●	●	—	—	—	
						12V	200V or less	<b>B64</b>	●	●	—	—	—	Relay PLC	
						12V	—	<b>C73C</b>	●	●	●	●	—	—	
						5V, 12V	24V or less	<b>C80C</b>	●	●	●	●	—	IC	
						12V	—	<b>A33A</b>	—	—	—	●	—	—	PLC
						12V	100V, 200V	<b>A34A</b>	—	—	—	●	—	—	Relay PLC
—	—	<b>A44A</b>	—	—	—	●	—	—	—						
—	—	<b>B59W</b>	●	●	—	—	—	—	—						
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	<b>H7A1</b>	●	●	○	—	—	IC	
						5V, 12V	100V or less	<b>H7A2</b>	●	●	○	—	—	—	
						12V	—	<b>H7B</b>	●	●	○	—	—	—	
						5V, 12V	—	<b>H7C</b>	●	●	●	—	—	—	
						12V	—	<b>G39A</b>	—	—	—	●	—	—	IC
						5V, 12V	—	<b>K39A</b>	—	—	—	●	—	—	—
						5V, 12V	—	<b>H7NW</b>	●	●	○	—	—	—	Relay PLC
						5V, 12V	—	<b>H7PW</b>	●	●	○	—	—	—	IC
						12V	—	<b>H7BW</b>	●	●	○	—	—	—	—
						5V, 12V	—	<b>H7BA</b>	—	●	○	—	—	—	—
						5V, 12V	—	<b>G5NT</b>	—	●	○	—	—	—	—
						5V, 12V	—	<b>H7NF</b>	●	●	○	—	—	—	IC
						—	—	<b>H7LF</b>	●	●	○	—	—	—	—

\* Lead wire length  
 0.5m : —  
 3m : L  
 5m : Z  
 None : N  
 e.g.) C80CZ, C80CN  
 \* Solid state switches marked with "○" are manufactured upon receipt of order.  
 \* Do not indicate symbol "N" for no lead wire on "D-A3□A", "A44A", "G39A" and "K39A" models.

# Series CM2Q

**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 pressures.**

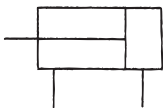
**Low sliding resistance  
Minimum operating pressure: 0.025MPa  
Stable sliding resistance**

The sliding resistance remains stable even when the operating pressure changes.



## JIS symbol

Double acting/Single rod

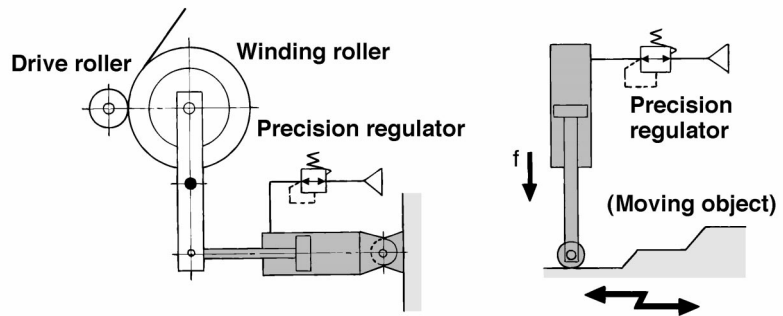


## Application Example

A low friction cylinder is used in combination with a precision regulator (Series IR, etc.).

① Even if the external diameter of the winding roller changes, the changes in the pressing force against the drive roller are kept low.

② Even if there is any change in the shape of the moving object, the changes in the  $f$  value of the cylinder's pressing force are kept low, resulting in a stable pressing force.



