



Series CV Precautions 1

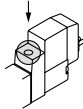
Be sure to read before handling.
Applicable Series: CVJ5, CVJ3

Manual Operation

Warning

1. Since the devices in connection are operated by manual override, make sure that there is no danger.

- **Non-locking push type (Standard type)**
Push in the direction the arrow indicates.



Solenoid Valve for 200/220 VAC Specifications

Warning

1. Grommet-type and L/M plug connector-type solenoid valves for AC specifications have built-in rectifier circuits in the pilot valves and drive the DC coil.

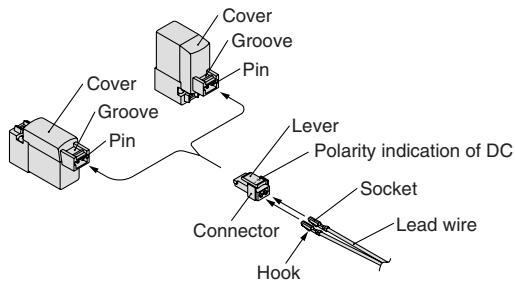
The rectifier circuit in the pilot valve for 200/220 VAC specifications generates heat when the valve is energized. The outside surface may, depending on the energizing conditions, become very hot, so please do not touch the valve, as this may result in burns.

Plug Connector

Caution

1. Connector installation and removal

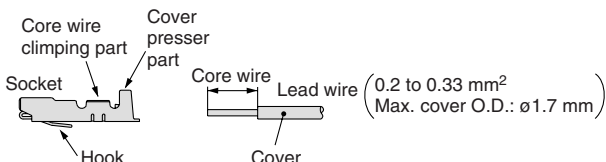
- To install the connector, squeeze the lever and the connector body with your fingers, slide the connector straight over the pin, and lock it in place by pushing the tab of the lever into the groove in the cover.
- To remove the connector, press the lever with your thumb to disengage the tab from the groove, and pull the connector straight out.



2. Crimping the lead wire into the socket

Peel approximately 3.2 to 3.7 mm of insulation from the tip of the lead wire, make sure that the ends of the core wire are even, insert the wire into the socket, and crimp it with a crimping tool. At this time, make sure that the insulation of the lead wire does not enter the area in which the core wire is crimped. Use a special crimping tool.

(Please contact SMC for details on the special crimping tool.)



Plug Connector

Caution

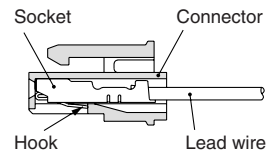
3. Installation and removal of the sockets containing lead wires

- **Installation:**

Insert the sockets into the square holes of the connector (marked + and -, respectively), pinch the lead wires to push them in entirely, allowing the hook on each socket to engage with the seat of the connector, thus locking the socket in place. (Because the hook is open, it locks automatically when the socket is pushed in.) Then, lightly pull on the lead wires to verify that the sockets have been properly locked.

- **Removal:**

To pull the sockets out of the connector, use a rod with a small tip (approximately 1 mm) to press the hook of the socket and pull the lead wire out. To reuse the socket, expand the hook outward.

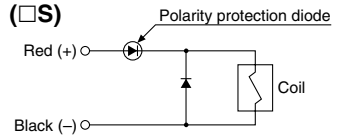


Surge Voltage Suppressor

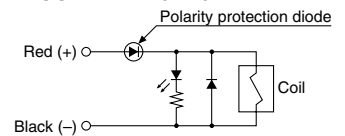
Caution

For DC:
Grommet type, L/M plug connector type

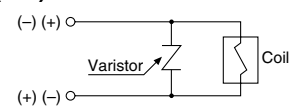
- **Standard type (With polarity)**
With surge voltage suppressor (□S)



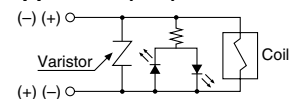
- **With light/surge voltage suppressor (□Z)**



- **Non-polar type**
With surge voltage suppressor (□R)



- **With light/surge voltage suppressor (□U)**



- Please correctly connect the lead wires to the + (positive) and - (negative) points on the connector when using the standard type. (For non-polar types, the lead wires can be connected in any order.)
- Because standard types with voltage specifications other than 24 and 12 VDC do not have polarity protection diodes, be careful not to mistake the polarity when connecting lead wires.
- If the lead wires are connected beforehand, the red wire is +, and the black wire is -.



Series CV Precautions 2

Be sure to read before handling.
Applicable Series: CVM5, CVM3, MVGQ

Surge Voltage Suppressor

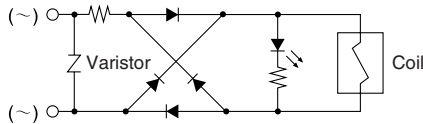
⚠ Caution

For AC:

(S option is not available since the voltage surge is suppressed by the rectifier.)

Grommet, L/M plug connector

With indicator light (□Z)



Selection

⚠ Warning

1. Please confirm product specifications

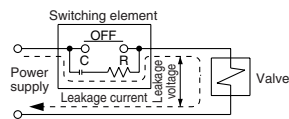
The products in this catalog are designed to be used with compressed air systems. Do not use them if pressure or temperature exceed specifications, since this may cause damage and/or malfunctions. (Refer to the specifications.)

2. Long-term continuous energization

- When valves are energized continuously for a long time, it may cause performance deterioration of solenoid valves and service life shortage, and adversely affect peripheral devices, due to temperature rise caused by the heat generation of coil.

3. Voltage leaking

When a resistor is used along with the switching element and a C-R element is used for protecting the switching element (surge voltage protector), be aware that there is an increase in leaked voltage when the leakage current flows through the resistor or the C-R element. Residual leaked voltage must be kept as follows.



For DC coil

3% of the rated voltage or below.

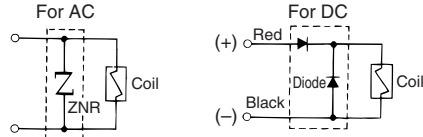
For AC coil

8% of the rated voltage or below.

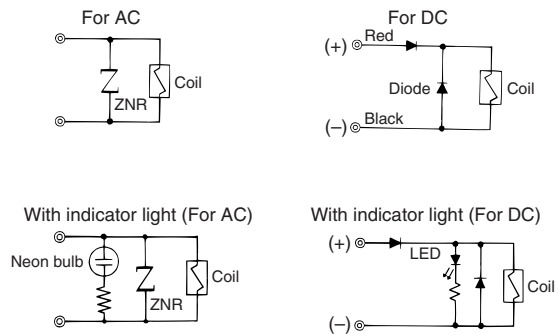
Light/Surge Voltage Suppressor

⚠ Caution

Grommet type

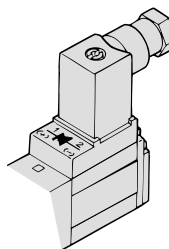


L/M plug connector type

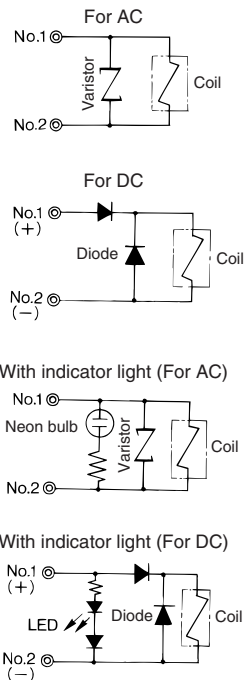
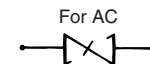


In the case of DC wiring, connect the wires by matching their polarities to the + and - marks. If the lead wires are connected beforehand, the red wire is +, and the black wire is -.

DIN terminal



* Marking



In the case of DC wiring, connect terminal no. 1 of the connector to the positive + side, and terminal no. 2 to the negative - side. (Refer to the marks on the terminal board.)

CV□

MVGQ

D-□

-X□

Individual
-X□



Series CV Precautions 3

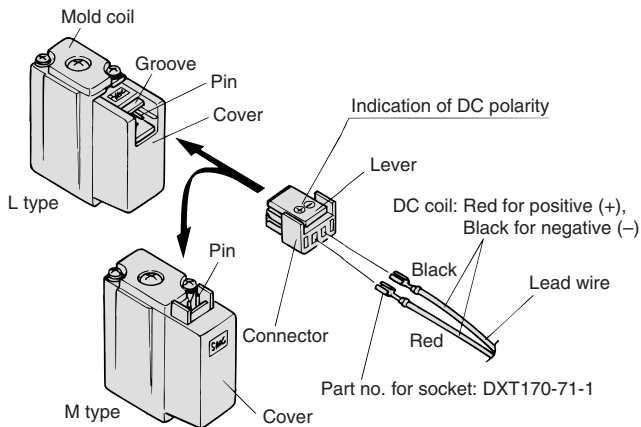
Be sure to read before handling.
Applicable Series: CVM5, CVM3, MVGG

Plug Connector

⚠ Caution

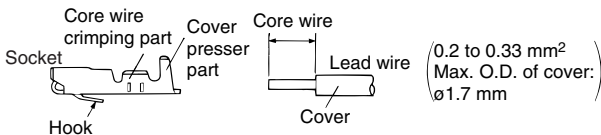
1. Connector installation and removal

- To install the connector, squeeze the lever and the connector body with your fingers, slide the connector straight over the pin, and lock it in place by pushing the tab of the lever into the groove in the cover.
- To remove the connector, press the lever with your thumb to disengage the tab from the groove, and pull the connector straight out.



