Valve Mounted Cylinder Double Acting, Single Rod

Series CVM5

ø20, ø25, ø32, ø40

How to Order

CVM5 L 32 ☐ ☐ – 100 ☐ ☐ – 1 1 M Z – ☐

With auto switch: CDVM5 L 32 ☐ ☐ – 100 ☐ ☐ – 1 1 M Z – M9BW ☐ – C – ☐

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
T	Head side trunnion style
U	Rod side trunnion style

With auto switch
(Built-in magnet)

Port thread type

Nil	Rc
TN	NPT
TF	G

Piping

Nil	Screw-in type
F	Built-in One-touch fitting

Cylinder stroke (mm)
(Refer to “Standard Stroke” on page 1724.)

Rod extended/retracted when energized

Nil	Rod extended when energized
B	Rod retracted when energized

∗ Only in case of 2 position single solenoid valve.

Suffix for cylinder

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Solenoid valve

1	2 position single
2	2 position double
3	3 position closed center (Option)
4	3 position exhaust center (Option)

Solenoid valve voltage

Standard		Option	
1	100 VAC (50/60Hz)	3	110 VAC (50/60Hz)
2	200 VAC (50/60Hz)	4	220 VAC (50/60Hz)
5	24 VDC	6	12 VDC

For other rated voltages, please consult with SMC.

Electrical entry

G	Grommet
L	L plug connector
M	M plug connector
D	DIN terminal

Light/Surge voltage suppressor

Nil	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor (Except Type G)

Made to Order
Refer to page 1724 for details.

Auto switch

Nil	Without auto switch

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDVM5B25-150-25GS

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	“n” pcs.

Auto switch mounting bracket Note)

Note) This symbol is indicated when the D-A9☐ or M9☐ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7☐ and H7☐, etc.) (Nil)

Applicable Auto Switches/Refer to pages 1893 to 2007 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○		
				2-wire		12 V		M9BV	M9B	●	●	●	○	—	○	—	
		Connector						—	H7C	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	—	○		
				2-wire		12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)		5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PAV∗1	M9PA∗1	○	○	●	○	—	○		
				2-wire		12 V		M9BAV∗1	M9BA∗1	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		—	H7NF	●	—	●	○	—	○	IC circuit	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93V∗2	A93	●	●	●	●	—	—	—	Relay, PLC
			None				100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	
			Yes				100 V, 200 V	—	B54	●	—	●	●	—	—	—	
			None				200 V or less	—	B64	●	—	●	—	—	—		
		Connector	Yes				—	—	C73C	●	—	●	●	●	—		
			None				24 V or less	—	C80C	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	Yes			—	—	—	B59W	●	—	●	—	—	—	—	

∗ Lead wire length symbols: 0.5 m ········· Nil (Example) M9NW
1 m ········· M (Example) M9NWM
3 m ········· L (Example) M9NWL
5 m ········· Z (Example) M9NWZ
None ········· N (Example) H7CN

∗ Solid state auto switches marked with “○” are produced upon receipt of order.
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

∗ Since there are other applicable auto switches than listed, refer to page 1741 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1960 and 1961.
∗ D-A9☐/M9☐ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

Operation type can be changed to rod extended when energized or rod retracted when energized.

An auto switch cylinder with the switch installed can also be manufactured.

Specifications

Applicable bore size (mm)		20	25	32	40
Fluid		Air			
Action		Double acting, Single rod			
Cushion		Rubber bumper			
Proof pressure		1.0 MPa			
Maximum operating pressure		0.7 MPa			
Minimum operating pressure		0.15 MPa			
Ambient and fluid temperature		–10 to 50°C (No freezing)			
Lubrication		Not required (Non-lube)			
Stroke length tolerance		$^{+1.4}_{0}$			
Port size	**Screw-in type**	Rc 1/8			
	Built-in One-touch fitting	O.D.: ø6/I.D.: ø4			
Piston speed (mm/s) Note)		50 to 700*	50 to 650*	50 to 590*	50 to 420*
Allowable kinetic energy		0.27 J	0.4 J	0.65 J	1.2 J
Mounting		Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Head side trunnion style, Rod side trunnion style			

Note) The figures marked with "*" represent the values of the cylinder with the silencer type exhaust throttle valve removed. To operate the cylinder at these values, prevent dust from entering by installing an AN120-M5 silencer on the EXH port.

Solenoid Valve Specifications

Applicable solenoid valve model			Series VZ3□90
Coil rated voltage			Standard: 100/200 VAC (50/60 Hz), 24 VDC Semi-standard: 110/220 VAC, 12 VDC
Effective area of valve (Cv factor)			4.5mm² (0.25)
Allowable voltage			–15 to 10%
Coil insulation			Class B or equivalent (130°C)
Electrical entry			Grommet, L plug connector, M plug connector, DIN terminal
Power consumption (W) Note)	**DC**		1.8 (With indicator light: 2.1)
Appavent power (VA) Note)	**AC**	**Inrush**	4.5/50 Hz, 4.2/60 Hz
		Holding	3.5/50 Hz, 3.0/60 Hz

Note) At the rated voltage.

Made to Order Specifications

(For details, refer to pages 2009 to 2152.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw

Refer to pages 1893 to 2007 for cylinders with auto switches.

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

Standard Stroke

Bore size (mm)	Standard stroke (mm) Note)	Maximum stroke (mm)
20	25, 50, 75, 100, 125, 150, 200, 250, 300	1000
25		
32		
40		

Note) Other intermediate strokes can be manufactured upon receipt of order. When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

Rod Boot Material

Symbol	Rod boot material	Maximum ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C*

* Maximum ambient temperature for the rod boot itself.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic Weight	Basic style	0.25	0.32	0.39	0.67
	Axial foot style	0.40	0.48	0.55	0.94
	Flange style	0.31	0.41	0.48	0.79
	Single clevis style	0.29	0.36	0.43	0.76
	Double clevis style	0.30	0.38	0.44	0.80
	Trunnion style	0.29	0.39	0.45	0.77
Additional weight per each 50 mm of stroke		0.05	0.07	0.09	0.14
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) **CVM5L32-100-11G**

- Basic weight ····· 0.55 (kg) (Axial foot style ø32)
- Additional weight ····· 0.09/50 (kg/50 st)
- Cylinder stroke ····· 100 (st)

0.55 + 0.09 x 100/50 = 0.73 kg

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment			Option			
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint (3)	Pivot bracket (5)	Pivot bracket pin (6)
Basic style	● (1 pc.)	●	—	●	●	—	—
Axial foot style	● (2)	●	—	●	●		
Rod side flange style	● (1)	●	—	●	●		
Head side flange style	● (1)	●	—	●	●		
Single clevis style	— (1)	●	—	●	●	●	●
Double clevis style (3)	— (1)	●	● (4)	●	●	—	—
Head side trunnion style	● (1) (2)	●	—	●	●	●	—
Rod side trunnion style	● (1) (2)	●	—	●	●		

Note 1) Mounting nut is not equipped with single clevis style and double clevis style.
Note 2) Trunnion nuts are equipped for head side trunnion and rod side trunnion.
Note 3) Pin and set ring are shipped together with double clevis and double knuckle joint.
Note 4) Retaining rings (cotter pins for ø40) are included in clevis pins.
Note 5) Pin and retaining ring are not included in pivot bracket.
Note 6) Retaining rings are included in pivot bracket pin.

Mounting Bracket Part No.

Bore size (mm)	20	25	32	40
Axial foot *	CM-L020B	CM-L032B		CM-L040B
Flange	CM-F020B	CM-F032B		CM-F040B
Single clevis	CM-C020B	CM-C032B		CM-C040B
Double clevis**	CM-D020B	CM-D032B		CM-D040B
Trunnion (With nut)	CM-T020B	CM-T032B		CM-T040B

* Two foot brackets and a mounting nut are attached.
When ordering the foot bracket, order 2 pcs. per cylinder.
** Clevis pin and retaining ring (cotter pin for ø40) are packaged together.

⚠Precautions

Be sure to read before handling. Refer to front matter 39 for Safety Instructions, pages 3 to 12 for Actuator and Auto Switch Precautions and 3/4/5 Port Solenoid Valve Precautions in Best Pneumatics No. 1.

Mounting

⚠Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a retaining ring.

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

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burns.

4. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

5. Conjoin the rod end part, so that rod boot might not be twisted.

If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

Model Selection

⚠Warning

1. Confirm the specifications.

Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. Energizing continuously for a long period of time

When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or affect peripheral equipment adversely since temperature rises when coils generate heat.

