CAT.ES20-155 A

SMC

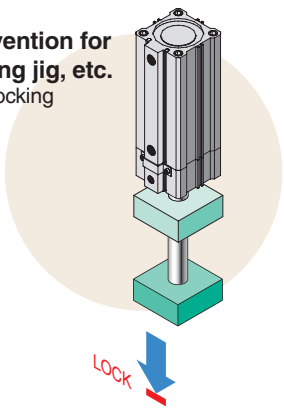
Compact Cylinder with Lock

Series CLQ

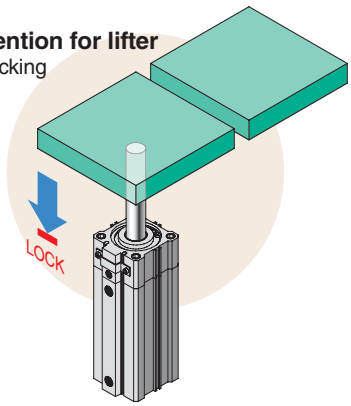
Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63, Ø 80, Ø 100

Maintains cylinder position when supply pressure falls or residual pressure is released

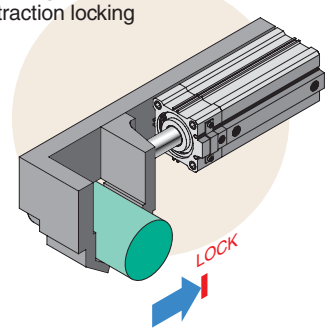
Drop prevention for press fitting jig, etc.
Extension locking



Drop prevention for lifter
Retraction locking



Holding a clamped condition
Retraction locking



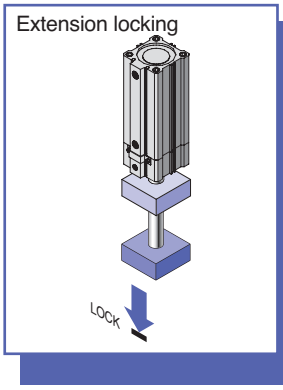
Series CLQ

Locking is possible at any position within the entire stroke

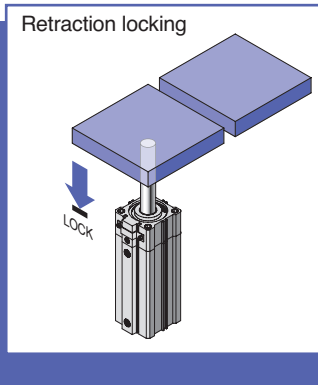
Can be locked at any desired position

- **Drop prevention for mid-stroke emergency stops**
- **Locking position can be changed to accommodate external stopper positions and thickness of clamped work pieces**

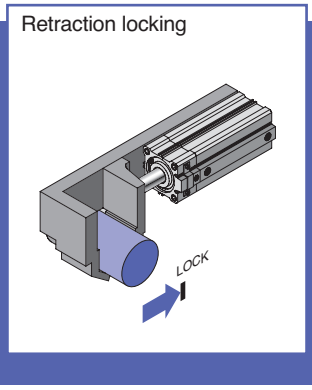
Drop prevention for press fitting jig, etc.



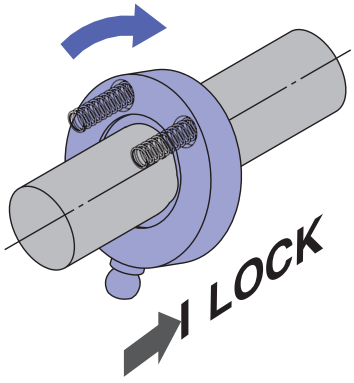
Drop prevention for lifter

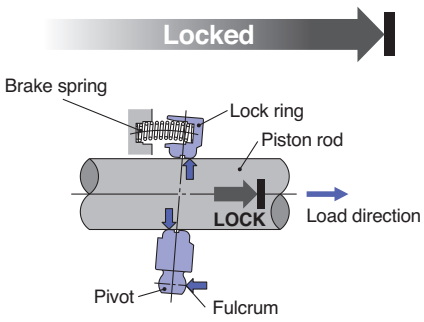


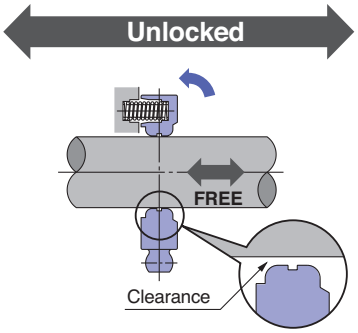
Holding a clamped condition



Simple construction/Simple and reliable locking system







Unlocking port: Air exhausted

1. The lock ring is tilted by the brake spring force.
2. The tilting is increased by the load and the piston rod is securely locked.

Unlocking port: Air supplied

1. The lock ring becomes perpendicular to the piston, creating clearance between the piston rod and lock ring, which allows the piston rod to move freely.

Compact Cylinder with Lock

Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63, Ø 80, Ø 100

Low profile with compact lock unit

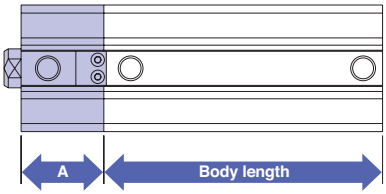
- Lock unit length

  27 mm to 50 mm

- The lock unit does not project beyond the cylinder's external dimensions

Lock unit thickness (mm)

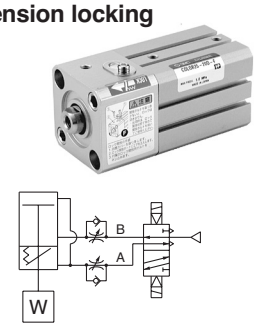
Bore size (mm)	A
20	27
25	31
32	32
40	34
50	35
63	38
80	43
100	50



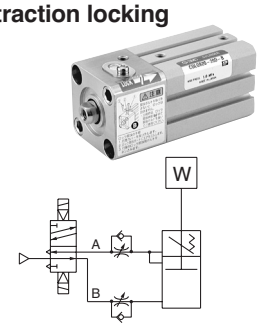
Locking direction is selectable.

(Must be selected at time of order.)

Extension locking

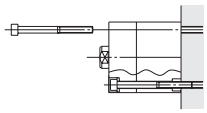


Retraction locking

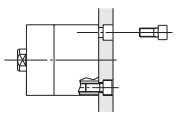


Two types of mounting

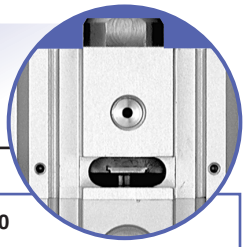
Through holes



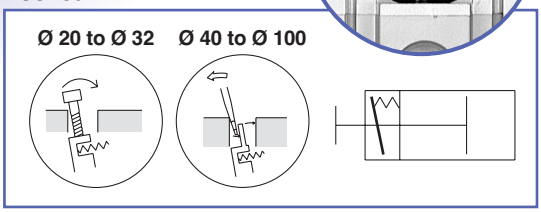
Double end taps



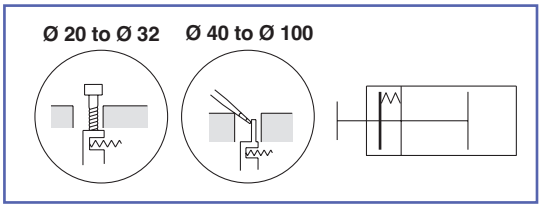
Easy manual unlocking



Locked



Unlocked



Wide variations from *Ø 20 to Ø 100*

Series	Mounting	Locking direction	Bore size (mm)	Standard stroke (mm)											
				5	10	15	20	25	30	35	40	45	50	75	100
CLQ	Through holes, double end taps common	Extension locking	20	●	●	●	●	●	●	●	●	●	●		
			25	●	●	●	●	●	●	●	●	●	●		
	Through holes Double end taps		32		●	●	●	●	●	●	●	●	●	●	●
			40		●	●	●	●	●	●	●	●	●	●	●
		Retraction locking	50		●	●	●	●	●	●	●	●	●	●	●
			63		●	●	●	●	●	●	●	●	●	●	●
			80		●	●	●	●	●	●	●	●	●	●	●
			100		●	●	●	●	●	●	●	●	●	●	●

Compact Cylinder with lock
Double Acting: Single Rod
Series CLQ
Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63, Ø 80, Ø 100

How to Order

Without Auto Switch CLQ B 40 – 30 D ☐ – F

With Auto Switch CDLQ B 40 – 30 D ☐ – F – A73 S

With auto switch (built-in magnet)

Mounting

Ø 20, Ø 25		Ø 32 to Ø 100	
B	Through hole/Double end tapped common (standard)	B	Through hole (standard)
L	Foot type	A	Double end tapped
F	Front flange type	L	Foot type
G	Rear flange type	F	Front flange type
D	Double clevis type	G	Rear flange type
		D	Double clevis type

∗ Mounting brackets are packed together when shipped (unassembled).

Bore size

20	20 mm	50	50 mm
25	25 mm	63	63 mm
32	32 mm	80	80 mm
40	40 mm	100	100 mm

Cylinder Stroke (mm)
Refer to page 2 for standard strokes and intermediate strokes.

Action

D	Double acting

Body option

–	Standard (rod end female threads)
C	With rubber bumper
M	Rod end male threads
CM	With rubber bumper, Rod end male threads

Locking direction

F	Extension locking
B	Retraction locking

Auto switch type

–	Without auto switch (built-in magnet cylinder)

∗ Select auto switch models from the table below.

Number of auto switches

–	2 pcs.
S	1 pc.
n	"n" pcs.

Mounting bracket part nos.

Bore size (mm)	Foot Note 1)	Flange	Double clevis Note 3)
20	CLQ-L020	CLQ-F020	CLQ-D020
25	CLQ-L025	CLQ-F025	CLQ-D025
32	CLQ-L032	CLQ-F032	CLQ-D032
40	CLQ-L040	CLQ-F040	CLQ-D040
50	CLQ-L050	CLQ-F050	CLQ-D050
63	CLQ-L063	CLQ-F063	CLQ-D063
80	CLQ-L080	CLQ-F080	CLQ-D080
100	CLQ-L100	CLQ-F100	CLQ-D100

Note 1) When using foot brackets, order 2 pcs. for each cylinder.

Note 2) The parts included with each bracket are shown below.
Foot, Flange: Body mounting screws
Double clevis: Clevis pin, C type snap ring for shaft, Body mounting screws, Flat washer

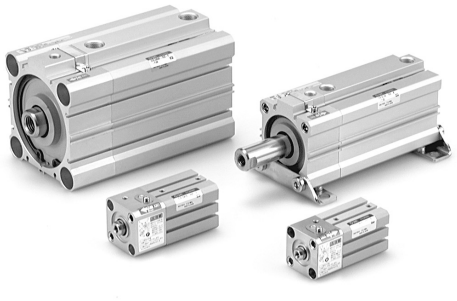
Note 3) Clevis pin and snap ring are included with the double clevis type

Auto switch specifications

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Rail mount Ø 32 to Ø 100 Perpendicular	Rail mount Ø 32 to Ø 100 In-line	Direct mount Ø 20 to Ø 100 Perpendicular	Direct mount Ø 20 to Ø 100 In-line	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
Reed switch	——	Grommet	Yes	3 wire (NPN equiv.)	—	5 V	—	—	A76H	A96V	A96	●	●	—	—	IC circuit	—
				2 wire	—	—	200 V	A72	A72H	—	—	●	●	—	—	IC circuit	Relay, PLC
					24 V	12 V	100 V	A73	A73H	—	—	●	●	●	—	IC circuit	
								—	—	A93V	A93	●	●	—	—		
			No			5 V, 12 V	100 V or less	A80	A80H	A90V	A90	●	●	—	—		
		Connector	Yes			12 V	—	A73C	—	—	—	●	●	●	●	IC circuit	
			No			5 V, 12 V	24 V or less	A80C	—	—	—	●	●	●	●		
	Diagnostic indication (2 colour indicator)	Grommet	Yes			—	—	A79W	—	—	—	●	●	—	—	—	
Solid state switch	——	Grommet	Yes	3 wire (NPN)	24 V	5 V, 12 V	—	F7NV	F79	M9NV	M9N	●	●	○	—	IC circuit	Relay, PLC
				3 wire (PNP)				F7PV	F7P	M9PV	M9P	●	●	○	—		
				2 wire		12 V		F7BV	J79	M9BV	M9B	●	●	○	—	—	
		Connector						J79C	—	—	—	●	●	●	●		
	Diagnostic indication (2 colour indicator)	Grommet		3 wire (NPN)		5 V, 12 V		F7NWV	F79W	M9NWV	M9NW	●	●	○	—		
				3 wire (PNP)				—	F7PW	M9PWV	M9PW	●	●	○	—		
				2 wire		12 V		F7BWV	J79W	M9BWV	M9BW	●	●	○	—	—	
	Water resistant (2 colour indicator)							—	F7BA	—	M9BA	—	●	○	—		
	With timer			3 wire (NPN)		5 V, 12 V		—	F7NT	—	—	—	●	○	—		
	With diagnostic output (2 colour indicator)			4 wire (NPN)				—	F79F	—	—	●	●	○	—		
	Latch type with diagnostic output (2 colour indicator)					—		—	F7LF	—	—	●	●	○	—	—	

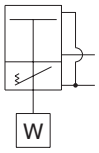
∗ Lead wire length symbols 0.5 m …. Nil (Example) A80C
3 m ……. L (Example) A80CL
5 m …….…. Z (Example) A80CZ
None ……. N (Example) A80CN

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

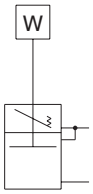


Symbols

Extension locking



Retraction locking



Auto Switch Mounting Bracket Part Nos. (Rail Mount)

Bore size (mm)	Bracket no.	Note
32, 40 50, 63 80, 100	BQ-2	• Switch mounting screw (M3 x 0.5 x 10ℓ) • Switch spacer • Switch mounting nut

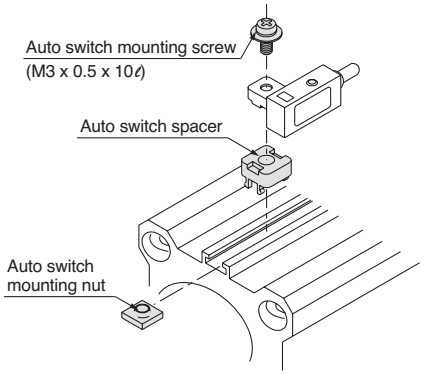
Applicable switch	
Reed switch	Solid state switch
D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-A79W	D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F7BAL D-F7□F D-F7NTL

[Stainless steel mounting screw kit]

Use the following stainless steel mounting screw kit (includes nut) depending on the operating environment.
(Auto switch spacer must be ordered separately.)

BBA2: For D-A7/A8/F7/J7

The above stainless steel screw kit is used for water resistant auto switch type D-F7BAL when it is shipped mounted on a cylinder.
Also, BBA2 is included when an auto switch alone is shipped.



Cylinder Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting single rod							
Fluid	Air							
Proof pressure	1.5MPa							
Maximum operating pressure	1.0MPa							
Minimum operating pressure	0.2MPa Note)							
Ambient and fluid temperature	Without auto switch: –10 to 70 °C (with no freezing) With auto switch: –10 to 60 °C (with no freezing)							
Lubrication	Non-lube							
Piston speed	50 to 500mm/s							
Stroke length tolerance	$^{+1.0}_{0}$ mm							
Cushion	None or rubber bumper							
Rod end thread tolerance	JIS class 2							
Port size	M5 x 0.8		Rc 1/8		Rc 1/4		Rc 3/8	

Note) The minimum operating pressure of the cylinder is 0.1MPa when the cylinder and lock are connected to separate ports.

