










Valve Mounted Cylinder

Series CV/MVGQ

ø10, ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

Series Variations

Series	Action	Standard variations					Bore size (mm)	Page
		Built-in magnet	With air cushion	Built-in One-touch fitting	With auto switch	With strong scraper		
Series CVJ5 	Double acting	●			●		10 16	10-15-4
Series CVJ3 	Single acting (Spring return) (Spring extend)	●			●		10 16	10-15-10
Series CVM5/CVM5K 	Double acting	Standard	●		●	●	20 25 32 40	10-15-16 10-15-26
		Non-rotating rod	●		●	●		
Series CVM3/CVM3K 	Single acting (Spring return) (Spring extend)	Standard	●		●	●	20 25 32 40	10-15-31 10-15-44
		Non-rotating rod	●		●	●		
Series CV3/CV3K 	Double acting	Standard	●	●		●	40, 50 63, 80 100	10-15-50
		Non-rotating rod	●	●		●		40, 50 63
Series CVS1/CVS1K 	Double acting	Standard	●	●		●	40, 50 63, 80 100	10-15-67
		Non-rotating rod	●	●		●		40, 50 63
Series MVGQ 	Double acting	●			●		12, 16 20, 25 32, 40 50, 63 80, 100	10-16-1

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C_G5-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CV Valve Mounted Cylinder Precautions

Be sure to read before handling. Refer to pages 10-24-3 to 10-24-6 for Safety Instructions and Actuator Precautions on the products mentioned in this catalog, and refer to main text for more detailed precautions on every series.

Applicable Series: CVJ5, CVJ3

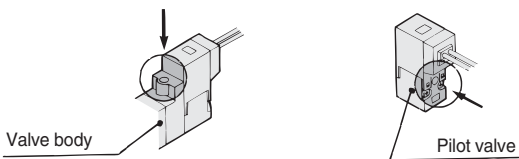
Manual Operation

⚠ Warning

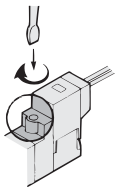
- Manual overrides are provided on two locations, one on the pilot valve, and the other on the valve body. Operate either one to effect manual operation.

■ Non-locking push type

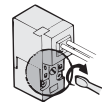
Push in the direction the arrow indicates.



■ Locking slotted type



Press it to enable manual operation and turn it in the direction of the arrow to lock it. If this is not turned, it can be used in the same way as the non-locking type.



Simply turn in the direction of the arrow.

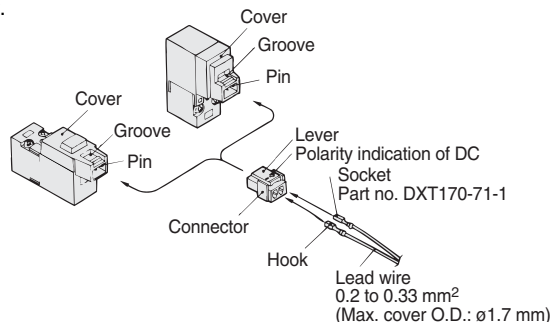
Since the devices in connection are operated by manual override, make sure that there is no danger.

Plug Connector

⚠ Caution

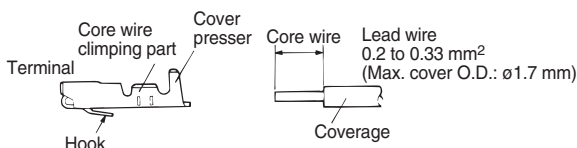
1. Connector installation and removal

- 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.



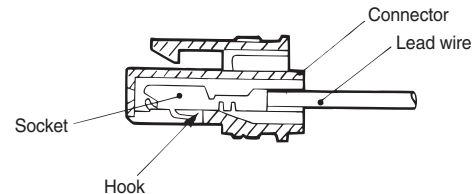
2. Crimping the lead wire into the socket

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



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

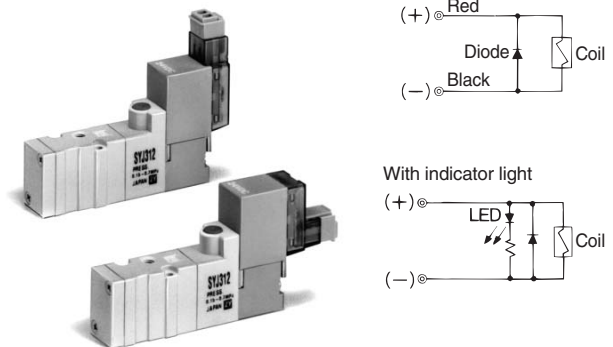
⚠ Caution

For DC:

- Connect the wires by matching their polarities to the + and - marks. Be very careful not to interchange the polarities as this could cause the diodes or the switching elements to burn.
- If the lead wires are connected beforehand, the red wire is +, and the black wire is -.

For AC:

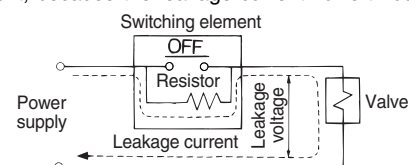
- A rectifier assembly is used for preventing the generation of surge voltage.



Leakage Voltage

⚠ Caution

- Be aware that there is an increase in the leakage voltage particularly if a C-R element (surge voltage protector) is used for protecting the switching element, because the leakage current flows through the C-R element.



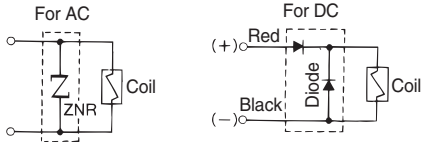
- The residual leakage voltage must be kept as follows:
 - With a DC coil, 3% of the rated voltage or below
 - With an AC coil, 8% of the rated voltage or below.

Applicable series: CVM5, CVM3, MVGQ

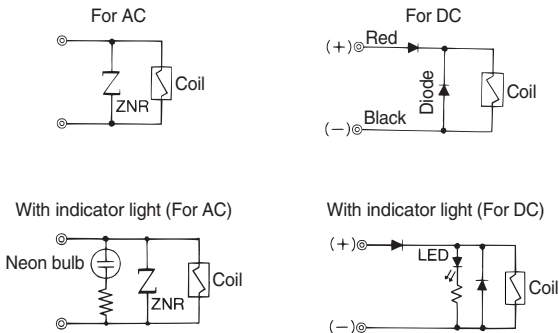
Light/Surge Voltage Suppressor

Warning

Grommet

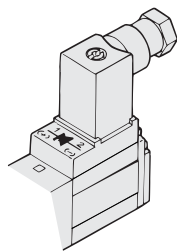


L/M plug connector

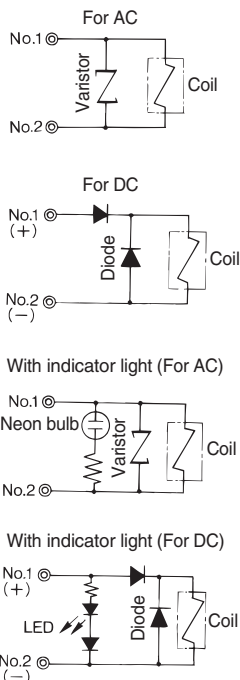
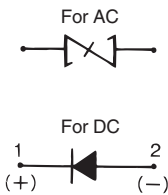


In the case of DC wiring, connect the wires by matching their polarities to the + and - marks. If the lead wires are connected beforehand, the red wire is +, and the black wire is -.

DIN terminal



* Marking



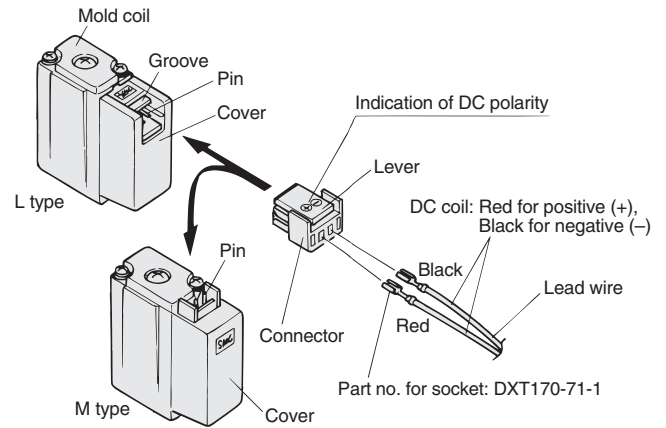
In the case of DC wiring, connect terminal no. 1 of the connector to the positive + side, and terminal no. 2 to the negative - side. (Refer to the marks on the terminal board.)

Plug Connector

Warning

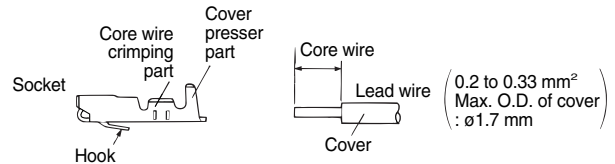
1. Connector installation and removal

- 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.
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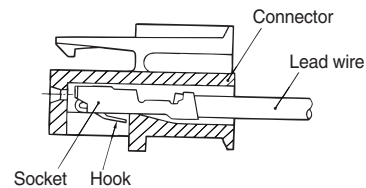
2. Crimping the lead wire into the socket

- 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.



RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹/₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Valve Mounted Cylinder

Double Acting, Single Rod

Series CVJ5

ø10, ø16

How to Order

Stroke (mm)

ø10	15, 30, 45, 60
ø16	15, 30, 45, 60

Bore size

10	10 mm
16	16 mm

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style

Electrical entry

G	Grommet
L	L plug connector
M	M plug connector

Light/Surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (No polarity)
U	With light/surge voltage suppressor (No polarity)

* Type "R", "U": DC only
* In the case of AC, since the rectifier prevents the production of surge voltage, there is no type "S".

Number of auto switches

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

Without auto switch CVJ5 L 16 60 5 L

With auto switch CDVJ5 L 16 60 5 L J79W

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of the w/ auto switch cylinder part number.

Example	Rail mounting style	CDVJ5B15-60-A
	Band mounting style	CDVJ5B10-45-B

Rod extended/retracted when energized

Nil	Rod extended when energized
B	Rod retracted when energized

Solenoid valve voltage

DC specifications		AC specifications (50/60 Hz)	
5	24 VDC	1	100 VAC
6	12 VDC	2	200 VAC
V	6 VDC	3	110 VAC (115 VAC)
S	5 VDC	4	220 VAC (230 VAC)
R	3 VDC		

Auto switch

Magnet installed even without auto switch

Symbol	Auto switch mounting
A	Rail mounting style
B	Band mounting style

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together (but not assembled).

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model			Lead wire length (m)*				Pre-wire connector	Applicable load					
					DC	AC	Band mounting	Rail mounting Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC				
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	—	A76H	●	●	—	—	—	IC circuit	—			
						24 V	200 V	—	A72	A72H	●	●	—	—	—	—	—	—		
		connector		2-wire	12 V	100 V	C73	A73	A73H	●	●	●	—	—	—	—	—	—	Relay, PLC	
					12 V	—	C73C	A73C	—	●	●	●	●	—	—	—	—	—	—	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	—	5 V, 12 V	—	H7A1	F7NV	F79	●	●	○	—	○	IC circuit	—			
						12 V	—	H7A2	F7PV	F7P	●	●	○	—	○	—	—	—	—	
		connector		2-wire	12 V	—	H7B	F7BV	J79	●	●	○	—	○	—	—	—	—	Relay, PLC	
					12 V	—	H7C	J79C	—	●	●	●	●	—	—	—	—	—	—	
		Grommet		Diagnostic indication (2-color indication)	3-wire (NPN)	5 V, 12 V	—	H7NW	F7NWV	F79W	●	●	○	—	○	—	○	IC circuit	—	
						12 V	—	H7PW	—	F7PW	●	●	○	—	○	—	—	—	—	
					3-wire (PNP)	12 V	—	H7BW	F7BWV	J79W	●	●	○	—	○	—	○	—	—	—
						5 V, 12 V	—	H7NF	—	F79F	●	●	○	—	○	—	○	—	○	IC circuit

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

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

• Since there are other applicable auto switches than listed, refer to page 10-15-6 for details.
 • For details about auto switches with pre-wire connector, refer to page 10-20-66.

Valve Mounted Cylinder Double Acting, Single Rod Series CVJ5

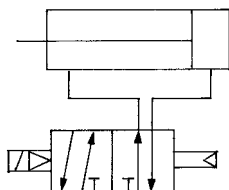
Operation type can be changed to rod extended when energized or rod retracted when energized.

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



JIS Symbol

Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape

Specifications

Action	Double acting, Single rod
Type	Non-lube
Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.15 MPa
Ambient and fluid temperature	-10 to 50°C (No freezing)
Cushion	Rubber bumper
Lubrication	Not required (Non-lube)
Thread tolerance	JIS Class 2
Stroke length tolerance	+1.0 0
Applicable bore size (mm)	10, 16
Effective area of valve (Cv factor)	1.8 mm ² (0.1)
Port size	M5 x 0.8
Mounting	Basic style, Axial foot style, Rod side flange style
Piston speed	ø10: 50 to 750 mm/s, ø16: 50 to 150 mm/s

Allowable Kinetic Energy

Bore size (mm)	10	16
Allowable kinetic energy	0.035	0.090

Solenoid Valve Specifications

Applicable solenoid valve model	SYJ3190		
Electrical entry	Grommet (G)/(H), L plug connector (L), M plug connector (M)		
Coil rated voltage (V) ⁽¹⁾	DC	24, 12, 6, 5, 3	
	AC 50/60 Hz	100, 110, 200, 220	
Allowable voltage	±10% of the rated voltage		
Power consumption (W) ⁽²⁾	DC	0.5 (With indicator light: 0.55)	
Apparent power (VA)	AC	100 V	0.9 (With indicator light: 1.0)
		110 V [115 V]	1.0 (With indicator light: 1.1) [1.1 (With indicator light: 1.2)]
		200 V	1.8 (With indicator light: 1.9)
		220 V [230 V]	1.9 (With indicator light: 2.0) [2.2 (With indicator light: 2.3)]



Note 1) 110 VAC and 115 VAC types and 220 VAC and 230 VAC types are common respectively.

Note 2) At the rated voltage.

Standard Stroke

Bore size (mm)	Standard stroke
10	15, 30, 45, 60
16	15, 30, 45, 60

* If types for more than the strokes indicated in the table above (61 strokes) are required, please ask SMC.

RE_A
B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C_G¹_{5-S}

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CVJ5

Minimum Stroke for Auto Switch Mounting (mm)

Auto switch mounting	Auto switch model	No. of auto switches mounted				
		2 (Same side)	2 (Different sides)	1	2	1
Band mounting style	D-C7□/C80	50	15	10	—	—
	D-H7□/H7□W D-H7NF	60	15	10	—	—
	D-C73C/C80C D-H7C	65 ^{Note)}	15	10	—	—
Rail mounting style	D-A7□/A80 D-A7□H/A80H D-A73C/A80C	—	—	—	10	5
	D-F7□/J79 D-F7□V D-J79C	—	—	—	5	5
	D-A79W/F7□W D-J79W D-F7□WV/F79F	—	—	—	15	10

Note) A type for 65 stroke is not available.

Mounting Style and Accessory/For details, refer to page 10-15-9.

Mounting		Basic style	Axial foot style	Rod side style Flange side style
Standard equipment	Mounting nut	●	●	●
	Rod end nut	●	●	●
Option	Single knuckle joint	●	●	●
	Double knuckle joint (With pin)*	●	●	●

* Knuckle pin and set ring are shipped together.

Weight (g)

Bore size (mm)		10	16
Basic weight*		74	107
Additional weight per each 15 mm of stroke		6.5	9.5
Mounting bracket weight	Axial foot style	7	19
	Rod side flange	5	13

* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example) CVJ5L10-45-1G

- Basic weight.....74 (g) (ø10)
 - Additional weight6.5/15 stroke
 - Cylinder stroke45 stroke
 - Weight of bracket7 (g) (Axial foot style)
- $$74 + 6.5/15 \times 45 + 7 = 100.5 \text{ g}$$

Mounting Bracket Part No.

Bore size (mm)	10	16
Foot	CJ-L010B	CJ-L016B
Flange	CJ-F010B	CJ-F016B

Auto Switch Mounting Bracket Part No. (Band mounting style)

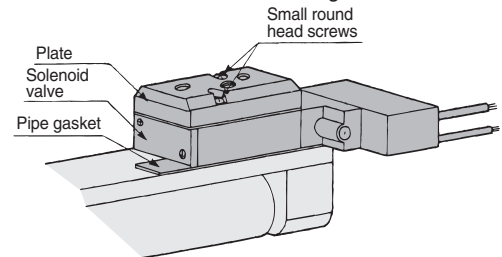
Bore size (mm)	Part no.	Note
10	BJ2-010	Common for the types of D-C7, C8 and D-H7
16	BJ2-016	

Changing between Rod Extended when Energized and Rod Retracted when Energized

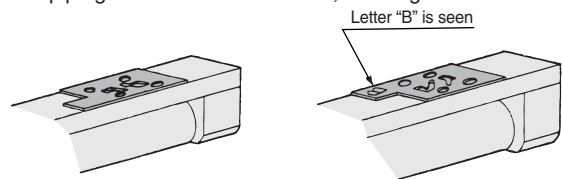
<Step>

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

1. Using a screwdriver, loosen the two small round head screws, 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 round head screws remaining inserted.

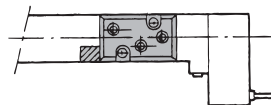


2. Turn the pipe gasket at 180° and mount, showing the letter "B".

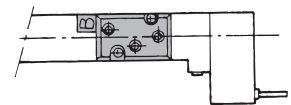


3. Install the solenoid valve and the plate, and tighten the small round head screws, with a screw driver. After tightening, press the manual button on the solenoid valve, check for any air leaks, and verify the operating conditions. When the cylinder is viewed from above, the position of the gasket is as shown in the figure below.

Rod extended when energized

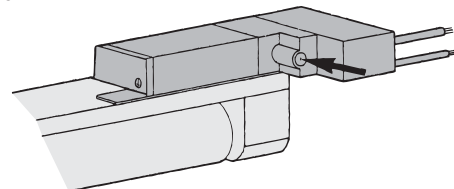


Rod retracted when energized



Manual Operation

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



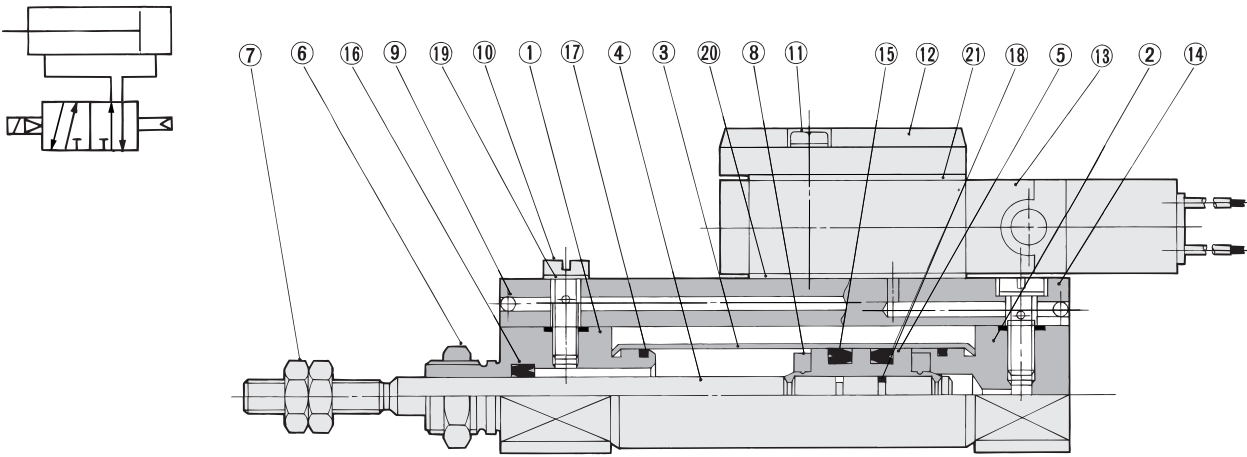
Other than the models listed in "How to Order", the following auto switches are applicable. For detailed specifications, refer to page 10-20-1.

Type	Model	Electrical entry	Features
Reed switch	D-A80	Grommet	Without indicator light
	D-A80H		
	D-A80C	Connector	
	D-C80	Grommet	
	D-C80C	Connector	
Solid state switch	D-F7NNTL	Grommet	With timer

* With pre-wire connector is available for D-F7NNTL type, too. For details, refer to page 10-20-61.

Valve Mounted Cylinder Double Acting, Single Rod Series CVJ5

Construction/(Not able to disassemble.)



