Compact Cylinder

Series CQS

ø12, ø16, ø20, ø25

Ideal for machine designs with small space requirements

The "D-A9□" and "D-M9□" auto switches will not protrude from switch mounting groove.

Square body shape gives you flexibility for machine design

Auto switch mounting allows for flexible designing requirements

3 faces on ø12 & ø16, and all 4 faces including port side on ø20, ø25.

2 way basic mounting: Through-hole or both ends tapped

Basic mounting is 2 way. You can choose either through-hole or both ends tapped mounting.

Non-rotating piston rod model Superior non-rotating accuracy

Hexagonal cross sectional shape piston rod for high non-rotation accuracy.
ø12, ø16 —— ±1°
ø20, ø25 —— ±0.7°

Variations

				Basic model	Variations (Standard)	Applicable auto switch	Bore size (mm)	Stroke (mm)	Page
Basic	Series CQS	Double Acting	Single Rod	●	1* 2*	Reed switch D-A90, A90V D-A93, A93V D-A96, A96V / Solid state switch D-M9N, M9NV D-M9P, M9PV D-M9B, M9BV D-M9NW, M9NWV D-M9PW, M9PWV D-M9BW, M9BWV	12, 16 20, 25	Standard stroke: ø12, ø16 — 5, 10, 15, 20, 25, 30; ø20, ø25 — 5, 10, 15, 20, 25, 30, 35, 40, 45, 50. Long stroke: ø12, ø16 — 35, 40, 45, 50, 75, 100, 125, 150, 175, 200; ø20 — 75, 100, 125, 150, 175, 200; ø25 — 75, 100, 125, 150, 175, 200, 250, 300	1-372
Basic	Series CQSW	Double Acting	Double Rod	●				ø12, ø16 — 5, 10, 15, 20, 25, 30; ø20, ø25 — 5, 10, 15, 20, 25, 30, 35, 40, 45, 50	1-380
Basic	Series CQS	Single Acting	Return/Extend	●				ø12, ø16, ø20, ø25 — 5, 10	1-386
Non-rotating Rod	Series CQSK	Double Acting	Single Rod	●				ø12, ø16 — 5, 10, 15, 20, 25, 30; ø20, ø25 — 5, 10, 15, 20, 25, 30, 35, 40, 45, 50	1-394
Anti-lateral Load	Series CQS□S	Double Acting	Single Rod	●	1*			ø12, ø16 — 5, 10, 15, 20, 25, 30; ø20, ø25 — 5, 10, 15, 20, 25, 30, 35, 40, 45, 50	1-400

Built-in magnet
Rod end male thread
Rubber bumper
Foot/Flange mounting
Double clevis mounting
Clean Series

∗ Non-rotating rod/Double acting double rod can be made.

∗1 Standard equipment on long stroke model/anti-lateral load model
∗2 Available only for standard stroke model

Reduction of installation space

Added compact type foot brackets.

■Compact foot bracket has the same width as the cylinder. Overall width reduced by up to 43% (for ø12)

■More compact installation space possible

- Short pitch mounting is possible.
- Allows installation close against a wall.

Bore size (mm)	New Compact foot type width **A** (mm)	Existing foot type width **B** (mm)	Reduced width for short pitch mounting (mm)		
			1 unit	2 units	3 units
12	25	44	19	38	57
16	29	48	19	38	57
20	36	62	26	52	78
25	40	66	26	52	78

∗ Short pitch mounting is possible only without auto switch.
Consult with SMC for mounting with auto switch.

■Height from the bottom of brackets to the center of a cylinder is the same as the existing model.

Applicable cylinders: C(D)QS, C(D)QSW, C(D)QS (Single acting, return/extend), C(D)QSK, C(D)QSKW (Non-rotating), C(D)QS□S (Anti-lateral load)

Reduction in labor for design

Added pivot brackets for double clevis.

■Rotating angle: Max. 100°

(For ø12, ø16)

- Time to design rotating bracket saved.
- Improved amount of mounting freedom
- Can be mounted to an installed double clevis cylinder.

Applicable cylinders: CQS (Bore size ø12 to ø25, Mounting bracket, Applicable only to double clevis.)

Compact Cylinder/Standard: Double Acting Single Rod

Series CQS

ø12, ø16, ø20, ø25

How to Order

Standard CQS B 20 – 30 D

With auto switch CDQS B 20 – 30 D – A90 S

With auto switch
(Built-in magnet)

Mounting style

B	Through-hole/Both ends tapped (Standard)
L	Foot
LC	Compact foot style
F	Front flange
G	Rear flange
D	Double clevis

∗ In case of long stroke, use either ends tapped mounting or bracket mounting.
∗∗ Mounting brackets are shipped not assembled with the cylinder.

Bore size

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

Cylinder stroke (mm)

Bore size (mm)	Standard stroke (mm)	Long stroke (mm)
12, 16	5, 10, 15, 20, 25, 30	35, 40, 45, 50, 75, 100, 125, 150, 175, 200
20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	75, 100, 125, 150, 175, 200
25		75, 100, 125, 150, 175, 200, 250, 300

• Refer to p.1-373 for intermediate strokes.

Action

D	Double acting

Option

<Standard stroke>

—	No option
C	Rubber bumper
M	Rod end male thread

∗ "C" and "M" can be combined.

<Long stroke>

C	Rubber bumper (Standard equipment for long stroke model)
CM	Rubber bumper & Rod end male thread

Auto switch

—	Without auto switch (Built-in magnet)

Refer to the table below for auto switch symbol.

Number of auto switches

—	2
S	1
n	n

Applicable Auto Switches

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire(m)∗ 0.5 (—)	3 (L)	5 (Z)	Applicable load	
Reed switch	—	Grommet	No	2 wire	24V	5V 12V	100V or less	A90V	A90	●	●	—	IC	Relay PLC
						12V	100V	A93V	A93	●	●	—	—	
			Yes	3 wire (Equiv. NPN)	—	5V	—	A96V	A96	●	●	—	IC	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	M9NV	M9N	●	●	—	—	Relay PLC
				3 wire (PNP)				M9PV	M9P	●	●	—		
				2 wire				M9BV	M9B	●	●	—		
	Diagnostic indication (2 colour)			3 wire (NPN)				M9NWV	M9NW	●	●	○		
				3 wire (PNP)				M9PWV	M9PW	●	●	○		
				2 wire				M9BWV	M9BW	●	●	○		
	Water resistant (2 colour)							—	M9BA	—	●	○		

∗ Lead wire length 0.5m ····· — (Example) A93
3m ····· L (Example) A93L
5m ····· Z (Example) M9NWZ
∗ ○: Manufactured upon receipt of order.

Mounting Bracket Part No.

Bore size (mm)	Foot(1)	Compact Foot(1)	Flange	Double clevis
12	CQS-L012	CQS-LC012	CQS-F012	CQS-D012
16	CQS-L016	CQS-LC016	CQS-F016	CQS-D016
20	CQS-L020	CQS-LC020	CQS-F020	CQS-D020
25	CQS-L025	CQS-LC025	CQS-F025	CQS-D025

Note 1) 2 pieces per cylinder should be ordered.
Note 2) Each package contains the following parts.
Foot, Compact Foot, or Flange style:
Body mounting bolt Double clevis style:
Clevis pin, snap ring retainer,
body mounting bolt.

Specifications

Style	Pneumatic (Non-lube)
Action	Double acting, single rod
Fluid	Air
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient & fluid temperature	Without auto switch –10°C to 70°C (No freezing)
	With auto switch –10°C to 60°C (No freezing)
Rubber bumper	Standard stroke: None Long stroke: Standard equipment
Rod end thread	Female
Rod end thread tolerance	JIS class 2
Stroke length tolerance	Standard stroke: $^{+1.0}_{0}$ Long stroke: $^{+1.4}_{0}$
Basic mounting	Through-hole/Both ends tapped
Operating piston speed	50 to 500 mm/s

Minimum Strokes for Auto Switch Mounting

Unit: mm

No. of auto switches	D-A9□, D-M9□WV	D-A9□V	D-M9N	D-M9$^{B}_{P}$, D-M9□W	D-M9□V	D-M9BA
2	10	10	15*	20*	5	25*
1	10*	5	15*	20*	5	25*

* Consult SMC for shorter stroke lengths than indicated in the table.

JIS symbol

Theoretical Force

Unit: N

Bore size (mm)	Rod diameter (mm)	Operation	Piston area (mm²)	Operating pressure (MPa)		
				0.3	0.5	0.7
12	6	IN	84.8	25	42	59
		OUT	113	34	57	79
16	8	IN	151	45	75	106
		OUT	201	60	101	141
20	10	IN	236	71	118	165
		OUT	314	94	157	220
25	12	IN	378	113	189	264
		OUT	491	147	245	344

Allowable Kinetic Energy

Unit: J

Bore size (mm)	12	16	20	25
Standard	0.022	0.038	0.055	0.09
With rubber bumper	0.043	0.075	0.11	0.18

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	12	16	20	25
Min. operating pressure (MPa)	0.07	0.07	0.05	0.05

Option

Option	Availability
Rod end thread	Available for all standard models of double acting single rod.
Rubber bumper *	

* Rubber bumper is a standard equipment for long stroke models.

Intermediate Strokes

Method		**Spacer is attached on standard stroke body.**		**Exclusive body (–XB10)**	
Model no.		Refer to "How to Order" for standard model no.		Specify "–XB10" at the end of standard model number.	
Standard stroke	**Method**	Intermediate strokes at 1mm intervals are available by using spacers with standard stroke cylinders.		Intermediate strokes at 1mm intervals are available by using exclusive body with required stroke.	
	Stroke range	Bore size	Stroke range	Bore size	Stroke range
		12, 16	1 to 30	12, 16	6 to 30
		20, 25	1 to 50	20, 25	6 to 50
Long stroke	**Method**	Intermediate strokes at 5mm intervals are available by using spacers with standard stroke cylinders.		Intermediate strokes at 1mm intervals are available by using exclusive body with required stroke.	
	Stroke range	Bore size	Stroke range	Bore size	Stroke range
		12, 16	35 to 200	12, 16	31 to 200
		20	55 to 200	20	31 to 200
		25	55 to 300	25	31 to 300
Example		Model no. : CQSB25-47D CQSB25-50D with 3mm width spacer inside. B dimension is 72.5mm.		Model no. : CQSB25-47D -XB10 Makes 47stroke tube. B dimension is 69.5mm.	

Weight/Without Auto Switch

Unit: g

Bore (mm)	Stroke (mm)																	
	5	10	15	20	25	30	35	40	45	50	75	100	125	150	175	200	250	300
12	29	36	42	49	56	63	93	100	107	113	147	180	213	246	279	312	—	—
16	38	47	56	64	73	82	119	128	136	145	187	229	271	313	355	397	—	—
20	63	75	88	101	114	127	140	153	166	178	306	370	434	498	562	627	—	—
25	91	107	123	139	155	171	186	202	218	234	399	478	557	636	715	794	952	1110

Standard stroke model

Calculation Example) CQSD20-20DCM

- Cylinder weight: CQSB20-20D ····· 101g
- Option weight: Rod end male thread ····· 10g
  - Rubber bumper ····· –2g
  - Double clevis ····· 92g

Total 201g

Weight/With Auto Switch (Built-in magnet)

Unit: g

Bore (mm)	Stroke (mm)																	
	5	10	15	20	25	30	35	40	45	50	75	100	125	150	175	200	250	300
12	37	43	50	57	63	70	94	101	108	114	148	181	214	247	280	313	—	—
16	48	57	66	74	83	92	121	129	137	146	188	231	273	315	357	399	—	—
20	93	106	119	132	144	157	170	182	195	208	311	375	439	503	567	632	—	—
25	134	150	166	182	197	213	229	245	261	277	406	485	564	643	721	800	958	1116

Option Weights

Unit: g

Bore size (mm)		**12**	**16**	**20**	**25**
Rod end thread	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Rubber bumper (1)		0	1	–2	–3
Compact foot style (Including mounting bolt)		41 (39)	51 (47)	121 (115)	140 (131)
Foot (including bolt)		55(53)	65(61)	159(153)	181(172)
Front flange (including bolt)		58(56)	70(66)	143(137)	180(171)
Rear flange (including bolt)		56	66	137	171
Double clevis (including pin, retainer, bolt)		34	40	92	127

( ): Long stroke model

Note 1) Do not add value shown in the table above to long stroke models.

Copper Free

20 — CQS [Mounting] [Bore size] — [Stroke] D (C)(M)

- 20: Copper free series
- Bore size: **ø12, ø16, ø20, ø25**

To eliminate influences of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used as component parts.