## Specifications

Bore size (mm)	20	25	32	40
Action	Double acting/Single rod			
Low friction direction	One direction			
Fluid	Air			
Proof pressure	1.05MPa			
Max. operating pressure	0.7MPa			
Min. operating pressure	0.025MPa			
Ambient and fluid temperature	Without auto switch: -10 to +70°C (No freezing) With auto switch: -10 to +60°C (No freezing)			
Allowable leakage	0.5 $\mu$ /min (ANR) or less			
Lubrication	Non-lube			
Thread tolerance	JIS class 2			
Stroke tolerance	+1.4 0			
Cushion	Rubber bumper			
Piping (Screw-in)	Rc(PT) $\frac{1}{8}$			Rc(PT) $\frac{1}{4}$

## Standard Stroke

Bore size (mm)	Standard stroke (mm)	Long stroke <sup>(2)</sup> (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300	400
25		450
32		450
40		500



Note 1) Any intermediate stroke that is not indicated above will be produced on order.

Note 2) The long stroke style is applicable to the axial foot style and the rod side flange style. If other mounting brackets are used or the application exceeds the long stroke limit, the maximum stroke that can be used is determined based on the stroke selection table in technical data.

Note 3) The longer the stroke, the greater the sliding resistance could become, due to the deflection of the piston rod. Therefore, consider installing a guide for such operation.

Note 4) Contact SMC for applications that exceed the stroke ranges shown above. (The maximum manufacturable stroke is 1000mm.)

## Minimum Strokes for Auto Switch Mounting

Refer to p.1.4-4 for minimum stroke table.

# Low Friction: Double Acting Single Rod *Series CM2Q*

## Mounting Accessories

Mounting	Accessories					
	Standard			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint	Pivot bracket
Basic	● (1 pc.)	●	—	●	●	—
Axial foot	● (2)	●	—	●	●	—
Front flange	● (1)	●	—	●	●	—
Rear flange	● (1)	●	—	●	●	—
Integrated clevis	— (1)	●	—	●	●	●
Single clevis	— (1)	●	—	●	●	—
Double clevis	— (1)	●	●	●	●	—
Front trunnion	● (1) (2)	●	—	●	●	—
Rear trunnion	● (1) (2)	●	—	●	●	—
Boss-cut basic	● (1)	●	—	●	●	—
Boss-cut flange	● (1)	●	—	●	●	—
Boss-cut trunnion	● (1)	●	—	●	●	—
Note					With pins	With pins



Note 1) Mounting nuts are not attached for the integrated clevis, the single clevis, and the double clevis styles.

Note 2) Trunnion nuts are attached for the front and rear trunnion styles.

## Weight

Bore size (mm)		(kg)			
		20	25	32	40
Basic weight	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
	Integrated clevis 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 weight by each 50 stroke		0.04	0.06	0.08	0.13
Accessory	Pivot bracket (with pins)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (with pins)	0.07	0.07	0.07	0.20

Calculation Example: CM2L32-100

- Basic weight: ..... 0.44 (Foot, ø32)
  - Additional weight: ... 0.08/50 stroke
  - Cylinder stroke: ..... 100 stroke
- 0.44 + 0.08 X 100/50 = 0.60kg

## Mounting Bracket Part No.

Bore size(mm)	20	25	32	40
Axial foot*	CM-L020B	CM-L032B	CM-L040B	
Flange	CM-F020B	CM-F032B	CM-F040B	
Single clevis	CM-C020B	CM-C032B	CM-C040B	
Double clevis (with pins)**	CM-D020B	CM-D032B	CM-D040B	
Trunnion (with nuts)	CM-T020B	CM-T032B	CM-T040B	

\* Two foot brackets and a mounting nut are attached.

\*\* Clevis pins and snap rings (cotter pins for bore size 40) are attached.

## Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7/C8 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5/B6 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



A set of following stainless steel mounting screws is attached.

(A switch mounting band is not attached. Please order the band separately.)

BBA4: D-C7/C8/H7

· "D-H7BAL" switch is set on the cylinder with the screws above when shipped.