2. Crimping the lead wire into the socket

- Peel approximately 3.2 to 3.7 mm of insulation from the tip of the lead wire, make sure that the ends of the core wire are even, insert the wire into the socket, and crimp it with a crimping tool. At this time, make sure that the insulation of the lead wire does not enter the area in which the core wire is crimped. Use a special crimping tool. (Crimping tool: model no. DX170-75-1)



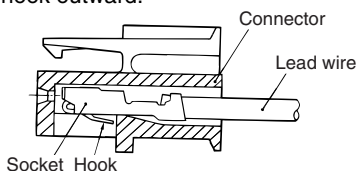
3. Installation and removal of the sockets containing lead wires

• Installation:

Insert the sockets into the square holes of the connector (marked + and -, respectively), then pinch the lead wires to push them in entirely, allowing the hook on each socket to engage with the seat of the connector, thus locking the socket in place. (Because the hook is open, it locks automatically when the socket is pushed in.) Then, lightly pull on the lead wires to verify that the sockets have been properly locked.

• Removal:

To pull the sockets out of the connector, use a rod with a small end (approximately 1 mm) to press the hook of the socket and pull the lead wire out. To reuse the socket, expand the hook outward.



Selection

⚠ Warning

1. Please confirm product specifications

The products in this catalog are designed to be used with compressed air systems. Do not use them if pressure or temperature exceed specifications, since this may cause damage and/or malfunctions. (Refer to the specifications.)

2. Long-term continuous energization

- When valves are energized continuously for a long time, it may cause performance deterioration of solenoid valves and service life shortage, and adversely affect peripheral devices, due to temperature rise caused by the heat generation of coil.

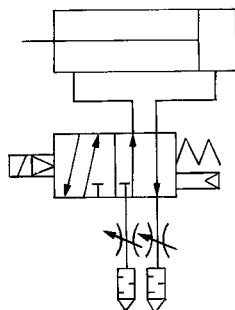
Series CVM5

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.



JIS Symbol



Made to Order Specifications

(For details, refer to pages 1836, 1851 to 1954.)

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 1579 to 1581 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
Fluid		Air			
Action		Double acting, Single rod			
Cushion		Rubber bumper			
Proof pressure		1 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 Option: 110/220 VAC, 12 VDC	
Effective area of valve (Cv factor)		4.5mm ² (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)}	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.

Mass

(kg)

Bore size (mm)		20	25	32	40
Basic mass	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 mass 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 mass 0.55 (kg) (Axial foot style ø32)
 - Additional mass 0.09/50 (kg/50 st)
 - Cylinder stroke 100 (st)
- $0.55 + 0.09 \times 100/50 = 0.73 \text{ kg}$

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment			Option	
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint ⁽³⁾
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⁾	●	●	●	●
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.

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 matters 42 and 43 for Safety Instructions, pages 3 to 11 for Actuator and Auto Switch Precautions and 3/4/5 Port Solenoid Valve Precautions in Best Pneumatics No. 1.

Mounting

⚠ Warning

- 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

- 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.
- 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.
- 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.
- 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.
- 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

- 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.)
- 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.

CV□
MVGQ

D-□
-X□
Individual
-X□

Series CVM5

Built-in One-touch Fitting

CVM5 Mounting style Bore size F — For "How to Order", refer to page 1563.

↓ Built-in One-touch fitting

One-touch fittings are installed on cylinders.



Application/Tubing O.D.

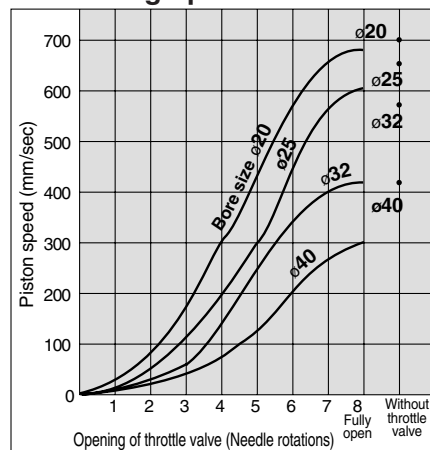
Bore size (mm)	20	25	32	40
Applicable tubing O.D. (mm)	ø6/4	ø6/4	ø6/4	ø6/4
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tube.			

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 1569 to 1572.

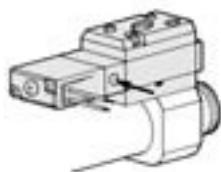
Opening Range of Throttle Valve and Driving Speed



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.



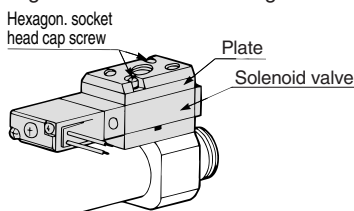
Piston Speed Adjustment

- 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.

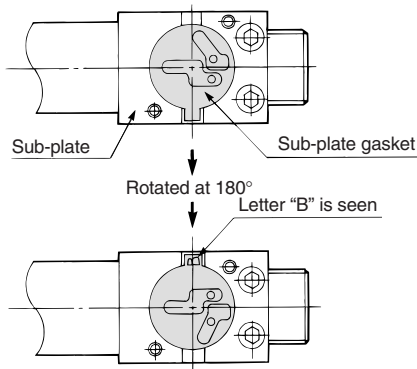
Changing between Rod Extended when Energized and Rod Retracted when Energized

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

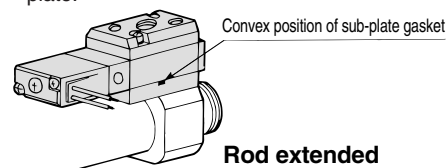


2. A sub-plate gasket is inside the sub-plate. Invert this sub-plate gasket 180° and install it with its letter "B" visible. (A portion that protrudes is provided on the periphery of the sub-plate gasket, and the letter "B" is on one side of this protrusion.)



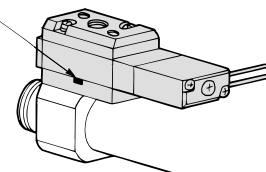
3. Install the solenoid valve and the plate, and tighten the hexagon socket bolts with a tool. The tightening torque is between 0.6 and 0.8 N·m.

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.