Specifications

Action	Double acting single rod
Cylinder bore size	**ø12, ø16, ø20, ø25**
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Rubber bumper	Standard stroke: Without, Long stroke: With
Piston speed	50 to 500mm/s
Mounting	Through-hole, Both ends tapped

Compact Cylinder with Stable Lubrication Function (Lube-retainer)

C D QS [Mounting] [Bore size] M — [Stroke] D [Rod end thread] — [Auto switch]

- D: With auto switch (Built-in magnet)
- M: With stable lubrication function (Lube-retainer)
- Auto switch: * Available only for with auto switch.

Specifications

Bore size (mm)	**20, 25**
Action	Double acting, Single rod
Min. operating pressure	0.1 MPa
Piston speed	50 to 500 mm/s
Cushion	None

* Specifications other than those shown above are the same as the standard model.

Dimensions (Dimensions other than those shown below are the same as the standard model.)

DM: Rod end male thread

(mm)

Bore size	Standard stroke	T
20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	15
25		18

Mounting Bracket Part No.

Bore size (mm)	Foot	Compact foot	Flange
20	CQS-LM020	CQS-LCM020	CQS-FM020
25	CQS-LM025	CQS-LCM025	CQS-FM025

* The double clevis type is the same as the standard model.
* When ordering foot and compact foot brackets, order 2 pieces per cylinder.

* The mounting dimensions of the mounting bracket are the same as the standard model.

⚠ Precautions

⚠ Caution

Handling

① All loads to piston rod must be applied in axial direction only.
- Unavoidable side loads to rod end must be less than the values in the graphs.
- Cylinder installation requires accurate alignment.
- Adoption of guide mechanism is strongly recommended for the case when CQS is used as stopper to prevent non-rotating piston rod from side loads.

② To secure a workpiece to the end of the piston rod, make sure to retract the piston rod entirely, and place a wrench on the portion of the rod that protrudes beyond the section. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.

⚠ Caution

Snap Ring Installation/Removal

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

② Exercise caution even when using an appropriate pair of pliers (tool for installing a C snap ring), because of the possibility of the snap ring becoming detached from the tip of the pliers and flying away, which could injure humans or damage the peripheral equipment. After installing the snap ring, make sure that it is placed securely in the ring groove before supplying air.

Allowable Rod End Lateral Load

<Figure 1>Basic: Non-rotating rod/ Without auto switch

<Figure 2>Standard: Non-rotating rod/ Without auto switch

<Figure 3>Anti-lateral load/ Without auto switch

<Figure 4>Anti-lateral load/ Without auto switch

<Figure 5>Long stroke/ With & Without auto switch

Note 1) Figure 1 to 5: Rod end female thread
Note 2) Lateral load allowance varies depending upon rod end shape dimensions or load valve (distance to the centre of the gravity of load.) Consult SMC.

Construction

Basic

With rubber bumper

With auto switch (Built-in magnet) ø12, ø16

Rod end male thread

Long stroke

ø20, ø25

Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Collar	Aluminum bearing alloy	Anodized
③	Piston	Aluminum alloy	Chromated
④	Piston rod	Stainless steel	
⑤	Snap ring	Carbon tool steel	Phosphate coating
⑥	Rod end nut	Carbon steel	Nickel plated
⑦	Switch spacer	Aluminum alloy	Chromated
⑧	Bumper A	Urethane	
⑨	Bumper B	Urethane	
⑩	Head cover	Aluminum alloy	Anodized

Component Parts

No.	Description	Material	Note
⑪	Collar	Aluminum alloy	Anodized
⑫	Bushing	Oil impregnated sintered alloy	
⑬	Wearing	Resin	
⑭	Magnet	—	
⑮	Rod seal	NBR	
⑯	Piston seal	NBR	
⑰	Tube gasket	NBR	

Replacement Parts: Seal Kits

Bore size (mm)	Kit No.	Contents
12	CQSB12-PS	Kits includes items ⑮, ⑯ and ⑰ from the table above.
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	

Seal kits consist of items ⑮, ⑯ and ⑰ contained in one kit, and can be ordered using the order number for each respective tube bore size.

Clean Series (Available only on standard stroke.)

□ — C(D)QSB | Bore size | — | Stroke | D(M)

• **SMC Clean Series**

10	Relief style
11	Vacuum suction style

The rod portion of the actuator has a double seal construction, and a relief port is provided to discharge the exhaust air directly outside of the clean room. Thus, it can be used in a Class 100 clean room.

Specifications

Action	Double acting single rod
Bore size	ø12, ø16, ø20, ø25
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Rubber bumper	None
Piping	Screw-in
Operating piston speed	50 to 500mm/s
Mounting	Through-hole/Both ends tapped
Auto switch	Attachable

Note) Contact SMC for further information.

Mounting Bolt for CQS

Special bolt for through-hole mounting is available as an option.

How to Order: Specify the required bolts

Example) Bolt M3 X 25ℓ 4pcs. (Standard stroke)
Bolt M3 X 75ℓ 4pcs. (Long stroke)

Note 1) The appropriate plain washer must be used for through-hole mounting.
Note 2) Contact SMC for details concerning the mounting bolts to be used with ø12 and ø16 that exceed 30mm strokes, or ø20 and ø25 that exceed 50mm strokes.

Model	C	D	Mounting bolt
CQSB12–5D	6.5	25	M3 X 25ℓ
–10D		30	X 30ℓ
–15D		35	X 35ℓ
–20D		40	X 40ℓ
–25D		45	X 45ℓ
–30D		50	X 50ℓ
–35DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–40DC			
–45DC			
–50DC			
–75DC			
–100DC			
CQSB16–5D	6.5	25	M3 X 25ℓ
–10D		30	X 30ℓ
–15D		35	X 35ℓ
–20D		40	X 40ℓ
–25D		45	X 45ℓ
–30D		50	X 50ℓ
–35DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–40DC			
–45DC			
–50DC			
–75DC			
–100DC			
CQSB20–5D	6.5	25	M5 X 25ℓ
–10D		30	X 30ℓ
–15D		35	X 35ℓ
–20D		40	X 40ℓ
–25D		45	X 45ℓ

Model	C	D	Mounting bolt
CQSB20–30D	6.5	50	M5 X 50ℓ
–35D		55	X 55ℓ
–40D		60	X 60ℓ
–45D		65	X 65ℓ
–50D		70	X 70ℓ
–75DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–100DC			
–125DC			
–150DC			
–175DC			
–200DC			
CQSB25–5D	8.5	30	M5 X 30ℓ
–10D		35	X 35ℓ
–15D		40	X 40ℓ
–20D		45	X 45ℓ
–25D		50	X 50ℓ
–30D		55	X 55ℓ
–35D		60	X 60ℓ
–40D		65	X 65ℓ
–45D		70	X 70ℓ
–50D		75	X 75ℓ
–75DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–100DC			
–125DC			
–150DC			
–175DC			
–200DC			
–250DC			
–300DC			

Mounting Bolt for CDQS

Special bolt for through-hole mounting is available as option.

How to Order: Specify the required bolts

Example) Bolt M3 X 30ℓ 4pcs. (Standard stroke)
Bolt M3 X 75ℓ 4pcs. (Long stroke)

Note 1) The appropriate plain washer must be used for through-hole mounting.
Note 2) Contact SMC for details concerning the mounting bolts to be used with ø12 and ø16 that exceed 30mm strokes, or ø20 and ø25 that exceed 50mm strokes.

Model	C	D	Mounting bolt
CDQSB12–5D	6.5	30	M3 X 30ℓ
–10D		35	X 35ℓ
–15D		40	X 40ℓ
–20D		45	X 45ℓ
–25D		50	X 50ℓ
–30D		55	X 55ℓ
–35DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–40DC			
–45DC			
–50DC			
–75DC			
–100DC			
CDQSB16–5D	6.5	30	M3 X 30ℓ
–10D		35	X 35ℓ
–15D		40	X 40ℓ
–20D		45	X 45ℓ
–25D		50	X 50ℓ
–30D		55	X 55ℓ
–35DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–40DC			
–45DC			
–50DC			
–75DC			
–100DC			
CDQSB20–5D	6.5	35	M5 X 35ℓ
–10D		40	X 40ℓ
–15D		45	X 45ℓ
–20D		50	X 50ℓ
–25D		55	X 55ℓ

Model	C	D	Mounting bolt
CDQSB20–30D	6.5	60	M5 X 60ℓ
–35D		65	X 65ℓ
–40D		70	X 70ℓ
–45D		75	X 75ℓ
–50D		80	X 80ℓ
–75DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–100DC			
–125DC			
–150DC			
–175DC			
–200DC			
CDQSB25–5D	8.5	40	M5 X 40ℓ
–10D		45	X 45ℓ
–15D		50	X 50ℓ
–20D		55	X 55ℓ
–25D		60	X 60ℓ
–30D		65	X 65ℓ
–35D		70	X 70ℓ
–40D		75	X 75ℓ
–45D		80	X 80ℓ
–50D		85	X 85ℓ
–75DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–100DC			
–125DC			
–150DC			
–175DC			
–200DC			
–250DC			
–300DC			

Accessory Bracket

Since the attached bracket of CQS is same as CQ2 series, please refer to P.1-442

- **Single knuckle joint**
- **Double knuckle joint**
- **Pin for knuckle**
- **Rod end nut**

*Refer to p.1-408 for mounting position and height of auto switch.

Basic (Through-hole/Both ends tapped)/CQSB, CDQSB

ø12

ø16

ø20, ø25

Rod end male thread

Rod end male thread ("L" is the only dimension that changes between standard stroke and long stroke.)

Bore (mm)	Standard stroke L_1	Long stroke L_1	C_1	H_1	X
12	14	24	9	M5	10.5
16	15.5	25.5	10	M6	12
20	18.5	28.5	12	M8	14
25	22.5	32.5	15	M10 X 1.25	17.5

• Length with intermediate stroke
(1) Spacer ···The dimensions will be identical to those of the nearest long stroke.
Those that exceed the standard stroke will have the long stroke dimensions.
(2) Exclusive body (-X10)···Add stroke. Stroke lengths that exceed standard are long stroke dimensions.

Basic

("A", "B", "F" and "L" are different between standard stroke and long stroke.)

Bore (mm)	Standard stroke (mm)	Standard stroke: Without auto switch A	B	F	L	With auto switch A	B	F	L	Long stroke (mm)	Long stroke: With/Without auto switch A	B	F	L	C	D	E	H	I	K	M	N	OA	OB	Q	RA	RB	T
12	5 to 30	20.5	17	5	3.5	25.5	22	5	3.5	35 to 200	45.5	32	7.5	13.5	6	6	25	M3	32	5	15.5	3.5	M4	6.5	7.5	7	4	0.5
16	5 to 30	20.5	17	5	3.5	25.5	22	5	3.5	35 to 200	45.5	32	7.5	13.5	8	8	29	M4	38	6	20	3.5	M4	6.5	7.5	7	4	0.5
20	5 to 50	24	19.5	5.5	4.5	34	29.5	5.5	4.5	75 to 200	55.5	41	8	14.5	7	10	36	M5	47	8	25.5	5.4	M6	9	8	10	7	1
25	5 to 50	27.5	22.5	5.5	5	37.5	32.5	5.5	5	75 to 300	59	44	9	15	12	12	40	M6	52	10	28	5.4	M6	9	9	10	7	1

Note 1) For the following bore/stroke sizes through-hole is threaded over the entire length: Basic style ø12 and ø16; 5 stroke, ø20; 5 to 15 stroke, ø25; 5 to 10 stroke, ø20 with auto switch built-in magnet; 5 stroke.
Note 2) Rubber bumper style has the same dimensions as those indicated above.
∗ Refer to p.1-442 for details of the rod end nut and mounting brackets.

