Compact Cylinder

Series CQS

ø12, ø16, ø20, ø25

Ideal for machine designs with small space requirements

The "D-M9" auto switch will not protrude from switch mounting groove.

Square body shape gives you flexibility for designing machine.

Cross-section of a cylinder tube is the same configuration regardless of w/ switch or w/o switch.

Auto switch mounting allows for flexible designing requirements

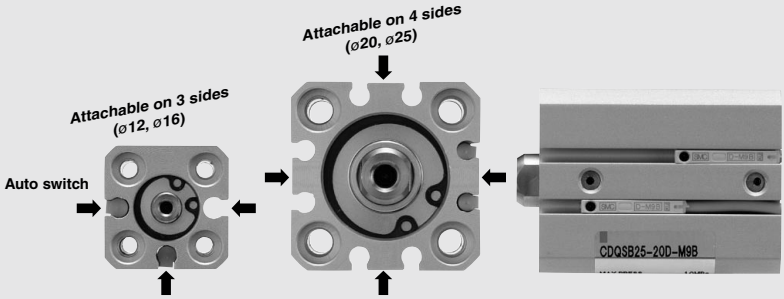
3 faces on ø12, ø16, and all 4 faces including port side on ø20, ø25.

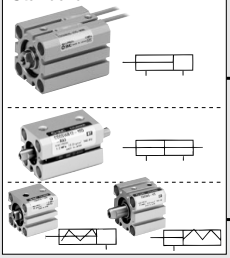
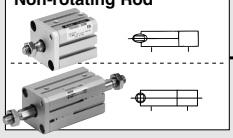
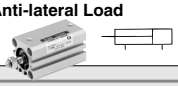
2 way basic mounting: Through-hole or both ends tapped

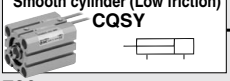
Basic mounting is 2 way. You can choose either through-hole or both ends tapped mounting.

Non-rotating accuracy Non-rotating rod

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



			Bore size (mm)	Stroke (mm)		Page
Standard 	Double acting	Single rod **CQS**	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	725
				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	
		Double rod **CQSW**			ø12, ø16: 5, 10, 15, 20; 25, 30 ø20, ø25: 5, 10, 15, 20, 25; 30, 35, 40, 45, 50	734
	Single acting	Return/Extend **CQS**			ø12, ø16, ø20, ø25: 5, 10	741
Non-rotating Rod 	Double acting	Single rod **CQSK**			ø12, ø16: 5, 10, 15, 20; 25, 30 ø20, ø25: 5, 10, 15, 20, 25; 30, 35, 40, 45, 50	749
		Double rod **CQSKW**				756
Anti-lateral Load 	Double acting	Single rod **CQS□S**			ø12, ø16: 5, 10, 15, 20; 25, 30 ø20, ø25: 5, 10, 15, 20, 25; 30, 35, 40, 45, 50	763

Smooth cylinder (Low friction) **CQSY** 	Refer to Best Pneumatics No. 3.	**Low-speed cylinder** **CQSX** 	Refer to Best Pneumatics No. 3.

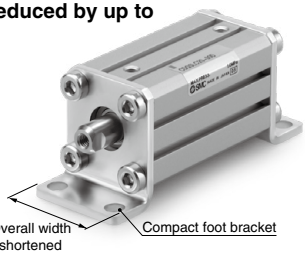
SMC

Reduction of installation space

Added compact type foot brackets.

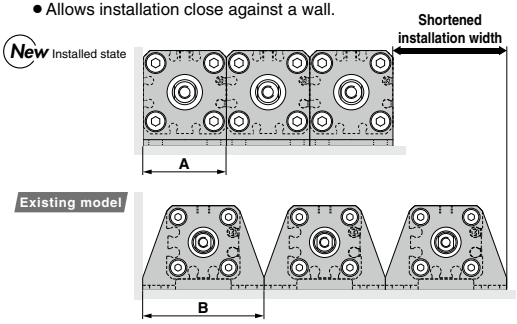
■Compact foot bracket has the same width as the cylinder.

Overall width reduced by up to
43% (for ø12)



■More compact installation space possible

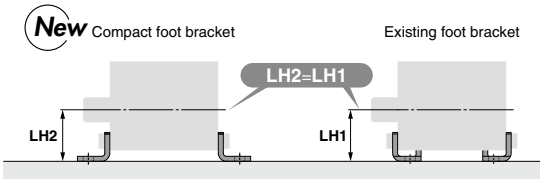
- Short pitch mounting is possible.
- Allows installation close against a wall.



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.



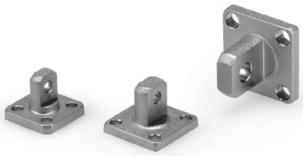
Applicable cylinders: C(D)QS, C(D)QSW, C(D)QS (Single acting, return/extend), C(D)QSK, C(D)QSKW (Non-rotating), C(D)QS□S (Anti-lateral load)

Reduction in labor for design

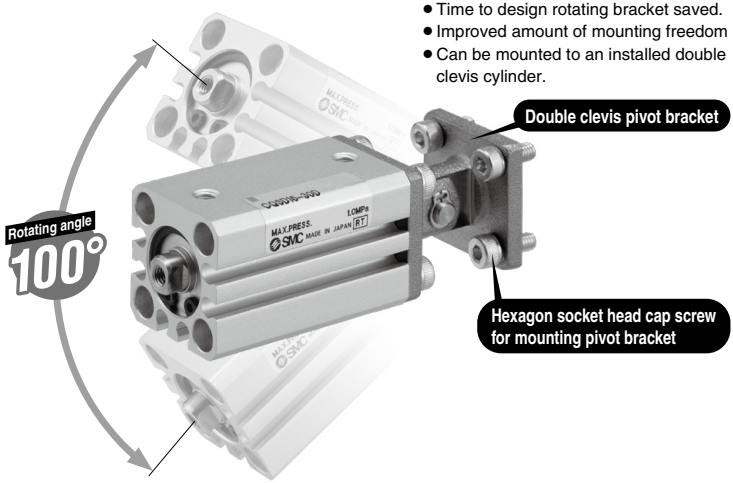
Added pivot brackets for double clevis.

■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.)

Series CQS

●: Standard
◎: Made to Order specifications
○: Special product (Contact SMC for details.)
—: Not available

Symbol	Specification	Applicable bore size	CQS (Standard) Double acting Single rod	Double acting Double rod	Single acting Single rod/ Extension	Single acting Single rod/ Retraction
			ø12 to ø25			
Standard	Standard	ø12 to ø25	●	●	●	●
D	Built-in magnet		●	●	●	●
CQS□-□M	Rod end male thread		●	●	●	●
CQS□-□C	With rubber bumper		●	●	○	○
CQS□-□F	With boss on head end		●	—	●	●
CQS$^{LF}_{G}$	Foot, Flange		●	●	●	●
CQSD	Double clevis style		●	—	●	●
10-, 11-	Clean series		●	○	○	○
25-	Copper (Cu)-free (5)		●	○	○	○
25A-	Copper (Cu) and zinc (Zn)-free (5)		●	○	○	○
20-	Copper (4) and Fluorine-free		●	●	●	●
CQS□M	Cylinder with Stable Lubrication Function (Lube-retainer) (6)	ø20 to ø25	●	○	○	○
XB6	Heat-resistant cylinder (–10 to 150 °C)	ø12 to ø25	◎	◎	○	○
XB7	Cold-resistant cylinder (–40 to 70 °C)		◎	◎	○	○
XB9	Low-speed cylinder (5 to 50 mm/s)		◎	◎	○	○
XB10	Intermediate stroke (Using exclusive body)		◎	◎	◎	○
XB13	Low-speed cylinder (5 to 50 mm/s)		◎	◎	○	○
XC6	Piston rod, retaining ring, rod end nut made of stainless steel		◎	◎	◎	◎
XC8	Adjustable stroke cylinder/Adjustable extension type		◎	—	○	○
XC9	Adjustable stroke cylinder/Adjustable retraction type		◎	—	○	○
XC10	Dual stroke cylinder/Double rod type		◎	—	◎	◎
XC11	Dual stroke cylinder/Single rod type		◎	—	○	○
XC36	With boss on rod side		◎	◎	◎	◎
XC85	Grease for food processing equipment		◎	◎	◎	◎
XC92	Dust resistant cylinder		◎	○	○	○
X235	Change of piston rod end of double rod cylinder		—	◎	—	—
X271	Fluororubber seal		◎	◎	◎	◎
X525	Long stroke of adjustable extension stroke cylinder (-XC8)		◎	—	○	○
X526	Long stroke of adjustable retraction stroke cylinder (-XC9)		◎	—	○	○
X633	Intermediate stroke of double rod type		—	◎	—	—
X636	Long stroke of dual stroke single rod		◎	—	○	—
X1876	With concave shape end boss on the cylinder tube head side	ø20, ø25	◎	—	◎	◎

Note 1) A rubber bumper comes as standard.
Note 2) For ø12 and ø16 only. (○) for ø20 and ø25.
Note 3) Refer to Best Pneumatics No. 3 for low-speed cylinders.
Note 4) Copper-free for the externally exposed part.
Note 5) For details, refer to the SMC website.
Note 6) Only the products with an auto switch and without rubber bumper are compatible.

	CQSK (Non-rotating rod)		CQS (Long stroke)	CQS□S (Anti-lateral load)	CQSY Smooth cylinder (Low friction) (3)	CQSX Low-speed cylinder (3)
	Double acting		Double acting	Double acting	Double acting	Double acting
	Single rod	Double rod	Single rod	Single rod	Single rod	Single rod
	ø12 to ø25					
	●	●	●	●	●	●
	●	●	●	●	●	●
	●	●	●	●	●	●
	○	○	● (1)	● (1)	● (1)	●
	●	—	○	●	○	○
	●	●	●	●	●	●
	●	—	●	●	●	●
	○	○	○	○	—	●
	○	○	●	●	○	○
	○	○	●	●	○	○
	○	○	●	●	—	—
	—	—	○	○	○	○
	○	○	○	○	—	—
	○	○	○	○	—	—
	○	○	○	○	—	—
	○	○	◎	◎	○	○
	○	○	○	○	—	—
	◎	◎	◎	◎	○	○
	◎	—	○	○	○	○
	◎	—	○	○	○	○
	◎	—	○	○	○	○
	◎	—	○	○	○	○
	○	○	◎ (2)	◎ (2)	◎ (2)	◎ (2)
	○	○	◎	◎	—	—
	—	—	○	○	—	—
	—	○	—	—	—	—
	○	○	◎	◎	—	—
	○	—	○	○	○	○
	○	—	○	○	○	○
	—	◎	—	—	—	—
	○	—	○	○	○	○
	◎	—	—	◎	○	—

Series CQS
Specific Product Precautions

Be sure to read before handling. Refer to front matter 57 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

Operating Precautions

⚠Caution

1. All loads to piston rod must be applied in axial direction only.
- When a lateral load is applied unavoidably, ensure that it should not exceed the allowable lateral load to the rod end as specified in graph (1) to (5).
- When installing a cylinder, centering should be required accurately.
- 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. When a workpiece is secured to the end of the piston rod, ensure that the piston rod is retracted entirely, and place a wrench on the portion of the rod that protrudes beyond the section. Also, tighten by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.

Retaining Ring Installation/Removal

⚠Caution

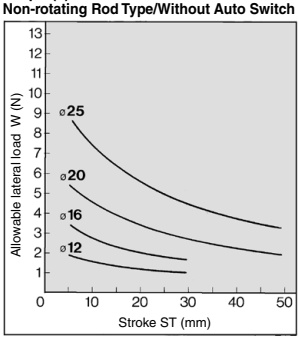
1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).

2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

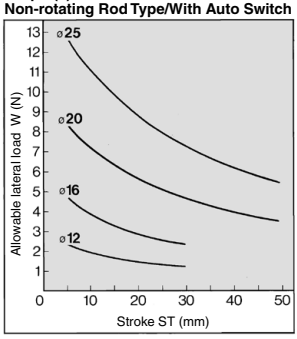
Allowable Lateral Load at Rod End

W (Mounting orientation: Horizontal)

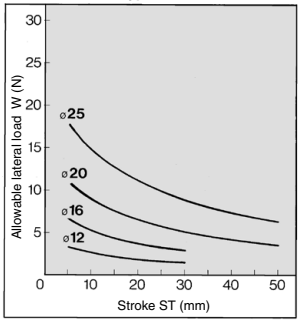
Graph (1) Standard: Non-rotating Rod Type/Without Auto Switch



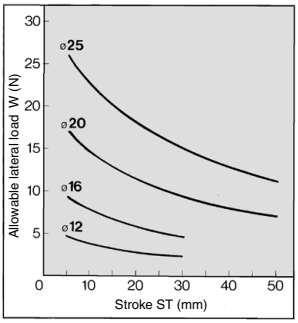
Graph (2) Standard: Non-rotating Rod Type/With Auto Switch



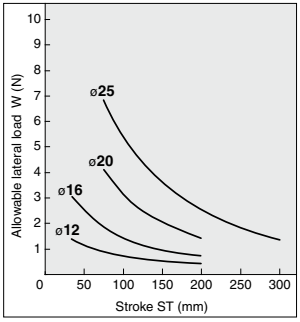
Graph (3) Anti-lateral Load Type/Without Auto Switch



Graph (4) Anti-lateral Load Type/With Auto Switch



Graph (5) Long Stroke/With & Without Auto Switch



Note 1) Graph (1) to (5): Rod end female thread

Note 2) Lateral load allowance varies depending upon rod end shape dimensions or load value (distance to the center of the gravity of load). Please consult with SMC.

Compact Cylinder: Standard Type
Double Acting, Single Rod
Series CQS
ø12, ø16, ø20, ø25

How to Order

	CQS	B	20	–	30	D		–				
With auto switch	CDQS	B	20	–	30	D		–	M9BW		–	

With auto switch (Built-in magnet)

Mounting style

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

∗ In the case of long strokes, use either ends tapped mounting or bracket mounting.
∗ Mounting brackets are shipped together (but not assembled).
∗ Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQS" on pages 730 and 731.

Bore size

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

Cylinder stroke (mm)

Bore size	Standard stroke	Long stroke
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

For "Manufacture of Intermediate Strokes", refer to page 726.

Action

D	Double acting

Body option

<Standard stroke>

Nil	Standard
C	With rubber bumper
M	Rod end male thread
F	Boss on head end

∗ Combination of body options is available. CM, FC, FM, FCM

<Long stroke>

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

∗ Rubber bumper is standard equipment for long stroke type.

Auto switch

Nil	Without auto switch

∗ Refer to the table below for the applicable auto switch model.

Number of auto switches

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

Made to Order
Refer to page 726 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSL25-30D

Applicable Auto Switches/Refer to pages 1559 to 1673 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	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		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1	○	○	●	○	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1	○	○	●	○	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—		—	P3DWA∗∗	●	—	●	●	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V∗2	●	●	●	●	—	—	Relay, PLC
							100 V or less	A90V	●	—	●	—	—	IC circuit	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

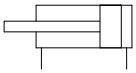
∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗∗ Available only for ø25. It is mounted away from the port side to avoid interference with fittings.

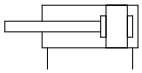
∗ Since there are other applicable auto switches than listed, refer to page 771 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1626 and 1627. For the D-P3DWA□, refer to the **WEB catalog**.
∗ Auto switches are shipped together (not assembled).
Note) There is the case D-A9□V/M9□V/M9□WV/M9□AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.

Symbol

Without cushion



Rubber bumper



Made to Order: Individual Specifications

(For details, refer to pages 774 to 776)

Symbol	Specifications
-X271	Fluororubber seals
-X525	Long stroke of adjustable extension stroke cylinder (-XC8)
-X526	Long stroke of adjustable retraction stroke cylinder (-XC9)
-X636	Long stroke of dual stroke single rod
-X1876	With concave shape end boss on the cylinder tube head side

Made to Order Specifications

(For details, refer to pages 1675 to 1818.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat-resistant cylinder (–10 to 150 °C) (without an auto switch)
-XB7	Cold-resistant cylinder (–40 to 70 °C) (without an auto switch)
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB10	Intermediate stroke (Using exclusive body)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC6	Piston rod, retaining ring, rod end nut made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC36	With boss in rod side
-XC85	Grease for food processing equipment
-XC92	Dust resistant cylinder

Body Option

Description	Application
Rod end male thread	Available for all standard models of double acting, single rod.
Rubber bumper	

∗ Rubber bumper is standard equipment for long stroke type.

Moisture Control Tube Series IDK

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **Series IDK in the WEB catalog**.

Specifications

Bore size (mm)		12	16	20	25
Action		Double acting, Single rod			
Fluid		Air			
Lubrication		Not required (Non-lube)			
Proof pressure		1.5 MPa			
Maximum operating pressure		1.0 MPa			
Minimum operating pressure		0.07 MPa		0.05 MPa	
Ambient and fluid temperature		Without auto switch: –10 to 70°C (No freezing)			
		With auto switch: –10 to 60°C (No freezing)			
Cushion		None, Rubber bumper ∗			
Rod end thread		Female thread			
Stroke length tolerance		Standard stroke: $^{+1.0}_{0}$ Long stroke: $^{+1.4}_{0}$ ∗			
Piston speed		50 to 500 mm/s			
Allowable kinetic energy (J)	Standard type	0.022	0.038	0.055	0.09
	With rubber bumper	0.043	0.075	0.11	0.18

∗ Stroke length tolerance does not include the deflection of the bumper.
∗ Only rubber bumper is available for the long stroke type.

Theoretical Output

OUT IN (N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	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

Manufacture of Intermediate Stroke

Description		Spacer is installed in the standard stroke body.		Exclusive body (**-XB10**)	
Part no.		Refer to "How to Order" for the standard model no. (page 725).		Suffix "-XB10" to the end of standard model no. (page 725).	
Standard stroke	Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.		Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.	
	Stroke range	Bore size	Stroke range	Bore size	Stroke range
		12, 16	1 to 29	12, 16	6 to 29
		20, 25	1 to 49	20, 25	6 to 49
Long stroke	Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.		Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.	
	Stroke range	Bore size	Stroke range	Bore size	Stroke range
		12, 16	31 to 199	12, 16	31 to 199
		20	51 to 199	20	51 to 199
		25	51 to 299	25	51 to 299
Example		Part no.: CQSB25-47D CQSB25-50D with 3 mm width spacer inside. B dimension is 72.5 mm.		Part no.: CQSB25-47D-XB10 Makes 47 stroke tube. B dimension is 69.5 mm.	

Refer to pages 769 to 771 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket/Part no.

Weight/Without Auto Switch

(g)

Bore size (mm)	Cylinder 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

Weight/With Auto Switch (Built-in magnet)

(g)

Bore size (mm)	Cylinder 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

Additional Weight

(g)

Bore size (mm)		**12**	**16**	**20**	**25**
Rod end male thread	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Rubber bumper * (No need to add for long stroke)		0	1	–2	–3
Compact foot style (Including mounting bolt)		41 (39)	51 (47)	121 (115)	140 (131)
Foot style (Including mounting bolt)		55 (53)	65 (61)	159 (153)	181 (172)
Rod side flange style (Including mounting bolt)		58 (56)	70 (66)	143 (137)	180 (171)
Head side flange style (Including mounting bolt)		56	66	137	171
Double clevis style (Including pin, snap ring, bolt)		34	40	92	127

( ): denotes the values of long stroke model.

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

Note1) When ordering foot and compact foot brackets, order 2 pieces per cylinder.
Note2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange style: Body mounting bolt
Double clevis style: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

For standard stroke

Calculation: (Example) **CQSD20-20DCM**

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

201 g

Allowable Kinetic Energy

Load Mass and Piston Speed

[J]

Bore size (mm)	12	16	20	25
Standard/ Allowable kinetic energy: **Ea**	0.022	0.038	0.055	0.09
With rubber bumper/ Allowable kinetic energy: **Eb**	0.043	0.075	0.110	0.18

Kinetic energy E (J) = $\frac{(m1+m2)V^2}{2}$

m1: Mass of cylinder movable parts kg
m2: Load mass kg
V: Piston speed m/s

Mass of Movable Parts/Without Built-in Magnet: CQSB□-□D(C)(M)

(g)

Bore size (mm)	Cylinder stroke (mm)																	
	5	10	15	20	25	30	35	40	45	50	75	100	125	150	175	200	250	300
12	5	6	7	8	9	11	16	17	18	19	25	30	36	41	47	53	—	—
16	8	10	12	14	16	18	28	30	32	34	44	54	64	74	84	94	—	—
20	15	18	21	24	28	31	34	37	40	43	73	88	104	119	135	150	—	—
25	23	28	32	37	41	46	50	55	59	64	112	135	157	179	202	224	269	314

Mass of Movable Parts/With Built-in Magnet: CDQSB□-□D(C)(M)

(g)

Bore size (mm)	Cylinder stroke (mm)																	
	5	10	15	20	25	30	35	40	45	50	75	100	125	150	175	200	250	300
12	5	7	8	9	10	11	16	18	19	20	25	31	37	42	48	53	—	—
16	9	11	13	15	17	19	29	31	33	35	45	55	65	75	85	95	—	—
20	21	24	27	30	33	36	39	42	46	49	78	93	109	124	140	155	—	—
25	37	42	46	51	55	59	64	68	73	77	118	141	163	186	208	230	275	320

Additional Mass of Movable Parts

(g)

Bore size (mm)		12	16	20	25
Rod end male thread	Male thread	2	3	6	13
	Nut	1	2	4	8
Rubber bumper (No need to add for long stroke)		0	–1	–2	–2
Foot style, Rod side flange style (No need to add for long stroke)		2	4	6	9

Calculation: (Example) **CQSB20-20DCM**
●Basic mass: CQSB20-20D ..... 24 g
●Additional mass: Rod end male thread ..... 10 g
: With rubber bumper ..... –2 g
Total 32 g

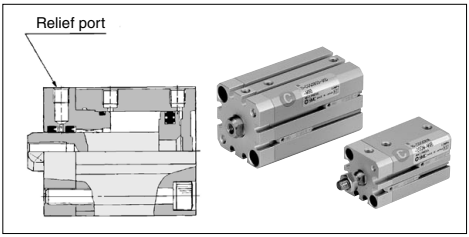
Clean Series (Standard stroke is only available.)