Component Parts

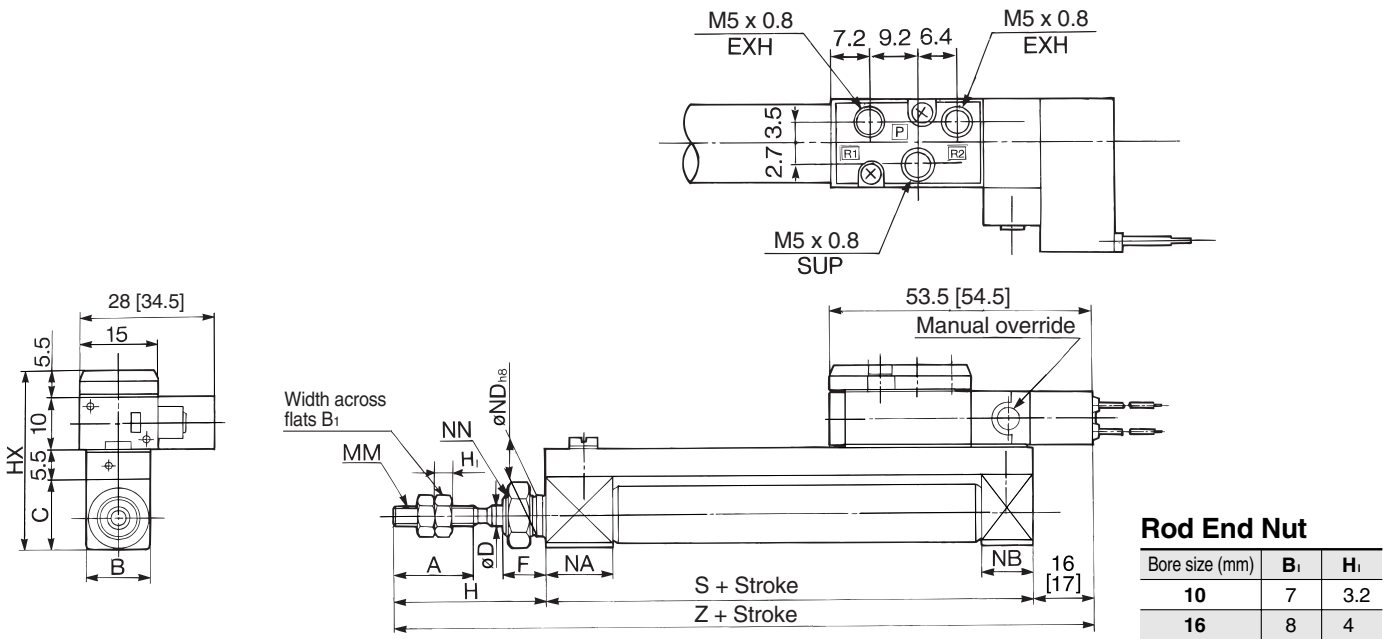
No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Head cover	Aluminum alloy	Clear anodized
③	Cylinder tube	Stainless steel	
④	Piston rod	Stainless steel	
⑤	Piston	Brass	
⑥	Mounting nut	Brass	Nickel plated
⑦	Rod end nut	Rolled steel	Nickel plated
⑧	Bumper	Urethane	
⑨	Steel ball	Carbon steel	
⑩	Stud	Brass	Electroless nickel plated
⑪	Phillips screw	Rolled steel	Black zinc chromated

No.	Description	Material	Note
⑫	Plate	Zinc alloy	
⑬	Solenoid valve	—	* Refer to the note below.
⑭	Pipe	Aluminum alloy	Clear anodized
⑮	Piston seal	NBR	
⑯	Rod seal	NBR	
⑰	Tube gasket	NBR	
⑱	Piston gasket	NBR	
⑲	Gasket	Resin	
⑳	Pipe gasket	NBR	
㉑	Plate gasket	NBR	

* How to order solenoid valves
SYJ3190- [Voltage] [Electrical entry]

Basic Style (B)

CVJ5



Rod End Nut

Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	H	HX	MM	NA	NB	ND	NN	S	Z
10	15	12	14	4	8	28	35	M4 x 0.7	12.5	9.5	8 ⁰ _{-0.022}	M8 x 1	46	90 [91]
16	15	18	20	5	8	28	41	M5 x 0.8	12.5	9.5	10 ⁰ _{-0.022}	M10 x 1	47	91 [92]

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹₅-S

CV

MVGQ

CC

RB

J

D-

-X

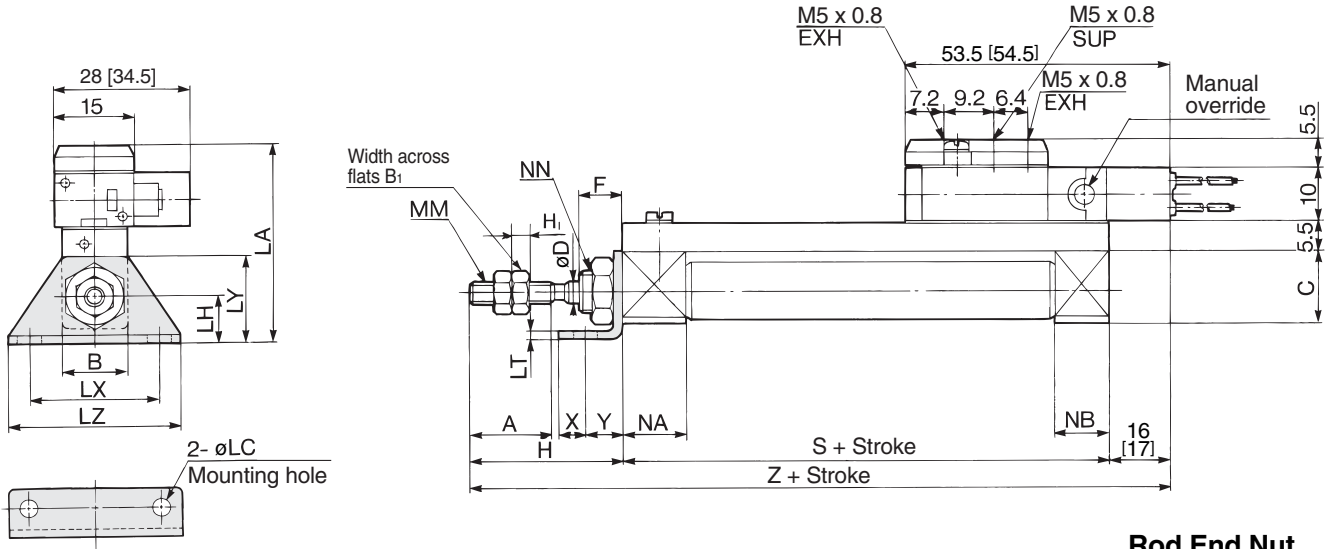
20-

Data

Series CVJ5

Axial Foot Style (L)

CVJ5L



Rod End Nut

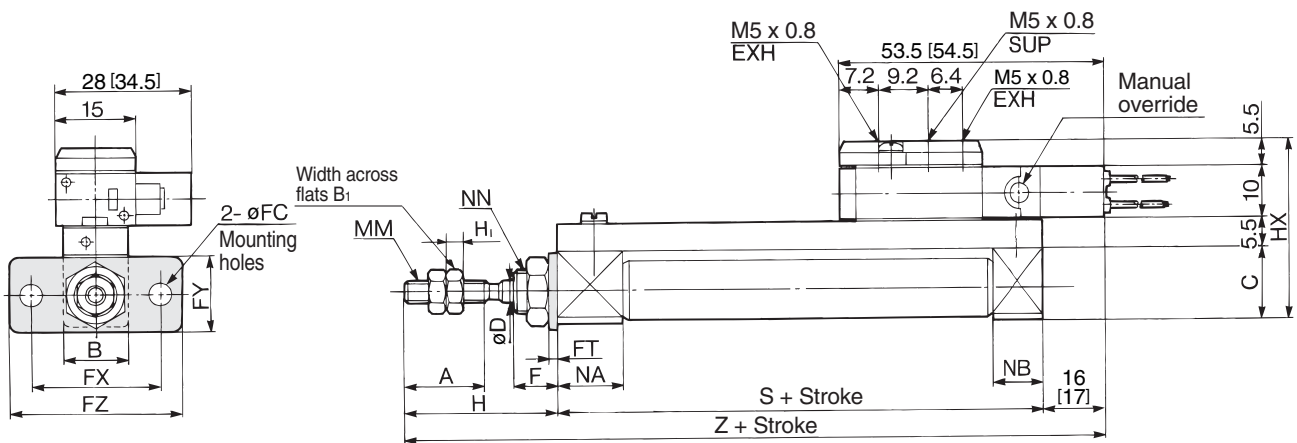
Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	H	LA	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	S	X	Y	Z
10	15	12	14	4	8	28	38	4.5	9	1.6	24	16.5	32	M4 x 0.7	12.5	9.5	M8 x 1	46	5	7	90 [91]
16	15	18	20	5	8	28	46	5.5	14	2.3	33	25	42	M5 x 0.8	12.5	9.5	M10 x 1	47	6	9	91 [92]

Rod Side Flange Style (F)

CVJ5F Rod extended/retracted when energized



Rod End Nut

Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

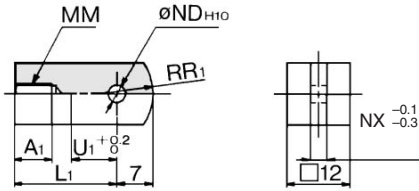
* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	FC	FT	FX	FY	FZ	H	HX	MM	NA	NB	NN	S	Z
10	15	12	14	4	8	4.5	1.6	24	14	32	28	35	M4 x 0.7	12.5	9.5	M8 x 1	46	90 [91]
16	15	18	20	5	8	5.5	2.3	33	20	42	28	41	M5 x 0.8	12.5	9.5	M10 x 1	47	91 [92]

Valve Mounted Cylinder Double Acting, Single Rod Series CVJ5

Accessory Dimensions

Single Knuckle Joint

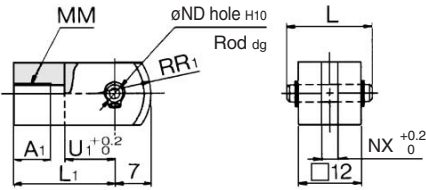


Material: Rolled steel

Part no.	Applicable bore size	A ₁	L ₁	MM	ND ^{H10}	NX	R ₁	U ₁
I-J010B	10	8	21	M4 x 0.7	3.3 ^{+0.048} ₀	3.1	8	9
I-J016B	16	8	25	M5 x 0.8	5 ^{+0.048} ₀	6.4	12	14

Double Knuckle Joint

* Knuckle pin and set ring are shipped together.

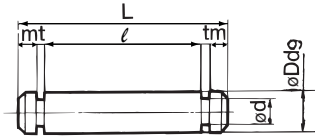


Material: Rolled steel

Part no.	Applicable bore size	A ₁	L	L ₁	MM
Y-J010B	10	8	16.2	21	M4 x 0.7
Y-J016B	16	11	16.6	21	M5 x 0.8

Part no.	ND ^{ø9}	ND ^{H10}	NX	R ₁	U ₁
Y-J010B	3.3 ^{-0.030} _{-0.060}	3.3 ^{+0.048} ₀	3.2	8	10
Y-J016B	5 ^{-0.030} _{-0.060}	5 ^{+0.048} ₀	6.5	12	10

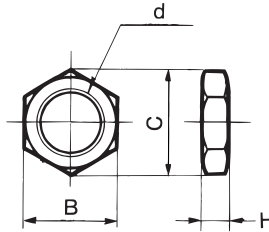
Knuckle Pin



Material: Stainless steel

Part no.	Applicable bore size	Dd9	d	L	l	m	t	Applicable snap ring
IY-J010	10	3.3 ^{-0.030} _{-0.060}	3	16.2	12.2	1.7	0.3	Type C 3.2
IY-J015	16	5 ^{-0.030} _{-0.060}	4.8	16.6	12.2	1.5	0.7	Type C 5

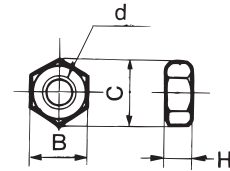
Mounting Nut



Material: Brass

Part no.	Applicable bore size	B	C	d	H
SNJ-010B	10	11	12.7	M8 x 1.0	4
SNJ-016B	16	14	16.2	M10 x 1.0	4

Rod End Nut



Material: Iron

Part no.	Applicable bore size	B	C	d	H
NTJ-010A	10	7	8.1	M4 x 0.7	3.2
NTJ-015A	16	8	9.2	M5 x 0.8	4

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹₆-5-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Valve Mounted Cylinder

Single Acting, Single Rod, Spring Return/Extend

Series CVJ3

ø10, ø16

How to Order

Stroke (mm)	
ø10	15, 30, 45, 60
ø16	15, 30, 45, 60

Bore size	
10	10 mm
16	16 mm

Mounting style	
B	Basic style
L	Axial foot style
F	Rod side flange style

Electrical entry	
G	Grommet
L	L plug connector
M	M plug connector

Light/Surge voltage suppressor	
Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (No polarity)
U	With light/surge voltage suppressor (No polarity)

* Type "R", "U": DC only
* In the case of AC, since the rectifier prevents the production of surge voltage, there is no type "S".

Without auto switch CVJ3 L 16 60 S 5 L

With auto switch CDVJ3 L 16 60 S 5 L J79W

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

Solenoid valve voltage	
DC specifications	
5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC
AC specifications (50/60 Hz)	
1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]

Number of auto switches	
Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of the w/ auto switch cylinder part number.

Example	Rail mounting style	CDVJ5B15-60-A
	Band mounting style	CDVJ5B10-45-B

Auto switch
Magnet installed even without auto switch

Symbol	Auto switch mounting
A	Rail mounting style
B	Band mounting style

* For the applicable auto switch model, refer to the table below.
* Auto switches for rail mounting style are shipped together (but not assembled).

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model			Lead wire length (m) *				Pre-wire connector	Applicable load		
					DC	AC	Band mounting	Rail mounting		0.5 (Nil)	3 (L)	5 (Z)	None (N)				
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	—	A76H	●	●	—	—	—	IC circuit	
											—	200 V	—	A72			A72H
	Diagnostic indication (2-color indication)	Connector		Grommet	2-wire	24 V	12 V	100 V	C73	A73	A73H	●	●	●	—	—	Relay, PLC
												—	—	C73C	A73C		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	F7NV	F79	●	●	○	—	○	IC circuit	
				3-wire (PNP)				H7A2	F7PV	F7P	●	●	○	—	○		
		2-wire		H7B				F7BV	J79	●	●	○	—	○			
		—		H7C				J79C	—	●	●	○	●	○			
	Diagnostic indication (2-color indication)	Grommet		Grommet	3-wire (NPN)	24 V	5 V, 12 V	—	H7NW	F7N WV	F79W	●	●	○	—	○	IC circuit
					3-wire (PNP)				H7PW	—	F7PW	●	●	○	—	○	
		2-wire		H7BW	F7B WV				J79W	●	●	○	—	○			
		4-wire (NPN)		H7NF	—				F79F	●	●	○	—	○			
With diagnostic output (2-color indication)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

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

- Since there are other applicable auto switches than listed, refer to page 10-15-12 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

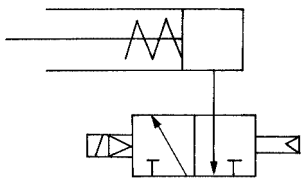
Valve Mounted Cylinder Single Acting, Spring Return/Extend Series CVJ3

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

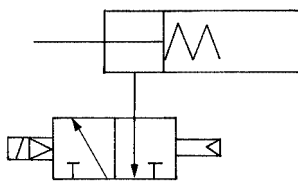


JIS Symbol

Single acting,
Spring return



Single acting,
Spring extend



Made to Order Made to Order Specifications
(For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape

Specifications

Action	Single acting, Single rod, Spring return/Spring extend
Type	Non-lube
Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.15 MPa
Ambient and fluid temperature	-10 to 50°C (No freezing)
Cushion	Rubber bumper
Lubrication	Not required (Non-lube)
Thread tolerance	JIS Class 2
Stroke length tolerance	$+1.0$ 0
Applicable bore size (mm)	10, 16
Effective area of valve (Cv factor)	1.8 mm ² (0.1)
Port size	M5 x 0.8
Mounting	Basic style, Axial foot style, Rod side flange style
Piston speed	ø10: 50 to 750 mm/s, ø16: 50 to 350 mm/s

Allowable Kinetic Energy

Bore size (mm)	10	16
Allowable kinetic energy	0.035	0.090

Solenoid Valve Specifications

Applicable solenoid valve model	SYJ319	
Electrical entry	Grommet (G)/(H), L plug connector (L), M plug connector (M)	
Coil rated voltage (V) ⁽¹⁾	DC	24, 12, 6, 5, 3
	AC 50/60 Hz	100, 110, 200, 220
Allowable voltage	±10% of the rated voltage	
Power consumption (W) ⁽²⁾	DC	0.5 (With indicator light: 0.55)
	AC	0.9 (With indicator light: 1.0)
Apparent power (VA)	100 V	1.0 (With indicator light: 1.1)
	110 V [115 V]	[1.1 (With indicator light: 1.2)]
	200 V	1.8 (With indicator light: 1.9)
	220 V [230 V]	1.9 (With indicator light: 2.0) [2.2 (With indicator light: 2.3)]



Note 1) 110 VAC and 115 VAC types and 220 VAC and 230 VAC types are common respectively.

Note 2) At the rated voltage.

Standard Stroke

Bore size (mm)	Standard stroke
10	15, 30, 45, 60
16	15, 30, 45, 60

Spring Back Force

Bore size (mm)	Retracted side	Extended side
10	6.9	3.5
16	14.2	6.9

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C₆¹/₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CVJ3

Minimum Stroke for Auto Switch Mounting (mm)

Auto switch mounting	Auto switch model	No. of auto switches mounted		
		2 (Same side)	2 (Different sides)	1
Band mounting style	D-C7□/C80	50	15	10
	D-H7□/H7□W	60	15	10
	D-H7NF			
	D-C73C/C80C	65 ^{Note)}	15	10
D-H7C				
Rail mounting style	D-A7□/A80	10	—	5
	D-A7□H/A80H			
	D-A73C/A80C			
	D-F7□/J79	5	—	5
	D-F7□V			
	D-J79C			
D-A79W/F7□W	15	—	10	
D-J79W				
D-F7□WV/F79F				

Note) A type for 65 stroke is not available.

Mounting Style and Accessory

(For details, refer to page 10-15-9.)

Mounting		Basic style	Axial foot style	Rod side style Flange side style
Standard equipment	Mounting nut	●	●	●
	Rod end nut	●	●	●
Option	Single knuckle joint	●	●	●
	Double knuckle joint (With pin)*	●	●	●

* Knuckle pin and set ring are shipped together.

Accessory

Accessories of Series CVJ3 are the same specifications as those of series CVJ5. Refer to page 10-15-9.

Mounting Bracket Part No.

Bore size (mm)	10	16
Foot	CJ-L010B	CJ-L016B
Flange	CJ-F010B	CJ-F016B

Auto Switch Mounting Bracket Part No. (Band mounting style)

Bore size (mm)	Part no.	Note
10	BJ2-010	Common for the types of D-C7/C8 and D-H7
16	BJ2-016	

Weight

Spring Return (g)

Bore size (mm)		10	16
Basic weight*	15 stroke	80	121
	30 stroke	88	140
	45 stroke	98	164
	60 stroke	110	189
Mounting bracket weight	Axial foot style	7	19
	Rod side flange style	5	13

* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example) CVJ3L10-45S

- Basic weight 94 (g) (ø10-45 stroke)
 - Mounting bracket weight 7 (g) (Axial foot)
- 94 + 7 = 105 g

Spring Extend (g)

Bore size (mm)		10	16
Basic weight*	15 Stroke	76	116
	30 Stroke	83	134
	45 Stroke	94	156
	60 Stroke	104	180
Mounting bracket weight	Axial foot style	7	19
	Rod side flange style	5	13

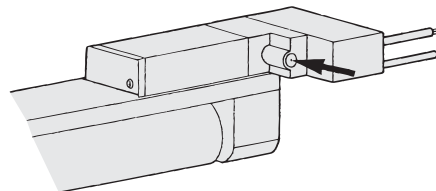
* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example) CVJ3L10-45T

- Basic weight 94 (g) (ø10-45 stroke)
 - Mounting bracket weight 7 (g) (Axial foot)
- 94 + 7 = 101 g

Manual Operation

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



Other than the models listed in "How to Order", the following auto switches are applicable. For detailed specifications, refer to page 10-20-1.

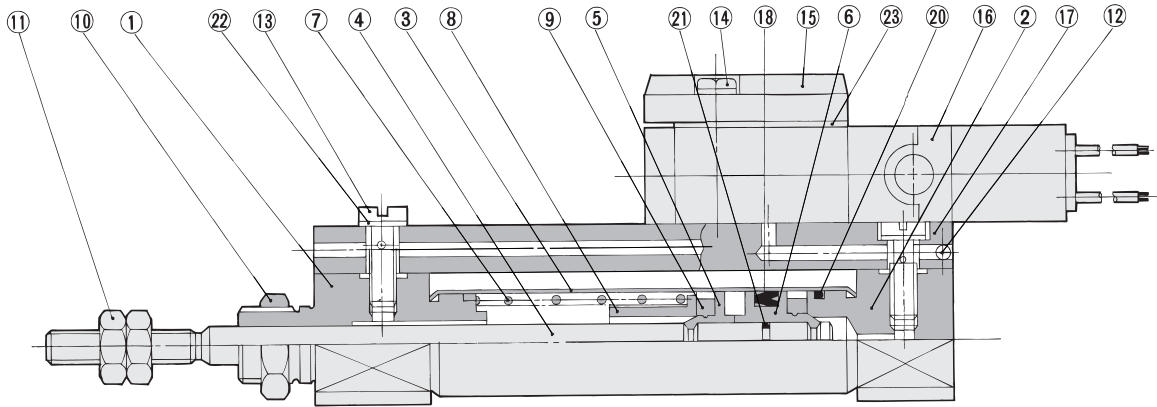
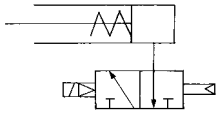
Type	Model	Electrical entry	Features
Reed switch	D-A80	Grommet	Without indicator light
	D-A80H		
	D-A80C	Connector	
	D-C80	Grommet	
	D-C80C	Connector	
Solid state switch	D-F7NNTL	Grommet	With timer

* With pre-wire connector is available for D-F7NNTL type, too. For details, refer to page 10-20-61.