Lock Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Locking action	Spring locking (exhaust locking)							
Unlocking pressure	0.2MPa or more							
Locking pressure	0.05MPa or less							
Locking direction	One direction (extension locking, retraction locking, each type)							
Unlocking port size	M5 x 0.8		Rc 1/8					Rc 1/4
Holding force N (Maximum static load)	157	245	403	629	982	1559	2514	3927
	Equivalent to 0.5MPa							

Standard Strokes

Bore size (mm)	Standard stroke (m)
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32, 40, 50, 63, 80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

Manufacture of Intermediate Strokes

Method	Spacers installed in standard stroke body	
Part number	Refer to standard part number and ordering on page 1.	
Method	Strokes are available in 1mm increments by installing spacers in standard stroke cylinders	
Stroke range	Bore size (mm)	Stroke range (mm)
	20, 25	1 to 50
	32, 40, 50, 63, 80, 100	1 to 100
Example	**Part number: CLQB40-47D-B** A 3 mm spacer is installed in standard cylinder CLQB40-50D-B. The B dimension is 79.5mm.	

Note) Consult SMC regarding intermediate strokes for sizes Ø 40 through Ø 100 with rubber bumpers.

Theoretical Output

Unit: N

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

Weights

Basic weight: Mounting hole through (type B)

Unit: g

Bore size (mm)	Standard stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
20*	184	199	213	227	241	255	270	284	298	312	—	—
25*	260	278	295	312	329	346	364	381	398	415	—	—
32	—	407	430	453	475	498	521	544	566	589	754	867
40	—	514	537	560	583	606	630	653	676	699	883	1003
50	—	838	874	910	947	983	1019	1055	1092	1128	1421	1609
63	—	1202	1242	1283	1324	1365	1406	1447	1488	1529	1877	2088
80	—	2229	2297	2364	2432	2500	2568	2636	2704	2771	3344	3678
100	—	3770	3860	3951	4041	4132	4223	4313	4404	4495	5299	5759

∗ The through hole and double end tap are common for sizes Ø 20 and Ø 25.

Basic weight: Mounting hole double end tapped (type A)

Unit: g

Bore size (mm)	Standard stroke (mm)										
	10	15	20	25	30	35	40	45	50	75	100
32	405	429	453	475	499	523	546	569	593	763	879
40	542	568	593	619	644	670	695	721	746	947	1079
50	883	922	962	1002	1041	1081	1121	1161	1200	1517	1723
63	1330	1377	1424	1471	1518	1565	1613	1660	1707	2099	2341
80	2468	2545	2623	2700	2778	2856	2933	3011	3089	3729	4113
100	4054	4154	4254	4355	4455	4556	4656	4757	4857	5730	6239

Additional weight

Unit: g

Bore size (mm)		20	25	32	40	50	63	80	100
Magnet		35	45	64	77	118	158	261	380
Rod end male threads	Threads	6	12	26	27	53	53	120	175
	Nut	4	8	17	17	32	32	49	116
With rubber cushion		–2	–3	–3	–7	–9	–18	–31	–56
Foot type (includes mounting bolt)		152	174	137	149	221	288	638	1009
Front flange type (includes mounting bolt)		127	149	174	208	351	523	998	1307
Rear flange type (includes mounting bolt)		121	140	159	192	326	498	959	1251
Double clevis type (includes pin, snap ring, bolt, and flat washer)		76	111	145	190	373	518	1064	1839

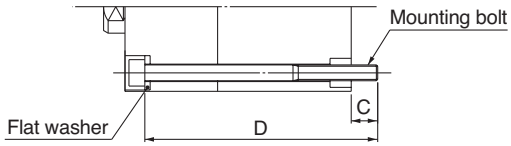
Calculation (example) **CDLQD32-20DCM-B**

- **Basic weight:** CLQA32-20D-∗..... 453g
- **Additional weight:** Magnet..... 64g
  Rod end male threads 43g
  With rubber cushion .....–3g
  Double clevis type.....145g

  702g

Mounting Bolts for C□LQB

Mounting: Mounting bolts are available for the through hole type C□LQB.
Ordering : Add the word "Bolt" in front of the bolts to be used.
Example) Bolt M6 x 90ℓ\ 4 pcs.



Note) When mounting Ø 50 to Ø 100 cylinders from the rod side, be sure to use the attached flat washers because the bearing surface is limited.

CLQB/Without built-in magnet

Model	C	D	Mounting bolt
CLQB20-5D	10.5	55	M5 x 55ℓ
-10D		60	x 60ℓ
-15D		65	x 65ℓ
-20D		70	x 70ℓ
-25D		75	x 75ℓ
-30D		80	x 80ℓ
-35D		85	x 85ℓ
-40D		90	x 90ℓ
-45D		95	x 95ℓ
-50D		100	x 100ℓ
CLQB25-5D	8.5	60	M5 x 60ℓ
-10D		65	x 65ℓ
-15D		70	x 70ℓ
-20D		75	x 75ℓ
-25D		80	x 80ℓ
-30D		85	x 85ℓ
-35D		90	x 90ℓ
-40D		95	x 95ℓ
-45D		100	x 100ℓ
-50D		105	x 105ℓ

Model	C	D	Mounting bolt
CLQB32-10D	7	65	M5 x 65ℓ
-15D		70	x 70ℓ
-20D		75	x 75ℓ
-25D		80	x 80ℓ
-30D		85	x 85ℓ
-35D		90	x 90ℓ
-40D		95	x 95ℓ
-45D		100	x 100ℓ
-50D		105	x 105ℓ
-75D		140	x 140ℓ
-100D		165	x 165ℓ
CLQB40-10D	8.5	75	M5 x 75ℓ
-15D		80	x 80ℓ
-20D		85	x 85ℓ
-25D		90	x 90ℓ
-30D		95	x 95ℓ
-35D		100	x 100ℓ
-40D		105	x 105ℓ
-45D		110	x 110ℓ
-50D		115	x 115ℓ
-75D		150	x 150ℓ
-100D		175	x 175ℓ

Model	C	D	Mounting bolt
CLQB50-10D	12.5	80	M6 x 80ℓ
-15D		85	x 85ℓ
-20D		90	x 90ℓ
-25D		95	x 95ℓ
-30D		100	x 100ℓ
-35D		105	x 105ℓ
-40D		110	x 110ℓ
-45D		115	x 115ℓ
-50D		120	x 120ℓ
-75D		155	x 155ℓ
-100D		180	x 180ℓ
CLQB63-10D	16.5	90	M8 x 90ℓ
-15D		95	x 95ℓ
-20D		100	x 100ℓ
-25D		105	x 105ℓ
-30D		110	x 110ℓ
-35D		115	x 115ℓ
-40D		120	x 120ℓ
-45D		125	x 125ℓ
-50D		130	x 130ℓ
-75D		165	x 165ℓ
-100D		190	x 190ℓ

Model	C	D	Mounting bolt
CLQB80-10D	17	100	M10 x 100ℓ
-15D		105	x 105ℓ
-20D		110	x 110ℓ
-25D		115	x 115ℓ
-30D		120	x 120ℓ
-35D		125	x 125ℓ
-40D		130	x 130ℓ
-45D		135	x 135ℓ
-50D		140	x 140ℓ
-75D		175	x 175ℓ
-100D		200	x 200ℓ
CLQB100-10D	15.5	115	M10 x 115ℓ
-15D		120	x 120ℓ
-20D		125	x 125ℓ
-25D		130	x 130ℓ
-30D		135	x 135ℓ
-35D		140	x 140ℓ
-40D		145	x 145ℓ
-45D		150	x 150ℓ
-50D		155	x 155ℓ
-75D		190	x 190ℓ
-100D		215	x 215ℓ

CDLQB/With built-in magnet

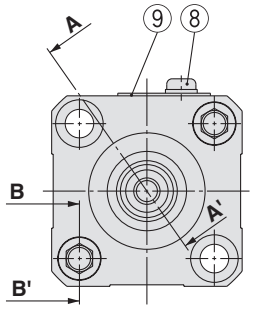
Model	C	D	Mounting bolt
CDLQB20-5D	10.5	65	M5 x 65ℓ
-10D		70	x 70ℓ
-15D		75	x 75ℓ
-20D		80	x 80ℓ
-25D		85	x 85ℓ
-30D		90	x 90ℓ
-35D		95	x 95ℓ
-40D		100	x 100ℓ
-45D		105	x 105ℓ
-50D		110	x 110ℓ
CDLQB25-5D	8.5	70	M5 x 70ℓ
-10D		75	x 75ℓ
-15D		80	x 80ℓ
-20D		85	x 85ℓ
-25D		90	x 90ℓ
-30D		95	x 95ℓ
-35D		100	x 100ℓ
-40D		105	x 105ℓ
-45D		110	x 110ℓ
-50D		115	x 115ℓ

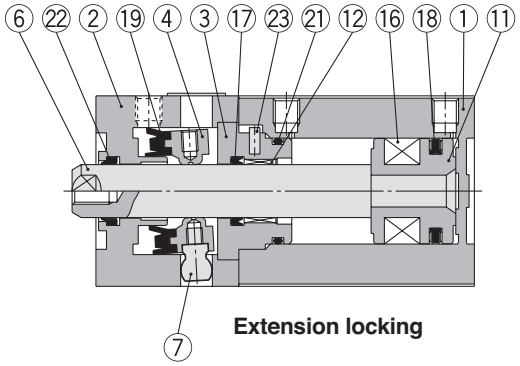
Model	C	D	Mounting bolt
CDLQB32-10D	7	75	M5 x 75ℓ
-15D		80	x 80ℓ
-20D		85	x 85ℓ
-25D		90	x 90ℓ
-30D		95	x 95ℓ
-35D		100	x 100ℓ
-40D		105	x 105ℓ
-45D		110	x 110ℓ
-50D		115	x 115ℓ
-75D		140	x 140ℓ
-100D		165	x 165ℓ
CDLQB40-10D	8.5	85	M5 x 85ℓ
-15D		90	x 90ℓ
-20D		95	x 95ℓ
-25D		100	x 100ℓ
-30D		105	x 105ℓ
-35D		110	x 110ℓ
-40D		115	x 115ℓ
-45D		120	x 120ℓ
-50D		125	x 125ℓ
-75D		150	x 150ℓ
-100D		175	x 175ℓ

Model	C	D	Mounting bolt
CDLQB50-10D	12.5	90	M6 x 90ℓ
-15D		95	x 95ℓ
-20D		100	x 100ℓ
-25D		105	x 105ℓ
-30D		110	x 110ℓ
-35D		115	x 115ℓ
-40D		120	x 120ℓ
-45D		125	x 125ℓ
-50D		130	x 130ℓ
-75D		155	x 155ℓ
-100D		180	x 180ℓ
CDLQB63-10D	16.5	100	M8 x 100ℓ
-15D		105	x 105ℓ
-20D		110	x 110ℓ
-25D		115	x 115ℓ
-30D		120	x 120ℓ
-35D		125	x 125ℓ
-40D		130	x 130ℓ
-45D		135	x 135ℓ
-50D		140	x 140ℓ
-75D		165	x 165ℓ
-100D		190	x 190ℓ

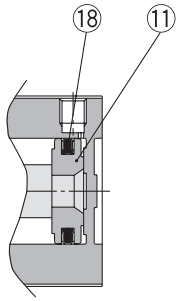
Model	C	D	Mounting bolt
CDLQB80-10D	17	110	M10 x 110ℓ
-15D		115	x 115ℓ
-20D		120	x 120ℓ
-25D		125	x 125ℓ
-30D		130	x 130ℓ
-35D		135	x 135ℓ
-40D		140	x 140ℓ
-45D		145	x 145ℓ
-50D		150	x 150ℓ
-75D		175	x 175ℓ
-100D		200	x 200ℓ
CDLQB100-10D	15.5	125	M10 x 125ℓ
-15D		130	x 130ℓ
-20D		135	x 135ℓ
-25D		140	x 140ℓ
-30D		145	x 145ℓ
-35D		150	x 150ℓ
-40D		155	x 155ℓ
-45D		160	x 160ℓ
-50D		165	x 165ℓ
-75D		190	x 190ℓ
-100D		215	x 215ℓ

Construction/Ø 20 to Ø 32

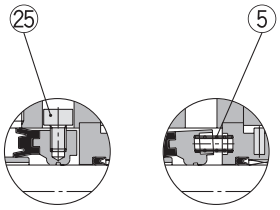




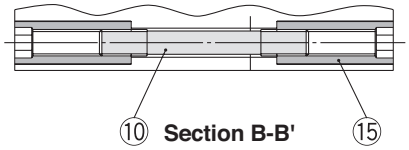
Extension locking



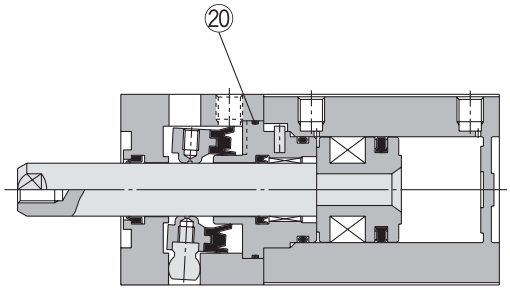
Without magnet



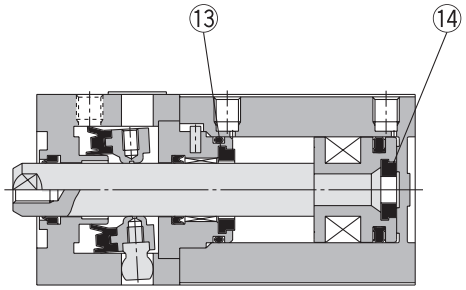
When shipped Section A-A'



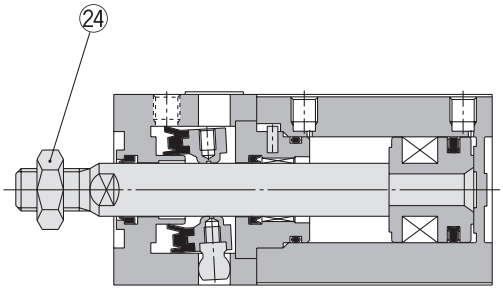
Section B-B'



Retraction locking



With bumper



Rod end male threads

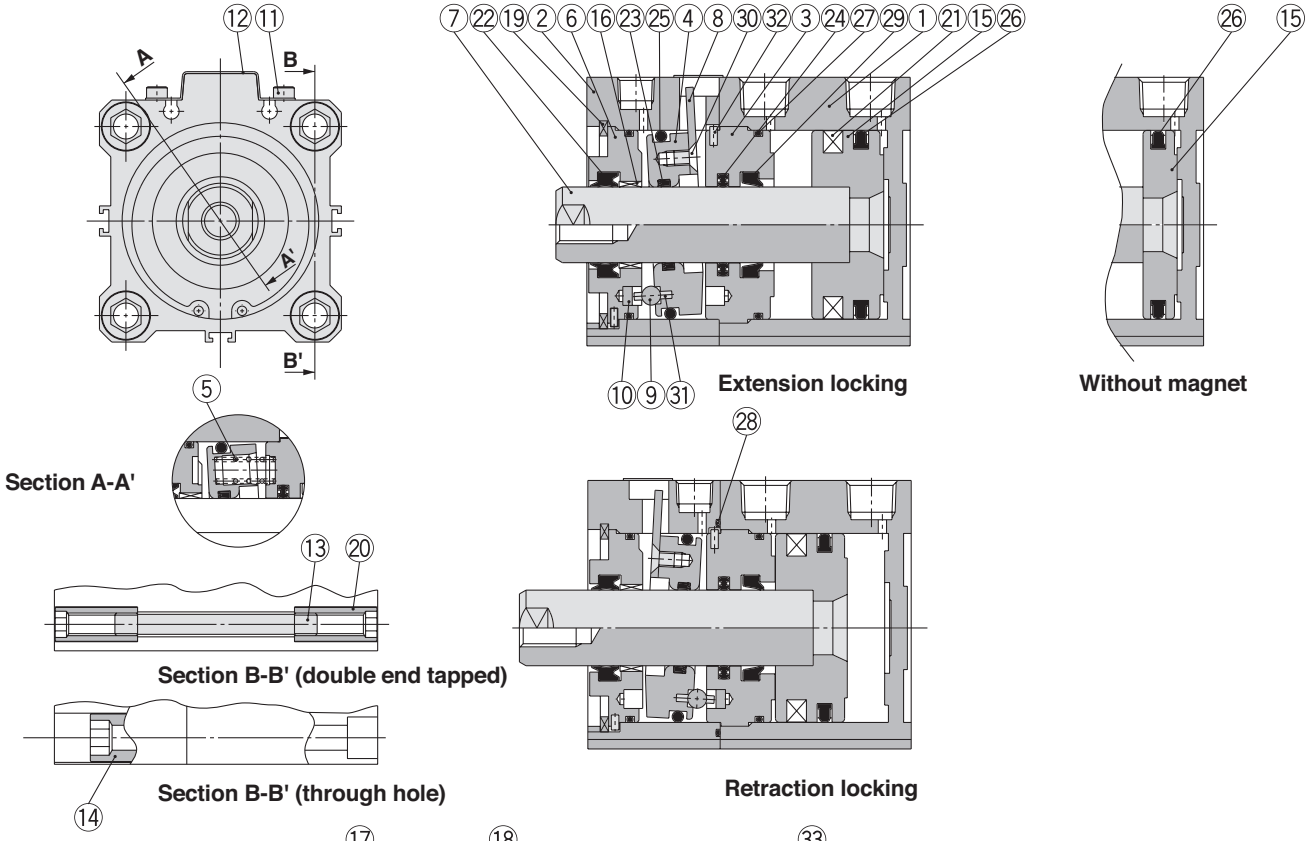
Note) The sectional drawing above shows the locked condition. (A bolt is used to maintain the cylinder in the unlocked condition when shipped.)