10 — C(D)QSB Bore size — Stroke D(M)

Clean Series

10	Relief type
11	Vacuum type

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.



For details, refer to the separate catalog "Pneumatic Clean Series".

Specifications

Action	Double acting, Single rod
Bore size (mm)	ø12, ø16, ø20, ø25
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Rubber bumper	None
Piping	Screw-in piping
Piston speed	30 to 400 mm/s
Mounting	Through-hole/Both ends tapped common
Auto switch	Mountable

Note) For details, please contact SMC.

Smooth Cylinder

CQS Y Mounting Bore size — Stroke DC(M)

Smooth Cylinder

Smooth operation with a little sticking and slipping at low speed.
Dual-side low friction operation is possible.

Some of the parts are different from the dimensions of the double acting, single rod type.
Refer to Best Pneumatics No. 3.

Specifications

Bore size (mm)	12	16	20	25
Type	Pneumatic (Non-lube)			
Action	Double acting, Single rod			
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)			
Cushion	None, Rubber bumper*			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0}_{0}$ *			
Mounting	Through-hole/Both ends tapped common			
Piston speed	50 to 500 mm/s			
Allowable leakage	0.5 L/min (ANR) or less			

* Stroke length tolerance does not include the deflection of the bumper.

Minimum operating pressure (MPa)

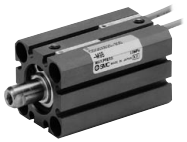
Bore size (mm)	12	16	20	25
Minimum operating pressure	0.03		0.02	

Low-speed Cylinder

CQS X Mounting Bore size — Stroke D(C)(M)

Low-speed Cylinder

Smooth operation with a little sticking and slipping at low speed.
Can start smoothly with a little ejection even after being rendered for hours.



The dimensions are the same as the double acting, single rod type.
Refer to Best Pneumatics No. 3.

Specifications

Bore size (mm)	12	16	20	25
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 With auto switch: –10 to 60°C (No freezing)			
Rubber bumper	None, Rubber bumper*			
Rod end thread	Female thread			
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			

* Stroke length tolerance does not include the deflection of the bumper.

Minimum operating pressure (MPa)

	12	16	20	25
Minimum operating pressure	0.03	0.03	0.025	0.025

Compact Cylinder with Stable Lubrication Function (Lub-retainer)

C D QS | **Mounting style** | **Bore size** | **M** — | **Stroke** | **D** | **Rod end thread** | — | **Auto switch**

∗ Available only for with auto switch.

- **With auto switch (Built-in magnet)**
- **With stable lubrication function (Lub-retainer)**

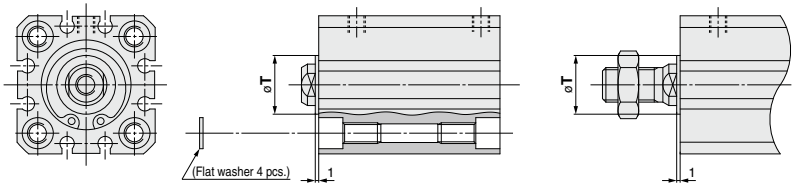
Specifications

Bore size (mm)	**20, 25**
Action	Double acting, Single rod
Minimum 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,	15
25	35, 40, 45, 50	18

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

Mounting Bracket Part No.

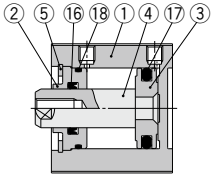
Bore size (mm)	Foot	Compact foot	Flange
20	CQS-LM020	CQS-LCM020	CQS-FM020
25	CQS-LM025	CQS-LCM025	CQS-FM025

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

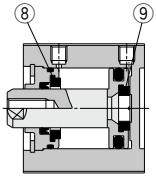
For details, refer to **the WEB catalog**.

Construction

Basic style

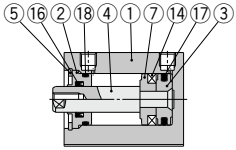


With rubber bumper

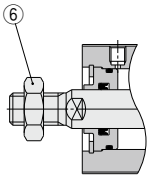


With auto switch (Built-in magnet)

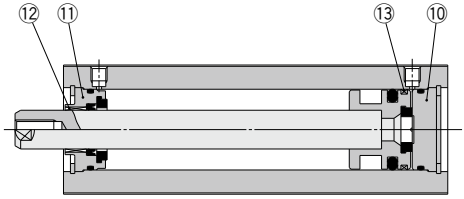
ø12, ø16



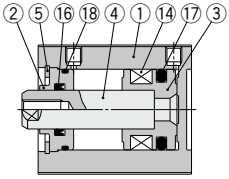
Rod end male thread



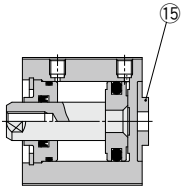
Long stroke



ø20, ø25



With boss on head end



Component 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	**Retaining ring**	Carbon tool steel	Phosphate coated
6	**Rod end nut**	Carbon steel	Nickel plated
7	**Spacer for switch type**	Aluminum alloy	Chromated
8	**Bumper A**	Urethane	
9	**Bumper B**	Urethane	
10	**Bottom plate**	Aluminum alloy	Anodized

Component Parts

No.	Description	Materia	Note
11	**Collar**	Aluminum alloy	Anodized
12	**Bushing**	Oil-impregnated sintered alloy	
13	**Wear ring**	Resin	
14	**Magnet**	—	
15	**Centering location ring**	Aluminum alloy	Anodized
16*	**Rod seal**	NBR	
17*	**Piston seal**	NBR	
18*	**Tube gasket**	NBR	

Replacement Parts: Seal Kit (Basic style)

Bore size (mm)	Kit no.	Contents
12	CQSB12-PS	Set of nos. above ⑯, ⑰, ⑱
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	

Replacement Parts: Seal Kit (Long stroke)

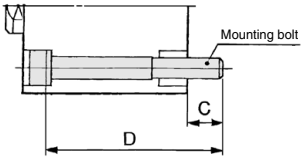
Bore size (mm)	Kit no.	Contents
12	CQSB12-L-PS	Set of nos. above ⑯, ⑰, ⑱
16	CQSB16-L-PS	
20	CQSB20-L-PS	
25	CQSB25-L-PS	

* Seal kit includes ⑯, ⑰, ⑱. Order the seal kit, based on each bore size. (The long stroke type includes 2 tube gaskets.)
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

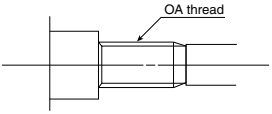
Mounting Bolt for CQS without Auto Switch

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

Example) CQ-M3x25L 4 pcs.



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



Cylinder model	C	D	Mounting bolt part no.
CQSB12–5D	6.5	25	CQ-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			
–125DC			
–150DC			
–175DC			
–200DC			
CQSB16–5D	6.5	25	CQ-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			
–125DC			
–150DC			
–175DC			
–200DC			

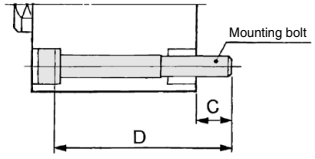
Cylinder model	C	D	Mounting bolt part no.
CQSB20–5D	6.5	25	CQ-M5 x 25L
–10D		30	x 30L
–15D		35	x 35L
–20D		40	x 40L
–25D		45	x 45L
–30D		50	x 50L
–35D		55	x 55L
–40D		60	x 60L
–45D		65	x 65L
–50D		70	x 70L
–75DC	Secure the cylinder by using the OA screws that are provided with the cylinder tube.		
–100DC			
–125DC			
–150DC			
–175DC			
–200DC			
CQSB25–5D	8.5	30	CQ-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			

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

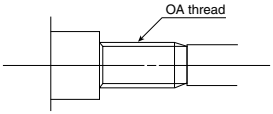
Mounting Bolt for CDQS with Auto Switch

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

Example) CQ-M3x30L 4 pcs.



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



Accessory

For accessory bracket for **Series CQS**, refer to page 804, since it is commonly used with **Series CQ2**.

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

Cylinder model	C	D	Mounting bolt part no.
CDQSB12–5D	6.5	30	CQ-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			
–125DC			
–150DC			
–175DC			
–200DC			
CDQSB16–5D	6.5	30	CQ-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			
–125DC			
–150DC			
–175DC			
–200DC			

Cylinder model	C	D	Mounting bolt part no.
CDQSB20–5D	6.5	35	CQ-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
–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	CQ-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			

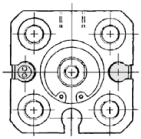
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Dimensions: ø12 to ø25

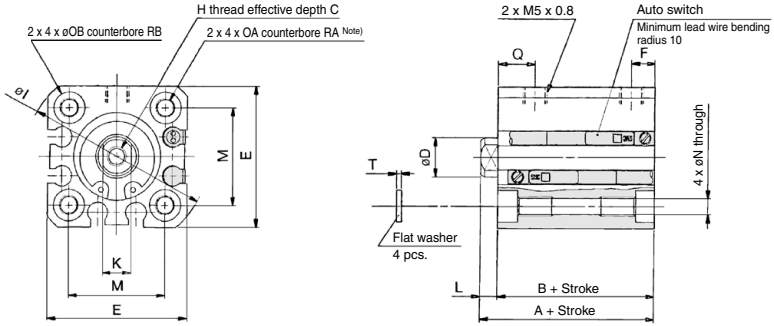
Basic style (Through-hole/Both ends tapped common): CQSB/CDQSB

∗ For the auto switch mounting position and its mounting height, refer to page 769.

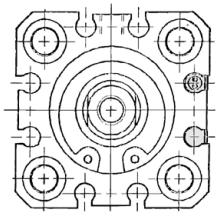
ø12



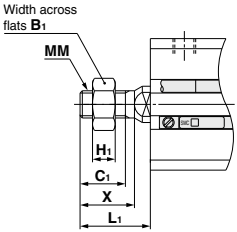
ø16



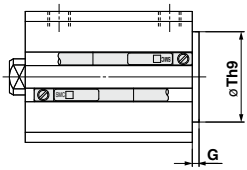
ø20, ø25



Rod end male thread



With boss on head end



• 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 (-XB10)····Add stroke. Also, the stroke length that exceeds the standard stroke would be the long stroke dimension.

Rod End Male Thread

Bore size (mm)	B_1	C_1	H_1	Standard stroke L_1	Long stroke L_1	MM	X
12	8	9	4	14	24	M5 x 0.8	10.5
16	10	10	5	15.5	25.5	M6 x 1.0	12
20	13	12	5	18.5	28.5	M8 x 1.25	14
25	17	15	6	22.5	32.5	M10 x 1.25	17.5

With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	$15^{\ 0}_{-0.043}$
16	1.5	$20^{\ 0}_{-0.052}$
20	2	$13^{\ 0}_{-0.043}$
25	2	$15^{\ 0}_{-0.043}$

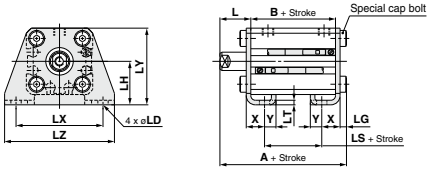
Note1) The product with boss on head end is applicable to only the standard stroke.
Note2) With boss on rod end : Option (Suffix "-XC36" to the end of part number.) Note that only bore sizes ø12 and ø16 are applicable to the long stroke.

Basic Style

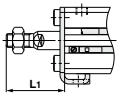
Bore size (mm)	Standard stroke range (mm)	Standard stroke: Without auto switch A	B	F	L	With auto switch A	B	F	L	Long stroke range (mm)	Long stroke: With/Without auto switch A	B	F	L	C	D	E	H	I	K	M	N	OA	OB	Q	RA	RB	T
12	5 to 30	20.5	17	5	3.5	25.5	22	5	3.5	35 to 200	45.5	32	7.5	13.5	6	6	25	M3 x 0.5	32	5	15.5	3.5	M4 x 0.7	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 x 0.7	38	6	20	3.5	M4 x 0.7	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 x 0.8	47	8	25.5	5.4	M6 x 1.0	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 x 1.0	52	10	28	5.4	M6 x 1.0	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 type has the same dimensions as those indicated above.
∗ For details about the rod end nut and accessory brackets, refer to page 804.

Foot style: CQSL/CDQSL



Rod end male thread



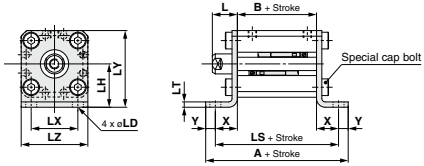
Foot Style

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

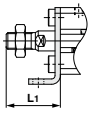
Bore size (mm)	L	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSLC/CDQSLC



Rod end male thread



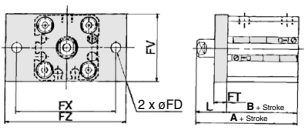
Compact Foot Style

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

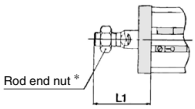
Bore size (mm)	L	L1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

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

Rod side flange style: CQSF/CDQSF



Rod end male thread



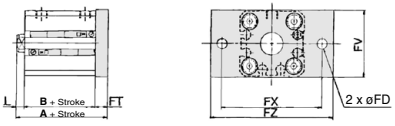
Rod Side Flange Style

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

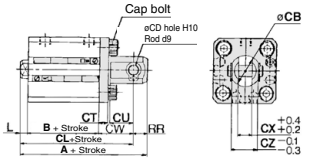
Bore size (mm)	Standard stroke range (mm)	Standard stroke								Long stroke range (mm)	Long stroke			
		Without auto switch				With auto switch					Without/With auto switch			
		A	B	L	L1	A	B	L	L1		A	B	L	L1
12	5 to 30	26	17	3.5	14	31	22	3.5	14	35 to 200	51	32	13.5	24
16	5 to 30	26	17	3.5	15.5	31	22	3.5	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

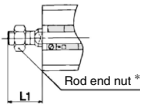
Flange bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 804.

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

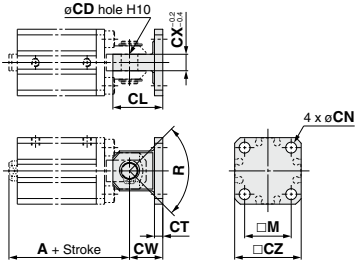
Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

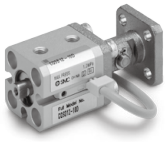
* For details about the double clevis pivot bracket, refer to page 733-2.
* For details about the rod end nut and accessory brackets, refer to page 804.

Accessory Dimensions

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 switch	With auto switch										
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 Type
Double Acting, Double Rod
Series CQSW
ø12, ø16, ø20, ø25

How to Order

CQSW **B** **20** – **30** **D** **C** – ☐

With auto switch **CDQSW** **B** **20** – **30** **D** **C** – **M9BW** ☐ – ☐

With auto switch
(Built-in magnet)

Mounting style

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

∗ Mounting brackets are shipped together (but not assembled).
∗ Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQSW" on page 738.

Bore size

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

Cylinder stroke (mm)

Standard Stroke

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

For "Manufacture of Intermediate Strokes", refer to page 735.

Body option

Nil	Standard
C	With rubber bumper
M	Rod end male thread

∗ Combination of body options is available. CM

Action

D	Double acting

Auto switch

Nil	Without auto switch

∗ Refer to the table below for the applicable auto switch model.

Number of auto switches

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

Made to Order
Refer to page 735 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSWL25-30D

Applicable Auto Switches/Refer to pages 1559 to 1673 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	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		**M9NWV**	**M9NW**	●	●	●	○	○	IC circuit	
				3-wire (PNP)			**M9PWV**	**M9PW**	●	●	●	○	○		
				2-wire	12 V		**M9BWV**	**M9BW**	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		**M9NAV**∗1	**M9NA**∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)			**M9PAV**∗1	**M9PA**∗1	○	○	●	○	○		
				2-wire	12 V		**M9BAV**∗1	**M9BA**∗1	○	○	●	○	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—		—	**P3DWA**∗∗	●	—	●	●	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	**A93V**∗2	**A93**	●	●	●	●	—	—	Relay, PLC
							100 V or less	**A90V**	**A90**	●	—	●	—	—	IC circuit	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

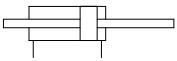
∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗∗ Available only for ø25.
It is mounted away from the port side to avoid interference with fittings.

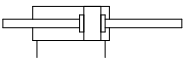
∗ Since there are other applicable auto switches than listed, refer to page 771 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1626 and 1627. For the D-P3DWA☐, refer to the **WEB catalog**.
∗ Auto switches are shipped together (not assembled).
Note) There is the case D-A9☐V/M9☐V/M9☐WV/M9☐AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.

Symbol

WIthout cushion



Rubber bumper



Specifications

Bore size (mm)		12	16	20	25
Action		Double acting, Double rod			
Fluid		Air			
Lubrication		Not required (Non-lube)			
Proof pressure		1.5 MPa			
Maximum operating pressure		1.0 MPa			
Minimum operating pressure		0.07 MPa		0.05 MPa	
Ambient and fluid temperature		Without auto switch: –10 to 70°C (No freezing)			
		With auto switch: –10 to 60°C (No freezing)			
Cushion		None, Rubber bumper			
Rod end thread		Female thread			
Stroke length tolerance		$^{+1.0}_{0}$ mm ∗			
Piston speed		50 to 500 mm/s			
Allowable kinetic energy (J)	Standard type	0.022	0.038	0.055	0.09
	With rubber bumper	0.043	0.075	0.11	0.18

∗ Stroke length tolerance does not include the deflection of the bumper.

Made to Order: Individual Specifications

(For details, refer to pages 774 and 775.)

Symbol	Specifications
-X235	Change of piston rod end of double rod cylinder
-X271	Fluororubber seals
-X633	Intermediate stroke of double rod cylinder

Made to Order Specifications

(For details, refer to pages 1675 to 1818.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat-resistant cylinder (–10 to 150 °C) (without an auto switch)
-XB7	Cold-resistant cylinder (–40 to 70 °C) (without an auto switch)
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB10	Intermediate stroke (Using exclusive body)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC6	Piston rod, retaining ring, rod end nut made of stainless steel
-XC36	With boss in rod side
-XC85	Grease for food processing equipment

Body Option

Description	Application
Rod end male thread	Available for all standard models of double acting, double rod.
Rubber bumper	

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) When ordering foot and compact foot brackets, order 2 pieces per cylinder.
Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange style: Body mounting bolt

Moisture Control Tube Series IDK

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **Series IDK in the WEB catalog**.

Theoretical Output

(N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	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				

Manufacture of Intermediate Stroke

Description	Spacer is installed in the standard stroke body.		Exclusive body (**-XB10**)	
Part no.	Suffix "-X633" to the end of standard model no. (page 734).		Suffix "-XB10" to the end of standard model no. (page 734).	
Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.		Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.	
Stroke range	Bore size	Stroke range	Bore size	Stroke range
	12, 16	1 to 29	12, 16	1 to 29
	20, 25	1 to 49	20, 25	1 to 49
Example	Part no.: CQSWB25-47D-X633 CQSWB25-50D with 3 mm width spacer inside. B dimension is 79 mm.		Part no.: CQSWB25-47D-XB10 Makes 47 stroke tube. B dimension is 76 mm.	

Refer to pages 769 to 771 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket/Part no.