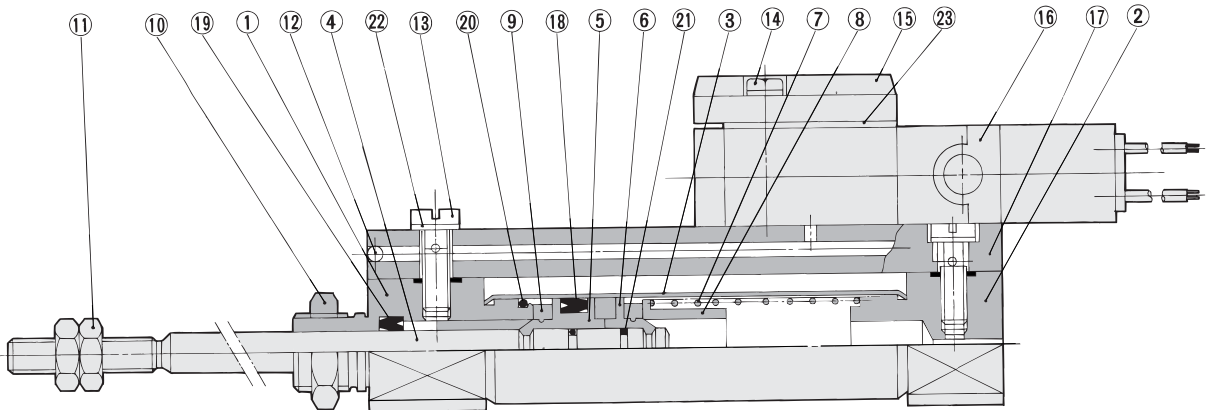
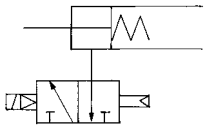
Valve Mounted Cylinder Single Acting, Spring Return/Extend Series CVJ3

Construction/Component Parts

Single acting, Spring return



Single acting, Spring extend



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 rod	Stainless steel	
⑤	Piston A	Brass	
⑥	Piston B	Brass	
⑦	Return spring	Piano wire	
⑧	Spring seat	Brass	
⑨	Bumper	Urethane	
⑩	Mounting nut	Brass	Nickel plated
⑪	Rod end nut	Brass	Nickel plated
⑫	Steel ball	Carbon steel	

No.	Description	Material	Note
⑬	Stud	Brass	Electroless nickel plated
⑭	Phillips screw	Rolled steel	Black zinc chromated
⑮	Plate	Zinc alloy	
⑯	Solenoid valve	—	Refer to "How to Order" below.*
⑰	Pipe	Aluminum alloy	Clear anodized
⑱	Piston seal	NBR	
⑲	Rod seal	NBR	
⑳	Tube gasket	NBR	
㉑	Piston gasket	NBR	
㉒	Gasket	Resin	
㉓	Plate gasket	NBR	

* How to Order solenoid valves
SYJ319-[Voltage][Electrical entry]

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C_G5-S

CV

MVGQ

CC

RB

J

D-

-X

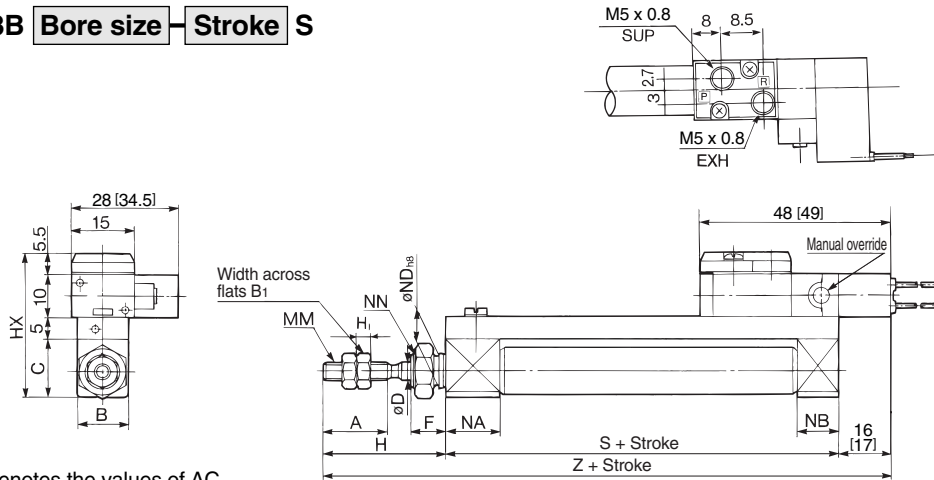
20-

Data

Series CVJ3

Single Acting, Spring Return/Basic Style (B)

CVJ3B **Bore size** **Stroke** S



Rod End Nut

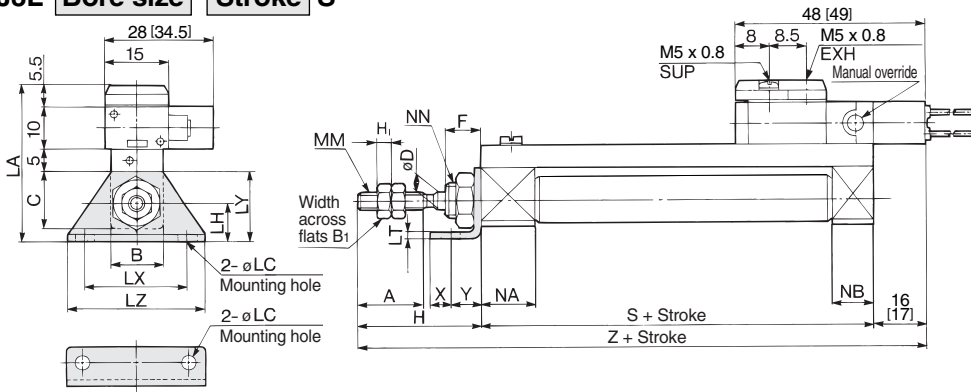
Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	H	HX	MM	NA	NB	ND	NN	5 to 15 st		16 to 30 st		31 to 45 st		46 to 60 st	
													S	Z	S	Z	S	Z	S	Z
10	15	12	14	4	8	28	34.5	M4 x 0.7	12.5	9.5	8 ⁰ _{-0.022}	M8 x 1	52.5	96.5 [97.5]	60	104 [105]	72	116 [117]	84	128 [129]
16	15	18	20	5	8	28	40.5	M5 x 0.8	12.5	9.5	10 ⁰ _{-0.022}	M10 x 1	52.5	96.5 [97.5]	61	105 [106]	73	117 [118]	85	129 [130]

Single Acting, Spring Return/Axial Foot Style (L)

CVJ3L **Bore size** **Stroke** S



Rod End Nut

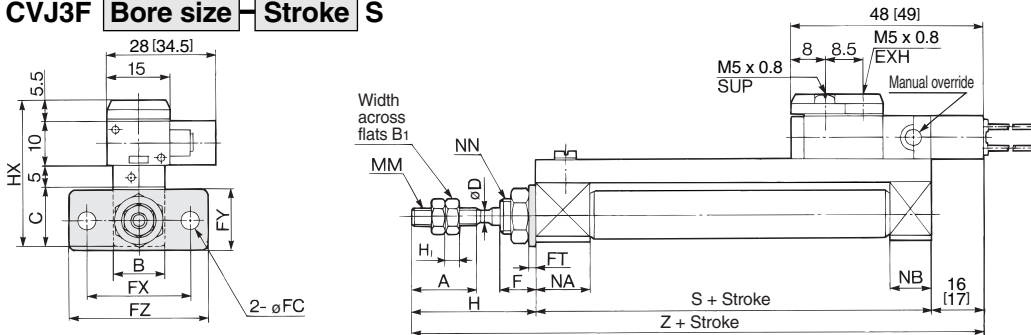
Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	H	LA	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	X	Y	5 to 15 st		16 to 30 st		31 to 45 st		46 to 60 st	
																					S	Z	S	Z	S	Z	S	Z
10	15	12	14	4	8	28	37.5	15	4.5	9	1.6	24	16.5	32	M4 x 0.7	12.5	9.5	M8 x 1	5	7	52.5	96.5 [97.5]	60	104 [105]	72	116 [117]	84	128 [129]
16	15	18	20	5	8	28	45.5	23	5.5	14	2.3	33	25	42	M5 x 0.8	12.5	9.5	M10 x 1	6	9	52.5	96.5 [97.5]	61	105 [106]	73	117 [118]	85	129 [130]

Single Acting, Spring Return/Rod Side Flange Style (F)

CVJ3F **Bore size** **Stroke** S



Rod End Nut

Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

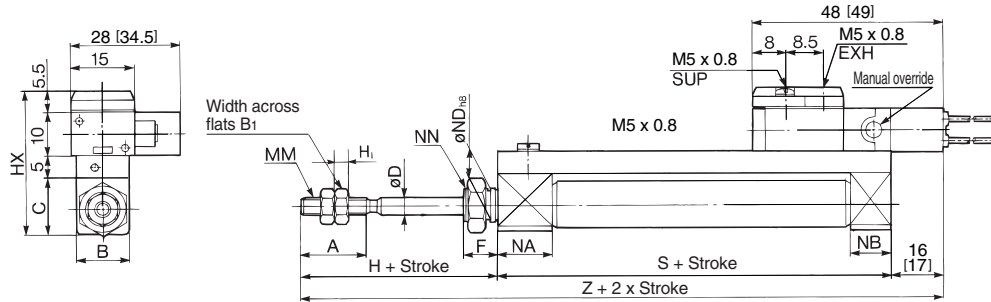
* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	FC	FT	FX	FY	FZ	H	HX	MM	NA	NB	NN	5 to 15 st		16 to 30 st		31 to 45 st		46 to 60 st	
																	S	Z	S	Z	S	Z	S	Z
10	15	12	14	4	8	4.5	1.6	24	14	32	28	34.5	M4 x 0.7	12.5	9.5	M8 x 1	52.5	96.5 [97.5]	60	104 [105]	72	116 [117]	84	128 [129]
16	15	18	20	5	8	5.5	2.3	33	20	42	28	40.5	M5 x 0.8	12.5	9.5	M10 x 1	52.5	96.5 [97.5]	61	105 [106]	73	117 [118]	85	129 [130]

Valve Mounted Cylinder Single Acting, Spring Return/Extend Series CVJ3

Single Acting, Spring Extend/Basic Style (B)

CVJ3B Bore size Stroke T



Rod End Nut

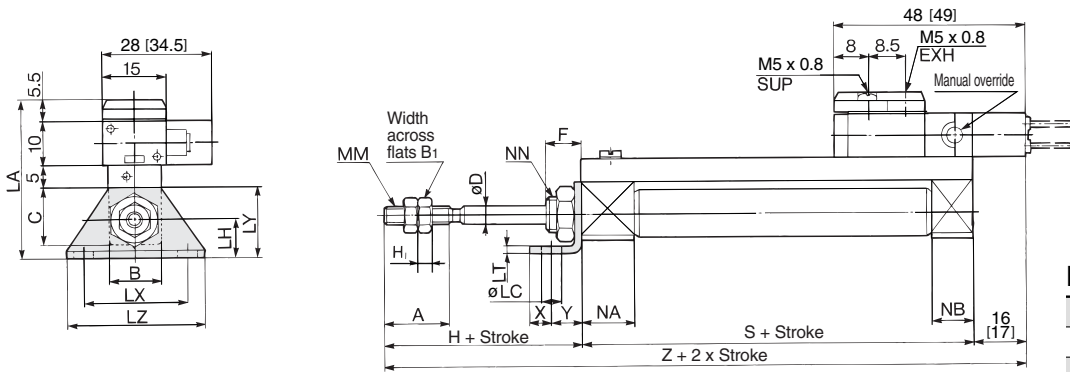
Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	H	HX	MM	NA	NB	ND	NN	5 to 15 st		16 to 30 st		31 to 45 st		46 to 60 st	
													S	Z	S	Z	S	Z	S	Z
10	15	12	14	4	8	28	34.5	M4 x 0.7	12.5	9.5	8 ⁰ _{-0.022}	M8 x 1	52.5	96.5 [97.5]	60	104 [105]	72	116 [117]	84	128 [129]
16	15	18	20	5	8	28	40.5	M5 x 0.8	12.5	9.5	10 ⁰ _{-0.022}	M10 x 1	52.5	96.5 [97.5]	61	105 [106]	73	117 [118]	85	129 [130]

Single Acting, Spring Extend/Axial Foot Style (L)

CVJ3L Bore size Stroke T



Rod End Nut

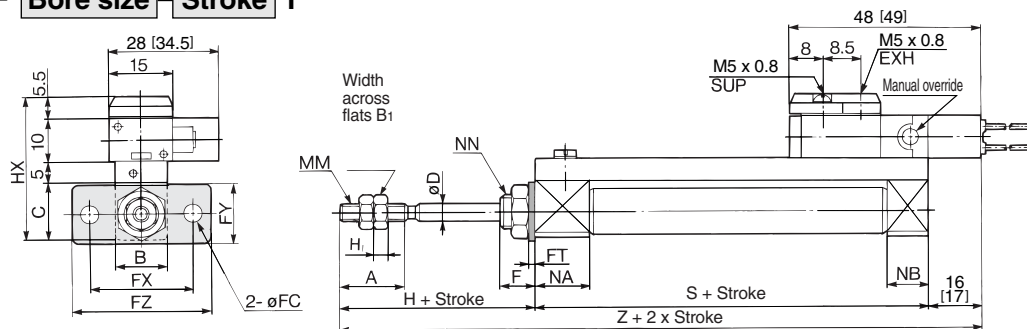
Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	H	LA	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	X	Y	5 to 15 st		16 to 30 st		31 to 45 st		46 to 60 st	
																					S	Z	S	Z	S	Z	S	Z
10	15	12	14	4	8	28	37.5	15	4.5	9	1.6	24	16.5	32	M4 x 0.7	12.5	9.5	M8 x 1	5	7	52.5	96.5 [97.5]	60	104 [105]	72	116 [117]	84	128 [129]
16	15	18	20	5	8	28	45.5	23	5.5	14	2.3	33	25	42	M5 x 0.8	12.5	9.5	M10 x 1	6	9	52.5	96.5 [97.5]	61	105 [106]	73	117 [118]	85	129 [130]

Single Acting, Spring Extend/Rod Side Flange Style (F)

CVJ3F Bore size Stroke T



Rod End Nut

Bore size (mm)	B ₁	H ₁
10	7	3.2
16	8	4

* []: Denotes the values of AC.

Bore size (mm)	A	B	C	D	F	FC	FT	FX	FY	FZ	H	HX	MM	NA	NB	NN	5 to 15 st		16 to 30 st		31 to 45 st		46 to 60 st	
																	S	Z	S	Z	S	Z	S	Z
10	15	12	14	4	8	4.5	1.6	24	14	32	28	34.5	M4 x 0.7	12.5	9.5	M8 x 1	52.5	96.5 [97.5]	60	104 [105]	72	116 [117]	84	128 [129]
16	15	18	20	5	8	5.5	2.3	33	20	42	28	40.5	M5 x 0.8	12.5	9.5	M10 x 1	52.5	96.5 [97.5]	61	105 [106]	73	117 [118]	85	129 [130]

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹/₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



Valve Mounted Cylinder Double Acting, Single Rod Series **CVM5** ø20, ø25, ø32, ø40

How to Order

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

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 Type G)

Without auto switch CVM5 L 32 [] - 100 [] J - 1 1 M Z

With auto switch CDVM5 L 32 [] - 100 [] J - 1 1 M Z - H7BW []

Piping

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

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 10-15-17.)

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

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.

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m)*				Pre-wire connector	Applicable load		
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)				
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	●	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V, 200 V	C73	●	●	●	—	—	—	Relay, PLC
	Diagnostic indication (2-color indication)	Grommet	Yes	2-wire	—	—	—	B54	●	●	●	●	—		
	—			—	—	—	C73C	●	●	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	●	●	○	—	○	IC circuit	—
				3-wire (PNP)				H7A2	●	●	○	—	○	—	
		2-wire		H7B				●	●	○	—	○	—		
		2-wire		H7C				●	●	●	●	—		—	
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7NW	●	●	○	—	○	IC circuit	—
				3-wire (PNP)				H7PW	●	●	○	—	○	—	
				2-wire				H7BW	●	●	○	—	○		
				4-wire (NPN)				H7NF	●	●	○	—	○	IC circuit	

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

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

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

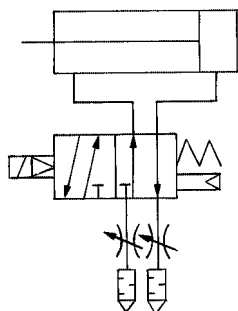
Valve Mounted Cylinder Double Acting, Single Rod Series CVM5

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 page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC6	Piston rod and rod end nut made of stainless steel

Specifications

Applicable bore size (mm)		20	25	32	40
Type	Non-lube type				
Fluid	Air				
Action	Double acting, Single rod				
Cushion	Rubber bumper				
Proof pressure	1.05 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)				
Thread tolerance	JIS Class 2				
Stroke length tolerance	+1.4 0				
Effective area of valve (Cv factor)	4.5 mm ² (0.25)				
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*	
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.

Allowable Kinetic Energy

Bore size (mm)	20	25	32	40
Allowable kinetic energy	0.27	0.4	0.65	1.2

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		
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.

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CVM5

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	No. of auto switches mounted				1
	2		n		
	Different sides	Same side	Different sides	Same side	
D-C7□/C80	15	50	$15 + 45 \left(\frac{n-2}{2}\right)$	$50 + 45(n-2)$	10
D-H7□/H7□W D-H7NF	15	60	$(n = 2, 4, 6 \dots)$	$60 + 45(n-2)$	10
D-C73C/C80C D-H7C	15	65	$15 + 50 \left(\frac{n-2}{2}\right)$	$65 + 50(n-2)$	10
D-B5□ D-B64 D-G5NTL	15	75	$15 + 50 \left(\frac{n-2}{2}\right)$	$75 + 55(n-2)$	10
D-B59W	20	75	$20 + 50 \left(\frac{n-2}{2}\right)$		15

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 ø32)
 - Additional weight 0.09/50 (kg/50 st)
 - Cylinder stroke 100 (st)
- $$0.55 + 0.09 \times 100 \div 50 = 0.73 \text{ kg}$$

Mounting Style and Accessory

(For details about accessory brackets, refer to Best Pneumatics Vol. 6.)

Mounting	Accessory	Standard equipment			Option	
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint ⁽⁹⁾	
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	CM-L040B
Flange	CM-F020B	CM-F032B	CM-F040B	CM-F040B
Single clevis	CM-C020B	CM-C032B	CM-C040B	CM-C040B
Double clevis**	CM-D020B	CM-D032B	CM-D040B	CM-D040B
Trunnion (With nut)	CM-T020B	CM-T032B	CM-T040B	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.

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

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 snap ring.

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

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.

Auto Switch Mounting Bracket Part No.

Bore (mm)	20	25	32	40
D-C7□/C80 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-G5NTL	BA2-020	BA2-025	BA2-032	BA2-040

Valve Mounted Cylinder Double Acting, Single Rod Series CVM5

Built-in One-touch Fitting

CVM5 **Mounting style** **Bore size** F — For "How to Order", refer to page 10-15-16.

● Built-in One-touch fitting

One-touch fittings are installed on cylinders.



Application/Tubing O.D.

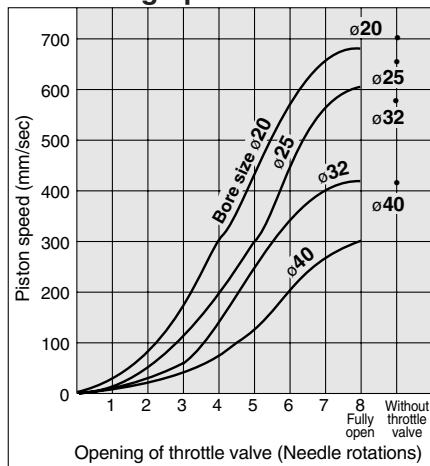
Bore size (mm)	20	25	32	40
Applicable tubing O.D. (mm)	ø6/4	ø6/4	ø6/4	ø6/4
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tube.			

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 10-15-22 to 25.

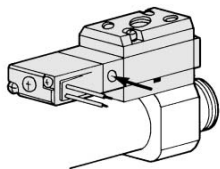
Opening Range of Throttle Valve and Driving Speed



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.



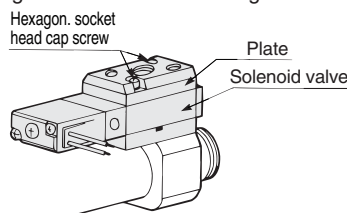
Piston Speed Adjustment

- 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.

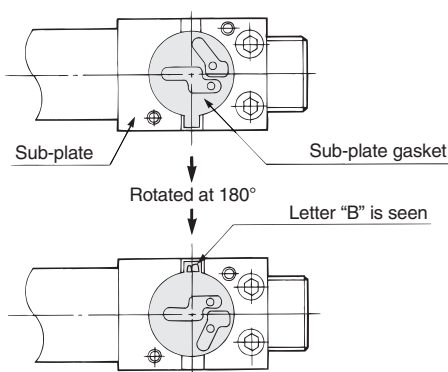
Changing between Rod Extended when Energized and Rod Retracted when Energized

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 head cap screws, 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.

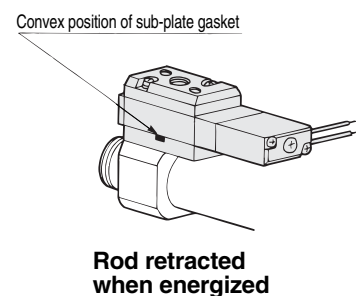
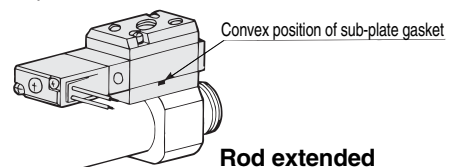


2. A sub-plate gasket is inside the sub-plate. Invert this sub-plate gasket 180° and install it with its letter "B" visible. (A portion that protrudes is provided on the periphery of the sub-plate gasket, and the letter "B" is on one side of this protrusion.)



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.

