

# Low Speed Cylinder

## *CJ2X/CUX/CQSX/CQ2X/CM2X*

ø10 to 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

RE<sub>B</sub><sup>A</sup>

10-3-6

REC

C□X

C□Y

### 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

10-3-8

MQ<sub>M</sub><sup>Q</sup>

RHC

MK(2)

RS<sub>G</sub><sup>Q</sup>

### 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

10-3-10

RS<sub>A</sub><sup>H</sup>

RZQ

MI<sub>S</sub><sup>W</sup>

CEP1

CE1

### 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

10-3-12

CE2

ML2B

C<sub>5</sub>-S

CV

### Compact Cylinder Series *CM2X*



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

10-3-14

MVGQ

CC

RB

J

D-

### Clean Series

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



### Air Cylinder Series *10-/11-CQ2X*



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



-X

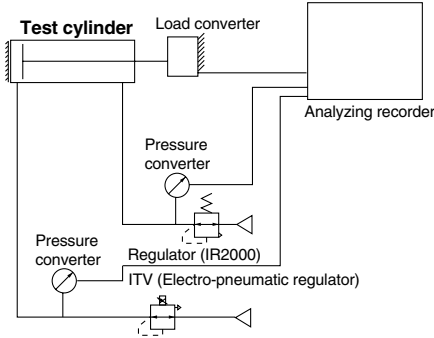
20-

Data

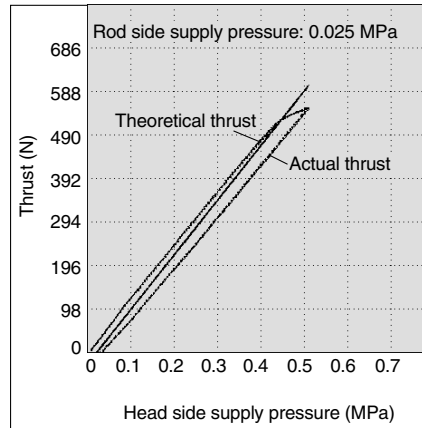
# Low Speed Cylinder

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

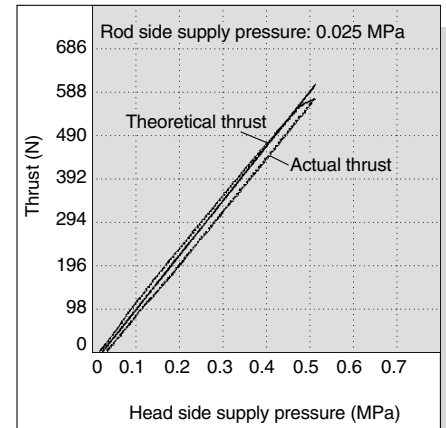
Measurement circuit of cylinder output relative to supply pressure



CQ2B40-75D (Standard)

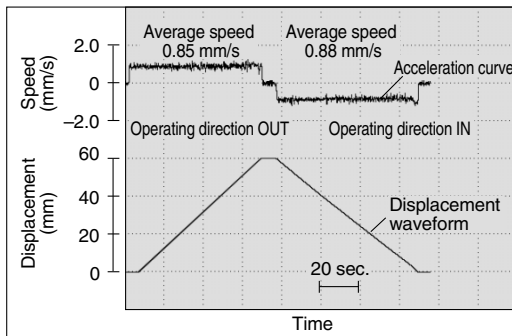


CQ2XB40-75D (Low speed cylinder)

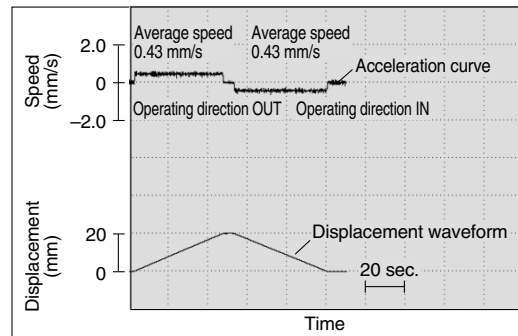


**Stable low speed operation even at 0.5 mm/s (1 mm/s for  $\phi 16$  or smaller) is achieved.**  
 Operates smoothly with minimal stick-slip.

CJ2XB10-60



CQSXB20-20D



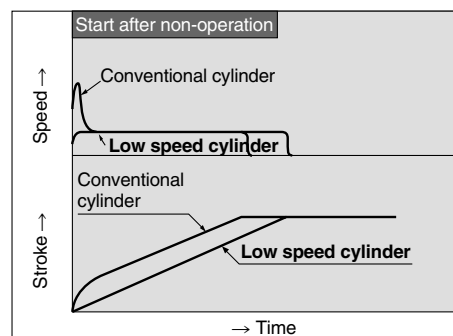
Note 1) Average speed is what the stroke is divided by piston rod's transit time.  
 Note 2) The OUT operating direction is considered to be positive with regard to speed.

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)

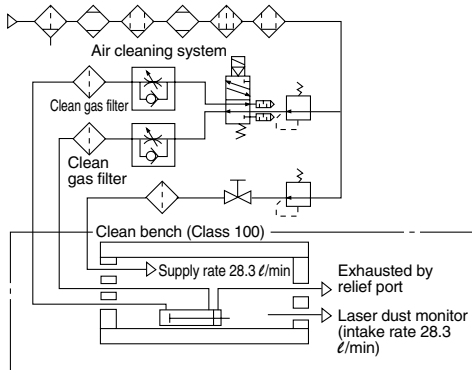
Particulate generation data for microspeed cylinder with clean room specifications are measured using the following test method.