When a switch only is shipped, "BBA4" screws are attached

CJ1

CJP

CJ2

CM2

C85

CG1

MB

C95

CA1

CS1

# Series CM2Q

## Boss-cut Style

Boss for the head cover bracket is eliminated and the total length of cylinder is shortened.



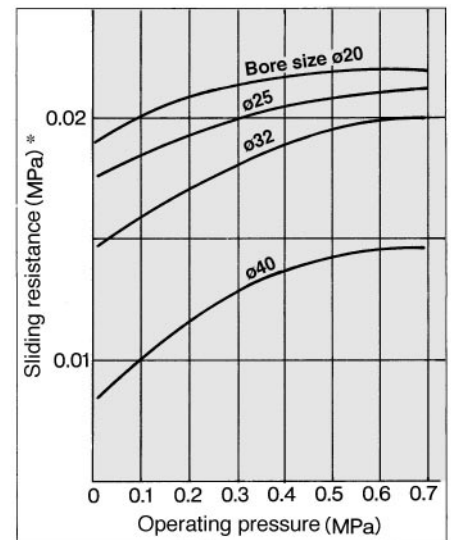
### Comparison of total cylinder length with standard style (mm)

ø20	ø25	ø32	ø40
▲13	▲13	▲13	▲16

### Mounting

- Boss-cut basic (BZ)
- Boss-cut flange (FZ)
- Boss-cut trunnion (UZ)

## Sliding Resistance of The Low Friction Side



\* Conversion into the cylinder operating pressure:

## Selecting The Low Friction Direction

To use the air cylinder as a balancer, pressurize it only from one of the ports as shown in the application example, and keep the other port open to the atmosphere.

To operate by applying pressure from the rod cover port:

Low friction direction B <Application example ①>

To operate by applying pressure from the head cover port:

Low friction direction F <Application example ②>

In either case, if the piston rod is moved by an external force, it will effect low friction operation both in the extending and retracting directions.



## Precautions

Be sure to read before handling. Refer to p.0-39 to p.0-43 for Safety Instructions and common precautions and refer to p.1.4-5 for those on CM2 series.

### Handling

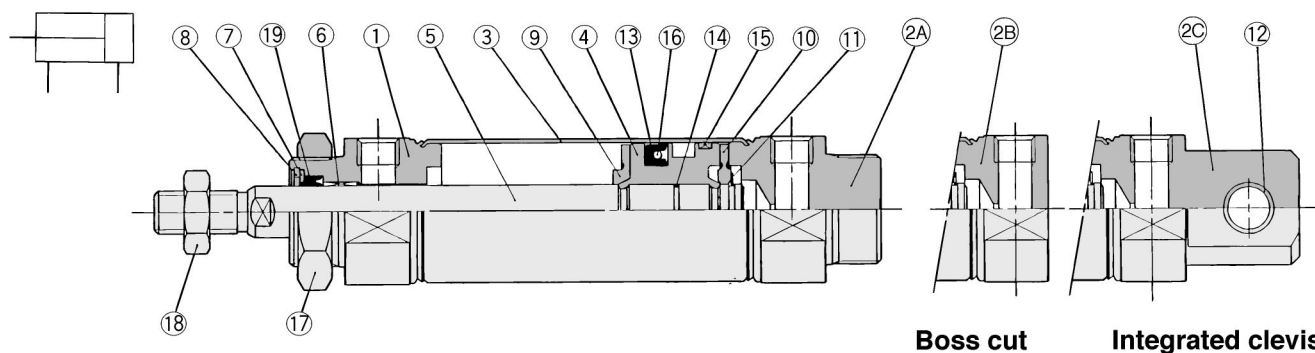


### Warning

- ① In the direction of low friction operation, speed control must be effected through the meter-in system. With meter-out control, the exhaust pressure will increase and create a greater sliding resistance.