Built-in One-touch Fitting

CVM5 | Mounting style | Bore size | **F** — | For "How to Order", refer to page 1723.

F: Built-in One-touch fitting

One-touch fittings are installed on cylinders.

Specifications

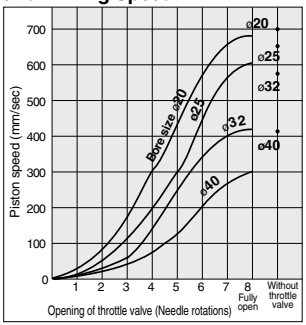
Action	Double acting, Single rod			
Bore size (mm)	20, 25, 32, 40			
Maximum operating pressure	0.7 MPa			
Minimum operating pressure	0.15 MPa			
Cushion	Rubber bumper			
Piping	Built-in One-touch fitting			
Piston speed (mm/s)	ø20	ø25	ø32	ø40
	50 to 700	50 to 650	50 to 590	50 to 420
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style			

For the dimensions of mounting bracket, refer to pages 1729 to 1732.

Application/Tubing O.D.

Bore size (mm)	20	25	32	40
Applicable tubing O.D. (mm)	ø6/4	ø6/4	ø6/4	ø6/4
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tube.			

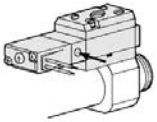
Opening Range of Throttle Valve and Driving Speed



Measuring conditions: Operating pressure 0.5 MPa
Mounting: horizontal Load: no load on the return side
The speeds indicated above are for reference.

Manual Operation

Manual operation is possible by pushing the manual button indicated with the arrow.



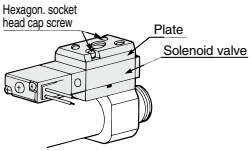
Piston Speed Adjustment

- To slow down the piston speed, screw in the needle of the silencer type exhaust throttle valve clockwise, which reduces the amount of air that is discharged.
- To adjust the piston extension side, regulate the "R1" side silencer type exhaust throttle valve.
  To adjust the retraction side, regulate the "R2" side silencer exhaust throttle valve.
- The needle valve of the throttle valve can be fully opened by loosening it 8 turns from the fully closed position.
- The needle valve has a loosening prevention construction.

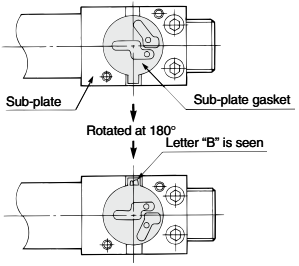
Changing between Rod Extended when Energized and Rod Retracted when Energized

Step [This procedure is for changing the rod extended when energized to the rod retracted when energized.]

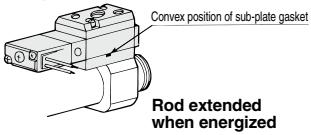
1. Using a tool, loosen the two hexagon socket bolts, and remove the plate and the solenoid valve. At this time, instead of removing the plate and the solenoid valve separately, remove them together, with the hexagon socket bolts remaining inserted.



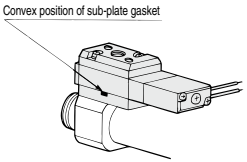
2. A sub-plate gasket is inside the sub-plate. Invert this sub-plate gasket 180° and install it with its letter "B" visible. (A portion that protrudes is provided on the periphery of the sub-plate gasket, and the letter "B" is on one side of this protrusion.)



3. Install the solenoid valve and the plate, and tighten the hexagon socket bolts with a tool. The tightening torque is between 0.6 and 0.8 N·m.
After tightening, press the manual button on the solenoid valve, check for any air leaks, and verify the operating conditions. Distinction between rod extended when energized and rod retracted when energized can be determined from the outside, by looking through the small window in the sub-plate.

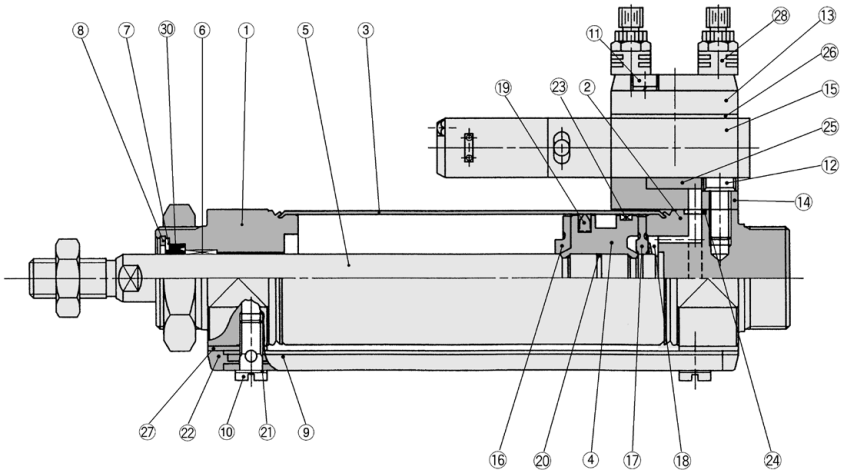


Rod extended when energized

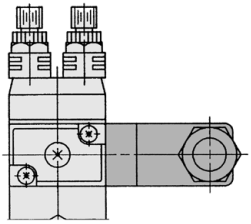


Rod retracted when energized

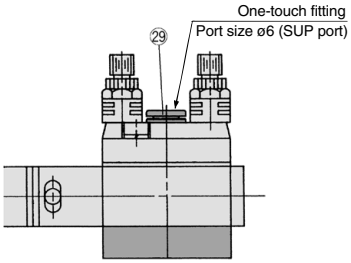
Construction



DIN terminal



Built-in One-touch fitting



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Clear anodized
2	**Head cover**	Aluminum alloy	Clear anodized
3	**Cylinder tube**	Stainless steel	
4	**Piston**	Aluminum alloy	Chromated
5	**Piston rod**	Carbon steel	Hard chrome plated
6	**Bushing**	Bearing alloy	
7	**Seal retainer**	Stainless steel	
8	**Retaining ring**	Carbon tool steel	Phosphate coated
9	**Pipe**	Aluminum alloy	Clear anodized
10	**Stud**	Brass	Electroless nickel plated
11	Hex. socket head cap screw with spring washer	Carbon steel	Nickel plated
12	Hex. socket head cap screw with spring washer	Carbon steel	Nickel plated
13	**Plate**	Aluminum alloy	Metallic painted
14	**Sub-plate**	Aluminum alloy	Metallic painted
15	**Solenoid valve**	—	Refer to the "How to order" below.*
16	**Bumper A**	Urethane	
17	**Bumper B**	Urethane	

* How to order solenoid valves

VZ3□90 – □□□

- Type of actuation
- Electrical entry
- Rated voltage
- Light/surge voltage suppressor

Component Parts

No.	Description	Material	Note
18	**Retaining ring**	Stainless steel	
19	**Piston seal**	NBR	
20	**Piston gasket**	NBR	
21	**Gasket**	Resin	
22	**Pipe gasket**	Urethane rubber	
23	**Wear ring**	Resin	
24	**Head cover gasket**	NBR	
25	**Sub-plate gasket**	NBR	
26	**Gasket**	NBR	
27	**Spacer gasket**	Resin	Except ø25
28	**Exhaust throttle with silencer**	—	ASN2-M5
29	**One-touch fitting**	—	Port size: ø6

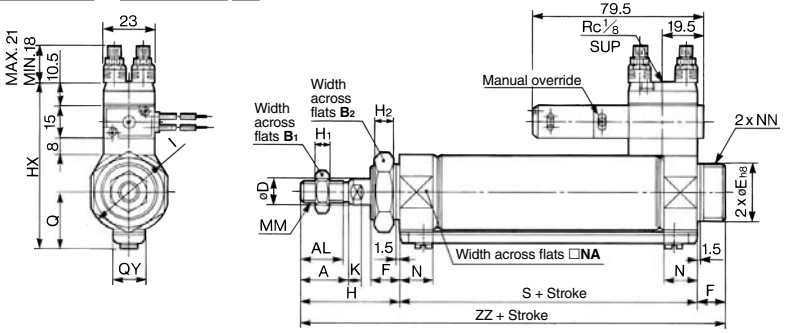
Replacement Parts/Seal Kit

No.	Description	Material	Part no.			
			20	**25**	**32**	**40**
30	**Rod seal**	NBR	CM220-PS	CM225-PS	CM232-PS	CM240-PS

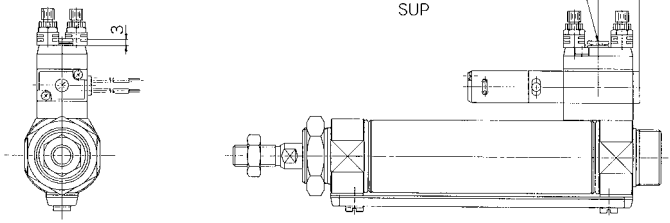
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10g)

Basic Style (B)

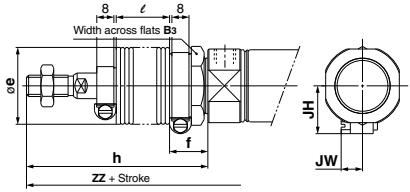
CVM5B **Bore size** — **Stroke** ☐



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 1732.