## [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.

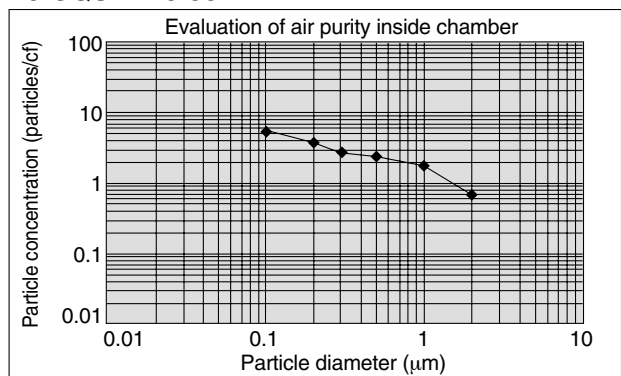
### Measuring Conditions

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

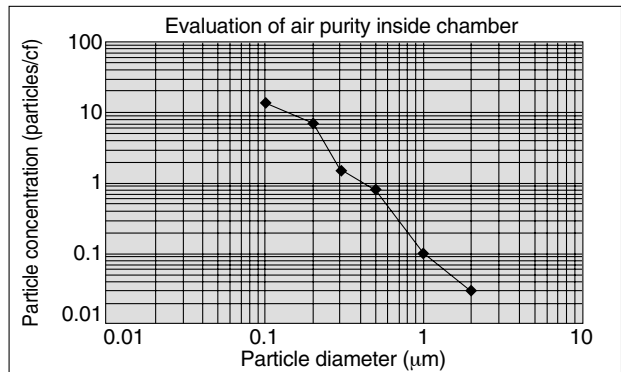


Particle generation measuring circuit

### 10-CQSXB20-50D



### 10-CM2XB20-50



RE<sub>B</sub><sup>A</sup>

REC

C□X

C□Y

MQ<sub>M</sub><sup>Q</sup>

RHC

MK(2)

RS<sub>G</sub><sup>Q</sup>

RS<sub>A</sub><sup>H</sup>

RZQ

MI<sub>S</sub><sup>W</sup>

CEP1

CE1

CE2

ML2B

C<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



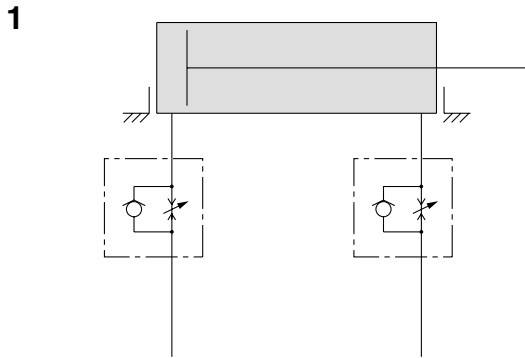
# Low Speed Cylinder Specific Product Precautions

Be sure to read before handling.

## Recommended Pneumatic Circuit

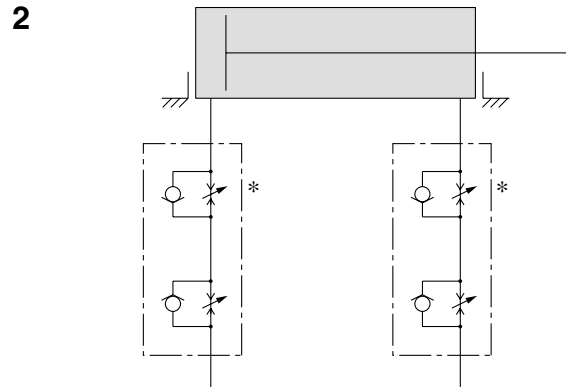
### Warning

#### Horizontal Operation



#### Meter-in speed controllers

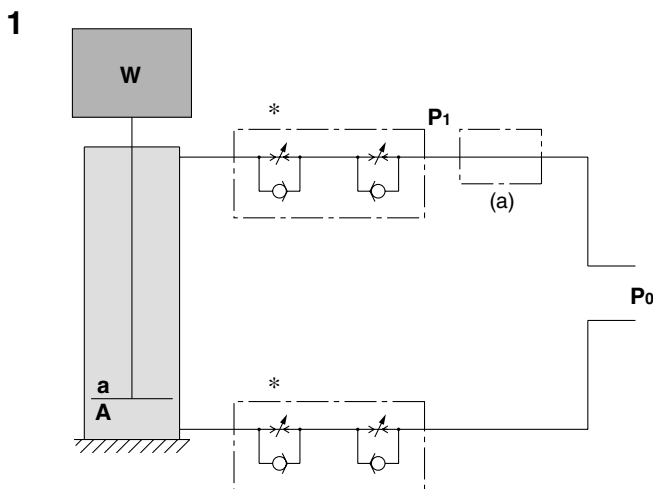
Meter-in speed controllers can reduce lurching while controlling the speed. The two knobs facilitate adjustment.



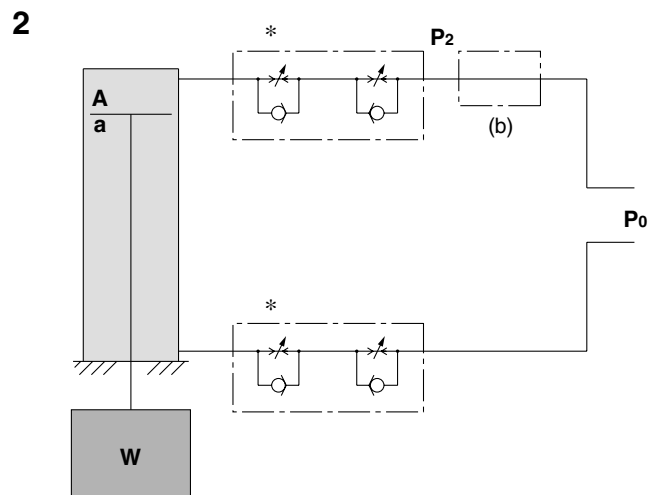
#### Dual speed controllers

Velocity 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.

#### Vertical Operation



- (1) The speed is controlled with meter-out control. When the meter-in controller is used in conjunction with the meter-out controller, lurching is reduced. (\*)
- (2) Depending on the size of the load, installing a regulator with check valve at position (a) can decrease lurching during descent, and operation delay during ascent.  
As a guide, when  
 $W + P_0a > P_0A$ ,  
adjust  $P_1$ , so that it could be  $W + P_1a = P_0A$ .



- (1) The speed is controlled with meter-out control. When the meter-in controller is used in conjunction with the meter-out controller, lurching is reduced. (\*)
- (2) Installing a regulator with check valve at position (b) can decrease lurching during descent, and actuation delay during ascent.  
As a guide,  
adjust  $P_2$ , so that it could be  $W + P_2A = P_0a$ .