Weight/Without Auto Switch

(g)

Bore size (mm)	Cylinder 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)

(g)

Bore size (mm)	Cylinder 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

Additional Weight

(g)

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

Calculation: (Example) **CQSWF12-10DM**
- Cylinder weight: CQSWB12-10D·····46 g
- Additional weight: Rod end male thread·····5 g
  : Rod side flange style····· 58 g

109 g

⚠Caution

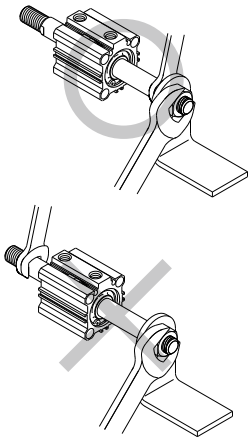
Retaining Ring Installation/Removal

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

⚠Warning

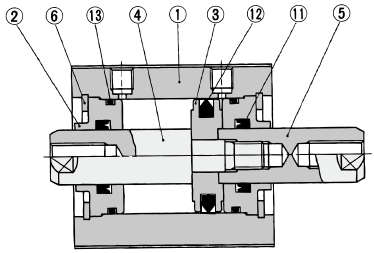
Mounting

Do not apply the reverse torque to the piston rods sticking out from both sides of this cylinder at the same time. The torque makes connection threads inside loosen, which may cause an accident or malfunction.
Install or remove a load while the piston rod width across flats are secured. Do not fix the other side of piston rod width across flat and apply the reverse torque.

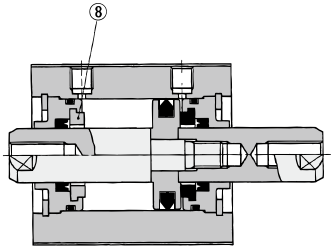


Construction

Basic style

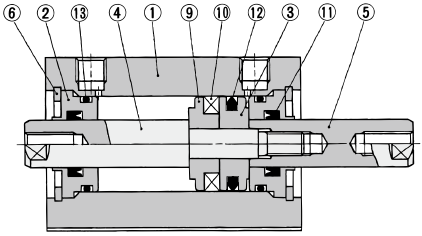


With rubber bumper

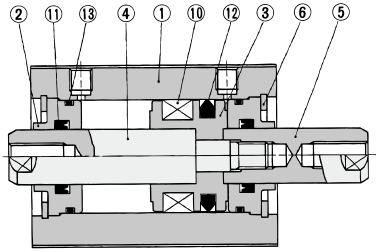


With auto switch (Built-in magnet)

ø12, ø16



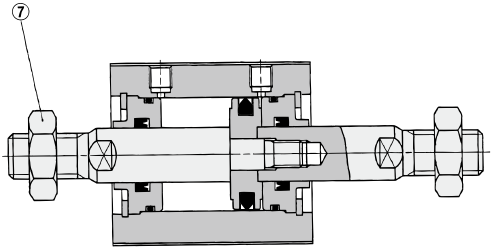
ø20, ø25



Component Parts

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

Rod end male thread



Replacement Parts/Seal Kit

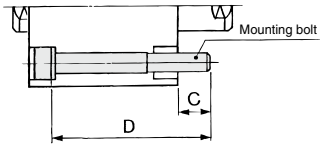
Bore size (mm)	Kit no.	Contents
12	CQSWB12-PS	Set of nos. above ⑪, ⑫, ⑬
16	CQSWB16-PS	
20	CQSWB20-PS	
25	CQSWB25-PS	

∗ Seal kit includes ⑪, ⑫, ⑬. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CQSW

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

Example) CQ-M3x30L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CQSWB12-5D	6.5	30	CQ-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	CQ-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	CQ-M5 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L

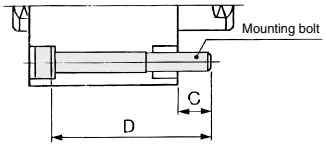
Cylinder model	C	D	Mounting bolt part no.
CQSWB20-25D	10	55	CQ-M5 x 55L
-30D		60	x 60L
-35D		65	x 65L
-40D		70	x 70L
-45D		75	x 75L
-50D		80	x 80L
CQSWB25-5D	7	35	CQ-M5 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
-35D		65	x 65L
-40D		70	x 70L
-45D		75	x 75L
-50D		80	x 80L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSW with Auto Switch

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

Example) CQ-M3x35L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CDQSWB12-5D	6.5	35	CQ-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	CQ-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	CQ-M5 x 45L
-10D		50	x 50L
-15D		55	x 55L
-20D		60	x 60L

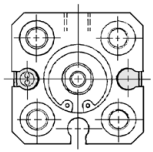
Cylinder model	C	D	Mounting bolt part no.
CDQSWB20-25D	10	65	CQ-M5 x 65L
-30D		70	x 70L
-35D		75	x 75L
-40D		80	x 80L
-45D		85	x 85L
-50D		90	x 90L
CDQSWB25-5D	7	45	CQ-M5 x 45L
-10D		50	x 50L
-15D		55	x 55L
-20D		60	x 60L
-25D		65	x 65L
-30D		70	x 70L
-35D		75	x 75L
-40D		80	x 80L
-45D		85	x 85L
-50D		90	x 90L

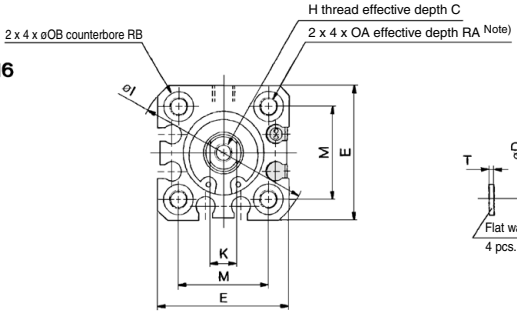
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

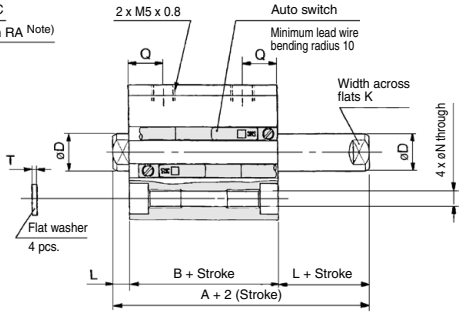
Dimensions: ø12 to ø25

Basic style (Through-hole/Both ends tapped common): CQSWB/CDQSWB

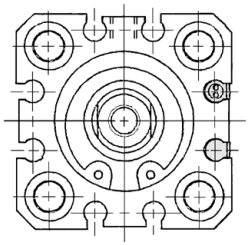
ø12



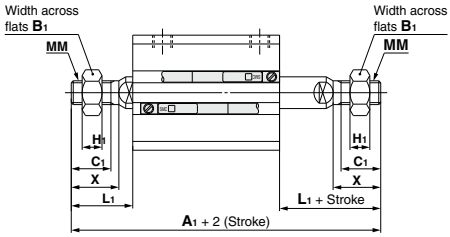




ø20, ø25



Rod end male thread



Rod End Male Thread

Bore size (mm)	Without auto switch A_1	With auto switch A_1	B_1	C_1	H_1	L_1	MM	X
12	50	55	8	9	4	14	M5 x 0.8	10.5
16	53	58	10	10	5	15.5	M6 x 1.0	12
20	63	73	13	12	5	18.5	M8 x 1.25	14
25	74	84	17	15	6	22.5	M10 x 1.25	17.5

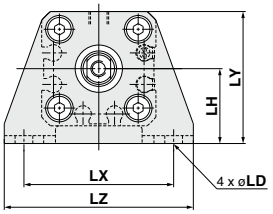
Basic Style

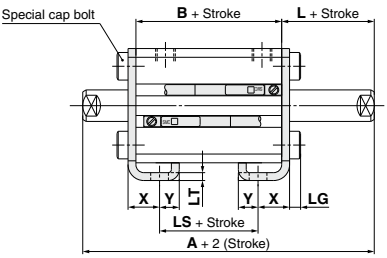
Bore size (mm)	Stroke range (mm)	Without auto switch A	Without auto switch B	With auto switch A	With auto switch B	C	D	E	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
12	5 to 30	29	22	34	27	6	6	25	M3 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	29	22	34	27	8	8	29	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	35	26	45	36	7	10	36	M5 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	9	8	10	7	1
25	5 to 50	39	29	49	39	12	12	40	M6 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	9	10	7	1

Note 1) For basic style ø20 and ø25 with 5 stroke, through-hole is threaded over the entire length.
Note 2) Rubber bumper type has the same dimensions as those indicated above
Note 3) The positions of width across flats on both sides are not the same.
* For details about the rod end nut and accessory brackets, refer to page 804.

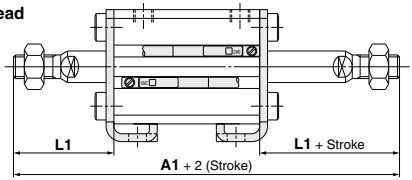
Dimensions: ø12 to ø25

Foot style: CQSWL/CDQSWL





Rod end male thread

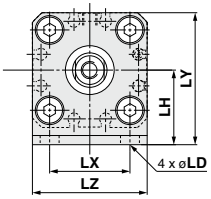


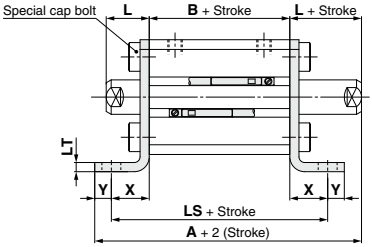
Foot Style

Bore size (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

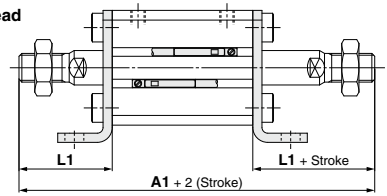
Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSWLC/CDQSWLC





Rod end male thread



Compact Foot Style

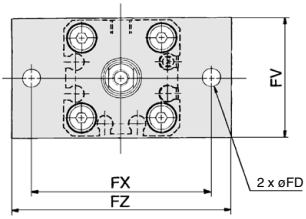
Bore size (mm)	Stroke range (mm)	Without auto switch				With auto switch				L	L1	LD	LH	LT	LX	LY	LZ	X	Y
		A	A1	B	LS	A	A1	B	LS										
12	5 to 30	49.3	70	22	40.6	54.3	75	27	45.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	5 to 30	49.8	73	22	40.6	54.8	78	27	45.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	5 to 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 to 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

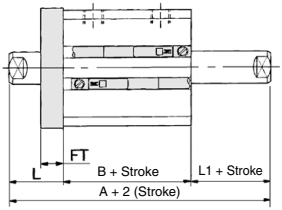
∗ For details about the rod end nut and accessory brackets, refer to page 804.

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

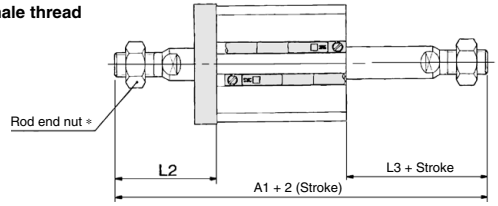
Dimensions: ø12 to ø25

Flange style: CQSWF/CDQSWF





Rod end male thread



Flange Style

Bore size (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

∗ For details about the rod end nut and accessory brackets, refer to page 804.
Note 1) The positions of width across flats on both sides are not the same.

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Compact Cylinder: Standard Type
Single Acting, Single Rod
Series CQS
ø12, ø16, ø20, ø25

How to Order

	CQS	B	20	–	10	S		–					
With auto switch	CDQS	B	20	–	10	S		–	M9BWV		–		

With auto switch (Built-in magnet)

Mounting style

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

∗ Mounting brackets are shipped together (but not assembled).
∗ Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQS" on page 743.

Bore size

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

Cylinder stroke (mm)

Standard Stroke

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

For "Manufacture of Intermediate Strokes", refer to page 742.

Action

S	Single acting, Spring return
T	Single acting, Spring extend

Body option

Nil	Standard (Rod end female thread)
M	Rod end male thread
F	Boss on head end

∗ Combination of body options is available. FM

Auto switch

Nil	Without auto switch

∗ Refer to the table below for the applicable auto switch model.

Number of auto switches

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

Made to Order
Refer to page 742 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSL25-10T

Applicable Auto Switches/Refer to pages 1559 to 1673 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	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		M9NWV	(M9NW)	●	●	●	○	○	IC circuit	
				3-wire (PNP)			M9PWV	(M9PW)	●	●	●	○	○		
				2-wire	12 V		M9BWV	(M9BW)	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV∗1	(M9NA)∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	(M9PA)∗1	○	○	●	○	○		
				2-wire	12 V		M9BAV∗1	(M9BA)∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V∗2	A93	●	●	●	●	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

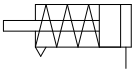
∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NWV
1 m····· M (Example) M9NWVM
3 m····· L (Example) M9NWVL
5 m····· Z (Example) M9NWVZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.

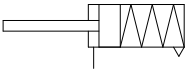
∗ Since there are other applicable auto switches than listed, refer to page 771 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1626 and 1627.
∗ Auto switches are shipped together (not assembled).
Note 1) There is the case D-A9□V/M9□V/M9□WV/M9□AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.
Note 2) The D-M9□□□ (in-line entry) type auto switch in ( ) cannot be mounted due to the manufacturable stroke. When this auto switch satisfies the conditions stated in Note 3) on page 771, it can be ordered separately.

Symbol

Single acting, Spring return



Single acting, Spring extend



Made to Order: Individual Specifications

(For details, refer to pages 774 and 776.)

Symbol	Specifications
-X271	Fluororubber seals
-X1876	With concave shape end boss on the cylinder tube head side

Made to Order Specifications

(For details, refer to pages 1675 to 1818.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB10	Intermediate stroke (Using exclusive body), Extension type only
-XC6	Piston rod, retaining ring, rod end nut made of stainless steel
-XC36	With boss on rod side, ø12 and ø16 only
-XC85	Grease for food processing equipment

Body Option

Description	Application
Rod end male thread	Available for all standard models of single acting, single rod.

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) When ordering foot and compact foot brackets, order 2 pieces per cylinder.

Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange style: Body mounting bolt
Double clevis style: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

Moisture Control Tube Series IDK

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **Series IDK in the WEB catalog**.

Standard Specifications

Bore size (mm)	12	16	20	25
Action	Single acting, Single rod			
Fluid	Air			
Lubrication	Not required (Non-lube)			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.25 MPa		0.18 MPa	
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing)			
	With auto switch: –10 to 60°C (No freezing)			
Cushion	None			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0}_{0}$ mm			
Piston speed	50 to 500 mm/s			
Allowable kinetic energy (J)	0.022	0.038	0.055	0.09

Theoretical Output

(N)

Action	Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa) 0.3	0.5	0.7	Retracted side	Extended side
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	–					

Manufacture of Intermediate Stroke (Single acting, Spring retract type is excluded.)

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. (page 741).	
Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.	
Stroke range	Bore size	Stroke range
	12 to 25	1 to 9
Example	Part no.: CQSB20-3T CQSB20-5T with 2 mm width spacer inside. B dimension is 24.5 mm.	

Refer to pages 769 to 771 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

Weight/Without Auto Switch
Spring return (Spring extend) (g)

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

∗ ( ): Denotes the values of spring extend.

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

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

∗( ): Denotes the values of spring extend.

Additional Weight
(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 style (Including mounting bolt)		55	65	159	181
Compact foot style (Including mounting bolt)		41	51	121	140
Rod side flange style (Including mounting bolt)		58	70	143	180
Head side flange style (Including mounting bolt)		56	66	137	171
Double clevis style (Including pin, retaining ring, bolt)		34	40	92	127

Calculation: (Example) **CQSG16-10S**
• Cylinder weight: CQSB16-10S·····48 g
• Additional weight: Head side flange style·····66 g
114 g

⚠Caution

Retaining Ring Installation/Removal

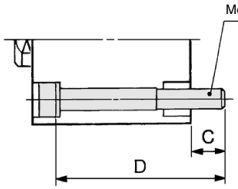
1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Mounting Bolt for CQS without Auto Switch

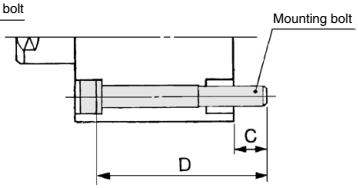
Mounting method: Mounting bolt for through-hole mounting style of CQS is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x25L 4 pcs.

Single acting, Spring return



Single acting, Spring extend



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Single Acting, Spring Return

Cylinder model	C	D	Mounting bolt part no.
CQSB12-5S	6.5	25	CQ-M3 x 25L
-10S		30	x 30L
CQSB16-5S	6.5	25	CQ-M3 x 25L
-10S		30	x 30L
CQSB20-5S	6.5	25	CQ-M5 x 25L
-10S		30	x 30L
CQSB25-5S	8.5	30	CQ-M5 x 30L
-10S		35	x 35L

Single Acting, Spring Extend

Cylinder model	C	D	Mounting bolt part no.
CQSB12-5T	6.5	25	CQ-M3 x 25L
-10T		30	x 30L
CQSB16-5T	6.5	25	CQ-M3 x 25L
-10T		30	x 30L
CQSB20-5T	6.5	25	CQ-M5 x 25L
-10T		30	x 30L
CQSB25-5T	8.5	30	CQ-M5 x 30L
-10T		35	x 35L

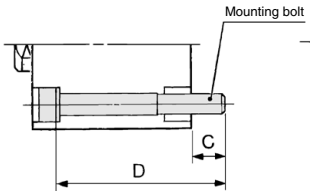
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQS with Auto Switch

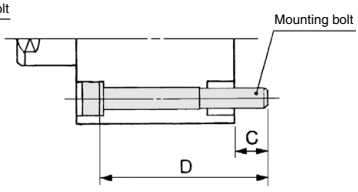
Mounting method: Mounting bolt for through-hole mounting style of CDQS is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x30L 4 pcs.

Single acting, Spring return



Single acting, Spring extend



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Single Acting, Spring Return

Cylinder model	C	D	Mounting bolt part no.
CDQSB12-5S	6.5	30	CQ-M3 x 30L
-10S		35	x 35L
CDQSB16-5S	6.5	30	CQ-M3 x 30L
-10S		35	x 35L
CDQSB20-5S	6.5	35	CQ-M5 x 35L
-10S		40	x 40L
CDQSB25-5S	8.5	40	CQ-M5 x 40L
-10S		45	45L

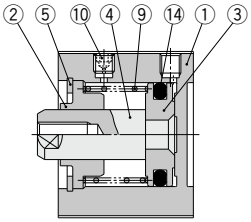
Single Acting, Spring Extend

Cylinder model	C	D	Mounting bolt part no.
CDQSB12-5T	6.5	30	CQ-M3 x 30L
-10T		35	x 35L
CDQSB16-5T	6.5	30	CQ-M3 x 30L
-10T		35	x 35L
CDQSB20-5T	6.5	35	CQ-M5 x 35L
-10T		40	x 40L
CDQSB25-5T	8.5	40	CQ-M5 x 40L
-10T		45	x 45L

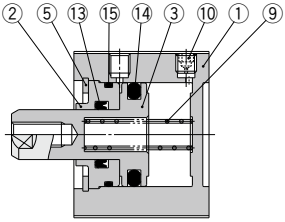
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Construction

Single acting, Spring return

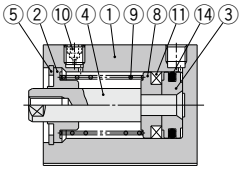


Single acting, Spring extend

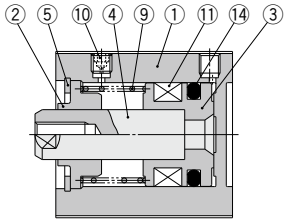


Single acting, Spring return/With auto switch (Built-in magnet)

ø12, 16

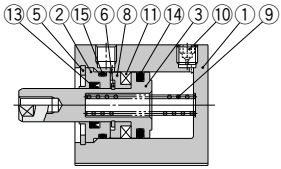


ø20, 25

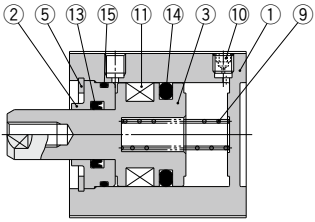


Single acting, Spring extend/With auto switch (Built-in magnet)

ø12, 16



ø20, 25



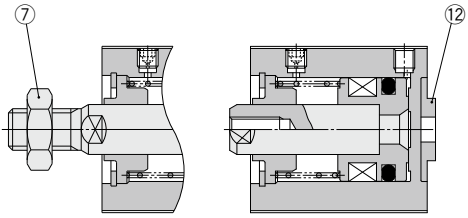
Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Collar**	Aluminum alloy	Anodized
3	**Piston**	Aluminum alloy	Single acting, Spring return
		Stainless steel	Single acting, Spring extend
4	**Piston rod**	Stainless steel	
5	**Retaining ring**	Carbon tool steel	Phosphate coated
6	**Retaining ring**	Carbon tool steel	Nickel plated
7	**Rod end nut**	Carbon steel	Nickel plated
8	**Spacer for switch type**	Aluminum alloy	Chromated
9	**Return spring**	Piano wire	Zinc chromated
10	**Plug with fixed orifice**	Alloy steel	Nickel plated
11	**Magnet**	—	
12	**Centering location ring**	Aluminum alloy	Anodized
13*	**Rod seal**	NBR	
14*	**Piston seal**	NBR	
15*	**Tube gasket**	NBR	

Rod end male thread

Single acting, Spring return
Single acting, Spring extend

With boss on head end



Replacement Parts/Seal Kit
Single acting, Spring return

Bore size (mm)	Kit no.	Contents
12	CQSB12-S-PS	Set of nos. above ⑭
16	CQSB16-S-PS	
20	CQSB20-S-PS	
25	CQSB25-S-PS	

∗ Seal kit includes ⑭. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Replacement Parts/Seal Kit
Single acting, Spring extend

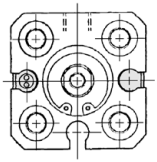
Bore size (mm)	Kit no.	Contents
12	CQSB12-T-PS	Set of nos. above ⑬, ⑭, ⑮
16	CQSB16-T-PS	
20	CQSB20-T-PS	
25	CQSB25-T-PS	

∗ Seal kit includes ⑬, ⑭, ⑮. Order the seal kit, based on each bore size.
∗ Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

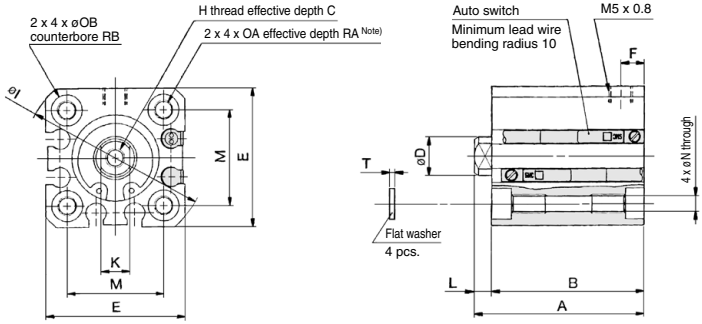
Dimensions: ø12 to ø25/Single Acting, Spring Return

Basic style (Through-hole/Both ends tapped common): CQSB/CDQSB

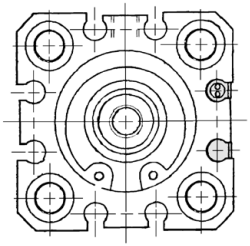
ø12



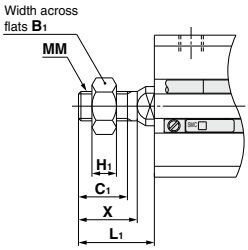
ø16



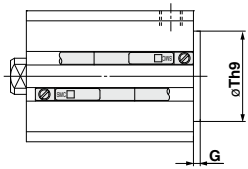
ø20, ø25



Rod end male thread



With boss on head end



Rod End Male Thread

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	$15^{0}_{-0.043}$
16	1.5	$20^{0}_{-0.052}$
20	2	$13^{0}_{-0.043}$
25	2	$15^{0}_{-0.043}$

Note) With boss on rod end : Option (Suffix "-XC36" to the end of part number.)