(mm)

Bore size (mm)	Stroke range	A	AL	B_1	B_2	D	Eh_8	F	Q	QY	H	H_1	H_2	HX	I	K	MM	N	NA	NN	S	ZZ
20	Up to 300	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	19.8	14	41	5	8	65.3	28	5	M8 x 1.25	15	24	M20 x 1.5	62	116
25	Up to 300	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	22	14	45	6	8	70.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	62	120
32	Up to 300	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	25.8	16	45	6	8	76.5	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	64	122
40	Up to 300	24	21	22	41	14	$32^{0}_{-0.039}$	16	29.8	16	50	8	10	84.5	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	88	154

With Rod Boot

(mm)

Bore size (mm)	B_3	e	f	h							ℓ							JH	JW
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	(Reference)	(Reference)
20	30	36	18	68	81	93	106	131	156	—	12.5	25	37.5	50	75	100	—	23.5	10.5
25	32	36	18	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	23.5	10.5
32	32	36	18	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	23.5	10.5
40	41	46	20	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	27	10.5

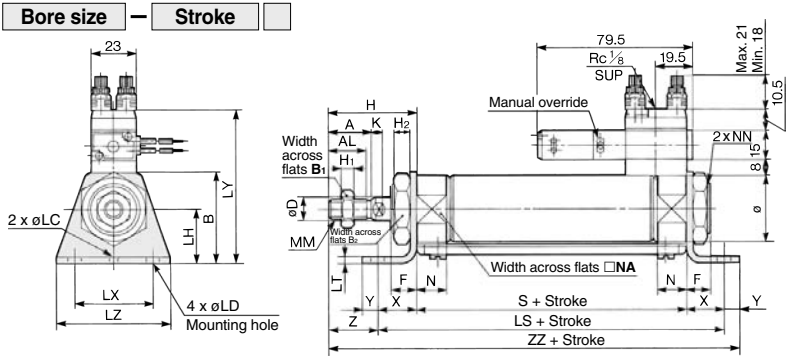
(mm)

Bore size (mm)	ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	143	156	168	181	206	231	256
25	147	160	172	185	210	235	260
32	149	162	174	187	212	237	262
40	181	194	206	219	244	269	294

∗ For short strokes, a solenoid valve may protrude from the rod cover end. Confirm S dimension and solenoid dimensions.
∗ Long stroke type includes ones for strokes more than 301 mm.

Axial Foot Style (L)

CVM5L Bore size — Stroke



(mm)

Bore size (mm)	Stroke range	A	AL	B	B_1	B_2	D	F	H	H_1	H_2	I	K	LC	LD	LH	LS	LT	LX	LY
20	Up to 300	18	15.5	40	13	26	8	13	41	5	8	28	5	4	6.8	25	102	3.2	40	70.5
25	Up to 300	22	19.5	47	17	32	10	13	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	76.5
32	Up to 300	22	19.5	47	17	32	12	13	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	78.8
40	Up to 300	24	21	54	22	41	14	16	50	8	10	46.5	7	4	7	30	134	3.2	55	84.8

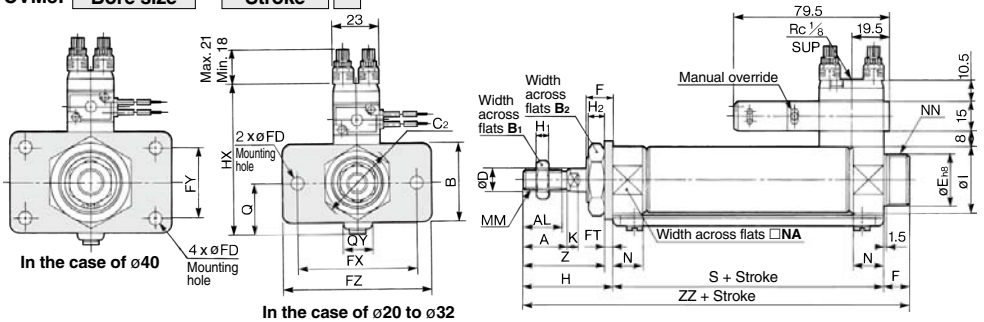
(mm)

Bore size (mm)	LZ	MM	N	NA	NN	S	X	Y	Z	ZZ
20	55	M8 x 1.25	15	24	M20 x 1.5	62	20	8	21	131
25	55	M10 x 1.25	15	30	M26 x 1.5	62	20	8	25	135
32	55	M10 x 1.25	15	34.5	M26 x 1.5	64	20	8	25	137
40	75	M14 x 1.5	21.5	42.5	M32 x 2	88	23	10	27	171

∗ Brackets are packaged together.

Rod Side Flange Style (F)

CVM5F Bore size — Stroke



(mm)

Bore size (mm)	Stroke range	A	AL	B	B_1	B_2	C_2	D	Eh8	F	FD	FT	FX	FY	FZ	H	H_1	H_2	HX
20	Up to 300	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	—	75	41	5	8	65.3
25	Up to 300	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	—	75	45	6	8	70.5
32	Up to 300	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	—	75	45	6	8	76.5
40	Up to 300	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	50	8	10	84.5

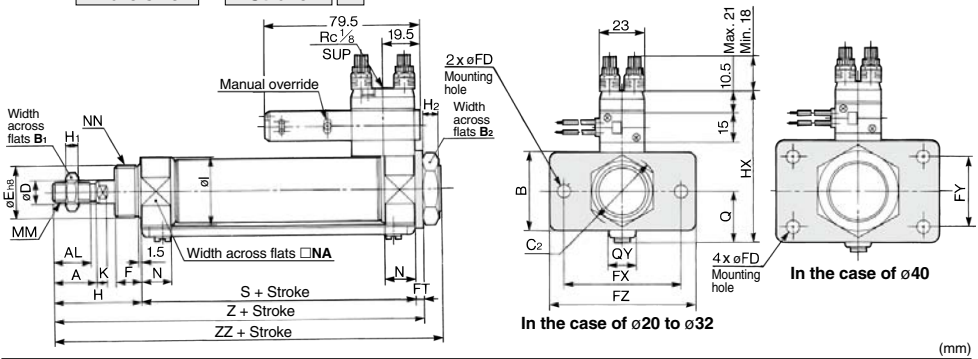
(mm)

Bore size (mm)	I	K	MM	N	NA	NN	Q	QY	S	Z	ZZ
20	28	5	M8 x 1.25	15	24	M20 x 1.5	19.8	14	62	37	116
25	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	22	14	62	41	120
32	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	25.8	16	64	41	122
40	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	29.8	16	88	45	154

∗ For short strokes, a solenoid valve may protrude from the rod cover end. Confirm S dimension and solenoid dimensions.
∗ Brackets are packaged together.