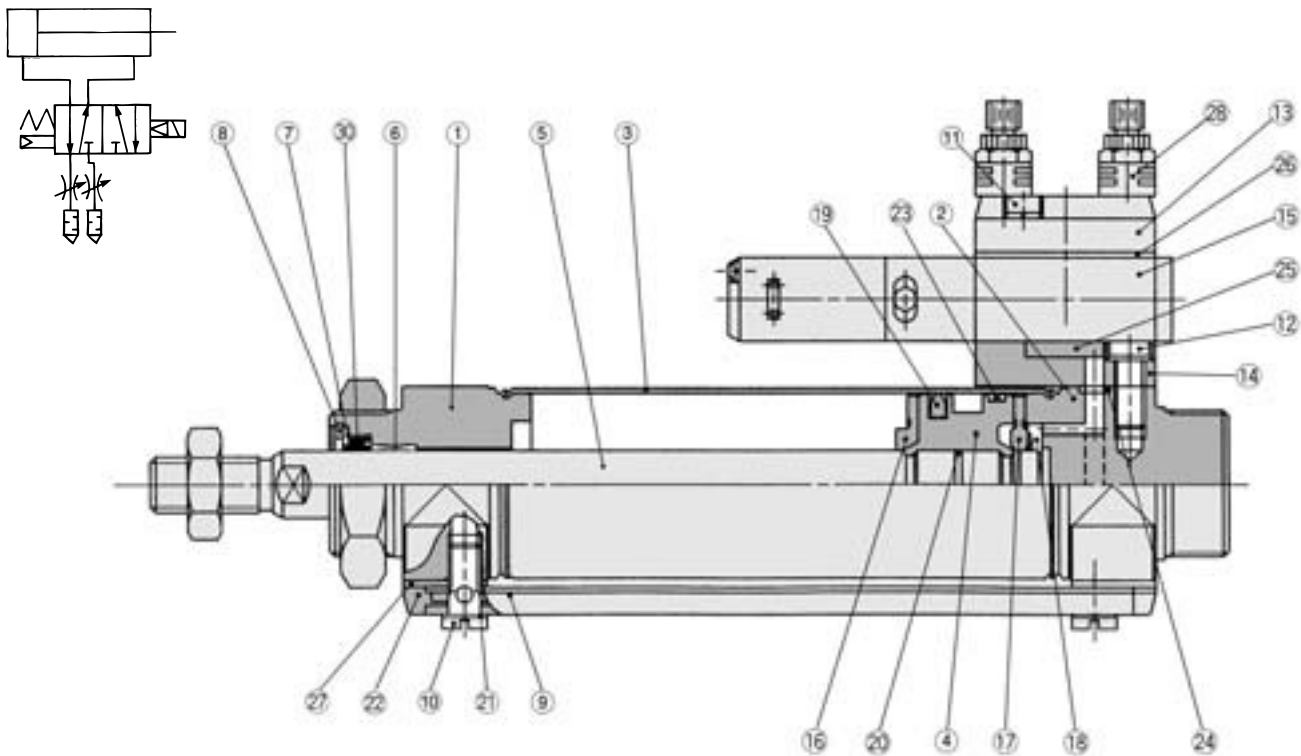
Rod extended when energized

Convex position of sub-plate gasket

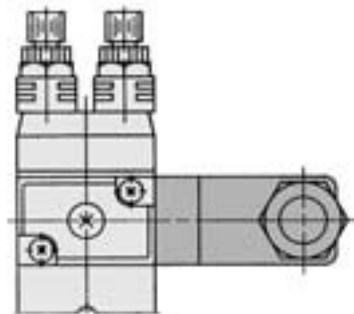


Rod retracted when energized

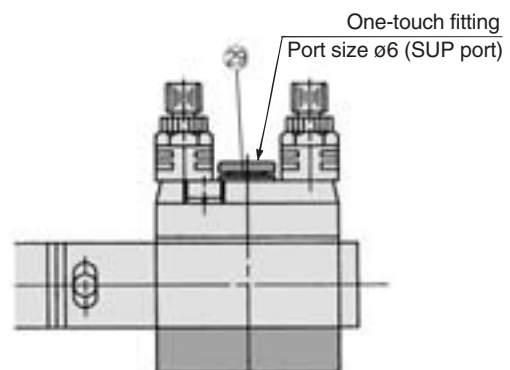
Construction



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	Oil-impregnated sintered alloy	
7	Seal retainer	Rolled steel	Nickel plated
8	Retaining ring	Carbon tool steel	Nickel plated
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 Electrical entry
VZ3□90- [Voltage]

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	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

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

CV□

MVGQ

D-□

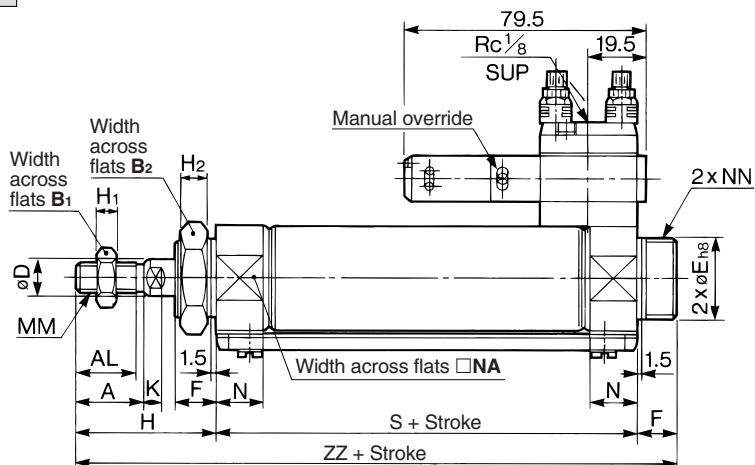
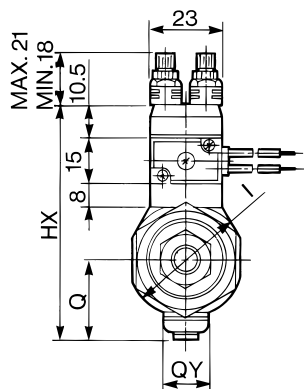
-X□

Individual
-X□

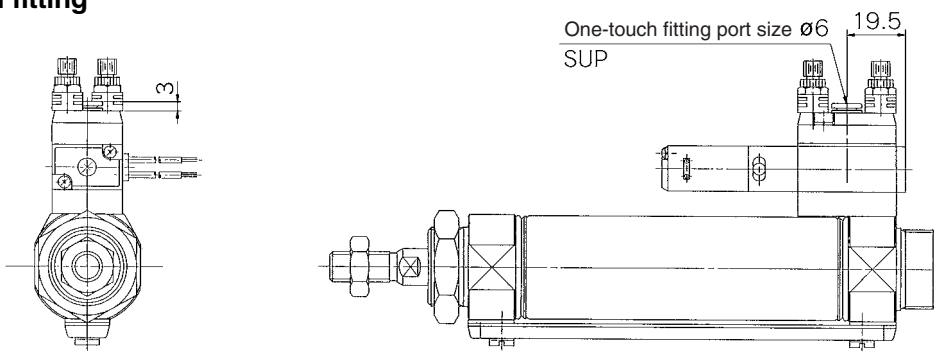
Series CVM5

Basic Style (B)

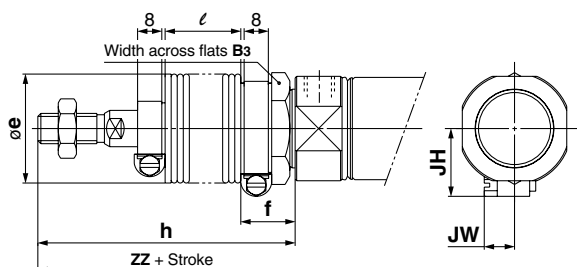
CVM5B Bore size — Stroke



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 1572.

Bore size (mm)	Stroke range	A	AL	B ₁	B ₂	D	Eh _s	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

Bore size (mm)	B ₃	e	f	h							l							JH (Reference)	JW (Reference)
				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		
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

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

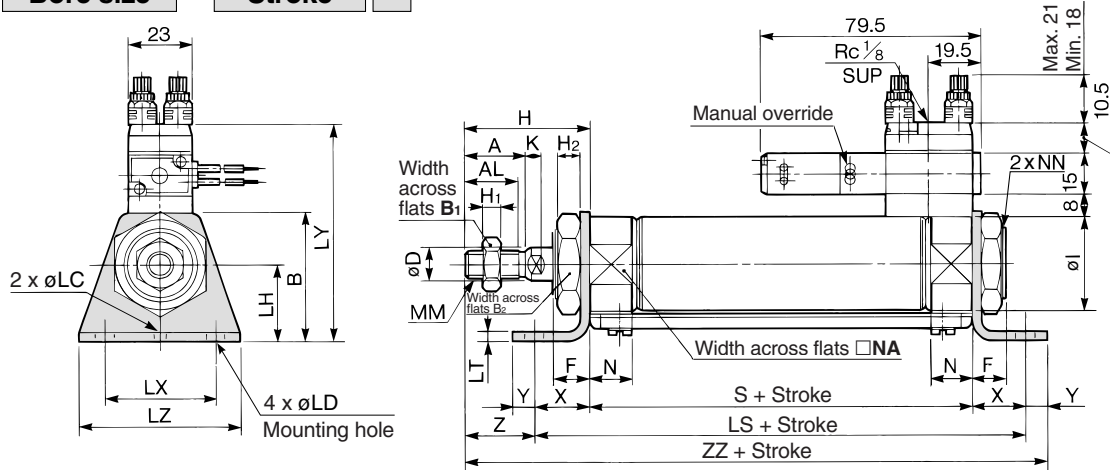
* For short strokes, a solenoid valve may protrude from the rod cover end. Confirm S dimension and solenoid dimensions.

* Long stroke type includes ones for strokes more than 301 mm.

