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 10-3-6

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

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

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

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

Clean Series

Compact Cylinder
Series 10-/11-CQSX

Air Cylinder
Series 10-/11-CQ2X

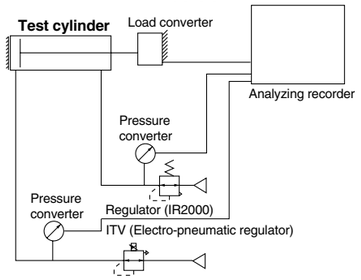
Air Cylinder
Series 10-/11-CM2X

Low Speed Cylinder

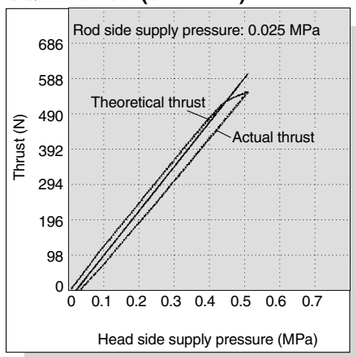
Improved low friction characteristics (CM2X, CQSX, CQ2X)

Minimum operating pressure is reduced in half (compared to previous version).
Stabilization of thrust has been realized.

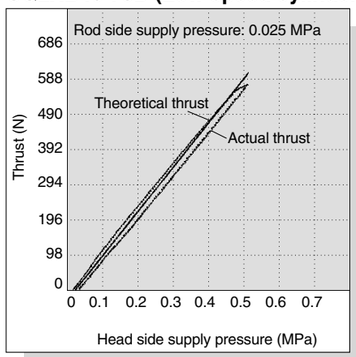
Measurement circuit of cylinder output relative to supply pressure



CQ2B40-75D (Standard)



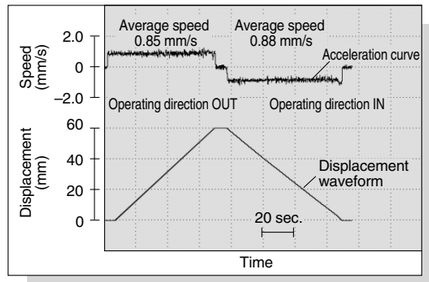
CQ2XB40-75D (Low speed cylinder)



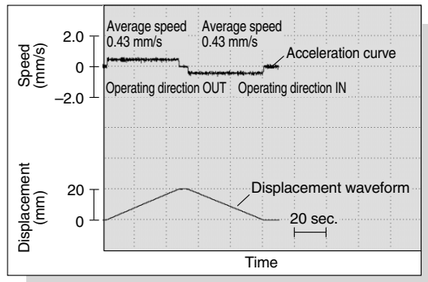
Stable low speed operation even at 0.5 mm/s (1 mm/s for ø16 or smaller) is achieved.

Operates smoothly with minimal stick-slip.

CJ2XB10-60



CQSXB20-20D

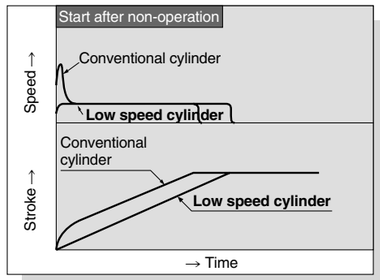


Note 1) Average speed is what the stroke is divided by piston rod's transit time.
Note 2) The OUT operating direction is considered to be positive with regard to speed.

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)

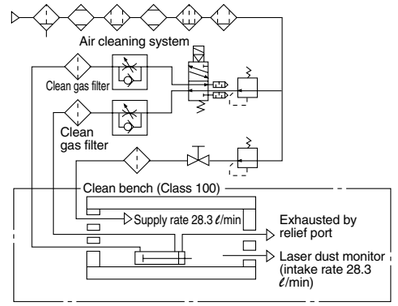
Particulate generation data for microspeed cylinder with clean room specifications are measured using the following test method.

[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.

