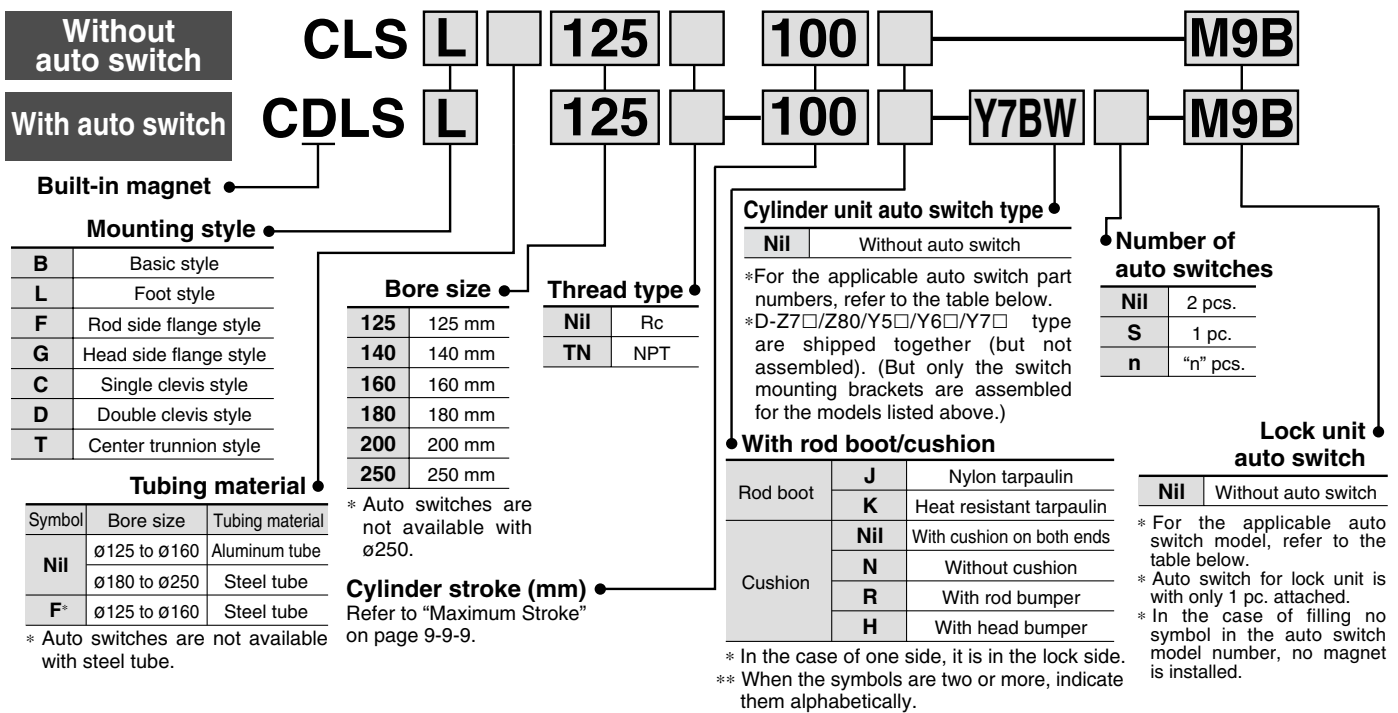




Cylinder with Lock Double Acting, Single Rod **Series CLS** ø125, ø140, ø160, ø180, ø200, ø250

How to Order



Cylinder Unit/Applicable Auto Switch/Refer to page 9-15-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)*			Pre-wire connector	Applicable load			
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)		IC circuit	Other		
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	Z76	—	●	●	—	—	IC circuit	—	
						100 V	—	Z73	—	●	●	●	—	Relay, PLC		
						100 V, 200 V	—	A54	—	●	●	●	—			
						12 V	—	A33	—	—	—	—	—	—	Relay, PLC	
							100 V, 200 V	—	A34	—	—	—	—	—		
								—	A44	—	—	—	—	—		—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	—	●	●	○	○	IC circuit	Relay, PLC	
						—	100 V, 200 V	Y7P	—	●	●	○	○			
						—	—	J51	—	●	●	○	○	—		
						12 V	—	Y59B	—	●	●	○	○	—		
						5 V, 12 V	—	G39	—	—	—	—	—	—		IC circuit
							—	K39	—	—	—	—	—	—		—
				24 V	5 V, 12 V	—	Y7NW	—	●	●	○	○	Relay, PLC			
					—	—	Y7PW	—	●	●	○	○				
					—	—	Y7BW	—	●	●	○	○				
				12 V	—	—	Y7BA	—	—	—	●	○	○	—		
					—	—	F59F	—	●	●	○	○	IC circuit			

Built-in Magnet Cylinder Model

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil".

* Lead wire length symbols:
 0.5 m Nil (Example) A54
 3 m L (Example) A54L
 5 m Z (Example) A54Z

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

• There are applicable auto switches other than listed at left. For details, refer to page 9-9-21.

• For details about auto switches with pre-wire connector, refer to page 9-15-66.

Lock Unit/Applicable Auto Switch

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m)*			Applicable load		
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)			
Reed switch	—	Grommet	No	2-wire	24 V	5 V, 12 V	100 V or less	A90	●	●	—	IC circuit	Relay, PLC
					—	12 V	100 V	A93	●	●	—	—	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	○	IC circuit	Relay, PLC
				3-wire (PNP)			—	M9P	●	●	○	—	
				2-wire			—	M9B	●	●	○	—	

* Lead wire length symbols:
 0.5 m Nil (Example) A93
 3 m L (Example) A93L
 5 m Z (Example) M9NZ

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

* PLC: Abbreviation of Programmable Logic Controller

** For related things about auto switches, refer to page 9-9-23.



Cylinder with Lock Double Acting, Single Rod Series CLS

Model

Series	Type	Action	Bore size (mm)	Lock operation
CLS□	Non-lube	Double acting	125, 140, 160, 180, 200, 250	Spring locking
CDLS□			125, 140, 160, 180, 200	

Cylinder Specifications

Type	Non-lube
Fluid	Air
Proof pressure	1.46 MPa 1.05 MPa *
Max. operating pressure	0.97 MPa 0.7 MPa *
Min. operating pressure	0.08 MPa
Piston speed	50 to 500 mm/s **
Cushion	Yes
Ambient and fluid temperature	Without auto switch: 0 to 70°C (No freezing) With auto switch: 0 to 60°C (No freezing)
Stroke length tolerance	Up to 250: $^{+1.0}_0$, 251 to 1000: $^{+1.4}_0$, 1001 to 1500: $^{+1.8}_0$ 1501 to 2000: $^{+2.2}_0$, 2001 to 2400: $^{+2.6}_0$,
Mounting	Basic style, Foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style

* For $\phi 180$ and $\phi 200$ with auto switches.

** There are load limitations depending on the piston speed when locked, the mounting method, and the operating pressure.

Lock Specifications

Locking action	Spring locking (Exhaust lock)
Unlocking pressure	0.25 MPa or more
Lock starting pressure	0.20 MPa or less
Max. operating pressure	1.0 MPa
Locking direction	Both directions

Maximum Stroke (): Denotes for steel tube.

Bore size (mm)	Maximum stroke	
	Basic style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style	Foot style, Rod side flange style
125, 140	Up to 1000 (Up to 1000)	Up to 1400 (Up to 1600)
160	Up to 1200 (Up to 1200)	Up to 1400 (Up to 1600)
180	Up to 1200 (Up to 1200)	Up to 1500 (Up to 2000)
200	Up to 998 (Up to 1200)	Up to 998 (Up to 2000)
250	— (Up to 1200)	— (Up to 2400)

* Auto switches are not available with steel tube.

Class 2 Pressure Vessel

Class 2 Pressure Vessel will be required for strokes exceeding those shown below.

Bore size (mm)	Cylinder stroke (mm)
180	1569
200	998
250	813



Made to Order Specifications (For details, refer to page 9-16-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port location
-XC14	Change of trunnion bracket mounting position

Stopping Accuracy

Lock type	Piston speed (mm/s)		
	100	300	500
Spring locking	± 0.5	± 1.0	± 2.0

Condition:

Lateral, Supply pressure P = 0.5 MPa

Load weight Upper limit of allowed value

Solenoid valve for locking Mounted directly to unlocking port

Maximum value of stopping position dispersion from 100 measurements

Holding Force of Spring Locking (Maximum static load)

Bore size (mm)	125	140	160	180	200	250
Holding force (KN)	8.4	10.5	13.8	17.4	21.5	33.6

* Be sure to make cylinder selections in accordance with the method given on page 9-9-6.

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

Series CLS

Mounting Bracket Part No.

Bore size (mm)	125	140	160	180	200	250
Foot ⁽¹⁾	CS1-L12	CS1-L14	CS1-L16	CS1-L18	CS1-L20	CS1-L25
Flange ⁽²⁾	CS1-F12	CS1-F14	CS1-F16	CS1-F18	CS1-F20	CS1-F25
Single clevis	CS1-C12	CS1-C14	CS1-C16	CS1-C18	CS1-C20	CS1-C25
Double clevis ⁽³⁾	CS1-D12	CS1-D14	CS1-D16	CS1-D18	CS1-D20	CS1-D25

Note 1) When ordering foot bracket, order 2 pieces per cylinder.
 Note 2) ø125 to ø250 rod side flange styles use Series CS1 long stroke flanges.
 Note 3) Clevis pin, plain washer, and cotter pin are shipped together with double clevis style.

Accessory Bracket

Mounting bracket		Basic style	Foot style	Rod side flange style	Head side flange style	Single clevis style	Double clevis style	Center trunnion style
Standard equipment	Clevis pin	—	—	—	—	—	●	—
Option	Rod end nut	●	●	●	●	●	●	●
	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (With pin)	●	●	●	●	●	●	●
	With rod boot	●	●	●	●	●	●	●

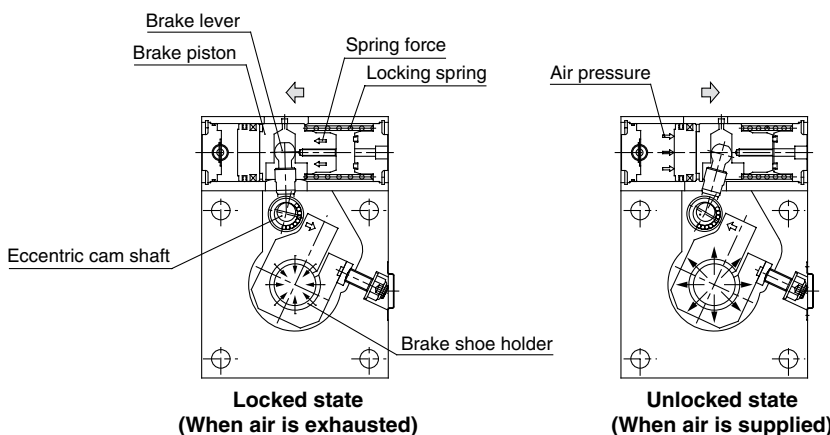
* For accessory models and its dimensions, refer to page 9-9-19.

Weight() denotes the values for iron tube.