W: Load (N) P<sub>0</sub>: Operating pressure (MPa) a: Piston area in the rod side (mm<sup>2</sup>) A: Piston area in the head side (mm<sup>2</sup>)

### 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.

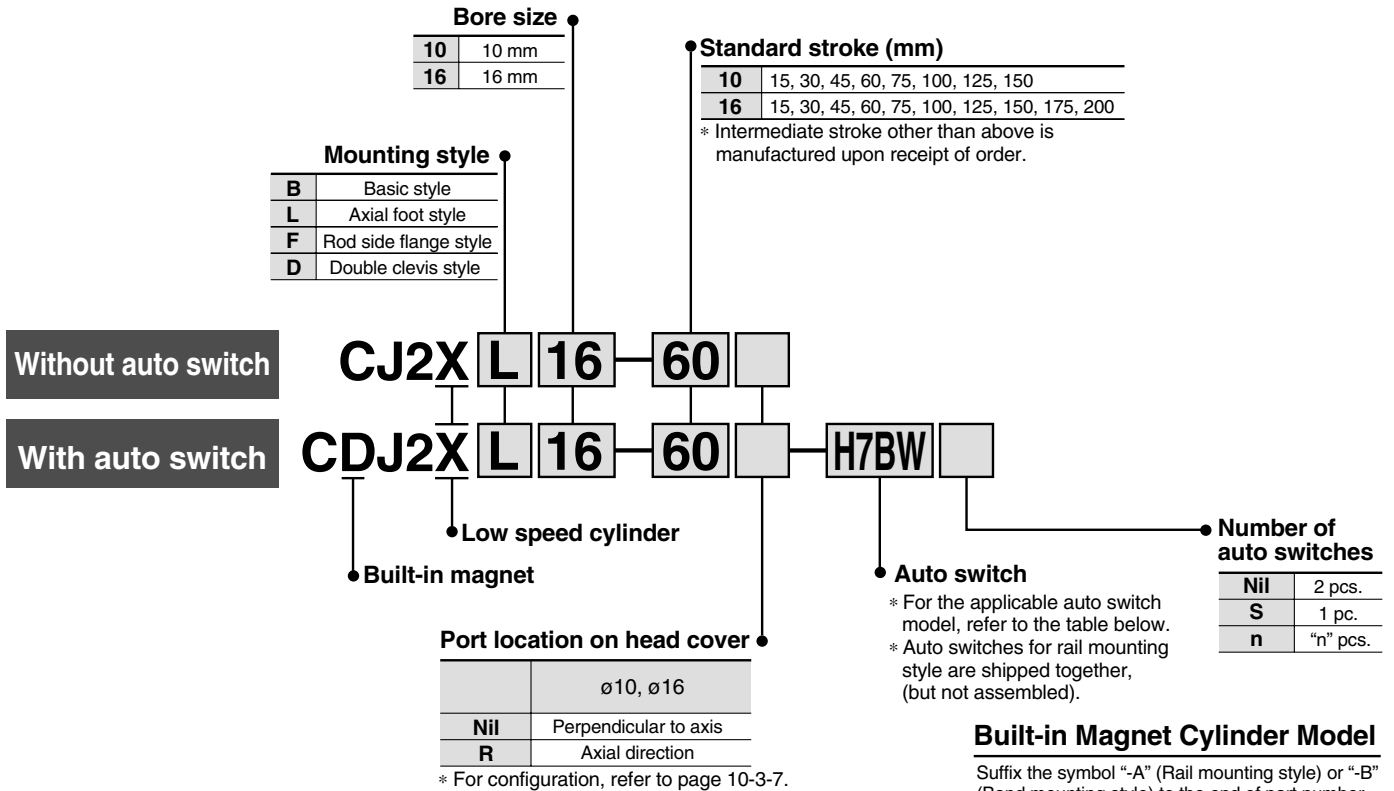
RE <sup>A</sup> <sub>B</sub>
REC
<b>C□X</b>
C□Y
MQ <sup>Q</sup> <sub>M</sub>
RHC
MK(2)
RS <sup>Q</sup> <sub>G</sub>
RS <sup>H</sup> <sub>A</sub>
RZQ
MI <sup>W</sup> <sub>S</sub>
CEP1
CE1
CE2
ML2B
C <sup>1</sup> / <sub>6</sub> 5-S
CV
MVGQ
CC
RB
J
D-
-X
20-
Data



The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CJ2, refer to Best Pneumatics Vol. 6.

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

## How to 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

### Applicable Auto Switch/Refer to page 10-20-1 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-wire connector	Applicable load			
					DC	AC	Band mounting	Rail mounting		0.5 (Nil)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC		
								Perpendicular	In-line									
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	—	A76H	●	●	—	—	—	IC circuit	—	
						—	200 V	—	A72	A72H	●	●	—	—	—			
		Connector		2-wire	24 V	12 V	100 V	C73	A73	A73H	●	●	●	—	—	—	—	Relay, PLC
						12 V	—	C73C	A73C	—	●	●	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	H7A1	F7NV	F79	●	●	○	—	○	IC circuit	—		
				3-wire (PNP)			H7A2	F7PV	F7P	●	●	○	—	○				
		Connector		2-wire	24 V	H7B	F7BV	J79	●	●	○	—	○	—	Relay, PLC			
						H7C	J79C	—	●	●	●	●	○			○		
		Grommet		3-wire (NPN)	5 V, 12 V	H7NW	F7NWW	F79W	●	●	○	—	○	IC circuit	—			
						3-wire (PNP)	H7PW	—	F7PW	●	●	○	—			○		
				2-wire	12 V	H7BW	F7BWV	J79W	●	●	○	—	○	—	—			
						4-wire (NPN)	H7NF	—	F79F	●	●	○	—			○		

\* Lead wire length symbols: 0.5 m ..... Nil (Example) C73C  
 3 m ..... L (Example) C73CL  
 5 m ..... Z (Example) C73CZ  
 None ..... N (Example) C73CN

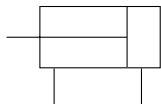
\* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

# Low Speed Cylinder Double Acting, Single Rod Series CJ2X



**JIS Symbol**  
Double acting,  
Single rod



## ⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

## Mounting

### ⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining nut 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 snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring). Especially with  $\phi 10$ , 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 Nℓ/min is the values at maximum in terms of its construction and there is internal leakage (ANR).