Basic Style

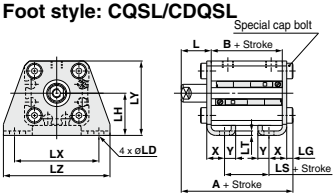
Bore size (mm)	Stroke range (mm)	Without auto switch A		Without auto switch B		With auto switch A		With auto switch B		C	D	E	F	H	I	K	L	M	N	OA	OB	RA	RB	T
		5^{ST}	10^{ST}	5^{ST}	10^{ST}	5^{ST}	10^{ST}	5^{ST}	10^{ST}															
12	5, 10	25.5	30.5	22	27	30.5	35.5	27	32	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7	4	0.5
16		25.5	30.5	22	27	30.5	35.5	27	32	8	8	29	5	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	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 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	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 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	10	7	1

Note) For basic style ø12 and ø16 with 5 stroke, through-hole is threaded over the entire length.
For basic style ø20, ø25 with 5 and 10 stroke, through-hole is threaded over the entire length.
With auto switch (Built-in magnet)/ø20; 5 stroke.

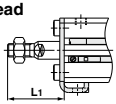
∗ For details about the rod end nut and accessory brackets, refer to page 804.

Dimensions: ø12 to ø25/Single Acting, Spring Return

Foot style: CQSL/CDQSL



Rod end male thread

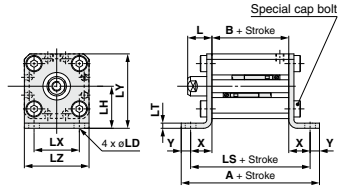


Foot Style

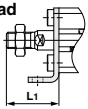
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L_1	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS											
12	5, 10	35.3	17	5	40.3	22	10	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16		35.3	17	5	40.3	22	10	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20		41.2	19.5	7.5	51.2	29.5	17.5	14.5	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

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSLC/CDQSLC



Rod end male thread

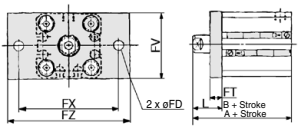


Compact Foot Style

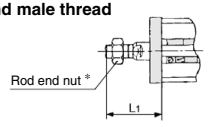
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L_1	LD	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS										
12	5, 10	44.6	17	35.6	49.6	22	40.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16		45.6	17	35.6	50.6	22	40.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20		57.5	19.5	45.9	67.5	29.5	55.9	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 side flange style: CQSF/CDQSF



Rod end male thread

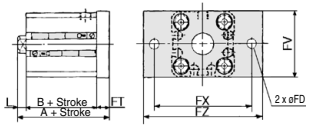


Rod Side Flange Style

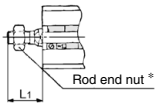
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5, 10	30.5	17	35.5	22	4.5	5.5	25	45	55	13.5	24
16		30.5	17	35.5	22	4.5	5.5	30	45	55	13.5	25.5
20		34	19.5	44	29.5	6.6	8	39	48	60	14.5	28.5
25		37.5	22.5	47.5	32.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head side flange style: CQSG/CDQSG



Rod end male thread



Head Side Flange Style

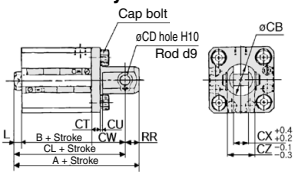
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5, 10	26	17	31	22	4.5	5.5	25	45	55	3.5	14
16		26	17	31	22	4.5	5.5	30	45	55	3.5	15.5
20		32	19.5	42	29.5	6.6	8	39	48	60	4.5	18.5
25		35.5	22.5	45.5	32.5	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

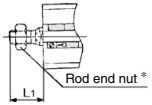
* For details about the rod end nut and accessory brackets, refer to page 804.

Dimensions: ø12 to ø25/Single Acting, Spring Return

Double clevis style: CQSD/CDQSD



Rod end male thread



Double Clevis Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CB	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	12	5	4	7	14	5	10	3.5	14	6
16		41.5	17	35.5	46.5	22	40.5	14	5	4	10	15	6.5	12	3.5	15.5	6
20		51	19.5	42	61	29.5	52	20	8	5	12	18	8	16	4.5	18.5	9
25		57.5	22.5	47.5	67.5	32.5	57.5	24	10	5	14	20	10	20	5	22.5	10

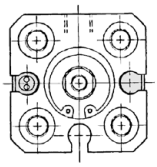
Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the double clevis pivot bracket, refer to page 733-2.
* For details about the rod end nut and accessory brackets, refer to page 804.

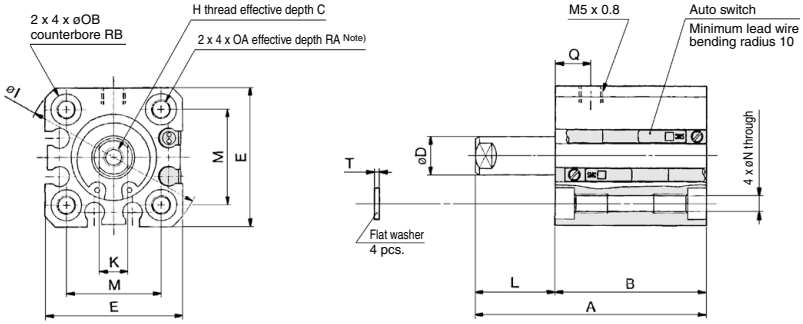
Dimensions: ø12 to ø25/Single Acting, Spring Extend

Basic style (Through-hole/Both ends tapped common): CQSB/CDQSB

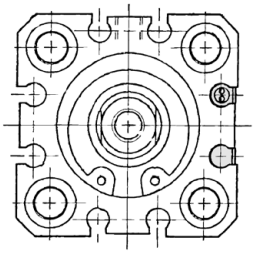
ø12



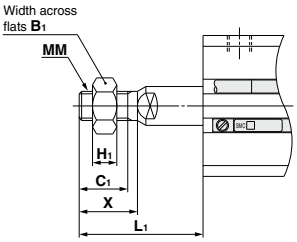
ø16



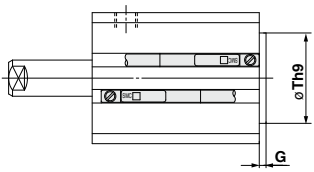
ø20, ø25



Rod end male thread



With boss on head end



Rod End Male Thread

Bore size (mm)	B_1	C_1	H_1	L_1		MM	X
				5^{ST}	10^{ST}		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	$15^{\ 0}_{-0.043}$
16	1.5	$20^{\ 0}_{-0.052}$
20	2	$13^{\ 0}_{-0.043}$
25	2	$15^{\ 0}_{-0.043}$

Note) With boss on rod end : Option (Suffix "-XC36" to the end of part number.)

Basic Style

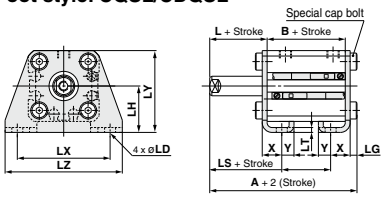
Bore size (mm)	Stroke range (mm)	Without auto switch				With auto switch				C	D	E	H	I	K	L		M	N	OA	OB	Q	RA	RB	T
		A		B		A		B																	
		5^{ST}	10^{ST}	5^{ST}	10^{ST}	5^{ST}	10^{ST}	5^{ST}	10^{ST}							5^{ST}	10^{ST}								
12	5, 10	30.5	40.5	22	27	35.5	45.5	27	32	6	6	25	M3 x 0.5	32	5	8.5	13.5	15.5	3.5	M4 x 0.7	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 x 0.7	38	6	8.5	13.5	20	3.5	M4 x 0.7	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 x 0.8	47	8	9.5	14.5	25.5	5.4	M6 x 1.0	9	8	10	7	1
25		37.5	47.5	27.5	32.5	47.5	57.5	37.5	42.5	12	12	40	M6 x 1.0	52	10	10	15	28	5.4	M6 x 1.0	9	9	10	7	1

Note) For basic style ø12 and ø16 with 5 stroke, through-hole is threaded over the entire length.
For basic style ø20, ø25 with 5 and 10 stroke, through-hole is threaded over the entire length.
With auto switch (Built-in magnet)/ø20; 5 stroke.

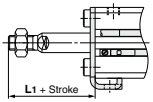
∗ For details about the rod end nut and accessory brackets, refer to page 804.

Dimensions: ø12 to ø25/Single Acting, Spring Extend

Foot style: CQSL/CDQSL



Rod end male thread



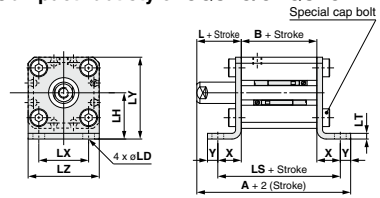
Foot Style

Bore size (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

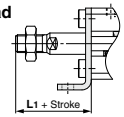
Bore size (mm)	L	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSLC/CDQSLC



Rod end male thread



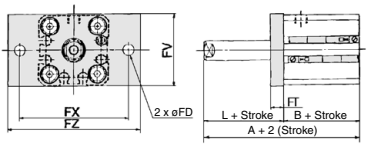
Compact Foot Style

Bore size (mm)	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

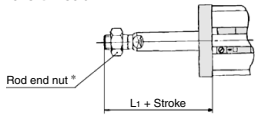
Bore size (mm)	L	L1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

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

Rod side flange style: CQSF/CDQSF



Rod end male thread

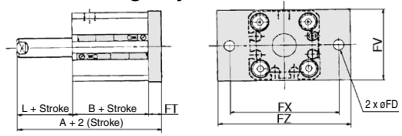


Rod Side Flange Style

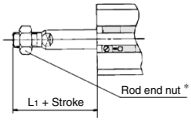
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L1
		A	B	A	B							
12	5, 10	30.5	17	35.5	22	4.5	5.5	25	45	55	13.5	24
16		30.5	17	35.5	22	4.5	5.5	30	45	55	13.5	25.5
20		34	19.5	44	29.5	6.6	8	39	48	60	14.5	28.5
25		37.5	22.5	47.5	32.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head side flange style: CQSG/CDQSG



Rod end male thread



Head Side Flange Style

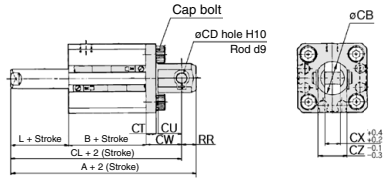
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L1
		A	B	A	B							
12	5, 10	26	17	31	22	4.5	5.5	25	45	55	3.5	14
16		26	17	31	22	4.5	5.5	30	45	55	3.5	15.5
20		32	19.5	42	29.5	6.6	8	39	48	60	4.5	18.5
25		35.5	22.5	45.5	32.5	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

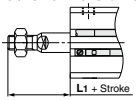
* For details about the rod end nut and accessory brackets, refer to page 804.

Dimensions: ø12 to ø25/Single Acting, Spring Extend

Double clevis style: CQSD/CDQSD



Rod end male thread



Double Clevis Style

Bore size (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 size (mm)	**CB**	**CD**	**CT**	**CU**	**CW**	**CX**	**CZ**	**L**	**L_1**	**RR**
12	12	5	4	7	14	5	10	3.5	14	6
16	14	5	4	10	15	6.5	12	3.5	15.5	6
20	20	8	5	12	18	8	16	4.5	18.5	9
25	24	10	5	14	20	10	20	5	22.5	10

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

∗ For details about the rod end nut and accessory brackets, refer to page 804.

Compact Cylinder: Non-rotating Rod Type
Double Acting, Single Rod
Series CQSK
ø12, ø16, ø20, ø25

How to Order

CQSK **B** **20** – **30** **D** □ – □

With auto switch **CDQSK** **B** **20** – **30** **D** □ – **M9BW** □ – □

With auto switch
(Built-in magnet)

Mounting style

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

∗ Mounting brackets are shipped together (but not assembled).
∗ Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQSK" on page 753.

Bore size

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

Cylinder stroke (mm)

Standard Stroke

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

For "Manufacture of Intermediate Strokes", refer to page 750.

Action

D	Double acting

Body option

Nil	Standard (Rod end female thread)
M	Rod end male thread
F	Boss on head side

∗ Combination of body options is available. FM

Auto switch

Nil	Without auto switch

∗ Refer to the table below for the applicable auto switch model.

Number of auto switches

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

Made to Order
Refer to page 750 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSKL25-30D

Applicable Auto Switches/Refer to pages 1559 to 1673 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	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		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1	○	○	●	○	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V∗2	A93	●	●	●	●	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

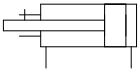
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed, refer to page 771 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1626 and 1627.
∗ Auto switches are shipped together (not assembled).
Note) There is the case D-A9□V/M9□V/M9□WV/M9□AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.

Symbol
Without cushion



Standard Specifications

Bore size (mm)	12	16	20	25
Action	Double acting, Single rod			
Fluid	Air			
Lubrication	Not required (Non-lube)			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.07 MPa		0.05 MPa	
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing)			
	With auto switch: –10 to 60°C (No freezing)			
Cushion	None			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0\ mm}_{0}$			
Piston speed	50 to 500 mm/s			
Allowable kinetic energy (J)	0.022	0.038	0.055	0.09
Rod non-rotating accuracy	±1°		±0.7°	

Made to Order: Individual Specifications

(For details, refer to page 776.)

Symbol	Specifications
-X1876	With concave shape end boss on the cylinder tube head side

Made to Order Specifications

(For details, refer to pages 1675 to 1818.)

Symbol	Specifications
-XA□	Change of Rod End Shape
-XC6	Piston rod and rod end nut made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type

Theoretical Output

OUT → ← IN (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

Body Option

Description	Application
Rod end male thread	Available for all non-rotating rod type.

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) When ordering foot and compact foot brackets, order 2 pieces per cylinder.
Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange style: Body mounting bolt
Double clevis style: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

Manufacture of Intermediate Stroke

Description		Spacer is installed in the standard stroke body.	
Part no.		Refer to "How to Order" for the standard model no. (page 749).	
Standard stroke	Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.	
	Stroke range	Bore size	Stroke range
		12, 16	1 to 29
		20, 25	1 to 49
Example		Part no.: CQSKB25–47D CQSKB25-50D with 3 mm width spacer inside. B dimension is 77.5 mm.	

Refer to pages 769 to 771 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

Moisture Control Tube Series IDK

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **Series IDK in the WEB catalog**.

Weight/Without Auto Switch

(g)

Bore size (mm)	Cylinder 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)

(g)

Bore size (mm)	Cylinder 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

Additional Weight

(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 style (Including mounting bolt)		55	64	158	179
Compact foot style (Including mounting bolt)		41	51	121	140
Rod side flange style (Including mounting bolt)		58	69	142	178
Head side flange style (Including mounting bolt)		56	66	137	171
Double clevis style (Including pin, retaining ring, bolt)		34	40	92	127

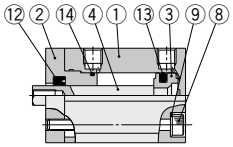
Calculation: (Example) **CQSKF20-5DM**
- Cylinder weight: CQSKB20-5D····89 g
- Additional weight: Rod end male thread····10 g
  : Rod side flange style····142 g

241 g

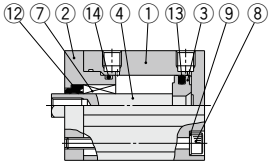
Construction

Basic style

ø12

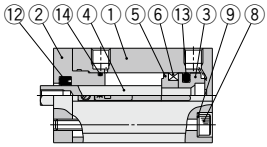


ø16, ø20, ø25

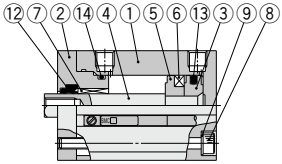


With auto switch (Built-in magnet)

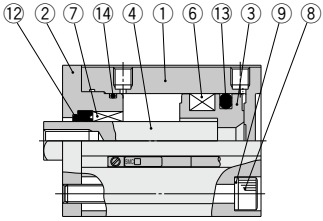
ø12



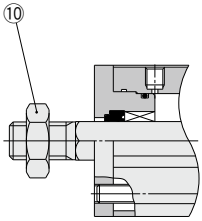
ø16



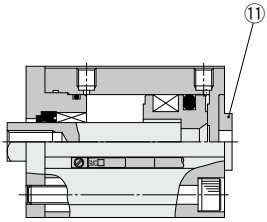
ø20, ø25



Rod end male thread



With boss on head end



Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Rod cover**	Aluminum alloy	Anodized
3	**Piston**	Aluminum alloy	Chromated
4	**Piston rod**	Stainless steel	
5	**Spacer for switch type**	Aluminum alloy	Chromated
6	**Magnet**	—	
7	**Non-rotating guide**	Oil impregnated sintered alloy	ø16, ø20 and ø25
8	**Hexagon socket head cap screw**	Alloy steel	Nickel plated
9	**Plain washer**	Rolled steel	Nickel plated
10	**Rod end nut**	Carbon steel	Nickel plated
11	**Centering location ring**	Aluminum alloy	Anodized
12*	**Rod seal**	NBR	
13*	**Piston seal**	NBR	
14*	**Tube gasket**	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
12	CQSKB12-PS	Set of nos. above ⑫ , ⑬ , ⑭.
16	CQSKB16-PS	
20	CQSKB20-PS	
25	CQSKB25-PS	

* Seal kit includes ⑫ , ⑬ , ⑭. Order the seal kit, based on each bore size.
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

⚠Precautions

Operating Precautions

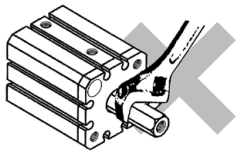
⚠Caution

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

Allowable rotational torque (N·m) or less	ø12	ø16	ø20	ø25
	0.04	0.04	0.2	0.25

2. Load to piston rod must always be in an axial direction.

3. When a workpiece is secured to the end of the piston rod, ensure that the piston rod is retracted entirely, and place a wrench on the portion of the rod that protrudes beyond the section. Also, tighten by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.