Bore size (mm)		125	140	160	180	200	250
Lock unit weight		9.40	11.37	16.93	26.20	36.4	61.70
Basic weight	Basic style	23.49 (24.96)	28.30 (30.11)	40.87 (43.08)	57.30 (63.91)	75.46 (82.01)	— (138.94)
	Foot style	25.12 (26.59)	30.82 (32.63)	43.67 (45.88)	61.50 (68.11)	80.34 (86.89)	— (148.44)
	Flange style	26.17 (27.64)	33.30 (35.11)	47.26 (49.47)	67.13 (73.74)	87.37 (93.92)	— (160.78)
	Single clevis style	26.56 (28.03)	32.59 (34.40)	46.36 (48.57)	65.69 (72.30)	85.36 (91.91)	— (157.33)
	Double clevis style (Including clevis pin and cotter pin)	27.02 (28.49)	33.34 (35.15)	47.21 (49.42)	67.37 (73.98)	87.39 (93.94)	— (160.52)
	Trunnion style	27.62 (29.09)	34.03 (35.84)	48.27 (50.48)	68.46 (75.07)	89.45 (96.00)	— (166.78)
	Additional weight per each 100 mm of stroke	1.77 (2.66)	1.96 (3.01)	2.39 (3.58)	2.85 (4.95)	3.42 (5.75)	— (9.08)
Accessory bracket	Single knuckle joint	0.91	1.16	1.56	3.07	2.90	5.38
	Double knuckle joint (With pin)	1.37	1.81	2.48	4.74	4.59	9.22
	Rod end nut	0.16	0.16	0.23	0.33	0.56	1.01

Calculation: (Example) CLSL140-100 Basic weight.....30.82 (Foot style, ø140)
 Additional weight1.96/100 stroke
 Cylinder stroke100 stroke
 $30.82 + 1.96 \times 100/100 = 32.78$ kg

Construction Principle



Spring locking (Exhaust lock)

The brake piston actuated by the force of the spring turns the eccentric cam shaft via the brake lever. This turning force distorts the shoe holder due to the wedge effect of the cam, acting on the brake shoe and locking the piston rod by tightening on it with a large force.

Unlocking occurs when air pressure is supplied to the unlocking port, causing the brake piston to counteract the force of the spring and push the brake lever back. This removes the force which is distorting the shoe holder and unlocks the piston rod.

Rod Boot Material

Symbol	Rod boot material	Max. ambient temperature
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C *

* Maximum ambient temperature for the rod boot itself.

Cylinder Unit Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)				
	125	140	160	180	200
D-A5□/A6□/A59W D-F5□/J5□ D-F5□W/J59W/F5BAL D-F59F/F5NTL	BT-12	BT-12	BT-16	BT-18A	BT-20
D-A3□/A44/G39/K39	BS1-125	BS1-140	BS1-160	BS1-180	BS1-200
D-Z7□/Z80 D-Y5□/Y6□/Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL	BS4-125	BS4-125	BS4-160	BS4-180	BS4-200

[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

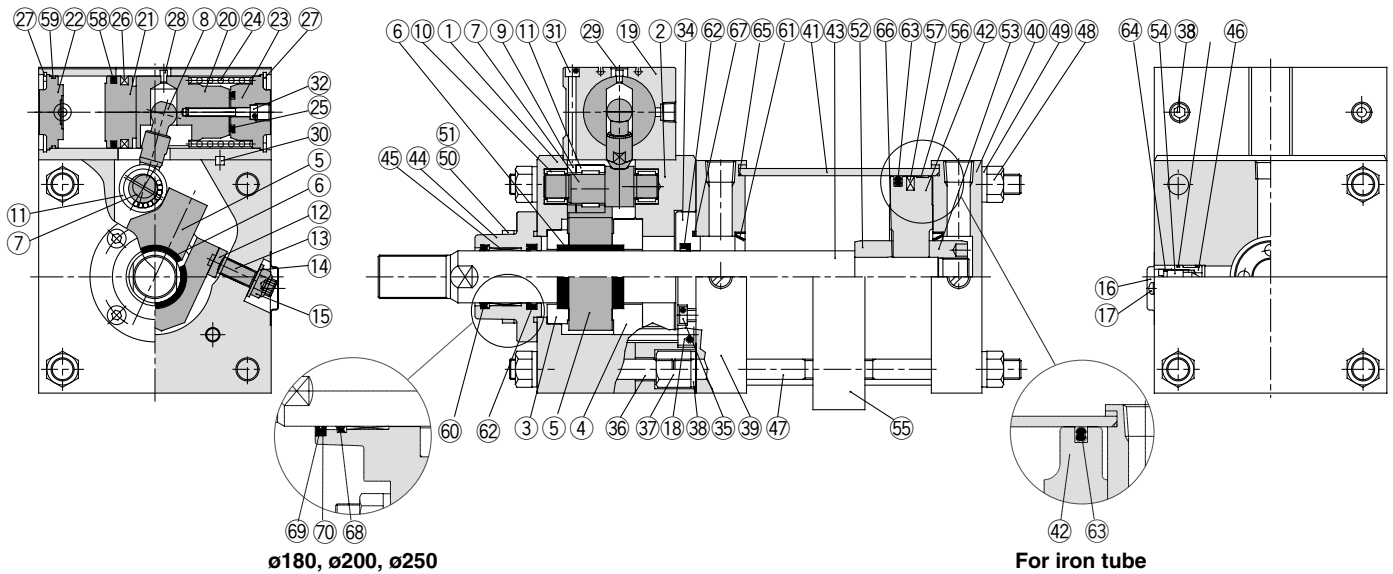
(Please order the mounting band separately, since it is not included.)

BBA1: For use with D-A5/A6/F5/J5

• "D-F5BAL" switch is set on the cylinder with the stainless steel screws above when shipped. When the switches are shipped as individual parts, the BBA1 is included.

Cylinder with Lock Double Acting, Single Rod Series **CLS**

Construction



Component Parts

No.	Description	Material	Note
①	Cover A	Aluminum alloy	Black hard anodized (ø125, ø140, ø160) Hard anodized and painted (ø180, ø200, ø250)
②	Cover B	Aluminum alloy	Black hard anodized (ø125, ø140, ø160) Hard anodized and painted (ø180, ø200, ø250)
③	Thrust washer A	Carbon steel	Electroless nickel plated (ø125, ø140, ø160) Specially treated (ø180, ø200, ø250)
④	Thrust washer B	Carbon steel	Electroless nickel plated (ø125, ø140, ø160)
⑤	Brake shoe holder A	Chromium molybdenum steel	Specially treated
⑥	Brake shoe	Special friction material	
⑦	Eccentric cam shaft	Special steel	
⑧	Brake lever	Chromium molybdenum steel	Zinc chromated
⑨	Washer	Carbon steel	Zinc chromated
⑩	Needle bearing	—	
⑪	Needle bearing	—	
⑫	Stopper	Special steel	Electroless nickel plated
⑬	Adjusting screw	Chromium molybdenum steel	Zinc chromated
⑭	Conical spring washer	Spring steel	Zinc chromated
⑮	U nut	Carbon steel	Zinc chromated
⑯	Cover	Steel plate	Black zinc chromated
⑰	Cover holding screw	Carbon steel	
⑱	Cover holding bolt	Chromium molybdenum steel	Nickel plated
⑲	Brake tube	Aluminum alloy	Clear hard anodized
⑳	Brake piston A	Carbon steel	Tuffride
㉑	Brake piston B	Aluminum alloy	Chromated
㉒	Bottom plate	Aluminum alloy	Black anodized
㉓	Spring collar	Aluminum alloy	Black anodized
㉔	Brake spring	Steel wire	Zinc chromated
㉕	Bumper B	Polyurethane rubber	
㉖	Magnet	—	(With switch for lock unit)
㉗	Snap ring	Carbon tool steel	Phosphate coated
㉘	Marker	Resin	White
㉙	Trim plate	Resin	
㉚	Key	Carbon steel	
㉛	Brake tube holding bolt	Chromium molybdenum steel	Nickel plated
㉜	Manual release bolt	Chromium molybdenum steel	Nickel plated
㉝	Plug with breathing hole	—	Black zinc chromated
㉞	Retaining plate B	Bronze casted	
㉟	Holding bolt for retaining plate	Chromium molybdenum steel	Nickel plated
㊱	Unit holding tie-rod	Carbon steel	Chromated
㊲	Wing nut	Carbon steel	Nickel plated
㊳	Conical spring washer	Spring steel	Nickel plated
㊴	Rod cover	Rolled steel plate	Black painted
㊵	Head cover	Rolled steel plate	Black painted
㊶	Cylinder tube	Aluminum alloy	Hard anodized (ø125 to ø200)
		Carbon steel tube	Hard chrome plated (ø125 to ø250)

No.	Description	Material	Note
㊷	Piston	Aluminum alloy casted	In the case of aluminum tube
		Cast iron	In the case of iron tube
㊸	Piston rod	Carbon steel	Hard chrome plated
㊹	Retainer plate	Cast iron	Black painted (ø125, ø140, ø160)
㊺	Bushing	Lead-bronze casted	
㊻	Valve guide	Brass	
㊼	Tie-rod	Carbon steel	Chromated
㊽	Tie-rod nut	Rolled steel plate	Black zinc chromated
㊾	Spring washer	Steel wire	Black zinc chromated
㊿	Retainer plate bolt	Chromium molybdenum steel	Black zinc chromated
1	Spring washer	Steel wire	Black zinc chromated
2	Cushion ring A	Rolled steel	Zinc chromated
3	Cushion ring B	Rolled steel	Zinc chromated
4	Cushion valve	Rolled steel	Electroless nickel plated
5	Tie-rod reinforcement ring	Rolled steel	Black painted (Long stroke)
6	Wear ring	Resin	In the case of aluminum tube
7	Magnet	—	For built-in magnet type
8	Piston seal	NBR	
9	Tube gasket	NBR	
10	Wiper ring	NBR	
11	Cushion seal	NBR	
12	Rod seal	NBR	
13	Piston seal	NBR	
14	Valve seal	NBR	
15	Tube gasket	NBR	
16	Piston gasket	NBR	
17	Retainer plate gasket	NBR	
18	Guide gasket	NBR	
19	Coil scraper	Phosphor bronze	(ø180, ø200, ø250)
20	Coil scraper holder	Aluminum alloy	Black anodized (ø180, ø200, ø250)

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
125	CLS125-PS	Set of above nos. ⑥0, ⑥2, ⑥3, ⑥4, ⑥5, ⑥7
140	CLS140-PS	
160	CLS160-PS	
180	CLS180-PS	
200	CLS200-PS	
250	CLS250-PS	

* Since the lock section for Series CLS is normally replaced as a unit, kits are for the cylinder section only.