Foot style: CQSL/CDQSL

Rod end male thread

Foot Style

Bore size (mm)	Standard stroke range (mm)	Standard stroke						Long stroke range (mm)	Long stroke		
		Without auto switch			With auto switch				Without/With auto switch		
		A	B	LS	A	B	LS		A	B	LS
12	5 to 30	35.3	17	5	40.3	22	10	35 to 200	50.3	32	20
16	5 to 30	35.3	17	5	40.3	22	10	35 to 200	50.3	32	20
20	5 to 50	41.2	19.5	7.5	51.2	29.5	17.5	75 to 200	62.7	41	29
25	5 to 50	44.7	22.5	7.5	54.7	32.5	17.5	75 to 300	66.2	44	29

Bore size (mm)	L	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSLC/CDQSLC

Rod end male thread

Compact Foot Style

Bore size (mm)	Standard stroke range (mm)	Standard stroke						Long stroke range (mm)	Long stroke		
		Without auto switch			With auto switch				Without/With auto switch		
		A	B	LS	A	B	LS		A	B	LS
12	5 to 30	44.6	17	35.6	49.6	22	40.6	35 to 200	59.6	32	50.6
16	5 to 30	45.6	17	35.6	50.6	22	40.6	35 to 200	60.6	32	50.6
20	5 to 50	57.5	19.5	45.9	67.5	29.5	55.9	75 to 200	79	41	67.4
25	5 to 50	60.5	22.5	48.9	70.5	32.5	58.9	75 to 300	82	44	70.4

Bore size (mm)	L	L1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod side flange style: CQSF/CDQSF

Rod end male thread

Rod Side Flange Style

Bore size (mm)	Standard stroke range (mm)	Standard stroke				Long stroke range (mm)	Long stroke	
		Without auto switch		With auto switch			Without/With auto switch	
		A	B	A	B		A	B
12	5 to 30	30.5	17	35.5	22	35 to 200	45.5	32
16	5 to 30	30.5	17	35.5	22	35 to 200	45.5	32
20	5 to 50	34	19.5	44	29.5	75 to 200	55.5	41
25	5 to 50	37.5	22.5	47.5	32.5	75 to 300	59	44

Bore size (mm)	FD	FT	FV	FX	FZ	L	L1
12	4.5	5.5	25	45	55	13.5	24
16	4.5	5.5	30	45	55	13.5	25.5
20	6.6	8	39	48	60	14.5	28.5
25	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head side flange style: CQSG/CDQSG

Rod end male thread

Head Side Flange Style

Bore size (mm)	Standard stroke range (mm)	Standard stroke								Long stroke range (mm)	Long stroke			
		Without auto switch				With auto switch					Without/With auto switch			
		A	B	L	L1	A	B	L	L1		A	B	L	L1
12	5 to 30	26	17	3.5	14	31	22	3.5	14	35 to 200	51	32	13.5	24
16	5 to 30	26	17	3.5	15.5	31	22	3.5	15.5	35 to 200	51	32	13.5	25.5
20	5 to 50	32	19.5	4.5	18.5	42	29.5	4.5	18.5	75 to 200	63.5	41	14.5	28.5
25	5 to 50	35.5	22.5	5	22.5	45.5	32.5	5	22.5	75 to 300	67	44	15	32.5

Bore size (mm)	FD	FT	FV	FX	FZ
12	4.5	5.5	25	45	55
16	4.5	5.5	30	45	55
20	6.6	8	39	48	60
25	6.6	8	42	52	64

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 1-442.

Double clevis style: CQSD/CDQSD

Rod end male thread

Double Cevis Style

Bore size (mm)	Standard stroke range (mm)	Standard stroke										Long stroke range (mm)	Long stroke				
		Without auto switch					With auto switch						Without/With auto switch				
		A	B	CL	L	L1	A	B	CL	L	L1		A	B	CL	L	L1
12	5 to 30	40.5	17	34.5	3.5	14	45.5	22	39.5	3.5	14	35 to 200	65.5	32	59.5	13.5	24
16	5 to 30	41.5	17	35.5	3.5	15.5	46.5	22	40.5	3.5	15.5	35 to 200	66.5	32	60.5	13.5	25.5
20	5 to 50	51	19.5	42	4.5	18.5	61	29.5	52	4.5	18.5	75 to 200	82.5	41	73.5	14.5	28.5
25	5 to 50	57.5	22.5	47.5	5	22.5	67.5	32.5	57.5	5	22.5	75 to 300	89	44	79	15	32.5

Bore size (mm)	CB	CD	CT	CU	CW	CX	CZ	RR
12	12	5	4	7	14	5	10	6
16	14	5	4	10	15	6.5	12	6
20	20	8	5	12	18	8	16	9
25	24	10	5	14	20	10	20	10

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated
∗ For details about the double clevis pivot bracket, refer to table bellow.

Double Clevis Pivot Bracket

Bore size ø12 to ø25

(mm)

Bracket part no.	Bore size	Stroke range	A		CW	CT	CL	CX	CD	M	CZ	R	CN	Hexagon socket head cap screw for mounting pivot bracket (Accessory)
			Without auto	With auto										
CQ-C012	12	5 to 30	34.5	39.5	14	4	19	5	5	15.5	25	100°	4.5	M4 x 10L
CQ-C016	16	5 to 30	35.5	40.5	15	4	21	6.5	5	20	28	100°	4.5	M4 x 10L
CQ-C020	20	5 to 50	42	52	18	5	27	8	8	25.5	35	80°	6.6	M6 x 12L
CQ-C025	25	5 to 50	47.5	57.5	20	5	30	10	10	28	40	90°	6.6	M6 x 12L

∗The double clevis pin and retaining ring are not included.

Double clevis pivot bracket material: Carbon steel Surface treatment: Nickel plated

Compact Cylinder/Standard: Double Acting Double Rod

Series CQSW

ø12, ø16, ø20, ø25

How to Order

Standard CQSW B 20 – 30 D C

With auto switch CDQSW B 20 – 30 D C – A90 S

With auto switch
(Built-in magnet)

Mounting style

B	Through-hole/Both ends tapped
L	Foot
LC	Compact foot style
F	Flange

Bore size

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

Cylinder stroke (mm)

Standard stroke

Bore (mm)	Standard stroke (mm)
12, 16	5 , 10, 15, 20, 25, 30
20, 25	5 , 10, 15, 20, 25, 30, 35, 40, 45, 50

Action

D	Double acting

Option

—	No option
C	Rubber bumper
M	Rod end male thread

∗ "C" and "M" can be combined.

Auto switch

—	Without auto switch (Built-in magnet)

∗ Refer to table below for auto switch no.

Number of auto switches

—	2
S	1
n	n

Mounting Bracket Part No.

Bore size (mm)	Foot (1)	Compact Foot (1)	Flange
12	CQS-L012	CQS-LC012	CQS-F012
16	CQS-L016	CQS-LC016	CQS-F016
20	CQS-L020	CQS-LC020	CQS-F020
25	CQS-L025	CQS-LC025	CQS-F025

Note 1) 2 pieces per cylinder should be ordered.
Note 2) Each package contains the following parts.
Foot, Compact foot or Flange style : Body mounting bolt

Applicable Auto Switches

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire (m)∗ 0.5 (—)	Lead wire (m)∗ 3 (L)	Lead wire (m)∗ 5 (Z)	Applicable load	Applicable load
Reed switch	—	Grommet	No	2 wire	24V	5V 12V	100V or less	A90V	A90	●	●	—	IC	Relay PLC
			Yes	2 wire		12V	100V	A93V	A93	●	●	—	—	
				3 wire (Equiv. NPN)	—	5V	—	A96V	A96	●	●	—	IC	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	M9NV	M9N	●	●	—	—	Relay PLC
				3 wire (PNP)				M9PV	M9P	●	●	—		
				2 wire				M9BV	M9B	●	●	—		
	Diagnostic indication (2 colour)			3 wire (NPN)				M9NWV	M9NW	●	●	○		
				3 wire (PNP)				M9PWV	M9PW	●	●	○		
				2 wire				M9BWV	M9BW	●	●	○		
	Water resistant (2 colour)							—	M9BA	—	●	○		

∗ Lead wire length 0.5m ····· — (Example) A93
3m ····· L (Example) A93L
5m ····· Z (Example) M9NWZ
∗○ : Manufacutured upon receipt of order.

JIS symbol

⚠ Precautions

⚠ Caution

Snap Ring Installation/Removal

① For installation and removal, use an appropriate pair of pliers (Tool for installing a C snap ring.)
② Exercise caution even when using an appropriate pair of pliers, because of the possibility of the snap ring becoming detached from the tip of the pliers and flying away, which could injure humans or damage the peripheral equipment. After installing the snap ring, make sure that it is placed securely in the ring groove before supplying air.

Mounting

① When removing a load, be sure to secure the wrench flats of the piston rod on the load side.
② If this is done without securing the piston rod on the load side, be aware that the coupled (screwed-in) portion of the piston rod could become loosened.

Minimum Operating Pressure

Unit: MPa

Bore size(mm)	12	16	20	25
Min. operating pressure	0.07	0.07	0.05	0.05

Allowable Kinetic Energy

Unit: J

Bore size(mm)	12	16	20	25
Standard	0.022	0.038	0.055	0.09
Rubber bumper	0.043	0.075	0.11	0.18

Option

Option	Availability
Rod end male thread	Available for all standard models of double acting double rod
Rubber bumper	

Calculation Example: CQSWF12-10DM
• Cylinder weight: CQSWB12-10D·····46g
• Option weight: Rod end male thread·····5g
Front flange·····58g
Total 109g

Standard Specifications

Style	Pneumatic (Non-lube)
Action	Double acting double rod
Fluid	Air
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient and fluid temperature	Without auto switch –10C to 70ºC (No freezing)
	With auto switch –10C to 60ºC (No freezing)
Rubber bumper	None
Rod end thread	Female thread
Rod end thread tolerance	JIS Class 2
Tolerance of stroke length	$^{+1.0}_{0}$
Mounting	Through hole/Both ends tapped
Operating piston speed	50 to 500mm/s

Minimum Strokes for Auto Switch Mounting

Unit: mm

No. of auto switches	D-A9□, D-M9□WV	D-A9□V	D-M9N	D-M9$^{B}_{P}$, D-M9□W	D-M9□V	D-M9BA
2	10	10	15*	20*	5	25*
1	10*	5	15*	20*	5	25*

* Consult SMC for shorter strokes than indicated in the table.

Theoretical Force

Unit: N

Bore size (mm)	Rod diameter (mm)	Operation	Piston area (mm²)	Operating pressure (MPa)		
				0.3	0.5	0.7
12	6	IN	84.8	25	42	59
		OUT				
16	8	IN	151	45	75	106
		OUT				
20	10	IN	236	71	118	165
		OUT				
25	12	IN	378	113	189	264
		OUT				

Weight/Without Auto Switch

Unit: g

Bore (mm)	Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	38	46	54	62	69	77	—	—	—	—
16	50	61	71	81	92	102	—	—	—	—
20	89	104	120	136	152	167	183	199	215	231
25	127	146	166	186	206	227	247	267	287	308

Weight/With Auto Switch(Built-in magnet)

Unit: g

Bore (mm)	Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	46	54	62	70	77	85	—	—	—	—
16	60	71	81	91	102	112	—	—	—	—
20	119	134	150	166	182	198	214	230	245	261
25	154	174	195	215	235	255	276	296	316	336

Option Weights

Unit: g

Bore size (mm)		12	16	20	25
Rod end male thread	Male thread	3	6	12	24
	Nut	2	4	8	16
Rubber bumper		0	–1	–2	–2
Foot (including bolt)		55	65	159	181
Compact foot style (Including mounting bolt)		41	51	121	140
Front flange (including bolt)		58	70	143	180

Construction

Basic

With rubber bumper

With auto switch (Built-in magnet)

ø12, ø16

ø20, ø25

Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Collar	Aluminum bearing alloy	Anodized
③	Piston	Aluminum alloy	Chromated
④	Piston rod A	Stainless steel	
⑤	Piston rod B	Stainless steel	
⑥	Snap ring	Carbon tool steel	Phosphate coating
⑦	Rod end nut	Carbon steel	Nickel plated
⑧	Bumper	Urethane	
⑨	Switch spacer	Aluminum alloy	Chromated
⑩	Magnet	—	
⑪	Rod seal	NBR	
⑫	Piston seal	NBR	
⑬	Tube gasket	NBR	

Rod end male thread

Replacement Parts : Seal Kits

Bore size (mm)	Kit No.	Contents
12	CQSWB12-PS	Kits include items ⑪, ⑫ and ⑬ from the table above.
16	CQSWB16-PS	
20	CQSWB20-PS	
25	CQSWB25-PS	

∗Seal kit consist of items ⑪, ⑫ and ⑬ contained in one kit, and can be ordered using the order number for each respective tube bore size.

Mounting Bolt for CQSW

Special long bolt for through-hole mounting is available as an option.
How to Order: Specify the required bolts.
Example) Bolt M3 X 30ℓ 4pcs.

Model	C	D	Mounting bolt
CQSWB12–5D	6.5	30	M3 X 30ℓ
–10D		35	X 35ℓ
–15D		40	X 40ℓ
–20D		45	X 45ℓ
–25D		50	X 50ℓ
–30D		55	X 55ℓ
CQSWB16–5D	6.5	30	M3 X 30ℓ
–10D		35	X 35ℓ
–15D		40	X 40ℓ
–20D		45	X 45ℓ
–25D		50	X 50ℓ
–30D		55	X 55ℓ
CQSWB20–5D	10	35	M5 X 35ℓ
–10D		40	X 40ℓ
–15D		45	X 45ℓ
–20D		50	X 50ℓ

Model	C	D	Mounting bolt
CQSWB20–25D	10	55	M5 X 55ℓ
–30D		60	X 60ℓ
–35D		65	X 65ℓ
–40D		70	X 70ℓ
–45D		75	X 75ℓ
–50D		80	X 80ℓ
CQSWB25–5D	7	35	M5 X 35ℓ
–10D		40	X 40ℓ
–15D		45	X 45ℓ
–20D		50	X 50ℓ
–25D		55	X 55ℓ
–30D		60	X 60ℓ
–35D		65	X 65ℓ
–40D		70	X 70ℓ
–45D		75	X 75ℓ
–50D		80	X 80ℓ

Note) Appropriate plain washer must be used for through-hole mounting.