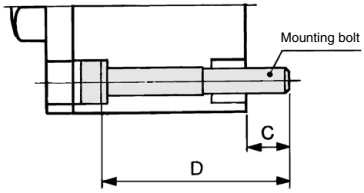


Mounting Bolt for CQSK

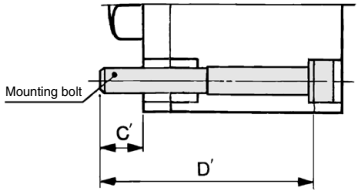
Mounting method: Mounting bolt for through-hole mounting style of CQSK is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x25L 2 pcs.

Head side mounting style



Rod side mounting style



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.	C′	D′	Mounting bolt part no.
CQSKB12-5D	6.5	25	CQ-M3 x 25L	6.5	30	CQ-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	CQ-M3 x 25L	6.5	30	CQ-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	CQ-M5 x 25L	6.5	30	CQ-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	CQ-M5 x 30L	8.5	35	CQ-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

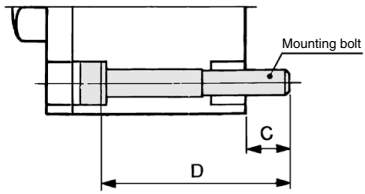
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSK

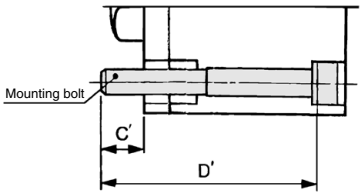
Mounting method: Mounting bolt for through-hole mounting style of CDQSK is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x30L 2 pcs.

Head side mounting style



Rod side mounting style



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.	C′	D′	Mounting bolt part no.
CDQSKB12-5D	6.5	30	CQ-M3 x 30L	6.5	35	CQ-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	CQ-M3 x 30L	6.5	35	CQ-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	CQ-M5 x 35L	6.5	40	CQ-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	CQ-M5 x 40L	8.5	45	CQ-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

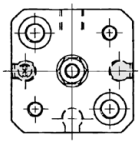
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Dimensions: ø12 to ø25

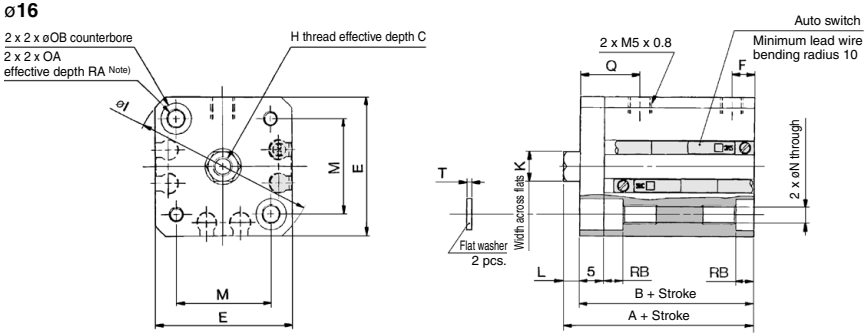
Basic style (Through-hole/Both ends tapped common): CQSK/CDQSK

* For the auto switch mounting position and its mounting height, refer to page 770.

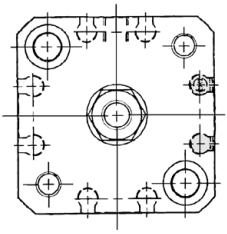
ø12



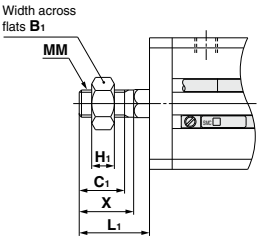
ø16



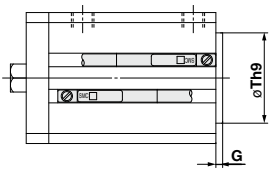
ø20, ø25



Rod end male thread



With boss on head end



Rod End Male Thread

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	$15^{0}_{-0.043}$
16	1.5	$20^{0}_{-0.052}$
20	2	$13^{0}_{-0.043}$
25	2	$15^{0}_{-0.043}$

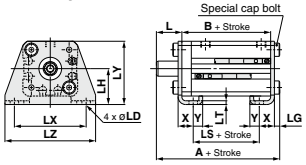
Basic Style

Bore size (mm)	Stroke range (mm)	Without 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 x 0.5	32	5.2	3.5	15.5	3.5	M4 x 0.7	6.5	12.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	29	5	M4 x 0.7	38	6.2	3.5	20	3.5	M4 x 0.7	6.5	12.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	36	5.5	M5 x 0.8	47	8.2	4.5	25.5	5.4	M6 x 1.0	9	13	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	40	5.5	M6 x 1.0	52	10.2	5	28	5.4	M6 x 1.0	9	14	10	7	1

Note) For basic style ø12 and ø16 with 5 stroke, through-hole is threaded over the entire length.
For basic style ø20 with 5 to 15 stroke, through-hole is threaded over the entire length.
For basic style ø25 with 5 and 10 stroke, through-hole is threaded over the entire length.
Note) With auto switch (Built-in magnet): ø20; 5 stroke

* For details about the rod end nut and accessory brackets, refer to page 804.

Foot style: CQSKL/CDQSKL

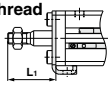


Foot Style

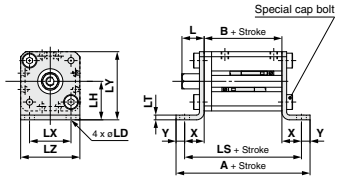
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L_1	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS											
12	5 to 30	40.3	22	10	45.3	27	15	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	5 to 30	40.3	22	10	45.3	27	15	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	5 to 50	46.2	24.5	12.5	56.2	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

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Compact foot style: CQSKLC/CDQSKLC

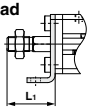


Compact Foot Style

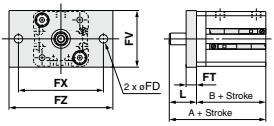
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L_1	LD	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS										
12	5 to 30	49.6	22	40.6	54.6	27	45.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	5 to 30	50.6	22	40.6	55.6	27	45.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	5 to 50	62.5	24.5	50.9	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

Rod end male thread



Rod side flange style: CQSKF/CDQSKF

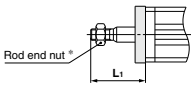


Rod Side Flange Style

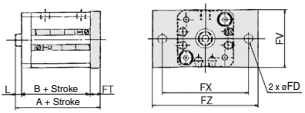
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L_1
		A	B	A	B							
12	5 to 30	35.5	22	40.5	27	4.5	5.5	25	45	55	13.5	24
16	5 to 30	35.5	22	40.5	27	4.5	5.5	30	45	55	13.5	25.5
20	5 to 50	39	24.5	49	34.5	6.6	8	39	48	60	14.5	28.5
25	5 to 50	42.5	27.5	52.5	37.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head side flange style: CQSKG/CDQSKG

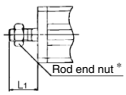


Head Side Flange Style

Bore size (mm)	Stroke range (mm)	Without 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

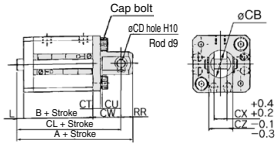
Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread

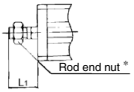


* For details about the rod end nut and accessory brackets, refer to page 804.

Double clevis style: CQSKD/CDQSKD



Rod end male thread



Double Clevis Style

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CB	CD	CT	CU	CW	CX	CZ	L	L1	RR
		A	B	CL	A	B	CL										
12	5 to 30	45.5	22	39.5	50.5	27	44.5	12	5	4	7	14	5	10	3.5	14	6
16	5 to 30	46.5	22	40.5	51.5	27	45.5	14	5	4	10	15	6.5	12	3.5	15.5	6
20	5 to 50	56	24.5	47	66	34.5	57	20	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	24	10	5	14	20	10	20	5	22.5	10

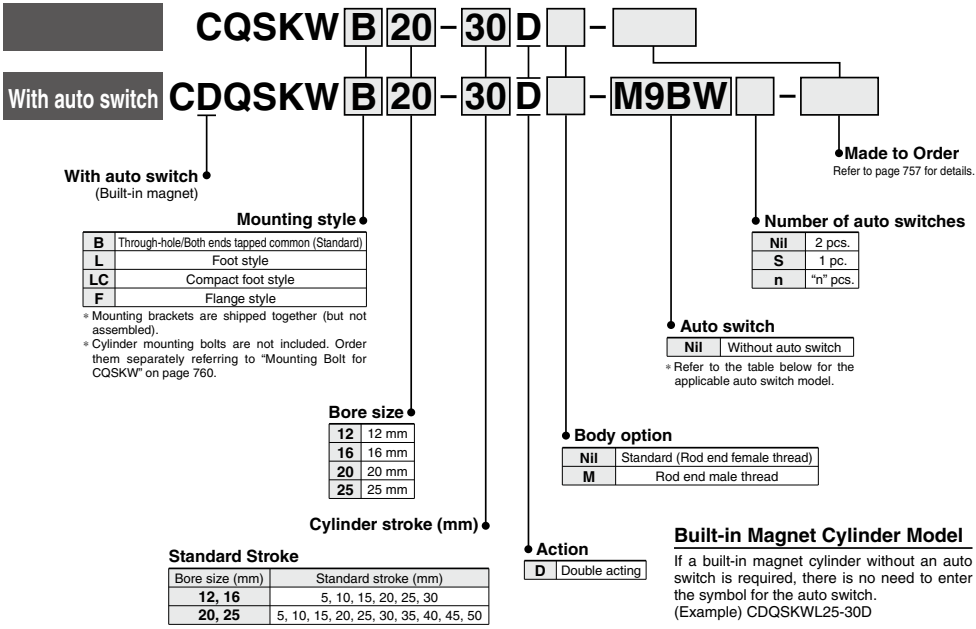
Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the double clevis pivot bracket, refer to page 733-2.
* For details about the rod end nut and accessory brackets, refer to page 804.

CUJ
CU
CQS
CQ2 -Z
RQ
CQM
CQU
MU -Z
D-□
-X□
Technical data

Compact Cylinder: Non-rotating Rod Type
Double Acting, Double Rod
Series CQSKW
ø12, ø16, ø20, ø25

How to Order



Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSKWL25-30D

Applicable Auto Switches/Refer to pages 1559 to 1673 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto 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		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	○		
				2-wire		12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)				M9PAV∗1	M9PA∗1	○	○	●	○	○		
				2-wire		12 V		M9BAV∗1	M9BA∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V∗2	A93	●	●	●	●	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

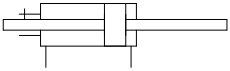
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed, refer to page 771 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1626 and 1627.
∗ Auto switches are shipped together (not assembled).
Note) There is the case D-A9□V/M9□V/M9□WV/M9□AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.

Symbol
Without cushion



Specifications

Bore size (mm)	12	16	20	25
Action	Double acting, Single rod			
Fluid	Air			
Lubrication	Not required (Non-lube)			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.07 MPa		0.05 MPa	
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing)			
	With auto switch: –10 to 60°C (No freezing)			
Cushion	None			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0}_{0}$ mm			
Piston speed	50 to 500 mm/s			
Allowable kinetic energy (J)	0.022	0.038	0.055	0.09
Rod non-rotating accuracy	±1°		±0.7°	

Theoretical Output

(N)

Bore size (mm)	Rod width across flats (mm)	Piston area (mm^2)	Operating pressure (MPa)		
			0.3	0.5	0.7
12	5.2	90	27	45	63
16	6.2	168	50	84	117
20	8.2	256	77	128	179
25	10.2	401	120	200	281

Refer to pages 769 to 771 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

Made to Order: Individual Specifications

(For details, refer to page 775.)

Symbol	Specifications
-X633	Intermediate stroke of double rod cylinder

Made to Order Specifications

(For details, refer to pages 1675 to 1818.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC6	Piston rod, retaining ring, rod end nut made of stainless steel

Body Option

Description	Application
Rod end male thread	Available for all non-rotating rod type.

Mounting Bracket Part No.

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

Note 1) When ordering foot and compact foot brackets, order 2 pieces per cylinder.
Note 2) Parts belonging to each bracket are as follows. Foot, Compact foot, Flange style: Body mounting bolt

Moisture Control Tube Series IDK

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **Series IDK in the WEB catalog**.

Weight/Without Auto Switch

(g)

Bore size (mm)	Cylinder stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
12	48	56	65	73	80	88	–	–	–	–
16	64	75	84	95	105	115	–	–	–	–
20	115	131	148	164	191	196	213	229	246	264
25	160	180	200	221	241	263	285	305	320	347

Weight/With Auto Switch (Built-in magnet)

(g)

Bore size (mm)										
	5	10	15	20	25	30	35	40	45	50
12	56	65	74	82	90	98	–	–	–	–
16	75	85	95	105	116	126	–	–	–	–
20	148	164	180	197	214	231	247	265	280	297
25	188	209	230	251	273	293	315	335	356	376

Additional Weight

(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 style (Including mounting bolt)		55	64	158	179
Compact foot style (Including mounting bolt)		41	51	121	140
Rod side flange style (Including mounting bolt)		58	69	142	178

Calculation: (Example) **CQSKWF20-5DM**

- Cylinder weight: CQSKWB20-5D·····115 g
- Additional weight: Rod end male thread·····10 g
  : Rod side flange style·····142 g

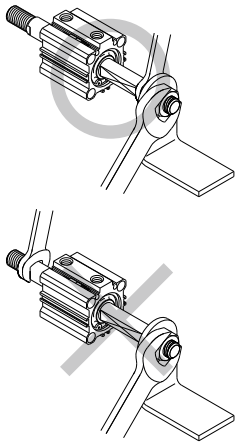
267 g

⚠Precautions

Operating Precautions

⚠Warning

1. Do not apply the reverse torque to the piston rods sticking out from both sides of this cylinder at the same time. The torque makes connection threads inside loosen, which may cause an accident or malfunction.
Install or remove a load while the piston rod width across flats are secured. Do not fix the other side of piston rod width across flat and apply the reverse torque.



⚠Caution

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

Allowable rotational torque (N·m) or less	**ø12**	**ø16**	**ø20**	**ø25**
	0.04	0.04	0.2	0.25

2. Load to piston rod must always be in an axial direction.

Retaining Ring Installation/Removal

⚠Caution

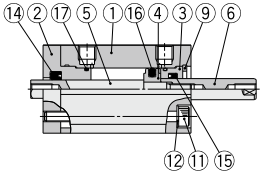
1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).

2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

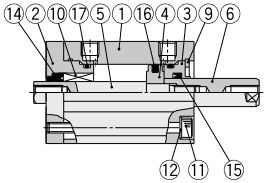
Construction

Basic style

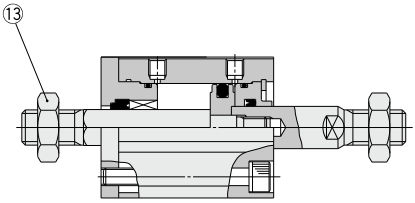
ø12



ø16, ø20, ø25

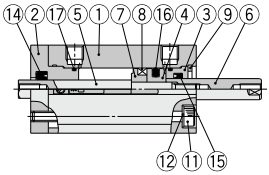


Rod end male thread

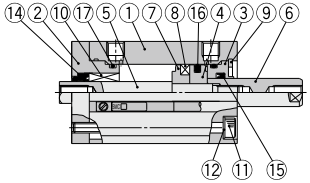


With auto switch (Built-in magnet)

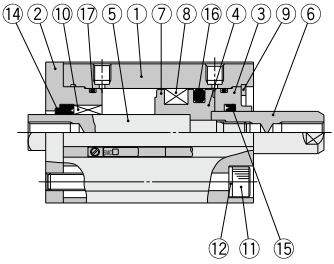
ø12



ø16



ø20, ø25



Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Rod cover**	Aluminum alloy	Anodized
3	**Collar**	Aluminum alloy	Anodized
4	**Piston**	Aluminum alloy	Chromated
5	**Piston rod A**	Stainless steel	
6	**Piston rod B**	Stainless steel	
7	**Spacer for switch type**	Aluminum alloy	Chromated
8	**Magnet**	—	
9	**Retaining ring**	Carbon tool steel	Phosphate coated
10	**Non-rotating guide**	Oil impregnated sintered alloy	ø16, ø20 and ø25
11	**Hexagon socket head cap screw**	Alloy steel	Nickel plated
12	**Plain washer**	Rolled steel	Nickel plated
13	**Rod end nut**	Carbon steel	Nickel plated
14*	**Rod seal for non-rotating**	NBR	
15*	**Rod seal**	NBR	
16*	**Piston seal**	NBR	
17*	**Tube gasket**	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
12	CQSKWB12-PS	Set of nos. above ⑭, ⑮, ⑯, ⑰.
16	CQSKWB16-PS	
20	CQSKWB20-PS	
25	CQSKWB25-PS	

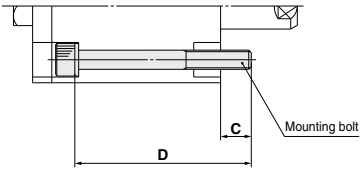
* Seal kit includes ⑭, ⑮, ⑯, ⑰. Order the seal kit, based on each bore size.
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CQSKW

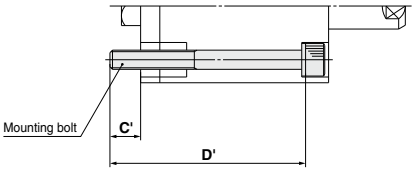
Mounting method: Mounting bolt for through-hole mounting style of CQSKW is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x30L 2 pcs.

Round rod side mounting



Non-rotating rod side mounting



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CQSKWB12-5D	6.5	25	CQ-M3 x 30L	6.5	30	CQ-M3 x 35L
-10D		30	x 35L		35	x 40L
-15D		35	x 40L		40	x 45L
-20D		40	x 45L		45	x 50L
-25D		45	x 50L		50	x 55L
-30D		50	x 55L		55	x 60L
CQSKWB16-5D	6.5	25	CQ-M3 x 30L	6.5	30	CQ-M3 x 35L
-10D		30	x 35L		35	x 40L
-15D		35	x 40L		40	x 45L
-20D		40	x 45L		45	x 50L
-25D		45	x 50L		50	x 55L
-30D		50	x 55L		55	x 60L
CQSKWB20-5D	10	25	CQ-M5 x 35L	10	30	CQ-M5 x 40L
-10D		30	x 40L		35	x 45L
-15D		35	x 45L		40	x 50L
-20D		40	x 50L		45	x 55L
-25D		45	x 55L		50	x 60L
-30D		50	x 60L		55	x 65L
-35D		55	x 65L		60	x 70L
-40D		60	x 70L		65	x 75L
-45D		65	x 75L		70	x 80L
-50D		70	x 80L		75	x 85L
CQSKWB25-5D	7	30	CQ-M5 x 35L	7	35	CQ-M5 x 40L
-10D		35	x 40L		40	x 45L
-15D		40	x 45L		45	x 50L
-20D		45	x 50L		50	x 55L
-25D		50	x 55L		55	x 60L
-30D		55	x 60L		60	x 65L
-35D		60	x 65L		65	x 70L
-40D		65	x 70L		70	x 75L
-45D		70	x 75L		75	x 80L
-50D		75	x 80L		80	x 85L

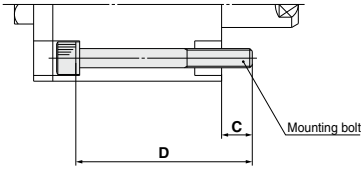
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CQSKW

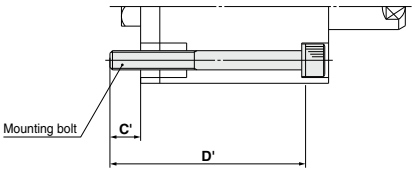
Mounting method: Mounting bolt for through-hole mounting style of CDQSKW is available as an option.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x35L 2 pcs.