## Specifications

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)	
Thread tolerance	JIS Class 2	
Stroke length tolerance	+1.0 0	
Piston speed	1 to 300 mm/s	
Allowable kinetic energy	$\phi 10$	0.035 J
	$\phi 16$	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

## 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 snap 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).

## Auto Switch Mounting Bracket Part No. (Band mounting style)

Bore size (mm)	Auto switch mounting bracket part no.	Note
10	BJ2-010	Common for the types of D-C7/C8 and D-H7
16	BJ2-016	

RE<sub>B</sub><sup>A</sup>

REC

C□X

C□Y

MQ<sub>M</sub><sup>Q</sup>

RHC

MK(2)

RS<sub>G</sub><sup>Q</sup>

RS<sub>A</sub><sup>H</sup>

RZQ

MI<sub>S</sub><sup>W</sup>

CEP1

CE1

CE2

ML2B

C<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

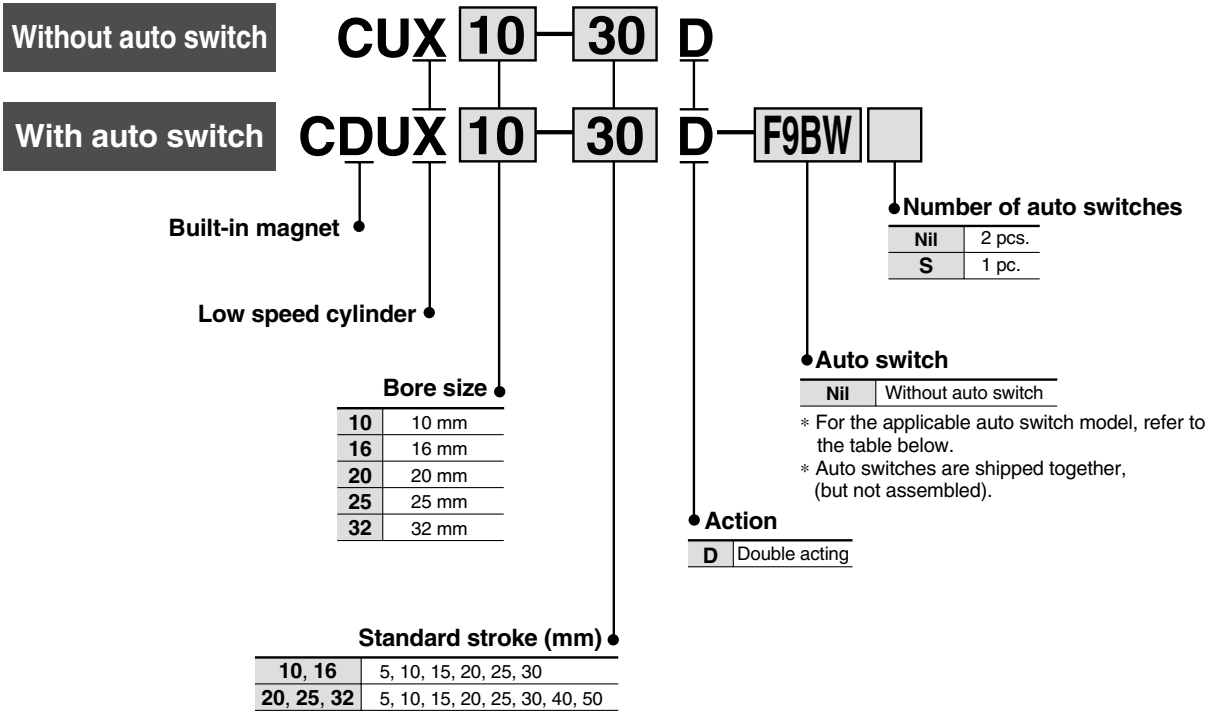
Data



The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CU, CDU, refer to Best Pneumatics Vol. 7.

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

## How to Order



### Applicable Auto Switch/Refer to page 10-20-1 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-wire connector	Applicable load	
					DC	AC	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)	IC circuit		Relay, PLC	
															5 V
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93V	A93	●	●	—	—	—	Relay, PLC
Solid state switch	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	○	○	IC circuit	Relay, PLC	
				3-wire (PNP)					24 V	12 V	●	●			○
				2-wire	5 V, 12 V		F9NVV	F9NW			●	●	○		○
				3-wire (NPN)					12 V	F9PWV	F9PW	●	●		○
				3-wire (PNP)	5 V, 12 V		F9BWW	F9BW				●	●		○
				2-wire					12 V	—	—	—	—		—

\* Lead wire length symbols: 0.5 m..... Nil (Example) A93  
3 m..... L (Example) A93L  
5 m..... Z (Example) F9NWZ

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

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 7 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

# Low Speed Cylinder Double Acting, Single Rod Series CUX

## Specifications



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
Thread tolerance	JIS Class 2
Stroke length tolerance	+1.0 (Note) 0
Mounting	Basic style

Note) Tolerance  $^{+1.0}_0$

## Minimum Operating Pressure

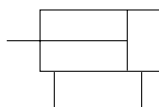
Bore size (mm)	10	16	20	25	32
Min. operating pressure (MPa)	0.06	0.06	0.05	0.05	0.05

## 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

### JIS Symbol

Double acting,  
Single rod



## ⚠ Precautions

**Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.**

### 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 Series CUX10, up to 0.1 Nl/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  
GR-L-005 (5 g)  
GR-L-010 (10 g)  
GR-L-150 (150 g)

RE<sup>A</sup><sub>B</sub>

REC

C□X

C□Y

MQ<sup>Q</sup><sub>M</sub>

RHC

MK(2)