** Seal kit includes ⑥0, ⑥2, ⑥3, ⑥4, ⑥5, ⑥7. Order the seal kit, based on each bore size.

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

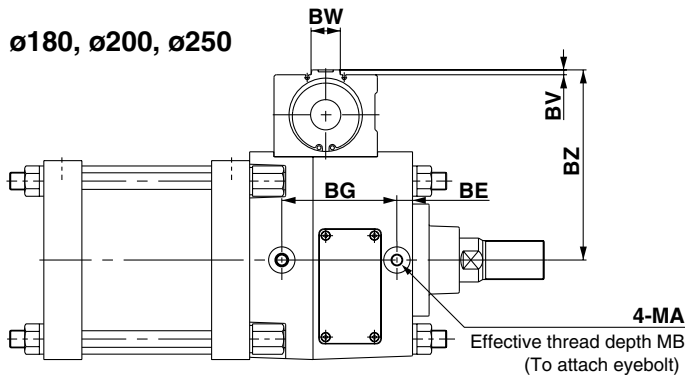
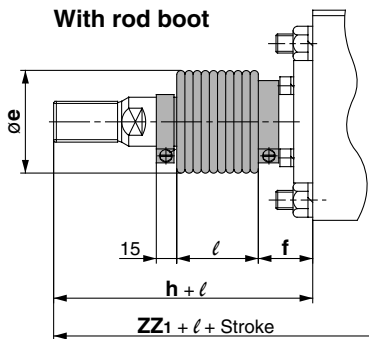
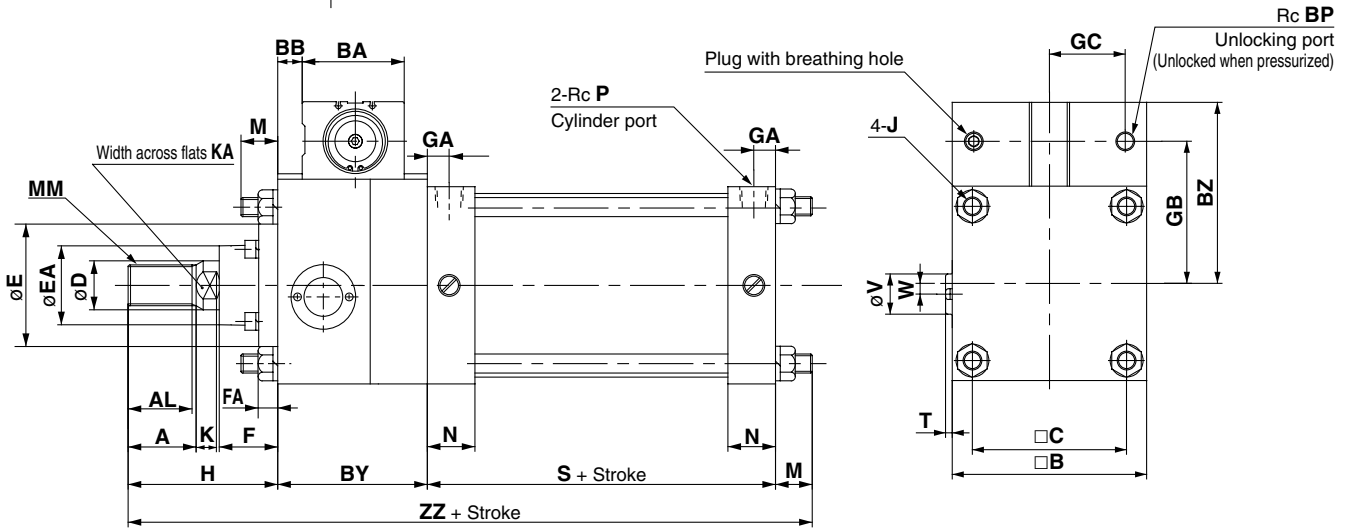
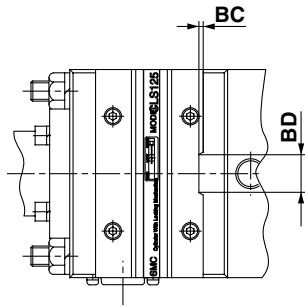
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Data

Series CLS

Dimensions

Basic style (B): CLSB



Bore size (mm)	Stroke range (mm)	A	AL	B	BA	BB	BC	BD	BE	BG	BY	BZ	BV	BW	BP	C	D	E	EA	F	FA	GA	GB	GC	H	J	K	KA	M	MM	MA	MB	N
125	Up to 1000	50	47	145	75	18	—	—	—	—	110	136	—	—	1/4	115	36	90	59	43	14	16	107	58	110	M14 x 1.5	15	31	27	M30 x 1.5	—	—	35
140	Up to 1000	50	47	161	78	18	3	30	—	—	110	146	—	—	1/4	128	36	90	59	43	14	16	114	64	110	M14 x 1.5	15	31	27	M30 x 1.5	—	—	35
160	Up to 1200	56	53	182	95	23	5	46	—	—	132	169	—	—	1/4	144	40	90	59	43	14	18.5	130	74	120	M16 x 1.5	17	36	30.5	M36 x 1.5	—	—	39
180	Up to 1200	63	60	204	106	36	—	—	16	118	167	195	5	30	3/8	162	45	115	70	48	17	18.5	149	86	135	M18 x 1.5	20	41	35	M40 x 1.5	M12 x 1.75	25	39
200	Up to 1200	63	60	226	124	40.5	—	—	21	131	187	216	5.5	34	3/8	182	50	115	74	48	17	18.5	165	97	135	M20 x 1.5	20	46	35	M45 x 1.5	M16 x 2	31	39
250	Up to 1200	71	67	277	152	58	—	—	35	155	237	261.5	6	42	1/2	225	60	140	86	60	20	23	200	117	160	M24 x 1.5	25	56	41.5	M56 x 2	M20 x 2.5	41	49

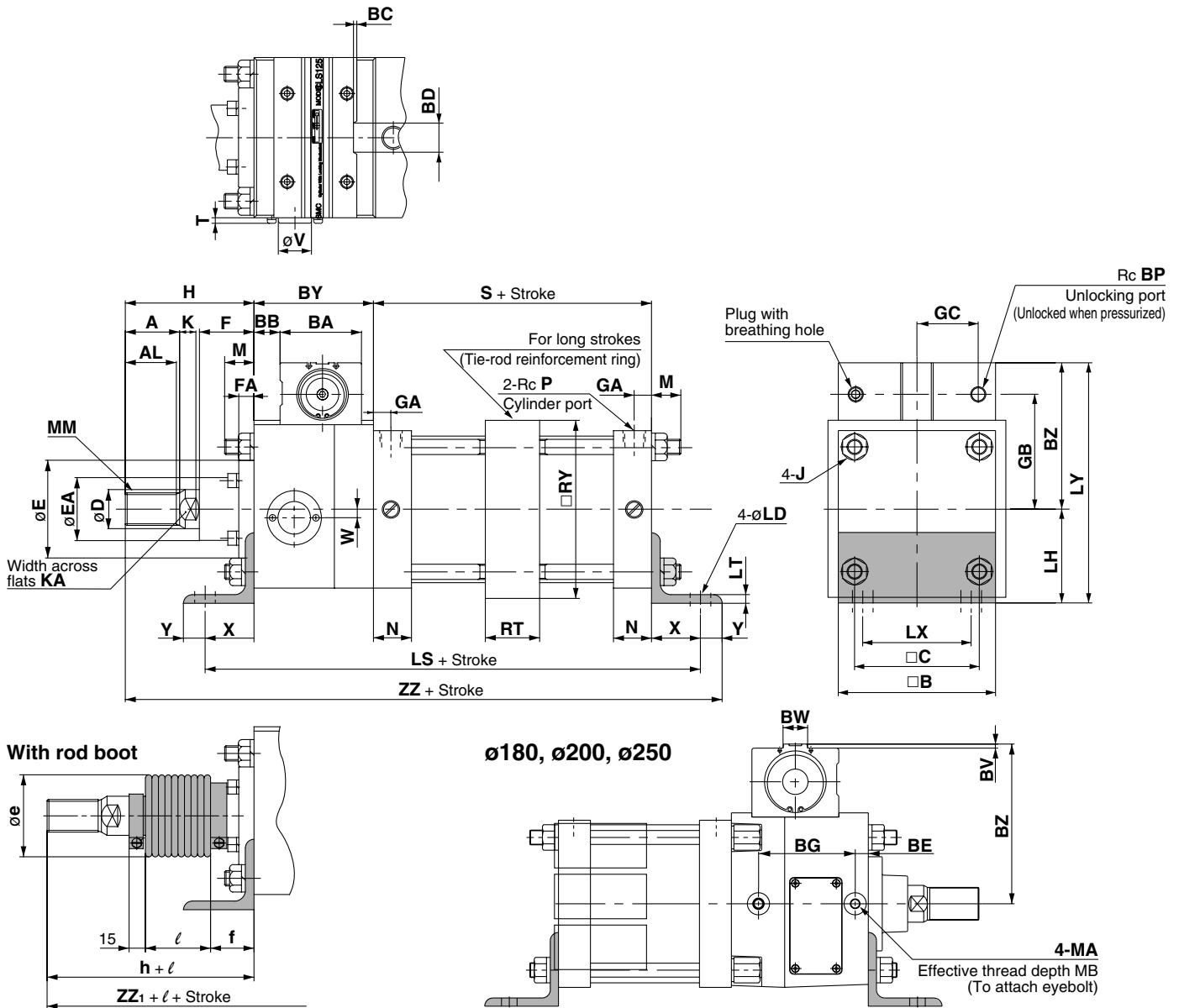
Bore size (mm)	P	S	T	V	W	ZZ
125	1/2	98	5	30	—	345
140	1/2	98	5	30	8	345
160	3/4	106	5	30	9	388.5
180	3/4	111	—	—	—	448
200	3/4	111	—	—	—	468
250	1	141	—	—	—	579.5

With Rod Boot						
Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ ₁
125	30 to 1000	75	40	133	0.2 stroke	368
140	30 to 1000	75	40	133	0.2 stroke	368
160	30 to 1200	75	40	141	0.2 stroke	409.5
180	30 to 1200	85	45	153	0.2 stroke	466
200	30 to 1200	90	45	153	0.2 stroke	486
250	30 to 1200	105	55	176	0.17 stroke	595.5

With Auto Switch				
Bore size (mm)	Stroke range (mm)	S	Without rod boot	
			ZZ	ZZ ₁
125	Up to 1000	98	345	368
140	Up to 1000	98	345	368
160	Up to 1200	106	388.5	409.5
180	Up to 1200	115	452	470
200	Up to 998	120	477	495

Cylinder with Lock Double Acting, Single Rod Series **CLS**

Axial foot style (L): CLSL



- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS**
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Bore size (mm)	Stroke range (mm)	Long stroke range (mm)	A	AL	B	BAB	BB	BC	BD	BE	BG	BY	BZ	BV	BW	BP	C	D	E	EA	F	FAG	AG	BG	GC	H	J	K	KAL	LD	LH	LS	LT	LX	LY	M
125	Up to 1400	1401 to 1600	50	47	145	75	18	—	—	—	110	136	—	—	1/4	115	36	90	59	43	14	16	107	58	110	M14 x 1.5	15	31	19	85	298	8	100	221	27	
140	Up to 1400	1401 to 1600	50	47	161	78	18	3	30	—	110	146	—	—	1/4	128	36	90	59	43	14	16	114	64	110	M14 x 1.5	15	31	19	100	298	9	112	246	27	
160	Up to 1400	1401 to 1600	56	53	182	95	23	5	46	—	132	169	—	—	1/4	144	40	90	59	43	14	18.5	130	74	120	M16 x 1.5	17	36	19	106	338	9	118	275	30.5	
180	Up to 1800	1801 to 2000	63	60	204	106	36	—	—	16	118	167	195	5	30	3/8	162	45	115	70	48	17	18.5	149	86	135	M18 x 1.5	20	41	24	125	398	10	132	320	35
200	Up to 1800	1801 to 2000	63	60	226	124	40.5	—	—	21	131	187	216	5.5	34	3/8	182	50	115	74	48	17	18.5	165	97	135	M20 x 1.5	20	46	24	132	418	10	150	348	35
250	Up to 2000	2001 to 2400	71	67	277	152	58	—	—	35	155	237	261.5	6	42	1/2	225	60	140	86	60	20	23	200	117	160	M24 x 1.5	25	56	29	160	538	12	180	421.5	41.5