Round rod side mounting



Non-rotating rod side mounting



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CDQSKWB12-5D	6.5	30	CQ-M3 x 35L	6.5	35	CQ-M3 x 40L
-10D		35	x 40L		40	x 45L
-15D		40	x 45L		45	x 50L
-20D		45	x 50L		50	x 55L
-25D		50	x 55L		55	x 60L
-30D		55	x 60L		60	x 65L
CDQSKWB16-5D	6.5	30	CQ-M3 x 35L	6.5	35	CQ-M3 x 40L
-10D		35	x 40L		40	x 45L
-15D		40	x 45L		45	x 50L
-20D		45	x 50L		50	x 55L
-25D		50	x 55L		55	x 60L
-30D		55	x 60L		60	x 65L
CDQSKWB20-5D	10	35	CQ-M5 x 45L	10	40	x 50L
-10D		40	x 50L		45	x 55L
-15D		45	x 55L		50	x 60L
-20D		50	x 60L		55	x 65L
-25D		55	x 65L		60	x 70L
-30D		60	x 70L		65	x 75L
-35D		65	x 75L		70	x 80L
-40D		70	x 80L		75	x 85L
-45D		75	x 85L		80	x 90L
-50D		80	x 90L		85	x 95L
CDQSKWB25-5D	7	40	CQ-M5 x 45L	7	45	CQ-M5 x 50L
-10D		45	x 50L		50	x 55L
-15D		50	x 55L		55	x 60L
-20D		55	x 60L		60	x 65L
-25D		60	x 65L		65	x 70L
-30D		65	x 70L		70	x 75L
-35D		70	x 75L		75	x 80L
-40D		75	x 80L		80	x 85L
-45D		80	x 85L		85	x 90L
-50D		85	x 90L		90	x 95L

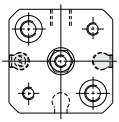
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Dimensions: ø12 to ø25

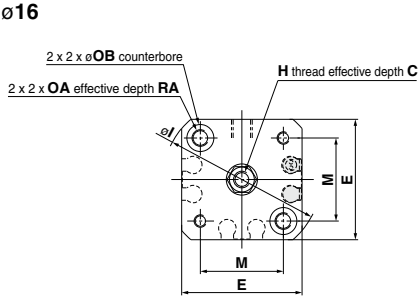
Basic style (Through-hole/Both ends tapped common): CQSKW/CDQSKW

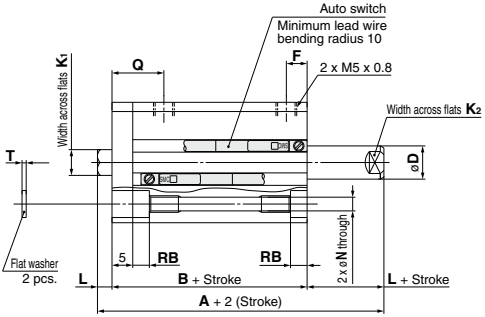
* For the auto switch mounting position and its mounting height, refer to page 770.

ø12

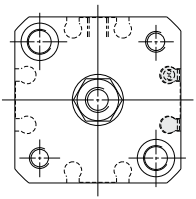


ø16

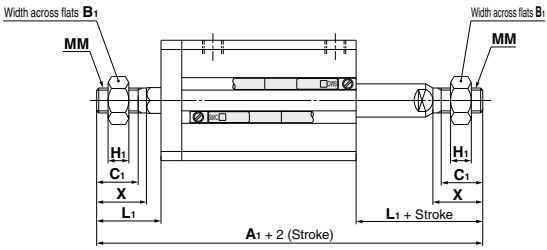




ø20, ø25



Rod end male thread



Rod End Male Thread

Bore size (mm)	Without auto switch A1	With auto switch A1	B1	C1	H1	L1	MM	X
12	55	60	8	9	4	14	M5 x 0.8	10.5
16	58	63	10	10	5	15.5	M6 x 1.0	12
20	68	78	13	12	5	18.5	M8 x 1.25	14
25	79	89	17	15	6	22.5	M10 x 1.25	17.5

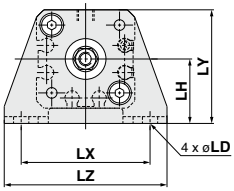
Basic Style

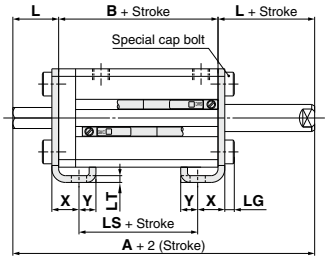
Bore size (mm)	Stroke range (mm)	Without auto switch A	Without auto switch B	With auto switch A	With auto switch B	C	D	E	F	H	I	K1	K2	L	M	N	OA	OB	Q	RA	RB	T
12	5 to 30	34	27	39	32	6	6	25	7.5	M3 x 0.5	32	5.2	5	3.5	15.5	3.5	M4 x 0.7	6.5	12.5	7	4	0.5
16	5 to 30	34	27	39	32	8	8	29	7.5	M4 x 0.7	38	6.2	6	3.5	20	3.5	M4 x 0.7	6.5	12.5	7	4	0.5
20	5 to 50	40	31	50	41	7	10	36	8	M5 x 0.8	47	8.2	8	4.5	25.5	5.4	M6 x 1.0	9	13	10	7	1
25	5 to 50	44	34	54	44	12	12	40	9	M6 x 1.0	52	10.2	10	5	28	5.4	M6 x 1.0	9	14	10	7	1

Note 1) For basic style ø20 and ø25 with 5 stroke, through-hole is threaded over the entire length.
Note 2) The positions of width across flats (K_2) on both sides are not the same.
* For details about the rod end nut and accessory brackets, refer to page 804.

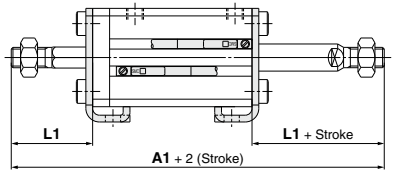
Dimensions: ø12 to ø25

Foot style: CQSKWL/CDQSKWL





Rod end male thread

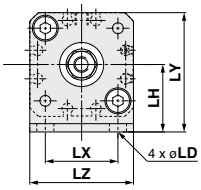


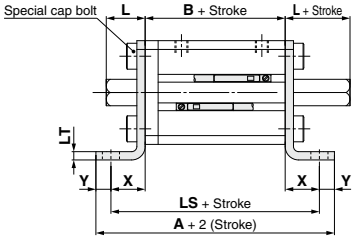
Foot Style

Bore size (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	54	75	27	15	59	80	32	20	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	5 to 30	54	78	27	15	59	83	32	20	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	5 to 50	60	88	31	19	70	98	41	29	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	5 to 50	64	99	34	19	74	109	44	29	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

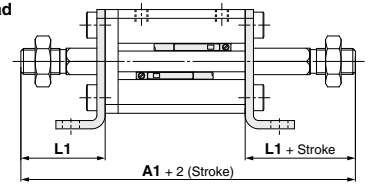
Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSKWLC/CDQSKWLC





Rod end male thread



Compact Foot Style

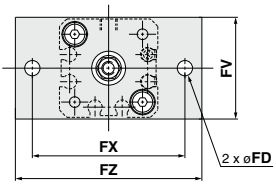
Bore size (mm)	Stroke range (mm)	Without auto switch				With auto switch				L	L1	LD	LH	LT	LX	LY	LZ	X	Y
		A	A1	B	LS	A	A1	B	LS										
12	5 to 30	54.3	75	27	45.6	59.3	80	32	50.6	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	5 to 30	54.8	78	27	45.6	59.8	83	32	50.6	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	5 to 50	64.5	88	31	57.4	74.5	98	41	67.4	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	5 to 50	68	99	34	60.4	78	109	44	70.4	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

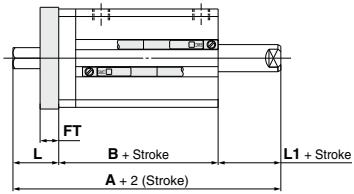
∗ For details about the rod end nut and accessory brackets, refer to page 804.

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

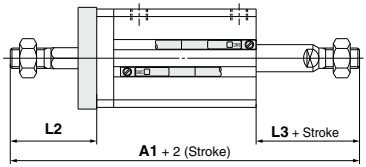
Dimensions: ø12 to ø25

Flange style: CQSKWF/CDQSKWF





Rod end male thread



Flange Style

Bore size (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	44	65	27	49	70	32	4.5	5.5	25	45	55	13.5	3.5	24	14
16	5 to 30	44	68	27	49	73	32	4.5	5.5	30	45	55	13.5	3.5	25.5	15.5
20	5 to 50	50	78	31	60	88	41	6.6	8	39	48	60	14.5	4.5	28.5	18.5
25	5 to 50	54	89	34	64	99	44	6.6	8	42	52	64	15	5	32.5	22.5

∗ For details about the rod end nut and accessory brackets, refer to page 804.
Note 1) The positions of piston rod width across flats (right side) are not constant.

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Compact Cylinder: Anti-lateral Load Type

Series CQS□S

ø12, ø16, ø20, ø25

How to Order

CQS B S 20 – 30 D □ C □ – □

With auto switch **CDQS B S 20 – 30 D □ C □ – M9BW □ – □**

With auto switch
(Built-in magnet)

Mounting style

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

∗ Mounting brackets are shipped together (but not assembled).
∗ Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQSBS" on page 765.

Cushion

S	Anti-lateral load type

Bore size

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

Cylinder stroke (mm)

Standard Stroke

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

For "Manufacture of Intermediate Strokes", refer to page 764.

Cushion

C	Rubber bumper

Body option 1

Nil	Standard
F	With boss on head end

Action

D	Double acting

Made to Order
Refer to page 764 for details.

Number of auto switches

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

Auto switch

Nil	Without auto switch

∗ Refer to the table below for the applicable auto switch model.

Body option 2

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSLS12-25D

Applicable Auto Switches/Refer to pages 1559 to 1673 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)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	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		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)	5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1	○	○	●	○	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V∗2	A93	●	●	●	●	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

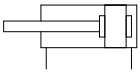
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

∗ Lead wire length symbols: 0.5 m····· Nil (Example) M9NW
1 m····· M (Example) M9NWM
3 m····· L (Example) M9NWL
5 m····· Z (Example) M9NWZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed, refer to page771 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1626 and 1627.
∗ Auto switches are shipped together (not assembled).
Note) There is the case D-A9□V/M9□V/M9□WV/M9□AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping.Consult with SMC for details.

Symbol
Rubber bumper



Made to Order: Individual Specifications

(For details, refer to pages 774 and 776.)

Symbol	Specifications
-X271	Fluororubber seals
-X1876	With concave shape end boss on the cylinder tube head side

Made to Order Specifications

(For details, refer to pages 1675 to 1818.)

Symbol	Specifications
-XA□	Change of Rod End Shape
-XB10	Intermediate stroke (Using exclusive body)
-XC6	Piston rod, retaining ring, rod end nut made of stainless steel
-XC85	Grease for food processing equipment

Body Option

Description	Application
Rod end male thread	Available for Double acting, Single rod models.

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

Note1) When ordering foot and compact foot brackets, order 2 pieces per cylinder.
Note2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange style: Body mounting bolt
Double clevis style: Clevis pin, type C retaining ring for axis, Body mounting bolt

Moisture Control Tube Series IDK

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **Series IDK in the WEB catalog**.

Standard Specifications

Bore size (mm)	12	16	20	25
Action	Double acting, Single rod			
Fluid	Air			
Lubrication	Not required (Non-lube)			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.07 MPa		0.05 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 *			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0}_{0}$ mm *			
Piston speed	50 to 500 mm/s			
Allowable kinetic energy (J)	0.043	0.075	0.11	0.18

* Stroke length tolerance does not include the deflection of the bumper.

Theoretical Output

OUT → IN (N)

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	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

Manufacture of Intermediate Stroke

Description		Spacer is installed in the standard stroke body.	
Part no.		Refer to "How to Order" for the standard model no. (page 763).	
Standard stroke	Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.	
	Stroke range	Bore size	Stroke range
		12, 16	1 to 29
		20, 25	1 to 49
Example		Part no.: CQSBS25–47D CQSBS25-50D with 3 mm width spacer inside. B dimension is 77.5 mm.	

Refer to pages 769 to 771 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

Weight/Without Auto Switch

(g)

Bore size (mm)	Cylinder 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)

(g)

Bore size (mm)	Cylinder 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

Additional Weight

(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 style (Including mounting bolt)		55	65	159	181
Compact foot style (Including mounting bolt)		41	51	121	140
Rod side flange style (Including mounting bolt)		58	70	143	180
Head side flange style (Including mounting bolt)		56	66	137	171
Double clevis style (Including pin, retaining ring, bolt)		34	40	92	127

For standard strokes

Calculation: (Example) **CQSDS20-20DCM**

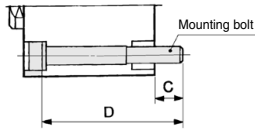
- Cylinder weight: CQSBS20-20DC ····· 114 g
- Additional weight: Rod end male thread ····· 10 g
  : Double clevis style ····· 92 g

216 g

Mounting Bolt for CQSBS

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

Example) CQ-M3x30L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CQSBS12–5DC	6.5	30	CQ-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	CQ-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	CQ-M5 x 30L
–10DC		35	x 35L
–15DC		40	x 40L
–20DC		45	x 45L

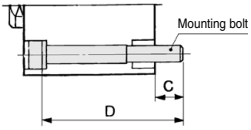
Cylinder model	C	D	Mounting bolt part no.
CQSBS20–25DC	6.5	50	CQ-M5 x 50L
–30DC		55	x 55L
–35DC		60	x 60L
–40DC		65	x 65L
–45DC		70	x 70L
–50DC		75	x 75L
CQSBS25–5DC	8.5	35	CQ-M5 x 35L
–10DC		40	x 40L
–15DC		45	x 45L
–20DC		50	x 50L
–25DC		55	x 55L
–30DC		60	x 60L
–35DC		65	x 65L
–40DC		70	x 70L
–45DC		75	x 75L
–50DC		80	x 80L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSBS with Auto Switch

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

Example) CQ-M3x35L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

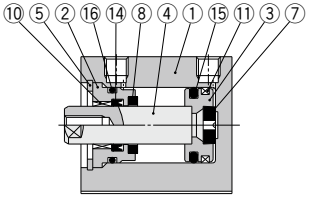
Cylinder model	C	D	Mounting bolt part no.
CDQSBS12–5DC	6.5	35	CQ-M3 x 35L
–10DC		40	x 40L
–15DC		45	x 45L
–20DC		50	x 50L
–25DC		55	x 55L
–30DC		60	x 60L
CDQSBS16–5DC	6.5	35	CQ-M3 x 35L
–10DC		40	x 40L
–15DC		45	x 45L
–20DC		50	x 50L
–25DC		55	x 55L
–30DC		60	x 60L
CDQSBS20–5DC	6.5	40	CQ-M5 x 40L
–10DC		45	x 45L
–15DC		50	x 50L
–20DC		55	x 55L

Cylinder model	C	D	Mounting bolt part no.
CDQSBS20–25DC	6.5	60	CQ-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	CQ-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

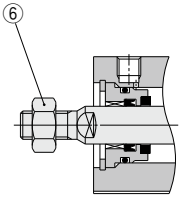
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Construction

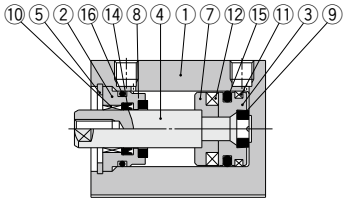
Basic style



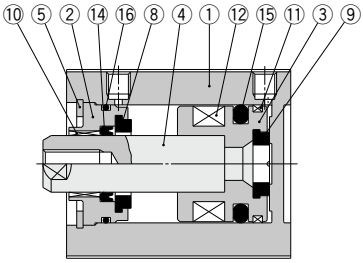
Rod end male thread



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



ø20, ø25



Component Parts

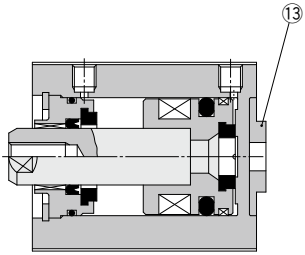
No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Collar**	Aluminum alloy	Anodized
3	**Piston**	Aluminum alloy	Chromated
4	**Piston rod**	Stainless steel	
5	**Retaining ring**	Carbon tool steel	Phosphate coated
6	**Rod end nut**	Carbon steel	Nickel plated
7	**Spacer for switch type**	Aluminum alloy	Chromated
8	**Bumper A**	Urethane	
9	**Bumper B**	Urethane	
10	**Bushing**	Oil-impregnated sintered alloy	
11	**Wear ring**	Resin	
12	**Magnet**	—	
13	**Centering location ring**	Aluminum alloy	Anodized
14*	**Rod seal**	NBR	
15*	**Piston seal**	NBR	
16*	**Tube gasket**	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
12	CQSB12-PS	Set of nos. above ⑭, ⑮, ⑯.
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	

* Seal kit includes ⑭, ⑮, ⑯. Order the seal kit, based on each bore size.
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

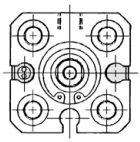
With boss on head end



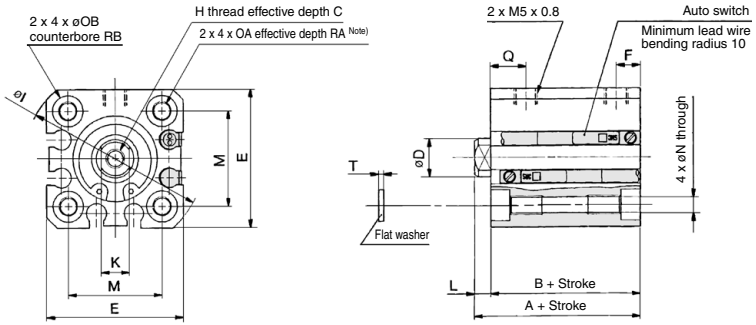
Dimensions: ø12 to ø25

Basic style (Through-hole/Both ends tapped common): CQSBS/CDQSBS

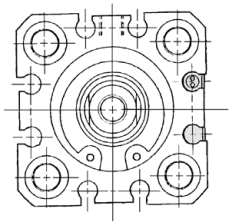
ø12



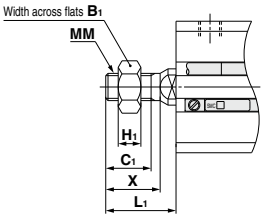
ø16



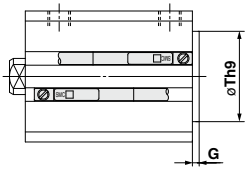
ø20, ø25



Rod end male thread



With boss on head end



Rod End Male Thread

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	$15^{0}_{-0.043}$
16	1.5	$20^{0}_{-0.052}$
20	2	$13^{0}_{-0.043}$
25	2	$15^{0}_{-0.043}$

Note) With boss on rod end: Option (Suffix "-XC36" to the end of part number.)
Note that only bore sizes ø12 and ø16 are applicable to the long stroke.

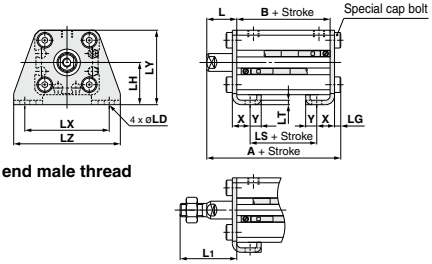
Basic Style

Bore size (mm)	Stroke range (mm)	Without 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 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	8	29	5	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	9	8	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	9	10	7	1

Note) For basic style 5 to10 stroke with ø20 and 5 stroke with ø25, through-hole is threaded over the entire length.
∗ For details about the rod end nut and accessory brackets, refer to page 804.

Dimensions: ø12 to ø25

Foot style: CQSLS/CDQSLS



Rod end male thread

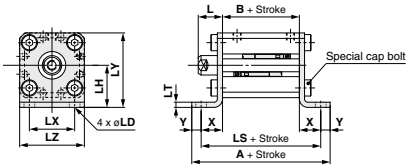
Foot Style

Bore size (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

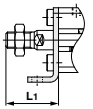
Bore size (mm)	L	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot style: CQSLCS/CDQSLCS



Rod end male thread



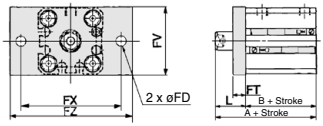
Compact Foot Style

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

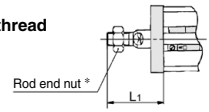
Bore size (mm)	L	L1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

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

Rod side flange style: CQSFS/CDQSFS



Rod end male thread



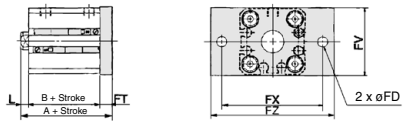
Rod Side Flange Style

Bore size (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

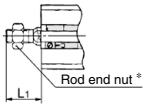
Bore size (mm)	FD	FT	FV	FX	FZ	L	L1
12	4.5	5.5	25	45	55	13.5	24
16	4.5	5.5	30	45	55	13.5	25.5
20	6.6	8	39	48	60	14.5	28.5
25	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head side flange style: CQSGS/CDQSGS



Rod end male thread



Head Side Flange Style

Bore size (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

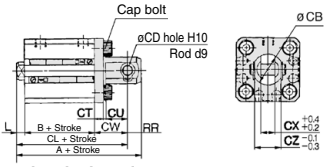
Bore size (mm)	FD	FT	FV	FX	FZ	L	L1
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	8	39	48	60	4.5	18.5
25	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

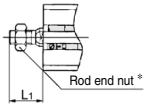
* For details about the rod end nut and accessory brackets, refer to page 804.