Head Side Flange Style (G)

CVM5G **Bore size** – **Stroke** ☐



(mm)

Bore size (mm)	Stroke range	A	AL	B	B_1	B_2	C_2	D	Eh_8	F	FD	FT	FX	FY	FZ	H	H_1	H_2	HX
20	Up to 300	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	—	75	41	5	8	65.3
25	Up to 300	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	—	75	45	6	8	70.5
32	Up to 300	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	—	75	45	6	8	76.5
40	Up to 300	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	50	8	10	84.5

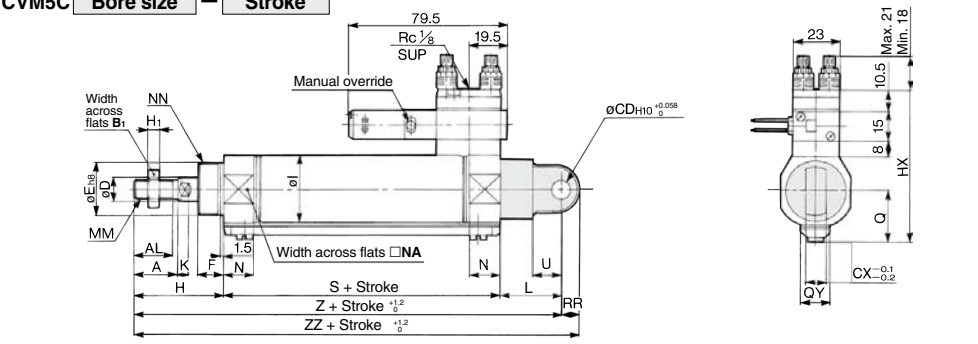
(mm)

Bore size (mm)	I	K	MM	N	NA	NN	Q	QY	S	Z	ZZ
20	28	5	M8 x 1.25	15	24	M20 x 1.5	19.8	14	62	107	116
25	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	22	14	62	111	120
32	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	25.8	16	64	113	122
40	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	29.8	16	88	143	154

∗ Brackets are packaged together.

Single Clevis Style (C)

CVM5C **Bore size** – **Stroke**



(mm)

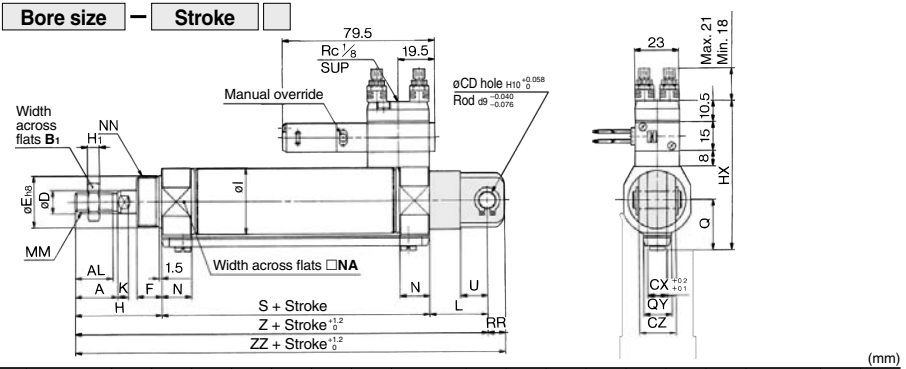
Bore size (mm)	Stroke range	A	AL	B_1	CD	CX	D	Eh_8	F	H	H_1	I	HX	K	L	MM	N	NA
20	Up to 300	18	15.5	13	9	10	8	$20^{0}_{-0.033}$	13	41	5	28	65.3	5	30	M8 x 1.25	15	24
25	Up to 300	22	19.5	17	9	10	10	$26^{0}_{-0.033}$	13	45	6	33.5	70.5	5.5	30	M10 x 1.25	15	30
32	Up to 300	22	19.5	17	9	10	12	$26^{0}_{-0.033}$	13	45	6	37.5	76.5	5.5	30	M10 x 1.25	15	34.5
40	Up to 300	24	21	22	10	15	14	$32^{0}_{-0.039}$	16	50	8	46.5	84.5	7	39	M14 x 1.5	21.5	42.5

(mm)

Bore size (mm)	NN	Q	QY	RR	S	U	Z	ZZ
20	M20 x 1.5	19.8	14	9	62	14	133	142
25	M26 x 1.5	22	14	9	62	14	137	146
32	M26 x 1.5	25.8	16	9	64	14	139	148
40	M32 x 2	29.8	16	11	88	18	177	188

Double Clevis Style (D)

CVM5D | **Bore size** | — | **Stroke** | |



(mm)

Bore size (mm)	Stroke range	A	AL	B1	CD	CX	CZ	D	Eh8	F	H	H1	HX	I	K	L	MM	N	NA
20	Up to 300	18	15.5	13	9	10	19	8	20 0 −0.033	13	41	5	65.3	28	5	30	M8 x 1.25	15	24
25	Up to 300	22	19.5	17	9	10	19	10	26 0 −0.033	13	45	6	70.5	33.5	5.5	30	M10 x 1.25	15	30
32	Up to 300	22	19.5	17	9	10	19	12	26 0 −0.033	13	45	6	76.5	37.5	5.5	30	M10 x 1.25	15	34.5
40	Up to 300	24	21	22	10	15	30	14	32 0 −0.039	16	50	8	84.5	46.5	7	39	M14 x 1.5	21.5	42.5

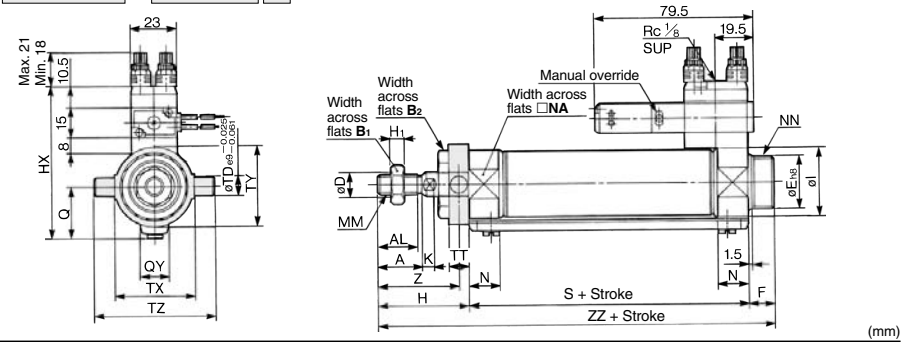
(mm)

Bore size (mm)	NN	Q	QY	RR	S	U	Z	ZZ
20	M20 x 1.5	19.8	14	9	62	14	133	142
25	M26 x 1.5	22	14	9	62	14	137	146
32	M26 x 1.5	25.8	16	9	64	14	139	148
40	M32 x 2	29.8	16	11	88	18	177	188

∗ Clevis pin and snap ring (cotter pin for ø40) are packaged together.

Rod Side Trunnion Style (U)

CVM5U | **Bore size** | — | **Stroke** | |



(mm)

Bore size (mm)	Stroke range	A	AL	B1	B2	D	Eh8	F	H	H1	HX	I	K	MM	N	NA	NN	Q
20	Up to 300	18	15.5	13	26	8	20 0 −0.033	13	41	5	65.3	28	5	M8 x 1.25	15	24	M20 x 1.5	19.8
25	Up to 300	22	19.5	17	32	10	26 0 −0.033	13	45	6	70.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	22
32	Up to 300	22	19.5	17	32	12	26 0 −0.033	13	45	6	76.5	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	25.8
40	Up to 300	24	21	22	41	14	32 0 −0.039	16	50	8	84.5	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	29.8

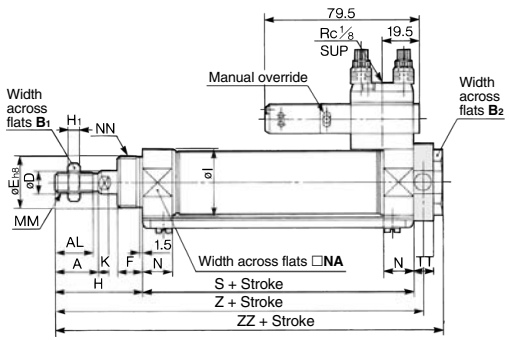
(mm)

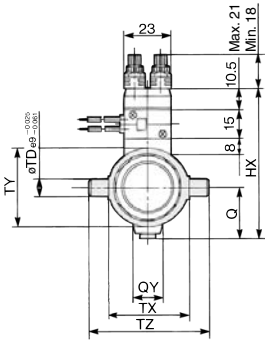
Bore size (mm)	QY	S	TD	TT	TX	TY	TZ	Z	ZZ
20	14	62	8	10	32	32	52	36	116
25	14	62	9	10	40	40	60	40	120
32	16	64	9	10	40	40	60	40	122
40	16	88	10	11	53	53	77	44.5	154

∗ Brackets are packaged together.