Mounting Bolt for CDQSW/With Auto Switch

Special long bolt for through-hole mounting is available as an option.
How to Order : Specify the required bolts.
Example) Bolt M3 X 35ℓ 4pcs.

Model	C	D	Mounting bolt
CDQSWB12–5D	6.5	35	M3 X 35ℓ
–10D		40	X 40ℓ
–15D		45	X 45ℓ
–20D		50	X 50ℓ
–25D		55	X 55ℓ
–30D		60	X 60ℓ
CDQSWB16–5D	6.5	35	M3 X 35ℓ
–10D		40	X 40ℓ
–15D		45	X 45ℓ
–20D		50	X 50ℓ
–25D		55	X 55ℓ
–30D		60	X 60ℓ
CDQSWB20–5D	10	45	M5 X 45ℓ
–10D		50	X 50ℓ
–15D		55	X 55ℓ
–20D		60	X 60ℓ

Model	C	D	Mounting bolt
CDQSWB20–25D	10	65	M5 X 65ℓ
–30D		70	X 70ℓ
–35D		75	X 75ℓ
–40D		80	X 80ℓ
–45D		85	X 85ℓ
–50D		90	X 90ℓ
CDQSWB25–5D	7	45	M5 X 45ℓ
–10D		50	X 50ℓ
–15D		55	X 55ℓ
–20D		60	X 60ℓ
–25D		65	X 65ℓ
–30D		70	X 70ℓ
–35D		75	X 75ℓ
–40D		80	X 80ℓ
–45D		85	X 85ℓ
–50D		90	X 90ℓ

Note) Appropriate plain washer must be used for through-hole mounting.

Dimensions/ø12 to ø25

Basic (Through-hole/Both ends tapped)/CQSWB, CDQSWB

ø12

ø16

ø20, ø25

Rod end male thread

Rod end male thread (All dimensions are common except "A".)

Bore (mm)	W/o auto switch A_1	With auto switch A_1	C_1	H_1	L_1	X
12	50	55	9	M5	14	10.5
16	53	58	10	M6	15.5	12
20	63	73	12	M8	18.5	14
25	74	84	15	M10 X 1.25	22.5	17.5

Basic (All dimensions are common except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch A	W/o auto switch B	With auto switch A	With auto switch B	C	D	E	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
12	5 to 30	29	22	34	27	6	6	25	M3	32	5	3.5	15.5	3.5	M4	6.5	7.5	7	4	0.5
16	5 to 30	29	22	34	27	8	8	29	M4	38	6	3.5	20	3.5	M4	6.5	7.5	7	4	0.5
20	5 to 50	35	26	45	36	7	10	36	M5	47	8	4.5	25.5	5.4	M6	9	8	10	7	1
25	5 to 50	39	29	49	39	12	12	40	M6	52	10	5	28	5.4	M6	9	9	10	7	1

Note 1) For the following bore/stroke sizes, through-hole is threaded over the entire length: Basic ø20, ø25; stroke.
Note 2) Rubber bumper style has the same dimensions as those indicated above.
* Refer to p.1-442 for detail of the rod end nut and mounting brackets.

Foot/CQSWL, CDQSWL

Rod end male thread

Foot

(All dimensions are common except "A", "A1", "B" and "LS".)

Bore (mm)	Stroke range (mm)	Without auto switch				With auto switch				L	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	A1	B	LS	A	A1	B	LS											
12	5 to 30	49	70	22	10	54	75	27	15	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	5 to 30	49	73	22	10	54	78	27	15	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	5 to 50	55	83	26	14	65	93	36	24	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	5 to 50	59	94	29	14	69	104	39	24	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Compact mounting: CQSWLC/CDQSWLC

Rod end male thread

Compact mounting

Bore size (mm)	Stroke range (mm)	Without auto switch				With auto switch				L	L1	LD	LH	LT	LX	LY	LZ	X	Y
		A	**A1**	**B**	**LS**	**A**	**A1**	**B**	**LS**										
12	5 a 30	49.3	70	22	40.6	54.3	75	27	45.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	5 a 30	49.8	73	22	40.6	54.8	78	27	45.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	5 a 50	59.5	83	26	52.4	69.5	93	36	62.4	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	5 a 50	63	94	29	55.4	73	104	39	65.4	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

∗ For details about the rod end nut and accessory brackets, refer to page 1-442.

Foot bracket material: Carbon steel
Surface treatment: Zinc-plated

Flange/CQSWF, CDQSWF

Rod end male thread

Flange

(All dimensions are common except "A", "A1" and "B".)

Bore (mm)	Stroke range (mm)	Without auto switch			With auto switch			FD	FT	FV	FX	FZ	L	L1	L2	L3
		A	A1	B	A	A1	B									
12	5 to 30	39	60	22	44	65	27	4.5	5.5	25	45	55	13.5	3.5	24	14
16	5 to 30	39	63	22	44	68	27	4.5	5.5	30	45	55	13.5	3.5	25.5	15.5
20	5 to 50	45	73	26	55	83	36	6.6	8	39	48	60	14.5	4.5	28.5	18.5
25	5 to 50	49	84	29	59	94	39	6.6	8	42	52	64	15	5	32.5	22.5

∗ Refer to p.1-442 for detail of the rod end nut and mounting brackets.

Compact Cylinder/Standard: Single Acting Spring Return/Extend

Series CQS

ø12, ø16, ø20, ø25

How to Order

Standard CQS B 20 – 10 S

With auto switch CDQS B 20 – 10 S – A90 S

With auto switch
(Built-in magnet)

Mounting style

B	Through-hole/Both ends tapped (Standard)
L	Foot
LC	Compact foot style
F	Front flange
G	Rear flange
D	Double clevis

∗ Mounting brackets are shipped not assembled with the cylinder.

Bore size

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

Cylinder stroke (mm)

Standard stroke

Bore size (mm)	Standard stroke (mm)
12, 16, 20, 25	5, 10

Action

S	Single acting spring return
T	Single acting spring extend

Option

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

Auto switch

—	Without auto switch (Built-in magnet)

∗ Refer to table below for auto switch model No.

Number of auto switches

—	2
S	1
n	n

Mounting Bracket Part No.

Bore size (mm)	Foot (1)	Compact Foot (1)	Flange	Double clevis
12	CQS-L012	CQS-LC012	CQS-F012	CQS-D012
16	CQS-L016	CQS-LC016	CQS-F016	CQS-D016
20	CQS-L020	CQS-LC020	CQS-F020	CQS-D020
25	CQS-L025	CQS-LC025	CQS-F025	CQS-D025

Note 1) 2 pieces per cylinder should be ordered.
Note 2) Each package contains the following parts.
Foot, Compact foot or Flange style: Body mounting bolt.
Double clevis: Clevis pin, snap ring retainer, body mounting bolt.

Applicable Auto Switches

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire (m)∗ 0.5 (—)	3 (L)	5 (Z)	Applicable load	
Reed switch	—	Grommet	No	2 wire	24V	5V 12V	100V	A90V	A90	●	●	—	IC	Relay PLC
						12V	100V	A93V	A93	●	●	—	—	
			Yes	3 wire (Equiv. NPN)	—	5V	—	A96V	A96	●	●	—	IC	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	M9NV	—	●	●	—	—	Relay PLC
				3 wire (PNP)				M9PV	—	●	●	—		
				2 wire				M9BV	—	●	●	—		
	Diagnostic indication (2 colour)			3 wire (NPN)				M9NWV	—	●	●	○		
				3 wire (PNP)				M9PWV	—	●	●	○		
				2 wire				M9BWV	—	●	●	○		

∗ Lead wire length 0.5m ····· — (Example) A93
3m ····· L (Example) A93L
5m ····· Z (Example) M9NWZ

∗ Solid state switches marked with a "○" are manufactured upon receipt of order.

JIS symbol

Standard Specifications

Style	Pneumatic (Non-lube)
Action	Single acting, single rod
Fluid	Air
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient and fluid temperature	Without auto switch: –10C to 70ºC (No freezing)
	With auto switch: –10C to 60ºC (No freezing)
Rubber bumper	None
Rod end nut	Female thread
Tolerance of rod end thread	JIS Class 2
Tolerance of stroke length	$^{+1.0}_{0}$
Mounting	Through hole/Both ends tapped
Operating piston speed	50 to 500mm/s

Minimum Strokes for Auto Switch Mounting

Unit: mm

No. of auto switches	D-A9□, D-M9□WV	D-A9□V	D-M9□V
2	10	10	5
1	10 (1)	5	5

Note 1) Consult SMC for shorter stroke length than indicated in the table.

Theoretical Force

Unit: N

Action	Bore size (mm)	Rod diameter (mm)	Operation	Piston area (mm^2)	Operating press (MPa) 0.3	0.5	0.7	Beginning	Ending
Spring return	**12**	6	IN	—	20	43	65	14	4
			OUT	113					
	16	8	IN	—	45	86	126	15	6
			OUT	201					
	20	10	IN	—	78	141	204	15	6
			OUT	314					
	25	12	IN	—	126	224	323	21	11
			OUT	491					
Spring extend	**12**	6	IN	84.8	14	31	48	10	3
			OUT	—					
	16	8	IN	151	24	54	85	19	4
			OUT	—					
	20	10	IN	236	44	91	138	27	5
			OUT	—					
	25	12	IN	378	84	160	235	29	10
			OUT	—					

⚠Caution

Snap Ring Installation/Removal

① For installation and removal, use an appropriate pair of pliers (Tool for installing a C snap ring).
② Exercise caution even when using an appropriate pair of pliers because of the possibility ofthe snap ring becoming detached from the tip of the pliers and flying away, which could injure humans or damage the peripheral equipment. After installing the snap ring, make sure that it is placed securely in the ring groove before supplying air.

Weight/Without Auto Switch Spring return (Spring extend)

Unit: g

Bore size (mm)	Stroke (mm) 5	10
12	29(31)	36(37)
16	39(39)	48(47)
20	63(68)	76(79)
25	92(98)	108(113)

∗( ): Spring extend

Weight/With Auto Switch (Built-in magnet) Spring return (Spring extend)

Unit: g

Bore size (mm)	Stroke (mm) 5	10
12	37(39)	44(45)
16	49(51)	58(59)
20	94(104)	107(115)
25	130(150)	146(165)

∗( ): Spring extend

Allowable Kinetic Energy

Unit: J

Bore size (mm)	12	16	20	25
Standard	0.022	0.038	0.055	0.09
Rubber bumper	0.043	0.075	0.11	0.18

Min. Operating Pressure

Unit: MPa

Bore size (mm)	12	16	20	25
Min. operating pressure	0.25	0.25	0.18	0.18

Option

Option	Availability
Rod end male thread	Available for all standard models of single acting single rod.

Example) CQSG16-10S
• Cylinder weight: CQSB16-10S·····48g
: Rear flange·····66g
Total 114g

Option Weights

Unit: g

Bore size (mm)		12	16	20	25
Rod end male thread	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Foot (including bolt)		55	65	159	181
Compact foot style (Including mounting bolt)		41	51	121	140
Front flange (including bolt)		58	70	143	180
Rear flange (including bolt)		56	66	137	171
Double clevis (including pin, snap ring, bolt)		34	40	92	127

Construction

Single acting/Spring return

Single acting/Spring extend

Single acting/Spring return/With auto switch (Built-in magnet)

ø12, ø16

ø20, 25

Single acting/Spring extend/With auto switch (Built-in magnet)

Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Collar	Aluminum bearing alloy	Anodized
③	Piston	Aluminum alloy	Spring return
		Stainless steel	Spring extend
④	Piston rod	Stainless steel	
⑤	Snap ring	Carbon tool steel	Phosphate coating
⑥	Snap ring	Carbon tool steel	Nickel plated
⑦	Rod end nut	Carbon steel	Nickel plated
⑧	Switch spacer	Aluminum alloy	Chromated
⑨	Return spring	Piano wire	Zinc chromated
⑩	Plug with fixed orifice	Alloy steel	Nickel plated
⑪	Magnet	—	
⑫ *	Rod seal	NBR	
⑬ *	Piston seal	NBR	
⑭ *	Tube gasket	NBR	

Rod end nut

Spring return

Spring extend

Replacement Parts: Seal Kits

Action	Bore size (mm)	Kit No.	Contents
Single acting Spring return	**12**	CQSB12-S-PS	Kits include item ⑬ from the table above.
	16	CQSB16-S-PS	
	20	CQSB20-S-PS	
	25	CQSB25-S-PS	

∗ Seal kits consist of item ⑬ contained in one kit, and can be ordered using the kit number for each respective tube bore size.