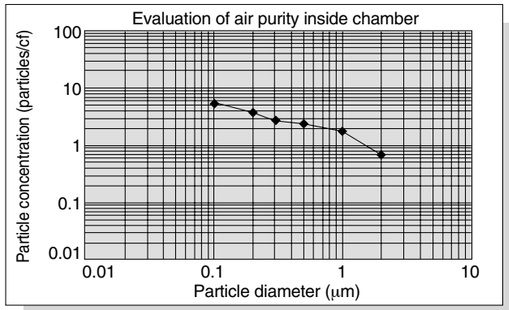
Measuring Conditions

Chamber volume	15 ℓ
Purity of air supplied to chamber	Same quality as supply air
Laser dust monitor	Hitachi Electoronics 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

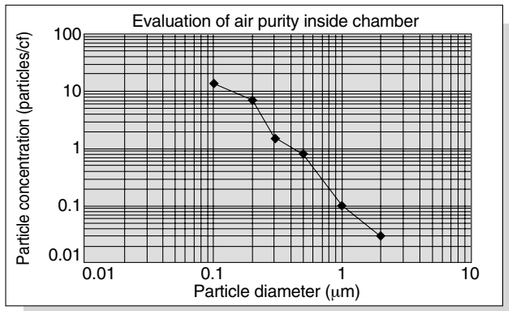


Particle generation measuring circuit

10-CQSXB20-50D



10-CM2XB20-50



Low Speed Cylinder
Specific Product Precautions

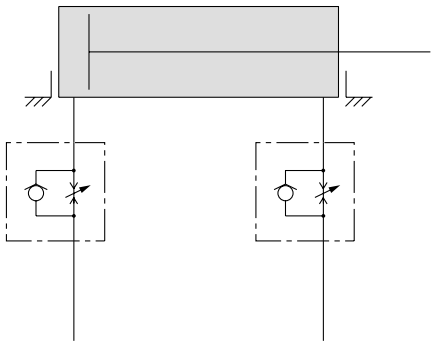
Be sure to read before handling.

Recommended Pneumatic Circuit

⚠ Warning

Horizontal Operation

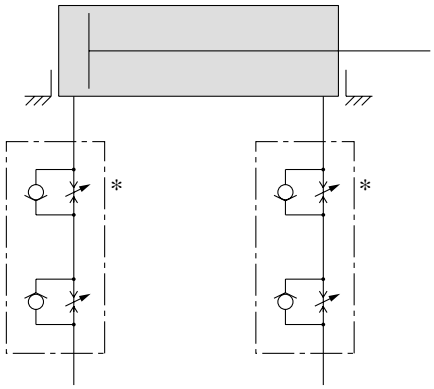
1



Meter-in speed controllers

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

2

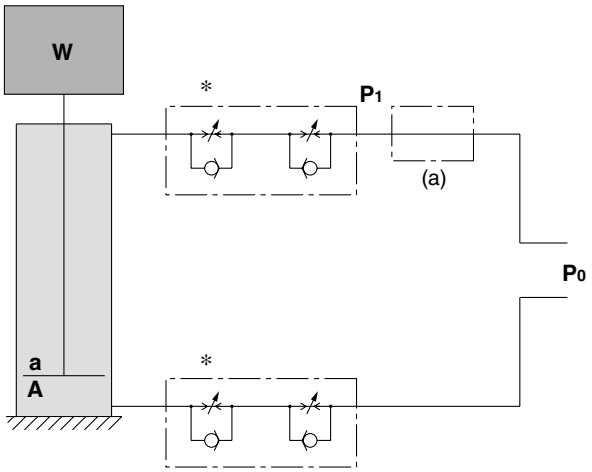


Dual speed controllers

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

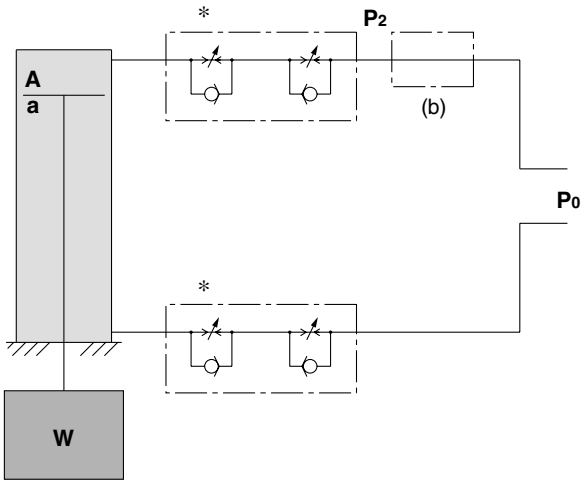
1



(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 pf 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 + **P0a** > **P0A**,
adjust **P1**, so that it could be **W** + **P1a** = **P0A**.

