



Compact Cylinder: Standard Type

Single Acting, Single Rod, Spring Return/Extend

Series CQS

ø12, ø16, ø20, ø25

How to Order

Without auto switch

With auto switch

CQS **B** **20** — **10** **S**

CDQS **B** **20** — **10** **S** — **F9BWV** **S**

Built-in magnet

Mounting style

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

* 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, 20, 25	5, 10

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)
M	Rod end male thread

Action

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

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

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-wire 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	—	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	—	●	●	○	○		
				2-wire	M9BV	—		●	●	○	○	—			
				3-wire (NPN)	F9NWV	—		●	●	○	○	IC circuit			
				3-wire (PNP)	F9PWV	—		●	●	○	○	IC circuit			
				2-wire	F9BWV	—		●	●	○	○	—			

* 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.



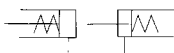
Compact Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend Series CQS



JIS Symbol

Single acting,
Spring return

Single acting,
Spring extend



⚠ 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.

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

Minimum Operating Pressure (MPa)

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

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)	Flange	Double clevis
12	CQS-L012	CQS-F012	CQS-D012
16	CQS-L016	CQS-F016	CQS-D016
20	CQS-L020	CQS-F020	CQS-D020
25	CQS-L025	CQS-F025	CQS-D025

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

Note 2) Parts belonging to each bracket are as follows.

Foot or Flange style: Body mounting bolt
Double clevis style: Clevis pin, Type C snap ring for axis, Body mounting bolt.

Standard Specifications

Type	Pneumatic (Non-lube)
Action	Single acting, Single rod
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)
Rubber bumper	None
Rod end thread	Female thread
Rod end thread tolerance	JIS Class 2
Stroke length tolerance	$+1.0$ 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□V
2	10	10	5
1	10 (Note)	5	5

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

Theoretical Output (N)

Action	Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)			Retracted side	Extended side
					0.3	0.5	0.7		
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 at left)	
Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.	
Stroke range	Bore size 12 to 25	Stroke range 1 to 9
Example	Part no.: CQSB20-3T CQSB20-5T with 2 mm width spacer inside. B dimension is 24.5 mm.	

CUJ

CU

CQS

CQM

CQ2

RQ

MU

D-

-X

20-

Data

Series CQS

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.



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

Symbol	Specifications
-XA□	Change of rod end shape
-XB10	Intermediate stroke (Using exclusive body)
-XC6	Piston rod and rod end nut made of stainless steel

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
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, snap ring, bolt)		34	40	92	127

Calculation: (Example) CQSG16-10S

• Cylinder weight: CQSB16-10S..... 48 g

• Option weight: Head side flange style.....66 g

114 g

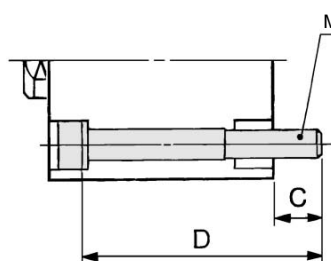
Mounting Bolt for CQS

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

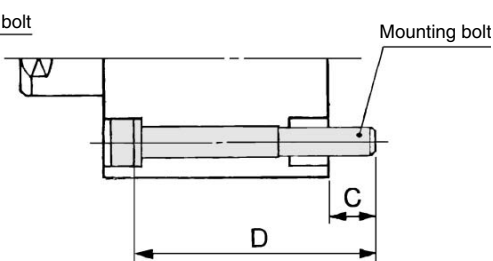
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 25ℓ 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

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

Single Acting, Spring Extend

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

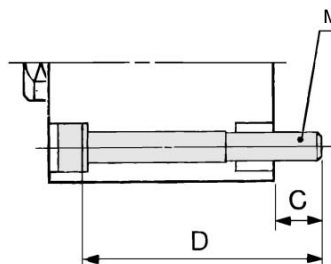
Mounting Bolt for CDQS with Auto Switch

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

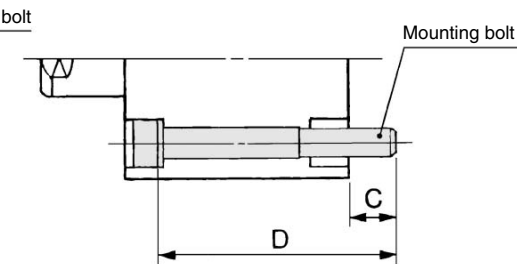
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 30ℓ 4 pcs.