Parts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Lock body**	Aluminum alloy	Hard anodized
3	**Intermediate collar**	Aluminum alloy	Extension locking: Chromated Retraction locking: Hard anodized
4	**Lock ring**	Carbon steel	Heat treated
5	**Brake spring**	Steel wire	Zinc chromated
6	**Piston rod**	Stainless steel Carbon steel Chrome molybdenum steel	Ø 20, 25: Hard chrome plated Ø 32: Hard chrome plated
7	**Pivot**	Carbon steel	Electroless nickel plated
8	**Dust cover holding bolt**	Stainless steel	Nickel plated
9	**Dust cover**		
10	**Tie-rod**	Rolled steel	Ø 20: Nickel plated Ø 25: Zinc chromated Ø 32: Black zinc chromated
11	**Piston**	Aluminum alloy	Chromated

No.	Description	Material	Note
12	**Bushing**	Oil-impregnated sintered alloy	Ø 20, 25
		Die-cast lead-bronze	Ø 32
13	**Bumper A**	Urethane	
14	**Bumper B**	Urethane	
15	**Tie-rod nut**	Carbon steel	Nickel plated
16	**Magnet**	—	
17	**Rod seal**	NBR	
18	**Piston seal**	NBR	
19	**Lock ring seal**	NBR	
20	**Tube gasket A**	NBR	
21	**Tube gasket B**	NBR	
22	**Scraper**	NBR	
23	**Parallel pin**	Stainless steel	JIS B1354
24	**Rod end nut**	Carbon steel	Nickel plated
25	**Unlocking bolt**	Chrome molybdenum steel	Nickel plated

Construction/Ø 40 to Ø 100



Note) The sectional drawing above shows the locked condition.

Parts list

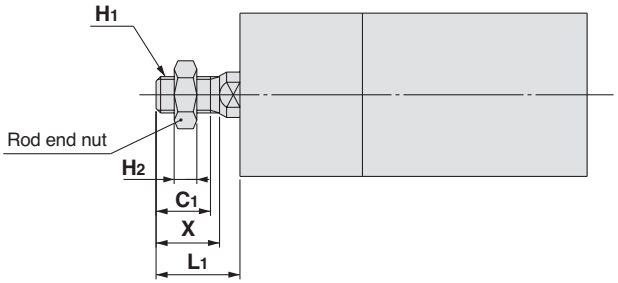
No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Lock body**	Aluminum alloy	Hard anodized
3	**Intermediate collar**	Aluminum alloy	Chromated
4	**Lock ring**	Carbon steel	Heat treated
5	**Brake spring**	Steel wire	Zinc chromated
6	**Collar**	Aluminum alloy	Ø 40: Hard anodized
		Die-cast aluminum alloy	Ø 50 to Ø 100: Chromated, coated
7	**Piston rod**	Carbon steel	Hard chrome plated
8	**Lever**	Stainless steel	
9	**Pivot pin**	Carbon steel	Zinc chromated
10	**Pivot key**	Carbon steel	Zinc chromated
11	**Dust cover holding bolt**	Chrome molybdenum steel	Nickel plated
12	**Dust cover**	Rolled steel	Nickel plated
13	**Tie-rod**	Rolled steel	Ø 40, Chromated
		Carbon steel	Ø 50 or larger, Chromated
14	**Unit holding bolt**	Carbon steel	Nickel plated
15	**Piston**	Aluminum alloy	Chromated
16	**Bushing**	Die-cast lead-bronze	For Ø 50 or larger only

No.	Description	Material	Note
17	**Bumper A**	Urethane	
18	**Bumper B**	Urethane	
19	**Snap ring**	Carbon tool steel	Phosphate coated
20	**Tie-rod nut**	Carbon steel	Nickel plated
21	**Magnet**	—	
22	**Rod seal A**	NBR	
23	**Rod seal B**	NBR	
24	**Rod seal C**	NBR	
25	**Piston seal A**	NBR	
26	**Piston seal B**	NBR	
27	**Tube gasket A**	NBR	
28	**Tube gasket B**	NBR	
29	**Scraper**	NBR	
30	**Hexagon socket countersunk head screw**	Chrome molybdenum steel	Nickel plated
31	**Spring pin**	Carbon steel	JIS B2808
32	**Parallel pin**	Stainless steel	JIS B1354
33	**Rod end nut**	Carbon steel	Nickel plated

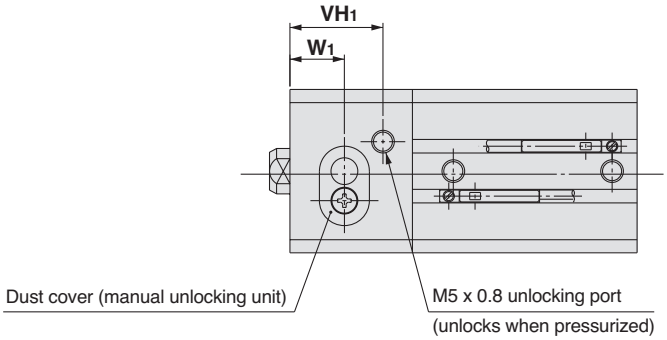
Dimensions/Ø 20, Ø 25

Standard type (through hole/double end tapped): C□LQB20/25

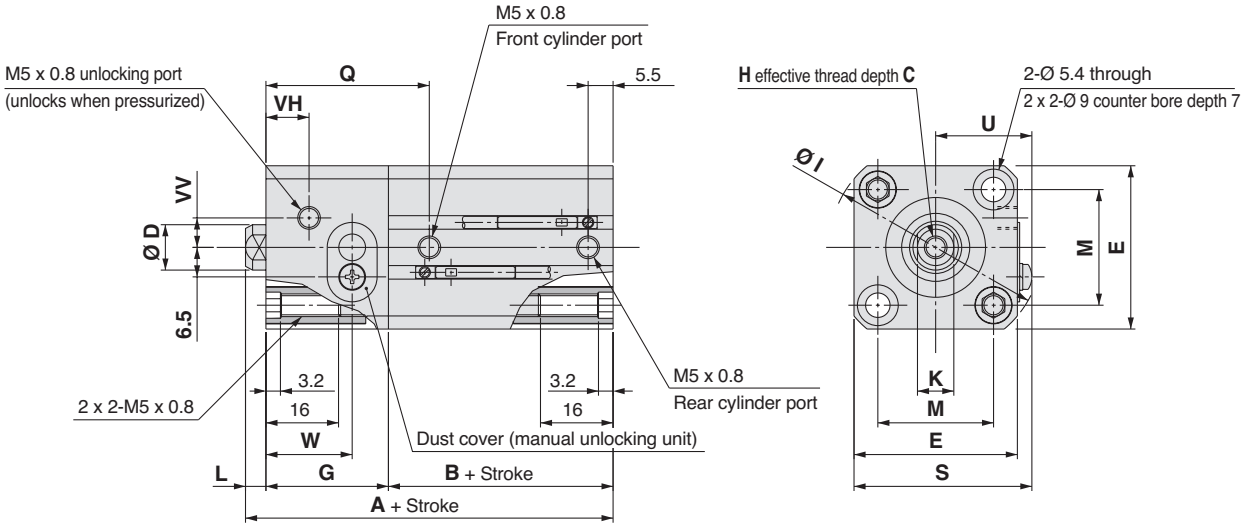
Rod end male threads



Retraction locking LOCK



Extension locking LOCK



(mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch		C	D	E	G	H	I	K	L	M	Q	S	U	VH	VV	W
		A	B	A	B															
20	5 to 50	51	19.5	61	29.5	7	10	36	27	M5 x 0.8	47	8	4.5	25.5	36	39.2	21.2	9.5	6.5	19
25	5 to 50	58.5	22.5	68.5	32.5	12	12	40	31	M6 x 1.0	52	10	5	28	42	43.2	23.2	10	7	21.5

For retraction locking (mm)

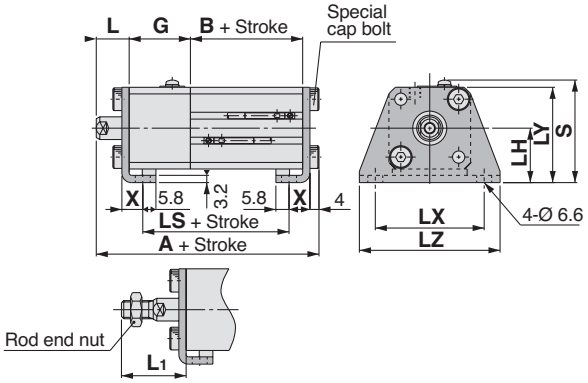
Bore size (mm)	VH1	W1
20	20.5	12
25	23	14.5

For rod end male threads (mm)

Bore size (mm)	C1	X	H1	H2	L1
20	12	14	M8 x 1.25	5	18.5
25	15	17.5	M10 x 1.25	6	22.5

Dimensions/Ø 20, Ø 25

Foot type: CLQL/CDLQL

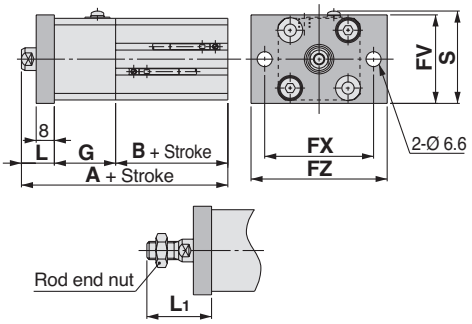


Foot type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
20	5 to 50	68.2	19.5	34.5	78.2	29.5	44.5
25	5 to 50	75.7	22.5	38.5	85.7	32.5	48.5

Bore size (mm)	G	L	L1	LH	LX	LY	LZ	X	S
20	27	14.5	28.5	24	48	42	62	9.2	45.2
25	31	15	32.5	26	52	46	66	10.7	49.2

Front flange type: CLQF/CDLQF

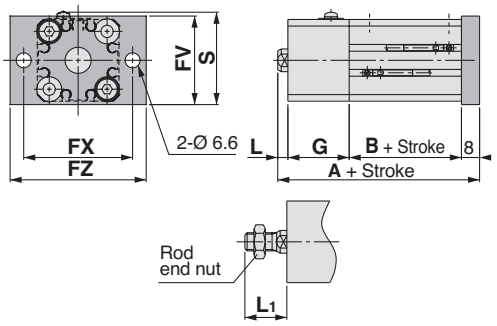


Front flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
20	5 to 50	61	19.5	71	29.5
25	5 to 50	68.5	22.5	78.5	32.5

Bore size (mm)	FV	FX	FZ	G	L	L1	S
20	39	48	60	27	14.5	28.5	40.7
25	42	52	64	31	15	32.5	44.2

Rear flange type: CLQG/CDLQG

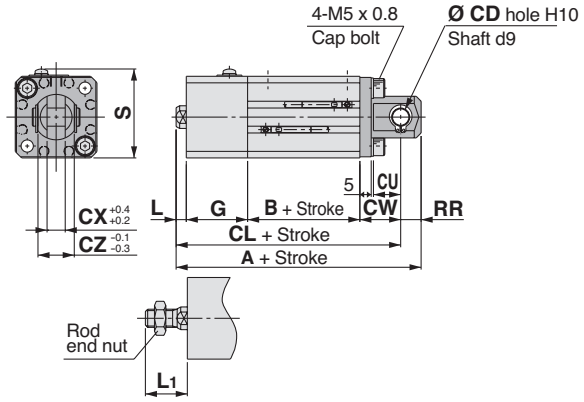


Rear flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
20	5 to 50	59	19.5	69	29.5
25	5 to 50	66.5	22.5	76.5	32.5

Bore size (mm)	FV	FX	FZ	G	L	L1	S
20	39	48	60	27	4.5	18.5	40.7
25	42	52	64	31	5	22.5	44.2

Double clevis type: CLQD/CDLQD



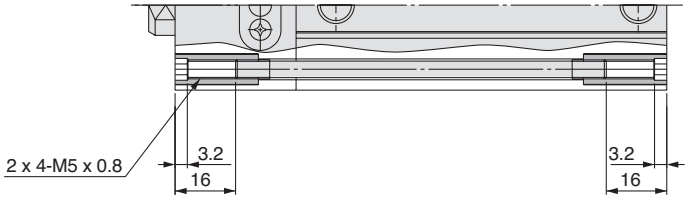
Double clevis type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
20	5 to 50	78	19.5	69	88	29.5	79
25	5 to 50	88.5	22.5	78.5	98.5	32.5	88.5

Bore size (mm)	CD	CU	CW	CX	CZ	G	L	L1	RR	S
20	8	12	18	8	16	27	4.5	18.5	9	39.2
25	10	14	20	10	20	31	5	22.5	10	43.2

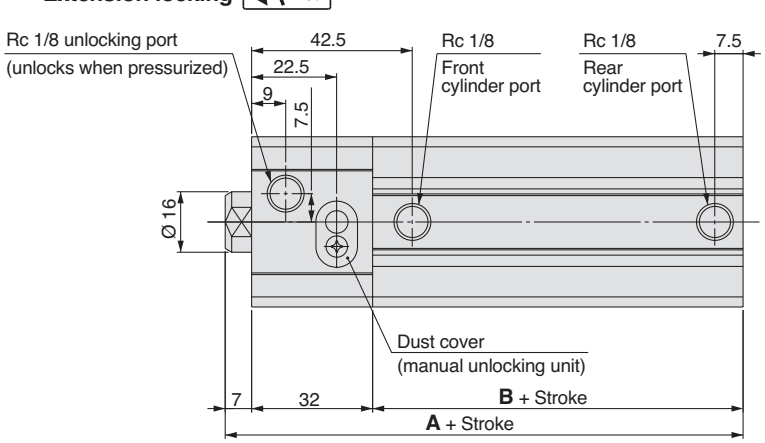
Dimensions/Ø 32

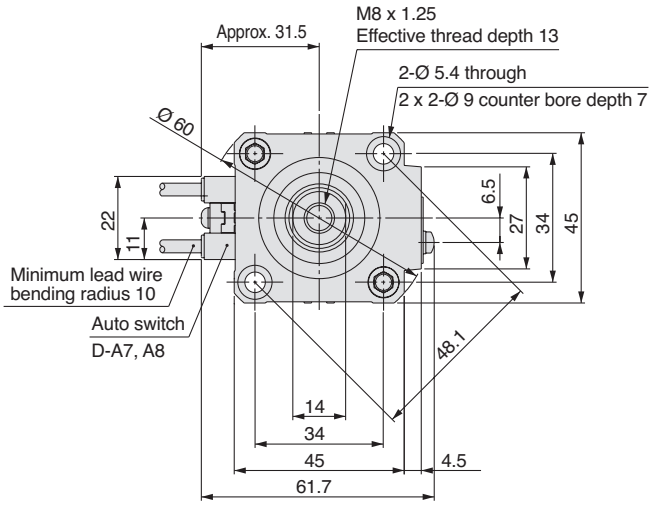
Double end tapped: C□LQA32



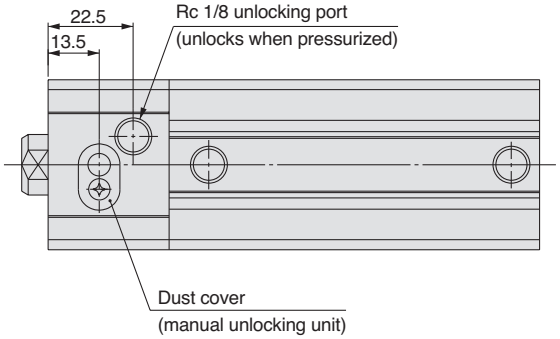
Standard type (through hole): C□LQB32

Extension locking LOCK





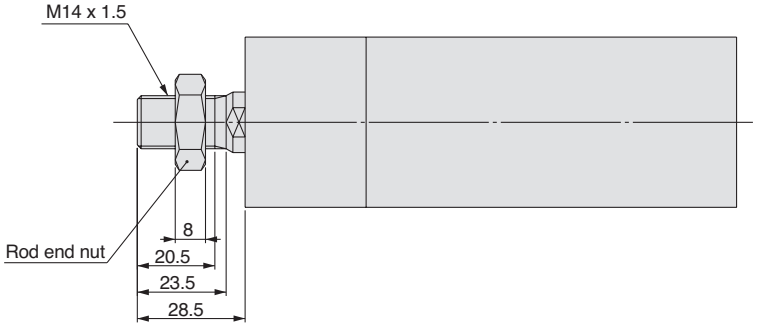
Retraction locking LOCK



(mm)