2



(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 **P2**, so that it could be **W** + **P2A** = **P0a**.

W: Load (N) **P0**: Operating pressure (MPa) **a**: Piston area in the rod side (mm^2) **A**: Piston area in the head side (mm^2)

⚠ 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.

CAD 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

Bore size

10	10 mm
16	16 mm

Standard stroke (mm)

10	15, 30, 45, 60, 75, 100, 125, 150
16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200

∗ Intermediate stroke other than above is manufactured upon receipt of order.

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
D	Double clevis style

Without auto switch CJ2X **L** **16** – **60** ☐

With auto switch CDJ2X **L** **16** – **60** ☐ – **H7BW** ☐

- CDJ2X: Built-in magnet
- **L**: Low speed cylinder
- ☐ (after 60): Port location on head cover
- **H7BW**: Auto switch
- ☐ (last): Number of auto switches

Port location on head cover

	ø10, ø16
Nil	Perpendicular to axis
R	Axial direction

∗ For configuration, refer to page 10-3-7.

Auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches for rail mounting style are shipped together, (but not assembled).

Number of auto switches

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

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.

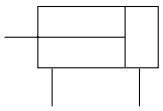
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model: Band mounting	Rail mounting: Perpendicular	Rail mounting: In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	—	A76H	●	●	—	—	—	IC circuit	—
				2-wire		–	200 V	—	A72	A72H	●	●	—	—	—	—	Relay, PLC
					24 V	12 V	100 V	C73	A73	A73H	●	●	●	—	—		
		Connector				12 V	—	C73C	A73C	—	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—		—	A79W	—	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	F7NV	F79	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				H7A2	F7PV	F7P	●	●	○	—	○		
				2-wire		12 V		H7B	F7BV	J79	●	●	○	—	○	—	
		Connector						H7C	J79C	—	●	●	●	●	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		H7NW	F7NWV	F79W	●	●	○	—	○	IC circuit	
				3-wire (PNP)				H7PW	—	F7PW	●	●	○	—	○		
				2-wire		12 V		H7BW	F7BWV	J79W	●	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		H7NF	—	F79F	●	●	○	—	○	IC circuit	

∗ 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.

JIS Symbol
Double acting,
Single rod



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	ø10	0.035 J
	ø16	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	

⚠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

1. During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining but 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.
2. 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

3. 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 ø10, use ultra thin pliers, such as Super Tool Corp., CSM-07A.
4. 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

1. It might not be able to control by meter-out at a low speed operation.

⚠Caution

1. For Series CJ2X, 0.1 Nℓ/min is the values at maximum in terms of its construction and there is internal leakage (ANR).

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

Without auto switch CUX 10 — 30 D

With auto switch CDUX 10 — 30 D — F9BW ☐

Built-in magnet

Low speed cylinder

Bore size

10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)

10, 16	5, 10, 15, 20, 25, 30
20, 25, 32	5, 10, 15, 20, 25, 30, 40, 50

Action

D	Double acting

Auto switch

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.

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 DC	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m)∗ 0.5 (Nil)	Lead wire length (m)∗ 3 (L)	Lead wire length (m)∗ 5 (Z)	Pre-wire connector	Applicable load	
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	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	–	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ 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.

Specifications

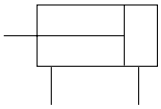
Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)
Lubrication	Not required (Non-lube)
Piston speed	ø10, ø16: 1 to 300 mm/s ø20 to ø32: 0.5 to 300 mm/s
Cushion	Rubber bumper on both ends
Rod end thread	Male thread
Thread tolerance	JIS Class 2
Stroke length tolerance	$^{+1.0}_{0}$ Note)
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

JIS Symbol
Double acting,
Single rod



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

⚠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

1. 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

1. It might not be able to control CUX10 by meter-out at a low speed operation.

⚠Caution

1. 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)

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

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

Low speed cylinder

Mounting style

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

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm

Standard stroke

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
25	

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

Action

D	Double acting

Cushion/Rod end thread

Nil	Standard (Rod end female thread)
C	With rubber bumper
M	Rod end male thread

∗ Combination above is possible.