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

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

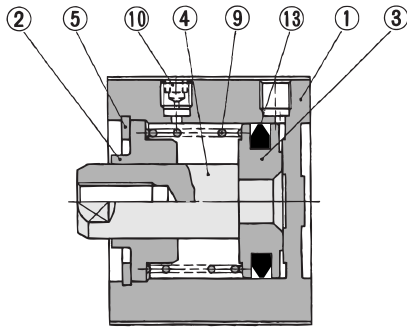
Single Acting, Spring Extend

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

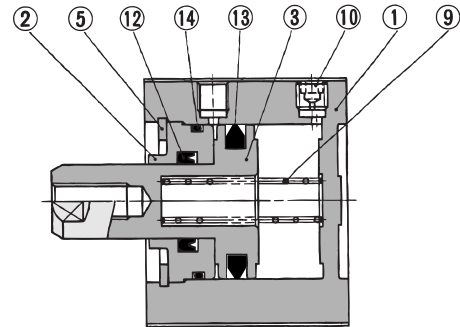
Compact Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend Series CQS

Construction

Single acting, Spring return

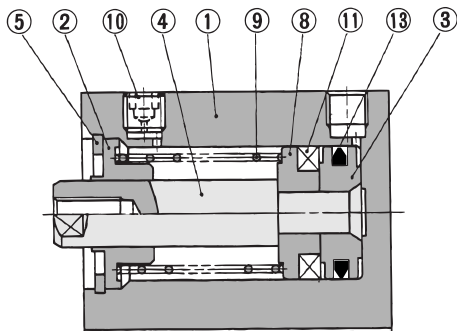


Single acting, Spring extend

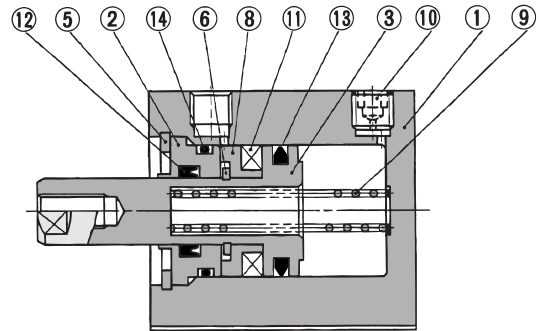


Single acting, Spring return/With auto switch (Built-in magnet)

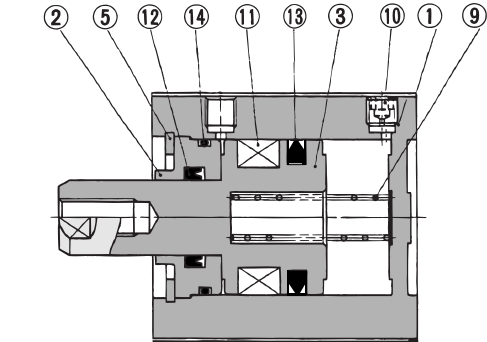
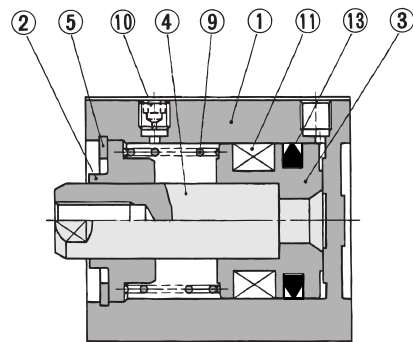
ø12, ø16



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



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	Snap ring	Carbon tool steel	Phosphate coated
⑥	Snap 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*	Rod seal	NBR	
⑬*	Piston seal	NBR	
⑭*	Tube gasket	NBR	

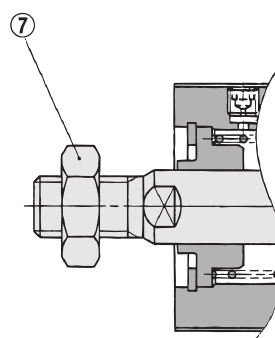
Replacement Parts: Seal Kit

Action	Bore size (mm)	Kit no.	Contents
Single actng, Spring return	12	CQSB12-S-PS	Set of nos. above ⑬
	16	CQSB16-S-PS	
	20	CQSB20-S-PS	
	25	CQSB25-S-PS	

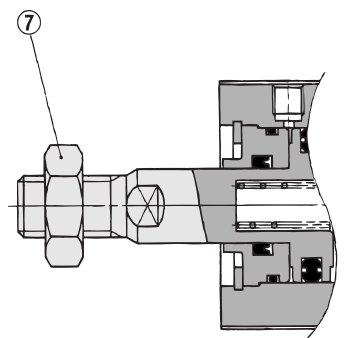
* Seal kit includes ⑬. Order the seal kit, based on each bore size.

