



Compact Cylinder: Standard Type Double Acting, Double Rod Series **CQSW** ø12, ø16, ø20, ø25

How to Order

Without auto switch

CQSW [B] [20] [30] [D] [C]

With auto switch

CDQSW [B] [20] [30] [D] [C] [F9BW] [S]

Built-in magnet → [S]

Mounting style → [B]

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

* Mounting brackets are shipped together, (but not assembled).

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

Number of auto switches

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

Auto switch

Nil	Without auto switch (Built-in magnet)
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* For the applicable auto switch model, refer to the table below.
* Auto switches are shipped together, (but not assembled).
(Note) There is the case A9□V type, M9□V type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Please confirm SMC separately.

Body option

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

* Combination of body options ("CM") is available.

Action

D	Double acting
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Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m) *			Pre-wired connector	Applicable load	
					DC	AC	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)	IC circuit		Relay, PLC	
															24 V
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93V	A93	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	○	○		
				2-wire				M9BV	M9B	●	●	○	○		
				3-wire (NPN)				F9NWV	F9NW	●	●	○	○		
				3-wire (PNP)				F9PWV	F9PW	●	●	○	○		
				2-wire				F9BWV	F9BW	●	●	○	○		
Diagnostic indication (2-color indication)	—	—	—	—	—	—	F9BA	—	●	○	○	—	—		
Water resistant (2-color indication)	—	—	—	—	—	—	—	—	—	●	○	○	—	—	

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

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

- Since there are other applicable auto switches than listed, refer to page 7-4-45 for details.
- For details about auto switches with pre-wire connector, refer to page 7-9-36.

Compact Cylinder: Standard Type Double Acting, Double Rod Series CQSW



JIS Symbol



⚠ Caution

Snap Ring Installation/Removal

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

Mounting

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

Minimum Operating Pressure (MPa)

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

Allowable Kinetic Energy (J)

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

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⁾	Flange
12	CQS-L012	CQS-F012
16	CQS-L016	CQS-F016
20	CQS-L020	CQS-F020
25	CQS-L025	CQS-F025



Note 1) When ordering foot bracket, order 2 pieces per cylinder.

Note 2) Parts belonging to each bracket are as follows.
Foot or Flange style: Body mounting bolt

Standard Specifications

Type	Pneumatic (Non-lube)
Action	Double acting, Double rod
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)
Rubber bumper	None
Rod end thread	Female thread
Rod end thread tolerance	JIS Class 2
Stroke length tolerance	+1.0 0
Mounting	Through-hole/Both ends tapped common
Piston speed	50 to 500 mm/s

Minimum Stroke for Auto Switch Mounting

(mm)

No. of auto switches mounted	D-A9□, D-F9□WV	D-A9□V	D-M9□, D-F9□W	D-M9□V	D-F9BAL
2	10	10	15 ^{Note)}	5	25 ^{Note)}
1	10 ^{Note)}	5	15 ^{Note)}	5	25 ^{Note)}

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

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.	
Part no.	Refer to "How to Order" for the standard model no. (page at left)		
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.: CQSWB25-47D CQSWB25-50D with 3 mm width spacer inside. B dimension is 79 mm.		

Series CQSW

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

Calculation: (Example) CQSWF12-10DM

- Cylinder weight: CQSWB12-10D.....46 g
- Option weight: Rod end male thread..... 5 g
- : Rod side flange style..... 58 g

109 g

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
Rod side flange style (Including mounting bolt)		58	70	143	180

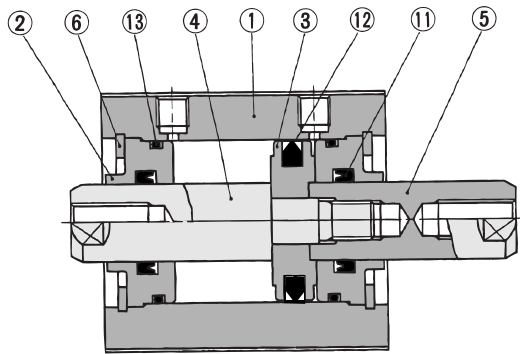


Made to Order Specifications (For details, refer to page 7-10-1.)