RE_A
B

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C_G^{1/5-S}

CV

MVGQ

CC

RB

J

D-

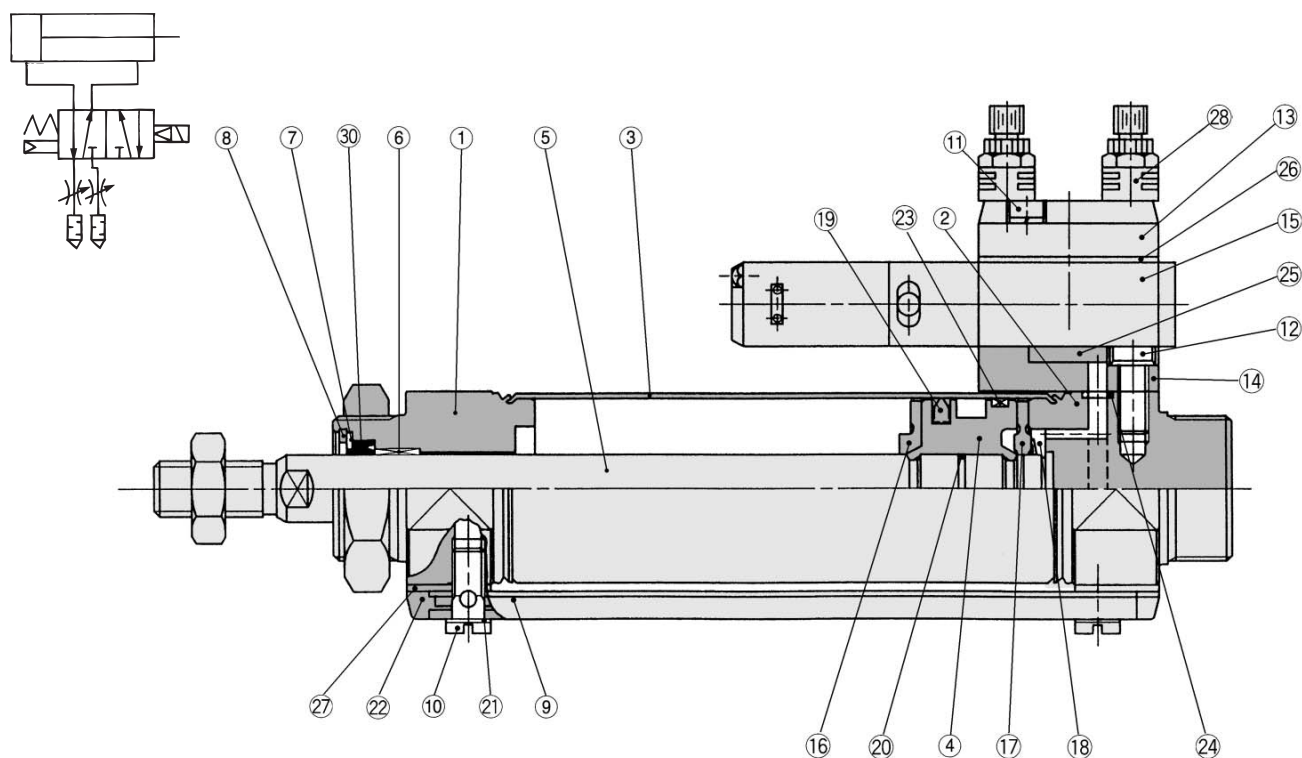
-X

20-

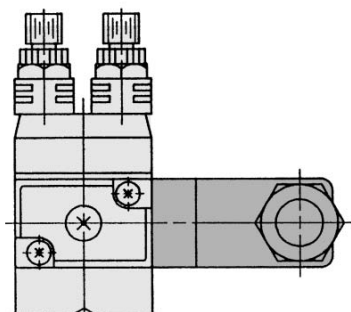
Data

Series CVM5

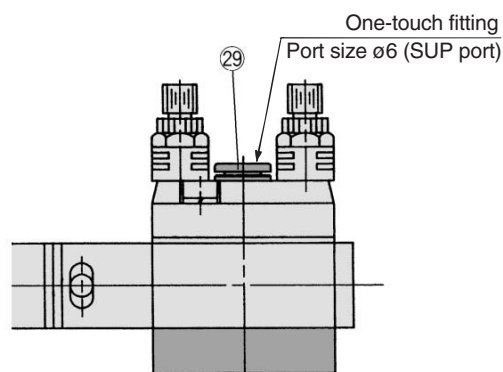
Construction



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	Snap 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	Stainless steel	M3 x 28ℓ
⑫	Hex. socket head cap screw with spring washer	Stainless steel	M3 x 10ℓ
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]

No.	Description	Material	Note
⑱	Snap 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	Not for ø25
㉘	Exhaust throttle with silencer	—	ASN2-M5
㉙	One-touch fitting	—	Port size: ø6

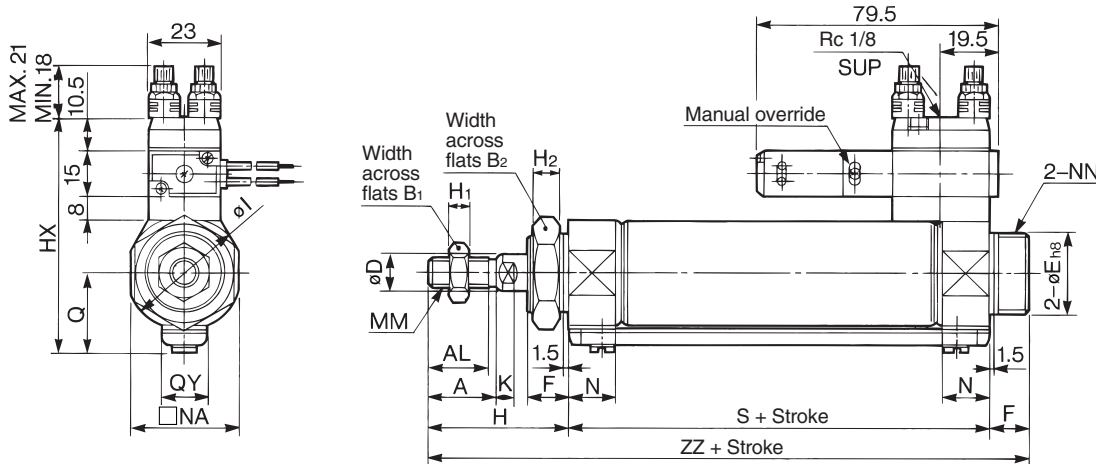
Replacement Parts

No.	Description	Material	Part no.			
			20	25	32	40
⑳	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

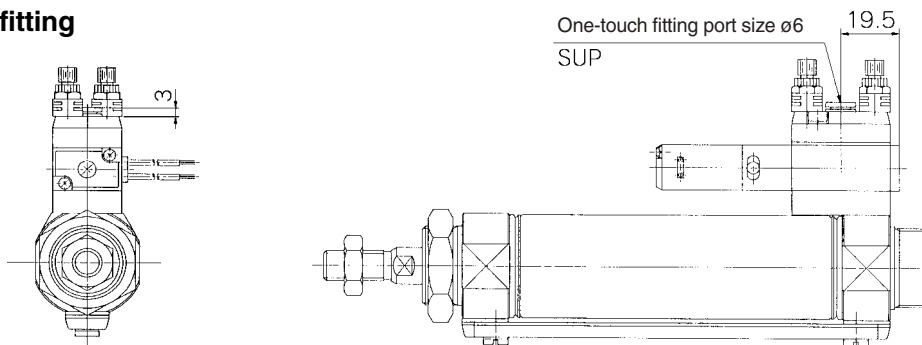
Valve Mounted Cylinder Double Acting, Single Rod Series CVM5

Basic Style (B)

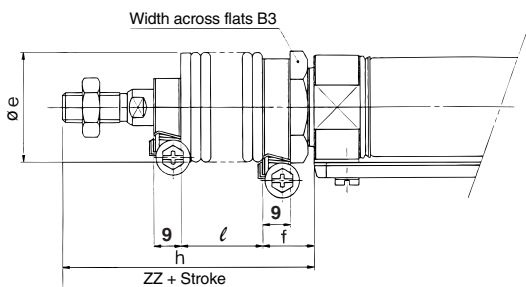
CVM5B Bore size Stroke



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 10-15-25.

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

Bore size (mm)	B ₃	e	f	h							ℓ												
				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	17	68	81	93	106	131	156	—	12.5	25	37.5	50	75	100	—						
25	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125						
32	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125						
40	41	46	19	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125						

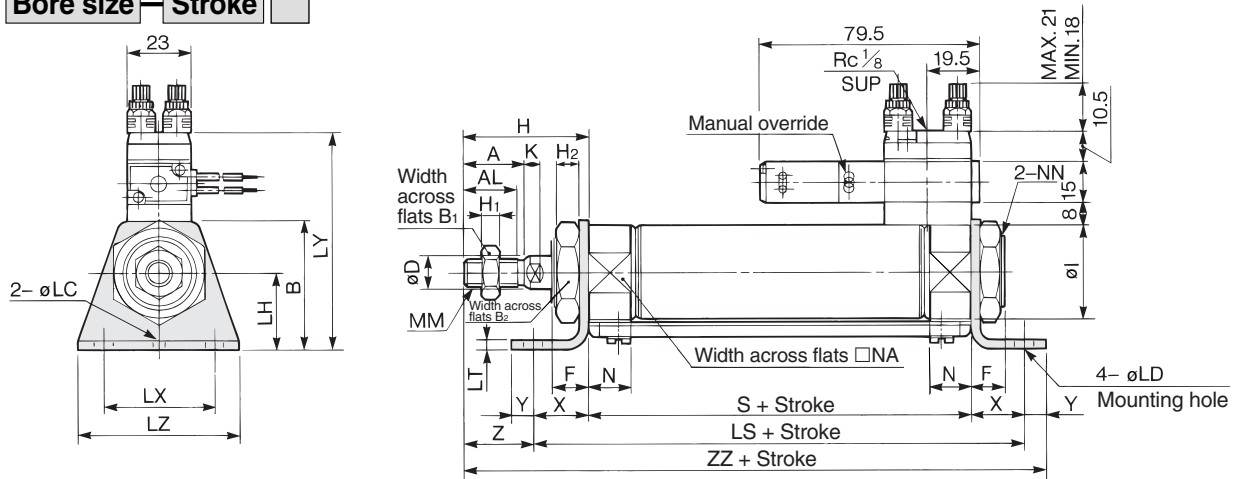
* Long stroke type includes ones for strokes more than 301 mm.

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_G5-S
- CV**
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CVM5

Axial Foot Style (L)

CVM5L **Bore size** **Stroke**

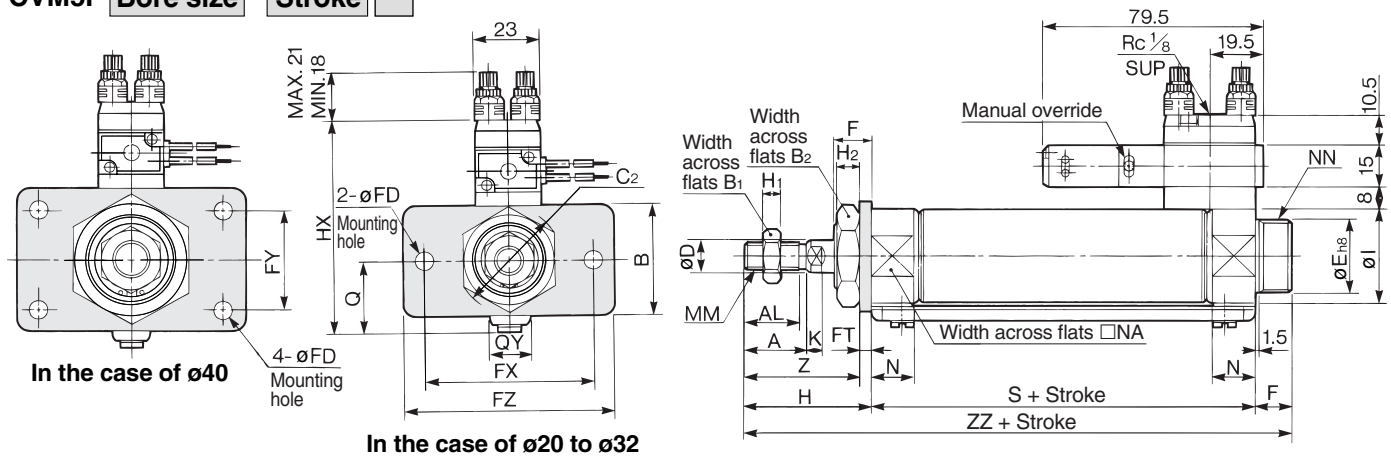


Bore size (mm)	Stroke range	A	AL	B	B ₁	B ₂	D	F	H	H ₁	H ₂	I	K	LC	LD	LH	LS	LT	LX	LY
20	Up to 300	18	15.5	40	13	26	8	13	41	5	8	28	5	4	6.8	25	102	3.2	40	70.5
25	Up to 300	22	19.5	47	17	32	10	13	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	76.5
32	Up to 300	22	19.5	47	17	32	12	13	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40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



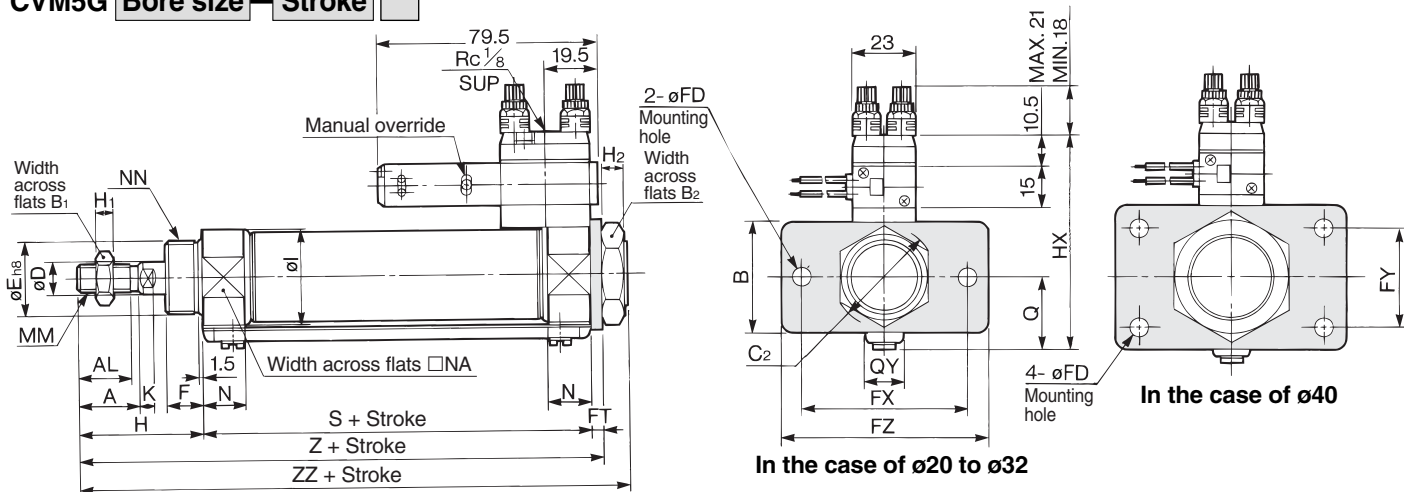
Bore size (mm)	Stroke range	A	AL	B	B ₁	B ₂	C ₂	D	Eh ₈	F	FD	FT	FX	FY	FZ	H	H ₁	H ₂	HX
20	Up to 300	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	7	4	60	—	75	41	5	8	65.3
25	Up to 300	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	70.5
32	Up to 300	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	7	4	60	—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

Valve Mounted Cylinder Double Acting, Single Rod Series CVM5

Head Side Flange Style (G)

CVM5G

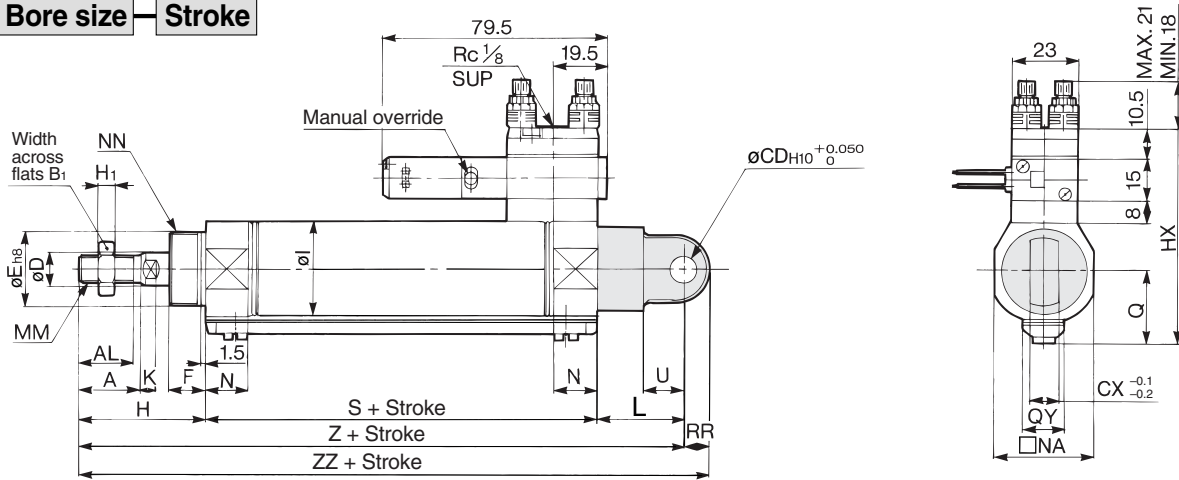


Bore size (mm)	Stroke range	A	AL	B	B ₁	B ₂	C ₂	D	Eh ₈	F	FD	FT	FX	FY	FZ	H	H ₁	H ₂	HX
20	Up to 300	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	7	4	60	—	75	41	5	8	65.3
25	Up to 300	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	70.5
32	Up to 300	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	7	4	60	—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

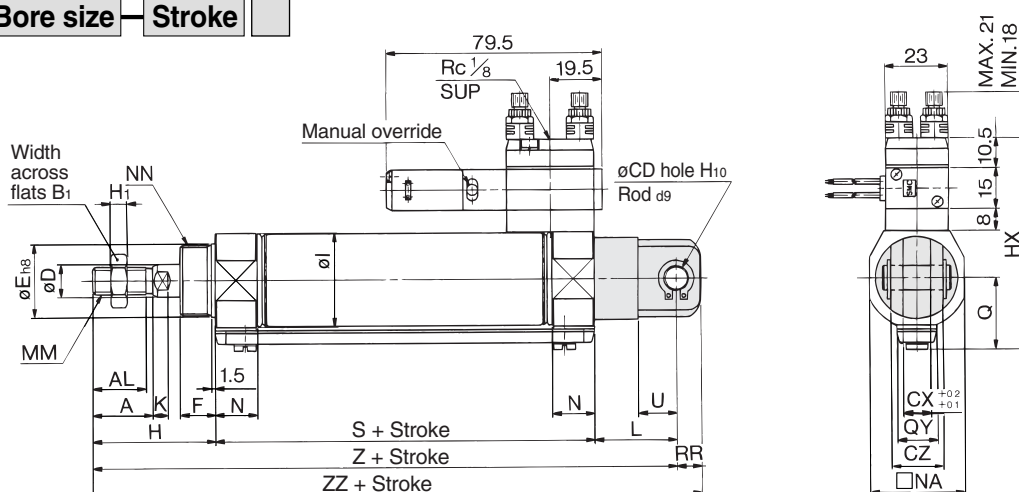
Bore size (mm)	NN	Q	QY	RR	S	U	Z	ZZ
20	M20 x 1.5	19.8	14	9	62	14	133	142
25	M26 x 1.5	22	14	9	62	14	137	146
32	M26 x 1.5	25.8	16	9	64	14	139	148
40	M32 x 2	29.8	16	11	88	18	177	188

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C^{1/2}_{5-S}
- CV**
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CVM5

Double Clevis Style (D)

CVM5D



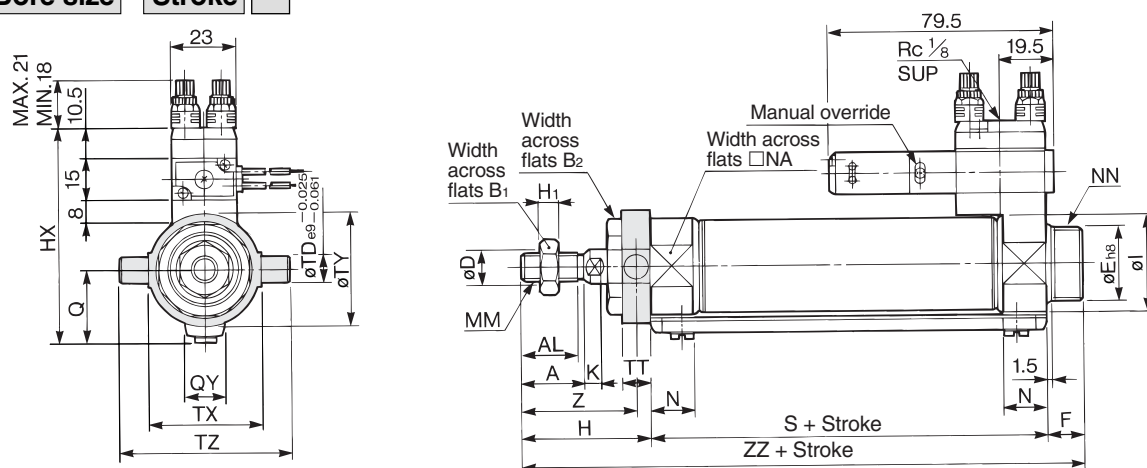
Bore size (mm)	Stroke range	A	AL	B ₁	CD	CX	CZ	D	Eh ₈	F	H	H ₁	HX	I	K	L	MM	N	NA
20	Up to 300	18	15.5	13	9	10	19	8	20 ⁰ _{-0.033}	13	41	5	65.3	28	5	30	M8 x 1.25	15	24
25	Up to 300	22	19.5	17	9	10	19	10	26 ⁰ _{-0.033}	13	45	6	70.5	33.5	5.5	30	M10 x 1.25	15	30
32	Up to 300	22	19.5	17	9	10	19	12	26 ⁰ _{-0.033}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



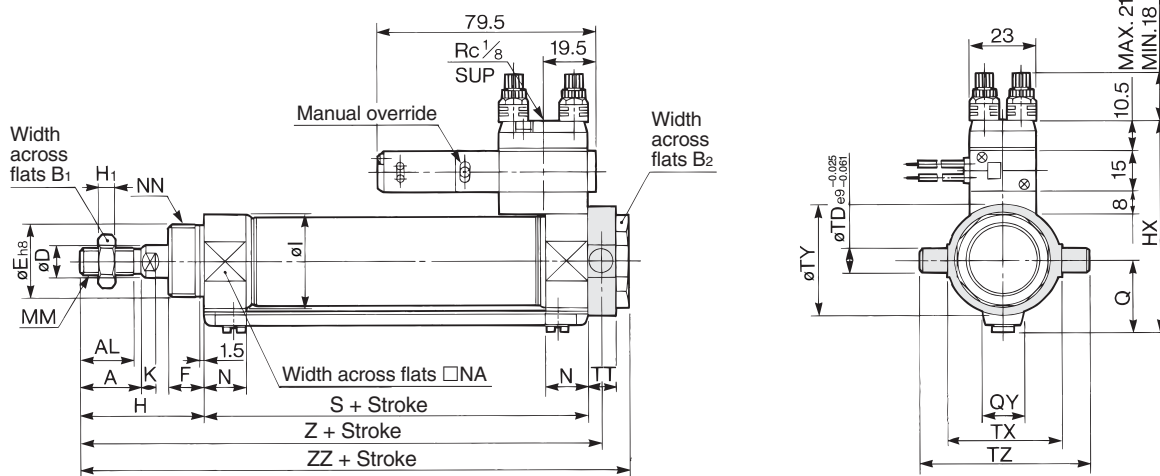
Bore size (mm)	Stroke range	A	AL	B ₁	B ₂	D	Eh ₈	F	H	H ₁	HX	I	K	MM	N	NA	NN	Q
20	Up to 300	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	41	5	65.3	28	5	M8 x 1.25	15	24	M20 x 1.5	19.8
25	Up to 300	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	45	6	70.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	22
32	Up to 300	22	19.5	17	32	12	26 ⁰ _{-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

Valve Mounted Cylinder Double Acting, Single Rod Series CVM5

Head Side Trunnion Style (T)

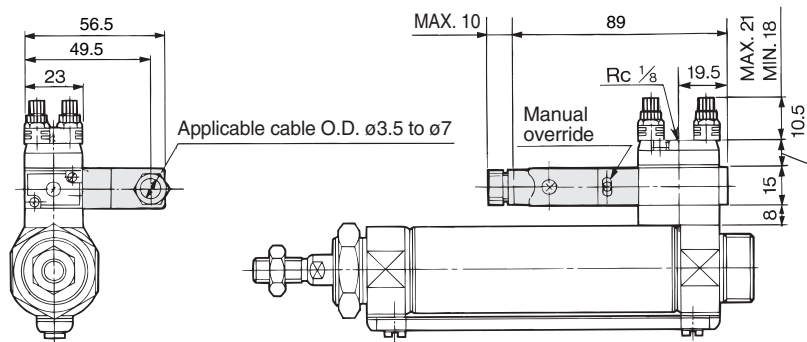
CVM5T



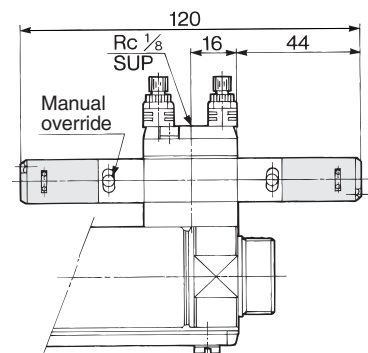
Bore size (mm)	Stroke range	A	AL	B ₁	B ₂	D	Eh ₆	F	H	H ₁	HX	I	K	MM	N	NA	NN
20	Up to 300	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	41	5	65.3	28	5	M8 x 1.25	15	24	M20 x 1.5
25	Up to 300	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	45	6	70.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5
32	Up to 300	22	19.5	17	32	12	26 ⁰ _{-0.033}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

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 of Best Pneumatics Vol. 6 (it is not applicable to clevis integrated style).