Head Side Trunnion Style (T)

CVM5T | **Bore size** | **—** | **Stroke** | |





(mm)

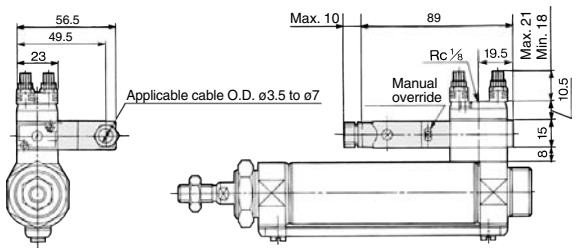
Bore size (mm)	Stroke range	A	AL	B_1	B_2	D	Eh_8	F	H	H_1	HX	I	K	MM	N	NA	NN
20	Up to 300	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	41	5	65.3	28	5	M8 x 1.25	15	24	M20 x 1.5
25	Up to 300	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	45	6	70.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5
32	Up to 300	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	45	6	76.5	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5
40	Up to 300	24	21	22	41	14	$32^{0}_{-0.039}$	16	50	8	84.5	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2

(mm)

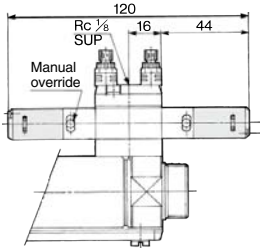
Bore size (mm)	Q	QY	S	TD	TT	TX	TY	TZ	Z	ZZ
20	19.8	14	62	8	10	32	32	52	108	118
25	22	14	62	9	10	40	40	60	112	122
32	25.8	16	64	9	10	40	40	60	114	124
40	29.8	16	88	10	11	53	53	77	143.5	154

∗ Brackets are packaged together.

DIN Terminal



Double Solenoid



∗ For the mounting brackets of flange, single clevis, double clevis and head side trunnion style, the doule soleoid may not be used depending on the mounting conditions.

Accessory Dimensions

Accessories for Series CVM5 are the same specifications as those for Series CM2. Refer to Best Pneumatics No. 2 (it is not applicable to clevis integrated style).

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting

Series CVM5K

ø20, ø25, ø32, ø40

How to Order

Solenoid valve voltage

Standard		Option	
1	100 VAC (50/60 Hz)	3	110 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)	4	220 VAC (50/60 Hz)
5	24 VDC	6	12 VDC

For other rated voltages, please consult with SMC.

Electrical entry

G	Grommet
L	L plug connector
M	M plug connector
D	DIN terminal

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
T	Head side trunnion style
U	Rod side trunnion style

Solenoid valve

1	2 position single
2	2 position double
3	3 position closed center (Option)
4	3 position exhaust center (Option)

Light/Surge voltage suppressor

Nil	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor (Except Type G)

Made to Order
Refer to page 1734 for details.

	CVM5K	L	32			–	100			–	1	1	M	Z	–					
With auto switch	CDVM5K	L	32			–	100			–	1	1	M	Z	–	M9BW		–	C	–

With auto switch (Built-in magnet)

Non-rotating rod type

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Piping

Nil	Screw-in type
F	Built-in One-touch fitting

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 1734.)

Suffix for cylinder

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Rod extended/retracted when energized

Nil	Rod extended when energized
B	Rod retracted when energized

∗ Only in case of 2 position single solenoid valve.

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Auto switch mounting bracket Note)

Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDVM5KF40-100-11GZ

Applicable Auto Switches/Refer to pages 1893 to 2007 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	●	●	●	○	—	○		
				2-wire	12 V		M9BV	M9B	●	●	●	○	—	○	—	
		Connector					—	H7C	●	—	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)	5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1	○	○	●	○	—	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1	○	○	●	○	—	○	—	
	With diagnostic output (2-color indication)			4-wire (NPN)	5 V, 12 V		—	H7NF	●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	●	—	●	—	—	—	IC circuit	—
			Yes	2-wire	24 V	100 V	—	A93V∗2	●	●	●	●	—	—	—	Relay, PLC
			None			100 V or less	—	A90V	●	—	●	—	—	—	IC circuit	
			Yes			100 V, 200 V	—	B54	●	—	●	●	—	—	—	
			None			200 V or less	—	B64	●	—	●	—	—	—		
		Connector	Yes			—	—	C73C	●	—	●	●	●	—		
			None			24 V or less	—	C80C	●	—	●	●	●	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	Yes		—		—	B59W	●	—	●	—	—	—	—	

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

∗ Since there are other applicable auto switches than listed, refer to page 1741 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1960 and 1961.
∗ D-A9□/M9□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

A hexagon shaped rod that does not rotate.

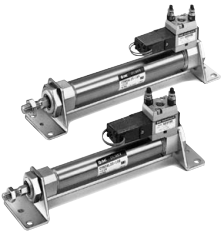
Non-rotating accuracy

ø20, ø25 — ±0.7°
ø32, ø40 — ±0.5°

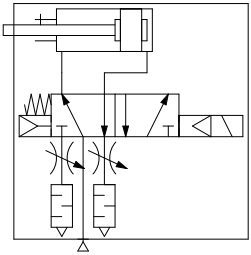
Can operate without lubrication.

Auto switches can also be mounted.

Can be installed with auto switches to facilitate the detection of the cylinder's stroke position.



Symbol
Rubber bumper



Made to Order

Made to Order Specifications (For details, refer to pages 2009 to 2152.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC6	Made of stainless steel

Refer to pages 1893 to 2007 for cylinders with auto switches.

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

Specifications

Applicable bore size (mm)		20	25	32	40
Rod non-rotating accuracy		± 0.7°		± 0.5°	
Fluid		Air			
Action		Double acting, Single rod			
Proof pressure		1.0 MPa			
Maximum operating pressure		0.7 MPa			
Minimum operating pressure		0.15 MPa			
Ambient and fluid temperature		–10 to 50°C (No freezing)			
Lubrication		Not required (Non-lube)			
Stroke length tolerance		$^{+1.4}_{0}$			
Piston speed (mm/s)		50 to 700*	50 to 650*	50 to 590*	50 to 420*
Allowable kinetic energy		0.27 J	0.4 J	0.65 J	1.2 J
Port size	**Screw-in type**	Rc 1/8			
	Built-in One-touch fitting	O.D.: ø6/I.D.: ø4			
Mounting		Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Head side trunnion style, Rod side trunnion style			

Note) The figures marked with "*" represent the values of the cylinder with the silencer type exhaust throttle valve removed. To operate the cylinder at these values, prevent dust from entering by installing an AN120-M5 silencer on the EXH port.

Solenoid Valve Specifications

Applicable solenoid valve model			Series VZ3□90
Coil rated voltage			Standard: 100/200 VAC (50/60 Hz), 24 VDC Semi-standard: 110/220 VAC, 12 VDC
Effective area of valve (Cv factor)			4.5 mm² (0.25)
Allowable voltage			–15 to 10%
Coil insulation			Class B or equivalent (130°C)
Electrical entry			Grommet, L plug connector, M plug connector, DIN terminal
Power consumption (W) Note)	**DC**		1.8 (With indicator light: 2.1)
Apparent power (VA) Note)	**AC**	**Inrush**	4.5/50 Hz, 4.2/60 Hz
		Holding	3.5/50 Hz, 3.0/60 Hz

Note) At the rated voltage.

Standard Stroke

Bore size (mm)	Standard stroke (mm) Note)
20	25, 50, 75, 100, 125, 150 200, 250, 300
25	
32	
40	

Note) Other intermediate strokes can be manufactured upon receipt of order.
Although it is possible to make up to 1000 stroke length, when exceeding the standard stroke, there may be the case which cannot meet the specifications.

Rod Boot Material

Symbol	Rod boot material	Maximum ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C *

* Maximum ambient temperature for the rod boot itself.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.25	0.32	0.39	0.67
	Axial foot style	0.40	0.48	0.55	0.94
	Flange style	0.31	0.41	0.48	0.79
	Single clevis style	0.29	0.36	0.43	0.76
	Double clevis style	0.30	0.38	0.44	0.80
	Trunnion style	0.29	0.39	0.45	0.77
Additional weight per each 50 mm of stroke		0.05	0.07	0.09	0.14
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (with pin)	0.07	0.07	0.07	0.20

Calculation: (Example) **CVM5KL32-100-11G**
- Basic weight····· 0.55 (kg) (Axial foot style ø32)
- Additional weight····· 0.09 (kg/50 st)
- Cylinder stroke ····· 100 (st) 0.55 + 0.09 x 100/50 = 0.73 kg

Mounting Bracket Part No.