Replacement Parts: Seal Kits

Action	Bore size (mm)	Kit No.	Contents
Single acting Spring extend	**12**	CQSB12-T-PS	Kits include items ⑫, ⑬ and ⑭ from the table above.
	16	CQSB16-T-PS	
	20	CQSB20-T-PS	
	25	CQSB25-T-PS	

∗ Seal kits consist of items ⑫, ⑬ and ⑭ contained in one kit, and can be ordered using the kit number for each respective tube bore size.

Mounting Bolt for CQS

Special long bolt for through-hole mounting is available as an option
How to Order: Specify the required bolts
Example) Bolt M3 X 25ℓ 4pcs.

Single acting/Spring return

Single acting/Spring extend

Note) The appropriate plain washer must be used for through-hole mounting.

Single acting/Spring return

Model	C	D	Mounting bolt
CQSB12–5S	6.5	25	M3 X 25ℓ
–10S		30	X 30ℓ
CQSB16–5S	6.5	25	M3 X 25ℓ
–10S		30	X 30ℓ
CQSB20–5S	6.5	25	M5 X 25ℓ
–10S		30	X 30ℓ
CQSB25-5S	8.5	30	M5 X 30ℓ
–10S		35	X 35ℓ

Single acting/Spring extend

Model	C	D	Mounting bolt
CQSB12–5T	6.5	25	M3 X 25ℓ
–10T		30	X 30ℓ
CQSB16–5T	6.5	25	M3 X 25ℓ
–10T		30	X 30ℓ
CQSB20–5T	6.5	25	M5 X 25ℓ
–10T		30	X 30ℓ
CQSB25–5T	8.5	30	M5 X 30ℓ
–10T		35	X 35ℓ

Mounting Bolt for CDQS

Special long bolt for through-hole mounting is available as an option
How to Order: Specify the required bolts
Example) Bolt M3 X 30ℓ 4pcs.

Single acting/Spring return

Single acting/Spring extend

Note) The appropriate plain washer must be used for through-hole mounting.

Single acting/Spring return

Model	C	D	Mounting bolt
CDQSB12–5S	6.5	30	M3 X 30ℓ
–10S		35	X 35ℓ
CDQSB16–5S	6.5	30	M3 X 30ℓ
–10S		35	X 35ℓ
CDQSB20–5S	6.5	35	M5 X 35ℓ
–10S		40	X 40ℓ
CDQSB25–5S	8.5	40	M5 X 40ℓ
–10S		45	45ℓ

Single acting/Spring extend

Model	C	D	Mounting bolt
CDQSB12–5T	6.5	30	M3 X 30ℓ
–10T		35	X 35ℓ
CDQSB16–5T	6.5	30	M3 X 30ℓ
–10T		35	X 35ℓ
CDQSB20–5T	6.5	35	M5 X 35ℓ
–10T		40	X 40ℓ
CDQSB25–5T	8.5	40	M5 X 40ℓ
–10T		45	X 45ℓ

Basic (Through-hole/Both ends tapped)/CQSB, CDQSB

ø12

ø16

ø20, ø25

Rod end male thread

Rod end male thread

Bore (mm)	C_1	H_1	L_1	X
12	9	M5	14	10.5
16	10	M6	15.5	12
20	12	M8	18.5	14
25	15	M10 X 1.25	22.5	17.5

Basic

(All dimensions are common expect "A" and "B".)

Bore (mm)	Stroke range (mm)	Without auto switch				With auto switch				C	D	E	F	H	I	K	L	M	N	OA	OB	RA	RB	T
		A		B		A		B																
		5ST	10ST	5ST	10ST	5ST	10ST	5ST	10ST															
12	5, 10	25.5	30.5	22	27	30.5	35.5	27	32	6	6	25	5	M3	32	5	3.5	15.5	3.5	M4	6.5	7	4	0.5
16		25.5	30.5	22	27	30.5	35.5	27	32	8	8	29	5	M4	38	6	3.5	20	3.5	M4	6.5	7	4	0.5
20		29	34	24.5	29.5	39	44	34.5	39.5	7	10	36	5.5	M5	47	8	4.5	25.5	5.4	M6	9	10	7	1
25		32.5	37.5	27.5	32.5	42.5	47.5	37.5	42.5	12	12	40	5.5	M6	52	10	5	28	5.4	M6	9	10	7	1

Note) Basic: For the following bore/stroke sizes, through-hole is threaded over the entire length.
ø12 and ø16; 5 stroke, ø20 and ø25; 5 to 10 stroke
(With auto switch (Built-in magnet): ø20; 5 stroke
∗ Refer to p.1-442 for details of the rod end nut and mounting brackets.

Foot/CQSL, CDQSL

Rod end nut

Foot

(All dimensions are common between standard stroke and long stroke except "A", "B" and "LS".)

Bore (mm)	Stroke range (mm)	W/o auto switch			With auto switch			L	L_1	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS											
12	5, 10	35.3	17	5	40.3	22	10	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16		35.3	17	5	40.3	22	10	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20		41.2	19.5	7.5	51.2	29.5	17.5	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25		44.7	22.5	7.5	54.7	32.5	17.5	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Compact foot style: CQSLC/CDQSLC

Compact Foot Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L_1	LD	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS										
12	5, 10	44.6	17	35.6	49.6	22	40.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16		45.6	17	35.6	50.6	22	40.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20		57.5	19.5	45.9	67.5	29.5	55.9	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25		60.5	22.5	48.9	70.5	32.5	58.9	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod end male thread

Front flange/CQSF, CDQSF

Front flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5, 10	30.5	17	35.5	22	4.5	5.5	25	45	55	13.5	24
16		30.5	17	35.5	22	4.5	5.5	30	45	55	13.5	25.5
20		34	19.5	44	29.5	6.6	8	39	48	60	14.5	28.5
25		37.5	22.5	47.5	32.5	6.6	8	42	52	64	15	32.5

Rod end nut

Rear flange mounting/CQSG, CDQSG

Rear flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5, 10	26	17	31	22	4.5	5.5	25	45	55	3.5	14
16		26	17	31	22	4.5	5.5	30	45	55	3.5	15.5
20		32	19.5	42	29.5	6.6	8	39	48	60	4.5	18.5
25		35.5	22.5	45.5	32.5	6.6	8	42	52	64	5	22.5

Rod end nut

Double clevis/CQSD, CDQSD

Rod end nut

Double clevis

(All dimensions are common between standard stroke and long stroke except "A", "B" and "CL".)

Bore (mm)	Stroke range (mm)	W/o auto switch			With auto switch			CD	CT	CU	CW	CX	CZ	L	L_1	RR
		A	B	CL	A	B	CL									
12	5, 10	40.5	17	34.5	45.5	22	39.5	5	4	7	14	5	10	3.5	14	6
16		41.5	17	35.5	46.5	22	40.5	5	4	10	15	6.5	12	3.5	15.5	6
20		51	19.5	42	61	29.5	52	8	5	12	18	8	16	4.5	18.5	9
25		57.5	22.5	47.5	67.5	32.5	57.5	10	5	14	20	10	20	5	22.5	10

∗ Refer to P.1-442 for detail of the rod end nut and mounting brackets.

∗ For details about the double clevis pivot bracket, refer to page 1-382.

Dimensions/ø12 to ø25: Spring Extend

Basic (Through-hole/Both ends tapped)/CQSB, CDQSB

ø12

ø16

ø20, ø25

Rod end male thread

Rod end male thread

Bore (mm)	C_1	H_1	L_1		X
			5ST	10ST	
12	9	M5	19	24	10.5
16	10	M6	20.5	25.5	12
20	12	M8	23.5	28.5	14
25	15	M10 X 1.25	27.5	32.5	17.5

Basic (All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	Without auto switch				With auto switch				C	D	E	H	I	K	L		M	N	OA	OB	Q	RA	RB	T
		A		B		A		B																	
		5ST	10ST	5ST	10ST	5ST	10ST	5ST	10ST							5ST	10ST								
12	5, 10	30.5	40.5	22	27	35.5	45.5	27	32	6	6	25	M3	32	5	8.5	13.5	15.5	3.5	M4	6.5	7.5	7	4	0.5
16		30.5	40.5	22	27	35.5	45.5	27	32	8	8	29	M4	38	6	8.5	13.5	20	3.5	M4	6.5	7.5	7	4	0.5
20		34	44	24.5	29.5	44	54	34.5	39.5	7	10	36	M5	47	8	9.5	14.5	25.5	5.4	M6	9	9	10	7	1
25		37.5	47.5	27.5	32.5	47.5	57.5	37.5	42.5	12	12	40	M6	52	10	10	15	28	5.4	M6	9	11	10	7	1

Note) For the following bore/stroke sizes, through-hole is threaded over the entire length.
Basic ø12 and ø16; 5 stroke, ø20 and ø25; 5 to 10 stroke
With auto switch (Built-in magnet)/ø20; 5 stroke.
∗Refer to p.1-442 for detail of the rod end nut and mounting brackets.

Foot/CQSL, CDQSL

Foot

(All dimensions are common between standard stroke and long stroke except "A", "B" and "LS".)

Bore (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
12	5, 10	35.3	17	5	40.3	22	10
16		35.3	17	5	40.3	22	10
20		41.2	19.5	7.5	51.2	29.5	17.5
25		44.7	22.5	7.5	54.7	32.5	17.5

Bore (mm)	L	L_1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Rod end male thread

Compact foot style: CQSLC/CDQSLC

Compact Foot Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
12	5, 10	44.3	17	35.6	49.3	22	40.6
16		44.8	17	35.6	49.8	22	40.6
20		53	19.5	45.9	63	29.5	55.9
25		56.5	22.5	48.9	66.5	32.5	58.9

Bore size (mm)	L	L_1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod end male thread

Front flange/CQSF, CDQSF

Front flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5, 10	30.5	17	35.5	22	4.5	5.5	25	45	55	13.5	24
16		30.5	17	35.5	22	4.5	5.5	30	45	55	13.5	25.5
20		34	19.5	44	29.5	6.6	8	39	48	60	14.5	28.5
25		37.5	22.5	47.5	32.5	6.6	8	42	52	64	15	32.5

Rod end male thread

Rear flange/CQSG, CDQSG

Rear flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5, 10	26	17	31	22	4.5	5.5	25	45	55	3.5	14
16		26	17	31	22	4.5	5.5	30	45	55	3.5	15.5
20		32	19.5	42	29.5	6.6	8	39	48	60	4.5	18.5
25		35.5	22.5	45.5	32.5	6.6	8	42	52	64	5	22.5

Rod end male thread

Double clevis/CQSD, CDQSD

Rod end male thread

Double clevis

(All dimensions are common between standard stroke and long stroke except "A", "B" and "CL".)

Bore (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
12	5, 10	40.5	17	34.5	45.5	22	39.5
16		41.5	17	35.5	46.5	22	40.5
20		51	19.5	42	61	29.5	52
25		57.5	22.5	47.5	67.5	32.5	57.5

Bore (mm)	CD	CT	CU	CW	CX	CZ	L	L_1	RR
12	5	4	7	14	5	10	3.5	14	6
16	5	4	10	15	6.5	12	3.5	15.5	6
20	8	5	12	18	8	16	4.5	18.5	9
25	10	5	14	20	10	20	5	22.5	10

*Refer to p.1-442 for detail of the rod end nut and mounting brackets.

Compact Cylinder/Non-rotating Rod: Double Acting Single Rod

Series CQSK

ø12, ø16, ø20, ø25

How to Order

Standard CQSK B 20 – 30 D

With auto switch CDQSK B 20 – 30 D – A90 S

With auto switch
(Built-in magnet)

Mounting style

B	Through-hole/Both ends tapped (Standard)
L	Foot
LC	Compact foot style
F	Front flange
G	Rear flange
D	Double clevis

∗ Mounting brackets are shipped not assembled with the cylinder.

Bore size

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

Cylinder stroke (mm)

Standard stroke

Bore (mm)	Standard stroke (mm)
12, 16	5 , 10, 15, 20, 25, 30
20, 25	5 , 10, 15, 20, 25, 30, 35, 40, 45, 50

Intermediate strokes at 1mm intervals are available by using spacers with standard stroke sylinders. Intermediate stroke model has the same body length as standard model whose stroke is longer than that of the intermediate model.
Example) CQSKB25–47D: CQSKB25–50D with 3mm width spacer inside.