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data



Valve Mounted Cylinder: Non-rotating Rod Type

Double Acting, Single Rod

Series CVM5K

ø20, ø25, ø32, ø40

How to Order

Bore size		Mounting style		Solenoid valve voltage		Electrical entry	
20	20 mm	B	Basic style	1	100 VAC (50/60 Hz)	G	Grommet
25	25 mm	L	Axial foot style	2	200 VAC (50/60 Hz)	L	L plug connector
32	32 mm	F	Rod side flange style	5	24 VDC	M	M plug connector
40	40 mm	G	Head side flange style	3	110 VAC (50/60 Hz)	D	DIN terminal
		C	Single clevis style	4	220 VAC (50/60 Hz)		
		D	Double clevis style	6	12 VDC		
		T	Head side trunnion style	9	Other		
		U	Rod side trunnion style				

Solenoid valve		Light/Surge voltage suppressor	
1	2 position single	Nil	None
2	2 position double	S	With surge voltage suppressor
3	3 position closed center (Option)	Z	With light/surge voltage suppressor (Except Type G)
4	3 position exhaust center (Option)		

Without auto switch CVM5K L 32 [] 100 [] J 1 1 M Z

With auto switch CDVM5K L 32 [] 100 [] J 1 1 M Z H7BW []

Built-in magnet

Non-rotating rod type

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

Piping

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 10-15-27.)

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.

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m) *				Pre-wire connector	Applicable load	
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)			
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	C76	●	●	—	—	—	IC circuit	
				2-wire	24 V	12 V	C73	●	●	●	—	—	—	Relay, PLC
	100 V, 200 V	B54	●			●	●	—	—					
	Diagnostic indication (2-color indication)	Connector	Grommet	Yes	—	—	—	●	●	—	—	—	—	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	H7A1	●	●	○	—	○	IC circuit	
				3-wire (PNP)		12 V	H7A2	●	●	○	—	○	—	Relay, PLC
	2-wire	—	H7B	●	●	○	—	○						
	2-wire	—	H7C	●	●	●	●	—	—					
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	H7NW	●	●	○	—	○	IC circuit	
				3-wire (PNP)		12 V	H7PW	●	●	○	—	○	—	—
				2-wire		—	H7BW	●	●	○	—	○		
				4-wire (NPN)		5 V, 12 V	H7NF	●	●	○	—	○	IC circuit	

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

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

• Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
 • For details about auto switches with pre-wire connector, refer to page 10-20-66.



Valve Mounted Cylinder: Non-rotating Rod Type

Double Acting, Single Rod Series CVM5K

A hexagon shaped rod that does not rotate.

Non-rotating accuracy

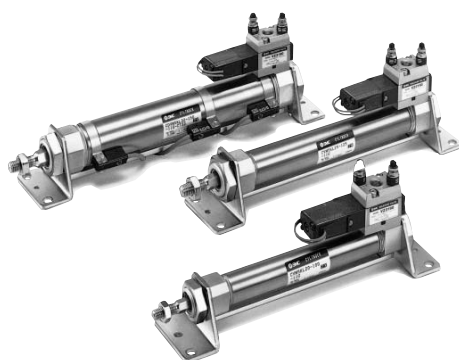
$\phi 20, \phi 25$ — $\pm 0.7^\circ$

$\phi 32, \phi 40$ — $\pm 0.5^\circ$

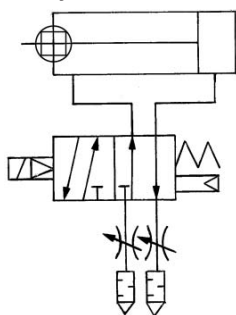
Can operate without lubrication.

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 **Made to Order Specifications**
(For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape

Specifications

Applicable bore size (mm)		20	25	32	40
Rod non-rotating accuracy		$\pm 0.7^\circ$		$\pm 0.5^\circ$	
Type		Non-lube			
Fluid		Air			
Action		Double acting, Single rod			
Proof pressure		1.05 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)			
Thread tolerance		JIS Class 2			
Stroke length tolerance		$+1.4$ 0			
Effective area of valve (Cv factor)		4.5 mm ² (0.25)			
Piston speed (mm/s)		50 to 700*	50 to 650*	50 to 590*	50 to 420*
Port size	Screw-in type	Rc 1/8			
	Built-in One-touch fitting	O.D.: $\phi 6$ /I.D.: $\phi 4$			
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.

Allowable Kinetic Energy

(J)

Bore size (mm)	20	25	32	40
Allowable kinetic energy	0.27	0.4	0.65	1.2

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	
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	25, 50, 75, 100, 125, 150
32	200, 250, 300
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.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹_{5-S}

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CVM5K

Minimum Stroke for Auto Switch Mounting

Auto switch model	No. of auto switches mounted				1
	2		n		
	Different sides	Same side	Different sides	Same side	
D-C7□/C80	15	50	$15 + 45 \left(\frac{n-2}{2} \right)$	$50 + 45(n-2)$	10
D-H7□/H7□W D-H7NF	15	60	$(n = 2, 4, 6 \dots)$	$60 + 45(n-2)$	10
D-C73C/C80C D-H7C	15	65	$15 + 50 \left(\frac{n-2}{2} \right)$ $(n = 2, 4, 6 \dots)$	$65 + 50(n-2)$	10
D-B5□ D-B64 D-G5NTL	15	75	$15 + 50 \left(\frac{n-2}{2} \right)$ $(n = 2, 4, 6 \dots)$	$75 + 55(n-2)$	10
D-B59W	20	75	$20 + 50 \left(\frac{n-2}{2} \right)$ $(n = 2, 4, 6 \dots)$		15

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) $0.55 + 0.09 \times 100 \div 50 = 0.73$ kg

Mounting Bracket and Accessory

(For details about the attached bracket, refer to Best Pneumatics Vol. 6.)

Accessory	Standard equipment			Option	
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint ⁽³⁾
Mounting					
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 snap ring (cotter pin for ø40) are packaged together.

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6. and refer to page 10-15-3 for common precautions for solenoid valves mounted on cylinders.

Precautions

⚠ Warning

1. Do not rotate the cover.

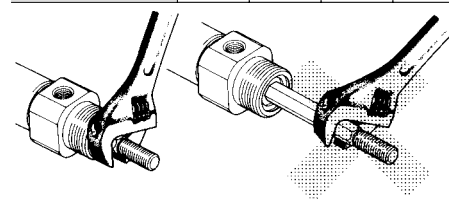
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠ 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.

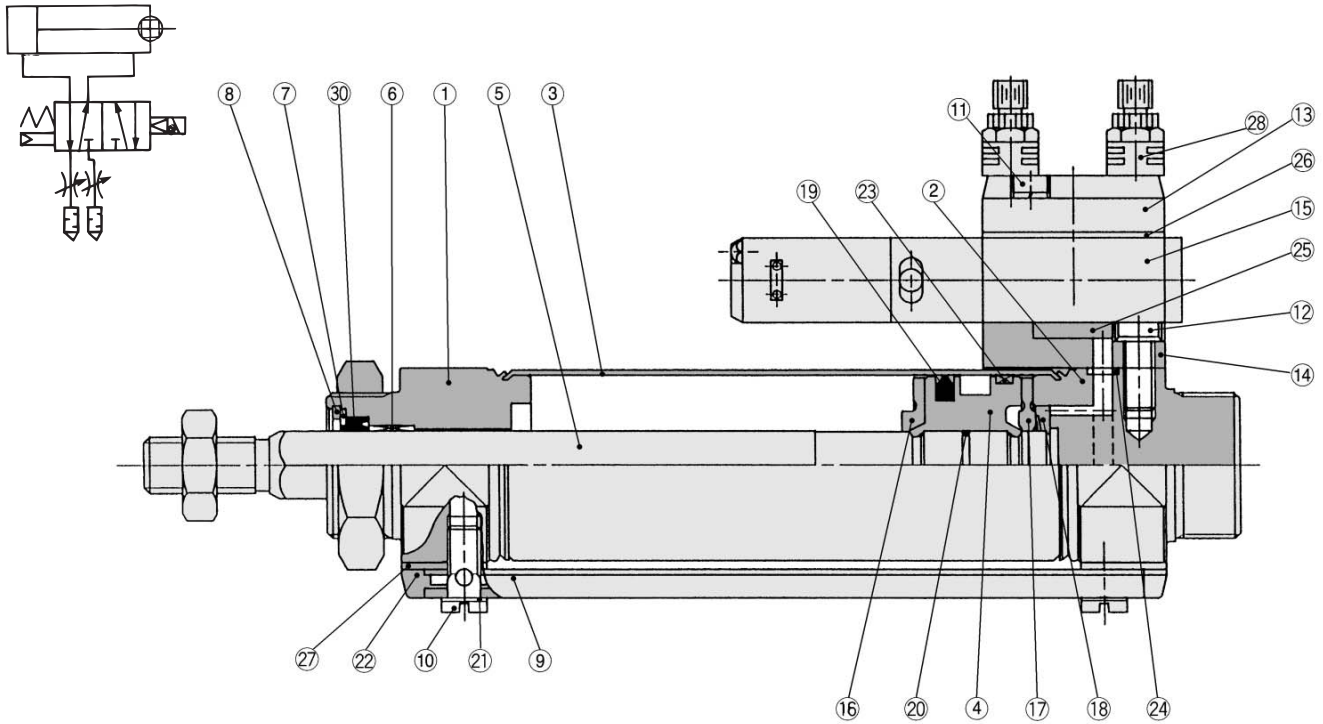
If a cylinder were installed with its rod boot being twisted, the rod boot could be damaged during operation.

Auto Switch Mounting Bracket Part No.

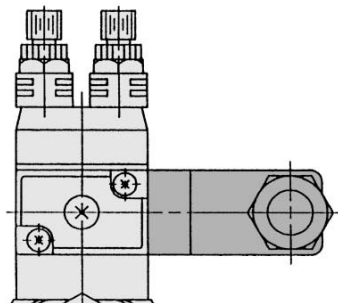
Bore size (mm)	20	25	32	40
D-C7□/C80 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-G5NTL	BA2-020	BA2-025	BA2-032	BA2-040

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

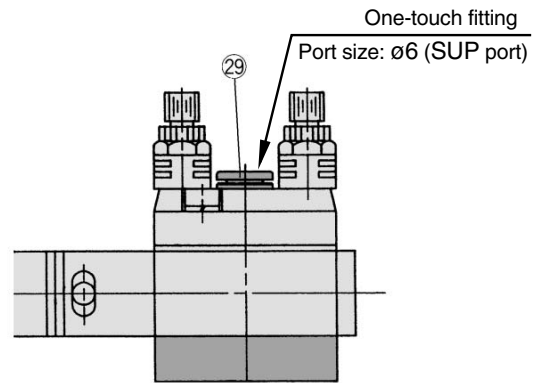
Construction



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	Snap 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	Stainless steel	M3 x 28 l
⑫	Hex. socket head cap screw with spring washer	Stainless steel	M3 x 10 l
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]

No.	Description	Material	Note
⑱	Snap 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

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

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹/₅-S

CV

MVGQ

CC

RB

J

D-

-X

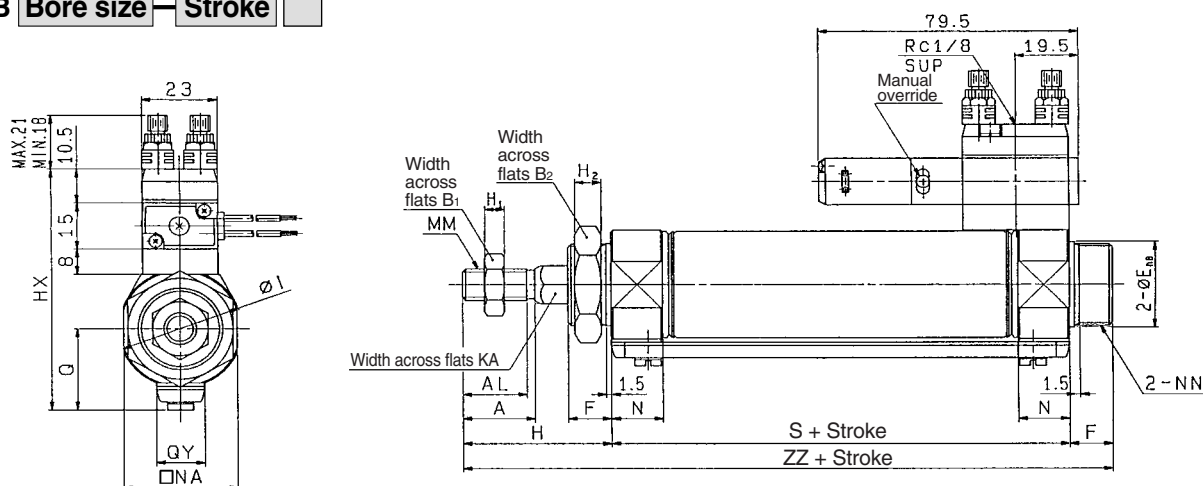
20-

Data

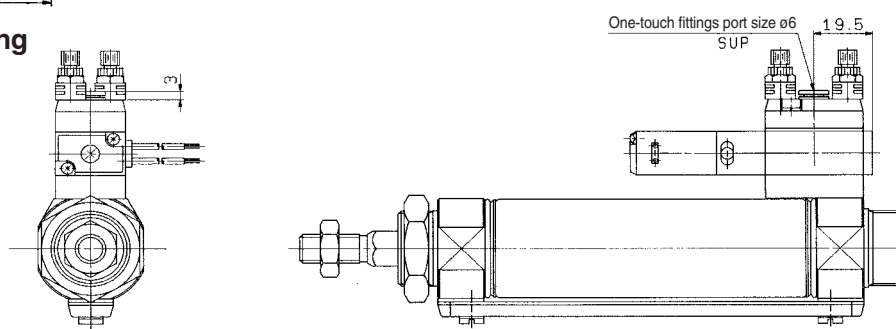
Series CVM5K

Basic Style (B): External Dimensions

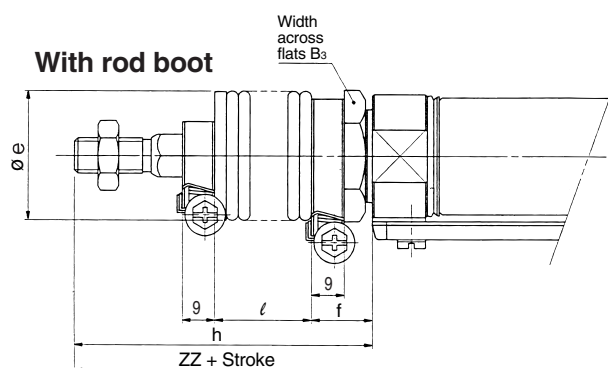
CVM5KB



Built-in One-touch fitting



With rod boot



For DIN terminal and double solenoid, refer to page 10-15-25.

Bore (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

Bore (mm)	B ₃	e	f	h					l				
				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	17	68	81	93	106	131	12.5	25	37.5	50	75
25	32	36	17	72	85	97	110	135	12.5	25	37.5	50	75
32	32	36	17	72	85	97	110	135	12.5	25	37.5	50	75
40	41	46	19	77	90	102	115	140	12.5	25	37.5	50	75

Valve Mounted Cylinder

Single Acting, Single Rod, Spring Return/Extend

Series CVM3

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

Bore size

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

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

Action

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

Light/Surge voltage suppressor

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

Without auto switch

CVM3 [L] [32] [] [100] [T] [1] [L] [Z]

With auto switch

CDVM3 [L] [32] [] [100] [T] [1] [L] [Z] [H7BW] []

Built-in magnet

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

Piping

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

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 10-15-32.)

Electrical entry

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

Number of auto switches

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

Auto switch

Nil	Without auto switch
-----	---------------------

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

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m) *				Pre-wire connector	Applicable load		
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	C76	●	●	—	—	—	IC circuit	—	
				2-wire	24 V	12 V	100 V, 200 V	C73	●	●	●	—	—	Relay, PLC	
	Diagnostic indication (2-color indication)	Connector	Grommet	Yes	2-wire	—	—	C73C	●	●	●	●	—		—
	—	Grommet			—	—	B59W	●	●	—	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				H7A2	●	●	○	—	○	—	
		2-wire		H7B				●	●	○	—	○	—		
		2-wire		H7C				●	●	●	●	—	—		
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7NW	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				H7PW	●	●	○	—	○	—	
		2-wire		H7BW				●	●	○	—	○	—		
		4-wire (NPN)		H7NF				●	●	○	—	○	—	IC circuit	

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

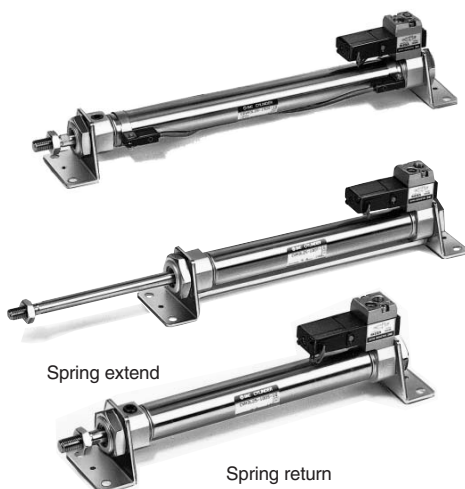
* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

RE^A_B
 REC
 C□X
 C□Y
 MQ^Q_M
 RHC
 MK(2)
 RS^Q_G
 RS^H_A
 RZQ
 MI^W_S
 CEP1
 CE1
 CE2
 ML2B
 C¹/₅-S
 CV
 MVGQ
 CC
 RB
 J
 D-
 -X
 20-
 Data

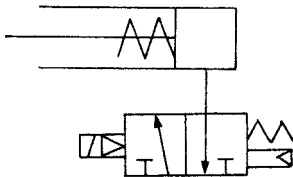
Series CVM3

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

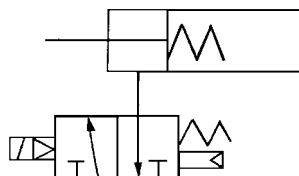


JIS Symbol

Spring return



Spring extend



Made to Order Specifications
(For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape

Specifications

Applicable bore size (mm)		20	25	32	40
Model		Non-lube			
Action		Single acting, Spring return/Spring extend			
Fluid		Air			
Cushion		Rubber bumper			
Proof pressure		1.05 MPa			
Maximum operating pressure		0.7 MPa			
Minimum operating pressure		0.18 MPa Spring return		0.23 MPa Spring extend	
Ambient and fluid temperature		-10 to 50°C (No freezing)			
Lubrication		Not required (Non-lube)			
Thread tolerance		JIS Class 2			
Stroke length tolerance		+1.4 0			
Effective area of valve (Cv factor)		4.5 mm ² (0.25)			
Piping	Screw-in type	Rc 1/8			
	Built-in One-touch fitting	O.D.: ø6/I.D.: ø4			
Manual override		Non locking (Standard)			
Piston speed (mm/s)		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, Head side trunnion style, Rod side trunnion style			

Allowable Kinetic Energy

(J)

Bore size (mm)	20	25	32	40
Allowable kinetic energy	0.27	0.4	0.65	1.2

Solenoid Valve Specifications

Applicable solenoid valve model		VZ319	
Coil rated voltage		Standard: 100/200 VAC (50/60 Hz), 24 VDC Option: 110/220 VAC, 12 VDC	
Allowable voltage		-15 to 10% of the rated voltage	
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
		AC	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 *
25	25, 50, 75, 100, 125, 150 *
32	25, 50, 75, 100, 125, 150, 200 *
40	25, 50, 75, 100, 125, 150, 200, 250 *



Note 1) Intermediate stroke except mentioned above is produced upon receipt of order.

Note 2) Strokes marked with "*" are the maximum strokes which are available.

Theoretical Output

Refer to "Theoretical Output Table 1" on page 10-23-1.

Spring Reaction Force

Refer to "Spring Reaction Force" on page 10-23-1.

Valve Mounted Cylinder Single Acting, Single Rod, Spring Return/Extend Series CVM3

Mounting Bracket and Accessory

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.

Weight

Spring Return/(): Denotes Spring Extend.

Bore size (mm)		(kg)			
		20	25	32	40
Basic weight	25 stroke	0.30 (0.30)	0.40 (0.04)	0.52 (0.51)	0.87 (0.86)
	50 stroke	0.32 (0.32)	0.43 (0.43)	0.56 (0.56)	0.94 (0.93)
	75 stroke	0.37 (0.37)	0.52 (0.51)	0.68 (0.66)	1.13 (1.09)
	100 stroke	0.39 (0.39)	0.55 (0.54)	0.73 (0.70)	1.19 (1.16)
	125 stroke	0.45 (0.44)	0.64 (0.61)	0.86 (0.82)	1.39 (1.33)
	150 stroke	0.47 (0.46)	0.67 (0.64)	0.90 (0.86)	1.46 (1.40)
	200 stroke	— (—)	— (—)	1.07 (1.02)	1.71 (1.63)
Mounting bracket weight	250 stroke	— (—)	— (—)	— (—)	1.97 (1.85)
	Axial foot	0.15 (0.15)	0.16 (0.16)	0.16 (0.16)	0.27 (0.27)
	Flange	0.06 (0.06)	0.09 (0.09)	0.09 (0.09)	0.12 (0.12)
	Single clevis	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.09 (0.09)
	Double clevis	0.05 (0.05)	0.06 (0.06)	0.06 (0.06)	0.13 (0.13)
Option bracket	Trunnion	0.04 (0.04)	0.07 (0.07)	0.07 (0.07)	0.10 (0.10)
	Single knuckle joint	0.06 (0.06)	0.06 (0.06)	0.06 (0.06)	0.23 (0.23)
	Double knuckle (With pin)	0.07 (0.07)	0.07 (0.07)	0.07 (0.07)	0.20 (0.02)

Calculation: (Example) CVM3L32-100-1G (ø32, 100 stroke, Spring return)

- Basic weight.....0.73 (kg)
 - Weight of brackets.....0.16 (kg)
- 0.73 + 0.16 = 0.89 kg

Minimum Stroke for Auto Switch Mounting

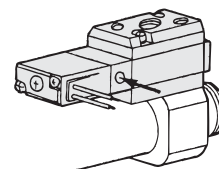
Auto switch model	No. of auto switches mounted				1
	2		n		
	Different sides	Same side	Different sides	Same side	
D-C7□/C80	15	50	15 + 45 ($\frac{n-2}{2}$) (n = 2, 4, 6...)	50 + 45 (n - 2)	10
D-H7□/H7□W D-H7NF	15	60		60 + 45 (n - 2)	10
D-C73C/C80C D-H7C	15	65	15 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6...)	65 + 50 (n - 2)	10
D-B5□ D-B64 D-G5NTL	15	75	15 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6...)	75 + 55 (n - 2)	10
D-B59W	20	75	20 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6...)		15

Accessory Bracket

Further information on accessories are the same specifications as these of the standard double acting single rod. Refer to Best Pneumatics Vol. 6.