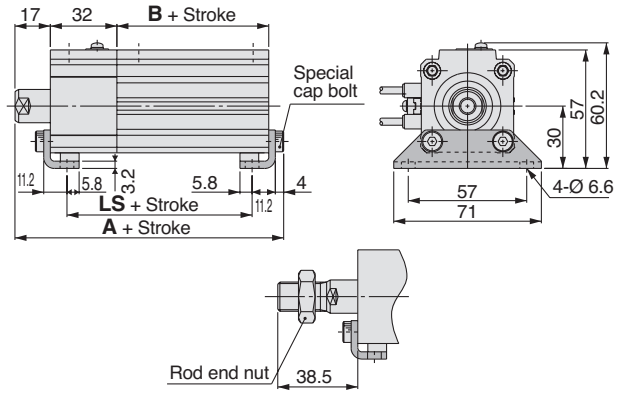
Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
32	10 to 50	62	23	72	33
	75, 100	72	33		

Rod end male threads



Dimensions/Ø 32

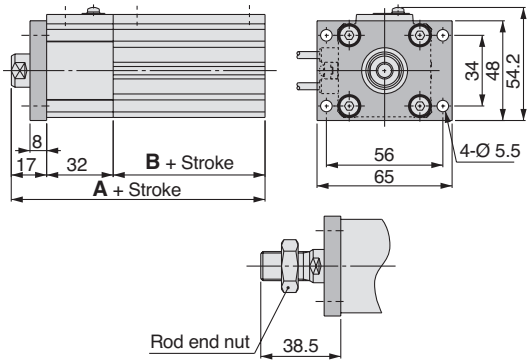
Foot type: C□LQL32



Foot type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
32	10 to 50	79.2	23	39	89.2	33	49
	75, 100	89.2	33	49			

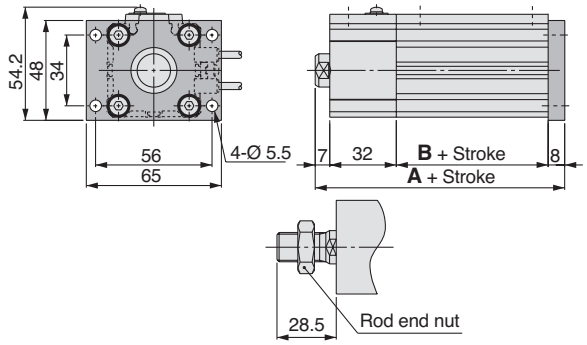
Front flange type: C□LQF32



Front flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
32	10 to 50	72	23	82	33
	75, 100	82	33		

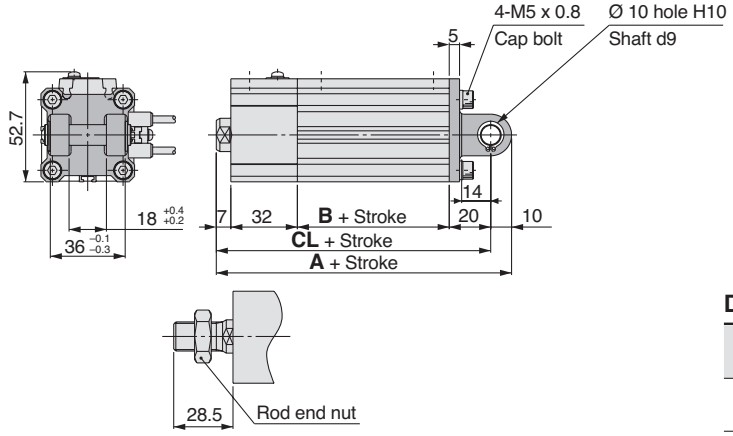
Rear flange type: C□LQG32



Rear flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
32	10 to 50	70	23	80	33
	75, 100	80	33		

Double clevis type: C□LQD32

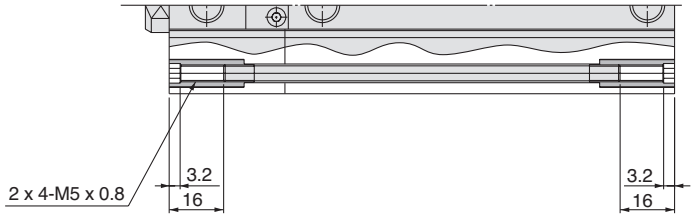


Double clevis type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
32	10 to 50	92	23	82	102	33	92
	75, 100	102	33	92			

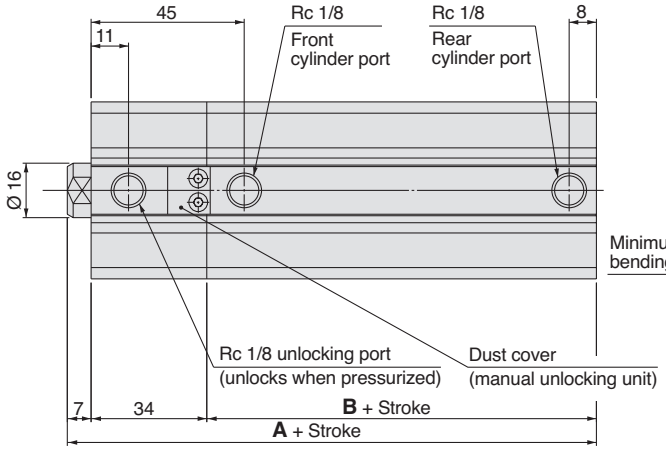
Dimensions/Ø 40

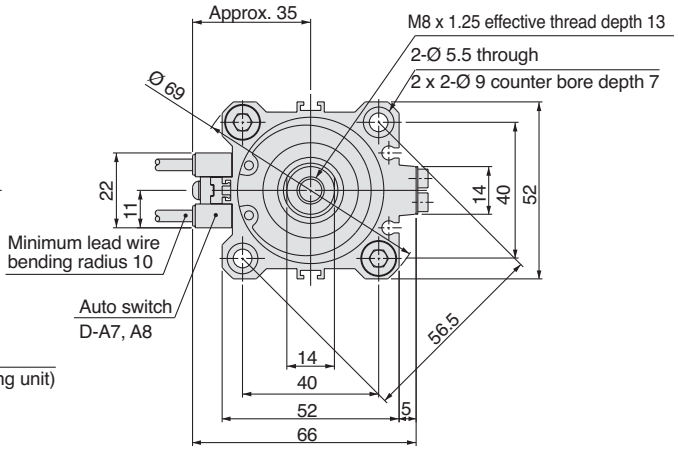
Double end tapped: C□LQA40



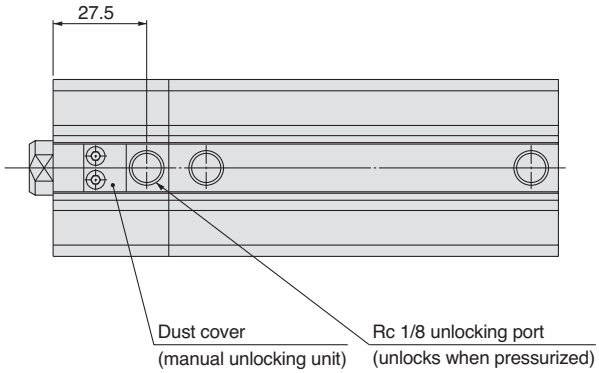
Standard type (through hole): C□LQB40

Extension locking 





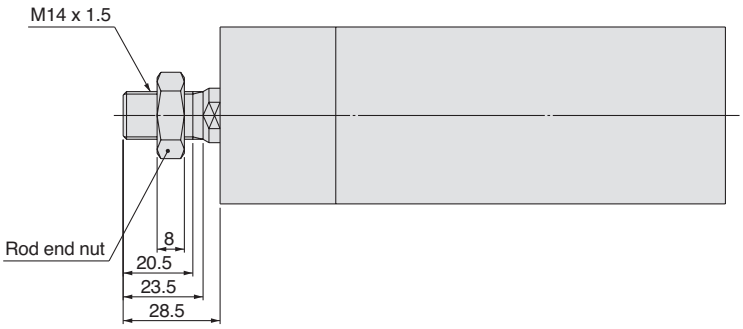
Retraction locking 



A, B dimensions (mm)

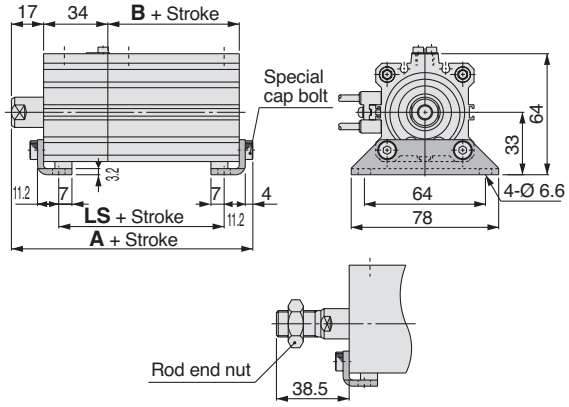
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
40	10 to 50	70.5	29.5	80.5	39.5
	75, 100	80.5	39.5		

Rod end male threads



Dimensions/Ø 40

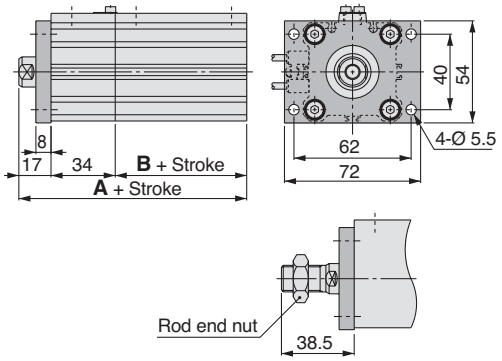
Foot type: C□LQL40



Foot type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
40	10 to 50	87.7	29.5	47.5	97.7	39.5	57.5
	75, 100	97.7	39.5	57.5			

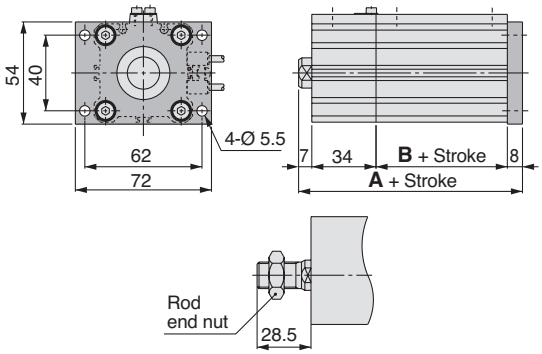
Front flange type: C□LQF40



Front flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
40	10 to 50	80.5	29.5	90.5	39.5
	75, 100	90.5	39.5		

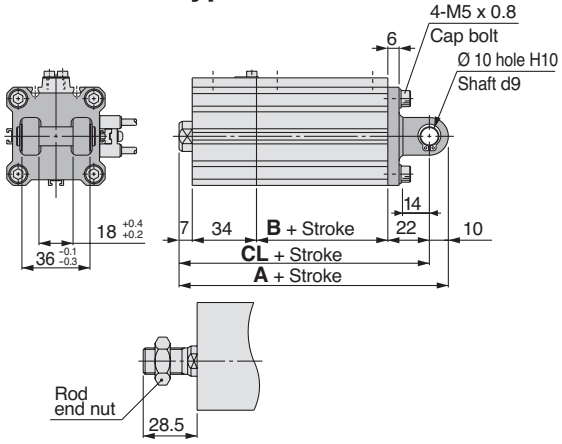
Rear flange type: C□LQG40



Rear flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
40	10 to 50	78.5	29.5	88.5	39.5
	75, 100	88.5	39.5		

Double clevis type: C□LQD40

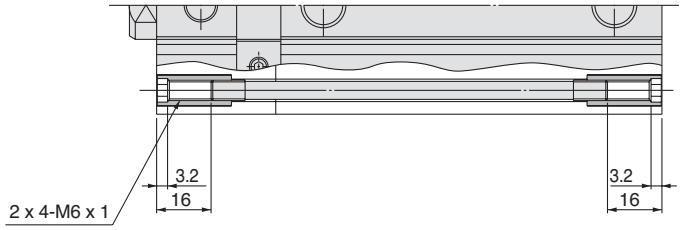


Double clevis type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
40	10 to 50	102.5	29.5	92.5	112.5	39.5	102.5
	75, 100	112.5	39.5	102.5			