Action

D	Double acting

Option

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

Auto switch

—	Without auto switch (Built-in magnet)

∗ Refer to table below for auto switch model no.

Number of auto switches

—	2
S	1
n	n

Mounting Bracket Part No.

Bore size (mm)	Foot (1)	Compact Foot (1)	Flange	Double clevis
12	CQSK-L012	CQSK-LC012	CQSK-F012	CQSK-D012
16	CQSK-L016	CQSK-LC016	CQSK-F016	CQSK-D016
20	CQSK-L020	CQSK-LC020	CQSK-F020	CQSK-D020
25	CQSK-L025	CQSK-LC025	CQSK-F025	CQSK-D025

Note 1) 2 pieces per cylinder should be ordered.
Note 2) Each package contains the following parts.
Foot, Compact foot or Flange style: Body mounting bolt.
Double clevis style: Clevis pin, snap ring retainer, body mounting bolt.

Double acting double rod model is now available. Consult SMC for the detail.

Applicable Auto Switch

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire (m)∗ 0.5 (—)	3 (L)	5 (Z)	Applicable load	
Reed switch	—	Grommet	No	2 wire	24V	5V 12V	100V or less	A90V	A90	●	●	—	IC	Relay PLC
						12V	100V	A93V	A93	●	●	—	—	
			Yes	3 wire (Equiv. NPN)	—	5V	—	A96V	A96	●	●	—	IC	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	M9NV	M9N	●	●	—	—	Relay PLC
				3 wire (PNP)				M9PV	M9P	●	●	—		
				2 wire				M9BV	M9B	●	●	—		
	Diagnostic indication (2 colour)			3 wire (NPN)				M9NWV	M9NW	●	●	○		
				3 wire (PNP)				M9PWV	M9PW	●	●	○		
				2 wire				M9BWV	M9BW	●	●	○		
	Water resistant (2 colour)							—	M9BA	—	●	○		

∗ Lead wire length 0.5m ····· — (Example) A93
3m ····· L (Example) A93L
5m ····· Z (Example) M9NWZ

∗ Solid state switches marked with a "○" are manufatured upon receipt of order.

Standard Specifications

Style	Pneumatic(Non-lube)
Operating type	Double acting Single rod
Fluid	Air
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient and fluid temperature	Without auto switch –10C to 70ºC (No freezing)
	With auto switch –10C to 60ºC (No freezing)
Rubber bumper	None
Rod end nut	Female thread
Tolerance of rod end thread	JIS Class 2
Stroke length tolerance	$^{+1.0}_{0}$
Mounting	Through-hole/Both ends tapped
Piston speed	50 to 500mm/s

Minimum Strokes for Auto Switch Mounting

Unit: mm

No. of auto switches	D-A9□, D-M9□WV	D-A9□V	D-M9N	D-M9$^{B}_{P}$, D-M9□W	D-M9□V	D-M9BA
2	10	10	15*	20*	5	25*
1	10*	5	15	20*	5	25*

* Consult SMC for shorter stroke length than indicated in the table.

Theoretical Force

Unit: N

Bore size (mm)	Rod width across flats (mm)	Action	Piston area (mm^2)	Operating pressure (MPa)		
				0.3	0.5	0.7
12	5.2	IN	90	27	45	63
		OUT	113	34	57	79
16	6.2	IN	168	50	84	117
		OUT	201	60	101	141
20	8.2	IN	256	77	128	179
		OUT	314	94	157	220
25	10.2	IN	401	120	200	281
		OUT	491	147	245	344

Weight/Without Auto Switch

Unit: g

Bore size (mm)	Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	39	46	53	60	67	74	—	—	—	—
16	52	61	69	78	86	95	—	—	—	—
20	89	102	116	129	143	156	170	183	197	211
25	124	141	157	174	190	207	224	240	257	273

Weight/With Auto Switch (Built-in magnet)

Unit: g

Bore size (mm)	Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	47	54	62	69	76	83	—	—	—	—
16	63	71	80	88	97	106	—	—	—	—
20	122	136	149	163	176	190	203	217	230	244
25	168	185	201	218	235	251	268	284	301	317

Option Weights

Unit: g

Bore size (mm)		12	16	20	25
Rod end male thread	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Foot (including bolt)		55	64	158	179
Compact foot style (Including mounting bolt)		41	51	121	140
Front flange (including bolt)		58	69	142	178
Rear flange (including bolt)		56	66	137	171
Double clevis (including pin, snap ring, bolt)		34	40	92	127

⚠ Caution

Snap Ring Installation/Removal

① For installation and removal, use an appropriate pair of pliers (tool for installing a C type snap ring).
② Exercise caution even when using an appropriate pair of pliers because of the possibility of the snap ring becoming detached from the tip of the pliers and flying away, which could injure humans or damage the peripheral equipment. After installing the snap ring, make sure that it is placed securely in the ring groove before supplying air.

Allowable Kinetic Energy

Unit: J

Bore size (mm)	12	16	20	25
Kinetic energy	0.022	0.038	0.055	0.09

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	12	16	20	25
Min. operating pressure	0.07	0.07	0.05	0.05

Rod Non-rotating Specifications

Bore size (mm)	12	16	20	25
Rod non-rotating accuracy	1		0.7	

Option

Description	Availability
Rod end male thread	Available for all non-rotating rod models.

Calculation Example) CQSKF20-5DM
• Cylinder weight: CQSKB20-5D·····89g
• Option weight: Rod end male thread·····10g
: Front flange·····142g
Total 241g

Construction

Standard

ø12

ø16, ø20, ø25

With auto switch (Built-in magnet)

ø12

ø16

ø20, ø25

Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Rod cover	Aluminum alloy (1)	Anodized
③	Piston	Aluminum alloy	Chromated
④	Piston rod	Stainless steel	
⑤	Switch spacer	Aluminum alloy	Chromated
⑥	Magnet	—	
⑦	Ron rotating guide	Oil impregnated sintered alloy	ø16, ø20 and ø25
⑧	Hex. socket head cap screw	Alloy steel	Nickel plated
⑨	Plain washer	Rolled steel	Nickel plated
⑩	Rod end nut	Carbon steel	Nickel plated
⑪*	Rod seal	NBR	
⑫*	Piston seal	NBR	
⑬*	Tube gasket	NBR	

Note 1) ø12: Aluminum bearing alloy.

Replacement Parts: Seal Kits

Bore size (mm)	Kit No.	Contents
12	CQSKB12-PS	Kits include items ⑪, ⑫ and ⑬ from the table above.
16	CQSKB16-PS	
20	CQSKB20-PS	
25	CQSKB25-PS	

*Seal kits consist of items ⑪, ⑫ and ⑬ contained in one kit, and can be ordered using the order number for each respective tube bore size.

⚠ Precautions

⚠ Caution

①Any kind of operation producing rotation torque to piston rod must be considered.
The non-rotating guide would be deformed and the accuracy would be compromised. See the table below for rotation torque allowance.

Allowable rotation torque Nm	ø12	ø16	ø20	ø25
	0.04	0.04	0.2	0.25

②Load to piston rod must always be in an axial direction.
③When fixing work piece to piston rod end, completely retract the rod before applying any kind of torque. Prevent torque on the guide bushing by holding the rod stationary with a wrench. Do not apply torque directly to the rod.

Mounting Bolt for CQSK

Special long bolt for through hole mounting is available as an option.
How to Order: Specify the required bolts.

Example) Bolt M3 X 30ℓ 2pcs.

Note) The appropriate plain waher must be used for through-hole.

Model	C	D	Mounting bolt	C'	D'	Mounting bolt
CQSKB12–5D	6.5	25	M3 X 25ℓ	6.5	30	M3 X 30ℓ
–10D		30	X 30ℓ		35	X 35ℓ
–15D		35	X 35ℓ		40	X 40ℓ
–20D		40	X 40ℓ		45	X 45ℓ
–25D		45	X 45ℓ		50	X 50ℓ
–30D		50	X 50ℓ		55	X 55ℓ
CQSKB16–5D	6.5	25	M3 X 25ℓ	6.5	30	M3 X 30ℓ
–10D		30	X 30ℓ		35	X 35ℓ
–15D		35	X 35ℓ		40	X 40ℓ
–20D		40	X 40ℓ		45	X 45ℓ
–25D		45	X 45ℓ		50	X 50ℓ
–30D		50	X 50ℓ		55	X 55ℓ
CQSKB20–5D	6.5	25	M5 X 25ℓ	6.5	30	M5 X 30ℓ
–10D		30	X 30ℓ		35	X 35ℓ
–15D		35	X 35ℓ		40	X 40ℓ
–20D		40	X 40ℓ		45	X 45ℓ
–25D		45	X 45ℓ		50	X 50ℓ
–30D		50	X 50ℓ		55	X 55ℓ
–35D		55	X 55ℓ		60	X 60ℓ
–40D		60	X 60ℓ		65	X 65ℓ
–45D		65	X 65ℓ		70	X 70ℓ
–50D		70	X 70ℓ		75	X 75ℓ
CQSKB25–5D	8.5	30	M5 X 30ℓ	8.5	35	M5 X 35ℓ
–10D		35	X 35ℓ		40	X 40ℓ
–15D		40	X 40ℓ		45	X 45ℓ
–20D		45	X 45ℓ		50	X 50ℓ
–25D		50	X 50ℓ		55	X 55ℓ
–30D		55	X 55ℓ		60	X 60ℓ
–35D		60	X 60ℓ		65	X 65ℓ
–40D		65	X 65ℓ		70	X 70ℓ
–45D		70	X 70ℓ		75	X 75ℓ
–50D		75	X 75ℓ		80	X 80ℓ

Mounting Bolt for CDQSK

Special long bolt for through hole mounting is available as an option.
How to Order: Specify the required bolts.

Example) Bolt M3 X 35ℓ 2pcs.

Note) The appropriate plain washer must be used for through-hole.

Model	C	D	Mounting bolt	C'	D'	Mounting bolt
CDQSKB12–5D	6.5	30	M3 X 30ℓ	6.5	35	M3 X 35ℓ
–10D		35	X 35ℓ		40	X 40ℓ
–15D		40	X 40ℓ		45	X 45ℓ
–20D		45	X 45ℓ		50	X 50ℓ
–25D		50	X 50ℓ		55	X 55ℓ
–30D		55	X 55ℓ		60	X 60ℓ
CDQSKB16–5D	6.5	30	M3 X 30ℓ	6.5	35	M3 X 35ℓ
–10D		35	X 35ℓ		40	X 40ℓ
–15D		40	X 40ℓ		45	X 45ℓ
–20D		45	X 45ℓ		50	X 50ℓ
–25D		50	X 50ℓ		55	X 55ℓ
–30D		55	X 55ℓ		60	X 60ℓ
CDQSKB20–5D	6.5	35	M5 X 35ℓ	6.5	40	M5 X 40ℓ
–10D		40	X 40ℓ		45	X 45ℓ
–15D		45	X 45ℓ		50	X 50ℓ
–20D		50	X 50ℓ		55	X 55ℓ
–25D		55	X 55ℓ		60	X 60ℓ
–30D		60	X 60ℓ		65	X 65ℓ
–35D		65	X 65ℓ		70	X 70ℓ
–40D		70	X 70ℓ		75	X 75ℓ
–45D		75	X 75ℓ		80	X 80ℓ
–50D		80	X 80ℓ		85	X 85ℓ
CDQSKB25–5D	8.5	40	M5 X 40ℓ	8.5	45	M5 X 45ℓ
–10D		45	X 45ℓ		50	X 50ℓ
–15D		50	X 50ℓ		55	X 55ℓ
–20D		55	X 55ℓ		60	X 60ℓ
–25D		60	X 60ℓ		65	X 65ℓ
–30D		65	X 65ℓ		70	X 70ℓ
–35D		70	X 70ℓ		75	X 75ℓ
–40D		75	X 75ℓ		80	X 80ℓ
–45D		80	X 80ℓ		85	X 85ℓ
–50D		85	X 85ℓ		90	X 90ℓ

Dimensions/ø12 to ø25

∗Refer to P.1-408 for mounting position and height of auto switch.

Basic (Through-hole/Both ends tapped)/CQSK, CDQSK

ø12

ø16

ø20, ø25

Rod end male thread

Rod end male thread

Bore(mm)	C_1	H_1	L_1	X
12	9	M5	14	10.5
16	10	M6	15.5	12
20	12	M8	18.5	14
25	15	M10 X 1.25	22.5	17.5

Basic

(All dimension are common except "A" and "B").