Bore size (mm)	20	25	32	40
Axial foot *	CM-L020B	CM-L032B		CM-L040B
Flange	CM-F020B	CM-F032B		CM-F040B
Single clevis	CM-C020B	CM-C032B		CM-C040B
Double clevis **	CM-D020B	CM-D032B		CM-D040B
Trunnion (With nut)	CM-T020B	CM-T032B		CM-T040B

* Two foot brackets and a mounting nut are attached. When ordering the foot bracket, order 2 pcs. per cylinder.
** Clevis pin and snap ring (cotter pin for ø40) are packaged together.

Mounting Bracket and Accessory

Accessory / Mounting	Standard equipment			Option			
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint (3)	Pivot bracket (5)	Pivot bracket pin (6)
Basic style	● (1 pc.)	●	—	●	●	—	—
Axial foot style	● (2)	●	—	●	●		
Rod side flange style	● (1)	●	—	●	●		
Head side flange style	● (1)	●	—	●	●		
Single clevis style	— (1)	●	—	●	●	●	●
Double clevis style (3)	— (1)	●	● (4)	●	●	—	—
Head side trunnion style	● (1) (2)	●	—	●	●	●	—
Rod side trunnion style	● (1) (2)	●	—	●	●		

Note 1) Mounting nut is not equipped with single clevis style and double clevis style.
Note 2) Trunnion nuts are equipped for head side trunnion and rod side trunnion.
Note 3) Pin and set ring are shipped together with double clevis and double knuckle joint.
Note 4) Retaining rings (cotter pins for ø40) are included in clevis pins.
Note 5) Pin and retaining ring are not included in pivot bracket.
Note 6) Retaining rings are included in pivot bracke pin.

⚠ Precautions

Be sure to read before handling. Refer to front matter 39 for Safety Instructions, pages 3 to 12 for Actuator and Auto Switch Precautions and 3/4/5 Port Solenoid Valve Precautions in Best Pneumatics No. 1.

Precautions

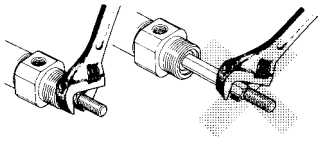
⚠Warning

1. Do not rotate the cover.
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠Caution

1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.
If rotational torque is applied, the non-rotating guide will deform, causing a loss of non-rotating accuracy. Also, to screw a bracket or a nut onto the threaded portion at the end of the piston rod, make sure to retract the piston rod entirely, and place a wrench on the parallel sections of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.

Allowable rotational torque (N·m or less)	ø20	ø25	ø32	ø40
	0.2	0.25	0.25	0.44



Disassembly/Replacement

⚠Caution

1. When replacing rod seals, please contact SMC.
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.

2. Not able to disassemble.
Since the cover and the cylinder tube are combined by crimping method, it is impossible to disassemble it. Therefore, the internal parts of a cylinder other than rod seal cannot be replaced at all.

3. Do not touch the cylinder during operation.
If the cylinder is operating at a high frequency, be aware that the cylinder tube surface could become very hot, creating the risk of burns.

4. Conjoin the rod end part, so that rod boot might not be twisted.
If a cylinder were installed with its rod boot being twisted, the rod boot could be damaged during operation.

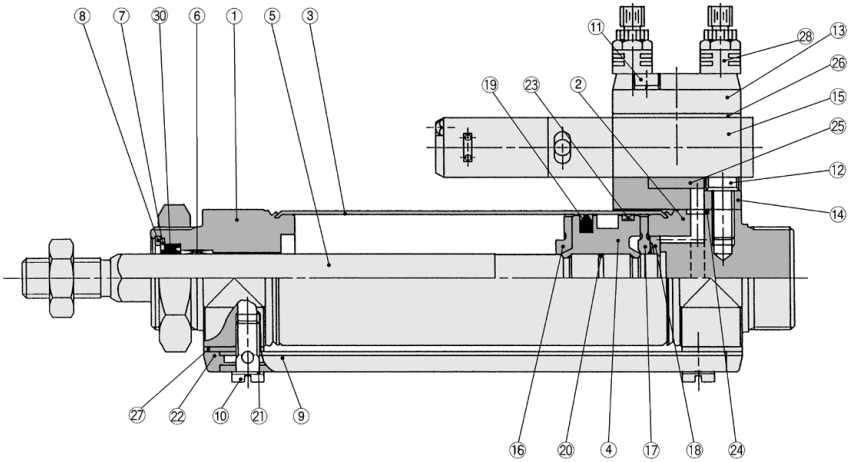
Model Selection

⚠Warning

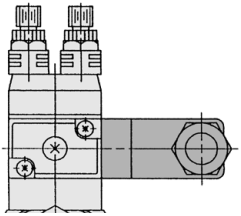
1. Confirm the specifications.
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)

2. Energizing continuously for a long period of time
When the valve is continuously energized for a long period of time, the performance may deteriorate, shorten the service life or affect peripheral equipment adversely since temperature rises when coils generate heat.

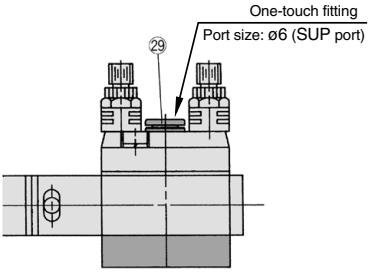
Construction



DIN terminal



Built-in One-touch fitting



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Clear anodized
2	**Head cover**	Aluminum alloy	Clear anodized
3	**Cylinder tube**	Stainless steel	
4	**Piston**	Aluminum alloy	Chromated
5	**Piston rod**	Stainless steel	
6	**Non-rotating guide**	Bearing alloy	
7	**Seal retainer**	Rolled steel	Nickel plated
8	**Retaining ring**	Carbon tool steel	Phosphate coated
9	**Pipe**	Aluminum alloy	White anodized
10	**Stud**	Brass	Electroless nickel plated
11	Hex. socket head cap screw with spring washer	Carbon steel	Nickel plated
12	Hex. socket head cap screw with spring washer	Carbon steel	Nickel plated
13	**Plate**	Aluminum alloy	Metallic painted
14	**Sub-plate**	Aluminum alloy	Metallic painted
15	**Solenoid valve**	—	Refer to the "How to order" below.*
16	**Bumper A**	Urethane	
17	**Bumper B**	Urethane	

Component Parts

No.	Description	Material	Note
18	**Retaining ring**	Stainless steel	
19	**Piston seal**	NBR	
20	**Piston gasket**	NBR	
21	**Gasket**	Resin	
22	**Pipe gasket**	Urethane rubber	
23	**Wear ring**	Resin	
24	**Head cover gasket**	NBR	
25	**Sub-plate gasket**	NBR	
26	**Gasket**	NBR	
27	**Spacer gasket**	Resin	Except ø25
28	**Exhaust throttle with silencer**	—	ASN2-M5
29	**One-touch fitting**	—	Port size: ø6

∗ How to order solenoid valves

VZ3 □ 90 – □□□

- Type of actuation
- Electrical entry
- Rated voltage
- Light/surge voltage suppressor

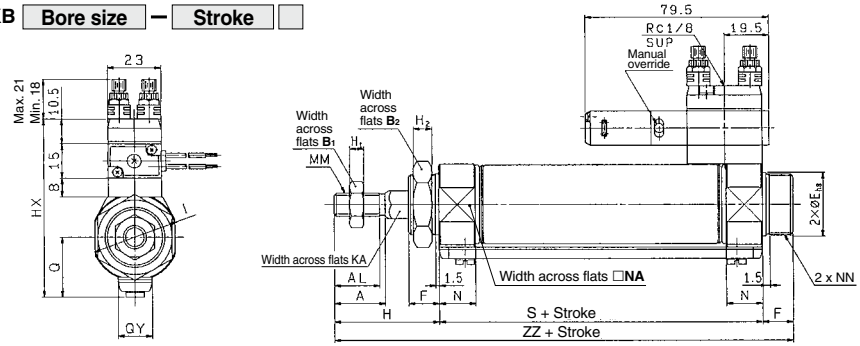
Replacement Parts/Seal Kit

No.	Description	Material	Part no.			
			20	**25**	**32**	**40**
30	**Rod seal**	NBR	CM2K20-PS	CM2K25-PS	CM2K32-PS	CM2K40-PS

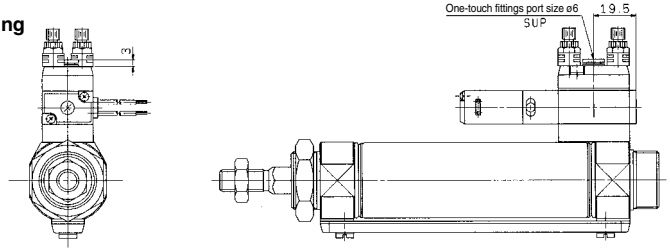
∗ Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10g)

Basic Style (B): External Dimensions

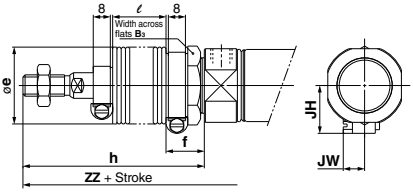
CVM5KB Bore size – Stroke



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 1732.