Valve Mounted Cylinder Double Acting, Single Rod **Series CVM5**

Axial Foot Style (L)

CVM5L Bore size — Stroke

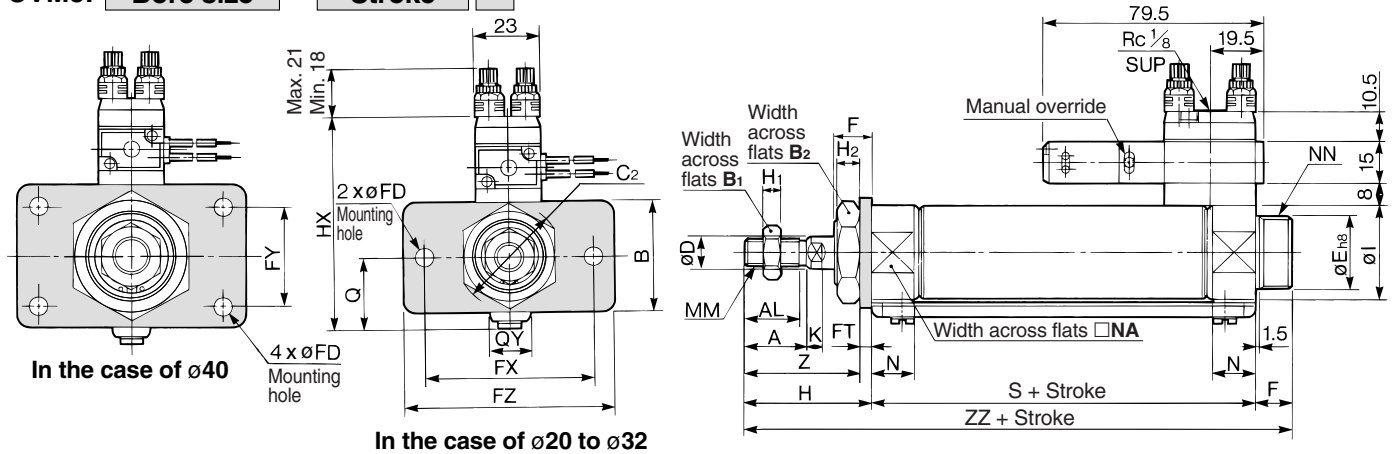


Bore size (mm)	Stroke range	A	AL	B	B ₁	B ₂	D	F	H	H ₁	H ₂	I	K	LC	LD	LH	LS	LT	LX	LY
20	Up to 300	18	15.5	40	13	26	8	13	41	5	8	28	5	4	6.8	25	102	3.2	40	70.5
25	Up to 300	22	19.5	47	17	32	10	13	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	76.5
32	Up to 300	22	19.5	47	17	32	12	13	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	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

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

Rod Side Flange Style (F)

CVM5F Bore size — Stroke



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

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.

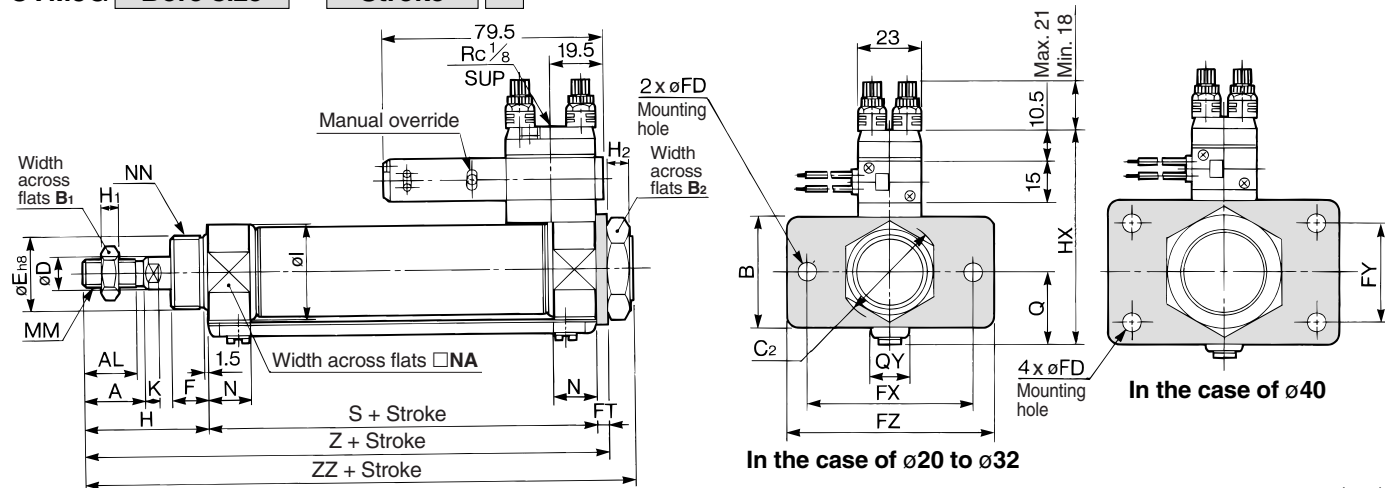
CVM□
 MVG□

D-□
 -X□
Individual
 -X□

Series CVM5

Head Side Flange Style (G)

CVM5G Bore size — Stroke

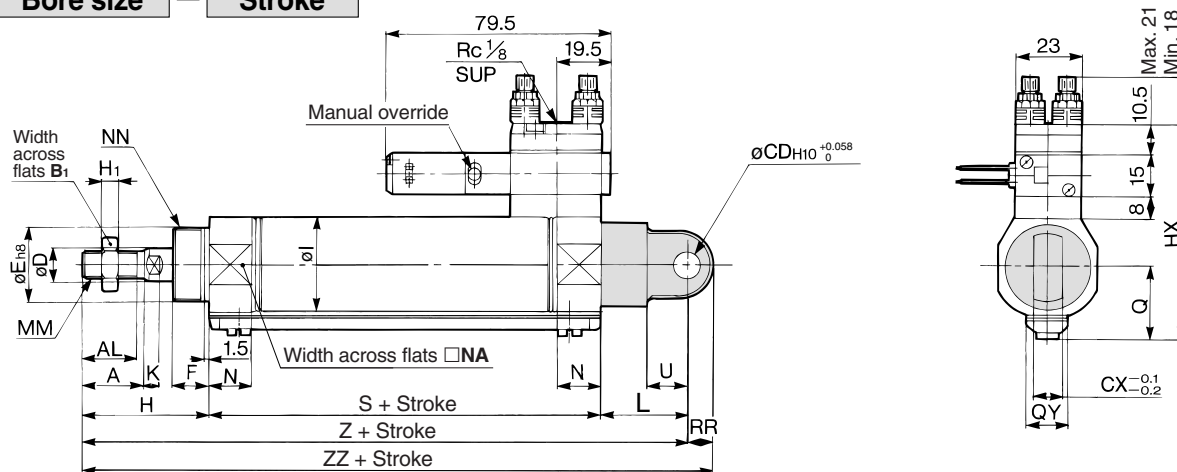


Bore size (mm)	Stroke range	A	AL	B	B ₁	B ₂	C ₂	D	Eh ₈	F	FD	FT	FX	FY	FZ	H	H ₁	H ₂	HX
20	Up to 300	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	7	4	60	—	75	41	5	8	65.3
25	Up to 300	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	70.5
32	Up to 300	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	7	4	60	—	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

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

Single Clevis Style (C)

CVM5C Bore size — Stroke



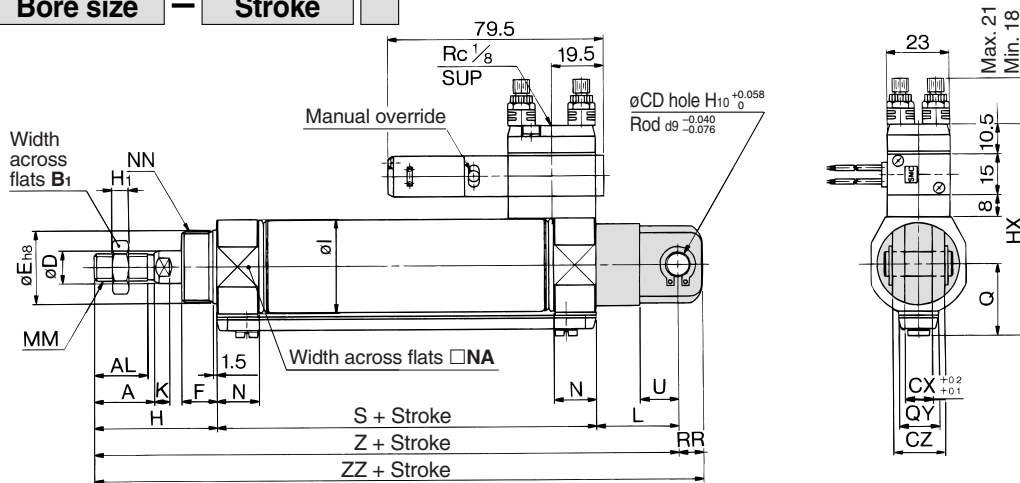
Bore size (mm)	Stroke range	A	AL	B ₁	CD	CX	D	Eh ₈	F	H	H ₁	I	HX	K	L	MM	N	NA
20	Up to 300	18	15.5	13	9	10	8	20 ⁰ _{-0.033}	13	41	5	28	65.3	5	30	M8 x 1.25	15	24
25	Up to 300	22	19.5	17	9	10	10	26 ⁰ _{-0.033}	13	45	6	33.5	70.5	5.5	30	M10 x 1.25	15	30
32	Up to 300	22	19.5	17	9	10	12	26 ⁰ _{-0.033}	13	45	6	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