Manual Operation

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



⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

Operating 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. 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 snap ring.

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

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 burned.

4. One-touch fitting cannot be replaced.

One-touch fitting is press-fit into the cover, thus cannot be replaced.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹/₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CVM3

Built-in One-touch Fitting

CVM3 **Mounting style** **Bore size** **F** — For “How to Order”, refer to page 10-15-31.

• Built-in One-touch fitting

One-touch fittings are installed on cylinders.



For dimensions of each mounting bracket, refer to page 10-15-37 and after.

Specifications

Action	Single acting, Spring return	Single acting, Spring extend		
Bore size (mm)	20, 25, 32, 40			
Max. operating pressure	0.7 MPa			
Min. operating pressure	0.18 MPa	0.23 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
Port size (Tube bore size)	O.D.: ø6/I.D.: ø4			
Applicable bore size	Can be used for either nylon, soft nylon or polyurethane tube.			
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			

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.

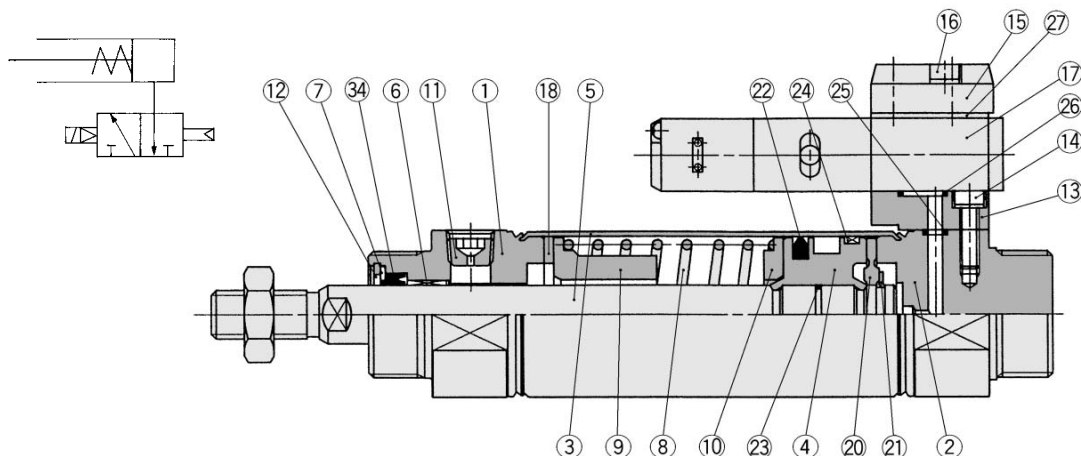
Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7□/C80 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-G5NTL	BA2-020	BA2-025	BA2-032	BA2-040

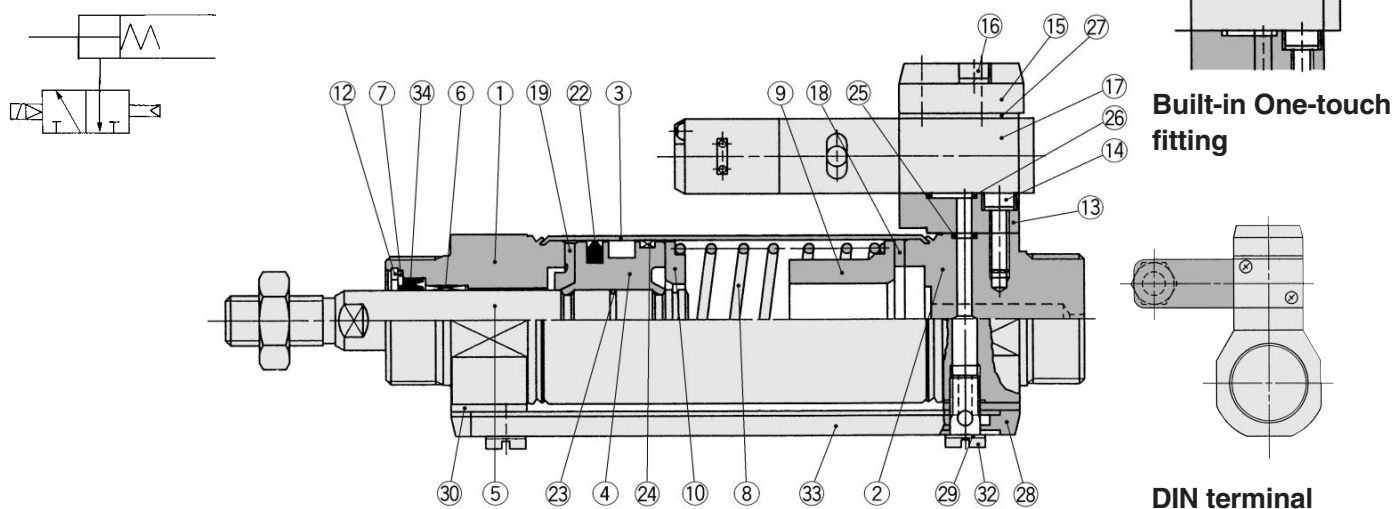
Valve Mounted Cylinder Single Acting, Single Rod, Spring Return/Extend Series CVM3

Construction

Spring return



Spring extend



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 chromium electroplated
⑥	Bushing	Oil-impregnated sintered alloy	
⑦	Seal retainer	Rolled steel	Nickel plated
⑧	Return spring	Steel wire	Zinc chromated
⑨	Spring guide	Aluminum alloy	Chromated
⑩	Spring seat	Aluminum alloy	Chromated
⑪	Plug with fixed orifice	Alloy steel	Black zinc chromated
⑫	Snap ring	Carbon tool steel	Nickel plated
⑬	Sub-plate	Aluminum alloy	Metallic painted
⑭	Hex. socket head cap screw with spring washer	Stainless steel	M3 x 10ℓ
⑮	Plate	Aluminum alloy	Metallic painted
⑯	Hex. socket head cap screw with spring washer	Stainless steel	M3 x 28ℓ
⑰	Solenoid valve	—	Refer to "How to order" below.*
⑱	Bumper	Urethane	
⑲	Bumper A	Urethane	

* How to order solenoid valves
VZ319-[Voltage] [Electrical entry]

No.	Description	Material	Note
⑳	Bumper B	Urethane	
㉑	Snap ring	Stainless steel	
㉒	Piston seal	NBR	
㉓	Piston gasket	NBR	
㉔	Wear ring	Resin	
㉕	Head cover gasket	NBR	
㉖	Sub-plate gasket	NBR	
㉗	Gasket	NBR	
㉘	Pipe gasket	Urethane rubber	
㉙	Gasket	Resin	
㉚	Spacer gasket	Resin	
㉛	One-touch fitting	—	Port size: ø6
㉜	Stud	Brass	Electroless nickel plated
㉝	Pipe	Aluminum alloy	Clear anodized

Replacement Parts

No.	Description	Material	Part no.			
			20	25	32	40
⑳	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C_G¹-S

CV

MVGQ

CC

RB

J

D-

-X

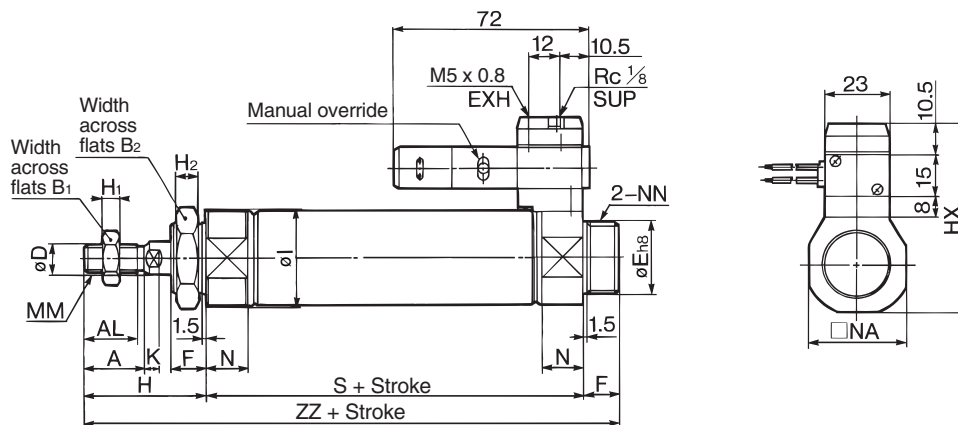
20-

Data

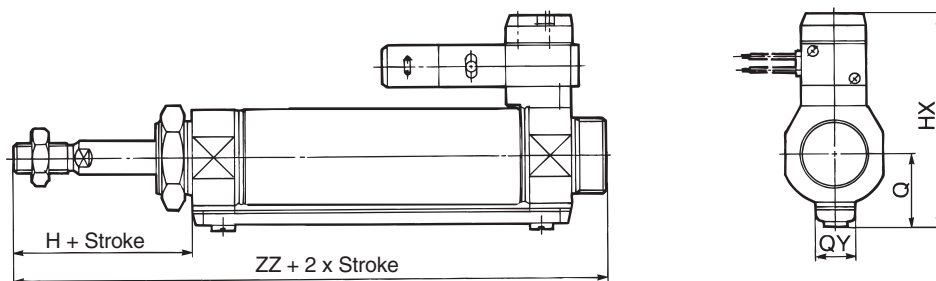
Series CVM3

Basic Style (B)

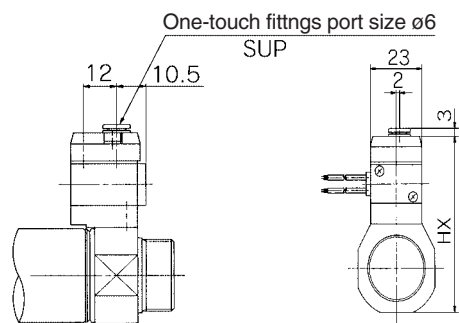
Single acting, Spring return: CVM3B Bore size Stroke S



Single acting, Spring extend: CVM3B Bore size Stroke T



Built-in One-touch fitting



Bore size (mm)	A	AL	B ₁	B ₂	D	Eh ₈	F	H	H ₁	H ₂	HX	I	K	MM	N	NA	NN
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	41	5	8	57.5	28	5	M8 x 1.25	15	24	M20 x 1.5
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	45	6	8	63.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	45	6	8	68	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	50	8	10	76	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2

Dimensions by Stroke

Stroke Symbol Bore (mm)	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	ZZ	S	ZZ	S	ZZ	S	ZZ	S	ZZ
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

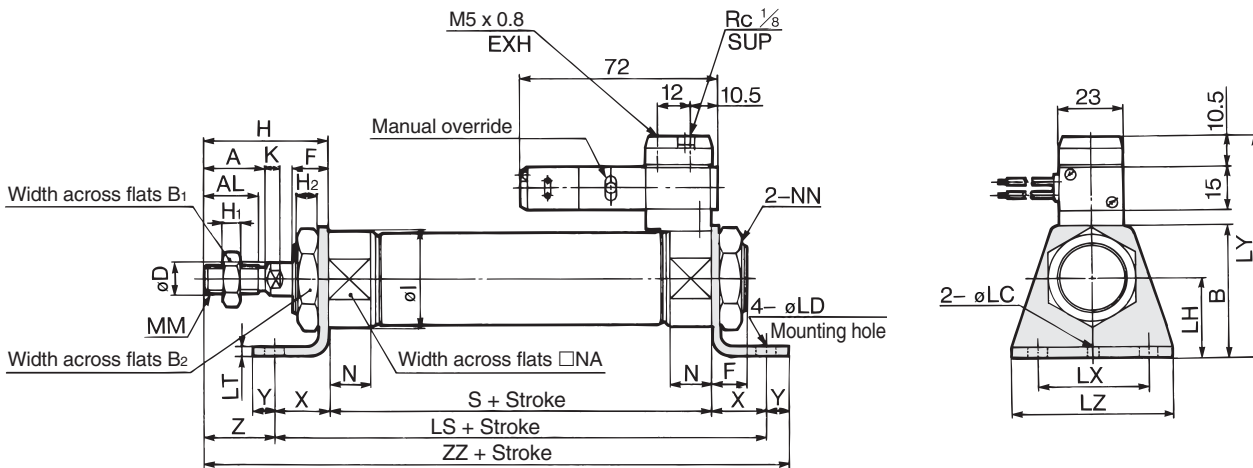
Single Acting/Spring Extend

Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

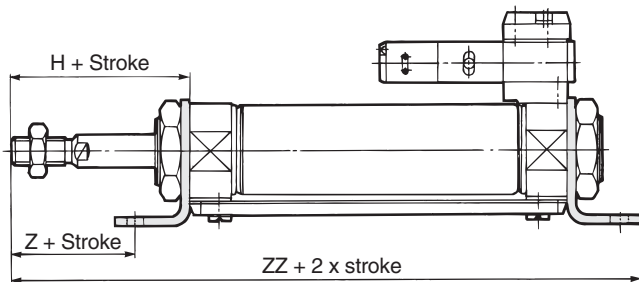
Valve Mounted Cylinder Single Acting, Single Rod, Spring Return/Extend Series **CVM3**

Axial Foot Style (L)

Single acting, Spring return: CVM3L Bore size Stroke S



Single acting, Spring extend: CVM3L Bore size Stroke T



Bore size (mm)	A	AL	B	B ₁	B ₂	D	F	H	H ₁	H ₂	I	K	LC	LD	LH	LT	LX	LY	LZ	MM	N	NA
20	18	15.5	40	13	26	8	13	41	5	8	28	5	4	6.8	25	3.2	40	70.5	55	M8 x 1.25	15	24
25	22	19.5	47	17	32	10	13	45	6	8	33.5	5.5	4	6.8	28	3.2	40	76.5	55	M10 x 1.25	15	30
32	22	19.5	47	17	32	12	13	45	6	8	37.5	5.5	4	6.8	28	3.2	40	78.8	55	M10 x 1.25	15	34.5
40	24	21	54	22	41	14	16	50	8	10	46.5	7	4	7	30	3.2	55	84.8	75	M14 x 1.5	21.5	42.5

Dimensions by Stroke

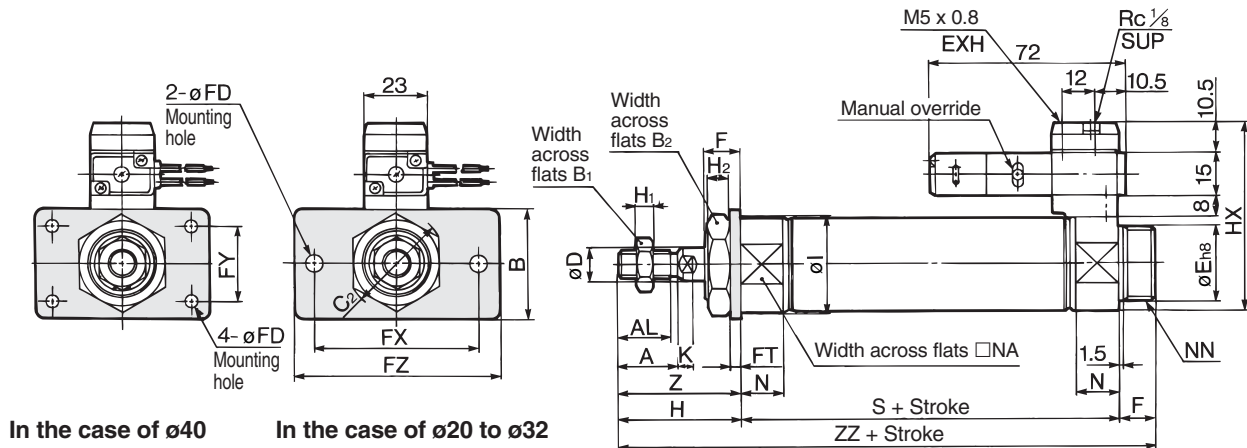
Bore size (mm)	NN	X	Y	Z	Stroke																		
					1 to 50			51 to 100			101 to 150			151 to 200			201 to 250						
					S	LS	ZZ	S	LS	ZZ	S	LS	ZZ	S	LS	ZZ	S	LS	ZZ	S	LS	ZZ	
20	M20 x 1.5	20	8	21	87	127	156	112	152	181	137	177	206	—	—	—	—	—	—	—	—	—	—
25	M26 x 1.5	20	8	25	87	127	160	112	152	185	137	177	210	—	—	—	—	—	—	—	—	—	
32	M26 x 1.5	20	8	25	89	129	162	114	154	187	139	179	212	164	204	237	—	—	—	—	—	—	
40	M32 x 2	23	10	27	113	159	196	138	184	221	163	209	246	188	234	271	213	259	296	—	—	—	

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹/₅-S
- CV**
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CVM3

Rod Side Flange Style (F)

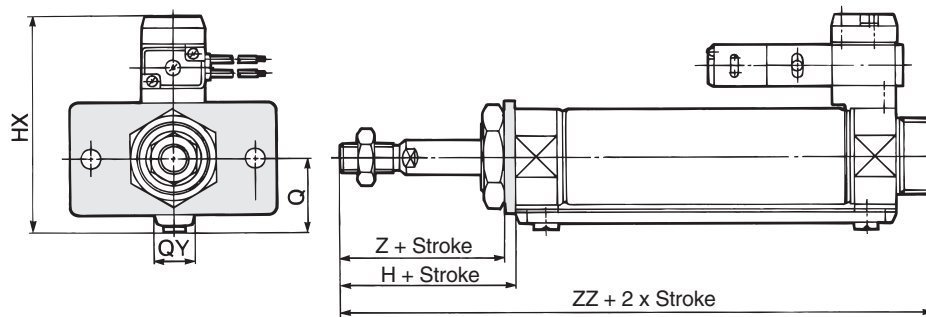
Single acting, Spring return: CVM3F Bore size Stroke S



In the case of ø40

In the case of ø20 to ø32

Single acting, Spring extend: CVM3F Bore size Stroke T



Bore size (mm)	A	AL	B	B ₁	B ₂	C ₂	D	Eh ₈	F	FD	FT	FX	FY	FZ	H	H ₁	H ₂	HX	I	K
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	7	4	60	—	75	41	5	8	57.5	28	5
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	63.5	33.5	5.5
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	68	37.5	5.5
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	7	5	66	36	82	50	8	10	76	46.5	7

Dimensions by Stroke

Bore size (mm)	MM	N	NA	NN	Z
20	M8 x 1.25	15	24	M20 x 1.5	37
25	M10 x 1.25	15	30	M26 x 1.5	41
32	M10 x 1.25	15	34.5	M26 x 1.5	41
40	M14 x 1.5	21.5	42.5	M32 x 2	45

Stroke Symbol	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	ZZ	S	ZZ	S	ZZ	S	ZZ	S	ZZ
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

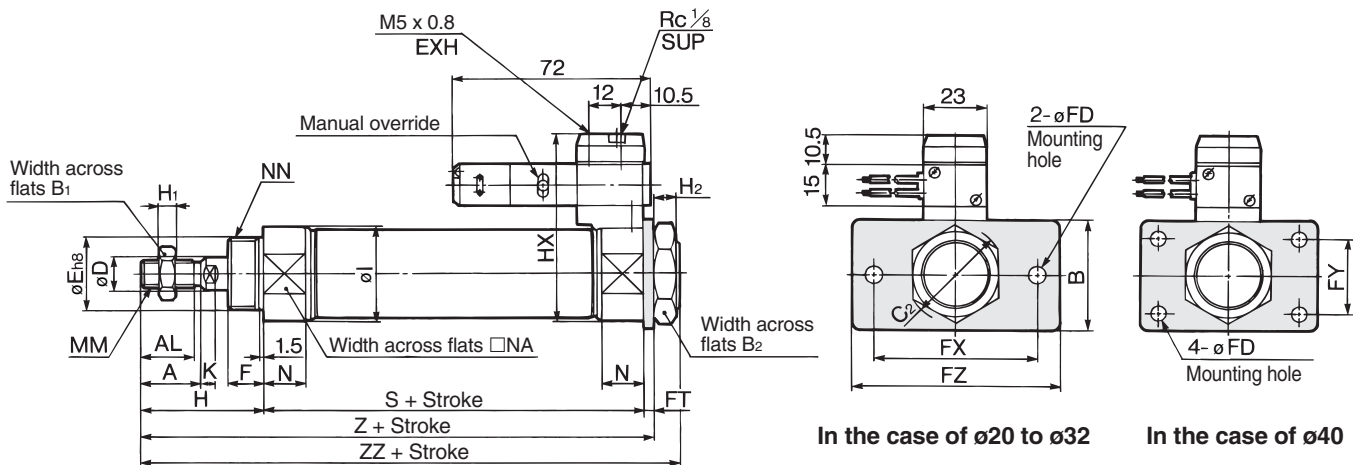
Single Acting/Spring Extend

Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

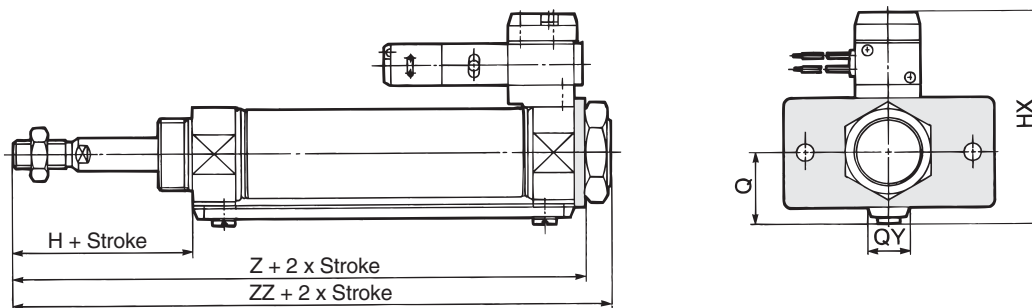
Valve Mounted Cylinder Single Acting, Single Rod, Spring Return/Extend Series **CVM3**