# Low Friction: Double Acting Single Rod *Series CM2Q*

## Construction



### Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	White anodized
②A	Head cover A	Aluminum alloy	White anodized (Standard style)
②B	Head cover B	Aluminum alloy	White anodized (Boss-cut style)
②C	Head cover C	Aluminum alloy	White anodized (Integrated clevis style)
③	Cylinder tube	Stainless steel	
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Carbon steel	Hard chrome plated
⑥	Bushing	Oil impregnated sintered alloy	
⑦	Seal retainer	Rolled steel	Nickel plated
⑧	Snap ring	Carbon steel	Nickel plated
⑨	Bumper A	Urethane	
⑩	Bumper B	Urethane	

No.	Description	Material	Note
⑪	Snap ring	Stainless steel	
⑫	Bushing for clevis	Oil impregnated sintered alloy	
⑬	Piston seal	NBR	
⑭	Piston gasket	NBR	
⑮	Wearing	Resin	
⑯	Back up O ring	NBR	
⑰	Mounting nut	Carbon steel	Nickel plated
⑱	Rod end nut	Carbon steel	Nickel plated

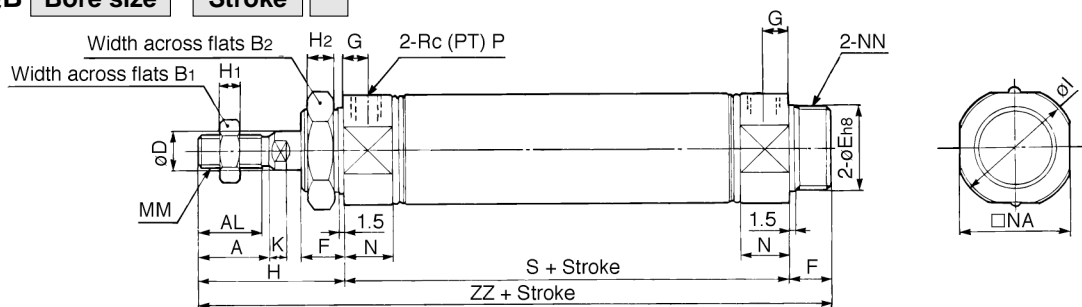
### Replacement Parts

No.	Description	Material	Bore size(mm)/Part No.			
			20	25	32	40
⑱	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

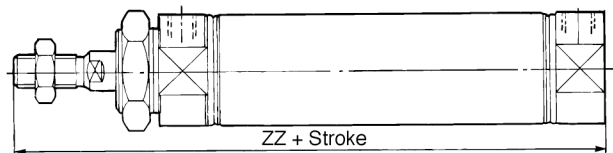
## Basic (B)



CM2QB



### Boss cut



Bore	Stroke range	A	AL	B1	B2	D	E	F	G	H	H1	H2	I	K	MM	N	NA	NN	P	S	ZZ
20	1 to 300	18	15.5	13	26	8	20 <sup>0</sup> <sub>-0.033</sub>	13	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	65	119
25	1 to 300	22	19.5	17	32	10	26 <sup>0</sup> <sub>-0.033</sub>	13	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	65	123
32	1 to 300	22	19.5	17	32	12	26 <sup>0</sup> <sub>-0.033</sub>	13	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	67	125
40	1 to 300	24	21	22	41	14	32 <sup>0</sup> <sub>-0.039</sub>	16	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	91	157

### Boss-cut

Bore	ZZ
20	106
25	110
32	112
40	141

### Dimensions for Other Mounting Brackets

Add 3mm to each "ZZ" dimension of the standard style (double acting/single rod) on p.1.4-10 to 1.4-18.

### Auto Switch Position

Add 3mm to each "A" dimension of the standard style (double acting/single rod) on p.1.4-21.



Low friction Basic  
 CM2QB20.....SCM220A, #1  
 CM2QB25.....SCM225A, #1  
 CM2QB32.....SCM232A, #1  
 CM2QB40.....SCM240A, #1

\* The data shows auto switch equipped types.  
 Please delete the unnecessary part.

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