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

Valve Mounted Cylinder Double Acting, Single Rod **Series CVM5**

Double Clevis Style (D)

CVM5D Bore size — Stroke



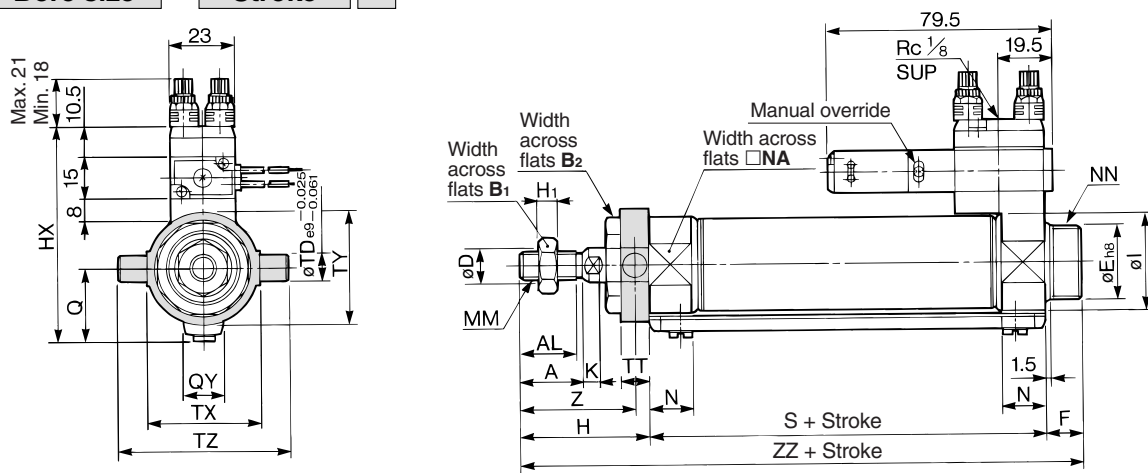
Bore size (mm)	Stroke range	A	AL	B ₁	CD	CX	CZ	D	Eh ₈	F	H	H ₁	HX	I	K	L	MM	N	NA
20	Up to 300	18	15.5	13	9	10	19	8	20 ⁰ _{-0.033}	13	41	5	65.3	28	5	30	M8 x 1.25	15	24
25	Up to 300	22	19.5	17	9	10	19	10	26 ⁰ _{-0.033}	13	45	6	70.5	33.5	5.5	30	M10 x 1.25	15	30
32	Up to 300	22	19.5	17	9	10	19	12	26 ⁰ _{-0.033}	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

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



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	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

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

CV□

MVGQ

D-□

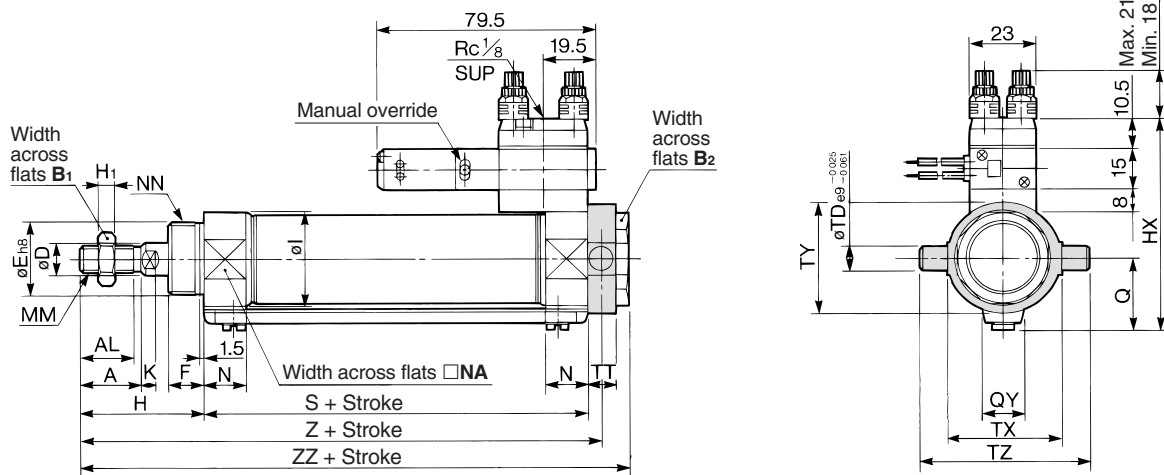
-X□

Individual
-X□

Series CVM5

Head Side Trunnion Style (T)

CVM5T Bore size — Stroke

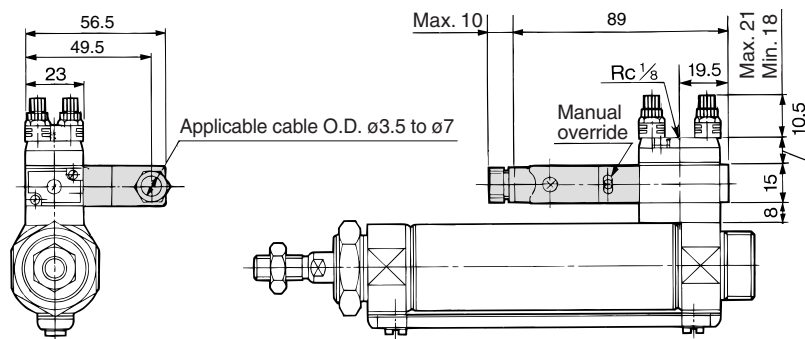


Bore size (mm)	Stroke range	A	AL	B ₁	B ₂	D	Eh ₈	F	H	H ₁	HX	I	K	MM	N	NA	NN
20	Up to 300	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	41	5	65.3	28	5	M8 x 1.25	15	24	M20 x 1.5
25	Up to 300	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	45	6	70.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5
32	Up to 300	22	19.5	17	32	12	26 ⁰ _{-0.033}	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

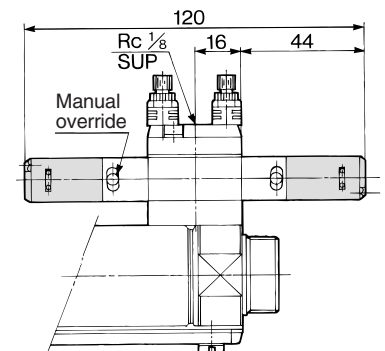
(mm)

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

DIN Terminal



Double Solenoid



* For the mounting brackets of flange, single clevis, double clevis and head side trunnion style, the double solenoid 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 pages 144 and 145 of 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

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 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
		9	Other

Electrical entry

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

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 T type G)

Made to Order
Refer to page 1574 for details.

Port thread type

Nil	Rc
TN	NPT
TF	G

Piping

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

Suffix for cylinder

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

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.

Rod extended/retracted when energized

Nil	Rod extended when energized
B	Rod retracted when energized

* Only in case of 2 position single solenoid valve.

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

Ordering Example:
CVM5K L 32 [] [] - 100 [] [] - 1 1 M Z - []
With auto switch: CDVM5K L 32 [] [] - 100 [] [] - 1 1 M Z - M9BW [] - []

With auto switch (Built-in magnet)

Non-rotating rod type

Bore size

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

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 1574.)

Applicable Auto Switch/Refer to pages 1719 to 1827 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m)					Pre-wired connector	Applicable load	
					DC	AC		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)			
Solid state switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	—	○	Relay, PLC
				3-wire (PNP)				M9P	●	●	●	○	—	○	
		2-wire	M9B	●				—	●	○	—	○			
		—	H7C	●				—	●	●	—	—			
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NW	●	●	●	○	—	○		
				3-wire (PNP)			M9PW	●	●	●	○	—	○		
				2-wire			M9BW	●	●	●	○	—	○		
With diagnostic output (2-color indication)	—	—	4-wire (NPN)	5 V, 12 V	—	H7NF	●	—	●	○	—	○			
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	12 V	—	A96	●	—	●	—	—	—	Relay, PLC
				None				A93	●	—	●	—	—	—	
				Yes				A90	●	—	●	—	—	—	
				None				B54	●	—	●	●	—	—	
		Connector	Yes	2-wire	—	24 V or less	B64	●	—	●	—	—	—		
				—			C73C	●	—	●	●	—	—		
				24 V or less			C80C	●	—	●	●	—	—		
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.
 * D-A9□V□/M9□V□/M9□WV□/□M9□A(V) types cannot be mounted.