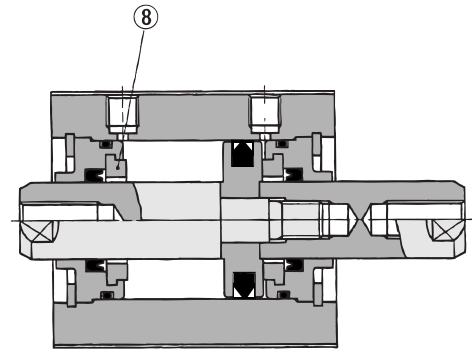
Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (150°C)
-XB7	Cold resistant cylinder
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB10	Intermediate stroke (Using exclusive body)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC6	Piston rod and rod end nut made of stainless steel
-XC36	With boss in rod side
-X235	Change of piston rod end of double rod cylinder
-X271	Fluoro rubber for seals
-X633	Intermediate stroke of double rod cylinder

Construction

Basic style

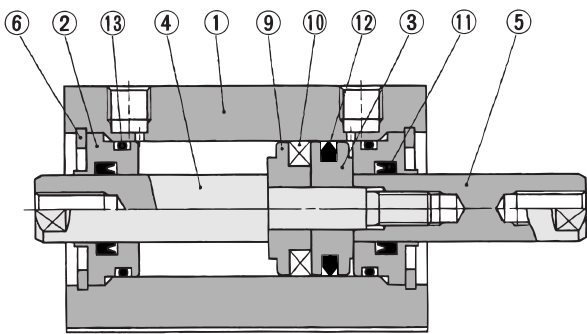


With rubber bumper

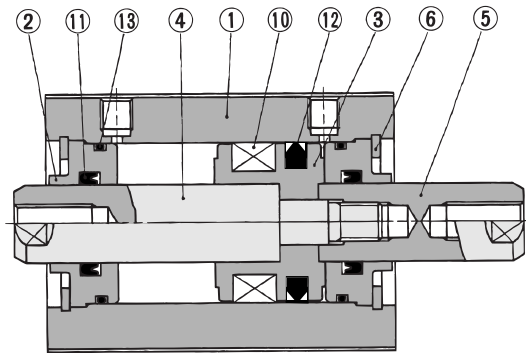


With auto switch (Built-in magnet)

ø12, ø16



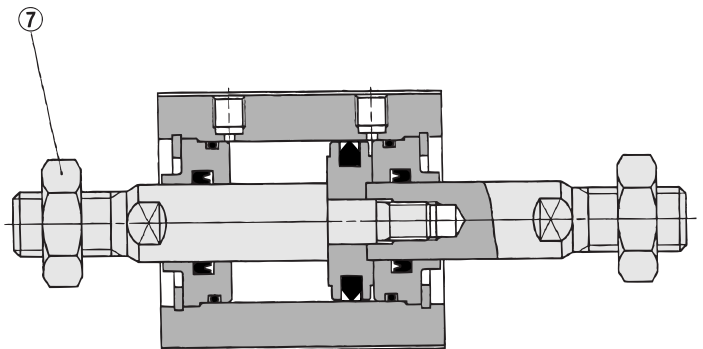
ø20, ø25



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	Snap 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 ①, ⑫, ⑬
16	CQSWB16-PS	
20	CQSWB20-PS	
25	CQSWB25-PS	

* Seal kit includes ①, ⑫, ⑬. Order the seal kit, based on each bore size.

CUJ

CU

CQS

CQM

CQ2

RQ

MU

D-

-X

20-

Data

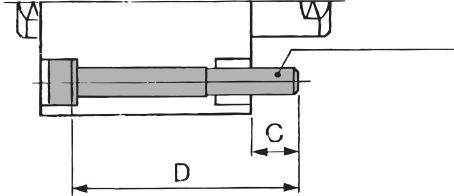
Series CQSW

Mounting Bolt for CQSW

Mounting method: Mounting bolt for through-hole mounting style of CQSW is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 30ℓ 4 pcs.



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

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

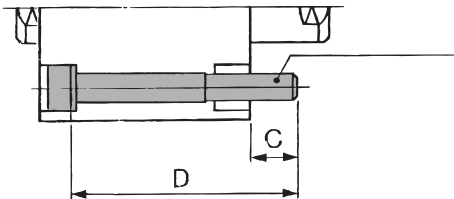
Model	C	D	Mounting bolt
CQSWB20-25D	10	55	M5 x 55ℓ
-30D		60	x 60ℓ
-35D		65	x 65ℓ
-40D		70	x 70ℓ
-45D		75	x 75ℓ
-50D		80	x 80ℓ
CQSWB25-5D	7	35	M5 x 35ℓ
-10D		40	x 40ℓ
-15D		45	x 45ℓ
-20D		50	x 50ℓ
-25D		55	x 55ℓ
-30D		60	x 60ℓ
-35D		65	x 65ℓ
-40D		70	x 70ℓ
-45D		75	x 75ℓ
-50D		80	x 80ℓ

Mounting Bolt for CDQSW with Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of CDQSW is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 35ℓ 4 pcs.