Dimensions: ø12 to ø25

Double clevis style: CQSDS/CDQSDS



Rod end male thread



Double Clevis Style

Bore size (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 size (mm)	**CB**	**CD**	**CT**	**CU**	**CW**	**CX**	**CZ**	**L**	**L_1**	**RR**
12	12	5	4	7	14	5	10	3.5	14	6
16	14	5	4	10	15	6.5	12	3.5	15.5	6
20	20	8	5	12	18	8	16	4.5	18.5	9
25	24	10	5	14	20	10	20	5	22.5	10

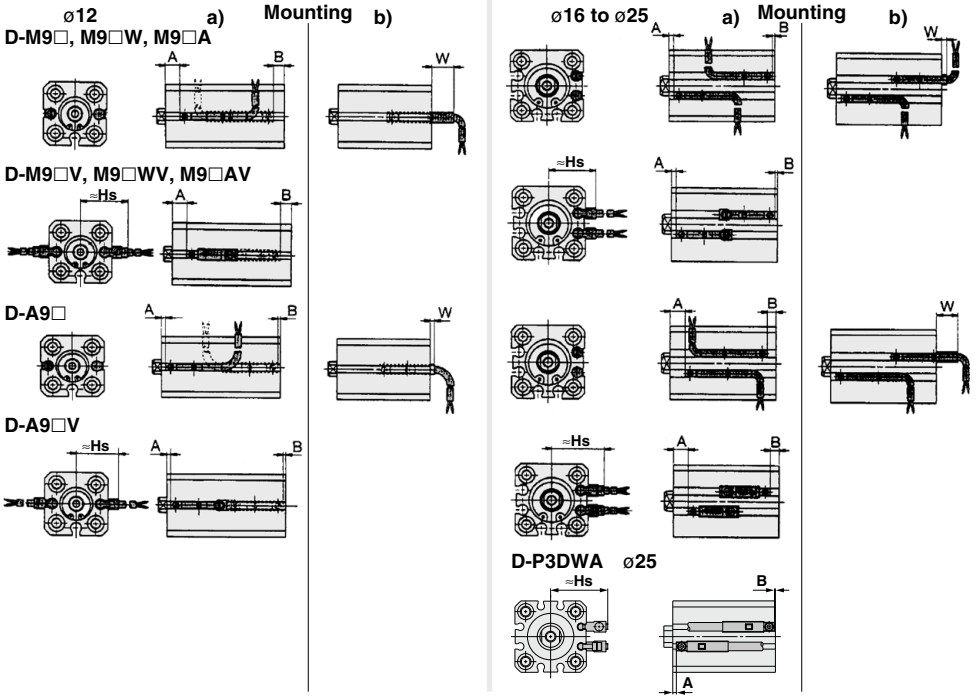
Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the double clevis pivot bracket, refer to page 733-2.
* For details about the rod end nut and accessory brackets, refer to page 804.

Auto Switch Mounting 1

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

● Double acting: Single rod, Single acting: Single rod, Spring return/Spring extend; Long stroke type, Anti-lateral load type, ● Double acting: Double rod)



Proper Auto Switch Mounting Position (Detection at stroke end)

● Double acting: Single rod, Single acting: Single rod, Spring return/Spring extend; Long stroke type, Anti-lateral load type, ● Double acting: Double rod)

Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-M9□/M9□W			D-M9□V/M9□WV/M9□AV			D-M9□A			D-A9□			D-A9□V			D-P3DWA		
	A	B	W	A	B	Hs	A	B	W	A	B	W	A	B	Hs	A	B	Hs
Double Acting, Single Rod; Single Acting, Single Rod, Spring Return/Spring Extend [ ]: Denotes the values of D-A93. ( ): Denotes the values of type T.																		
12	5.5 (6.5)	3.5 (4.5)	5.5 (6.5)	5.5 (6.5)	4.5 (3.5)	19.5	5.5 (6.5)	4.5 (3.5)	7.5 (8.5)	1.5 (2.5)	0	1.5 [4] (2.5 [5])	1.5 (2.5)	0	17	—	—	—
16	6	4	6	6	4	21.5	6	4	8	2	0	2 [4.5]	2	0	19	—	—	—
20	10	7.5	2.5	10	7.5	25	10	7.5	4.5	6	3.5	−1.5 [1]	6	3.5	22.5	—	—	—
25	11	9.5	0.5	11	9.5	27	11	9.5	2.5	7	5.5	−3.5 [−1]	7	5.5	24.5	6.5	5	33
Long Stroke																		
12	9	11	−1	9	11	19.5	9	11	1	5	7	−5 [−2.5]	5	7	17	—	—	—
16	9.5	10.5	−0.5	9.5	10.5	21.5	9.5	10.5	1.5	5.5	6	−4.5 [−2]	5.5	6	19	—	—	—
20	13	16	−6	13	16	25	13	16	−4	9	12	−10 [−7.5]	9	12	22.5	—	—	—
25	14	18	−8	14	18	27	14	18	−6	10	14	−12 [−9.5]	10	14	24.5	9.5	13.5	33
Anti-lateral Load Type																		
12	10	5	5	10	5	19.5	10	5	7	6	1	1 [3.5]	6	1	17	—	—	—
16	9.5	9	4.5	9.5	9	21.5	9.5	9	6.5	5.5	5	0.5 [3]	5.5	5	19	—	—	—
20	13	9.5	0.5	13	9.5	25	13	9.5	2.5	9	5.5	−3.5 [−1]	9	5.5	22.5	—	—	—
25	14	11.5	−1.5	14	11.5	27	14	11.5	0.5	10	7.5	−5.5 [−3]	10	7.5	24.5	9.5	7	33
Double Acting, Double Rod																		
12	5.5	9.5	0.5	5.5	9.5	19.5	5.5	9.5	2.5	1.5	5.5	3.5 [6]	1.5	5.5	17	—	—	—
16	6	9	1	6	9	21.5	6	9	3	2	5	3 [5.5]	2	5	19	—	—	—
20	10	14	−4	10	14	25	10	14	−2	6	10	8 [10.5]	6	10	22.5	—	—	—
25	11	16	−6	11	16	27	11	16	−4	7	12	10 [12.5]	7	12	24.5	6.5	11.5	33

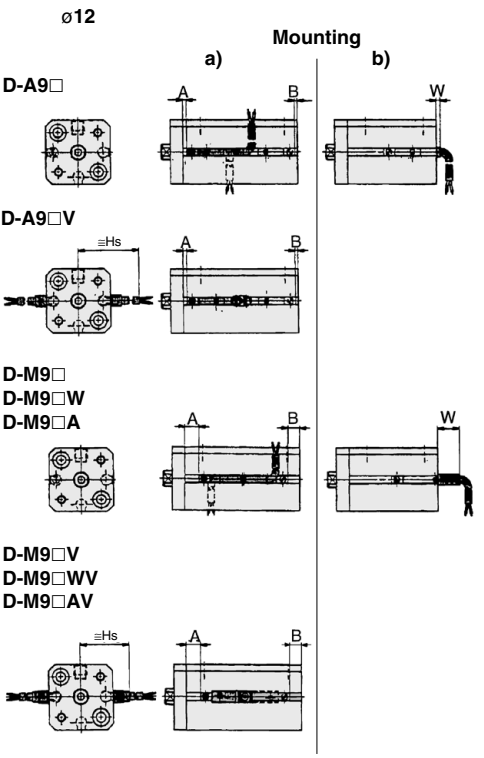
Note 1) The product is shipped out of the factory in installation state "a)". To change the electrical entry direction of the auto switch on the head, refer to installation state "b)".
Note 2) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 3) The D-M9□/M9□W and M9□A cannot be installed on the single acting: single rod type.
Note 4) Adjust the auto switch after confirming the operating conditions in the actual setting.
Note 5) The D-P3DWA□ is available only for ø25 of the double acting single rod, long stroke, anti-lateral load and double rod type.

Auto Switch Mounting 2

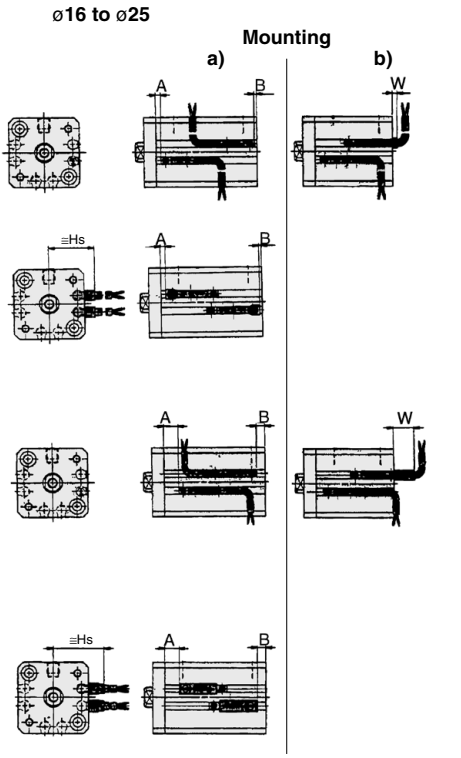
Proper Auto Switch Mounting Position (Detection at stroke end)

Non-rotating rod

ø12



ø16 to ø25



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-A9□			D-A9□V			D-M9□/M9□W			D-M9□V/M9□WV/M9□AV		
	A	B	W	A	B	Hs	A	B	W	A	B	Hs
12	1.5	0	1.5 (4)	1.5	0	17	5.5	4.5	5.5	5.5	4.5	19.5
16	2	0	2 (4.5)	2	0	19	6	4	6	6	4	21.5
20	6	3.5	–1.5 (1)	6	3.5	22.5	10	7.5	2.5	10	7.5	25
25	7	5.5	–3.5 (–1)	7	5.5	24.5	11	9.5	0.5	11	9.5	27

( ): Denotes the values of D-A93.

Auto switch model / Bore size (mm)	D-M9□A		
	A	B	W
12	5.5	4.5	7.5
16	6	4	8
20	10	7.5	4.5
25	11	9.5	2.5

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

Note 2) Adjust the auto switch after confirming the operating conditions in the actual setting.

Operating Range

(mm)

Auto switch model	Bore size (mm)			
	12	16	20	25
D-M9□/M9□V **D-M9□W/M9□WV** **D-M9□A/M9□AV**	3	4	5.5	5.5
D-A9□/A9□V	6	7.5	10	10
D-P3DWA	—	—	—	6

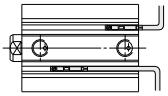
∗ Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately ±30% dispersion.) There may be the case it will vary substantially depending on an ambient environment.

Minimum Auto Switch Mounting Stroke

(mm)

No. of auto switch mounted	D-M9□V	D-M9□WV D-M9□AV	D-A9□	D-A9□V	D-M9□	D-M9□W D-M9□A	D-P3DWA Note 2)
1 pc.	5	10	10 (5)	5	15 (5)	15 (10)	15
2 pcs.	5	10	10	10	15 (5)	15 (10)	15

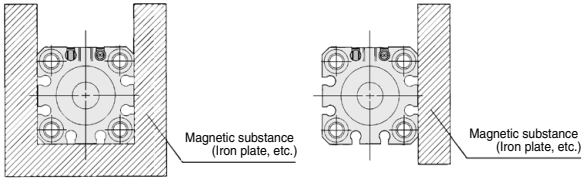
Note 1) The D-M9□/M9□W/M9□A and P3DWA□ cannot be installed on the single acting: single rod type.
Note 2) Available only for ø25.
Note 3) The dimension stated in ( ) shows the minimum mountable stroke when the auto switch does not project from the end face of the cylinder body and the lead wire bending space is not hindered. (Refer to the figure below.) The auto switch needs to be ordered separately.



⚠ Precautions

Be sure to read before handling.
Refer to front matter 57 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch 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 graph 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, please check with SMC for this type of application.



Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.
∗ Normally closed (NC = b contact), solid state auto switch (D-F9G/F9H type, and D-F8 type) are also available. For details, refer to pages 1576 and 1577.
∗ For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1626 and 1627 for details.

Made to Order: Individual Specifications 1

Please contact SMC for detailed dimensions, specifications, and lead times.

Made to Order

1 Special Piston Rod End for Double Rod Type Cylinder

Symbol **-X235**

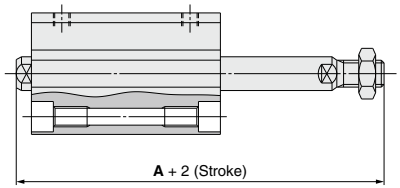
Male thread is used at one piston rod end of double rod style cylinder and female thread is used at the other end.

C□QSW | **Mounting** | **Bore size** — | **Stroke** | **D** — **X235**

"D" in the case of "-235"

Piston rod end
Male thread, Female thread

∗ Specifications: Same as standard type.
Note) Please contact SMC for mounting bracket.



Symbol \ Bore size	12	16	20	25
A	39.5 (44.5)	41 (46)	49 (59)	56.5 (66.5)
Applicable stroke	5 to 30		5 to 50	

Note 1) Applicable stroke is available by the 5 mm interval.
Note 2) ( ): Denotes the dimensions with auto switch.

2 Fluororubber for Seals

Symbol **-X271**

Material for seals is changed to fluororubber.

C□QS | **Standard model no.** — **X271**

Fluororubber for seals

All series variations except non-rotating piston rod style of Series CQS is available.
Specifications are the same as for each variation of CQS.

3 Long Stroke of Adjustable Extension Stroke Cylinder (-XC8)

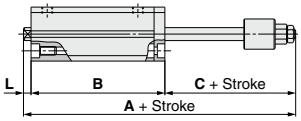
Symbol **-X525**

C□QS | **Mounting** | **Bore size** — | **Stroke** | **D(M)** — **X525**

Long stroke of XC8

Specifications are the same as for -XC8 of Series CQ2/CQS.
Refer to "Made to Order Common Specifications".
Note) For the tap mounting style (ø12 to ø25—without switch) and mounting bracket, please contact SMC.

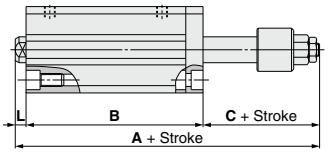
ø12, ø16



ø12, ø16

Bore (mm) \ Symbol / Stroke	A				B				C	L	Applicable stroke
	35st	40st	45st	50st	35st	40st	45st	50st			
12	91.1 (96.1)	96.1 (101.1)	101.1 (106.1)	106.1 (111.1)	62 (67)	67 (72)	72 (77)	77 (87)	25.6	3.5	35, 40, 45, 50
16	91.5 (96.5)	96.5 (101.5)	101.5 (106.5)	106.5 (111.5)	62 (67)	67 (72)	72 (77)	77 (87)	26	3.5	

ø20, ø25



ø20, ø25

Bore (mm) \ Symbol / Stroke	A		B		C	L	Applicable stroke
	55 to 75st	80 to 100st	55 to 75st	80 to 100st			
20	142.5 (152.5)	167.5 (177.5)	109 (119)	134 (144)	29	4.5	55 to 100
25	146 (156)	171 (181)	112 (122)	137 (147)	29	5	

Note 1) ( ): Denotes dimensions with auto switch.
Note 2) Applicable stroke is available by the 5 mm interval.

Symbol
-X526

4 Long Stroke of Adjustable Retraction Stroke Cylinder (-XC9)

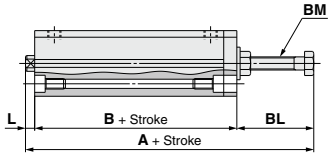
C□QS | Mounting | Bore size | — | Stroke | **D (M) — X526**

X526: Long stroke of XC9

Specifications are the same as for -XC9 of Series CQS.
Refer to "Made to Order Common Specifications".
Note) Please contact SMC for bracket style.

Dimensions

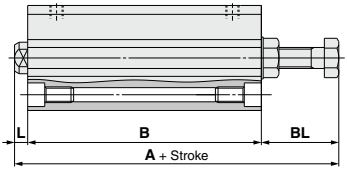
ø12, ø16



Bore (mm) \ Symbol	A	B	L	BL	BM	Applicable stroke
12	69.8	37	3.5	29.3	M5 x 0.8	35, 40, 45, 50, 75, 100
16	69.5	37	3.5	29	M6 x 1.0	
20	76	41	4.5	30.5	M8 x 1.25	75,100, 125, 150, 175, 200
25	78.5	44	5	29.5	M8 x 1.25	75, 100, 125, 150, 175, 200, 250, 300

Note 1) Intermediate stroke type (available by the 5 mm interval) is for spacer so that dimensions are the same as for each style of 75, 100, 125, 150, 175, 200, 250, 300 stroke.

ø20, ø25



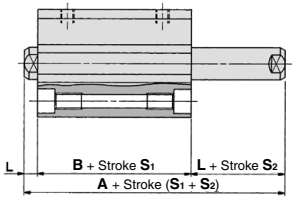
Symbol
-X633

5 Intermediate Stroke of Double Rod Type

C□QSW | Standard model no. | **— X633**

* Specifications: Same as standard type.
Note) Please contact SMC for bracket style.

Dimensions



Bore (mm) \ Symbol	A	B1	L	Stroke S1	Stroke S2
12	29 (34)	22 (27)	3.5	In the case of 5 to 30 stroke 5 mm intervals	In the case of 5 to 30 stroke 1 mm intervals
16	29 (34)	22 (27)	3.5		
20	35 (45)	26 (36)	4.5	In the case of 5 to 50 stroke 5 mm intervals	In the case of 5 to 50 stroke 1 mm intervals
25	39 (49)	29 (39)	5		

Note 1) ( ): Denotes the dimensions with auto switch.
Note 2) Installing a spacer inside the standard cylinder tube, stroke S_1 has 5 mm intervals to controlling intermediate stroke by the 1 mm interval.
Example) In the case of CDQ2WB40-18D, stroke S_1 is 20 mm and stroke S_2 is 18 mm.

Made to Order: Individual Specifications 2

Please contact SMC for detailed dimensions, specifications, and lead times.

Made to Order

6 Long Stroke of Dual Stroke Single Rod Type

Symbol **-X636**

C□QSB [Bore size] — [Stroke S_1] + [Stroke S_2-S_1] **DC (M)** — **X636**

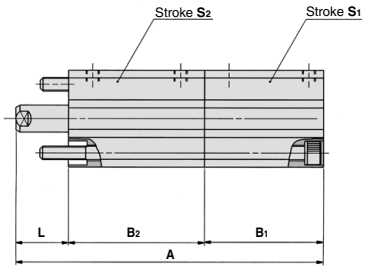
Long stroke of XC11

Applicable stroke

mm

Bore size	Stroke
ø12, ø16	Max. stroke S_2: up to 50 mm
ø20, ø25	Max. stroke S_2: up to 100 mm

Specifications are the same as for -XC11 of Series CQS.
Refer to "Made to Order Common Specifications".
Note) Please contact SMC for tap mounting style and bracket mounting style.



Bore size: ø12, ø16 mm

Bore \ Symbol	A	B_1	B_2	L	Stroke range	
					S_1	S_2
ø12	62.5 (67.5) + Stroke (S_1 + S_2)	17 (22) + Stroke S_1	32 + Stroke S_2	13.5	5 to 30	35 to 50
ø16	62.5 (67.5) + Stroke (S_1 + S_2)	17 (22) + Stroke S_1	32 + Stroke S_2	13.5	5 to 30	35 to 50

Bore size: ø20, ø25 mm

Bore \ Symbol / Stroke	A		B_1	B_2		L	Stroke range	
	Stroke S_2			Stroke S_2			S_1	S_2
	55 to 75	80 to 100		55 to 75	80 to 100			
ø20	150 (160) + Stroke S_1	175 (185) + Stroke S_1	19.5 (29.5) + Stroke S_1	116	141	14.5	5 to 50	55 to 100
ø25	156.5 (166.5) + Stroke S_1	181.5 (191.5) + Stroke S_1	22.5 (32.5) + Stroke S_1	119	144	15	5 to 50	55 to 100

Note 1) ( ): Denotes the dimensions with auto switch.
Note 2) Applicable stroke is available by the 5 mm interval.

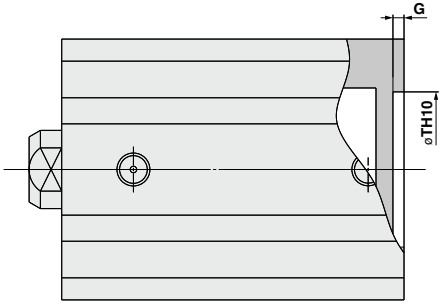
7 Cylinder Tube: With Concave Boss on Head End

Symbol **-X1876**

C□QS [Mounting] [Bore size] — [Stroke] **D (C) (M) S (M) T (M)** — **X1876**

With concave boss on head end

Specifications are the same as CQS.
Note) CQS: Excluding ø12 and ø16.