* Since there are other applicable auto switches than listed, refer to page 1581 for details.
 * For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
 * D-A9□/M9□/□M9□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

Series CVM5K

A hexagon shaped rod that does not rotate.

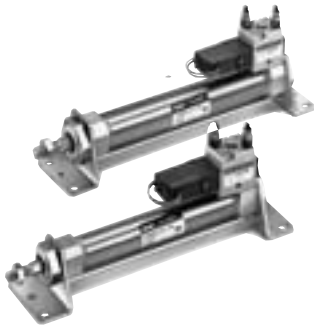
Non-rotating accuracy

∅20, ∅25 — ±0.7°
∅32, ∅40 — ±0.5°

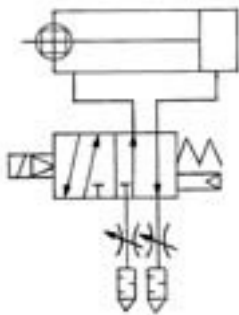
Can operate without lubrication.

Auto switches can also be mounted.

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



JIS Symbol



Made to Order Specifications
(For details, refer to pages 1836, 1882.)

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

Refer to pages 1579 to 1581 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 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.: ∅6/I.D.: ∅4			
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 Option: 110/220 VAC, 12 VDC		
Effective area of valve (Cv factor)	4.5 mm ² (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.

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting *Series CVM5K*

Mass

Bore size (mm)		20	25	32	40
Basic mass	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 mass 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 mass..... 0.55 (kg) (Axial foot style ø32)
- Additional mass..... 0.09 (kg/50 st)
- Cylinder stroke..... 100 (st) $0.55 + 0.09 \times 100/50 = 0.73$ kg

Mounting Bracket and Accessory

Mounting	Accessory	Standard equipment			Option	
		Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint ⁽³⁾
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⁾	●	●	●	●	
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.

⚠ Precautions

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions, pages 3 to 11 for Actuator and Auto Switch Precautions and 3/4/5 Port Solenoid Valve Precautions in Best Pneumatics No. 1.

Precautions

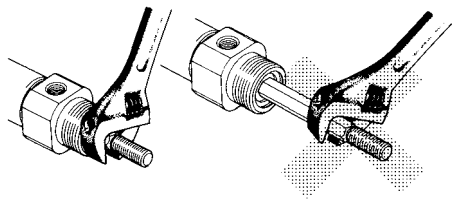
⚠ Warning

- 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

- 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

- 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.
- 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.
- 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.
- 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

- 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.)
- 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.

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	

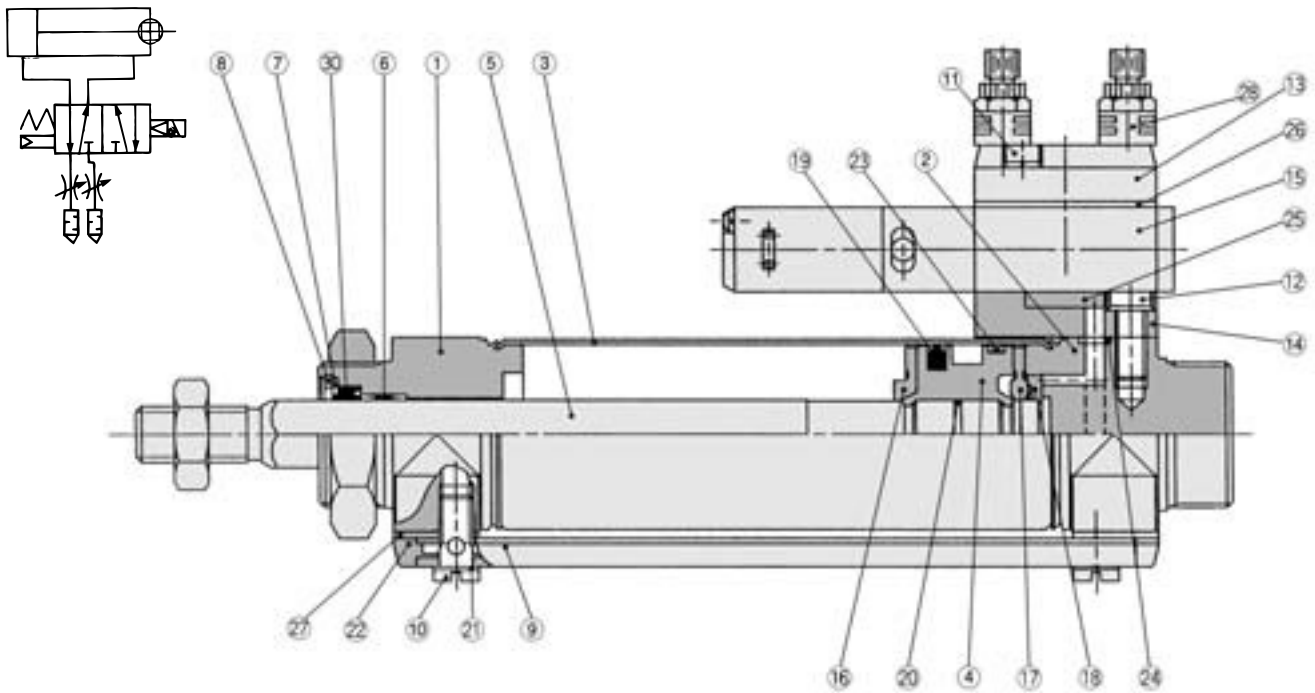
- * Two foot brackets and a mounting nut are attached. When ordering the foot bracket, order 2 pcs. per cylinder.
 ** Clevis pin and snap ring (cotter pin for ø40) are packaged together.

CV□
MVGQ

D-□
-X□
Individual
-X□

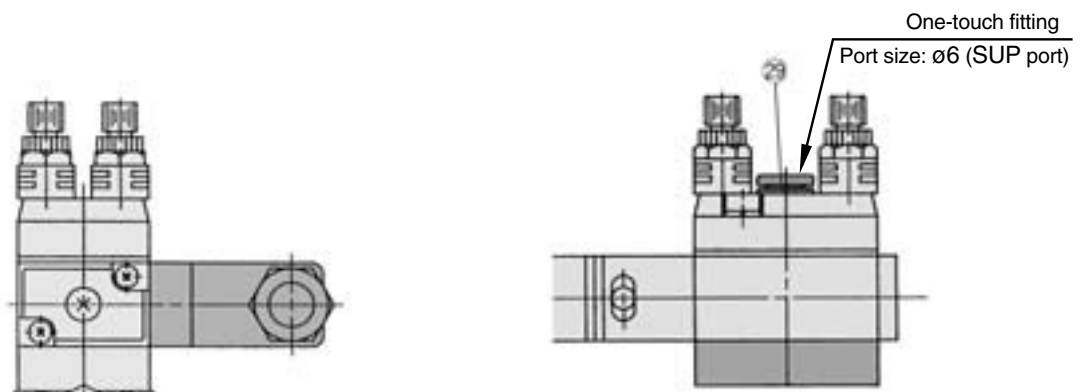
Series CVM5K

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	Oil-impregnated sintered alloy	
7	Seal retainer	Rolled steel	Nickel plated
8	Retaining ring	Carbon tool steel	Nickel plated
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	

* How to order solenoid valves
VZ3□90-|Voltage| |Electrical entry|

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

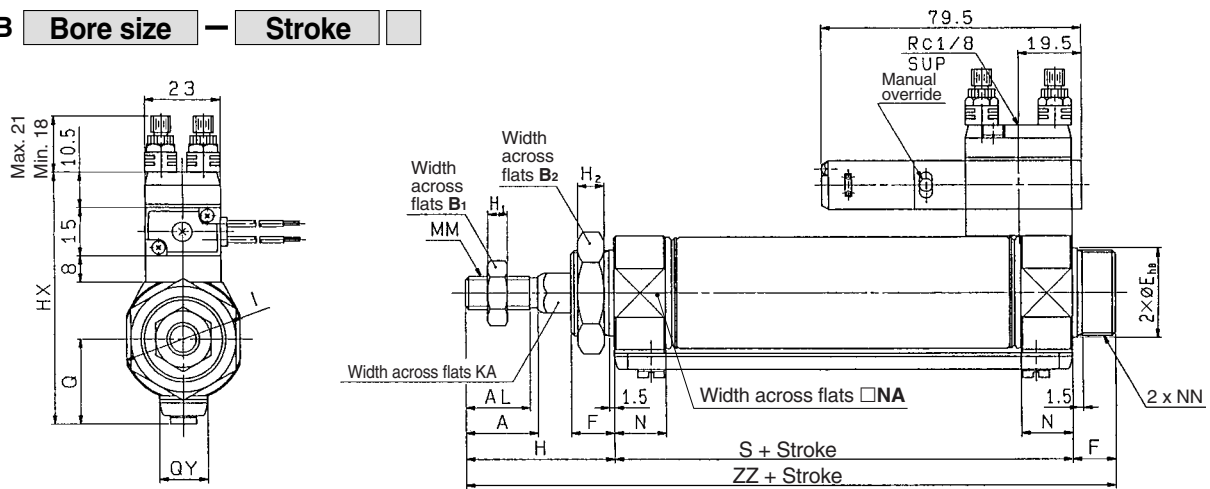
No.	Description	Material	Part no.			
			20	25	32	40
30	Rod seal	NBR	PDR-8W	PDR-10W	PDR-12W	PDR-14W