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

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

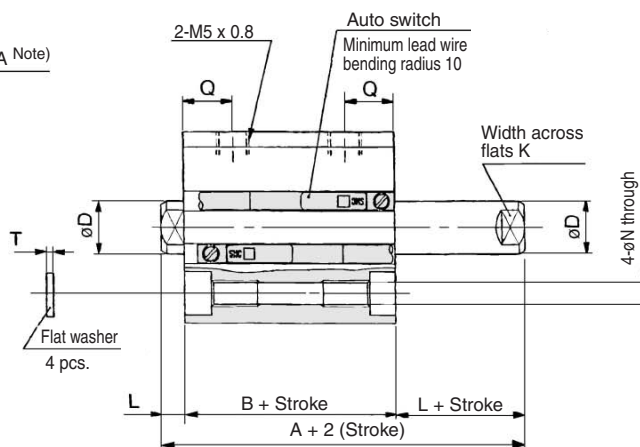
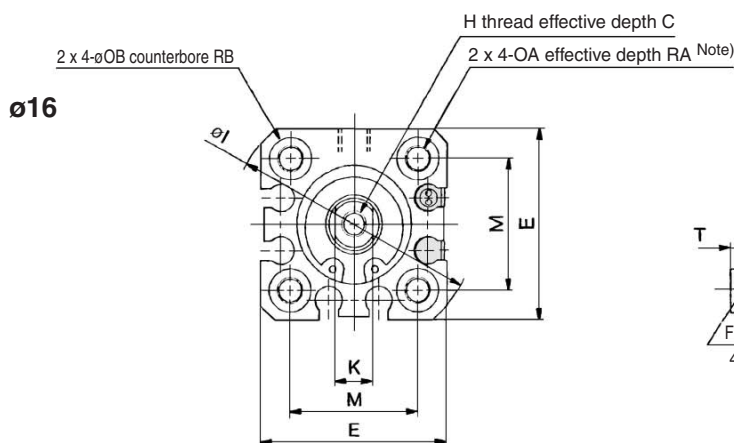
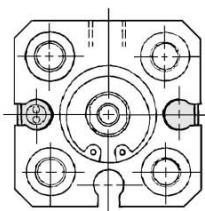
Model	C	D	Mounting bolt
CDQSWB20-25D	10	65	M5 x 65ℓ
-30D		70	x 70ℓ
-35D		75	x 75ℓ
-40D		80	x 80ℓ
-45D		85	x 85ℓ
-50D		90	x 90ℓ
CDQSWB25-5D	7	45	M5 x 45ℓ
-10D		50	x 50ℓ
-15D		55	x 55ℓ
-20D		60	x 60ℓ
-25D		65	x 65ℓ
-30D		70	x 70ℓ
-35D		75	x 75ℓ
-40D		80	x 80ℓ
-45D		85	x 85ℓ
-50D		90	x 90ℓ

Series CQSW

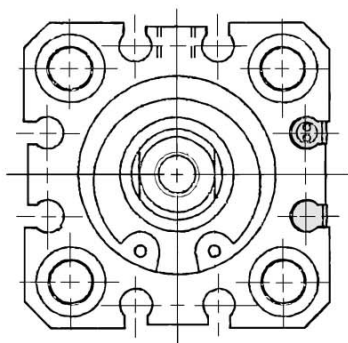
Dimensions: $\phi 12$ to $\phi 25$

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

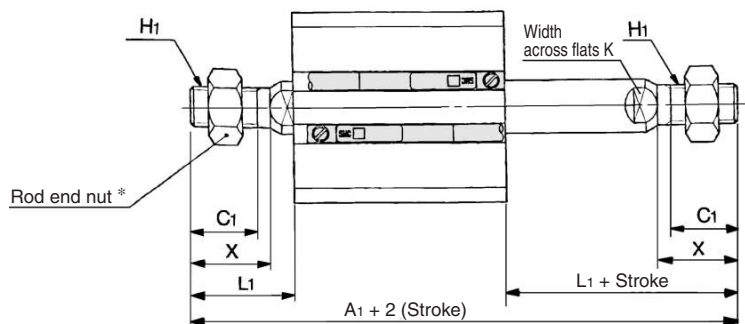
$\phi 12$



$\phi 20, \phi 25$



Rod end male thread



Rod End Male Thread

Bore size (mm)	Without auto switch	With auto switch	C ₁	H ₁	L ₁	X
	A ₁	A ₁				
12	50	55	9	M5 x 0.8	14	10.5
16	53	58	10	M6 x 1.0	15.5	12
20	63	73	12	M8 x 1.25	18.5	14
25	74	84	15	M10 x 1.25	22.5	17.5

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															
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	9	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	11	10	7	1