Bore size (mm)	MM	MA	MB	N	P	R	TR	RY	S	T	V	W	X	Y	ZZ
125	M30 x 1.5	—	—	35	1/2	36	164	98	5	30	—	45	20	383	
140	M30 x 1.5	—	—	35	1/2	36	184	98	5	30	8	45	30	393	
160	M36 x 1.5	—	—	39	3/4	45	204	106	5	30	9	50	25	433	
180	M40 x 1.5	M12 x 1.75	25	39	3/4	45	228	111	—	—	—	60	30	503	
200	M45 x 1.5	M16 x 2	31	39	3/4	45	257	111	—	—	—	60	30	523	
250	M56 x 2	M20 x 2.5	41	49	1	55	325	141	—	—	—	80	40	658	

With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ ₁
125	30 to 1400	75	40	133	0.2 stroke	406
140	30 to 1400	75	40	133	0.2 stroke	416
160	30 to 1400	75	40	141	0.2 stroke	454
180	30 to 1800	85	45	153	0.2 stroke	521
200	30 to 1800	90	45	153	0.2 stroke	541
250	30 to 2000	105	55	176	0.17 stroke	674

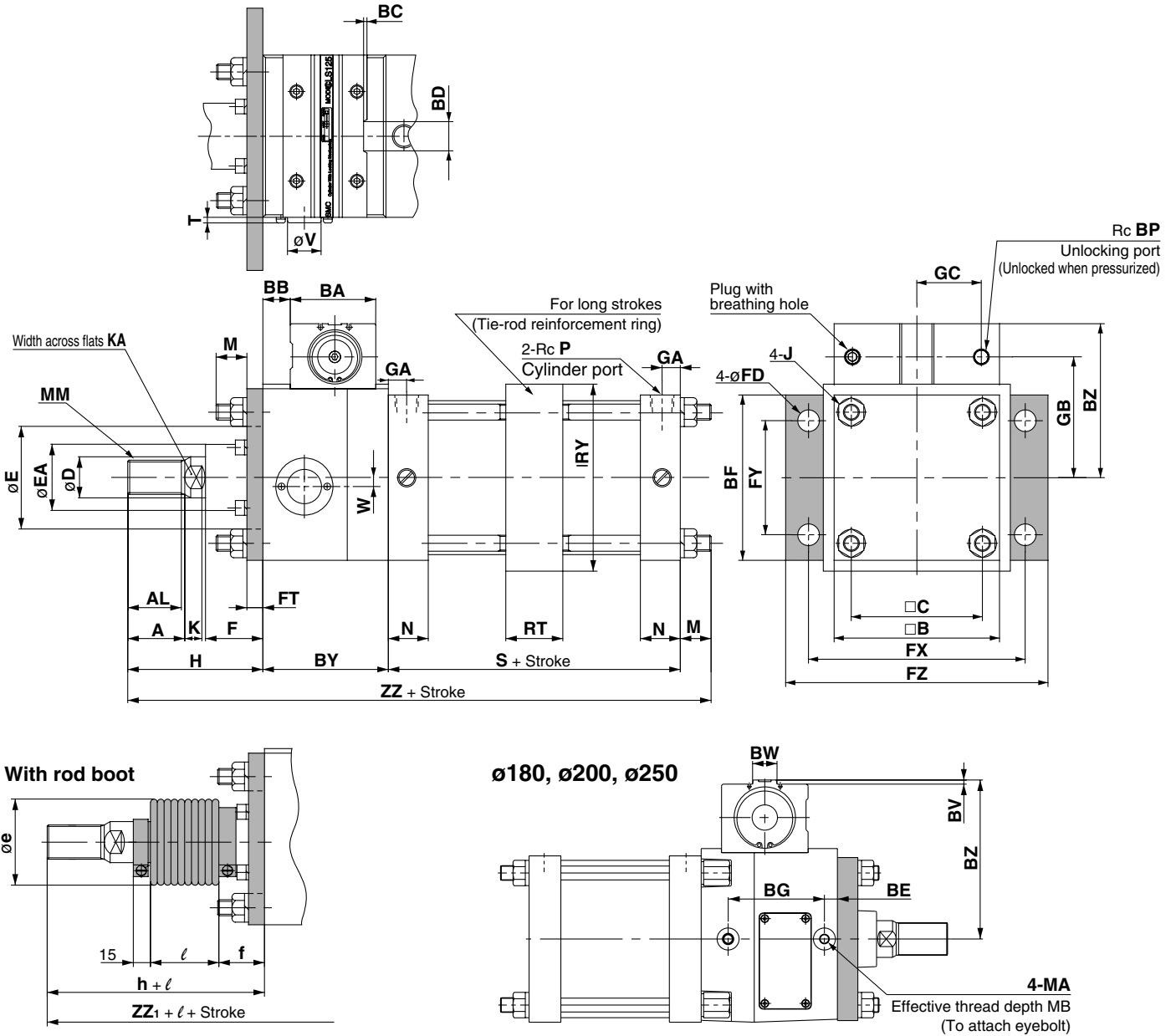
With Auto Switch

Bore size (mm)	Stroke range (mm)	S	LS	Without rod boot ZZ	With rod boot ZZ ₁
125	Up to 1400	98	298	383	406
140	Up to 1400	98	298	393	416
160	Up to 1400	106	338	433	454
180	Up to 1500	115	402	507	525
200	Up to 998	120	427	532	550

Series CLS

Dimensions

Rod side flange style (F): CLSF



Bore size (mm)	Stroke range (mm)	Long stroke range (mm)	A	AL	B	BAB	BB	BC	BD	BE	BG	BF	BY	BZ	BV	BW	BP	C	D	E	EA	F	FD	FT	FX	FY	FZ	G	GA	GB	GC	H	J	K	KA	M
125	Up to 1400	1401 to 1600	50	47	145	75	18	—	—	—	—	145	110	136	—	—	1/4	115	36	90	59	43	19	14	190	100	230	16	107	58	110	M14 x 1.5	15	31	19	
140	Up to 1400	1401 to 1600	50	47	161	78	18	3	30	—	—	160	110	146	—	—	1/4	128	36	90	59	43	19	20	212	112	255	16	114	64	110	M14 x 1.5	15	31	19	
160	Up to 1400	1401 to 1600	56	53	182	95	23	5	46	—	—	180	132	169	—	—	1/4	144	40	90	59	43	19	20	236	118	275	18.5	130	74	120	M16 x 1.5	17	36	22	
180	Up to 1800	1801 to 2000	63	60	204	106	36	—	—	16	118	200	167	195	5	30	3/8	162	45	115	70	48	24	25	265	132	320	18.5	149	86	135	M18 x 1.5	20	41	26	
200	Up to 1800	1801 to 2000	63	60	226	124	40.5	—	—	21	131	225	187	216	5.5	34	3/8	182	50	115	74	48	24	25	280	150	335	18.5	165	97	135	M20 x 1.5	20	46	26	
250	Up to 2000	2001 to 2400	71	67	277	152	58	—	—	35	155	275	237	261.5	6	42	1/2	225	60	140	86	60	29	30	355	180	420	23	200	117	160	M24 x 1.5	25	56	30	

Bore size (mm)	MM	MA	MB	N	P	R	RY	S	T	V	W	ZZ
125	M30 x 1.5	—	—	35	1/2	36	164	98	5	30	—	337
140	M30 x 1.5	—	—	35	1/2	36	184	98	5	30	8	337
160	M36 x 1.5	—	—	39	3/4	45	204	106	5	30	9	380
180	M40 x 1.5	M12 x 1.75	25	39	3/4	45	228	111	—	—	—	439
200	M45 x 1.5	M16 x 2	31	39	3/4	45	257	111	—	—	—	459
250	M56 x 2	M20 x 2.5	41	49	1	55	325	141	—	—	—	568

With Rod Boot

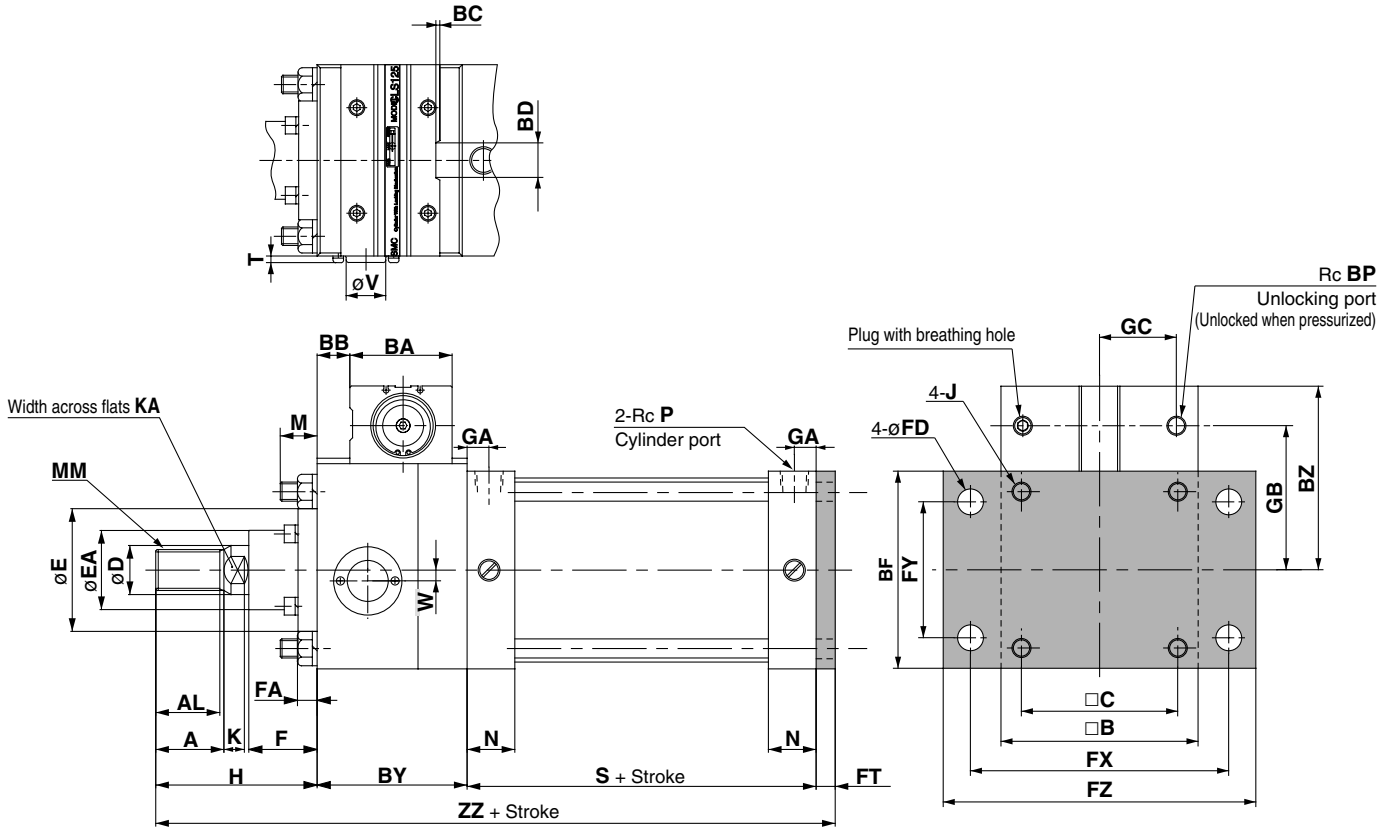
Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ ₁
125	30 to 1400	75	40	133	0.2 stroke	360
140	30 to 1400	75	40	133	0.2 stroke	360
160	30 to 1400	75	40	141	0.2 stroke	401
180	30 to 1800	85	45	153	0.2 stroke	457
200	30 to 1800	90	45	153	0.2 stroke	477
250	30 to 2000	105	55	176	0.17 stroke	584