RS<sup>Q</sup><sub>G</sub>

RS<sup>H</sup><sub>A</sub>

RZQ

MI<sup>W</sup><sub>S</sub>

CEP1

CE1

CE2

ML2B

C<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



# Low Speed Cylinder Double Acting, Single Rod Series CQSX

ø12, ø16, ø20, ø25

## How to Order

**Without auto switch** CQSX **B** **20** **30** **D**  

**With auto switch** CDQSX **B** **20** **30** **D**   **F9BW**  

**Built-in magnet** (points to CDQSX)

**Low speed cylinder** (points to CQSX)

**Mounting style** (points to B)

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

**Bore size** (points to 20)

<b>12</b>	12 mm
<b>16</b>	16 mm
<b>20</b>	20 mm
<b>25</b>	25 mm

**Standard stroke** (points to 30)

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

• Manufacturing of intermediate stroke cylinders 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**

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

**Auto switch** (points to F9BW)

**Nil** Without auto switch (Built-in magnet)

\* For the applicable auto switch model, refer to the table below.  
\* Auto switches are shipped together, (but not assembled).

**Cushion/Rod end thread**

<b>Nil</b>	Standard (Rod end female thread)
<b>C</b>	With rubber bumper
<b>M</b>	Rod end male thread

\* Combination above is possible.

**Action**

<b>D</b>	Double acting
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### Applicable Auto Switch/Refer to page 10-20-1 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-wire connector	Applicable load	
					DC	AC		Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)			
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	<b>A96V</b>	<b>A96</b>	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	<b>A93V</b>	<b>A93</b>	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NV</b>	<b>M9N</b>	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	○	○		
				2-wire	5 V, 12 V	<b>M9BV</b>	<b>M9B</b>	●	●	○	○	—			
				3-wire (NPN)		<b>F9NWV</b>	<b>F9NW</b>	●	●	○	○	IC circuit			
				Diagnostic indication (2-color indication)	3-wire (PNP)	12 V	<b>F9PWV</b>	<b>F9PW</b>	●	●	○	○	—		
					2-wire		<b>F9BWV</b>	<b>F9BW</b>	●	●	○	○	—		

\* Lead wire length symbols: 0.5 m ..... Nil (Example) A93  
3 m ..... L (Example) Y93BL  
5 m ..... Z (Example) F9NWZ

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

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 7 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

# Low Speed Cylinder Double Acting, Single Rod Series CQSX

## Specifications



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
Rod end thread tolerance	JIS Class 2
Stroke length tolerance	Standard stroke $^{+1.0}_0$
Mounting	Through-hole/Both ends tapped common
Piston speed	$\phi 12, \phi 16$ : 1 to 300 mm/s $\phi 20, \phi 25$ : 0.5 to 300 mm/s

## Minimum Stroke for Auto Switch Mounting

No. of auto switches mounted	(mm)			
	D-A9□, D-F9□WV	D-A9□V	D-M9□, D-F9□W	D-M9□V
2 pcs.	10	10	15 <sup>Note)</sup>	5
1 pc.	10 <sup>Note)</sup>	5	15 <sup>Note)</sup>	5

Note) Please consult with SMC for shorter stroke length than indicated in the table.

## Minimum Operating Pressure

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

## 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. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.**

### Snap Ring Installation/Removal

#### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C snap ring).
- Even if a proper plier (tool for installing type C snap ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier (tool for installing a type C snap ring). Be much careful with the popping of a snap ring. Besides, be certain that a snap 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.

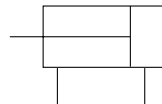
##### 2. Grease pack

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

Grease pack  
GR-L-005 (5 g)  
GR-L-010 (10 g)  
GR-L-150 (150 g)

### JIS Symbol

Double acting,  
Single rod



## Mounting Bracket Part No.

Bore size (mm)	Foot <sup>(1)</sup>	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 snap ring for shaft, Body mounting bolts

RE<sub>A</sub>  
B

REC

C□X

C□Y

MQ<sup>Q</sup><sub>M</sub>

RHC

MK(2)

RS<sup>Q</sup><sub>G</sub>

RS<sup>H</sup><sub>A</sub>

RZQ

MI<sup>W</sup><sub>S</sub>

CEP1

CE1

CE2

ML2B

C<sup>1</sup>/<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



# Low Speed Cylinder

## Double Acting, Single Rod

# Series CQ2X

ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

**Without auto switch**

**CQ2X B 40 30 D**

**With auto switch**

**CDQ2X B 40 30 D F9BW**

**Built-in magnet** →

**Low speed cylinder** →

**Mounting style** →

**Bore size** →

**Action** →

**Standard stroke** →

**Auto switch** →

**Cushion/Rod end thread** →

**Number of auto switches** →

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

Bore size	
<b>32</b>	32 mm
<b>40</b>	40 mm
<b>50</b>	50 mm
<b>63</b>	63 mm
<b>80</b>	80 mm
<b>100</b>	100 mm

Action	
<b>D</b>	Double acting

Auto switch	
<b>Nil</b>	Without auto switch (Built-in magnet)
<b>S</b>	Without auto switch (Built-in magnet)
<b>n</b>	"n" pcs.

Cushion/Rod end thread	
<b>Nil</b>	Standard (Rod end female thread)
<b>C</b>	With rubber bumper
<b>M</b>	Rod end male thread

Number of auto switches	
<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

\* For the applicable auto switch model, refer to the table below.  
\* Auto switches are shipped together, (but not assembled).  
\* Combination above is possible.

Refer to "Standard Stroke" on page 10-3-13.