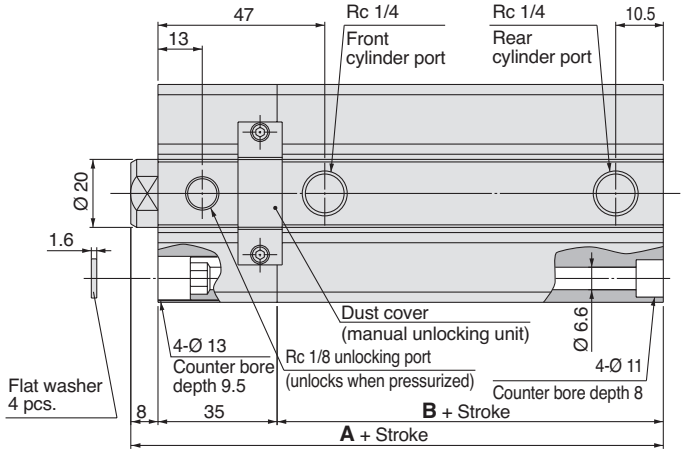
Dimensions/Ø 50

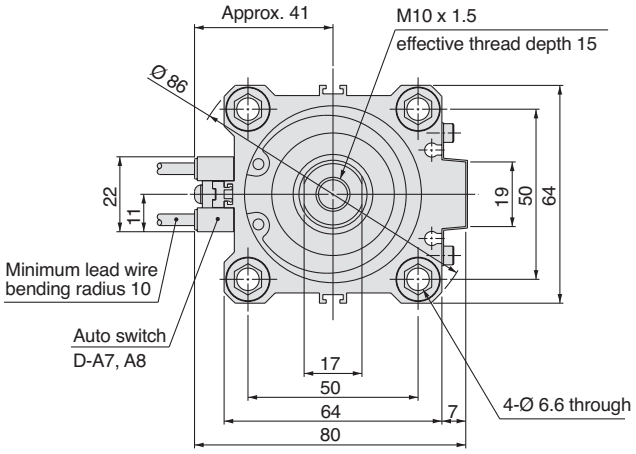
Double end tapped: C□LQA50



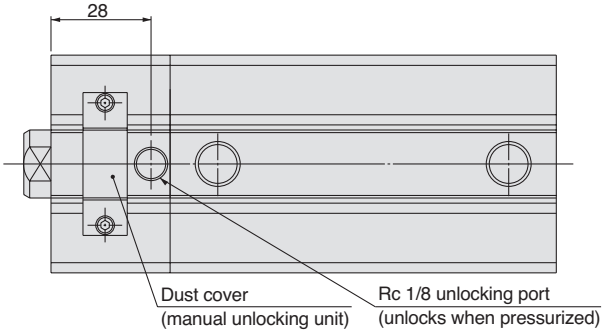
Standard type (through hole): C□LQB50

Extension locking LOCK





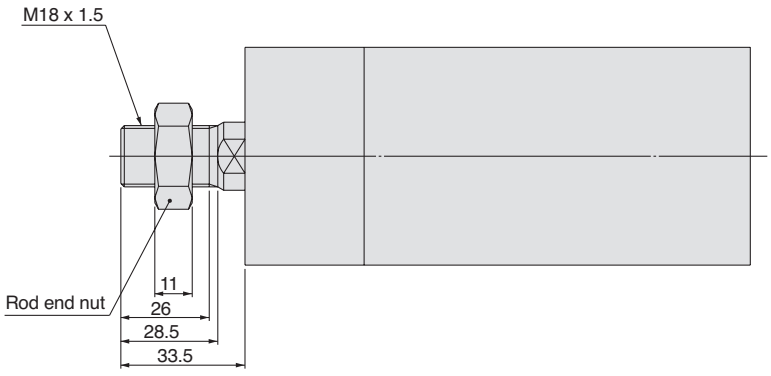
Retraction locking LOCK



A, B dimensions (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
50	10 to 50	73.5	30.5	83.5	40.5
	75, 100	83.5	40.5		

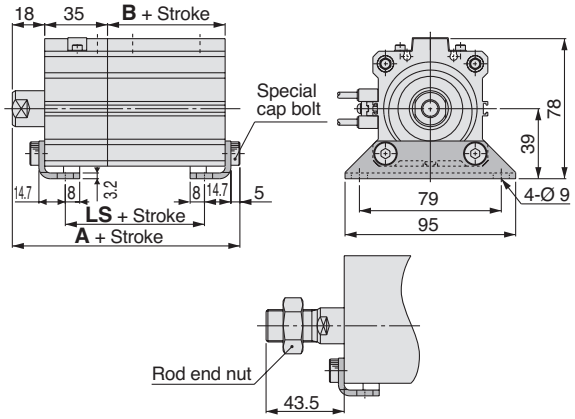
Rod end male threads



Note) Be sure to use the attached flat washers when mounting a cylinder from the rod side.

Dimensions/Ø 50

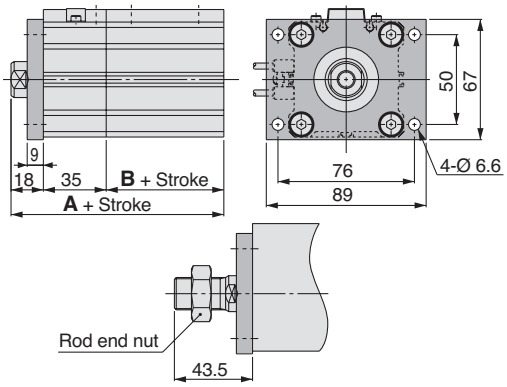
Foot type: C□LQL50



Foot type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
50	10 to 50	91.7	30.5	42.5	101.7	40.5	52.5
	75, 100	101.7	40.5	52.5			

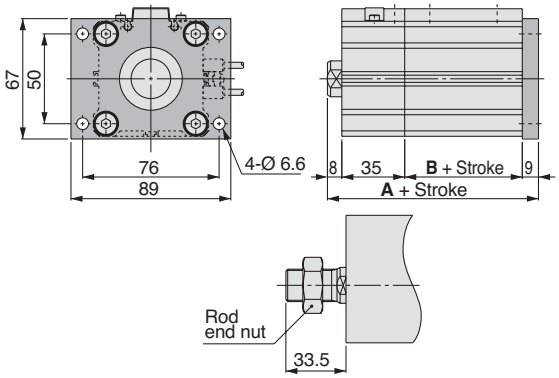
Front flange type: C□LQF50



Front flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
50	10 to 50	83.5	30.5	93.5	40.5
	75, 100	93.5	40.5		

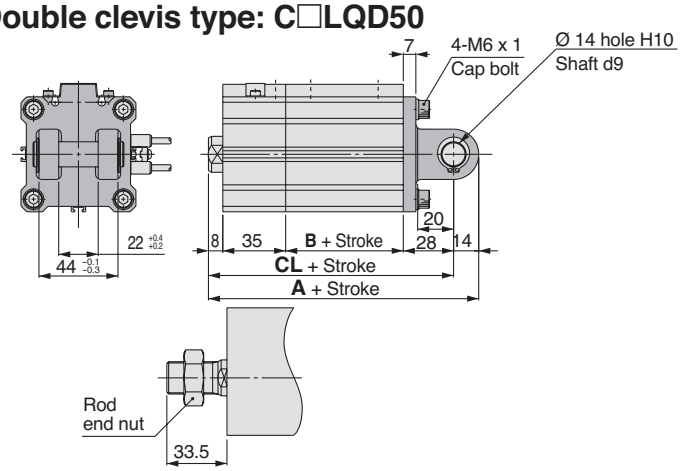
Rear flange type: C□LQG50



Rear flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch	
		A	B	A	B
50	10 to 50	82.5	30.5	92.5	40.5
	75, 100	92.5	40.5		

Double clevis type: C□LQD50

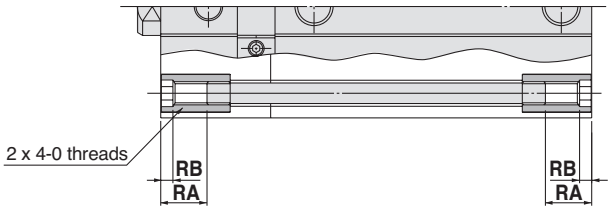


Double clevis type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch		
		A	B	CL	A	B	CL
50	10 to 50	115.5	30.5	101.5	125.5	40.5	111.5
	75, 100	125.5	40.5	111.5			

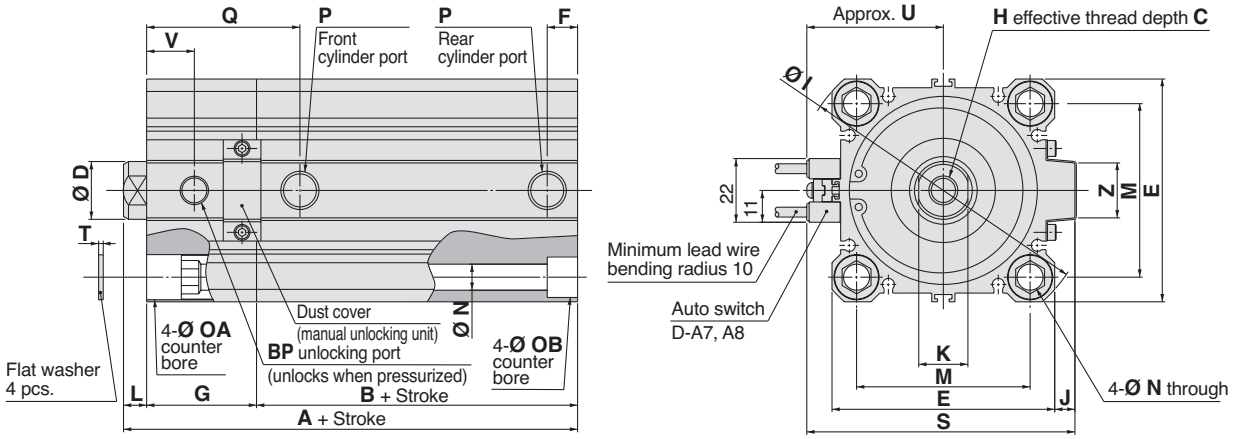
Dimensions/Ø 63, Ø 80, Ø 100

Double end tapped: C□LQA63/80/100

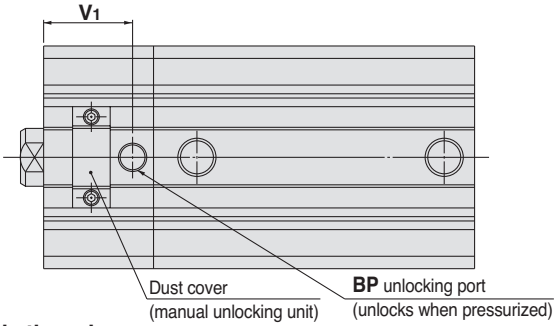


Standard type (through hole): C□LQB63/80/100

Extension locking LOCK



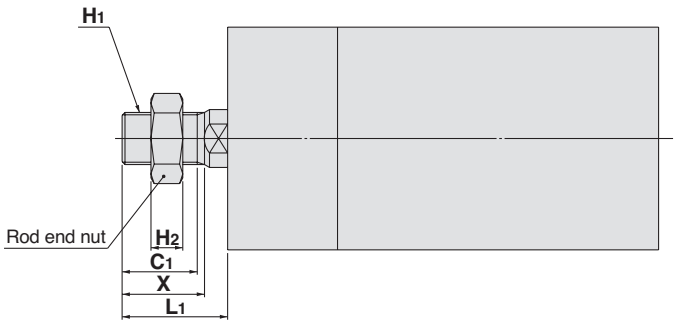
Retraction locking LOCK



For retraction locking (mm)

Bore size (mm)	V_1
63	30.5
80	35.5
100	40.5

Rod end male threads



For rod end male threads (mm)

Bore size (mm)	C_1	X	H_1	H_2	L_1
63	26	28.5	M18 x 1.5	11	33.5
80	32.5	35.5	M22 x 1.5	13	43.5
100	32.5	35.5	M26 x 1.5	16	43.5

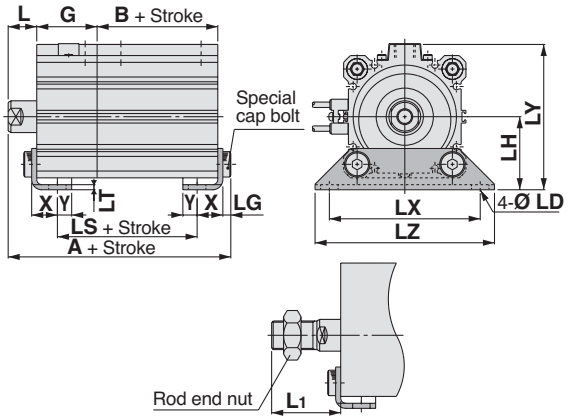
Note) Be sure to use the attached flat washers when mounting a cylinder from the rod side.

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A	Without auto switch B	With auto switch A	With auto switch B	BP	C	D	E	F	G	H	I	J	K	L	M	N	O	OA	OB	P	Q	RA	RB	S	T	U	V	Z
63	10 to 50	82	36	92	46	Rc 1/8	15	20	77	10.5	38	M10 x 1.5	103	7	17	8	60	9	M8M10 x 1.5	15.6 depth 12	14 depth 10.5	Rc 1/4	53	16	4.2	93	1.6	47.5	16.5	19
	75, 100	92	46																											
80	10 to 50	96.5	43.5	106.5	53.5	Rc 1/8	21	25	98	12.5	43	M16 x 2.0	132	6	22	10	77	11	M10	19.6 depth 15.5	17.5 depth 13.5	Rc 3/8	59	16	4.2	112.5	2	57.5	18.5	26
	75, 100	106.5	53.5																											
100	10 to 50	115	53	125	63	Rc 1/4	27	30	117	13	50	M20 x 2.5	156	6.5	27	12	94	11		19.6 depth 15.5	17.5 depth 13.5	Rc 3/8	73	16	4.2	132.5	2	67.5	23	26
	75, 100	125	63																											

Dimensions/Ø 63, Ø 80, Ø 100

Foot type: CLQL/CDLQL

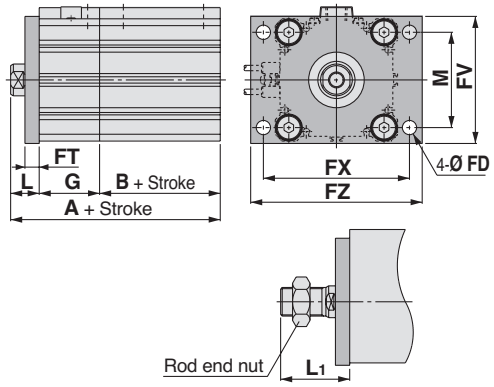


Foot type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch			G	L
		A	B	LS	A	B	LS		
63	10 to 50	100.2	36	48	110.2	46	58	38	18
	75, 100	110.2	46	58					
80	10 to 50	118	43.5	56.5	128	53.5	66.5	43	20
	75, 100	128	53.5	66.5					
100	10 to 50	138	53	69	148	63	79	50	22
	75, 100	148	63	79					

Bore size (mm)	L1	LD	LG	LH	LT	LX	LY	LZ	X	Y
63	43.5	11	5	46	3.2	95	91.5	113	16.2	9
80	53.5	13	7	59	4.5	118	114	140	19.5	11
100	53.5	13	7	71	6	137	136	162	23	12.5

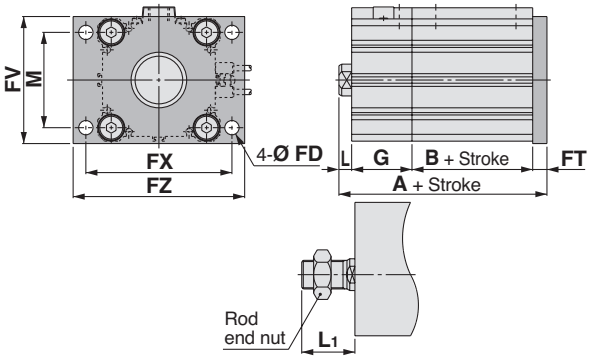
Front flange type: CLQF/CDLQF



Front flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	G	L	L1	M
		A	B	A	B									
63	10 to 50	92	36	102	46	9	9	80	92	108	38	18	43.5	60
	75, 100	102	46											
80	10 to 50	106.5	43.5	116.5	53.5	11	11	99	116	134	43	20	53.5	77
	75, 100	116.5	53.5											
100	10 to 50	125	53	135	63	11	11	117	136	154	50	22	53.5	94
	75, 100	135	63											

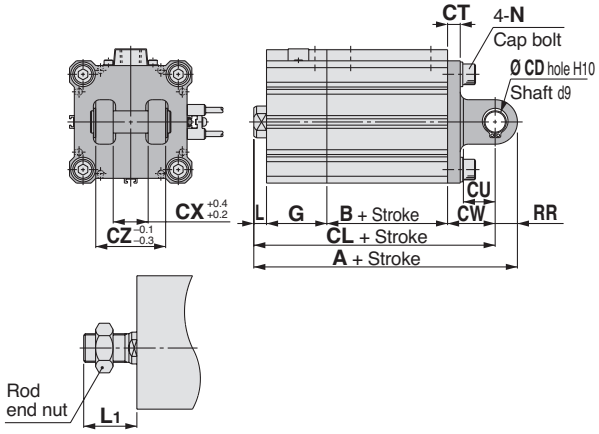
Rear flange type: CLQG/CDLQG



Rear flange type (mm)

Bore size (mm)	Stroke range	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	G	L	L1	M
		A	B	A	B									
63	10 to 50	91	36	101	46	9	9	80	92	108	38	8	33.5	60
	75, 100	101	46											
80	10 to 50	107.5	43.5	117.5	53.5	11	11	99	116	134	43	10	43.5	77
	75, 100	117.5	53.5											
100	10 to 50	126	53	136	63	11	11	117	136	154	50	12	43.5	94
	75, 100	136	63											