With Auto Switch

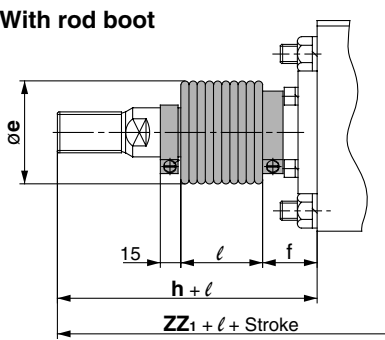
Bore size (mm)	Stroke range (mm)	S	Without rod boot	With rod boot
			ZZ	ZZ ₁
125	Up to 1400	98	337	360
140	Up to 1400	98	337	360
160	Up to 1400	106	380	401
180	Up to 1500	115	443	461
200	Up to 998	120	468	486

Cylinder with Lock Double Acting, Single Rod **Series CLS**

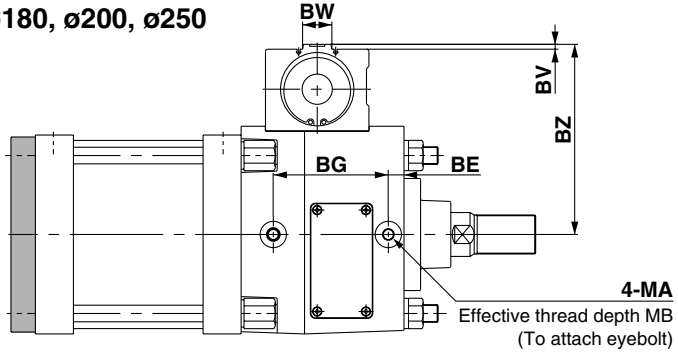
Head side flange style (G): CLSG



With rod boot



ø180, ø200, ø250



Bore size (mm)	Stroke range (mm)	A	AL	B	BA	BB	BC	BD	BE	BG	BF	BY	BZ	BV	BW	BP	C	D	E	EA	F	FA	FD	FT	FX	FY	FZ	GA	GB	GC	H	J	K	KA	M
125	Up to 1000	50	47	145	75	18	—	—	—	—	145	110	136	—	—	1/4	115	36	90	59	43	14	19	14	190	100	230	16	107	58	110	M14 x 1.5	15	31	19
140	Up to 1000	50	47	161	78	18	3	30	—	—	160	110	146	—	—	1/4	128	36	90	59	43	14	19	20	212	112	255	16	114	64	110	M14 x 1.5	15	31	19
160	Up to 1200	56	53	182	95	23	5	46	—	—	180	132	169	—	—	1/4	144	40	90	59	43	14	19	20	236	118	275	18.5	130	74	120	M16 x 1.5	17	36	22
180	Up to 1200	63	60	204	106	36	—	—	16	118	200	167	195	5	30	3/8	162	45	115	70	48	17	24	25	265	132	320	18.5	149	86	135	M18 x 1.5	20	41	26
200	Up to 1200	63	60	226	124	40.5	—	—	21	131	225	187	216	5.5	34	3/8	182	50	115	74	48	17	24	25	280	150	335	18.5	165	97	135	M20 x 1.5	20	46	26
250	Up to 1200	71	67	277	152	58	—	—	35	155	275	237	261.5	6	42	1/2	225	60	140	86	60	20	29	30	355	180	420	23	200	117	160	M24 x 1.5	25	56	30

Bore size (mm)	MM	MA	MB	N	P	S	T	V	W	ZZ
125	M30 x 1.5	—	—	35	1/2	98	5	30	—	332
140	M30 x 1.5	—	—	35	1/2	98	5	30	8	338
160	M36 x 1.5	—	—	39	3/4	106	5	30	9	378
180	M40 x 1.5	M12 x 1.75	25	39	3/4	111	—	—	—	438
200	M45 x 1.5	M16 x 2	31	39	3/4	111	—	—	—	458
250	M56 x 2	M20 x 2.5	41	49	1	141	—	—	—	568

With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	l	ZZ ₁
125	30 to 1000	75	40	133	0.2 stroke	355
140	30 to 1000	75	40	133	0.2 stroke	361
160	30 to 1200	75	40	141	0.2 stroke	399
180	30 to 1200	85	45	153	0.2 stroke	456
200	30 to 1200	90	45	153	0.2 stroke	476
250	30 to 1200	105	55	176	0.17 stroke	584

With Auto Switch

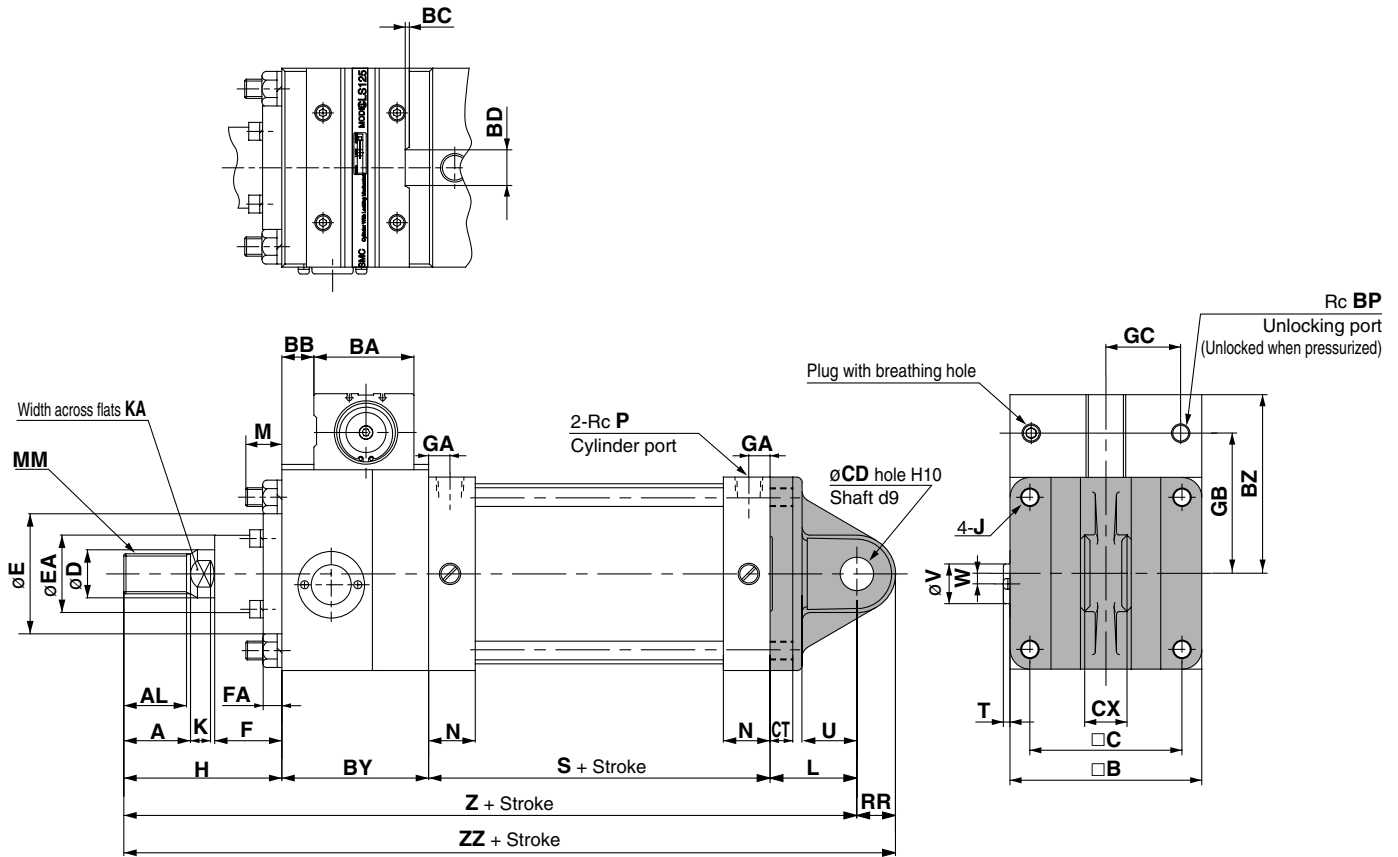
Bore size (mm)	Stroke range (mm)	S	Without rod boot ZZ	With rod boot ZZ ₁
125	Up to 1000	98	332	355
140	Up to 1000	98	338	361
160	Up to 1200	106	378	399
180	Up to 1200	115	442	460
200	Up to 998	120	467	485

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS**
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

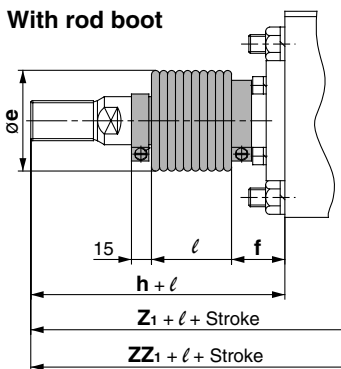
Series CLS

Dimensions

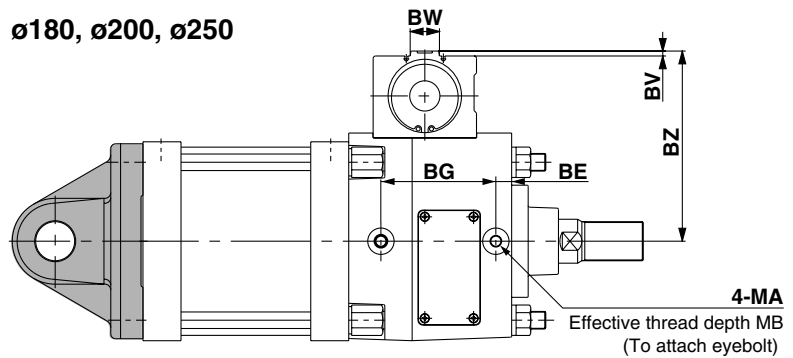
Single clevis style (C): CLSC



With rod boot



ø180, ø200, ø250



Bore size (mm)	Stroke range (mm)	A	AL	B	BA	BB	BC	BD	BE	BG	BY	BZ	BV	BW	BP	C	CD _{H10}	CT	CX	D	E	EA	F	FA	GA	GB	GC	H	J	K	KA	L	M
125	Up to 1000	50	47	145	75	18	—	—	—	—	110	136	—	—	1/4	115	25 ^{+0.084} ₀	17	32 ^{-0.1} _{-0.3}	36	90	59	43	14	16	107	58	110	M14 x 1.5	15	31	65	19
140	Up to 1000	50	47	161	78	18	3	30	—	—	110	146	—	—	1/4	128	28 ^{+0.084} ₀	17	36 ^{-0.1} _{-0.3}	36	90	59	43	14	16	114	64	110	M14 x 1.5	15	31	75	19
160	Up to 1200	56	53	182	95	23	5	46	—	—	132	169	—	—	1/4	144	32 ^{+0.100} ₀	20	40 ^{-0.1} _{-0.3}	40	90	59	43	14	18.5	130	74	120	M16 x 1.5	17	36	80	22
180	Up to 1200	63	60	204	106	36	—	—	16	118	167	195	5	30	3/8	162	40 ^{+0.100} ₀	23	50 ^{-0.1} _{-0.3}	45	115	70	48	17	18.5	149	86	135	M18 x 1.5	20	41	90	26
200	Up to 1200	63	60	226	124	40.5	—	—	21	131	187	216	5.5	34	3/8	182	40 ^{+0.100} ₀	25	50 ^{-0.1} _{-0.3}	50	115	74	48	17	18.5	165	97	135	M20 x 1.5	20	46	90	26
250	Up to 1200	71	67	277	152	58	—	—	35	155	237	261.5	6	42	1/2	225	50 ^{+0.100} ₀	30	63 ^{-0.1} _{-0.3}	60	140	86	60	20	23	200	117	160	M24 x 1.5	25	56	110	30