Series	CQS	
Bore size (mm)	**TH10**	**G**
20	$19.3^{+0.084}_{0}$	1.4
25	$23.8^{+0.084}_{0}$	1.4

Smooth Cylinder

Series CQSY

ø12, ø16, ø20, ø25

How to Order

CQSY **B** **20** – **30** **D** **C**

With auto switch **CDQSY** **B** **20** – **30** **D** **C** – **M9BW** ☐

With auto switch
(Built-in magnet)

Mounting

B	Through-hole/Both ends tapped (Standard)
L	Foot Note)
LC	Compact foot
F	Rod flange
G	Head flange
D	Double clevis

∗ Mounting bracket is shipped together with the product, (but not assembled).

Bore size

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

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 84.

Action

D	Double acting

Cushion/Rod end thread

C	With rubber bumper Female rod end
CM	With rubber bumper Male rod end

Auto switch

Nil	Without auto switch

∗ For applicable auto switches, refer to the table below.

Number of auto switches

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQSYL25-30DC

Applicable Auto Switches/Refer to **the WEB catalog** or Best Pneumatics No. 3 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 (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto 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)			3-wire (NPN)		5 V, 12 V		**M9NWV**	**M9NW**	●	●	●	○	○	IC circuit	
				3-wire (PNP)				**M9PWV**	**M9PW**	●	●	●	○	○		
				2-wire		12 V		**M9BWV**	**M9BW**	●	●	●	○	○	—	
	Water resistant (2-color indication)			3-wire (NPN)		5 V, 12 V		**M9NAV**∗1	**M9NA**∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)				**M9PAV**∗1	**M9PA**∗1	○	○	●	○	○		
				2-wire		12 V		**M9BAV**∗1	**M9BA**∗1	○	○	●	○	○	—	
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)		—		—	**P3DW**∗∗	●	—	●	●	○		
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	**A93V**∗2	**A93**	●	●	●	●	—	—	Relay, PLC
							100 V or less	**A90V**	**A90**	●	—	●	—	—	IC circuit	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗∗ The D-P3DW☐ is only compatible with ø25. It is mounted away from the port side to avoid interference with fittings.
∗ Since there are other applicable auto switches than listed, refer to page 90 for details.
∗ For details about auto switches with pre-wired connector, refer to **the WEB catalog** or Best Pneumatics No. 3.
For the D-P3DW☐, refer to **the WEB catalog** or Best Pneumatics No. 3.
∗ Auto switches are shipped together, (but not assembled).
Note) The D-A9☐V/M9☐V/M9☐WV/M9☐AV auto switches may not be mounted on the port side depending on the cylinder stroke or the fitting size of piping.

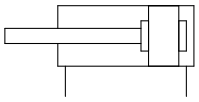
Specifications

Bore size (mm)	12	16	20	25
Type	Pneumatic (Non-lube)			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.05 MPa			
Maximum operating pressure	0.7 MPa			
Ambient and fluid temperature	Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)			
Cushion	Rubber bumper			
Rod end thread	Female thread			
Stroke length tolerance	$^{+1.0}_{0}$ mm Note)			
Piston speed	5 to 500 mm/s			
Allowable leakage rate	0.5 L/min (ANR) or less			

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

Symbol

Rubber bumper



Minimum Operating Pressure

Unit: MPa

Bore size (mm)	12	16	20	25
Minimum operating pressure	0.03		0.02	

Standard Strokes

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

Theoretical Output

Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm^2)	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

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents	
12	CQSY12-PS	Piston seal	1 pc.
16	CQSY16-PS	Rod seal	1 pc.
20	CQSY20-PS	Tube gasket	1 pc.
25	CQSY25-PS	Grease pack (10 g)	1 pc.

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

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

Intermediate Stroke

Method		Installation of spacer on standard stroke body.	
Model no.		Refer to page 83 for standard model no.	
Standard stroke	Method	Intermediate strokes at 1 mm intervals are available by using spacers with standard stroke cylinders.	
	Stroke range	Bore size (mm)	Stroke range (mm)
		12, 16	1 to 29
		20, 25	1 to 49
Example		Part no.: CQSYB25-47DC CQSYB25-50DC with 3 mm width spacer inside. B dimension is 77.5 mm. Calculation:ø25, B dimension 27.5 mm (without auto switch) 27.5 (B dimension) + 50 (st) = 77.5 (mm)	

Weights/Without Auto Switch

(g)

Bore size (mm)	Cylinder 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

Weights/With Auto Switch (Built-in magnet)

(g)

Bore size (mm)	Cylinder 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

Additional Weights

(g)

Bore size (mm)		**12**	**16**	**20**	**25**
Male rod end	Male thread	1.5	3	6	12
	Nut	1	2	4	8
Foot (Including mounting bolt)		55	65	159	181
Compact foot (Including mounting bolt)		32	40	97	116
Rod flange (Including mounting bolt)		58	70	143	180
Head flange (Including mounting bolt)		56	66	137	171
Double clevis (Including pin, retaining ring, mounting bolt)		34	40	92	127

For standard strokes

Calculation: (Example) **CQSYD20-20DCM**

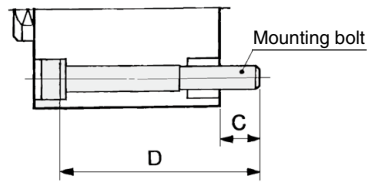
- Basic weight: CQSYB20-20DC ·····114 g
- Additional weight: Male rod end ·····10 g
  : Double clevis ·····92 g

216 g

Mounting Bolt for CQSYB without Auto Switch

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

Example) CQ-M3X30L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CQSYB12-5DC	6.5	30	CQ-M3X30L
-10DC		35	X35L
-15DC		40	X40L
-20DC		45	X45L
-25DC		50	X50L
-30DC		55	X55L
CQSYB16-5DC	6.5	30	CQ-M3X30L
-10DC		35	X35L
-15DC		40	X40L
-20DC		45	X45L
-25DC		50	X50L
-30DC		55	X55L
CQSYB20-5DC	6.5	30	CQ-M5X30L
-10DC		35	X35L
-15DC		40	X40L
-20DC		45	X45L

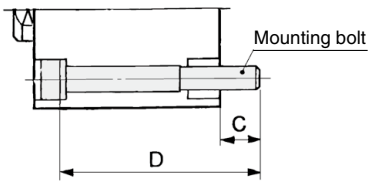
Cylinder model	C	D	Mounting bolt part no.
CQSYB20-25DC	6.5	50	CQ-M5X50L
-30DC		55	X55L
-35DC		60	X60L
-40DC		65	X65L
-45DC		70	X70L
-50DC		75	X75L
CQSYB25-5DC	8.5	35	CQ-M5X35L
-10DC		40	X40L
-15DC		45	X45L
-20DC		50	X50L
-25DC		55	X55L
-30DC		60	X60L
-35DC		65	X65L
-40DC		70	X70L
-45DC		75	X75L
-50DC		80	X80L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSYB with Auto Switch

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

Example) CQ-M3X35L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

Cylinder model	C	D	Mounting bolt part no.
CDQSYB12-5DC	6.5	35	CQ-M3X35L
-10DC		40	X40L
-15DC		45	X45L
-20DC		50	X50L
-25DC		55	X55L
-30DC		60	X60L
CDQSYB16-5DC	6.5	35	CQ-M3X35L
-10DC		40	X40L
-15DC		45	X45L
-20DC		50	X50L
-25DC		55	X55L
-30DC		60	X60L
CDQSYB20-5DC	6.5	40	CQ-M5X40L
-10DC		45	X45L
-15DC		50	X50L
-20DC		55	X55L

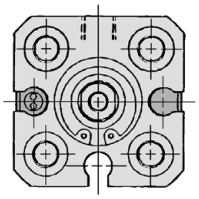
Cylinder model	C	D	Mounting bolt part no.
CDQSYB20-25DC	6.5	60	CQ-M5X60L
-30DC		65	X65L
-35DC		70	X70L
-40DC		75	X75L
-45DC		80	X80L
-50DC		85	X85L
CDQSYB25-5DC	8.5	45	CQ-M5X45L
-10DC		50	X50L
-15DC		55	X55L
-20DC		60	X60L
-25DC		65	X65L
-30DC		70	X70L
-35DC		75	X75L
-40DC		80	X80L
-45DC		85	X85L
-50DC		90	X90L

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

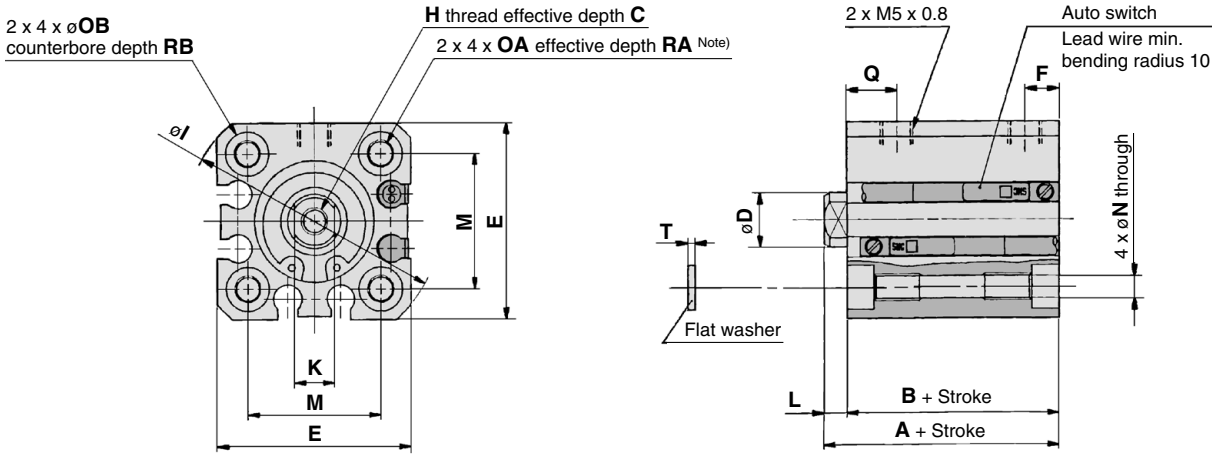
Dimensions: ø12 to ø25

Standard (Through-hole/Both ends tapped): CQSYB/CDQSYB

ø12

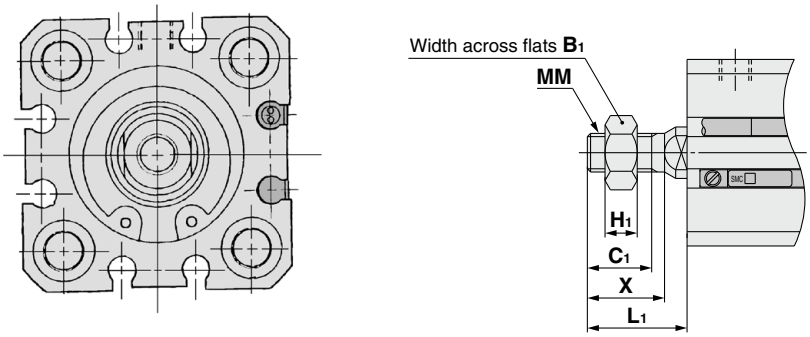


ø16



ø20, ø25

Male rod end



Male Rod End

Bore size (mm)	B_1	C_1	H_1	L_1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

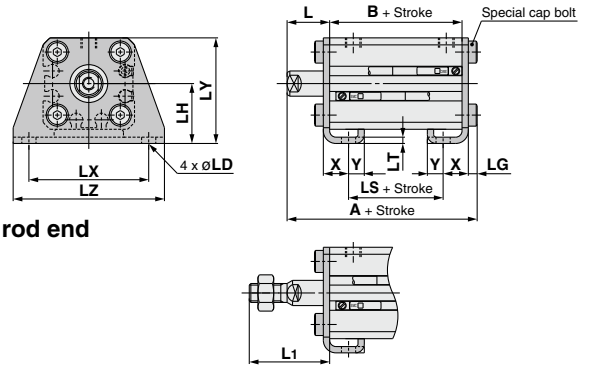
Standard

Bore size (mm)	Stroke range (mm)	Without 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 x 0.5	32	5	3.5	15.5	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
16	5 to 30	25.5	22	30.5	27	8	8	29	5	M4 x 0.7	38	6	3.5	20	3.5	M4 x 0.7	6.5	7.5	7	4	0.5
20	5 to 50	29	24.5	39	34.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.4	M6 x 1.0	9	8	10	7	1
25	5 to 50	32.5	27.5	42.5	37.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.4	M6 x 1.0	9	9	10	7	1

Note) Threaded through-hole is used for the standard of ø20 with 5 to 10 mm strokes and ø25 with a 5 mm stroke.

Dimensions: ø12 to ø25

Foot: CQSYL/CDQSYL



Male rod end

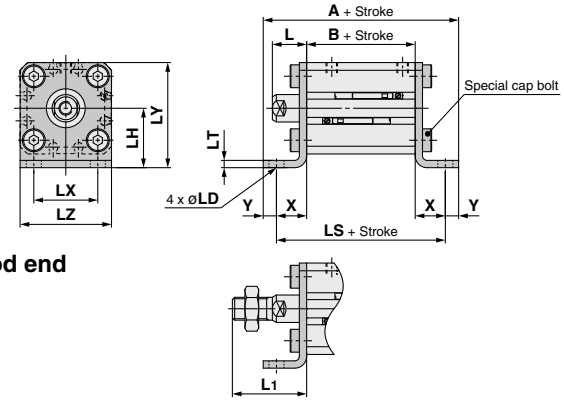
Foot

Bore size (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 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 plating

Compact foot: CQSYLC/CDQSYLC



Male rod end

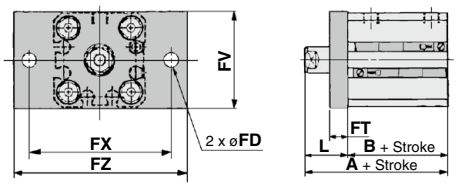
Compact Foot

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

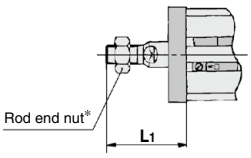
Bore size (mm)	L	L1	LD	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	17	2	15.5	29.5	25	9.3	4.5
16	13.5	25.5	4.5	19	2	20	33.5	29	9.3	5
20	14.5	28.5	6.6	24	3.2	25.5	42	36	13.2	5.8
25	15	32.5	6.6	26	3.2	28	46	40	13.2	5.8

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

Rod flange: CQSYF/CDQSYF



Male rod end



Rod Flange

Bore size (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

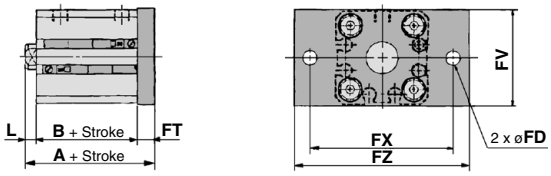
Bore size (mm)	FD	FT	FV	FX	FZ	L	L1
12	4.5	5.5	25	45	55	13.5	24
16	4.5	5.5	30	45	55	13.5	25.5
20	6.6	8	39	48	60	14.5	28.5
25	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

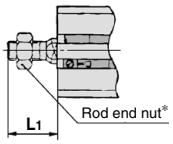
∗ For details about the rod end nut and accessory brackets, refer to page 103.

Dimensions: ø12 to ø25

Head flange: CQSYG/CDQSYG



Male rod end



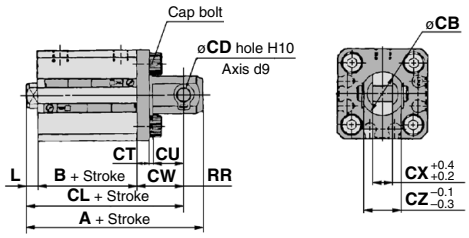
Head Flange

Bore size (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

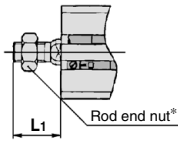
Bore size (mm)	FD	FT	FV	FX	FZ	L	L_1
12	4.5	5.5	25	45	55	3.5	14
16	4.5	5.5	30	45	55	3.5	15.5
20	6.6	8	39	48	60	4.5	18.5
25	6.6	8	42	52	64	5	22.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plating

Double clevis: CQSYD/CDQSYD



Male rod end



Double Clevis

Bore size (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 size (mm)	CB	CD	CT	CU	CW	CX	CZ	L	L_1	RR
12	12	5	4	7	14	5	10	3.5	14	6
16	14	5	4	10	15	6.5	12	3.5	15.5	6
20	20	8	5	12	18	8	16	4.5	18.5	9
25	24	10	5	14	20	10	20	5	22.5	10

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plating

∗ For details about the rod end nut and accessory brackets, refer to page 103.

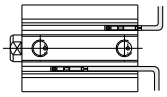
Auto Switch Mounting

Minimum Stroke for Auto Switch Mounting

(mm)

Number of auto switches	D-M9□V	D-A9□V	D-M9□WV D-M9□AV	D-A9□	D-M9□W D-M9□A	D-M9□	D-P3DW□ Note 1)
With 1 pc.	5	5	10	10(5)	15(10)	15(5)	15
With 2 pcs.	5	10	10	10	15(10)	15(5)	15

Note 1) ø25 is only applicable for the D-P3DW□.
Note 2) The dimensions stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure on the right.)
Order auto switches separately.

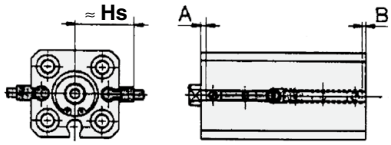


Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

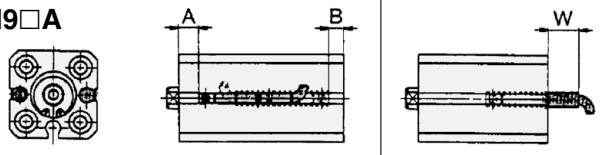
ø12

Mounting a) b)

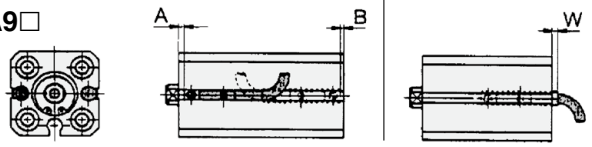
D-M9□V
D-M9□WV
D-M9□AV
D-A9□V



D-M9□
D-M9□W
D-M9□A

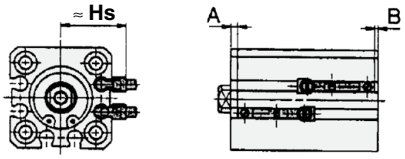


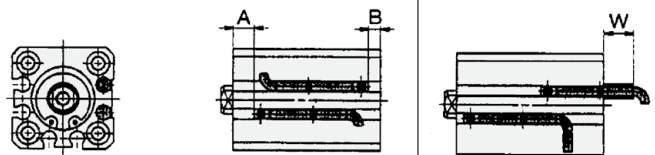
D-A9□

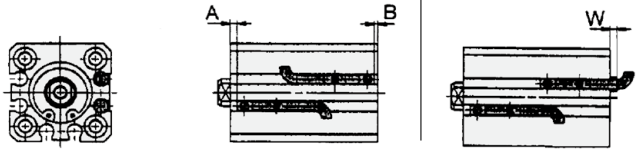


ø16 to ø25

Mounting a) b)

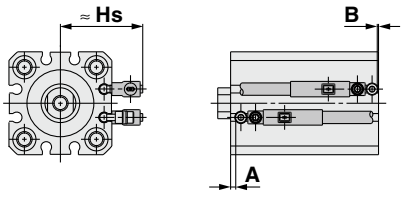






D-P3DW□

ø25



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□/M9□W			D-M9□A			D-M9□V/M9□WV D-M9□AV			D-A9□			D-A9□V			D-P3DW□		
	A	B	W	A	B	W	A	B	Hs	A	B	W	A	B	Hs	A	B	Hs
12	5.5	3.5	5.5	5.5	3.5	7.5	5.5	3.5	19.5	1.5	0	1.5 [4] [5]	1.5	0	17	—	—	—
16	6	4	6	6	4	8	6	4	21.5	2	0	2 [4.5]	2	0	19	—	—	—
20	10	7.5	2.5	10	7.5	4.5	10	7.5	25	6	3.5	–1.5 [1]	6	3.5	22.5	—	—	—
25	11	9.5	0.5	11	9.5	2.5	11	9.5	27	7	5.5	–3.5 [–1]	7	5.5	24.5	1.5	0	32

Note 1) [ ]: Denotes the dimensions of the D-A93.
Note 2) Adjust the auto switch after confirming the operating condition in the actual setting.
Note 3) 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 4) Negative figures for W indicate an auto switch is mounted inward from the edge of the cylinder body.

Operating Range

(mm)

Auto switch model	Bore size			
	12	16	20	25
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3	3.5	5.5	4.5
D-A9□/A9□V	6	7.5	10	10
D-P3DW	—	—	—	5.5

∗ Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to **the WEB catalog** or Best Pneumatics No. 3.

⚠Precautions

Be sure to read before handling.
Refer to back cover for Safety Instructions. For Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smcworld.com

• 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 figure 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, please consult with SMC for this type of application.