Auto switch

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).

Number of auto switches

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

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 DC		Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
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	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ 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.

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	ø12, ø16: 1 to 300 mm/s ø20, ø25: 0.5 to 300 mm/s

Minimum Stroke for Auto Switch Mounting

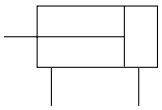
(mm)

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

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

JIS Symbol

Double acting,
Single rod



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	

Mounting Bracket Part No.

Bore size (mm)	Foot (1)	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

⚠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

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C snap ring).
2. 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)

The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CQ2, CDQ2, refer to Best Pneumatics Vol. 7.

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

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

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

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

Action

D	Double acting

Cushion/Rod end thread

Nil	Standard (Rod end female thread)
C	With rubber bumper
M	Rod end male thread

∗ Combination above is possible.

Auto switch

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).

Number of auto switches

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

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

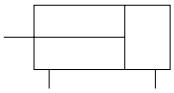
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Rail mounting style ø32 to ø100 Perpendicular	Rail mounting style ø32 to ø100 In-line	Direct mounting style ø32 to ø100 Perpendicular	Direct mounting style ø32 to ø100 In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	—	A76H	A96V	A96	●	●	—	—	—	IC circuit	—
				2-wire	—	—	200 V	A72	A72H	—	—	●	●	—	—	—	—	Relay, PLC
					24 V	12 V	100 V	A73	A73H	—	—	●	●	●	—	—		
								—	—	A93V	A93	●	●	—	—	—		
		Connector					—	A73C	—	—	—	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A79W	—	—	—	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F7NV	F79	M9NV	M9N	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				F7PV	F7P	M9PV	M9P	●	●	○	—	○		
				2-wire		12 V		F7BV	J79	M9BV	M9B	●	●	○	—	○	—	
		Connector						J79C	—	—	—	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		F7NWV	F79W	F9NWV	F9NW	●	●	○	—	○	IC circuit	
				3-wire (PNP)				—	F7PW	F9PWV	F9PW	●	●	○	—	○		
				2-wire		12 V		F7BWV	J79W	F9BWV	F9BW	●	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		—	F79F	—	—	●	●	○	—	○	IC circuit	

∗ 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.

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 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
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

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C snap ring).
2. 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.

Pneumatic Circuit

1. Pressure supplied to cylinder should be set affordably. When the operating pressure is low, low speed operation may not be stable depending on a load condition. Besides, the maximum speed may be restricted depending on a pneumatic circuit, or operating pressure.

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	
50	CQ2X50-PS	Rod seal: 1 pc.
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 (1)	Flange	Double clevis (3)
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.

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	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
U	Rod side trunnion style

T	Head side trunnion style
E	Clevis integrated style
BZ	Boss-cut basic style
FZ	Boss-cut rod side flange style
UZ	Boss-cut 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

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

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 the table below.

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

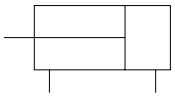
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**C76**	●	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**C73**	●	●	●	—	—	—	Relay, PLC
							100 V, 200 V	**B54**	●	●	●	—	—		
		Connector					—	**C73C**	●	●	●	●	—		
		Terminal conduit					—	**A33A**	—	—	—	●	—	—	PLC
							100 V, 200 V	**A34A**	—	—	—	●	—		Relay, PLC
		DIN terminal						**A44A**	—	—	—	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**B59W**	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**H7A1**	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				**H7A2**	●	●	○	—	○		
				2-wire		12 V		**H7B**	●	●	○	—	○	—	
		Connector						**H7C**	●	●	●	●	—		
		Terminal conduit		3-wire (NPN)		5 V, 12 V		**G39A**	—	—	—	●	—	IC circuit	
				2-wire		12 V		**K39A**	—	—	—	●	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**H7NW**	●	●	○	—	○	IC circuit	
				3-wire (PNP)				**H7PW**	●	●	○	—	○		
				2-wire		12 V		**H7BW**	●	●	○	—	○	—	
	Water resistant (2-color indication)							**H7BA**	—	●	○	—	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		**H7NF**	●	●	○	—	○	IC circuit	

∗ 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.