Bore size (mm)	MM	MA	MB	N	P	RR	S	T	U	V	W	Z	ZZ
125	M30 x 1.5	—	—	35	1/2	29	98	5	35	30	—	383	412
140	M30 x 1.5	—	—	35	1/2	32	98	5	40	30	8	393	425
160	M36 x 1.5	—	—	39	3/4	36	106	5	45	30	9	438	474
180	M40 x 1.5	M12 x 1.75	25	39	3/4	44	111	—	50	—	—	503	547
200	M45 x 1.5	M16 x 2	31	39	3/4	44	111	—	50	—	—	523	567
250	M56 x 2	M20 x 2.5	41	49	1	55	141	—	65	—	—	648	703

With Rod Boot

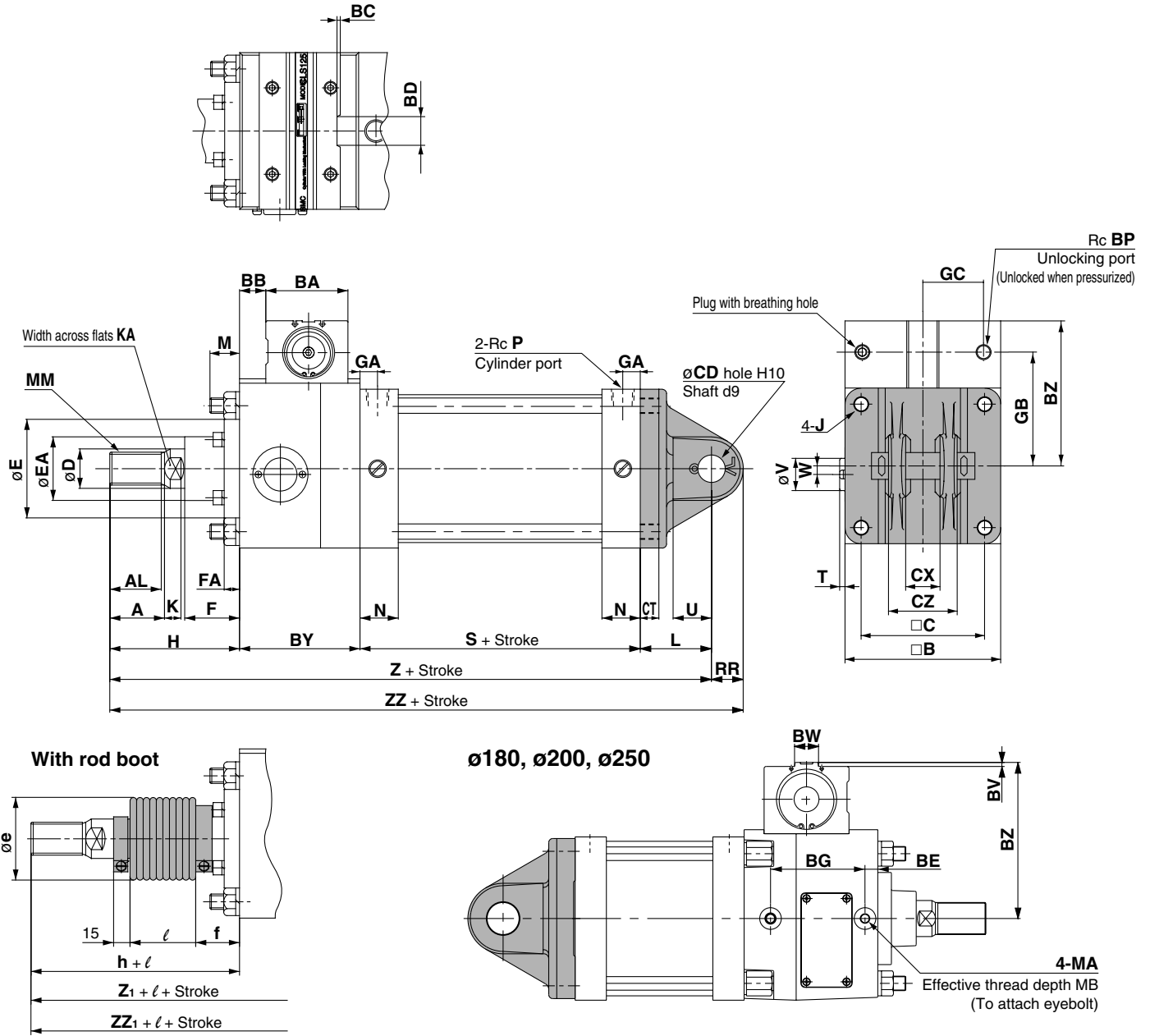
Bore size (mm)	Stroke range (mm)	e	f	h	ℓ	Z ₁	ZZ ₁
125	30 to 1000	75	40	133	0.2 stroke	406	435
140	30 to 1000	75	40	133	0.2 stroke	416	448
160	30 to 1200	75	40	141	0.2 stroke	459	495
180	30 to 1200	85	45	153	0.2 stroke	521	565
200	30 to 1200	90	45	153	0.2 stroke	541	585
250	30 to 1200	105	55	176	0.17 stroke	664	719

With Auto Switch

Bore size (mm)	Stroke range (mm)	S	Without rod boot		With rod boot	
			Z	ZZ	Z ₁	ZZ ₁
125	Up to 1000	98	383	412	406	435
140	Up to 1000	98	393	425	416	448
160	Up to 1200	106	438	474	459	495
180	Up to 1200	115	507	551	525	569
200	Up to 998	120	532	576	550	594

Cylinder with Lock Double Acting, Single Rod **Series CLS**

Double clevis style (D): CLSD



- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS**
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Bore size (mm)	Stroke range (mm)	A	AL	B	BA	BB	BC	BD	BE	BG	BY	BZ	BV	BW	BP	C	CD ^{H10}	CT	CX	CZ	D	E	EA	F	FA	GA	GB	GC	H	J	K	KA	L
125	Up to 1000	50	47	145	75	18	—	—	—	—	110	136	—	—	1/4	115	25 ^{+0.084} ₀	17	32 ^{+0.3} _{+0.1}	64 ⁰ _{-0.2}	36	90	59	43	14	16	107	58	110	M14 x 1.5	15	31	65
140	Up to 1000	50	47	161	78	18	3	30	—	—	110	146	—	—	1/4	128	28 ^{+0.084} ₀	17	36 ^{+0.3} _{+0.1}	72 ⁰ _{-0.2}	36	90	59	43	14	16	114	64	110	M14 x 1.5	15	31	75
160	Up to 1200	56	53	182	95	23	5	46	—	—	132	169	—	—	1/4	144	32 ^{+0.100} ₀	20	40 ^{+0.3} _{+0.1}	80 ⁰ _{-0.2}	40	90	59	43	14	18.5	130	74	120	M16 x 1.5	17	36	80
180	Up to 1200	63	60	204	106	36	—	—	16	118	167	195	5	30	3/8	162	40 ^{+0.100} ₀	23	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	45	115	70	48	17	18.5	149	86	135	M18 x 1.5	20	41	90
200	Up to 1200	63	60	226	124	40.5	—	—	21	131	187	216	5.5	34	3/8	182	40 ^{+0.100} ₀	25	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	50	115	74	48	17	18.5	165	97	135	M20 x 1.5	20	46	90
250	Up to 1200	71	67	277	152	58	—	—	35	155	237	261.5	6	42	1/2	225	50 ^{+0.100} ₀	30	63 ^{+0.3} _{+0.1}	126 ^{-0.1} _{-0.3}	60	140	86	60	20	23	200	117	160	M24 x 1.5	25	56	110

Bore size (mm)	M	MA	MB	MM	N	P	RR	S	T	U	V	W	Z	ZZ
125	19	—	—	M30 x 1.5	35	1/2	29	98	5	35	30	—	383	412
140	19	—	—	M30 x 1.5	35	1/2	32	98	5	40	30	8	393	425
160	22	—	—	M36 x 1.5	39	3/4	36	106	5	45	30	9	438	474
180	26	M12 x 1.75	25	M40 x 1.5	39	3/4	44	111	—	50	—	—	503	547
200	26	M16 x 2	31	M45 x 1.5	39	3/4	44	111	—	50	—	—	523	567
250	30	M20 x 2.5	41	M56 x 2	49	1	55	141	—	65	—	—	648	703

With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	ℓ	Z ₁	ZZ ₁
125	30 to 1000	75	40	133	0.2 stroke	406	435
140	30 to 1000	75	40	133	0.2 stroke	416	448
160	30 to 1200	75	40	141	0.2 stroke	459	495
180	30 to 1200	85	45	153	0.2 stroke	521	565
200	30 to 1200	90	45	153	0.2 stroke	541	585
250	30 to 1200	105	55	176	0.17 stroke	664	719