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

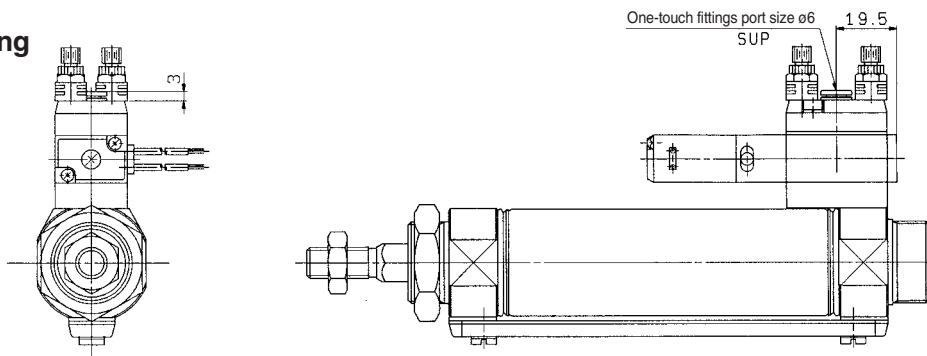
Valve Mounted Cylinder: Non-rotating Rod Type Double Acting **Series CVM5K**

Basic Style (B): External Dimensions

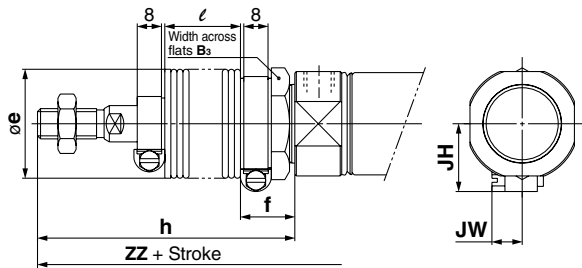
CVM5KB Bore size — Stroke



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 1572.

		(mm)																			
Bore size (mm)	Stroke range	A	AL	B ₁	B ₂	Eh ₈	F	Q	QY	H	H ₁	H ₂	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)	B ₃	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		
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

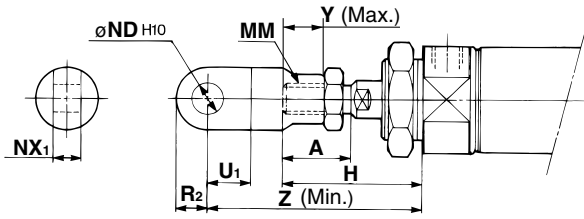
CV□
MVGQ

D-□
-X□
Individual
-X□

Series CVM5

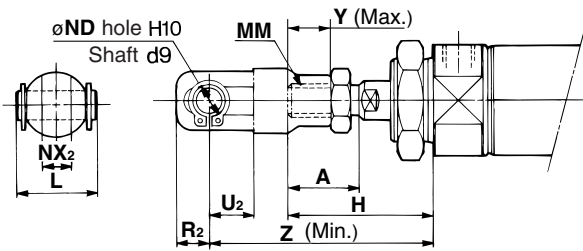
Accessory dimensions

Single Knuckle Joint Mounting (mm)



Bore size	A	H	MM	ND _{H10}	NX ₁	U ₁	R ₂	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)

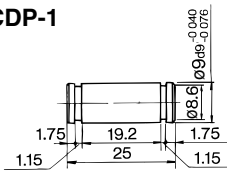


Bore size	A	H	L	MM	ND	NX ₂	R ₂	U ₂	Y	Z
20	18	41	25	M8 x 1.25	9	9 ^{+0.2} _{+0.1}	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	9 ^{+0.2} _{+0.1}	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	16 ^{+0.3} _{+0.1}	13	25	13	92

Double Clevis Pin/Material: Carbon steel (mm)

Bore size: $\varnothing 20, \varnothing 25, \varnothing 32$

CDP-1

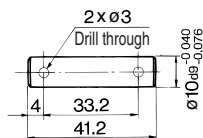


Retaining ring: Type C9 for shaft

* Retaining rings (cotter pins for $\varnothing 40$) are included.

Bore size: $\varnothing 40$

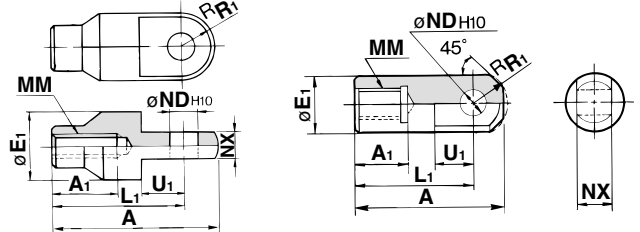
CDP-2



Cotter pins used
 $\varnothing 3 \times 18 \ell$

Single Knuckle Joint (mm)

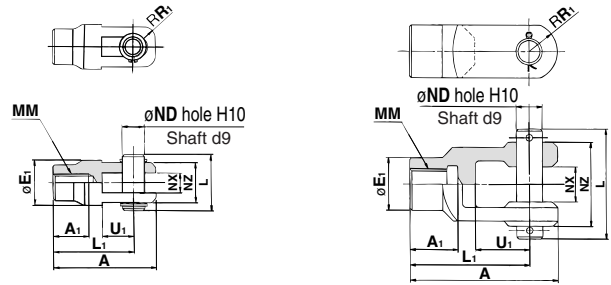
I-020B, 032B Material: Rolled steel I-040B Material: Free cutting sulfur steel



Part no.	Applicable bore size	A	A ₁	E ₁	L ₁	MM	ND _{H10}	NX	R ₁	U ₁
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	A ₁	E ₁	L	L ₁	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

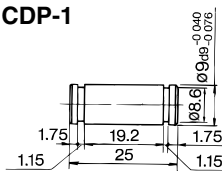
Part no.	NX	NZ	R ₁	U ₁	Applicable pin par no.	Retaining ring size
Y-020B	9 ^{+0.2} _{+0.1}	18	5	14	CDP-1	Type C9 for shaft
Y-032B	9 ^{+0.2} _{+0.1}	18	5	14	CDP-1	Type C9 for shaft
Y-040B	16 ^{+0.3} _{+0.1}	38	13	25	CDP-3	$\varnothing 3 \times 18 \ell$

* Knuckle pins and retaining rings (cotter pins for $\varnothing 40$) are included.

Double Clevis Pin/Material: Carbon steel (mm)

Bore size: $\varnothing 20, \varnothing 25, \varnothing 32$

CDP-1

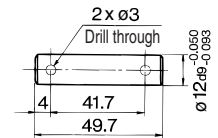


Retaining ring: Type C9 for shaft

* Retaining rings (cotter pins for $\varnothing 40$) are included.