Double clevis type: CLQD/CDLQD



Double clevis type (mm)

Bore size (mm)	Stroke range	Without auto switch			With auto switch			CD	CT
		A	B	CL	A	B	CL		
63	10 to 50	126	36	112	136	46	122	14	8
	75, 100	136	46	122					
80	10 to 50	152.5	43.5	134.5	162.5	53.5	144.5	18	10
	75, 100	162.5	53.5	144.5					
100	10 to 50	182	53	160	192	63	170	22	13
	75, 100	192	63	170					

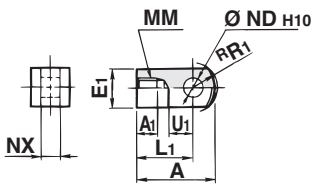
Bore size (mm)	CU	CW	CX	CZ	G	L	L1	N	RR
63	20	30	22	44	38	8	33.5	M8 x 1.25	14
80	27	38	28	56	43	10	43.5	M10 x 1.5	18
100	31	45	32	64	50	12	43.5	M10 x 1.5	22

Accessories

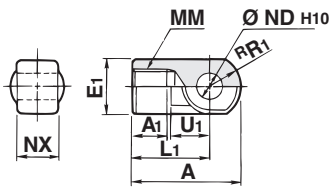
Single knuckle joint

I-G02, I-G03

I-G04, I-G05
I-G08, I-G10



Material: Rolled steel



Material: Cast iron

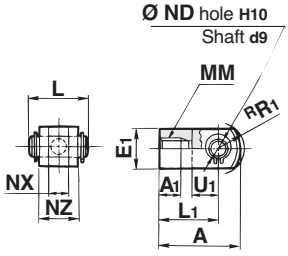
(mm)

Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	RR1	U1	ND	NX
I-G02	**20**	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 $^{+0.058}_{0}$	8 $^{-0.2}_{-0.4}$
I-G03	**25**	41	10.5	□20	30	M10 x 1.25	12.8	14	10 $^{+0.058}_{0}$	10 $^{-0.2}_{-0.4}$
I-G04	**32, 40**	42	14	Ø 22	30	M14 x 1.5	12	14	10 $^{+0.058}_{0}$	18 $^{-0.3}_{-0.5}$
I-G05	**50, 63**	56	18	Ø 28	40	M18 x 1.5	16	20	14 $^{+0.070}_{0}$	22 $^{-0.3}_{-0.5}$
I-G08	**80**	71	21	Ø 38	50	M22 x 1.5	21	27	18 $^{+0.070}_{0}$	28 $^{-0.3}_{-0.5}$
I-G10	**100**	79	21	Ø 44	55	M26 x 1.5	24	31	22 $^{+0.084}_{0}$	32 $^{-0.3}_{-0.5}$

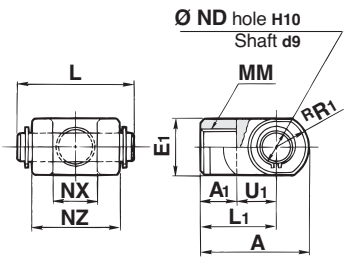
Double knuckle joint

Y-G02, Y-G03

Y-G04, Y-G05
Y-G08, Y-G10



Material: Rolled steel



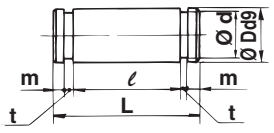
Material: Cast iron

(mm)

Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	RR1	U1	ND	NX	NZ	L	Applicable pin no.
Y-G02	**20**	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 $^{+0.058}_{0}$	8 $^{+0.4}_{+0.2}$	16	21	IY-G02
Y-G03	**25**	41	10.5	□20	30	M10 x 1.25	12.8	14	10 $^{+0.058}_{0}$	10 $^{+0.4}_{+0.2}$	20	25.6	IY-G03
Y-G04	**32, 40**	42	16	Ø 22	30	M14 x 1.5	12	14	10 $^{+0.058}_{0}$	18 $^{+0.5}_{+0.3}$	36	41.6	IY-G04
Y-G05	**50, 63**	56	20	Ø 28	40	M18 x 1.5	16	20	14 $^{+0.070}_{0}$	22 $^{+0.5}_{+0.3}$	44	50.6	IY-G05
Y-G08	**80**	71	23	Ø 38	50	M22 x 1.5	21	27	18 $^{+0.070}_{0}$	28 $^{+0.5}_{+0.3}$	56	64	IY-G08
Y-G10	**100**	79	24	Ø 44	55	M26 x 1.5	24	31	22 $^{+0.084}_{0}$	32 $^{+0.5}_{+0.3}$	64	72	IY-G10

* Knuckle pin and snap rings are included.

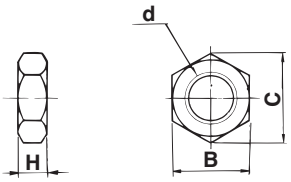
Knuckle pin (common with double clevis pin)



Material: Carbon steel
(mm)

Part no.	Applicable bore size (mm)	D	L	d	ℓ	m	t	Snap ring
IY-G02	**20**	8 $^{-0.040}_{-0.076}$	21	7.6	16.2	1.5	0.9	C type 8 for shaft
IY-G03	**25**	10 $^{-0.040}_{-0.076}$	25.6	9.6	20.2	1.55	1.15	C type 10 for shaft
IY-G04	**32, 40**	10 $^{-0.040}_{-0.076}$	41.6	9.6	36.2	1.55	1.15	C type 10 for shaft
IY-G05	**50, 63**	14 $^{-0.050}_{-0.093}$	50.6	13.4	44.2	2.05	1.15	C type 14 for shaft
IY-G08	**80**	18 $^{-0.050}_{-0.093}$	64	17	56.2	2.55	1.35	C type 18 for shaft
IY-G10	**100**	22 $^{-0.065}_{-0.117}$	72	21	64.2	2.55	1.35	C type 22 for shaft

Rod end nut



Material: Rolled steel
(mm)

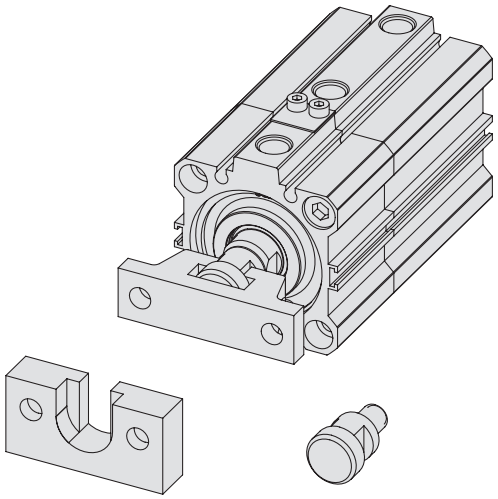
Part no.	Applicable bore size (mm)	d	H	B	C
NT-02	**20**	M8 x 1.25	5	13	15.0
NT-03	**25**	M10 x 1.25	6	17	19.6
NT-04	**32, 40**	M14 x 1.5	8	22	25.4
NT-05	**50, 63**	M18 x 1.5	11	27	31.2
NT-08	**80**	M22 x 1.5	13	32	37.0
NT-10	**100**	M26 x 1.5	16	41	47.3

Simple Joint (CLQ): Ø 20 to Ø 100

Joint/Mounting Bracket (Type A/B) Part Nos.

Bore size [mm]	Joint	Type A mounting bracket	Type B mounting bracket
20	YU-020	YA-020	YB-020
25	YU-025	YA-025	YB-025
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10

<Ordering>
●Joints are not included with type A or B mounting brackets. Order them separately.
(Example)
Bore size Ø 40 Part no.
●Type A mounting bracket……YA-03
●Joint……YU-03

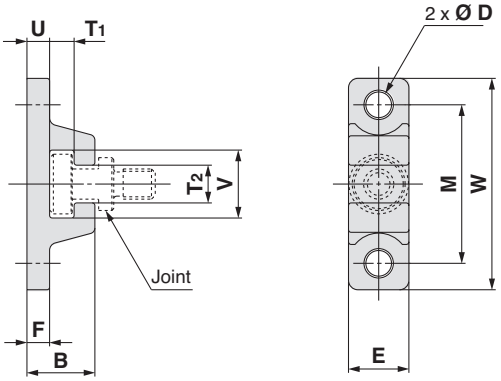


Allowable Eccentricity

[mm]

Bore size [mm]	20	25	32	40	50	63	80	100
Eccentricity tolerance	±0.5		±1				±1.5	±2
Axial direction backlash	0.5							

Type A Mounting Bracket



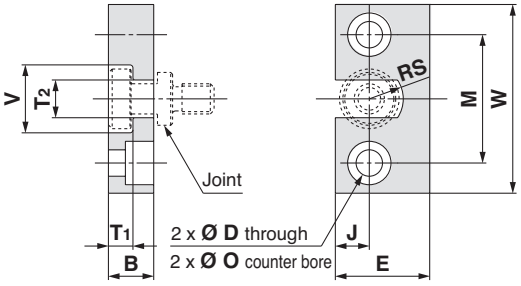
Material: Chromium molybdenum steel (Nickel plating)

[mm]

Bore size [mm]	Part no.	B	D	E	F	M	T1	T2
20	**YA-020**	12	4.5	13	5	30	3.5	6
25	**YA-025**	12.5	5.5	15	5	33	3.5	7
32, 40	**YA-03**	18	6.8	16	6	42	6.5	10
50, 63	**YA-05**	20	9	20	8	50	6.5	12
80	**YA-08**	26	11	25	10	62	8.5	16
100	**YA-10**	31	14	30	12	76	10.5	18

Bore size [mm]	Part no.	U	V	W	Weight [g]
20	**YA-020**	5	13.5	42	27
25	**YA-025**	5	16.5	45	34
32, 40	**YA-03**	6	18	56	55
50, 63	**YA-05**	8	22	67	100
80	**YA-08**	10	28	83	195
100	**YA-10**	12	36	100	340

Type B Mounting Bracket



Material: Stainless steel

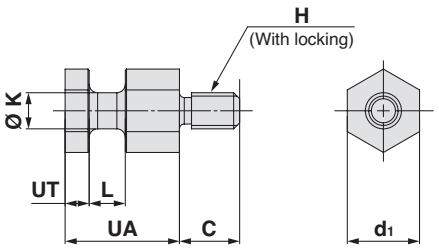
[mm]

Bore size [mm]	Part no.	B	D	E	J	M	O
20	**YB-020**	7	4.5	18	7	25.5	—
25	**YB-025**	7.5	5.5	20	8	28	—
32, 40	**YB-03**	12	7	25	9	34	11.5 depth 7.5
50, 63	**YB-05**	12	9	32	11	42	14.5 depth 8.5
80	**YB-08**	16	11	38	13	52	18 depth 12
100	**YB-10**	19	14	50	17	62	21 depth 14

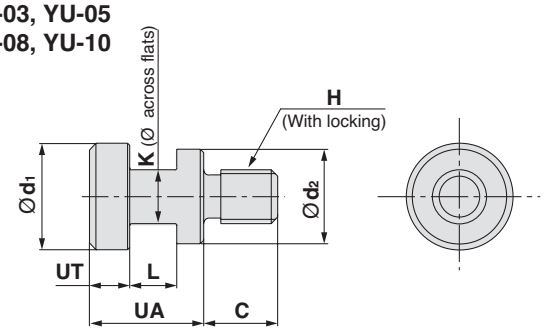
Bore size [mm]	Part no.	T1	T2	V	W	RS	Weight [g]
20	**YB-020**	3.5	6	13.6	36	3	28
25	**YB-025**	3.5	7	16.6	40	3.5	36
32, 40	**YB-03**	6.5	10	18	50	9	80
50, 63	**YB-05**	6.5	12	22	60	11	120
80	**YB-08**	8.5	16	28	75	14	230
100	**YB-10**	10.5	18	36	90	18	455

Joint

YU-020, YU-025



YU-03, YU-05
YU-08, YU-10



Material: Chromium molybdenum steel (Nickel plating)

[mm]

Applicable bore size [mm]	Part no.	UA	C	d_1	d_2	H	K	L	UT	Weight [g]
20	**YU-020**	11.5	6	10	—	M5 x 0.8	5	4	3	7
25	**YU-025**	12	11	12	—	M6 x 1.0	6	4.5	3	11
32, 40	**YU-03**	17	11	15.8	14	M8 x 1.25	8	7	6	25
50, 63	**YU-05**	17	13	19.8	18	M10 x 1.5	10	7	6	40
80	**YU-08**	22	20	24.8	23	M16 x 2	13	9	8	90
100	**YU-10**	26	26	29.8	28	M20 x 2.5	14	11	10	160

Auto Switch Mounting 1

Minimum Auto Switch Mounting Stroke

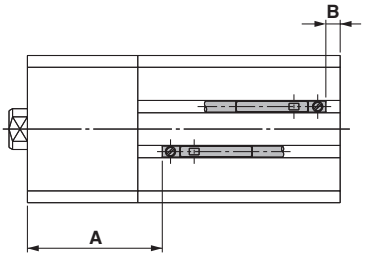
(mm)

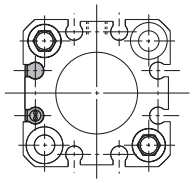
No. of auto switches mounted	D-M9□V D-F7□V D-J79C	D-A9□V D-A7□ D-A80 D-A73C D-A80C	D-A9□ D-M9□	D-M9□WV D-M9□AV D-F7□WV D-F7BAV	D-M9□W D-M9□A D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F7BA D-F79F	D-P3DWA	D-P4DW
1 pc.	5	5	10	10	15	15	20	15	15
2 pcs.	5	10	10	15	15	20	20	15	15

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

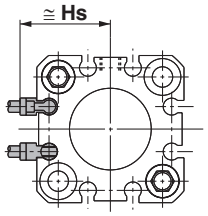
Ø 20, Ø 25

D-M9□
D-M9□W
D-M9□A
D-A9□



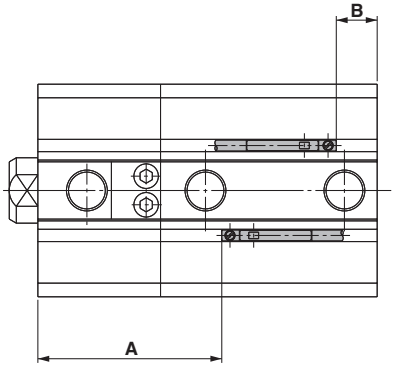


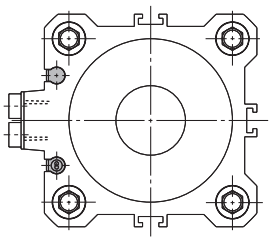
D-M9□V
D-M9□WV
D-M9□AV
D-A9□V



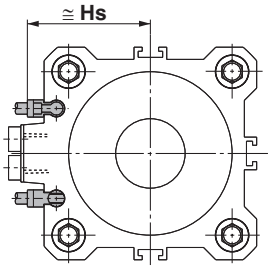
Ø 32 to Ø 100

D-M9□
D-M9□W
D-M9□A
D-A9□





D-M9□V
D-M9□WV
D-M9□AV
D-A9□V



Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V	
	A	B	A	B
20	37	7.5	33	3.5
25	42	9.5	38	5.5
32	44	9	40	5
40	50	11.5	46	7.5
50	49	14.5	45	10.5
63	54.5	17.5	50.5	13.5
80	63.5	21	59.5	17
100	74	27	70	23

Auto Switch Mounting Height (mm)

Auto switch model / Bore size (mm)	D-M9□V D-M9□WV D-M9□AV	D-A9□V
	Hs	Hs
20	25	22.5
25	27	24.5
32	29	27
40	32.5	30.5
50	38.5	36.5
63	42	40
80	52	50
100	62	60

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

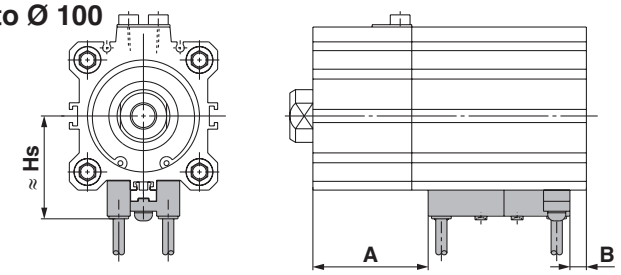
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79