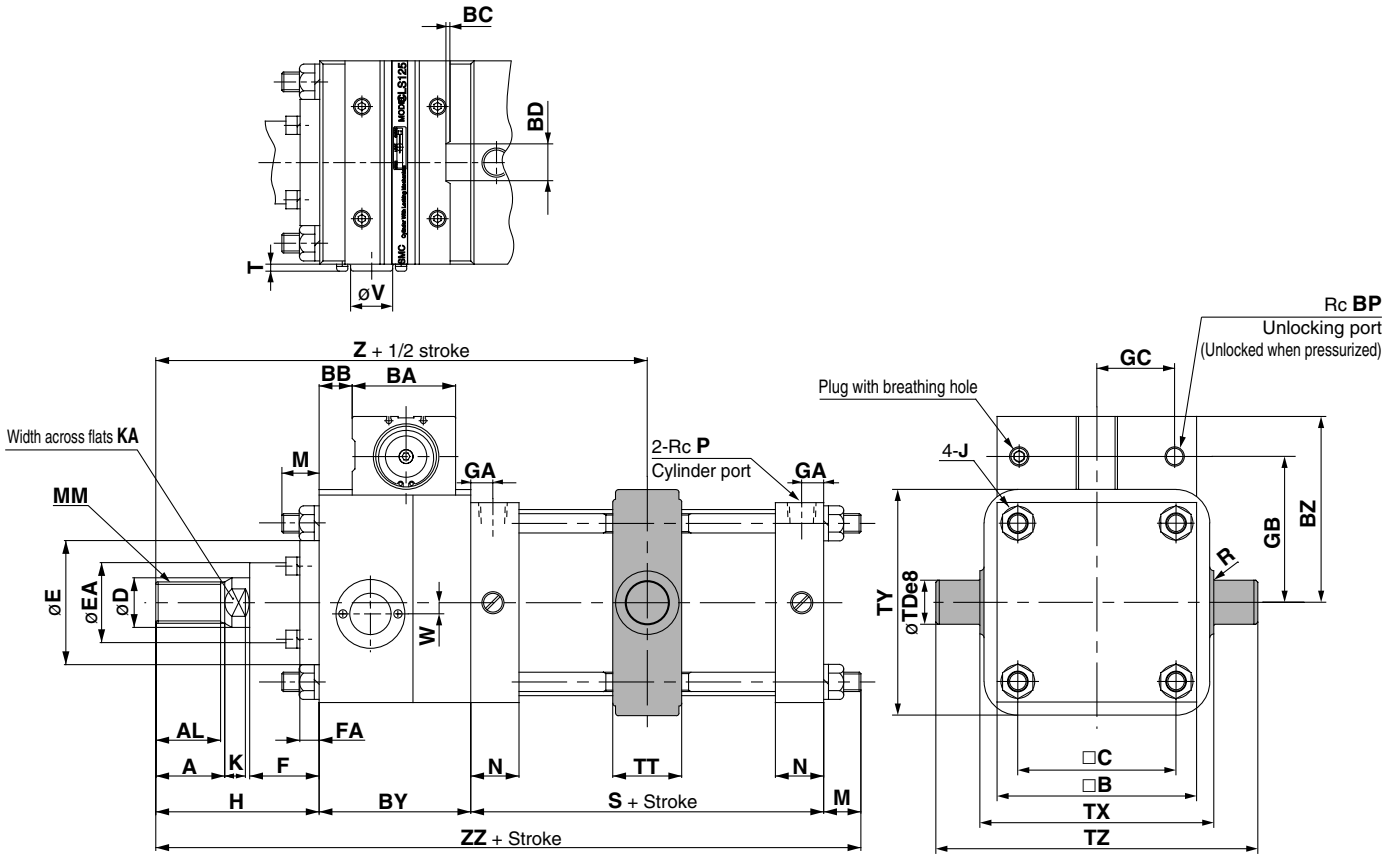
With Auto Switch

Bore size (mm)	Stroke range (mm)	S	Without rod boot		With rod boot	
			Z	ZZ	Z ₁	ZZ ₁
125	Up to 1000	98	383	412	406	435
140	Up to 1000	98	393	425	416	448
160	Up to 1200	106	438	474	459	495
180	Up to 1200	115	507	551	525	569
200	Up to 998	120	532	576	550	594

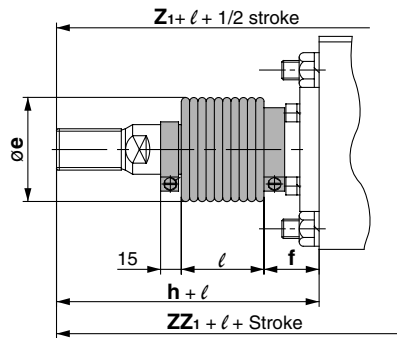
Series CLS

Dimensions

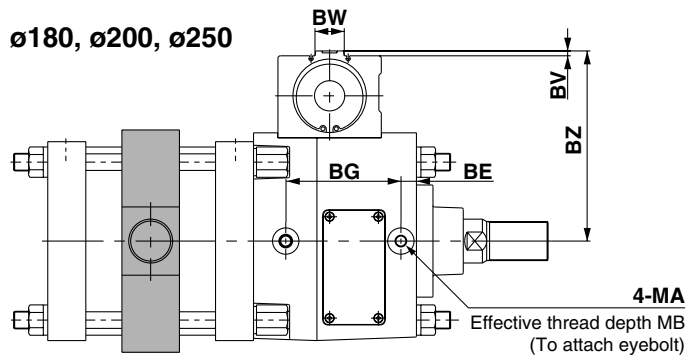
Center trunnion style (T): CLST



With rod boot



ø180, ø200, ø250



Bore size (mm)	Stroke range (mm)	A	AL	B	BA	BB	BC	BD	BE	BG	BY	BZ	BV	BW	BP	C	D	E	EA	F	FA	G	GA	GB	GC	H	J	K	KA	M	MM	MA	MB	N	P
125	25 to 1000	50	47	145	75	18	—	—	—	—	110	136	—	—	1/4	115	36	90	59	43	14	16	107	58	110	M14 x 1.5	15	31	19	M30 x 1.5	—	—	35	1/2	
140	30 to 1000	50	47	161	78	18	3	30	—	—	110	146	—	—	1/4	128	36	90	59	43	14	16	114	64	110	M14 x 1.5	15	31	19	M30 x 1.5	—	—	35	1/2	
160	35 to 1200	56	53	182	95	23	5	46	—	—	132	169	—	—	1/4	144	40	90	59	43	14	18.5	130	74	120	M16 x 1.5	17	36	22	M36 x 1.5	—	—	39	3/4	
180	30 to 1200	63	60	204	106	36	—	—	16	118	167	195	5	30	3/8	162	45	115	70	48	17	18.5	149	86	135	M18 x 1.5	20	41	26	M40 x 1.5	M12 x 1.75	25	39	3/4	
200	30 to 1200	63	60	226	124	40.5	—	—	21	131	187	216	5.5	34	3/8	182	50	115	74	48	17	18.5	165	97	135	M20 x 1.5	20	46	26	M45 x 1.5	M16 x 2	31	39	3/4	
250	30 to 1200	71	67	277	152	58	—	—	35	155	237	261.5	6	42	1/2	225	60	140	86	60	20	23	200	117	160	M24 x 1.5	25	56	30	M56 x 2	M20 x 2.5	41	49	1	

With Rod Boot

Bore size (mm)	R	S	T	TDe8	TT	TX	TY	TZ	V	W	Z	ZZ
125	1	98	5	32 ^{-0.050} _{-0.069}	50	170	164	234	30	—	269	337
140	1.5	98	5	36 ^{-0.050} _{-0.069}	55	190	184	262	30	8	269	337
160	1.5	106	5	40 ^{-0.050} _{-0.069}	60	212	204	292	30	9	305	380
180	2	111	—	45 ^{-0.050} _{-0.069}	59	236	228	326	—	—	357.5	439
200	2	111	—	45 ^{-0.050} _{-0.069}	59	265	257	355	—	—	377.5	459
250	3	141	—	56 ^{-0.060} _{-0.106}	69	335	325	447	—	—	467.5	568

With Auto Switch

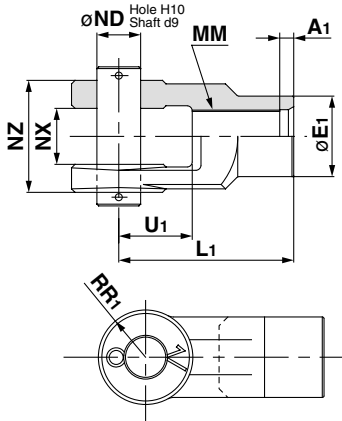
Bore size (mm)	Stroke range (mm)	S	Z	ZZ	Z1	ZZ1
125	Up to 1000	98	269	337	292	360
140	Up to 1000	98	269	337	292	360
160	Up to 1200	106	305	380	326	401
180	Up to 1200	115	359.5	443	377.5	461
200	Up to 998	120	382	468	400	486

Series CLS

Accessory Bracket Dimensions

Y Type Double Knuckle Joint

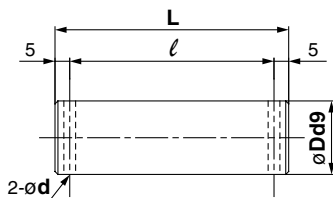
* Pin and snap ring are shipped together with double clevis and double knuckle joint.



Material: Cast iron

Model	Applicable bore size (mm)	A1	E1	L1	MM	NDH10	NX	NZ	RR1	U1
Y-12	125	8	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{+0.3} _{+0.1}	64 ^{-0.1} _{-0.3}	27	42
Y-14	140	8	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{+0.3} _{+0.1}	72 ^{-0.1} _{-0.3}	30	47
Y-16	160	8	55	110	M36 x 1.5	32 ^{+0.1} ₀	40 ^{+0.3} _{+0.1}	80 ^{-0.1} _{-0.3}	34	46
Y-18	180	8	70	125	M40 x 1.5	40 ^{+0.1} ₀	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	42.5	54
Y-20	200	8	70	125	M45 x 1.5	40 ^{+0.1} ₀	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	42.5	54
Y-25	250	9	86	160	M56 x 2	50 ^{+0.1} ₀	63 ^{+0.3} _{+0.1}	126 ^{-0.1} _{-0.3}	53	81

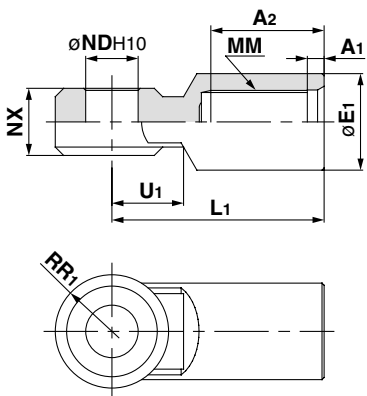
Clevis Pin/Knuckle Pin



Material: Carbon steel

Model	Applicable bore size (mm)	d (Drill through)	Dd9	L	l	Applicable cotter pin
IY-12	125	4	25 ^{-0.065} _{-0.117}	79.5	69.5	Ø4 x 40l
IY-14	140	4	28 ^{-0.065} _{-0.117}	86.5	76.5	Ø4 x 40l
IY-16	160	4	32 ^{-0.080} _{-0.142}	94.5	84.5	Ø4 x 40l
IY-18	180, 200	4	40 ^{-0.080} _{-0.142}	115	105	Ø4 x 55l
IY-25	250	5	50 ^{-0.080} _{-0.142}	144	132	Ø5 x 65l

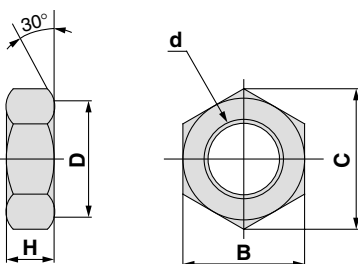
I Type Single Knuckle Joint



Material: Cast iron

Model	Applicable bore size (mm)	A1	A2	E1	L1	MM	NDH10	NX	RR1	U1
I-12	125	8	54	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{-0.1} _{-0.3}	27	33
I-14	140	8	54	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{-0.1} _{-0.3}	30	39
I-16	160	8	60	55	110	M36 x 1.5	32 ^{+0.1} ₀	40 ^{-0.1} _{-0.3}	34	39
I-18	180	8	67	70	125	M40 x 1.5	40 ^{+0.1} ₀	50 ^{-0.1} _{-0.3}	42.5	44
I-20	200	8	67	70	125	M45 x 1.5	40 ^{+0.1} ₀	50 ^{-0.1} _{-0.3}	42.5	44
I-25	250	9	75.5	86	160	M56 x 2	50 ^{+0.1} ₀	63 ^{-0.1} _{-0.3}	53	66

Rod End Nut



Material: Rolled steel

Model	Applicable bore size (mm)	d	H	B	C	D
NT-12	125, 140	M30 x 1.5	18	46	53.1	44
NT-16	160	M36 x 1.5	21	55	63.5	53
NT-18	180	M40 x 1.5	23	60	69.3	57
NT-20	200	M45 x 1.5	27	70	80.8	67
NT-25	250	M56 x 2	34	85	98.1	82

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

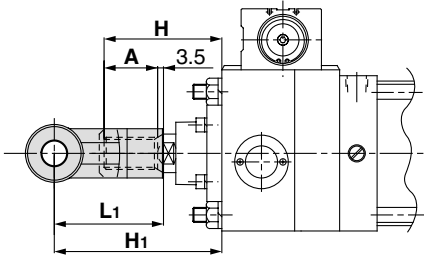
-X

20-

Data

Accessory Bracket Dimensions

Single/Double Knuckle Joint Mounting



Bore size (mm)	Symbol	H	A	L1	H1	Applicable knuckle joint part no.	
						I type single knuckle	Y type double knuckle
125		110	50	100	156.5	I-12	Y-12
140		110	50	105	161.5	I-14	Y-14
160		120	56	110	170.5	I-16	Y-16
180		135	63	125	193.5	I-18	Y-18
200		135	63	125	193.5	I-20	Y-20
250		160	71	160	245.5	I-25	Y-25

A, H Dimensions when Mounting a Single/Double Knuckle Joint together with a Rod End Nut

Bore size (mm)	A	H
125	65	125
140	65	125
160	76	140
180	83	155
200	88	160
250	106	195

- * Single knuckle joint and double knuckle joint should be used separately. (Fasten by screwing completely into the rod end threads.)
- * Extend the dimensions of **A** and **H** when using a single/double knuckle joint together with a rod end nut. (For extension of the **A** and **H** dimensions, refer to the table above and specify the made-to-order product -**XAO**.)