Rod end male thread

Single acting, Spring return



Single acting, Spring extend



Replacement Parts: Seal Kit

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

* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.

CUJ

CU

CQS

CQM

CQ2

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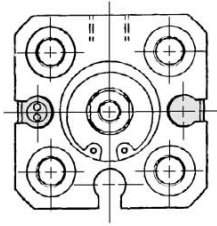
Data

Series CQS

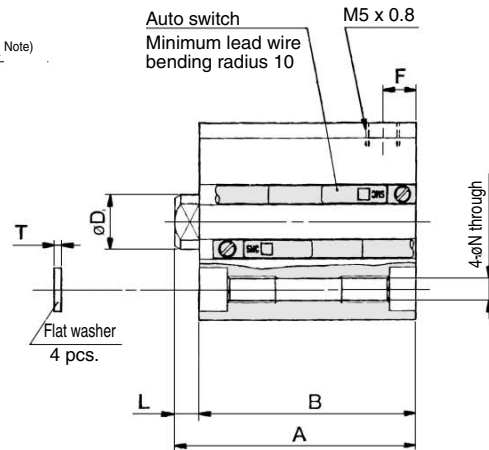
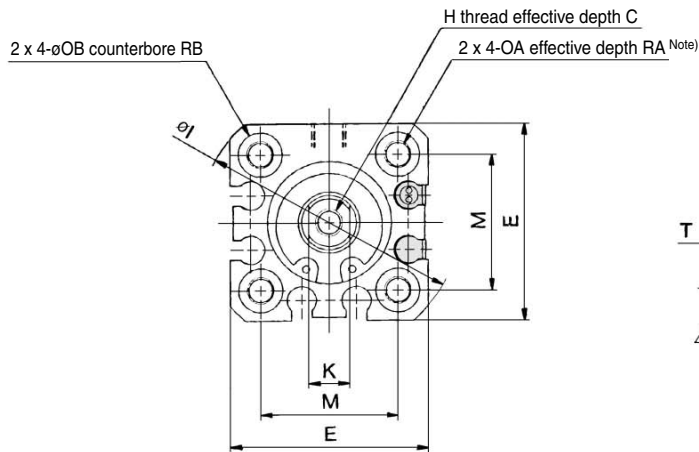
Dimensions: $\phi 12$ to $\phi 25$ /Single Acting, Spring Return

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

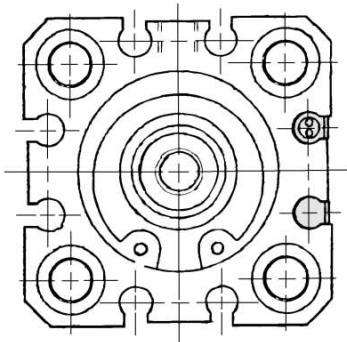
$\phi 12$



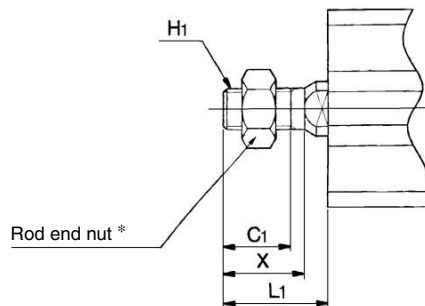
$\phi 16$



$\phi 20, \phi 25$



Rod end male thread



Rod End Male Thread

Bore size (mm)	C ₁	H ₁	L ₁	X
12	9	M5 x 0.8	14	10.5
16	10	M6 x 1.0	15.5	12
20	12	M8 x 1.25	18.5	14
25	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	F	H	I	K	L	M	N	OA	OB	RA	RB	T
		A		B		A		B																
		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

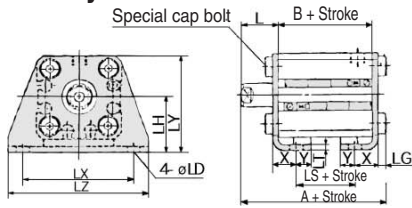


Note) For basic style $\phi 12$ and $\phi 16$ with 5 stroke, through-hole is threaded over the entire length.
 For basic style $\phi 20, \phi 25$ with 5 and 10 stroke, through-hole is threaded over the entire length.
 With auto switch (Built-in magnet)/ $\phi 20$; 5 stroke.

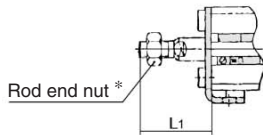
* For details about the rod end nut and accessory brackets, refer to page 7-6-20.