JIS Symbol
Double acting
Single rod



Standard Stroke

Bore size (mm)	Standard stroke (mm) Note)
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

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. 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. Grease pack (10 g): 1 pc.
25	CM2X25-PS	
32	CM2X32-PS	
40	CM2X40-PS	

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)

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 / Mounting	Standard equipment			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double (3) knuckle joint	Clevis bracket
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 (3)	— (1)	●	●	●	●	—
Rod side trunnion style	● (1) (2)	●	—	●	●	—
Head side trunnion style	● (1) (2)	●	—	●	●	—
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.)

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,
25	30, 35, 40, 45, 50

● 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.

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

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	M4 x 0.7	M5 x 0.8	M6 x 1.0
	Male thread	M5 x 0.8	M6 x 1.0	M8 x 1.25	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	M4 x 0.7	M5 x 0.8	M6 x 1.0
	Male thread	M5 x 0.8	M6 x 1.0	M8 x 1.25	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)

Standard Stroke

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

● 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.

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

Specifications

Bore size (mm)		10- (Relief type) 32	40	50	63	11- (Vacuum type) 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		M10 x 1.5		M8 x 1.25		M10 x 1.5	
	Male thread	M14 x 1.5		M18 x 1.5		M14 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.

Series 10-, 11-CM2X

How to Order

Clean Series

10	Relief type
11	Vacuum type

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

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

Number of auto switches

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

Cylinder stroke (mm)

Refer to "Standard Stroke" below.

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
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, Refief 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)

Made to Order Specifications:
-XB13: Low Speed Cylinder
5 to 50 mm/s (CY1: 7 to 50 mm/s)

Made to Order

Symbol

Low Speed Cylinder **-XB13**

CJ2 Standard model no. — **XB13**

CM2 Mounting style | Bore size | Stroke — **XB13**

CG1 Standard model no. — **XB13**

MB Standard model no. — **XB13**

CU Standard model no. — **XB13**

CQ2 Standard model no. — **XB13**

CQS Standard model no. — **XB13**

Low speed cylinder

CY1 Standard model no. — **XB13**

MGP$^{M}_{L}$ Standard model no. — **XB13**

MGGM Standard model no. — **XB13**

MGCM Standard model no. — **XB13**

CX2 Standard model no. — **XB13**

CXW$^{M}_{L}$ Standard model no. — **XB13**

CXS$^{M}_{L}$ Standard model no. — **XB13**

MXU Standard model no. — **XB13**

CXT$^{M}_{L}$ 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
										Slide bearing						
Series	**CJ2**	**CM2**	**CG1**	**MB**	**CU**	**CQ2**	**CQS**	**CY1**	**MGP$^{M}_{L}$**	**MGGM**	**MGCM**	**CX2**	**CXW$^{M}_{L}$**	**CXS$^{M}_{L}$**	**MXU**	**CXT$^{M}_{L}$**
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 (mm²)	0.1	0.2		0.6		
Free flow	Flow rate (ℓ/min (ANR))	100	180	230	260	390	460
	Effective area (mm²)	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 (mm²)	0.1	0.2		0.6	
Free flow	Flow rate (ℓ/min (ANR))	100	130	230	290	460
	Effective area (mm²)	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	M5 x 0.8	10-32 UNF	R 1/8	NPT 1/8	R 1/4	NPT 1/4
		Tube side			Rc 1/8		Rc 1/4	
Controlled flow	Air flow (ℓ/min (ANR))		7		12		38	
	Effective area (mm²)		0.1		0.2		0.6	
Free flow	Flow rate (ℓ/min (ANR))		105		280		420	
	Effective area (mm²)		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 (mm²)	0.1	0.2	0.6	
Free flow	Air flow (ℓ/min (ANR))	75	175	295	350
	Effective area (mm²)	1.1	2.7	4.5	5.3

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