Minimum Stroke for Auto Switch Mounting on Cylinder Unit

n: Quantity

Auto switch model	No. of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø125	ø140	ø160	ø180	ø200
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5BAL D-F59F	2 (Different sides, Same side), 1	25	125	135	135	150	150
	n (Same side)	$25 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$125 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$135 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$150 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
D-F5NTL	2 (Different sides, Same side), 1	35	145	155		170	
	n (Same side)	$35 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$145 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$155 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$170 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	
D-A3□ D-G39 D-K39	2	Different sides	35	110			150
		Same side	100	110			150
	n	Different sides	$35 + 30(n-2)$	$110 + 30(n-2)$ n = 2, 4, 6, 8...			$150 + 30(n-2)$ n = 2, 4, 6, 8...
		Same side	$100 + 100(n-2)$	$110 + 100(n-2)$ n = 2, 4, 6, 8...			$150 + 100(n-2)$ n = 2, 4, 6, 8...
1		15	110			150	
D-A44	2	Different sides	35	110			150
		Same side	55	110			150
	n	Different sides	$35 + 30(n-2)$	$110 + 30(n-2)$ n = 2, 4, 6, 8...			$150 + 30(n-2)$ n = 2, 4, 6, 8...
		Same side	$55 + 55(n-2)$	$110 + 50(n-2)$ n = 2, 4, 6, 8...			$150 + 50(n-2)$ n = 2, 4, 6, 8...
1		15	110			150	
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	1, 2		15	105	110	115	115
D-Y69□/Y7PV D-Y7□WV			10	90	95	100	100
D-Y7BAL			20	115	120	125	125

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 9-15-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	—
	D-A64/A67		Without indicator light
	D-Z80		
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		2-color indication
	D-F5BAL		Water resistant (2-color indication)
	D-F5NTL		With timer
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV/Y7PWV/Y7BWV		2-color indication

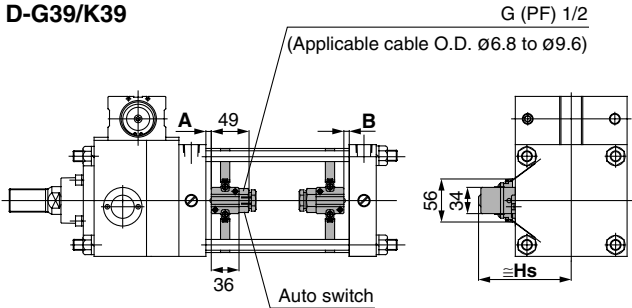
* With pre-wire connector is also available in solid state auto switches. For specifications, refer to page 9-15-66.
 *Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 9-15-40.

Series CLS

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

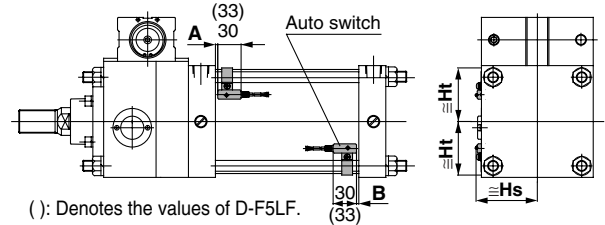
<Band mounting style>

D-A3
D-G39/K39

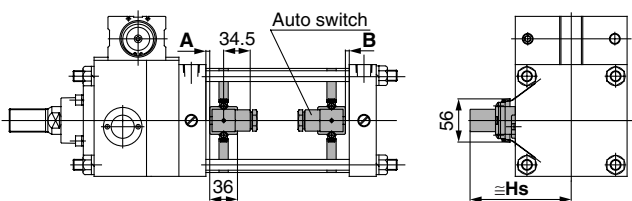


<Tie-rod mounting style>

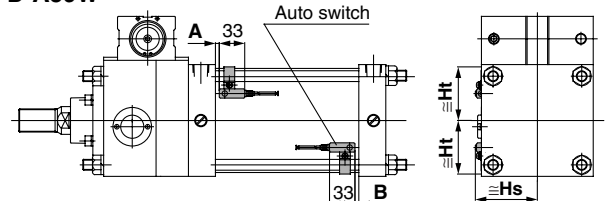
D-F5□/J5□, D-F5NTL
D-F5□W/J59W
D-F5BAL/F59F



D-A44



D-A5/A6
D-A59W



Proper Auto Switch Mounting Position

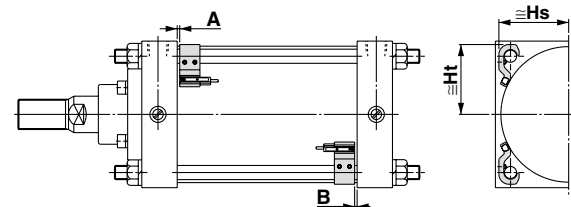
Auto switch model	D-A5□ D-A6□ D-A3□ D-A44 D-G39 D-K39		D-A59W		D-F5□W D-J59W D-F5BAL D-F5□ D-J5□ D-F59F		D-F5NTL	
	A	B	A	B	A	B	A	B
Bore size (mm)								
125	0	0	2	2	4.5	4.5	9.5	9.5
140	0	0	2	2	4.5	4.5	9.5	9.5
160	0	0	2	2	4.5	4.5	9.5	9.5
180	3.5	1.5	7.5	5.5	10	8	15	13
200	6	4	10	8	12.5	10.5	17.5	15.5

Auto Switch Mounting Height

Auto switch model	D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F5□W D-J59W D-F5BAL D-F59F D-F5NTL	
	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Ht
Bore size (mm)								
125	116	126	75.5	69.5	74.5	70		
140	124	134	81	76.5	80	76.5		
160	134.5	144.5	89	87.5	88	87.5		
180	144	154	97.0	97.5	96	97.5		
200	154	164	107.0	108.0	107.5	108.0		

<Tie-rod mount style>

D-Y7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BAL



Proper Auto Switch Mounting Position/ Auto Switch Mounting Height

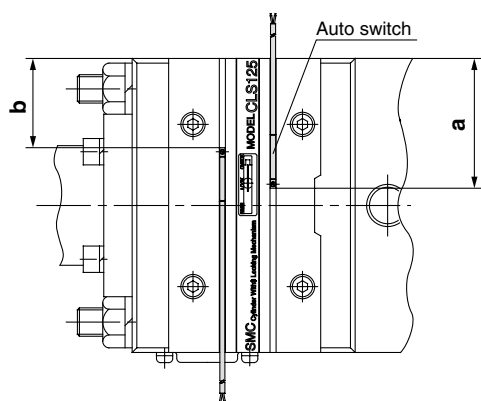
Bore size (mm)	Common for each auto switch		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P/Y7PV D-Y7□W/Y7□WV		D-Y7BAL	
	A	B	Hs	Ht	Hs	Ht
125	1.5	1.5	69	69.5	71	69.5
140	1.5	1.5	76	76	77	76
160	1.5	1.5	85	85	88.5	85
180	7	5	95	95	97.5	95
200	9.5	7.5	106	106	108	106

Operating Range

Auto switch model	Bore size (mm)				
	125	140	160	180	200
D-Z7□/Z80	14	14.5	13	14	14.5
D-A3□/A44 D-A5□/A6□	10	10	10	10	10
D-A59W	17	17	17	17	17
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	12	13	7	7.5	8
D-Y7BAL	6	6	7	7	7
D-F5□/J5□/F59F D-F5□W/J59W D-F5BAL/F5NTL	5	5	5.5	6	6
D-G39/K39	11	11	10	10	10

* 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.

Proper Auto Switch Mounting Position for Lock Unit

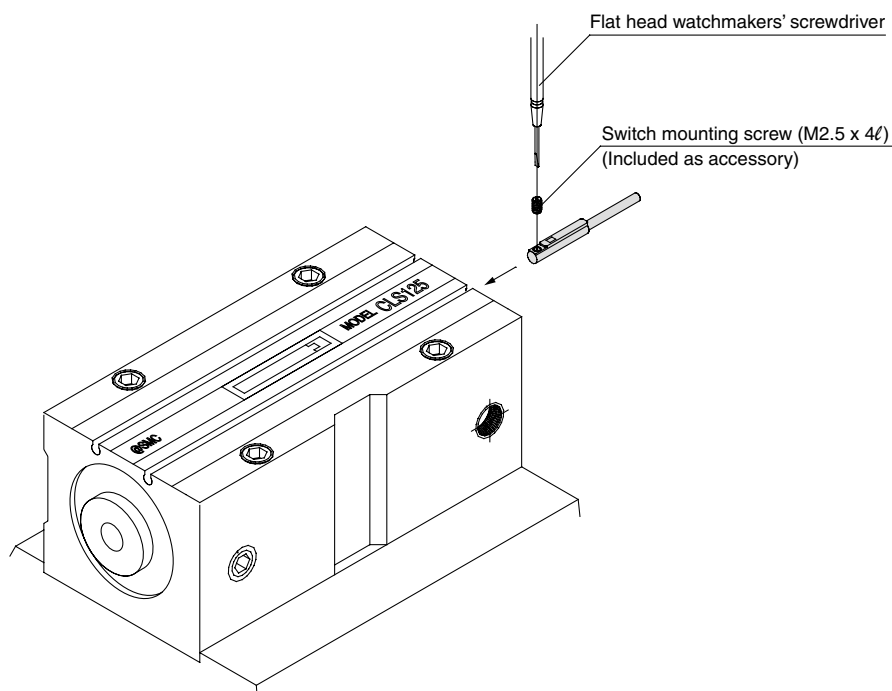


Auto switch model	D-A90 D-A93		D-M9N D-M9P D-M9B	
	a	b	a	b
Bore size (mm)				
125	59	39	57	45
140	68	48	66	54
160	68	48	66	54
180	80	60	76	64
200	86	66	82	70
250	102	82	98	86

* Be sure to confirm operation after mounting.

How to Mount Auto Switch for Lock Unit

When mounting an auto switch, insert it into the cylinder's switch groove from the direction shown in the drawing below. After placing it in the mounting position, use a flat head watchmakers' screwdriver to tighten the mounting screw which is included.



Caution

When tightening an auto switch mounting screw, use a watchmakers' screwdriver with a handle of approximately 5 to 6 mm in diameter. Also, tightening torque should be about 0.05 to 0.1 N·m. As a guide, it should be turned about 90° past the point at which tightening can be felt.

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data