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		C	E	F	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
		A	B	A	B															
12	5 to 30	25.5	22	30.5	27	6	25	5	M3	32	5.2	3.5	15.5	3.5	M4	6.5	12.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	29	5	M4	38	6.2	3.5	20	3.5	M4	6.5	12.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	36	5.5	M5	47	8.2	4.5	25.5	5.4	M6	9	13	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	40	5.5	M6	52	10.2	5	28	5.4	M6	9	14	10	7	1

Note) For the following bore/stroke sizes, through hole is threaded over the entire length.
Basic: ø12 and ø16; 5 stroke, ø20; 5 to 15 stroke, ø25; 5 and 10 stroke.
Note) With auto switch (Built-in magnet): ø20; 5 stroke
∗Refer to p.1-442 for detail of the rod end nut and mounting brackets.

Foot/CQSKL, CDQSKL

Foot

(All dimensions are common between standard stroke and long stroke except "A", "B" and "LS".)

Bore (mm)	Stroke range (mm)	W/o auto switch			With auto switch			L	L_1	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS											
12	5 to 30	40.3	22	10	45.3	27	15	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	5 to 30	40.3	22	10	45.3	27	15	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	5 to 50	46.2	24.5	12.5	56.2	34.5	22.5	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	5 to 50	49.7	27.5	12.5	59.7	37.5	22.5	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Rod end nut

Compact foot style: CQSKLC/CDQSKLC

Compact Foot Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L_1	LD	LH	LT	LX	LY	LZ	X	Y
		A	**B**	**LS**	**A**	**B**	**LS**										
12	5 to 30	49.6	22	40.6	54.6	27	45.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	5 to 30	50.6	22	40.6	55.6	27	45.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	5 to 50	62.5	24.5	50.9	72.5	34.5	60.9	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	5 to 50	65.5	27.5	53.9	75.5	37.5	63.9	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Front flange/CQSKF, CDQSKF

Front flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5 to 30	35.5	22	40.5	27	4.5	5.5	25	45	55	13.5	24
16	5 to 30	35.5	22	40.5	27	4.5	5.5	30	45	55	13.5	25.5
20	5 to 50	39	24.5	49	34.5	6.6	8	39	48	60	14.5	28.5
25	5 to 50	42.5	27.5	52.5	37.5	6.6	8	42	52	64	15	32.5

Rod end nut

Rear flange/CQSKG, CDQSKG

Rear flange

(All dimensions are common between standard stroke and long stroke except "A", and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5 to 30	31	22	36	27	4.5	5.5	25	45	55	3.5	14
16	5 to 30	31	22	36	27	4.5	5.5	30	45	55	3.5	15.5
20	5 to 50	37	24.5	47	34.5	6.6	8	39	48	60	4.5	18.5
25	5 to 50	40.5	27.5	50.5	37.5	6.6	8	42	52	64	5	22.5

Rod end nut

Double clevis/CQSKD, CDQSKD

Rod end nut

Double clevis

(All dimensions are common between standard stroke and long stroke except "A", "B" and "CL".)

Bore (mm)	Stroke range (mm)	W/o auto switch			With auto switch			CD	CT	CU	CW	CX	CZ	L	L_1	RR
		A	B	CL	A	B	CL									
12	5 to 30	45.5	22	39.5	50.5	27	44.5	5	4	7	14	5	10	3.5	14	6
16	5 to 30	46.5	22	40.5	51.5	27	45.5	5	4	10	15	6.5	12	3.5	15.5	6
20	5 to 50	56	24.5	47	66	34.5	57	8	5	12	18	8	16	4.5	18.5	9
25	5 to 50	62.5	27.5	52.5	72.5	37.5	62.5	10	5	14	20	10	20	5	22.5	10

*Refer to p.1-442 for detail of the rod end nut and mounting brackets.

* For details about the double clevis pivot bracket, refer to page 1-382

Compact Cylinder/Anti-lateral Load

Series CQS□S

ø12, ø16, ø20, ø25

How to Order

Standard CQS B S 20 – 30 D C

With auto switch CDQS B S 20 – 30 D C – A90 S

With auto switch
(Built-in magnet)

Mounting style

B	Through-hole/Both ends tapped (Standard)
L	Foot
LC	Compact foot style
F	Front flange
G	Rear flange
D	Double clevis

∗ Mounting brackets are shipped not assembled with the cylinder.

Style

S	Anti-lateral load

Bore size

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

Cylinder stroke (mm)

Action

D	Double acting

Option

C	Rod end female thread with rubber bumper
CM	Rod end male thread with rubber bumper

Auto switch

–	Without auto switch (Built-in magnet)

∗ Refer to table below for auto switch model no.

Number of auto switches

–	2
S	1
n	n

Standard stroke

Bore (mm)	Standard stroke (mm)
12, 16	5, 10, 15, 20, 25, 30
20, 25	5 , 10, 15, 20, 25, 30, 35, 40, 45, 50

Intermediate strokes at 1mm intervals are available by using spacers with standard stroke cylinders.
Intermediate stroke model has the same body length as standard model whose stroke is longer than that of the intermediate model.
Example) CQSBS25–47DC: CQSBS25–50DC
with 3mm width spacer inside.

Mounting Bracket Part No.

Bore size (mm)	Foot (1)	Compact Foot (1)	Flange	Double clevis
12	CQS-L012	CQS-LC012	CQS-F012	CQS-D012
16	CQS-L016	CQS-LC016	CQS-F016	CQS-D016
20	CQS-L020	CQS-LC020	CQS-F020	CQS-D020
25	CQS-L025	CQS-LC025	CQS-F025	CQS-D025

Note 1) 2 pieces per cylinder should be ordered.
Note 2) Each package contains the following parts.
Foot, Compact foot or Flange style: Body mounting bolt.
Double clevis style: Clevis pin, snap ring retainer, body mounting bolt

Applicable Auto Switches

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire(m)∗ 0.5 (–)	Lead wire(m)∗ 3 (L)	Lead wire(m)∗ 5 (Z)	Applicable load	Applicable load
Reed switch	—	Grommet	No	2 wire	24V	5V 12V	100V or less	A90V	A90	●	●	—	IC	Relay PLC
			Yes			12V	100V	A93V	A93	●	●	—	—	
				3 wire (Equiv. NPN)	—	5V	—	A96V	A96	●	●	—	IC	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	M9NV	M9N	●	●	—	—	Relay PLC
				3 wire (PNP)				M9PV	M9P	●	●	—		
				2 wire				M9BV	M9B	●	●	—		
	Diagnostic indication (2 colour indication)			3 wire (NPN)				M9NWV	M9NW	●	●	○		
				3 wire (PNP)				M9PWV	M9PW	●	●	○		
				2 wire				M9BWV	M9BW	●	●	○		
	Water resistant (2 colour indication)							—	M9BA	—	●	○		

∗ Lead wire length 0.5m ····· – (Example) A93
3m ····· L (Example) A93L
5m ····· Z (Example) M9NWZ

∗ Solid state switches marked with a "○" are manufactured upon receipt of order.

Standard Specifications

Style	Pneumatic(Non-lube)
Action	Double acting Single rod
Fluid	Air
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient and fluid temperature	Without auto switch –10C to 70ºC (No freezing)
	With auto switch –10C to 60ºC (No freezing)
Rubber bumper	Standard equipment
Rod end thread	Female thread
Tolerance of rod end thread	JIS Class 2
Allowable tolerance of stroke length	$^{+1.0}_{0}$
Mounting	Through-hole/Both ends tapped
Piston speed	50 to 500mm/s

Minimum Strokes for Auto Switch Mounting

Unit: mm

No. of auto switches	D-A9□, D-M9□WV	D-A9□V	D-M9N	D-M9$^{B}_{P}$, D-M9□W	D-M9□V	D-M9BA
2	10	10	15*	20*	5	25*
1	10*	5	15*	20*	5	25*

*Consult SMC for shorter stroke length than indicated in the table.

JIS symbol

Theoretical Force

Unit: N

Bore size (mm)	Rod diameter (mm)	Action	Piston area (mm²)	Operating pressure (MPa)		
				0.3	0.5	0.7
12	6	IN	84.8	25	42	59
		OUT	113	34	57	79
16	8	IN	151	45	75	106
		OUT	201	60	101	141
20	10	IN	236	71	118	165
		OUT	314	94	157	220
25	12	IN	378	113	189	264
		OUT	491	147	245	344

Allowable Kinetic Energy

Unit: J

Bore size (mm)	12	16	20	25
Kinetic energy	0.043	0.075	0.11	0.18

Minimum Operating Pressure

Unit: MPa

Bore size (mm)	12	16	20	25
Min. operating pressure	0.07	0.07	0.05	0.05

Option

Description	Application
Rod end male thread	Available for double acting single rod models.

Calculation Example: CQSDS20-20DCM
•Cylinder weight : CQSBS20-20DC····· 114g
•Option weight : Rod end male thread····· 10g
: Double clevis ····· 92g
Total 216g

Weight/Without Auto Switch

Unit: g

Bore size (mm)	Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	37	43	50	57	63	70	–	–	–	–
16	49	57	66	74	83	92	–	–	–	–
20	75	88	101	114	127	140	153	165	178	191
25	109	125	140	156	172	188	204	220	236	252

Weight/With Auto Switch (Built-in magnet)

Unit: g

Bore size (mm)	Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	45	51	58	65	71	78	–	–	–	–
16	59	67	76	85	94	103	–	–	–	–
20	106	119	132	145	157	170	183	195	208	221
25	151	167	183	199	215	231	246	262	278	294

Option Weights

Unit: g

Bore size (mm)		12	16	20	25
Rod end male thread	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Foot (including bolt)		55	65	159	181
Compact foot style (Including mounting bolt)		41	51	121	140
Front flange (including bolt)		58	70	143	180
Rear flange (including bolt)		56	66	137	171
Double clevis (including pin, snap ring, bolt)		34	40	92	127

Construction

Basic

Rod end male thread

With auto switch (Buit-in magnet)

ø12, ø16

ø20, ø25

Components Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Collar	Aluminum alloy	Anodized
③	Piston	Aluminum alloy	Chromated
④	Piston rod	Stainless steel	
⑤	Snap ring	Carbon tool steel	Phosphate coating
⑥	Rod end nut	Carbon steel	Nickel plated
⑦	Awitch spacer	Aluminum alloy	Chromated
⑧	Bumper A	Urethane	
⑨	Bumper B	Urethane	
⑩	Bushing	Oil impregnated sintered alloy	
⑪	Wearing	Resin	
⑫	Magnet	———	
⑬*	Rod seal	NBR	
⑭*	Piston seal	NBR	
⑮*	Tube gasket	NBR	

Replacement Parts: Seal Kits

Bore size (mm)	Kit No.	Contents
12	CQSB12-PS	Kits include items ⑬, ⑭ and ⑮ from the table above.
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	

*Seal kits consist of items ⑬, ⑭ and ⑮ contained in one kit, and can be ordered using the order number for each respective tube bore size.

Mounting Bolt for CQSBS

Special long bolt for through hole mounting is available as an option.
How to Order: Specify the required bolts.
Example) Bolt M3 X 30ℓ 4pcs.

Model	C	D	Mounting bolt
CQSBS12 – 5DC	6.5	30	M3 X 30ℓ
– 10DC		35	X 35ℓ
– 15DC		40	X 40ℓ
– 20DC		45	X 45ℓ
– 25DC		50	X 50ℓ
– 30DC		55	X 55ℓ
CQSBS16 – 5DC	6.5	30	M3 X 30ℓ
– 10DC		35	X 35ℓ
– 15DC		40	X 40ℓ
– 20DC		45	X 45ℓ
– 25DC		50	X 50ℓ
– 30DC		55	X 55ℓ
CQSBS20 – 5DC	6.5	30	M5 X 30ℓ
– 10DC		35	X 35ℓ
– 15DC		40	X 40ℓ
– 20DC		45	X 45ℓ

Model	C	D	Mounting bolt
CQSBS20 – 25DC	6.5	50	M5 X 50ℓ
– 30DC		55	X 55ℓ
– 35DC		60	X 60ℓ
– 40DC		65	X 65ℓ
– 45DC		70	X 70ℓ
– 50DC		75	X 75ℓ
CQSBS25 – 5DC	8.5	35	M5 X 35ℓ
– 10DC		40	X 40ℓ
– 15DC		45	X 45ℓ
– 20DC		50	X 50ℓ
– 25DC		55	X 55ℓ
– 30DC		60	X 60ℓ
– 35DC		65	X 65ℓ
– 40DC		70	X 70ℓ
– 45DC		75	X 75ℓ
– 50DC		80	X 80ℓ

Note) The appropriate plain washer must be used for through-hole.