Head Side Flange Style (G)

Single acting, Spring return: CVM3G Bore size Stroke **S**



Single acting, Spring extend: CVM3G Bore size Stroke **T**



Bore size (mm)	A	AL	B	B ₁	B ₂	C ₂	D	E _h	F	FD	FT	FX	FY	FZ	H	H ₁	H ₂	HX	I	K	MM
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	7	4	60	—	75	41	5	8	57.5	28	5	M8 x 1.25
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	63.5	33.5	5.5	M10 x 1.25
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	7	4	60	—	75	45	6	8	68	37.5	5.5	M10 x 1.25
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	7	5	66	36	82	50	8	10	76	46.5	7	M14 x 1.5

Dimensions by Stroke

Bore size (mm)	N	NA	NN	Stroke											
				Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250						
20	15	24	M20 x 1.5	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
25	15	30	M26 x 1.5	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
32	15	34.5	M26 x 1.5	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
40	21.5	42.5	M32 x 2	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ

Bore size (mm)	N	NA	NN	Stroke			Stroke			Stroke			Stroke			Stroke														
				Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250	Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250	Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250									
20	15	24	M20 x 1.5	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
25	15	30	M26 x 1.5	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
32	15	34.5	M26 x 1.5	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
40	21.5	42.5	M32 x 2	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ

Single Acting/Spring Extend

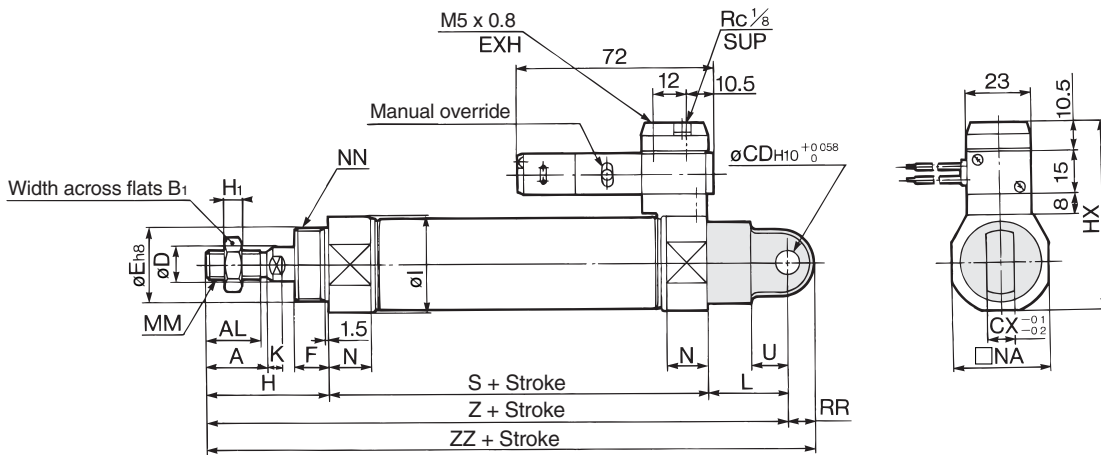
Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

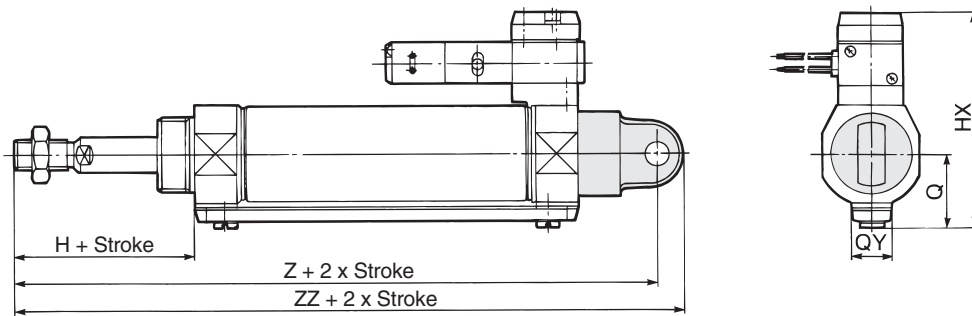
Series CVM3

Single Clevis Style (C)

Single acting, Spring return: CVM3C **Bore size** — **Stroke** S



Single acting, Spring extend: CVM3C **Bore size** — **Stroke** T



Bore size (mm)	A	AL	B ₁	CD	CX	D	Eh _s	F	H	H ₁	HX	I	K	L	MM	N	NA	NN	RR	U
20	18	15.5	13	9	10	8	20 ⁰ _{-0.033}	13	41	5	57.5	28	5	30	M8 x 1.25	15	24	M20 x 1.5	9	14
25	22	19.5	17	9	10	10	26 ⁰ _{-0.033}	13	45	6	63.5	33.5	5.5	30	M10 x 1.25	15	30	M26 x 1.5	9	14
32	22	19.5	17	9	10	12	26 ⁰ _{-0.033}	13	45	6	68	37.5	5.5	30	M10 x 1.25	15	34.5	M26 x 1.5	9	14
40	24	21	22	10	15	14	32 ⁰ _{-0.039}	16	50	8	76	46.5	7	39	M14 x 1.5	21.5	42.5	M32 x 2	11	18

Dimensions by Stroke

Bore size (mm)	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
20	87	158	167	112	183	192	137	208	217	—	—	—	—	—	—
25	87	162	171	112	187	196	137	212	221	—	—	—	—	—	—
32	89	164	173	114	189	198	139	214	223	164	239	248	—	—	—
40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

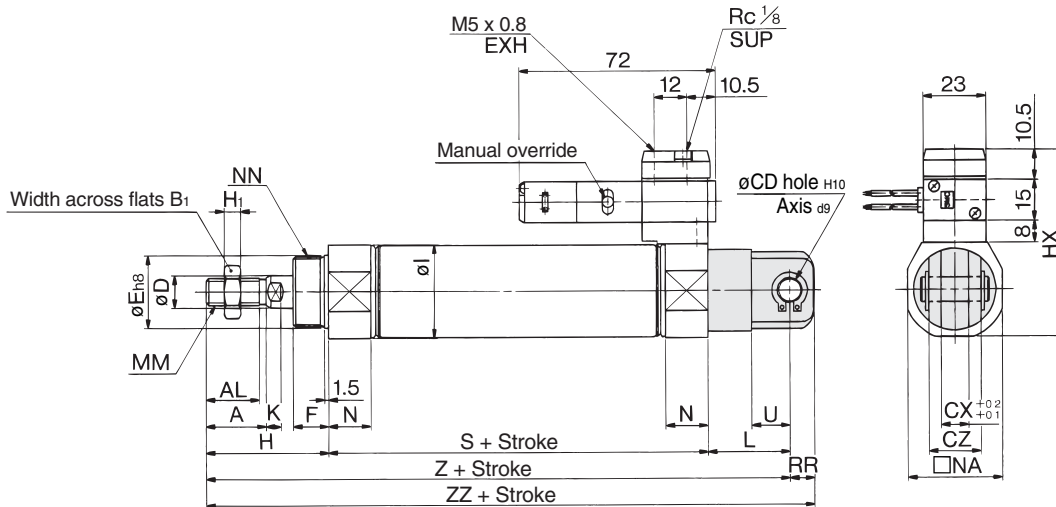
Single Acting/Spring Extend

Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

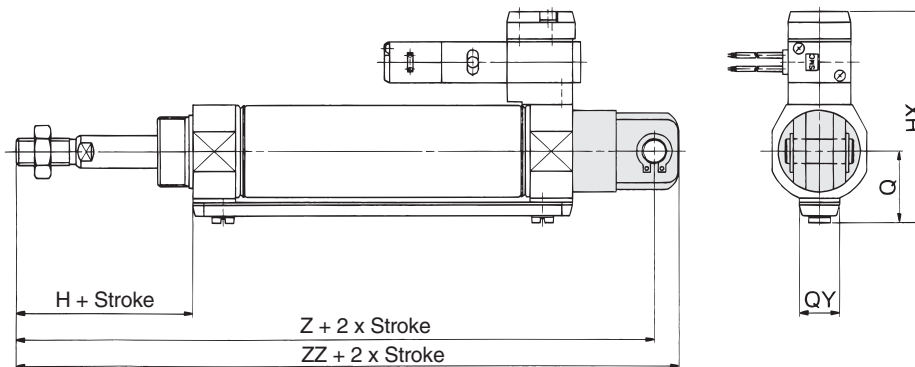
Valve Mounted Cylinder Single Acting, Single Rod, Spring Return/Extend **Series CVM3**

Double Clevis Style (D)

Single acting, Spring return: CVM3D Bore size Stroke S



Single acting, Spring extend: CVM3D Bore size Stroke T



Bore size (mm)	A	AL	B ₁	CD	CX	CZ	D	Eh ₈	F	H	H _i	HX	I	K	L	MM	N	NA	NN	RR	U
20	18	15.5	13	9	10	19	8	20 ⁰ _{-0.033}	13	41	5	57.5	28	5	30	M8 x 1.25	15	24	M20 x 1.5	9	14
25	22	19.5	17	9	10	19	10	26 ⁰ _{-0.033}	13	45	6	63.5	33.5	5.5	30	M10 x 1.25	15	30	M26 x 1.5	9	14
32	22	19.5	17	9	10	19	12	26 ⁰ _{-0.033}	13	45	6	68	37.5	5.5	30	M10 x 1.25	15	34.5	M26 x 1.5	9	14
40	24	21	22	10	15	30	14	32 ⁰ _{-0.039}	16	50	8	76	46.5	7	39	M14 x 1.5	21.5	42.5	M32 x 2	11	18

Dimensions by Stroke

Bore size (mm)	Stroke Symbol			1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
20	87	158	167	112	183	192	137	208	217	—	—	—	—	—	—	—	—	—
25	87	162	171	112	187	196	137	212	221	—	—	—	—	—	—	—	—	—
32	89	164	173	114	189	198	139	214	223	164	239	248	—	—	—	—	—	—
40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313	—	—	—

Single Acting/Spring Extend

Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

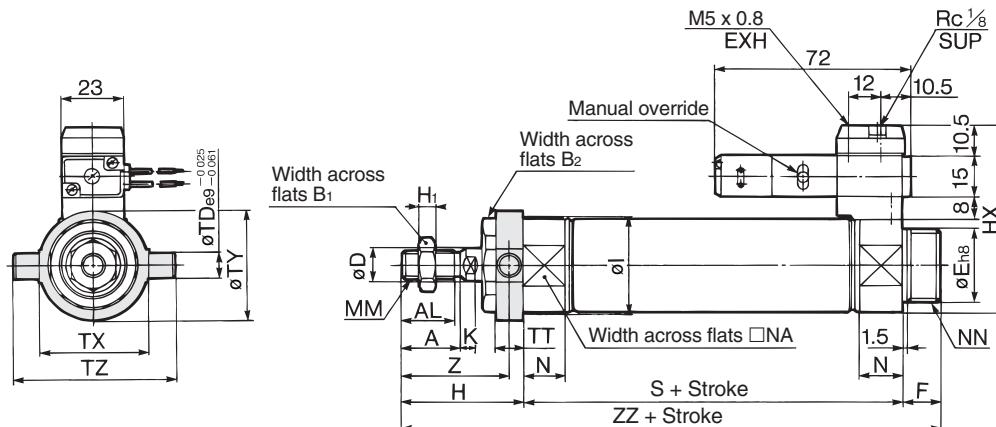
* Clevis pin and snap ring (cotter pin for ø40) is shipped together.

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV**
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

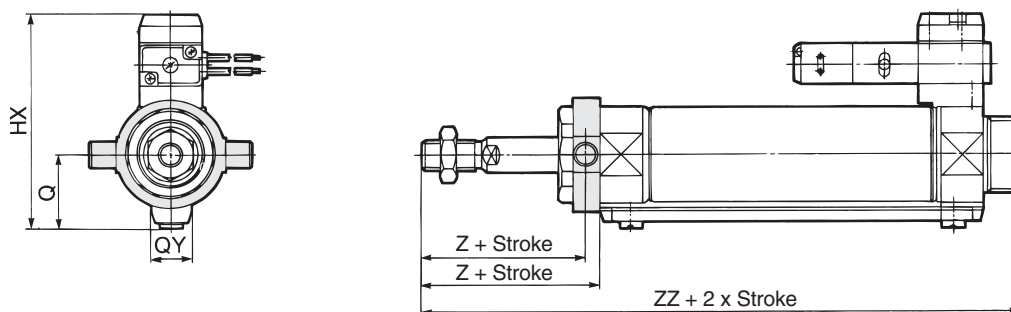
Series CVM3

Rod Side Trunnion Style (U)

Single acting, Spring return: CVM3U **Bore size** **Stroke S**



Single acting, Spring extend: CVM3U **Bore size** **Stroke T**



Bore size (mm)	A	AL	B ₁	B ₂	D	Eh ₈	F	H	H ₁	HX	I	K	MM	N	NA	NN	TD	TT	TX	TY	TZ	Z
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	41	5	57.5	28	5	M8 x 1.25	15	24	M20 x 1.5	8	10	32	32	52	36
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	45	6	63.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	9	10	40	40	60	40
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	45	6	68	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	9	10	40	40	60	40
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	50	8	76	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	10	11	53	53	77	44.5

Dimensions by Stroke

Bore (mm)	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	ZZ	S	ZZ	S	ZZ	S	ZZ	S	ZZ
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

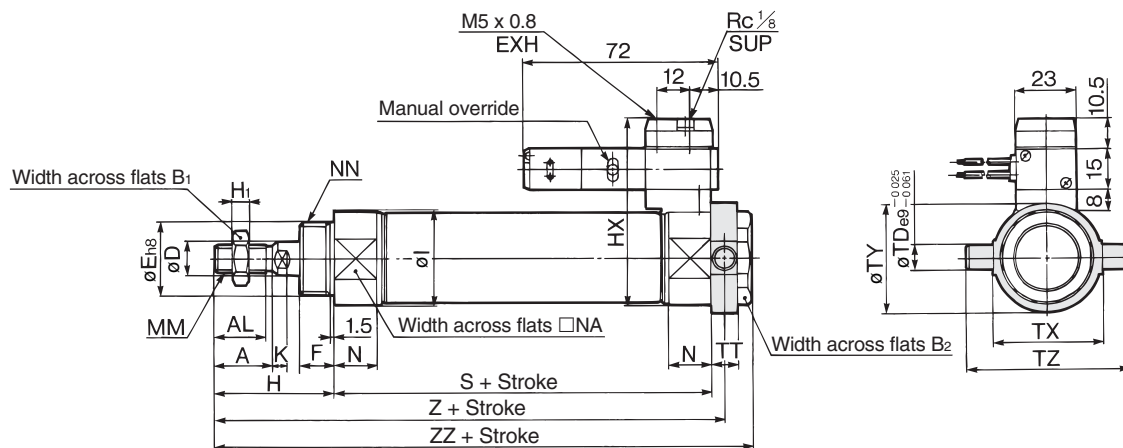
Single Acting/Spring Extend

Bore size	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

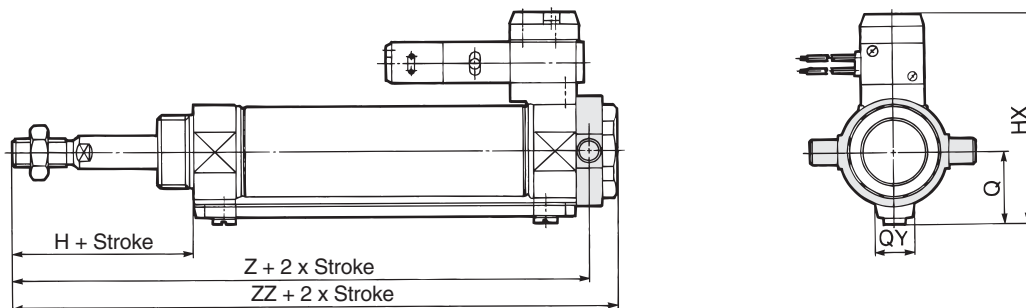
Valve Mounted Cylinder Single Acting, Single Rod, Spring Return/Extend **Series CVM3**

Head Side Trunnion Style (T)

Single acting, Spring return: CVM3T Bore size Stroke S



Single acting, Spring extend: CVM3T Bore size Stroke T



Bore size (mm)	A	AL	B ₁	B ₂	D	Eh _s	F	H	H ₁	HX	I	K	MM	N	NA	NN	TD	TT	TX	TY	TZ
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	41	5	57.5	28	5	M8 x 1.25	15	24	M20 x 1.5	8	10	32	32	52
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	45	6	63.5	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	9	10	40	40	60
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	45	6	68	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	9	10	40	40	60
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	50	8	76	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	10	11	53	53	77

Dimensions by Stroke

Bore size (mm)	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
20	87	133	143	112	158	168	137	183	193	—	—	—	—	—	—
25	87	137	147	112	162	172	137	187	197	—	—	—	—	—	—
32	89	139	149	114	164	174	139	189	199	164	214	224	—	—	—
40	113	168.5	179	138	193.5	204	163	218.5	229	188	243.5	254	213	268.5	279

Single Acting/Spring Extend

Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV**
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data



Valve Mounted Cylinder: Non-rotating Rod Type

Single Acting, Single Rod, Spring Return/Extend

Series CVM3K

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

Bore size

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

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

Action

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

Light/Surge voltage suppressor

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

Number of auto switches

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

Auto switch

Nil	Without auto switch
-----	---------------------

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

Electrical entry

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

Without auto switch CVM3K L 20 [] 100 T 1 L []

With auto switch CDVM3K L 20 [] 100 T 1 L [] H7BW []

Non-rotating rod type

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

Piping

Cylinder stroke (mm)
 (Refer to "Standard Stroke" on page 10-15-44.)

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m) *				Pre-wire connector	Applicable load		
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	●	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	C73	●	●	●	—	—	—	Relay, PLC
	—	100 V, 200 V	B54			●	●	●	—	—					
	Diagnostic indication (2-color indication)	Grommet	Yes	—	—	—	B73C	●	●	●	●	—	—		
—	—			—	—	B59W	●	●	—	—	—	—			
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				H7A2	●	●	○	—	○		
		2-wire		H7B				●	●	○	—	○			
		2-wire		H7C				●	●	●	●	—	—		
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7NW	●	●	○	—	○	IC circuit	
				3-wire (PNP)				H7PW	●	●	○	—	○		
		2-wire		H7BW				●	●	○	—	○	—		
		4-wire (NPN)		H7NF				●	●	○	—	○	IC circuit		
With diagnostic output (2-color indication)	Grommet	Yes	—	—	—	—	—	—	—	—	—	—			
—			—	—	—	—	—	—	—	—	—				

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

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

• Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
 • For details about auto switches with pre-wire connector, refer to page 10-20-66.

Valve Mounted Cylinder: Non-rotating Rod Type Single Acting, Single Rod, Spring Return/Extend Series CVM3K

A hexagon shaped rod that does not rotate.

Non-rotating accuracy

$\phi 20, \phi 25$ — $\pm 0.7^\circ$

$\phi 32, \phi 40$ — $\pm 0.5^\circ$

Can operate without lubrication.

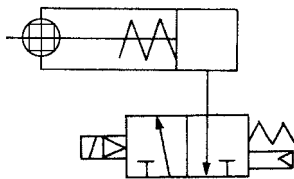
Auto switches can also be mounted.

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

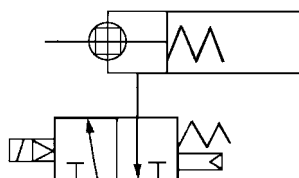


JIS Symbol

Spring extend



Spring return



Made to Order Specifications
(For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape

Mounting Bracket Part No.

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

Specifications

Applicable bore size (mm)		20	25	32	40
Rod non-rotating accuracy		$\pm 0.7^\circ$		$\pm 0.5^\circ$	
Type		Non-lube			
Action		Single acting, Spring return/Spring extend			
Fluid		Air			
Cushion		Rubber bumper			
Proof pressure		1.05 MPa			
Maximum operating pressure		0.7 MPa			
Minimum operating pressure		0.18 MPa spring return	0.23 MPa spring extend		
Ambient and fluid temperature		-10 to 50°C (No freezing)			
Lubrication		Not required (Non-lube)			
Thread tolerance		JIS Class 2			
Stroke length tolerance		$+1.4$ 0			
Effective area of valve (Cv factor)		4.5 mm ² (0.25)			
Piping	Screw-in type	Rc 1/8			
	Built-in One-touch fitting	O.D.: $\phi 6$ /I.D.: $\phi 4$			
Manual override		Non locking (Standard)			
Piston speed (mm/s)		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, Head side trunnion style, Rod side trunnion style			

Allowable Kinetic Energy

(J)

Bore size (mm)	20	25	32	40
Allowable kinetic energy	0.27	0.4	0.65	1.2

Solenoid Valve Specifications

Applicable solenoid valve model		VZ319	
Coil rated voltage		Standard: 100/200 VAC (50/60 Hz), 24 VDC Option: 110/220 VAC, 12 VDC	
Allowable voltage		-15 to 10% of the rated voltage	
Coil insulation		Class B or equivalent (130°C)	
Electrical entry		Grommet, L plug connector, M plug connector, DIN terminal	
Power consumption (W) <small>Note)</small>	DC	1.8 (With indicator light: 2.1)	
Apparent power (VA) <small>Note)</small>	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) <small>Note)</small>
20	25, 50, 75, 100, 125, 150 *
25	25, 50, 75, 100, 125, 150 *
32	25, 50, 75, 100, 125, 150, 200 *
40	25, 50, 75, 100, 125, 150, 200, 250 *

Note 1) Intermediate stroke other than above is manufactured upon receipt of order.

Note 2) Strokes marked with "*" are the maximum strokes which are available.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7□/C80 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 D-G5NTL	BA2-020	BA2-025	BA2-032	BA2-040

Theoretical Output

Refer to "Theoretical Output 1" on page 10-23-1.

Spring Reaction Force

Refer to "Spring Reaction Force" on page 10-23-1.

Series CVM3K

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.

Weight

Spring Return/(): Denotes Spring Extend.