(mm)

Bore size (mm)	Stroke range	A	AL	B1	B2	Eh8	F	Q	QY	H	H1	H2	HX	I	KA	MM	N	NA	NN	S	ZZ
20	Up to 300	18	15.5	13	26	$20^{0}_{-0.033}$	13	19.8	14	41	5	8	65.3	28	8.2	M8 x 1.25	15	24	M20 x 1.5	62	116
25	Up to 300	22	19.5	17	32	$26^{0}_{-0.033}$	13	22	14	45	6	8	70.5	33.5	10.2	M10 x 1.25	15	30	M26 x 1.5	62	120
32	Up to 300	22	19.5	17	32	$26^{0}_{-0.033}$	13	25.8	16	45	6	8	76.5	37.5	12.2	M10 x 1.25	15	34.5	M26 x 1.5	64	122
40	Up to 300	24	21	22	41	$32^{0}_{-0.039}$	16	29.8	16	50	8	10	84.5	46.5	14.2	M14 x 1.5	21.5	42.5	M32 x 2	88	154

With Rod Boot

(mm)

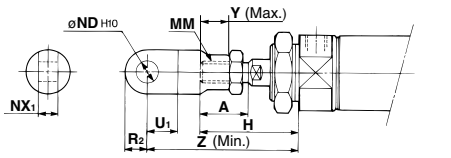
Bore size (mm)	B3	e	f	h					ℓ					JH	JW
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	(Reference)	(Reference)
20	30	36	18	68	81	93	106	131	12.5	25	37.5	50	75	23.5	10.5
25	32	36	18	72	85	97	110	135	12.5	25	37.5	50	75	23.5	10.5
32	32	36	18	72	85	97	110	135	12.5	25	37.5	50	75	23.5	10.5
40	41	46	20	77	90	102	115	140	12.5	25	37.5	50	75	27	10.5

(mm)

Bore size (mm)	ZZ				
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300
20	143	156	168	181	206
25	147	160	172	185	210
32	149	162	174	187	212
40	181	194	206	219	244

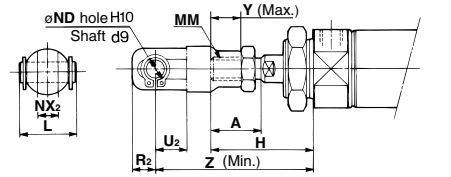
Accessory dimensions

Single Knuckle Joint Mounting (mm)



Bore size	A	H	MM	ND H10	NX1	U1	R2	Y	Z
20	18	41	M8 x 1.25	9 $^{+0.058}_{0}$	9 $^{-0.1}_{-0.2}$	14	10	11	66
25, 32	22	45	M10 x 1.25	9 $^{+0.058}_{0}$	9 $^{-0.1}_{-0.2}$	14	10	14	69
40	24	50	M14 x 1.5	12 $^{+0.070}_{0}$	16 $^{-0.1}_{-0.3}$	20	14	13	92

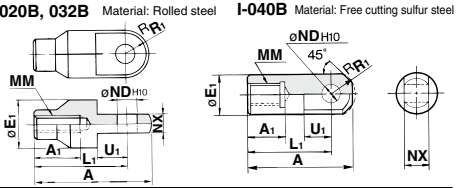
Double Knuckle Joint Mounting (mm)



Bore size	A	H	L	MM	ND	NX2	R2	U2	Y	Z
20	18	41	25	M8 x 1.25	9	9 $^{+0.2}_{+0.1}$	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	9 $^{+0.2}_{+0.1}$	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	16 $^{+0.3}_{+0.1}$	13	25	13	92

Single Knuckle Joint (mm)

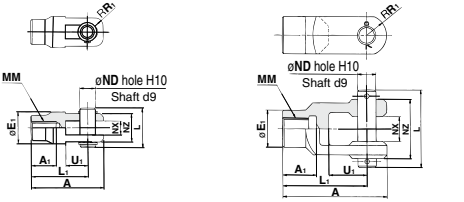
I-020B, 032B Material: Rolled steel **I-040B** Material: Free cutting sulfur steel



Part no.	Applicable bore size	A	A1	E1	L1	MM	ND H10	NX	R1	U1
I-020B	**20**	46	16	20	36	M8 x 1.25	9 $^{+0.058}_{0}$	9 $^{-0.1}_{-0.2}$	10	14
I-032B	**25, 32**	48	18	20	38	M10 x 1.25	9 $^{+0.058}_{0}$	9 $^{-0.1}_{-0.2}$	10	14
I-040B	**40**	69	22	24	55	M14 x 1.5	12 $^{+0.070}_{0}$	16 $^{-0.1}_{-0.3}$	15.5	20

Double Knuckle Joint (mm)

Y-020B, Y-032B Material: Rolled steel **Y-040B** Material: Cast iron



Part no.	Applicable cylinder bore size	A	A1	E1	L	L1	MM	ND
Y-020B	20	46	16	20	25	36	M8 x 1.25	9
Y-032B	25, 32	48	18	20	25	38	M10 x 1.25	9
Y-040B	40	68	22	24	49.7	55	M14 x 1.5	12

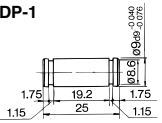
Part no.	NX	NZ	R1	U1	Applicable pin par no.	Retaining ring Cotter pin size
Y-020B	9 $^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C9 for shaft
Y-032B	9 $^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C9 for shaft
Y-040B	16 $^{+0.3}_{+0.1}$	38	13	25	CDP-3	ø3 x 18ℓ

∗ Knuckle pins and retaining rings (cotter pins for ø40) are included.

Double Clevis Pin/Material: Carbon steel (mm)

Bore size: ø20, ø25, ø32

CDP-1

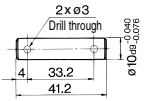


Retaining ring: Type C9 for shaft

∗ Retaining rings (cotter pins for ø40) are included.

Bore size: ø40

CDP-2

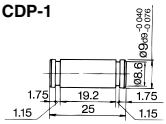


Cotter pins used
ø3 x 18ℓ

Double Clevis Pin/Material: Carbon steel (mm)

Bore size: ø20, ø25, ø32

CDP-1

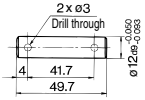


Retaining ring: Type C9 for shaft

∗ Retaining rings (cotter pins for ø40) are included.

Bore size: ø40

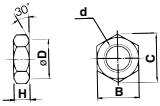
CDP-3



Cotter pins used
ø3 x 18ℓ

Rod End Nut (mm)

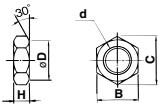
Material: Carbon steel



Part no.	Applicable bore size	B	C	D	d	H
NT-02	**20**	13	15.0	12.5	M8 x 1.25	5
NT-03	**25, 32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8

Mounting Nut (mm)

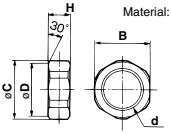
Material: Carbon steel



Part no.	Applicable bore size	B	C	D	d	H
SN-020B	**20**	26	30	25.5	M20 x 1.5	8
SN-032B	**25, 32**	32	37	31.5	M26 x 1.5	8
SN-040B	**40**	41	47.3	40.5	M32 x 2.0	10

Trunnion Nut (mm)

Material: Carbon steel



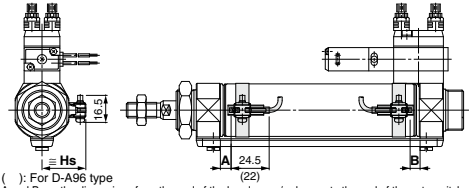
Part no.	Applicable bore size	B	C	D	d	H
TN-020B	**20**	26	28	25.5	M20 x 1.5	10
TN-032B	**25, 32**	32	34	31.5	M26 x 1.5	10
TN-040B	**40**	41	45	40.5	M32 x 2	10