Mounting Bolt for CDQSBS/With Auto Switch

Special long bolt for through hole mounting is available as an option.
How to Order: Specify the required bolts.
Example) Bolt M3 X 35ℓ 4pcs.

Model	C	D	Mounting bolt
CDQSBS12 – 5DC	6.5	35	M3 X 35ℓ
– 10DC		40	X 40ℓ
– 15DC		45	X 45ℓ
– 20DC		50	X 50ℓ
– 25DC		55	X 55ℓ
– 30DC		60	X 60ℓ
CDQSBS16 – 5DC	6.5	35	M3 X 35ℓ
– 10DC		40	X 40ℓ
– 15DC		45	X 45ℓ
– 20DC		50	X 50ℓ
– 25DC		55	X 55ℓ
– 30DC		60	X 60ℓ
CDQSBS20 – 5DC	6.5	40	M5 X 40ℓ
– 10DC		45	X 45ℓ
– 15DC		50	X 50ℓ
– 20DC		55	X 55ℓ

Model	C	D	Mounting bolt
CDQSBS20 – 25DC	6.5	60	M5 X 60ℓ
– 30DC		65	X 65ℓ
– 35DC		70	X 70ℓ
– 40DC		75	X 75ℓ
– 45DC		80	X 80ℓ
– 50DC		85	X 85ℓ
CDQSBS25 – 5DC	8.5	45	M5 X 45ℓ
– 10DC		50	X 50ℓ
– 15DC		55	X 55ℓ
– 20DC		60	X 60ℓ
– 25DC		65	X 65ℓ
– 30DC		70	X 70ℓ
– 35DC		75	X 75ℓ
– 40DC		80	X 80ℓ
– 45DC		85	X 85ℓ
– 50DC		90	X 90ℓ

Note) The appropriate plain washer must be used for through-hole.

Rod End Allowable Lateral Load

- All loads to piston rod must be applied in axial direction only.
- Unavoidable side loads to rod end must be less than the values in the figures.
- Cylinder installation requires accurate alignment.
- Adoption of guide mechanism is strongly recommended for the case when CQS is used as stopper to prevent non-rotating piston rod from side forces.

Note 1) Right figure: Rod end female thread.
Note 2) Lateral load allowance varies depending upon rod end shape dimensions or load value (distance to the centre of the gravity of load.) Consult SMC.

Without auto switch

With auto switch

Dimensions/ø12 to ø25

Basic (Through-hole/Both ends tapped)/CQSBS, CDQSBS

ø12

ø16

ø20, ø25

Rod end male thread

Rod end male thread

Bore (mm)	C_1	H_1	L_1	X
12	9	M5	14	10.5
16	10	M6	15.5	12
20	12	M8	18.5	14
25	15	M10 X 1.25	22.5	17.5

Basic

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	W/o auto switch		With auto switch		C	D	E	F	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
		A	B	A	B																
12	5 to 30	25.5	22	30.5	27	6	6	25	5	M3	32	5	3.5	15.5	3.5	M4	6.5	7.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	8	29	5	M4	38	6	3.5	20	3.5	M4	6.5	7.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	10	36	5.5	M5	47	8	4.5	25.5	5.4	M6	9	8	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	12	40	5.5	M6	52	10	5	28	5.4	M6	9	9	10	7	1

Note) For the following bore/stroke sizes, through-hole is threaded over the entire length.
ø20; 5 to 10 stroke, ø25; 5 stroke

*Refer to p.1-442 for details of the rod end nut and mounting brackets.

Foot/CQSLS, CQDSLS

Rod end male thread

Compact foot style: CQSLCS/CDQSLCS

Rod end male thread

Foot

(All dimensions are common between standard stroke and long stroke except "A", "B" and "LS".)

Bore (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
12	5 to 30	40.3	22	10	45.3	27	15
16	5 to 30	40.3	22	10	45.3	27	15
20	5 to 50	46.2	24.5	12.5	56.2	34.5	22.5
25	5 to 50	49.7	27.5	12.5	59.7	37.5	22.5

Bore (mm)	L	L_1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Compact Foot Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	**B**	**LS**	**A**	**B**	**LS**
12	5 to 30	49.6	22	40.6	54.6	27	45.6
16	5 to 30	50.6	22	40.6	55.6	27	45.6
20	5 to 50	62.5	24.5	50.9	72.5	34.5	60.9
25	5 to 50	65.5	27.5	53.9	75.5	37.5	63.9

Bore size (mm)	**L**	**L_1**	**LD**	**LH**	**LT**	**LX**	**LY**	**LZ**	**X**	**Y**
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Front flange/CQSFS, CDQSFS

Rod end male thread

Front flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
12	5 to 30	35.5	22	40.5	27
16	5 to 30	35.5	22	40.5	27
20	5 to 50	39	24.5	49	34.5
25	5 to 50	42.5	27.5	52.5	37.5

Bore (mm)	FD	FT	FV	FX	FZ	L	L_1
12	4.5	5.5	25	45	55	13.5	24
16	4.5	5.5	30	45	55	13.5	25.5
20	6.6	8	39	48	60	14.5	28.5
25	6.6	8	42	52	64	15	32.5

Rear flange/CQSGS, CDQSGS

Rod end male thread

Rear flange

(All dimensions are common between standard stroke and long stroke except "A" and "B".)

Bore (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
12	5 to 30	31	22	36	27
16	5 to 30	31	22	36	27
20	5 to 50	37	24.5	47	34.5
25	5 to 50	40.5	27.5	50.5	37.5

Bore (mm)	FD	FT	FV	FX	FZ	L	L_1
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	8	39	48	60	4.5	18.5
25	6.6	8	42	52	64	5	22.5

Double clevis/CQSDS, CDQSDS

Rod end male thread

Double clevis

(All dimensions are common between standard atroke and long stroke except "A", "B" and "CL".)

Bore (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
12	5 to 30	45.5	22	39.5	50.5	27	44.5
16	5 to 30	46.5	22	40.5	51.5	27	45.5
20	5 to 50	56	24.5	47	66	34.5	57
25	5 to 50	62.5	27.5	52.5	72.5	37.5	62.5

Bore (mm)	CD	CT	CU	CW	CX	CZ	L	L_1	RR
12	5	4	7	14	5	10	3.5	14	6
16	5	4	10	15	6.5	12	3.5	15.5	6
20	8	5	12	18	8	16	4.5	18.5	9
25	10	5	14	20	10	20	5	22.5	10

* Refer to p.1-442 detail of the rod end nut and mounting brackets.
* For details about the double clevis pivot bracket,, refer to page 1-382

Auto Switch Specifications

Refer to p.6-15 of details of auto switch.

Applicable auto switch

Applicable bore size	Auto switch model		Electrical entry	
ø12, ø16 ø20, ø25	Reed switch	**D-A90**	Grommet	2 wire, In-line
		D-A93		
		D-A96		3 wire, In-line
		D-A90V		2 wire, Perpendicular
		D-A93V		
		D-A96V		3 wire, Perpendicular
	Solid state switch	**D-M9N**		3 wire, NPN, In-line
		D-M9P		3 wire, PNP, In-line
		D-M9B		2 wire, In-line
		D-M9NW		3 wire, NPN, In-line (2 colour)
		D-M9PW		3 wire, PNP, In-line (2 colour)
		D-M9BW		2 wire, In-line(2 colour)
		D-M9NV		3 wire, NPN, Perpendicular
		D-M9PV		3 wire, Water resistant
		D-M9BV		2 wire, Perpendicular
		D-M9NWV		3 wire, NPN, Perpendicular(2 colour)
		D-M9PWV		3 wire, Water resistant(2 colour)
		D-M9BWV		2 wire, Perpendicular(2 colour)
		D-M9BAL		2 wire, In-line(2 colour), Water resistant

⚠ Precautions

- If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the diagram on the right (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable. Therefore, check with SMC for this type of application.

Auto Switch Mounting Position and Mounting Height

(Double acting single rod, Single acting single rod/spring return, spring extend, Long stroke, Anti-lateral load, Double acting double rod)

ø12

Mounting

a) **b)**

D-A9□

D-A9□V

D-M9□

D-M9□V
D-M9□WV

D-M9□W
D-M9BAL

ø16 to ø25

Mounting

a) **b)**

Auto Switch Mounting Position and Mounting Height

Auto switch model No.		D-A9□			D-A9□V			D-M9N/D-M9B D-M9P/D-M9□W			D-M9□V/D-M9□WV		
Symbol		A	B	W	A	B	Hs	A	B	W	A	B	W
Double acting: single rod, Single acting: single rod/spring return, spring extend													
Bore size (mm)	12	1.5 (2.5)	0	1.5[4] (2.5[5])	1.5 (2.5)	0	17	5.5	4.5	5.5	5.5 (6.5)	4.5 (3.5)	19
	16	2	0	2[4.5]	2	0	19	6	4	6	6	4	21
	20	6	3.5	–1.5[1]	6	3.5	22.5	10	7.5	2.5	10	7.5	24.5
	25	7	5.5	–3.5[-1]	7	5.5	24.5	11	9.5	0.5	11	9.5	26.5
Long stroke													
Bore size (mm)	12	5	7	–5[-2.5]	5	7	17	9	11	–1	9	11	19.5
	16	5.5	6	–4.5[-2]	5.5	6	19	9.5	10.5	–0.5	9.5	10.5	21.5
	20	9	11.5	–10[-7.5]	9	11.5	22.5	13	16	–6	13	16	25
	25	10	13.5	–12[-9.5]	10	13.5	24.5	14	18	–8	14	18	27
Anti-lateral load													
Bore size (mm)	12	6	0.5	1[3.5]	6	0.5	17	10	5	5	10	5	19.5
	16	5.5	1	0.5[3]	5.5	1	19	9.5	5.5	4.5	9.5	5.5	21.5
	20	9	5	–3.5[-1]	9	5	22.5	13	9.5	0.5	13	9.5	25
	25	10	7	–5.5[-3]	10	7	24.5	14	11.5	–1.5	14	11.5	27
Double acting: double rod													
Bore size (mm)	12	1.5	5.5	3.5[6]	1.5	5.5	17	5.5	9.5	0.5	5.5	9.5	19.5
	16	2	5	3[5.5]	2	5	19	6	9	1	6	9	21.5
	20	6	10	8[10.5]	6	10	22.5	10	14	–4	10	14	25
	25	7	12	10[12.5]	7	12	24.5	11	16	–6	11	16	27

Auto switch model No.		D-M9BAL			
Symbol		A	B	W	Hs
Double acting: single rod, Single acting: single rod/spring return, spring extend					
Bore size (mm)	12	4.5	3.5	14.5	16.5
	16	5	3	15	18.5
	20	9	6.5	11.5	22
	25	10	8.5	9.5	24
Long stroke					
Bore size (mm)	12	8	10	8	16.5
	16	8.5	9.5	8.5	18.5
	20	12	15	3	22
	25	13	17	1	24
Anti-lateral load					
Bore size (mm)	12	9	4	14	16.5
	16	8.5	4.5	13.5	18.5
	20	12	8.5	9.5	22
	25	13	10.5	7.5	24
Double acting: double rod					
Bore size (mm)	12	4.5	8.5	9.5	16.5
	16	5	8	10	18.5
	20	9	13	5	22
	25	10	15	3	24

Note 1) The product is shipped out of the factory in installation state "a)". To change the electrical entry direction of the switch on the head, refer to installation state "b)".
Note 2) In the W column in the table, if the indicated dimension is a negative number, the auto switch must be installed inward from the end of the cylinder body.
Note 3) The D-M9N, M9B, M9P, M9□W, and M9BAL cannot be installed on the single acting: single rod style.

Auto Switch Mounting Position and Mounting Height (Non-rotating rod)

Auto switch model		D-A9□			D-A9□V			D-M9N/D-M9B D-M9P/D-M9□W			D-M9□V/D-M9□WV		
Symbol		A	B	W	A	B	Hs	A	B	W	A	B	W
Bore size (mm)	12	1.5	0	1.5(4)	1.5	0	17	5.5	4.5	5.5	5.5	4.5	19
	16	2	0	2(4.5)	2	0	19	6	4	6	6	4	21
	20	6	3.5	–1.5(1)	6	3.5	22.5	10	7.5	2.5	10	7.5	24.5
	25	7	5.5	–3.5(-1)	7	5.5	24.5	11	9.5	0.5	11	9.5	26.5

Auto switch model		D-M9BAL			
Symbol		A	B	W	Hs
Bore size (mm)	12	4.5	3.5	14.5	16.5
	16	5	3	15	18.5
	20	9	6.5	11.5	22
	25	10	8.5	9.5	24

Note 1) The product is shipped out of the factory in installation state "a)".
To change the electrical entry direction of the switch on the head, refer to installation state "b)".