### Applicable Auto Switch

Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Rail mounting style		Direct mounting style		Lead wire length (m)*				Pre-wire connector	Applicable load			
					DC	AC	ø32 to ø100		ø32 to ø100		0.5 (Nil)	3 (L)	5 (Z)	None (N)					
							Perpendicular	In-line	Perpendicular	In-line									
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A76H	A96V	A96	●	●	—	—	—	—	IC circuit	—	
				—	—	200 V	A72	A72H	—	—	●	●	—	—	—	—	—	—	
		Connector		2-wire	24 V	12 V	100 V	—	—	A93V	A93	●	●	—	—	—	—	—	—
		Diagnostic indication (2-color indication)						—	—	A73C	—	—	—	—	●	●	●	●	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F7NV	F79	M9NV	M9N	●	●	○	—	○	—	IC circuit	
				3-wire (PNP)				F7PV	F7P	M9PV	M9P	●	●	○	—	○	—	—	—
		2-wire		F7BV				J79	M9BV	M9B	●	●	○	—	○	—	—	—	
		—		J79C				—	—	—	●	●	●	●	—	—	—	—	
		Grommet		3-wire (NPN)	F7NWV	F79W	F9NWV	F9NW	●	●	○	—	○	—	○	—	—	—	—
				3-wire (PNP)	—	F7PW	F9PWV	F9PW	●	●	○	—	○	—	○	—	—	—	
		Grommet		2-wire	F7BWV	J79W	F9BWV	F9BW	●	●	○	—	○	—	○	—	—	—	—
				With diagnostic output (2-color indication)	—	F79F	—	—	●	●	○	—	○	—	○	—	—	—	—
4-wire (NPN)	—	5 V, 12 V	—	—	●	●	○	—	○	—	○	—	—	—	—				

\* Lead wire length symbols: 0.5 m ..... Nil (Example) A73C  
 3 m ..... L (Example) A73CL  
 5 m ..... Z (Example) A73CZ  
 None ..... N (Example) A73CN

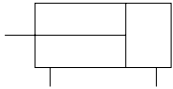
\* Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 7 for details.  
 • For details about auto switches with pre-wire connector, refer to page 10-20-66.

# Low Speed Cylinder Double Acting, Single Rod Series CQ2X



**JIS Symbol**  
Double acting,  
Single rod



## Specifications

Bore size (mm)		32	40	50	63	80	100
Model		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)					
Piping	Screw-in type	Note)					
		M5 x 0.8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
		Rc 1/8					
Rubber bumper		None					
Rod end thread		Female thread					
Rod end thread tolerance		JIS Class 2					
Stroke length tolerance		+1.0 0					
Mounting		Through-hole					
Piston speed		0.5 to 300 mm/s					

Note) Only 5 stroke comes with M5 x 0.8 in the case of no auto switch.

## 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. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.**

### Snap Ring Installation/Removal

#### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C snap ring).
- Even if a proper plier (tool for installing type C snap ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier (tool for installing a type C snap ring). Be much careful with the popping of a snap ring. Besides, be certain that a snap 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
32	CQ2X32-PS	Piston seal: 1 pc.
40	CQ2X40-PS	Rod seal: 1 pc.
50	CQ2X50-PS	
63	CQ2X63-PS	Gasket: 1 pc.
80	CQ2X80-PS	
100	CQ2X100-PS	Grease pack (10 g): 1 pc.

##### 2. Grease pack

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

Grease pack  
GR-L-005 (5 g)  
GR-L-010 (10 g)  
GR-L-150 (150 g)

## Mounting Bracket Part No.

Bore size (mm)	Foot <sup>(1)</sup>	Flange	Double clevis <sup>(3)</sup>
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 snap ring for shaft, Body mounting bolts

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

RE<sub>B</sub><sup>A</sup>

REC

C□X

C□Y

MQ<sub>M</sub><sup>Q</sup>

RHC

MK(2)

RS<sub>G</sub><sup>Q</sup>

RS<sub>A</sub><sup>H</sup>

RZQ

MI<sub>S</sub><sup>W</sup>

CEP1

CE1

CE2

ML2B

C<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CM2, refer to Best Pneumatics Vol. 6.

# Low Speed Cylinder Double Acting, Single Rod Series **CM2X** ø20, ø25, ø32, ø40

## How to Order

**Mounting style**

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

**Standard stroke**  
Refer to "Standard Stroke" on page 10-3-15.

**Without auto switch** **CM2X** **L** **40** **150**

**With auto switch** **CDM2X** **L** **40** **150** **H7BW** **□**

**Built-in magnet**

**Low speed cylinder**

**Bore size**

<b>20</b>	20 mm
<b>25</b>	25 mm
<b>32</b>	32 mm
<b>40</b>	40 mm

**Number of auto switches**

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

**Auto switch**

<b>Nil</b>	Without auto switch (Built-in magnet)
------------	---------------------------------------

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

### Applicable Auto Switch/Refer to page 10-20-1 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-wire connector	Applicable load			
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)					
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	<b>C76</b>	●	●	—	—	—	IC circuit	—	
				Connector	2-wire	24 V	12 V	100 V	—	<b>C73</b>	●	●	●	—	—	—
		100 V, 200 V						—	<b>B54</b>	●	●	●	—			
		—						—	<b>C73C</b>	●	●	●	●	—	PLC	
		100 V, 200 V						—	<b>A33A</b>	—	—	—	●	—		
		DIN terminal		—	—	—	—	—	—	<b>A34A</b>	—	—	—	●	—	Relay, PLC
<b>A44A</b>	—		—							—	●	—				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>B59W</b>	●	●	—	—	—	—		
				3-wire (PNP)				<b>H7A1</b>	●	●	○	—	○		IC circuit	
		Connector		2-wire				12 V	<b>H7A2</b>	●	●	○	—			○
									<b>H7B</b>	●	●	○	—		○	
		Terminal conduit		3-wire (NPN)				5 V, 12 V	—	<b>H7C</b>	●	●	●		●	—
										<b>G39A</b>	—	—	—		●	
		DIN terminal		2-wire				12 V	—	<b>K39A</b>	—	—	—		●	—
										<b>H7NW</b>	●	●	○		—	
		Grommet		3-wire (NPN)				5 V, 12 V	—	<b>H7PW</b>	●	●	○		—	—
										3-wire (PNP)	<b>H7BW</b>	●	●		○	
		Water resistant (2-color indication)		2-wire				12 V	—	<b>H7BA</b>	—	●	○		—	—
										<b>H7NF</b>	●	●	○		—	
With diagnostic output (2-color indication)	4-wire (NPN)	5 V, 12 V	—													

\* Lead wire length symbols: 0.5 m ..... Nil (Example) C73C  
 3 m ..... L (Example) C73CL  
 5 m ..... Z (Example) C73CZ  
 None ..... N (Example) C73CN

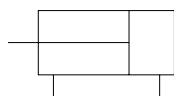
\* Solid state switches marked with "○" are produced upon receipt of order.  
 \* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

# Low Speed Cylinder Double Acting, Single Rod Series CM2X



**JIS Symbol**  
Double acting  
Single rod



## Standard Stroke

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

Note) Other intermediate strokes can be manufactured upon receipt of order.