Auto Switch Mounting 1

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

Reed auto switch

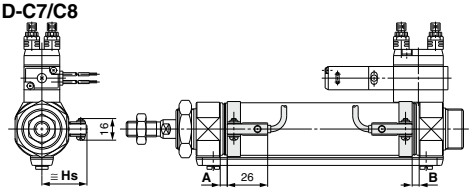
D-A9□



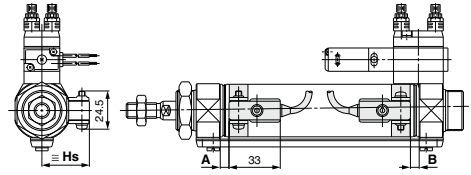
( ): For D-A96 type

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

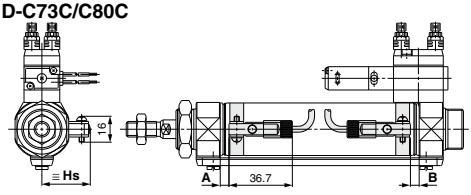
D-C7/C8



D-B5/B6/B59W

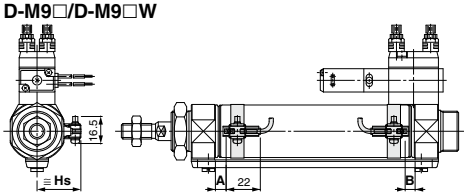


D-C73C/C80C

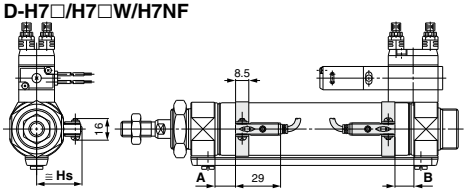


Solid state auto switch

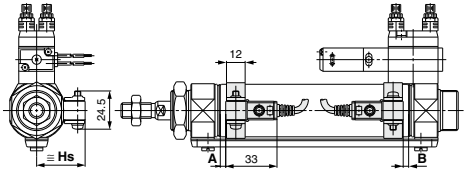
D-M9□/D-M9□W



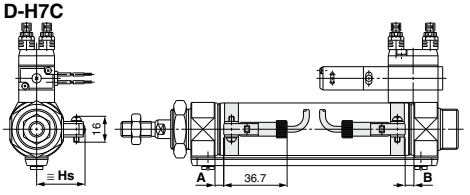
D-H7□/H7□W/H7NF



D-G5NT



D-H7C



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

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size (mm)	D-A9□(V)		D-M9□(V) D-M9□W(V) D-A9□A(V)		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-H7□ D-H7C D-H7□W D-H7NF		D-G5NT	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	6.5	5.5	10.5	9.5	1	0	7	6	4	3	6	5	2.5	1.5
25	6.5	5.5	10.5	9.5	1	0	7	6	4	3	6	5	2.5	1.5
32	7.5	6.5	11.5	10.5	2	1	8	7	5	4	7	6	3.5	2.5
40	13.5	11.5	17.5	15.5	7	6	13	12	10	9	12	11	8.5	7.5

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

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size (mm)	D-A9□(V) D-M9□(V) D-M9□W(V) D-M9□A(V)	D-B5□ D-B64 D-B59W D-G5NT D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C
	Hs	Hs	Hs	Hs
20	23	25.5	22.5	25
25	25.5	28	25	27.5
32	29	31.5	28.5	31
40	33	35.5	32.5	35

Auto Switch Mounting 2

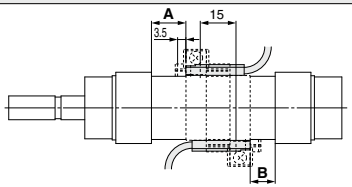
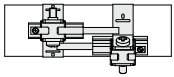
Minimum Auto Switch Mounting Stroke

n: No. of auto switches (mm)

Auto switch model	No. of auto switch mounted				
	1	2		n	
		Different surfaces	Same surface	Different surfaces	Same surface
D-A9□ **D-M9□** **D-M9□W**	10	15 Note 1)	45 Note 1)	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	45 + 45 (n - 2) (n = 2, 3, 4, 5···)
D-M9□V	5	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	35 + 35 (n - 2) (n = 2, 3, 4, 5···)
D-A9□V	5	15	25	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	25 + 35 (n - 2) (n = 2, 3, 4, 5···)
D-M9□WV **D-M9□AV**	10	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	35 + 35 (n - 2) (n = 2, 3, 4, 5···)
D-C7□ **D-C80**	10	15	50	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	50 + 45 (n - 2) (n = 2, 3, 4, 5···)
D-H7□ **D-H7□W** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	60 + 45 (n - 2) (n = 2, 3, 4, 5···)
D-C73C **D-C80C** **D-H7C**	10	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	65 + 50 (n - 2) (n = 2, 3, 4, 5···)
D-B5□/B64 **D-G5NT**	10	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	75 + 55 (n - 2) (n = 2, 3, 4, 5···)
D-B59W	15	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 2)	75 + 55 (n - 2) (n = 2, 3, 4, 5···)

Note 2) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

Auto switch model	With 2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
	 The proper auto switch mounting position is 6 mm inward from the switch holder edge.	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-A93	—	45 to less than 50 stroke
D-M9□ **D-M9□W**	15 to less than 20 stroke	45 to less than 55 stroke

Operating Range

(mm)

Auto switch model	Bore size (mm)			
	20	**25**	**32**	**40**
D-A9□(V)	6	6	6	6
D-M9□(V)/M9□W(V) **D-M9□A(V)**	3.5	3	3.5	3
D-C7□/C80 **D-C73C/C80C**	7	8	8	8
D-B5□/B64	8	8	9	9
D-B59W	12	12	13	13
D-H7□/H7□W **D-G5NT/H7NF**	4	4	4.5	5
D-H7C	7	8.5	9	10

∗ Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

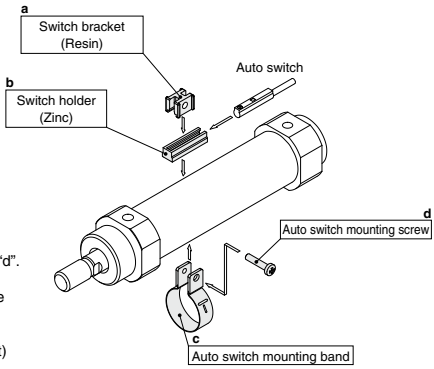
Auto Switch Mounting Bracket: Part No.

Auto switch mounting	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-M9□(V) **D-M9□W(V)** **D-A9□(V)**	BM5-020 Note 1)	BM5-025 Note 1)	BM5-032 Note 1)	BM5-040 Note 1)
D-M9□A(V)	BM5-020S Note 2)	BM5-025S Note 2)	BM5-032S Note 2)	BM5-040S Note 2)
D-H7□ **D-H7□W** **D-H7NF** **D-C7□/C80** **D-C73C/C80C**	BM2-020A	BM2-025A	BM2-032A	BM2-040A
D-B5□/B64 **D-B59W** **D-G5NT** **D-G5NB**	BA2-020	BA2-025	BA2-032	BA2-040

Note 1) Set part number which includes the auto switch mounting band (BM2-□□□A) and the holder kit (BJ5-1/Switch bracket: Transparent).
Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please consult SMC regarding other chemicals.
Note 2) Set part number which includes the auto switch mounting band (BM2-□□□AS/tainless steel screw) and the holder kit (BJ4-1/Switch bracket: White).
Note 3) For the D-M9□A (V) type auto switch, do not install the switch bracket on the indicator light.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)
BBA4: For D-C7/C8/H7 types
Note 2) Refer to page 1990 for the details of BBA4.



(1) BJ□-1 is a set of "a" and "b".
(2) BM2-□□□A (S) is a set of "c" and "d".
Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).
BJ4-1 (Switch bracket: White)
BJ5-1 (Switch bracket: Transparent)

Besides the models listed in How to Order, the following auto switches are applicable.
Refer to pages 1893 to 2007 for detailed specifications.

Auto switch type	Part no.	Electrical entry (Fetching direction)	Features
Reed	D-B53, C73, C76	Grommet (In-let)	—
	D-C80		Without indicator light
Solid state	D-H7A1, H7A2, H7B		—
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-color)
	D-G5NT		With timer

∗ For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1960 and 1961 for details.
∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to page 1911 for details.
∗ Wide range detection type, solid state auto switches (D-G5NB type) are also available. Refer to page 1953 for details.