Compact Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend Series CQS

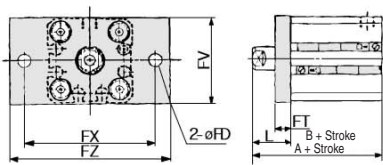
Foot style: CQSL/CDQSL



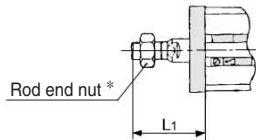
Rod end male thread



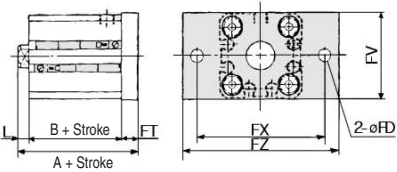
Rod side flange style: CQSF/CDQSF



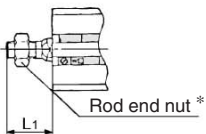
Rod end male thread



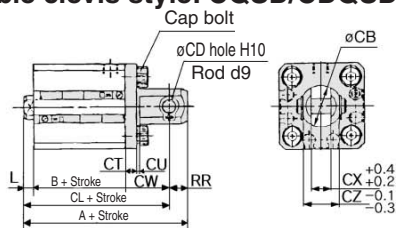
Head side flange style: CQSG/CDQSG



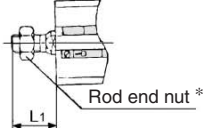
Rod end male thread



Double clevis style: CQSD/CDQSD



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

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

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

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

* For details about the rod end nut and accessory brackets, refer to page 7-6-20.

CUJ

CU

CQS

CQM

CQ2

RQ

MU

D-

-X

20-

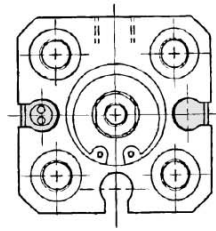
Data

Series CQS

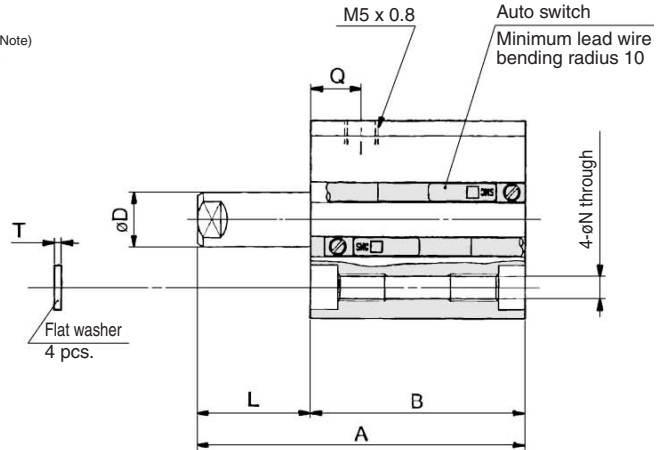
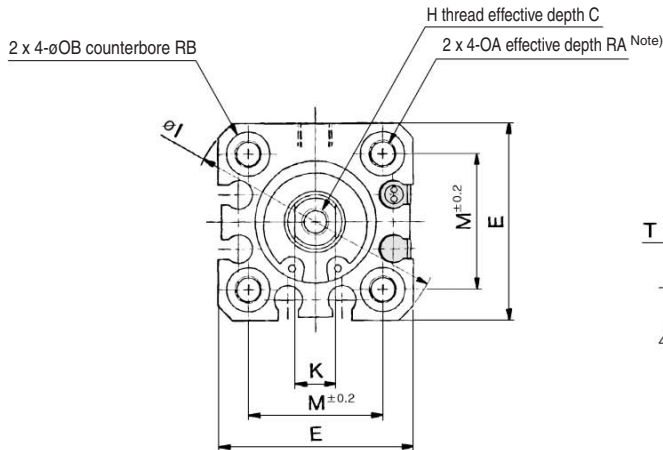
Dimensions: $\phi 12$ to $\phi 25$ /Single Acting, Spring Extend