## ⚠ Precautions

**Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.**

## 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 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

- 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  
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	
Piping	Screw-in type	ø20 to ø32: Rc 1/8, ø40: Rc 1/4
Lubrication	Not required (Non-lube)	
Thread tolerance	JIS Class 2	
Stroke length tolerance	+1.4 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.

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 pin) **	CM-D020B	CM-D032B	CM-D040B	
Trunnion (with nut)	CM-T020B	CM-T032B	CM-T040B	

\* When ordering foot bracket, order 2 pieces per cylinder.

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

## 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-G5	BA2-020	BA2-025	BA2-032	BA2-040
D-A3□A/A44A, D-G39A/K39A	BM3-020	BM3-025	BM3-032	BM3-040

## Mounting Style and Accessory

	Accessory	Standard equipment			Option		
		Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double <sup>(3)</sup> knuckle joint	Clevis bracket
Mounting							
Basic style	● (1 pc.)	●	—	●	●	—	
Axial foot style	● (2)	●	—	●	●	—	
Rod side flange style	● (1)	●	—	●	●	—	
Head side flange style	● (1)	●	—	●	●	—	
Clevis integrated style	— (1)	●	—	●	●	●	
Single clevis style	— (1)	●	—	●	●	—	
Double clevis style <sup>(3)</sup>	— (1)	●	●	●	●	—	
Rod side trunnion style	● (1) <sup>(2)</sup>	●	—	●	●	—	
Head side trunnion style	● (1) <sup>(2)</sup>	●	—	●	●	—	
Boss-cut basic style	● (1)	●	—	●	●	—	
Boss-cut flange style	● (1)	●	—	●	●	—	
Boss-cut trunnion style	● (1)	●	—	●	●	—	
Note					With pin	With pin	

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 snap ring are shipped together with double clevis and double knuckle joint. (ø40 is cotter pin.)

RE<sub>B</sub><sup>A</sup>

REC

C□X

C□Y

MQ<sub>M</sub><sup>Q</sup>

RHC

MK(2)

RS<sub>G</sub><sup>Q</sup>

RS<sub>A</sub><sup>H</sup>

RZQ

MI<sub>S</sub><sup>W</sup>

CEP1

CE1

CE2

ML2B

C<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

# 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

**Clean Series**

10	Relief type
11	Vacuum type



**10-C(D)QSX B 20-30 D [ ] F9BW [ ]**

- Built-in magnet**
- Low speed cylinder**
- Mounting style**

B	Through-hole/Both ends tapped common (Standard)
---	---
- Bore size**

12	12 mm
16	16 mm
20	20 mm
25	25 mm
- Cylinder stroke (mm)**

Bore size (mm)	Standard stroke (mm)
12, 16	5, 10, 15, 20, 25, 30
20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
25	30, 35, 40, 45, 50, 75, 100
- Number of auto switches**

Nil	2 pcs.
S	1 pc.
n	"n" pcs.
- Auto switch**

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------

\* For the applicable auto switch model, refer to page 10-3-10.  
\* Auto switches are shipped together, (but not assembled).
- Rod end thread**

Nil	Standard (Rod end female thread)
M	Rod end male thread
- Action**

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

● 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 10-CQSXB25-50D to make 10-CQSXB25-47D.

### 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 (No freezing) With auto switch: -10 to 60°C (No freezing)			
Piston speed	1 to 200 mm/s			
Piston rod size	6	8	10	12
Rod end thread	Female thread: M3 x 0.5 Male thread: M5 x 0.8	M4 x 0.7 M6 x 1.0	M5 x 0.8 M8 x 1.25	M6 x 1.0 M10 x 1.25
Rod end thread tolerance	JIS Class 2			
Stroke tolerance	+1.0 0 mm			
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 (No freezing) With auto switch: -10 to 60°C (No freezing)			
Piston speed	1 to 200 mm/s		0.5 to 200 mm/s	
Piston rod size	6	8	10	12
Rod end thread	Female thread: M3 x 0.5 Male thread: M5 x 0.8	M4 x 0.7 M6 x 1.0	M5 x 0.8 M8 x 1.25	M6 x 1.0 M10 x 1.25
Rod end thread tolerance	JIS Class 2			
Stroke tolerance	+1.0 0 mm			
Port size	M5 x 0.8			
Vacuum port, Relief port	M5 x 0.8			

### Series 10-, 11-CQ2X

#### How to Order

**Clean Series**

10	Relief type
11	Vacuum type



**10-C(D)Q2XB 40-30 D [ ] J79W [ ]**

- Built-in magnet**
- Low speed cylinder**
- Bore size**

32	32 mm
40	40 mm
50	50 mm
63	63 mm
- Cylinder stroke (mm)**

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
- Number of auto switches**

Nil	2 pcs.
S	1 pc.
n	"n" pcs.
- Auto switch**

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------

\* For the applicable auto switch model, refer to page 10-3-12.  
\* Auto switches are shipped together, (but not assembled).
- Rod end thread**

Nil	Standard (Rod end female thread)
M	Rod end male thread
- Action**

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

● 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 (No freezing) With auto switch: -10 to 60°C (No freezing)							
Piston speed	1 to 200 mm/s				0.5 to 200 mm/s			
Piston rod size	16		20		16		20	
Rod end thread	Female thread: M8 x 1.25 Male thread: M14 x 1.5	M10 x 1.5 M18 x 1.5	M8 x 1.25 M14 x 1.5	M10 x 1.5 M18 x 1.5	M8 x 1.25 M14 x 1.5	M10 x 1.5 M18 x 1.5	M8 x 1.25 M10 x 1.5	M10 x 1.5 M18 x 1.5
Rod end thread tolerance	JIS Class 2							
Stroke tolerance	+1.0 0 mm							
Port size	M5 x 0.8, RC 1/8 (Note)		Rc1/4		M5 x 0.8, RC 1/8 (Note)		Rc1/4	
Vacuum port, Relief port	M5 x 0.8							

Note) Only 5 stroke comes with M5 x 0.8 in the case of no auto switch on ø32.