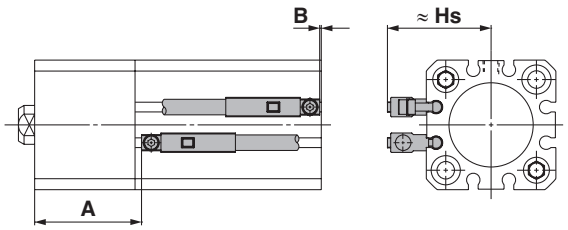
D-F7□W
D-J79W
D-F79F
D-F7NT
D-F7BA
D-A73C

D-A80C
D-J79C
D-A79W
D-F7□WV
D-F7□V
D-F7BAV

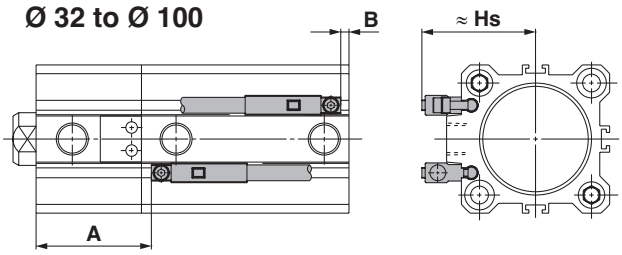
Ø 32 to Ø 100



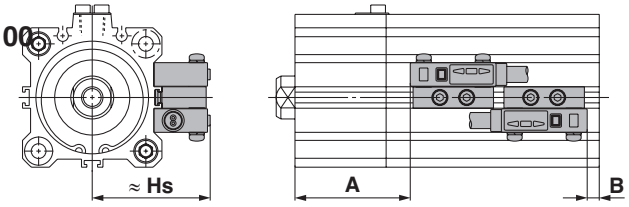
D-P3DWA
Ø 25



Ø 32 to Ø 100



D-P4DW
Ø 40 to Ø 100



Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size (mm)	D-A73 D-A80		D-A72/A7□H D-A80H/A73C D-A80C/F7BAV D-F7BA/F79F D-F7□W/F7□ D-J79/F7□V D-J79C/J79W D-F7□WV		D-F7NT		D-A79W		D-P3DWA		D-P4DW	
	A	B	A	B	A	B	A	B	A	B	A	B
20	—	—	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	37.5	5	—	—
32	41	6	41.5	6.5	46.5	11.5	38.5	3.5	39.5	4.5	—	—
40	47	8.5	47.5	9	52.5	14	44.5	6	45.5	7	43	4.5
50	46	11.5	46.5	12	51.5	17	43.5	9	44.5	10	42	7.5
63	51.5	14.5	52	15	57	20	49	12	50	13	47.5	10.5
80	60.5	18	61	18.5	66	23.5	58	15.5	59	16.5	56.5	14
100	71	24	71.5	24.5	76.5	29.5	68.5	21.5	69.5	22.5	67	20

Note 1) Adjust the auto switch after confirming the operating conditions in the actual setting.
Note 2) For bore sizes Ø 32 to Ø 50, the D-P3DWA is mountable only on the port side.

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size (mm)	D-A7□ D-A80	D-A7□H D-A80H D-F7□ D-J79 D-F7□W D-J79W D-F7BA D-F79F D-F7NT	D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAV	D-J79C	D-A79W	D-P3DWA	D-P4DW
	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs
20	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	33	—
32	31.5	32.5	38.5	35	38	34	35.5	—
40	35	36	42	38.5	41.5	37.5	39	44
50	41	42	48	44.5	47.5	43.5	45	50
63	47.5	48.5	54.5	51	54	50	48.5	56.5
80	57.5	58.5	64.5	61	64	60	58.5	66.5
100	67.5	68.5	74.5	71	74	70	68.5	76.5

CLQ Series
Auto Switch Mounting 2

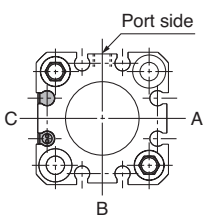
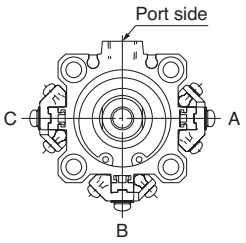
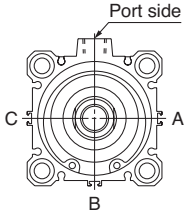
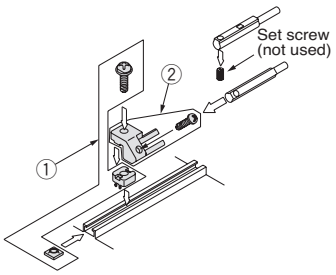
Operating Range

(mm)

Auto switch model	Bore size (mm)							
	20	**25**	**32**	**40**	**50**	**63**	**80**	**100**
D-M9□/M9□V **D-M9□W/M9□WV** **D-M9□A/M9□AV**	4.5	4.5	5	5	6	6.5	6.5	7.5
D-A9□/A9□V	10	10	9.5	9.5	9.5	11.5	9	11.5
D-A7□/F7□H **D-A73C** **D-A80/A80H** **D-A80C**	—	—	12	11	10	12	12	13
D-A79W	—	—	13	14	14	16	15	17
D-F7□/F7□V **D-J79/J79C** **D-F7□W/F7□WV** **D-J79W** **D-F7BA/F7BAV** **D-F7NT/F79F**	—	—	6	6	6	6.5	6.5	7
D-P3DWA	—	5	6	6	7.5	6.5	6.5	7.5
D-P4DW	—	—	—	5	5	5	5	5.5

∗ 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.
∗ Auto switch mounting brackets BQ2-012 are not used for sizes over Ø 32 of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types.
The above values indicate the operating range when mounted with the current auto switch installation groove.

Auto Switch Mounting Bracket: Part No.

Auto switch mounting surface / Auto switch model	Bore size (mm)				
	Ø 20	**Ø 25**	**Ø 32, Ø 40, Ø 50**		**Ø 63, Ø 80, Ø 100**
					
	Auto switch mounting surface		Auto switch mounting surface		Auto switch mounting surface
	Port, A, B, C sides		Port side	A, B, C sides	Port, A, B, C sides
D-M9□ **D-M9□V** **D-M9□W** **D-M9□WV** **D-M9□A** **D-M9□AV** **D-A9□** **D-A9□V**	Auto switch mounting bracket not required.		Auto switch mounting bracket not required.	1. BQ-2 2. BQ2-012 Two kinds of auto switch mounting brackets are used as a set. 	Auto switch mounting bracket not required.
D-P3DWA	—	Auto switch mounting bracket not required.	Auto switch mounting bracket not required.	—	Auto switch mounting bracket not required.

Note 1) For each cylinder series, when a compact auto switch is mounted on the three sides (A, B and C above) other than the port side of bore sizes Ø 32 to Ø 50, the auto switch mounting brackets above are required. Order them separately from cylinders.
(It is the same as when mounting compact cylinders with an auto switch mounting rail, but not with Ø 63 to Ø 100 compact auto switch installation groove.)
Example order
CDLQB32-50-M9BW 1 unit
BQ-2 2 pcs.
BQ2-012 2 pcs.
Note 2) Auto switch mounting brackets and auto switches are shipped together with cylinders.

Auto Switch Mounting Bracket: Part. No.

Auto switch model	Bore size (mm)						
	25	32	40	50	63	80	100
D-A7□/A80 **D-A73C/A80C** **D-A7□H/A80H** **D-A79W** **D-F7□/J79** **D-F7□V** **D-J79C** **D-F7□W/J79W** **D-F7□WV** **D-F7BA/F7BAV** **D-F79F/F7NT**	—	BQ-2					
D-P4DW	—		BQP1-050				

Note 1) Auto switch mounting brackets and auto switches are shipped together with cylinders.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel (including nuts) is available. Use it in accordance with the operating environment. (Please order BQ-2 separately, since the auto switch spacer (for BQ-2) is not included.)

BBA2: For D-A7/A8/F7/J7 types

Water resistant auto switches, D-F7BA/F7BAV are set on the cylinder with the stainless steel screws above when shipped. When an auto switch is shipped independently, BBA2 is attached.

Note 1) Refer to page 1443 for the details of BBA2.

Note 2) When mounting D-M9□A(V) on a port other than the ports for Ø 32, Ø 40 and Ø 50, order auto switch mounting brackets BQ2-012S, BQ-2 and stainless steel screw set BBA2 separately.

Auto Switch Mounting Bracket Weight

Auto switch mounting bracket part no.	Weight (g)
BQ-2	1.5
BQ2-012	5
BQP1-050	16

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.

Auto switch type	Model	Electrical entry (Fetching direction)	Features
Reed	D-A73	Grommet (Perpendicular)	—
	D-A80		Without indicator light
	D-A73H, A76H	Grommet (In-line)	—
	D-A80H		Without indicator light
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—
	D-F7NWV, F7BWV		Diagnostic indication(2-color indicator)
	D-F7BAV		Water resistant (2-color indicator)
	D-F79, F7P, J79	Grommet (In-line)	—
	D-F79W, F7PW, J79W		Diagnostic indication(2-color indicator)
	D-F7BA		Water resistant (2-color indicator)
	D-F7NT		With timer
	D-P5DW		Magnetic field resistant (2-color indicator)

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1410 and 1411 for details.
* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. Refer to page 1360 for details.
* D-A7/A8/F7/J7 types cannot be mounted on Ø 20 and Ø 25.

Series CLQ
Actuator Precautions 1
Be sure to read before handling.

Design

⚠Warning

1. There is a danger of sudden action by air cylinders if sliding parts of machinery are twisted, etc., and changes in forces occur.

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to avoid such dangers.

2. Attach a protective cover to minimize the risk of human injury.

If a driven object and moving parts of a cylinder pose a danger of human injury, design the structure to avoid contact with the human body.

3. Securely tighten all stationary parts and connected parts so that they will not become loose.

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

4. A deceleration circuit or shock absorber, etc., may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In this case, the rigidity of the machinery should also be examined.

5. Consider a possible drop in circuit pressure due to a power outage, etc.

When a cylinder is used in a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent damage to machinery and/or human injury. Suspension mechanisms and lifting devices also require consideration for drop prevention.

6. Consider a possible loss of power source.

Measures should be taken to protect against human injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity or hydraulics, etc.

7. Design circuitry to prevent sudden lurching of driven objects.

When a cylinder is driven by an exhaust center type directional control valve or when starting up after residual pressure is exhausted from the circuit, etc., the piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching because, there is a danger of human injury and/or damage to equipment when this occurs.

8. Consider emergency stops.

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

9. Consider the action when operation is restarted after an emergency stop or abnormal stop.

Design the machinery so that human injury or equipment damage will not occur upon restart of operation. When the cylinder has to be reset at the starting position, install safe manual control equipment.

Selection

⚠Warning

1. Confirm the specifications.

The products advertised in this catalog are designed according to use in industrial compressed air systems. If the products are used in conditions where pressure, temperature, etc., are out of specification, damage and/or malfunction may be caused. Do not use in these conditions. (Refer to specifications.)

Consult SMC if you use a fluid other than compressed air.

⚠Caution

1. Operate within the limits of the maximum usable stroke.

The piston rod will be damaged if operated beyond the maximum stroke. Refer to the air cylinder model selection procedures for the maximum usable stroke.

2. Operate the piston within a range such that collision damage will not occur at the stroke end.

Operate within a range such that damage will not occur when the piston having inertial force stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the range within which damage will not occur.

3. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

Mounting

⚠Caution

1. Be certain to align the rod axis with the load and direction of movement when connecting.

When not properly aligned, twisting may occur in the rod and tube, and damage may be caused due to wear on the inner tube surface, bushings, rod surface and seals, etc.

2. When an external guide is used, connect the rod end and the load in such a way that there is no interference at any point within the stroke.

3. Do not scratch or gouge the sliding parts of the cylinder tube or piston rod, etc., by striking or grasping them with other objects.

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause malfunction. Also, scratches or gouges, etc., in the piston rod may lead to damaged seals and cause air leakage.

4. Prevent the seizure of rotating parts.

Prevent the seizure of rotating parts (pins, etc.) by applying grease.

5. Do not use until you can verify that equipment can operate properly.

Following mounting, maintenance or conversions, verify correct mounting by suitable function and leakage tests after compressed air and power are connected

6. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.

Keep the instruction manual where it can be referred to as needed.

Series CLQ
Auto Switch Precautions 2

Be sure to read before handling.

Mounting and Adjustment

⚠Warning

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/sX or more for reed switches and 1000m/sX or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

2. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

3. Mount switches using the proper tightening torque.

If a switch is tightened beyond the range of tightening torque, the mounting screws, mounting brackets or switch may be damaged.

On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position. (Refer to page 19 for switch mounting instructions and tightening torque.)

4. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting position shown in the catalog indicates the optimum position at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation may be unstable.

Wiring

⚠Warning

1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires can result from wiring patterns which repeatedly apply bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.

<2 wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

4. Do not wire with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

Wiring

⚠Warning

5. Do not allow short circuit of loads.

<Reed switches>

If the power is turned ON with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switches>

D-M9□(V), D-M9□W(V), and all models of PNP output type switches do not have built-in short circuit protection circuits.
Note that if a load is short circuited, the switch will be instantly damaged as in the case of reed switches.

∗Take special care to avoid reverse wiring of the brown [red] power supply line and the black [white] output line on 3 wire type switches.

6. Avoid incorrect wiring.

<Reed switches>

A 24VDC switch with indicator light has polarity. The brown [red] lead wire is (+), and the blue [black] lead wire is (–).

1) If connections are reversed, a switch will operate, however, the light emitting diode will not light up.

Also note that a current greater than that specified will damage a light emitting diode and it will no longer operate.

Applicable models: D-A73/A73H/A73C
D-A93/A93V

2) Note however, that in the case of 2 color indication auto switches (D-A79W), the switch will be in a normally ON condition if the wiring is reversed.

<Solid state switches>

1) If connections are reversed on a 2 wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will be in a normally ON state. However, it is still necessary to avoid reversed connections, since the switch could be damaged by a load short circuit in this condition.

∗2) If connections are reversed (power supply line + and power supply line –) on a 3 wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue [black] wire and the power supply line (–) is connected to the black [white] wire, the switch will be damaged.

∗ Lead wire colour changes

Lead wire colours of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided.
Special care should be taken regarding wire polarity during the time that the old colors still coexist with the new colors.

2 wire

	Old	New
Output (+)	Red	Brown
Output (–)	Black	Blue

3 wire

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black

Solid state with diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

Solid state with latch type diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Latch type diagnostic output	Yellow	Orange

Note) Lead wire colors inside [ ] are those prior to conformity with NECA standards.

Series CLQ
Auto Switch Precautions 3

Be sure to read before handling.

Operating Environment

⚠Warning

1. Never use in an atmosphere of explosive gases.

The construction of auto switches is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an area where a magnetic field is generated.

Auto switches can malfunction or magnets inside cylinders can become demagnetized. (Consult SMC regarding the availability of a magnetic field resistant auto switch.)

3. Do not use in an environment where the auto switch will be continually exposed to water.

Although switches satisfy IEC standard IP67 construction (JIS C 0920: watertight construction), avoid using switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.

4. Do not use in an environment with oil or chemicals.

Consult SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Consult SMC if switches are used where there are temperature cycles other than normal air temperature changes, as there may be adverse effects inside the switches.

6. Do not use in an environment where there is excessive impact shock.

<Reed switches>

When excessive impact (300m/sX or more) is applied to a reed switch during operation, the contact point will malfunction and generate or cut off a signal momentarily (1ms or less). Consult SMC regarding the need to use a solid state switch depending upon the environment.

7. Do not use in an area where surges are generated.

<Solid state switches>

When there are units (solenoid type lifter, high frequency induction furnace, motor, etc.) which generate a large amount of surge in the area around cylinders with solid state auto switches, this may cause deterioration or damage to the switches. Avoid sources of surge generation and crossed lines.