Bore size: $\varnothing 40$

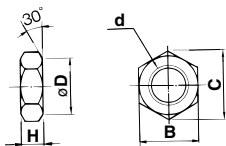
CDP-3



Cotter pins used
 $\varnothing 3 \times 18 \ell$

Rod End Nut (mm)

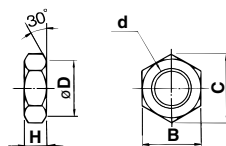
Material: Carbon steel



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)

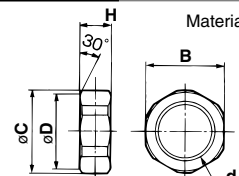
Material: Carbon steel



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)

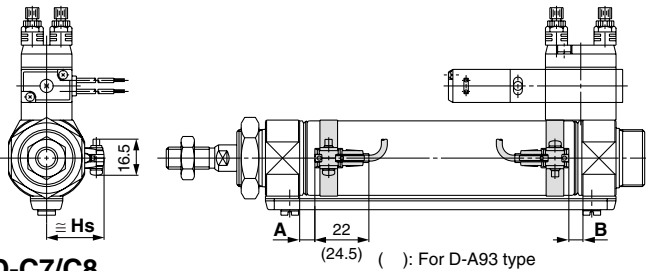
Material: Carbon steel



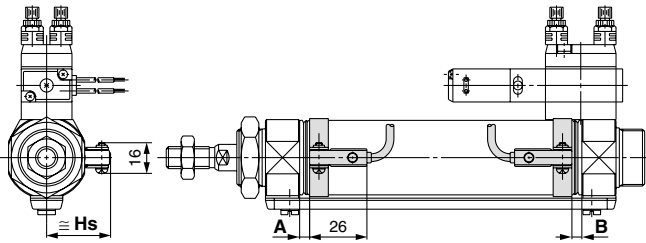
Part no.	Applicable bore size	B	C	D	d	H
TN-020B	20	26	28	25.5	M20 x 1.5	10
TN-032B	25, 32	32	34	31.5	M26 x 1.5	10
TN-040B	40	41	45	40.5	M32 x 2	10

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

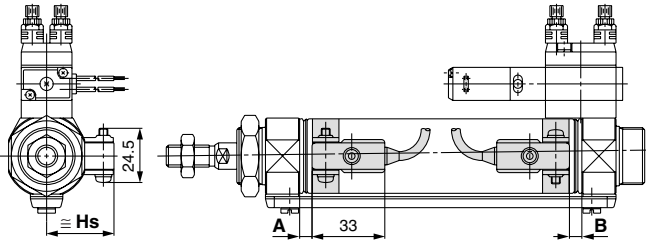
Reed auto switch D-A9□



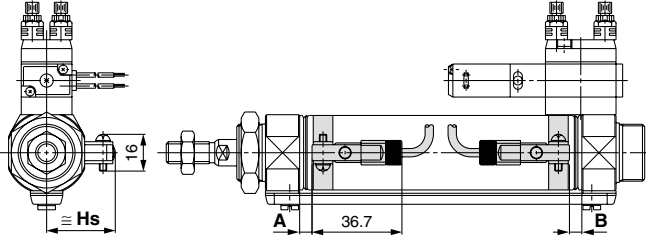
D-C7/C8



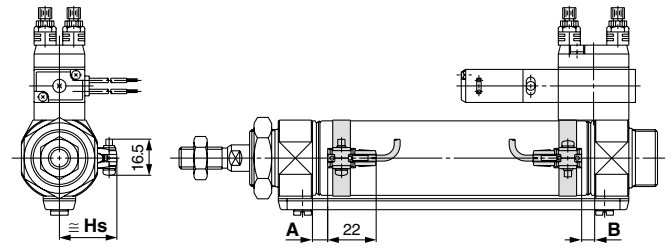
D-B5/B6/B59W



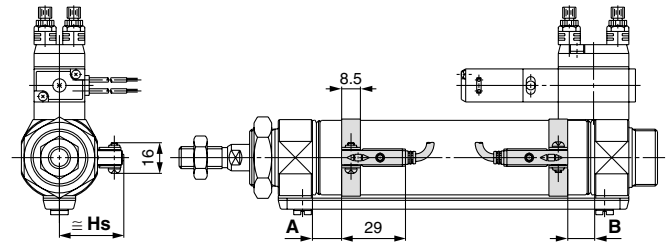
D-C73C/C80C



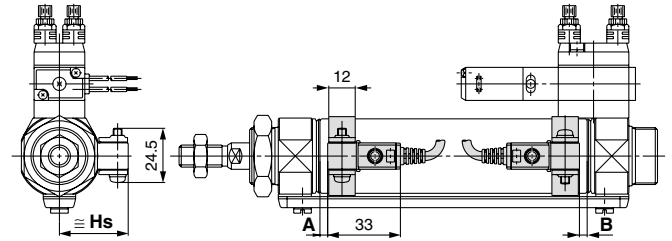
Solid state auto switch D-M9□ D-M9□W



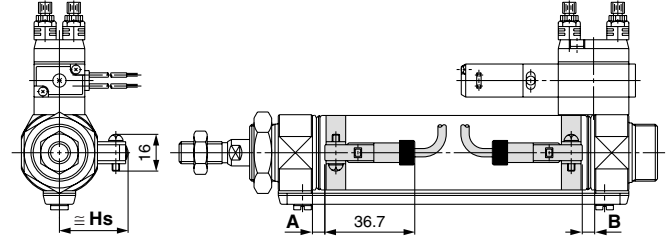
D-H7□/H7□W/H7NF



D-G5NTL



D-H7C



CV□
MVGQ

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□		D-M9□ D-M9□W		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-H7□ D-H7C D-H7□W D-H7NF		D-G5NTL	
	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□ D-M9□ D-M9□W	D-B5□ D-B64 D-B59W D-G5NTL D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7NF	D-C73C D-C80C
	Hs	Hs	Hs	Hs
20	22	25.5	22.5	25
25	24.5	28	25	27.5
32	28	31.5	28.5	31
40	32	35.5	32.5	35

D-□
-X□
Individual
-X□

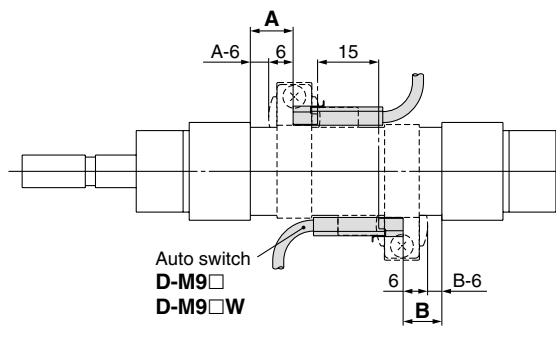
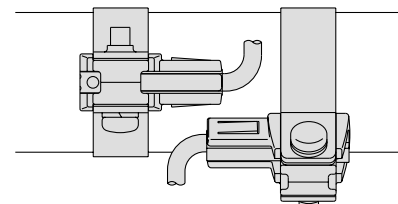
Series CVM5

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 ⁽¹⁾	45 ⁽¹⁾	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	45 + 45 (n - 2)
D-C7□ D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	50 + 45 (n - 2)
D-H7□ D-H7□W D-H7NF	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	60 + 45 (n - 2)
D-C73C D-C80C D-H7C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	65 + 50 (n - 2)
D-B5□/B64 D-G5NTL	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55 (n - 2)
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	75 + 55 (n - 2)

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 ⁽¹⁾	Same surface ⁽¹⁾
	 <p>The proper auto switch mounting position is 6 mm inward from the switch holder edge.</p>	 <p>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.</p>
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□	6	6	6	6
D-M9□/M9□W	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-G5NTL/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-A9□ D-M9□ D-M9□W	Note 1) ①BM2-020 ②BJ3-1	Note 1) ①BM2-025 ②BJ3-1	Note 1) ①BM2-032 ②BJ3-1	Note 1) ①BM2-040 ②BJ3-1
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-B59W D-G5NTL D-G5NBL	BA2-020	BA2-025	BA2-032	BA2-040

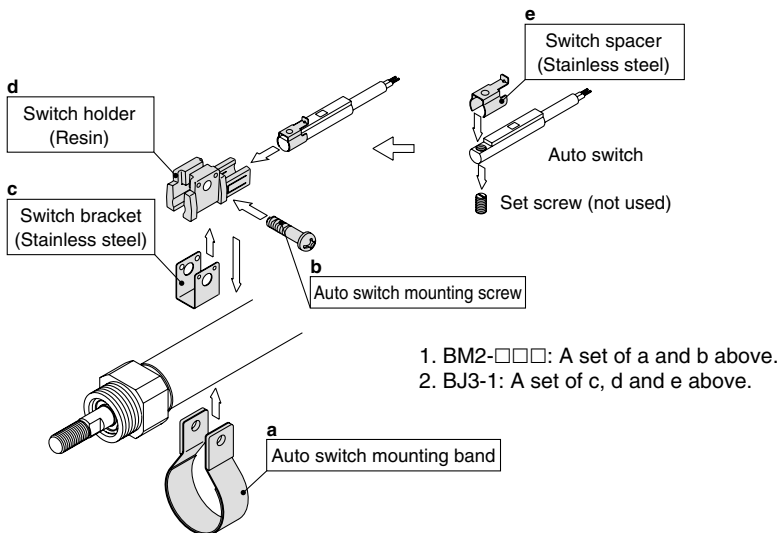
Note 1) Two kinds of auto switch mounting brackets are used as a set.

[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 1814 for the details of BBA4.



CV□

MVGQ

Besides the models listed in How to Order, the following auto switches are applicable. Refer to pages 1719 to 1827 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-G5NTL		With timer

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1784 and 1785 for details.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to page 1746 for details.

* Wide range detection type, solid state auto switches (D-G5NBL type) are also available. Refer to page 1776 for details.

D-□

-X□

Individual
-X□