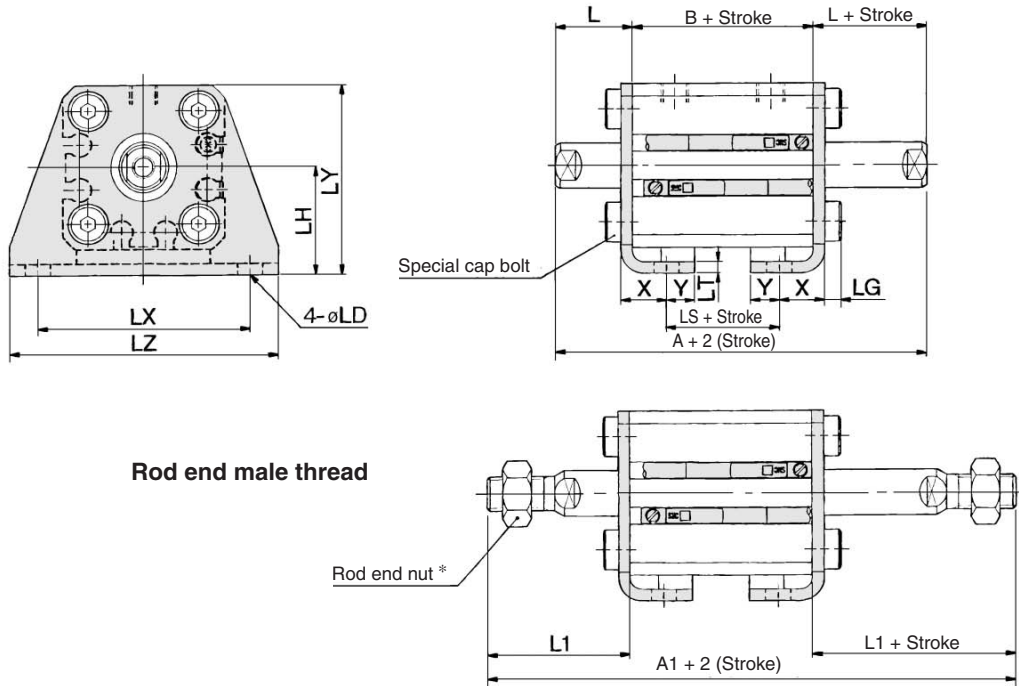
Note 1) For basic style $\phi 20$ and $\phi 25$ with 5 stroke, through-hole is threaded over the entire length.

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 7-6-20.

Compact Cylinder: Standard Type Double Acting, Double Rod Series CQSW

Foot style: CQSWL/CDQSWL

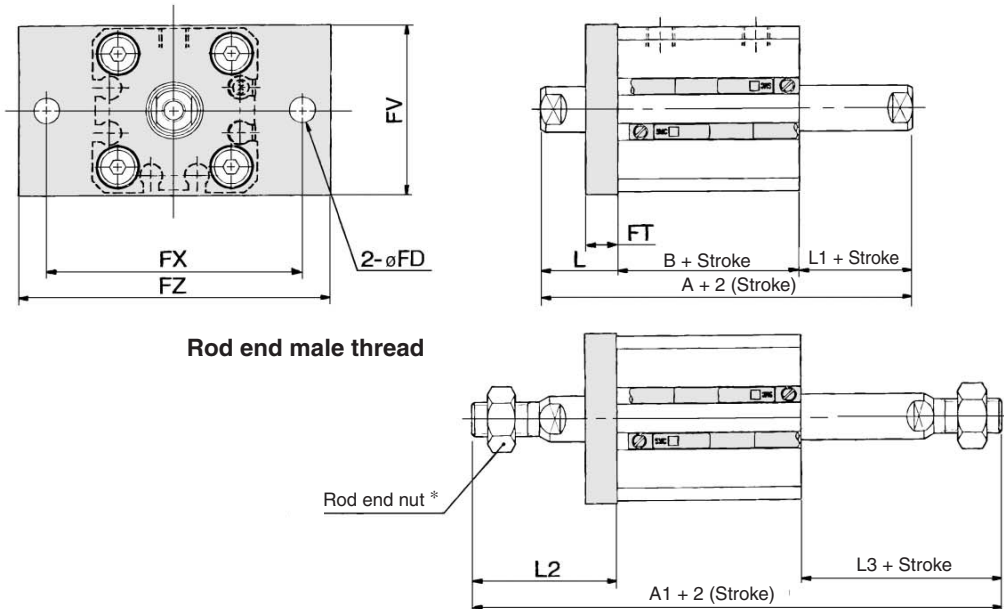


Foot Style

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

Flange style: CQSWF/CDQSWF



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 7-6-20.

Flange bracket material: Carbon steel