8. Avoid accumulation of iron waste or close contact with magnetic substances.

When a large amount of iron waste such as machining chips or spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with an auto switch cylinder, it may cause auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

Maintenance

⚠Warning

1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Securely tighten switch mounting screws.

If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.

2) Confirm that there is no damage to lead wires.

To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.

3) Confirm the lighting of the green light on the 2 colour indicator type switch.

Confirm that the green LED is on when stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

Other

⚠Warning

1. Consult SMC concerning water resistance, elasticity of lead wires, and usage at welding sites, etc.

Series CLQ
Specific Product Precautions 1

Be sure to read before handling.

Refer to pages 23 through 28 for safety instructions, actuator precautions and auto switch precautions.

Selection

⚠Warning

1. Do not use for intermediate cylinder stops.

This cylinder is designed for locking against inadvertent movement from a stationary condition. Do not perform intermediate stops while the cylinder is operating, as this will shorten its service life.

2. Select the correct locking direction, as this cylinder does not generate holding force opposite to the locking direction.

The extension lock does not generate holding force in the cylinder's retracting direction, and the retraction lock does not generate holding force in the cylinder's extending direction (free).

3. Even when locked, there may be stroke movement of about 1mm in the locking direction due to external forces such as the weight of the work piece.

Even when locked, if air pressure drops, stroke movement of about 1mm may be generated in the locking direction of the lock mechanism due to external forces such as the work piece weight.

4. When locked, do not apply impact loads, strong vibration or rotational force, etc.

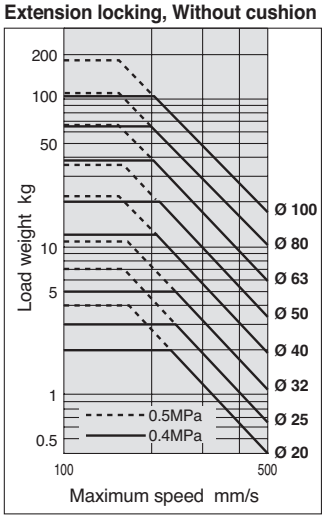
This will lead to lock mechanism damage and reduced service life, etc.

5. Operate so that load weight, maximum speed and eccentric distance are within the limiting ranges in the graphs below.

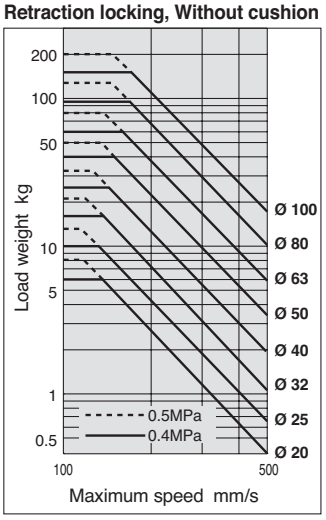
Operation beyond the limiting range will lead to cylinder damage and reduced service life, etc.

Allowable kinetic energy

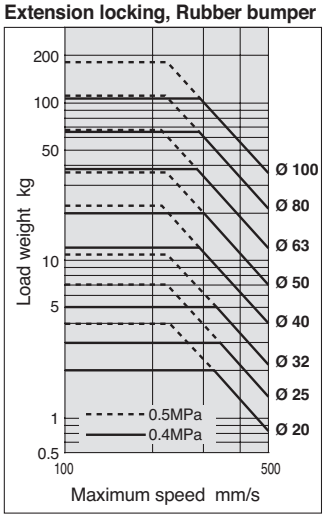
Extension locking, Without cushion



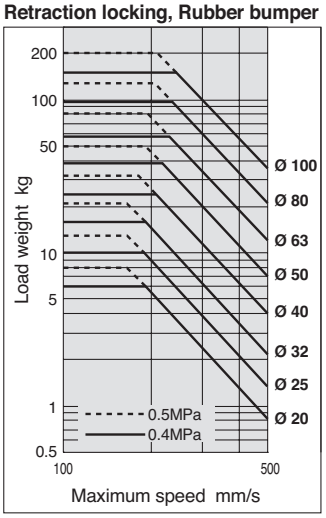
Retraction locking, Without cushion



Extension locking, Rubber bumper



Retraction locking, Rubber bumper

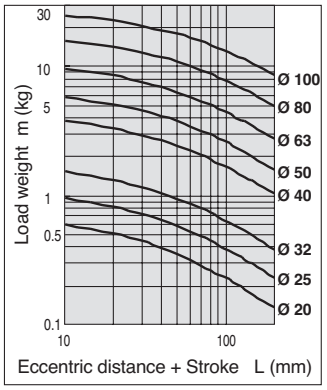


Selection

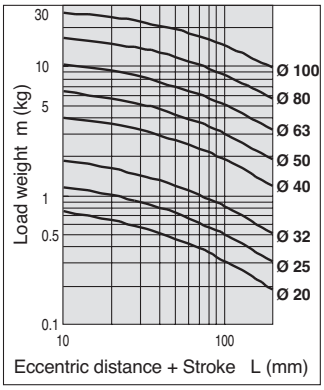
⚠Warning

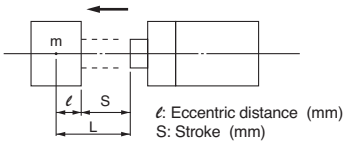
Allowable load weight

Horizontal (without switch)



Horizontal (with switch)





ℓ: Eccentric distance (mm)
S: Stroke (mm)

Pneumatic Circuits

⚠Warning

1. Do not use 3 position valves.

The lock may be released due to inflow of the unlocking pressure.

2. Install speed controllers for meter-out control.

Malfunction may occur if meter-in control is used.

3. Be careful of reverse exhaust pressure flow from a common exhaust type valve manifold.

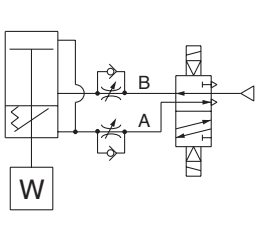
Since the lock may be released due to reverse exhaust pressure flow, use an individual exhaust type manifold or single type valve.

4. Branch off the compressed air piping for the lock unit between the cylinder and the speed controller.

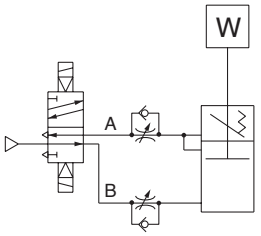
Use of an external branch may cause a reduction in service life.

5. Perform piping so that the side going from the piping junction to the lock unit is short.

If it is long, this may cause unlocking malfunction and reduce the lock's service life, etc.



F: Extension locking



B: Retraction locking

Series CLQ
Specific Product Precautions 2

Be sure to read before handling.

Refer to pages 23 through 28 for safety instructions, actuator precautions and auto switch precautions.

Mounting

⚠ Caution

1. Be sure to connect the load to the rod end with the cylinder in an unlocked condition.

If this is done when in a locked condition, it may cause damage to the lock mechanism.

Preparing for Operation

⚠ Warning

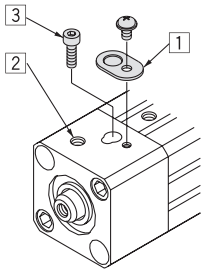
1. When starting operation from the locked position, be sure to restore air pressure to the B line in the pneumatic circuit.

It is very dangerous to apply pressure to the A line with the B line in an unpressurized state, because the cylinder will move suddenly when unlocked.

2. Sizes Ø 20 to Ø 32 are shipped in the unlocked condition maintained by the unlocking bolt. Be sure to remove the unlocking bolt following the procedures below before operation.

The locking mechanism will not be effective without the removal of the unlocking bolt.

Ø 20 to Ø 32 only



1) Confirm that there is no air pressure inside the cylinder, and remove dust cover 1.
2) Supply air pressure of 0.2MPa or more to unlocking port 2 shown in the drawing on the left.
3) Use a hexagon wrench (width across flats: 2.5) to remove unlocking bolt 3.

Since a holding function for the unlocked condition is not available for sizes Ø 40 through Ø 100, they can be used as shipped.

Manual Unlocking

⚠ Warning

1. Do not perform unlocking when an external force such as a load or spring force is being applied.

This is very dangerous because the cylinder will move suddenly. Take the following steps.

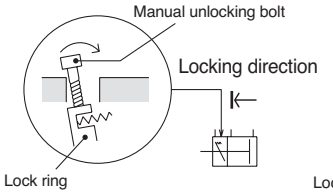
1) the lock after restoring the air pressure in the B line of the pneumatic circuit to operating pressure, and then reduce the pressure gradually.
2) In case air pressure cannot be used, release the lock after preventing cylinder movement with a lifting device such as a jack.

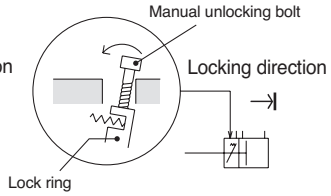
2. After confirming safety, operate the manual release following the steps shown below.

Carefully confirm that no one is inside the load movement range, etc., and that there is no danger even if the load moves suddenly.

Manual unlocking

Ø 20 to Ø 32





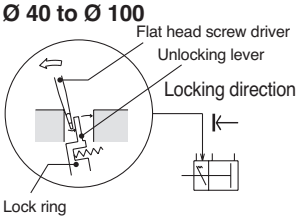
Extension locking

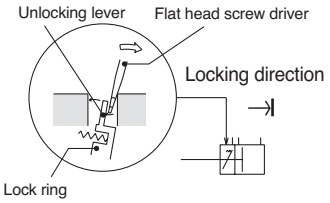
1) Remove the dust cover.
2) Screw a manual unlocking bolt (a conventional bolt of M3 x 0.5 x 15ℓ or more) into the lock ring threads as shown above, and lightly push the bolt in the direction of the arrow (head side) to unlock.

Retraction locking

1) Remove the dust cover.
2) Screw a manual unlocking bolt (a conventional bolt of M3 x 0.5 x 15ℓ or more) into the lock ring threads as shown above, and lightly push the bolt in the direction of the arrow (rod side) to unlock.

Ø 40 to Ø 100





Extension locking

1) Remove the dust cover.
2) Insert a flat head screw driver on the rod side of the manual unlocking lever as shown in the figure above, and lightly push the screw driver in the direction of the arrow (rod side) to unlock.

Retraction locking

1) Remove the dust cover.
2) Insert a flat head screw driver on the head side of the manual unlocking lever as shown in the figure above, and lightly push the screw driver in the direction of the arrow (head side) to unlock.

Maintenance

⚠ Caution

1. In order to maintain good performance, operate with clean unlubricated air.
If lubricated air, compressor oil or drainage, etc., enter the cylinder, there is a danger of sharply reducing the locking performance.

2. Do not apply grease to the piston rod.
There is a danger of sharply reducing the locking performance.

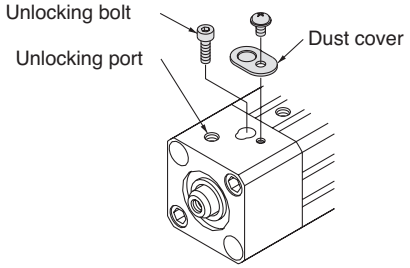
3. Never disassemble the lock unit.
It contains a heavy duty spring which is dangerous. There is also a danger of reducing the locking performance.

4. Never remove the pivot seal and disassemble the internal unit.
Sizes Ø 20 to Ø 32 have a silver seal (pivot seal) of Ø 12 applied on one side of the lock body (opposite side from the unlocking port). The seal is applied for dust prevention, but there is no functional problem even if the seal is removed. However, never disassemble the internal unit .

Holding the Unlocked Condition

⚠ Warning

1. Sizes Ø 20 to Ø 32 can hold the unlocked condition.
<Holding the unlocked condition>
1) Remove the dust cover.
2) Supply air pressure of 0.2MPa or more to the unlocking port, and set the lock ring to the perpendicular position.
3) Screw the unlocking bolt which is included (hexagon socket head cap screw/Ø 20, Ø 25: M3 x 5ℓ, Ø 32: M3 x 10ℓ) into the lock ring to hold the unlocked condition.



2. To use the locking mechanism again, be sure to remove the unlocking bolt.
The locking mechanism will not function with the unlocking bolt screwed-in. Remove the unlocking bolt according to the procedures described in the section "Preparing for Operation".

Adjustment

⚠ Warning

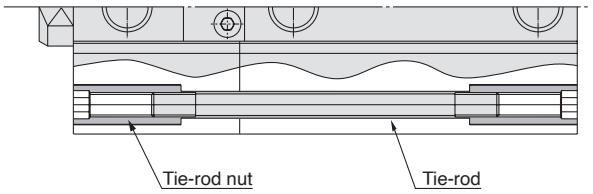
1. Use the hexagon wrenches shown below when replacing mounting brackets.

Bore size (mm)	Mounting bracket bolt width across flats (mm)	Tightening torque (N·m)
20, 25, 32, 40	4	2.8 to 5.1
50	5	9.0 to 12.0
63	6	11.4 to 22.4
80, 100	8	25.0 to 44.9

2. When replacing the mounting bracket, the tie-rod nut on the cylinder body will also loosen. Be sure to retighten it with the proper tightening torque.

After retightening the tie-rod nut at the proper tightening torque, install the mounting bracket.

Bore size (mm)	Mounting bracket bolt width across flats (mm)	Tightening torque (N·m)
20, 25, 32, 40	5	2.8 to 5.1
50	6	9.0 to 12.0
63	8	11.4 to 22.4
80, 100	10	25.0 to 44.9



⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) [1], and other safety regulations.

⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first. [2] Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

SMC Corporation (Europe)

Austria	+43 (0)2262622800	www.smc.at	office.at@smc.com
Belgium	+32 (0)33551464	www.smc.be	info@smc.be
Bulgaria	+359 (0)2807670	www.smc.bg	sales.bg@smc.com
Croatia	+385 (0)13707288	www.smc.hr	sales.hr@smc.com
Czech Republic	+420 541424611	www.smc.cz	office.at@smc.com
Denmark	+45 70252900	www.smcdk.com	smc.dk@smc.com
Estonia	+372 651 0370	www.smcee.ee	info.ee@smc.com
Finland	+358 207513513	www.smc.fi	smc.fi@smc.com
France	+33 (0)164761000	www.smc-france.fr	supportclient.fr@smc.com
Germany	+49 (0)61034020	www.smc.de	info.de@smc.com
Greece	+30 210 2717265	www.smchellas.gr	sales@smchellas.gr
Hungary	+36 23513000	www.smc.hu	office.hu@smc.com
Ireland	+353 (0)14039000	www.smcautomation.ie	technical.ie@smc.com
Italy	+39 03990691	www.smcitalia.it	mailbox.it@smc.com
Latvia	+371 67817700	www.smc.lv	info.lv@smc.com
Lithuania	+370 5 2308118	www.smclt.lt	info.lt@smc.com
Netherlands	+31 (0)205318888	www.smc.nl	info@smc.nl
Norway	+47 67129020	www.smc-norge.no	post.no@smc.com
Poland	+48 22 344 40 00	www.smc.pl	office.pl@smc.com
Portugal	+351 214724500	www.smc.eu	apoiocliente.pt@smc.com
Romania	+40 213205111	www.smcromania.ro	office.ro@smc.com
Russia	+7 (812)3036600	www.smc.eu	sales@smcru.com
Slovakia	+421 (0)413213212	www.smc.sk	sales.sk@smc.com
Slovenia	+386 (0)73885412	www.smc.si	office.si@smc.com
Spain	+34 945184100	www.smc.eu	post.es@smc.com
Sweden	+46 (0)86031240	www.smc.nu	order.se@smc.com
Switzerland	+41 (0)523963131	www.smc.ch	helpcenter.ch@smc.com
Turkey	+90 212 489 0 440	www.smcturkey.com.tr	satis@smcturkey.com.tr
UK	+44 (0)845 121 5122	www.smc.uk	sales.gb@smc.com
South Africa	+27 10 900 1233	www.smcza.co.za	Sales.za@smc.com

Printing DO 00 Printed in Spain