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

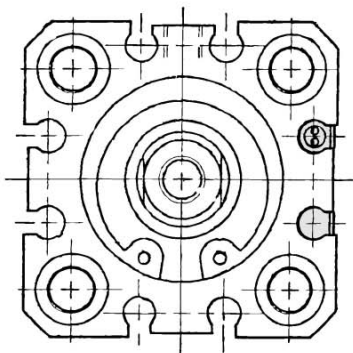
$\phi 12$



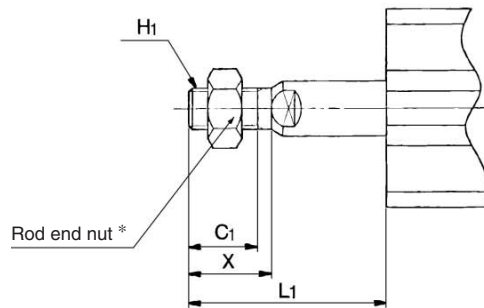
$\phi 16$



$\phi 20, \phi 25$



Rod end male thread



Rod End Male Thread

Bore size (mm)	C ₁	H ₁	L ₁		X
			5 ST	10 ST	
12	9	M5 x 0.8	19	24	10.5
16	10	M6 x 1.0	20.5	25.5	12
20	12	M8 x 1.25	23.5	28.5	14
25	15	M10 x 1.25	27.5	32.5	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								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	9	10	7	1
25		37.5	47.5	27.5	32.5	47.5	57.5	37.5	42.5	12	12	40	M6 x 1.0	52	10	10	15	28	5.4	M6 x 1.0	9	11	10	7	1

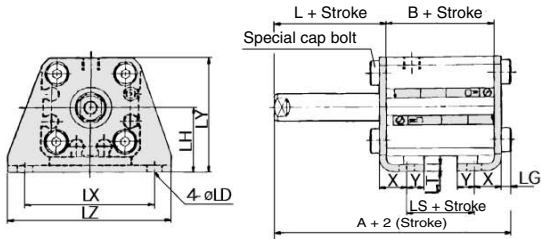


Note) For basic style $\phi 12$ and $\phi 16$ with 5 stroke, through-hole is threaded over the entire length.
For basic style $\phi 20, \phi 25$ with 5 and 10 stroke, through-hole is threaded over the entire length.
With auto switch (Built-in magnet)/ $\phi 20$; 5 stroke.

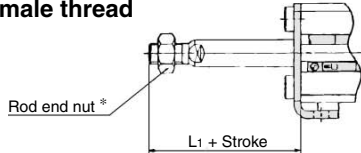
* For details about the rod end nut and accessory brackets, refer to page 7-6-20.

Compact Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend Series CQS

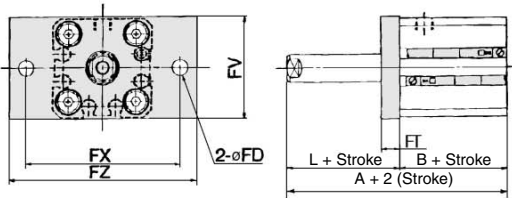
Foot style: CQSL/CDQSL



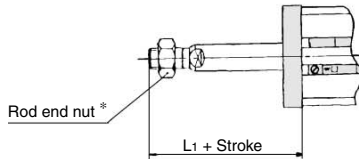
Rod end male thread



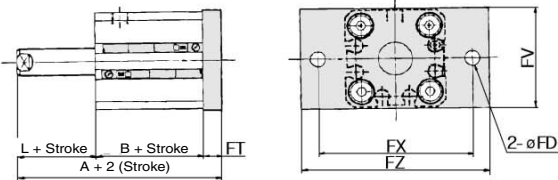
Rod side flange style: CQSF/CDQSF



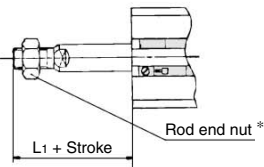
Rod end male thread



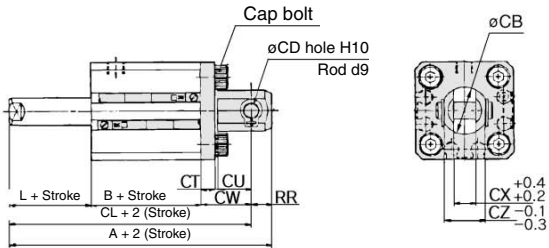
Head side flange style: CQSG/CDQSG



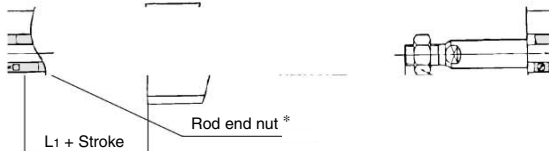
Rod end male thread



Double clevis style: CQSD/CDQSD



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	L ₁	LD	LG	LH	LT	LX	LY	LZ	X	Y
12	13.5	24	4.5	2.8	17	2	34	29.5	44	8	4.5
16	13.5	25.5	4.5	2.8	19	2	38	33.5	48	8	5
20	14.5	28.5	6.6	4	24	3.2	48	42	62	9.2	5.8
25	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel

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

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

Double Clevis Style

Bore size (mm)	Stroke range (mm)	Without auto switch			Without 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

* For details about the rod end nut and accessory brackets, refer to page 7-6-20.