# Microspeed Cylinder for Clean Room Series 10-, 11-CM2X

## Series 10-, 11-CM2X

### How to Order

Clean Series	
10	Relief type
11	Vacuum type

**10-C(D)M2X L 40-150-F9BW**

Built-in magnet

Low speed cylinder

Bore size

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

Cylinder stroke (mm)

Refer to "Standard Stroke" below.

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
BZ	Boss-cut basic style
FZ	Boss-cut rod style Flange style



Number of auto switches

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

Auto switch

Nil	Without auto switch (Built-in magnet)
-----	--

\* For the applicable auto switch model, refer to page 10-3-14.

### 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	
	32	
	40	

### 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 (No freezing) With auto switch: -10 to 60°C (No freezing)							
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	M14 x 1.5	M14 x 1.5
Rod end thread tolerance	JIS Class 2							
Stroke tolerance	+1.4 0 mm							
Port size	Rc 1/8			Rc 1/4	Rc 1/8			Rc 1/4
Vacuum port, Relief port	M5 x 0.8							

## ⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

### 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 numbers to order.  
GR-X-005 (5 g)

RE<sup>A</sup><sub>B</sub>

REC

C□X

C□Y

MQ<sup>Q</sup><sub>M</sub>

RHC

MK(2)

RS<sup>Q</sup><sub>G</sub>

RS<sup>H</sup><sub>A</sub>

RZQ

MI<sup>W</sup><sub>S</sub>

CEP1

CE1

CE2

ML2B

C<sup>1</sup>/<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

# Made to Order Specifications:

## -XB13: Low Speed Cylinder

5 to 50 mm/s (CY1: 7 to 50 mm/s)



Symbol

Low Speed Cylinder										-XB13			
CJ2	Standard model no.				—XB13		CY1	Standard model no.				—XB13	
CM2	Mounting style	Bore size	Stroke		—XB13		MGP <sup>M</sup> <sub>L</sub>	Standard model no.				—XB13	
CG1	Standard model no.				—XB13		MGGM	Standard model no.				—XB13	
MB	Standard model no.				—XB13		MGCM	Standard model no.				—XB13	
CU	Standard model no.				—XB13		CX2	Standard model no.				—XB13	
CQ2	Standard model no.				—XB13		CXW <sup>M</sup> <sub>L</sub>	Standard model no.				—XB13	
CQS	Standard model no.				—XB13		CXS <sup>M</sup> <sub>L</sub>	Standard model no.				—XB13	
					Low speed cylinder ●		MXU	Standard model no.				—XB13	
							CXT <sup>M</sup> <sub>L</sub>	Standard model no.				—XB13	
												Low speed cylinder ●	

Note) Operate without lubrication from a pneumatic system lubricator.

### Specifications

Applicable cylinder	Air cylinder/Standard					Free mount cylinder	Compact cylinder	Compact cylinder	Magnetically coupled rodless cylinder	Compact guide cylinder	Guide cylinder		Slide unit	Dual rod cylinder	Compact slide	Platform cylinder
	Series	CJ2	CM2	CG1	MB						CU	CQ2				
Action	Double acting, Single rod						Double acting									
Bore size (mm)	6, 10 16	20, 25 32, 45	20, 25 32, 40 50, 63	32, 40 50, 63 80, 100	6, 10 16, 20 25, 32	12, 16, 20 25, 32, 40 50, 63, 80 100	12, 16 20, 25	CY1B: 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	10, 15 25	10, 16, 20 25, 32	6, 10 15, 20 25, 32	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 on both ends	No rubber bumper	No rubber bumper	Rubber bumper on both ends	Rubber bumper (Basic cylinder)	Shock absorber (CX2: Option)		Rubber bumper					
Auto switch	Mountable															
Mounting	Basic Foot Flange Double clevis	Basic Foot Flange Trunnion Clevis	Basic Foot Flange Clevis Trunnion	Basic	Basic Foot Flange Double clevis	Basic Foot Flange Double clevis	Basic Slider	Basic	Basic Front mounting Flange	Basic						
Dimensions	Dimensions and specifications are the same as standard products of double acting. Refer to Best Pneumatics Vol. 6, 7 and 8.															
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 <sup>2</sup> )	0.1	0.2		0.6		
Free flow	Flow rate (ℓ/min (ANR))	100	180	230	260	390	460
	Effective area (mm <sup>2</sup> )	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 <sup>2</sup> )	0.1	0.2		0.6	
Free flow	Flow rate (ℓ/min (ANR))	100	130	230	290	460
	Effective area (mm <sup>2</sup> )	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 Tube side	M5 x 0.8	10-32 UNF		R 1/8	NPT 1/8		R 1/4
					Rc 1/8			Rc 1/4
Controlled flow	Air flow (ℓ/min (ANR))	7		12		38		
	Effective area (mm <sup>2</sup> )	0.1		0.2		0.6		
Free flow	Flow rate (ℓ/min (ANR))	105		280		420		
	Effective area (mm <sup>2</sup> )	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	Air flow (ℓ/min (ANR))	7	12	38	
	Effective area (mm <sup>2</sup> )	0.1	0.2	0.6	
Free flow	Air flow (ℓ/min (ANR))	75	175	295	350
	Effective area (mm <sup>2</sup> )	1.1	2.7	4.5	5.3

Note) Supply pressure: 0.5 MPa, Temperature: 20°C

RE<sup>A</sup><sub>B</sub>

REC

C□X

C□Y

MQ<sup>Q</sup><sub>M</sub>

RHC

MK(2)

RS<sup>Q</sup><sub>G</sub>

RS<sup>H</sup><sub>A</sub>

RZQ

MI<sup>W</sup><sub>S</sub>

CEP1

CE1

CE2

ML2B

C<sup>1</sup>/<sub>5</sub>-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data