Bore size (mm)		20	25	32	40
Basic weight	25 stroke	0.30 (0.30)	0.40 (0.04)	0.52 (0.51)	0.87 (0.86)
	50 stroke	0.32 (0.32)	0.43 (0.43)	0.56 (0.56)	0.94 (0.93)
	75 stroke	0.37 (0.37)	0.52 (0.51)	0.68 (0.66)	1.13 (1.09)
	100 stroke	0.39 (0.39)	0.55 (0.54)	0.73 (0.70)	1.19 (1.16)
	125 stroke	0.45 (0.44)	0.64 (0.61)	0.86 (0.82)	1.39 (1.33)
	150 stroke	0.47 (0.46)	0.67 (0.64)	0.90 (0.86)	1.46 (1.40)
	200 stroke	— (—)	— (—)	1.07 (1.02)	1.71 (1.63)
	250 stroke	— (—)	— (—)	— (—)	1.97 (1.85)
Mounting bracket weight	Axial foot	0.15 (0.15)	0.16 (0.16)	0.16 (0.16)	0.27 (0.27)
	Flange	0.06 (0.06)	0.09 (0.09)	0.09 (0.09)	0.12 (0.12)
	Single clevis	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.09 (0.09)
	Double clevis	0.05 (0.05)	0.06 (0.06)	0.06 (0.06)	0.13 (0.13)
	Trunnion	0.04 (0.04)	0.07 (0.07)	0.07 (0.07)	0.10 (0.10)
Option bracket weight	Single knuckle joint	0.06 (0.06)	0.06 (0.06)	0.06 (0.06)	0.23 (0.23)
	Double knuckle (With pin)	0.07 (0.07)	0.07 (0.07)	0.07 (0.07)	0.20 (0.02)

Calculation: (Example) CVM3KL32-100-1G (ø32, 100 stroke, Spring return)

● Basic weight.....0.73 (kg)

● Weight of brackets.....0.16 (kg)

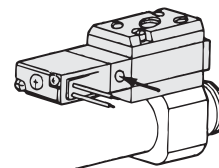
0.73 + 0.16 = 0.89 kg

Minimum Stroke for Auto Switch Mounting

Auto switch model	No. of auto switches mounted				1
	2		n		
	Different sides	Same side	Different sides	Same side	
D-C7□/C80	15	50	$15 + 45 \left(\frac{n-2}{2} \right)$	$50 + 45 (n-2)$	10
D-H7□/H7□W D-H7NF	15	60	$(n = 2, 4, 6 \dots)$	$60 + 45 (n-2)$	10
D-C73C/C80C D-H7C	15	65	$15 + 50 \left(\frac{n-2}{2} \right)$ $(n = 2, 4, 6 \dots)$	$65 + 50 (n-2)$	10
D-B5□ D-B64 D-G5NTL	15	75	$15 + 50 \left(\frac{n-2}{2} \right)$ $(n = 2, 4, 6 \dots)$	$75 + 55 (n-2)$	10
D-B59W	20	75	$20 + 50 \left(\frac{n-2}{2} \right)$ $(n = 2, 4, 6 \dots)$	$75 + 55 (n-2)$	15

Manual Operation

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



⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

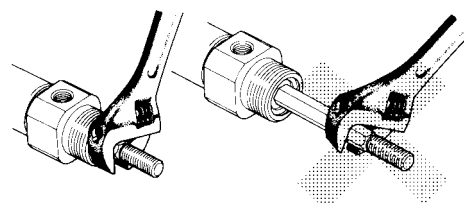
Operating Precautions

⚠ 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

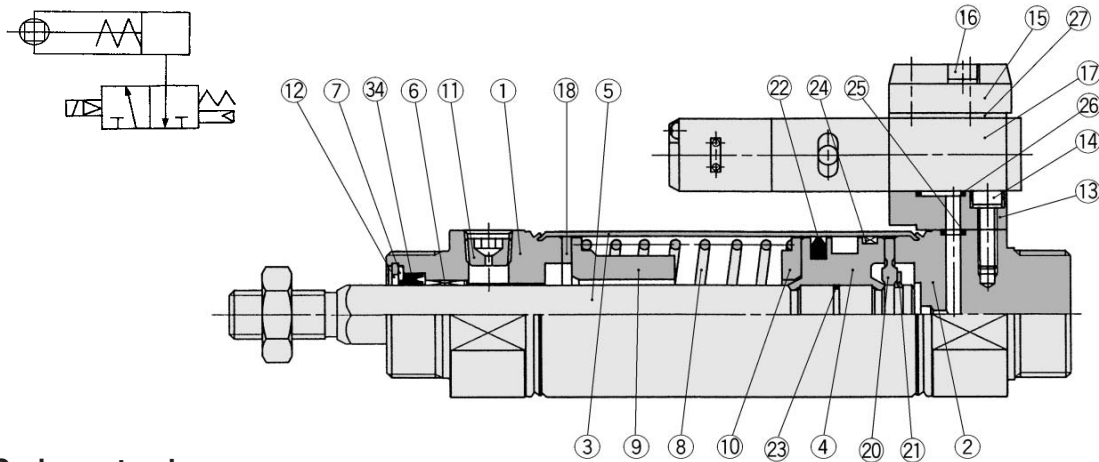
1. When replacing rod seals, please contact SMC.

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

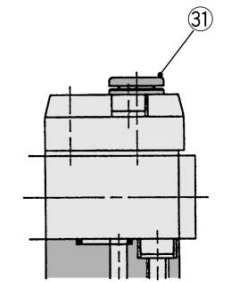
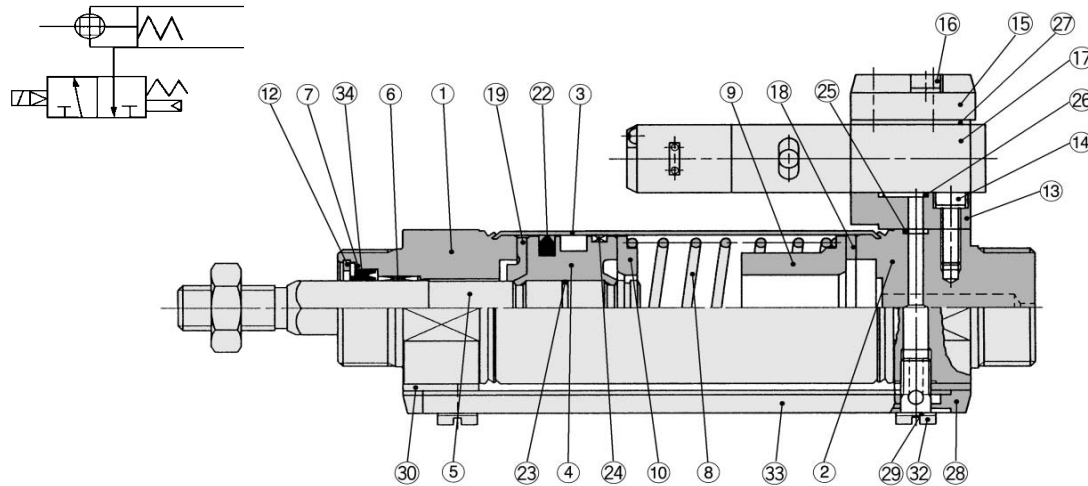
Valve Mounted Cylinder: Non-rotating Rod Type Single Acting, Single Rod, Spring Return/Extend Series CVM3K

Construction

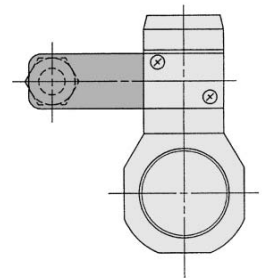
Spring return



Spring extend



Built-in One-touch fitting



DIN terminal

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	Non-rotating guide	Stainless steel	
⑦	Seal retainer	Rolled steel	Nickel plated
⑧	Return spring	Steel wire	Zinc chromated
⑨	Spring guide	Aluminum alloy	Chromated
⑩	Spring seat	Aluminum alloy	Chromated
⑪	Plug with fixed orifice	Alloy steel	Black zinc chromated
⑫	Snap ring	Carbon tool steel	Nickel plated
⑬	Sub-plate	Aluminum alloy	Metallic painted
⑭	Hex. socket head cap screw with spring washer	Stainless steel	M3 x 10ℓ
⑮	Plate	Aluminum alloy	Metallic painted
⑯	Hex. socket head cap screw with spring washer	Stainless steel	M3 x 28ℓ
⑰	Solenoid valve	—	Refer to the below.*
⑱	Bumper	Urethane	
⑲	Bumper A	Urethane	

* How to order solenoid valves
VZ319-[Voltage] [Electrical entry]

No.	Description	Material	Note
⑳	Bumper B	Urethane	
㉑	Snap ring	Stainless steel	
㉒	Piston seal	NBR	
㉓	Piston gasket	NBR	
㉔	Wear ring	Resin	
㉕	Head cover gasket	NBR	
㉖	Sub-plate gasket	NBR	
㉗	Gasket	NBR	
㉘	Pipe gasket	Urethane rubber	
㉙	Gasket	Resin	
㉚	Spacer gasket	Resin	
㉛	One-touch fitting	—	Port size: ø6
㉜	Stud	Brass	Electroless nickel plated
㉝	Pipe	Aluminum alloy	Clear anodized

Replacement Parts

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

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C_{5-S}¹

CV

MVGQ

CC

RB

J

D-

-X

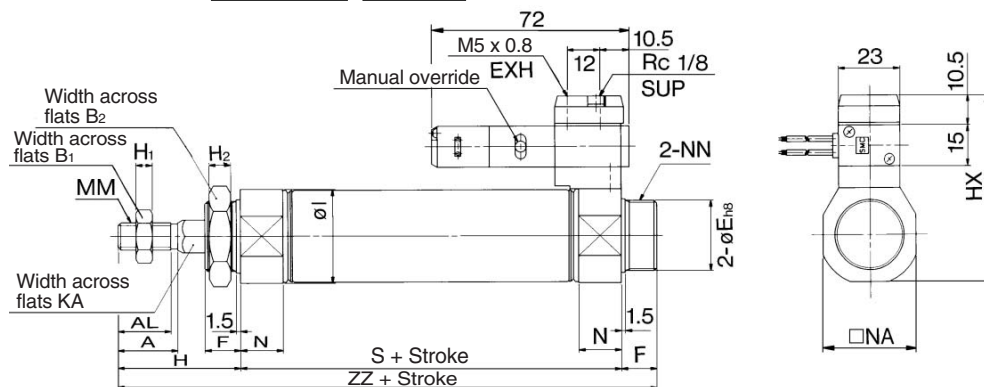
20-

Data

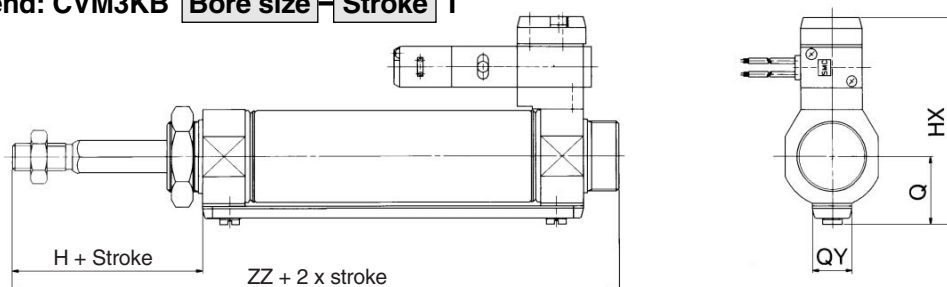
Series CVM3K

Basic Style (B): External Dimensions

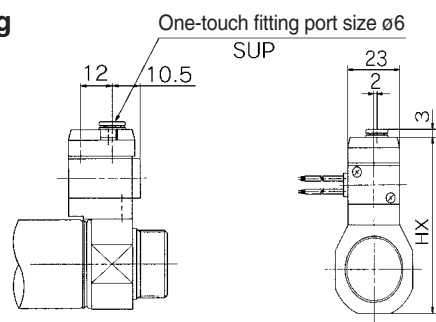
Single acting, Spring return: CVM3KB **Bore size** — **Stroke S**



Single acting, Spring extend: CVM3KB **Bore size** — **Stroke T**



Built-in One-touch fitting



Bore size (mm)	A	AL	B ₁	B ₂	Eh ₈	F	H	H ₁	H ₂	HX	I	KA	MM	N	NA	NN
20	18	15.5	13	26	20 ⁰ _{-0.033}	13	41	5	8	57.5	28	8.2	M8 x 1.25	15	24	M20 x 1.5
25	22	19.5	17	32	26 ⁰ _{-0.033}	13	45	6	8	63.5	33.5	10.2	M10 x 1.25	15	30	M26 x 1.5
32	22	19.5	17	32	26 ⁰ _{-0.033}	13	45	6	8	68	37.5	12.2	M10 x 1.25	15	34.5	M26 x 1.5
40	24	21	22	41	32 ⁰ _{-0.039}	16	50	8	10	76	46.5	14.2	M14 x 1.5	21.5	42.5	M32 x 2

Dimensions by Stroke

Bore (mm)	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	ZZ	S	ZZ	S	ZZ	S	ZZ	S	ZZ
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

Single Acting/Spring Extend

Bore size (mm)	HX	Q	QY
20	65.3	19.8	14
25	70.5	22	14
32	76.5	25.8	16
40	84.5	29.8	16

Valve Mounted Cylinder Double Acting, Single Rod Series CV3

Lube/Non-lube Type: $\varnothing 40$, $\varnothing 50$, $\varnothing 63$, $\varnothing 80$, $\varnothing 100$

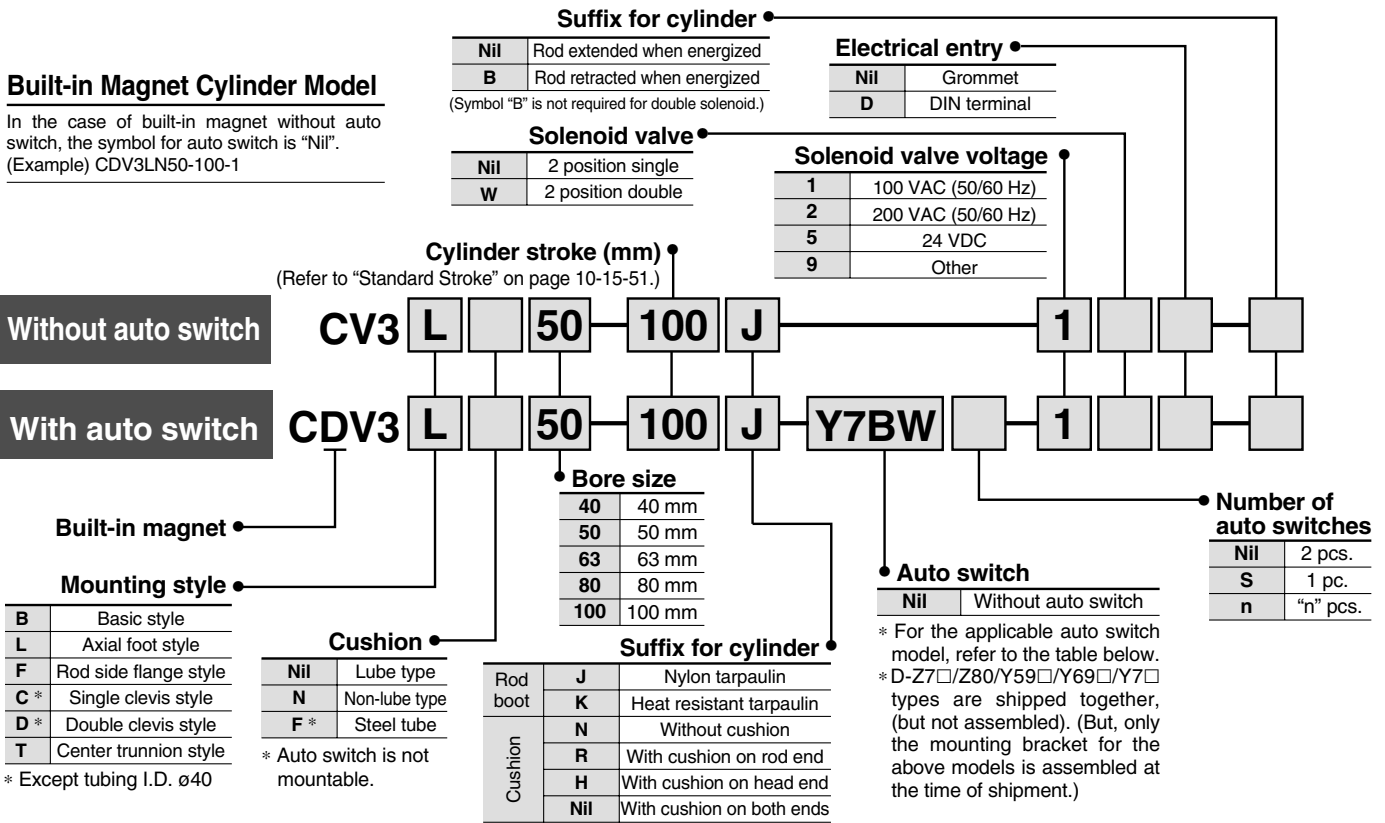
How to Order

Built-in Magnet Cylinder Model

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil".
(Example) CDV3LN50-100-1

Without auto switch

With auto switch



Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)*			Pre-wire connector	Applicable load		
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)				
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	Z76	—	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	Z73	—	●	●	●	—	—	Relay, PLC
							—	B53***	—	●	●	●	—	—	PLC
		100 V, 200 V					A54	B54***	●	●	●	—	—	Relay, PLC	
		Terminal conduit		—	—	—	A33C	A33	—	—	—	—	—	—	PLC
				100 V	200 V	A44C	A44	—	—	—	—	—	—	—	Relay, PLC
Diagnostic indication (2-color indication)	—	Grommet	—	—	—	—	A59W	B59W***	●	●	—	—	—	—	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	G59***	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7P	G5P***	●	●	○	○		
				2-wire				J51	—	●	●	○	—		
		Terminal conduit		12 V	Y59B	K59***	●	●	○	○	IC circuit				
				5 V, 12 V	G39C	G39	—	—	—	—	IC circuit				
		Grommet		12 V	K39C	K39	—	—	—	—	—				
				5 V	Y7NW	G59W**	●	●	○	○	IC circuit				
				12 V	Y7PW	G5PW**	●	●	○	○	IC circuit				
				2-wire	12 V	Y7BW	K59W**	●	●	○	○	—			
		Diagnostic indication (2-color indication)		—	Grommet	—	—	—	—	—	—	—	—	—	
With diagnostic output (2-color indication)	—	Grommet	—	—	—	—	—	—	—	—	—	—	—	—	
4-wire (NPN)	5 V, 12 V	F59F	G59F***	●	●	○	○	IC circuit							

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

- Since there are other applicable auto switches than listed, refer to page 10-15-61 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

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

** D-G5□W/K59W/G59F cannot be mounted on bore sizes $\varnothing 40$ and $\varnothing 50$ lube style cylinder.

*** D-B5□W/G5□/K5□ types are mountable only upon a receipt of order. (Not mountable after the time of shipment)

Valve Mounted Cylinder Double Acting, Single Rod Series CV3

Adjustable speed.

Built-in throttle valves are provided to enable speed adjustments in each direction.

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

Ease of maintenance and inspection.

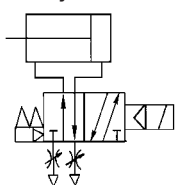
The solenoid valve can be separated easily and the cylinder can also be disassembled.

A manual operation mechanism is provided as standard equipment (non-locking).

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



JIS Symbol



Made to Order Specifications (For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC6	Piston rod and rod end nut made of stainless steel
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC15	Change of tie-rod length
-XC22	Fluoro rubber seals
-XC29	Double knuckle joint with spring pin

⚠ Precautions

Minimum stroke for auto switch mounting

⚠ Caution

- Each switch and mounting style of cylinder has different minimum mountable stroke. Be careful especially of the center trunnion style. (For details, refer to page 10-15-62.)

Specifications

Applicable bore size (mm)	40, 50, 63, 80, 100	
Type	Lube	Non-lube
Series	CV3	CV3□N
Action	Double acting	
Fluid	Air	
Proof pressure	1.35 MPa	
Maximum operating pressure	0.9 MPa	
Minimum operating pressure	0.15 MPa	
Ambient & fluid temperature	-10 to 50°C (No freezing)	
Cushion	Air cushion	
Thread tolerance	JIS Class 2	
Stroke length tolerance	Up to 250 st : $^{+0.0}_{-0}$, 251 to 1000 st : $^{+0.14}_{-0}$	
Effective area of valve (Cv factor)	18 mm ² (1.0)	
Port size	Rc 1/4	
Electrical entry	Grommet, DIN terminal	
Piston speed	ø40 to ø80: 50 to 500 mm/s*, ø100: 50 to 350 mm/s*	
Mounting	Basic style, Axial foot style, Rod side flange style Single clevis style, Double clevis style, Center trunnion style	

* Operate within the range of absorbed energy.

Allowable Kinetic Energy

Bore size (mm)	40	50	63	80	100
Allowable kinetic energy	2.4 J	4.4 J	7.8 J	11.7 J	20.5 J

Solenoid Valve Specifications

Applicable solenoid valve model	V3□08			
Coil rated voltage	100/200 VAC (50/60 Hz), 24 VDC			
Allowable voltage	-15 to 10% of the rated voltage			
Coil insulation	Class B or equivalent (130°C)			
Apparent power ^{Note)}	AC	Inrush	50 Hz	8.5 VA
			60 Hz	7.5 VA
	Holding	50 Hz	7.0 VA	
		60 Hz	5.5 VA	
Power consumption ^{Note)}	DC	6 W		

Note) At the rated voltage.

Standard Stroke

Bore size (mm)	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500
50, 63	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600
80, 100	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700

Note) The cylinders with the standard strokes indicated above can be delivered in a short term. Intermediate stroke except mentioned above is manufactured upon receipt of order. When the auto switch is attached, the minimum stroke is going to be different. Refer to page 10-15-62. The minimum stroke length is different in the trunnion style. For further information, refer to page 10-15-62.

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.

Accessory

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

* Pin, plain washer and cotter pin are packaged together with double clevis and double knuckle joint.

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C_G¹5-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CV3

Weight

(kg)

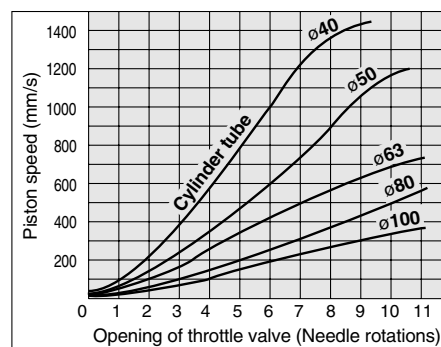
Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	1.30 (1.35)	1.73 (1.77)	2.57 (2.61)	4.29 (4.44)	6.01 (6.21)
	Axial foot style	1.47 (1.52)	1.93 (1.97)	2.86 (2.9)	5.08 (5.23)	6.94 (7.14)
	Rod side flange style	1.56 (1.61)	2.14 (2.18)	3.19 (3.23)	5.39 (5.54)	7.40 (7.6)
	Single clevis style	—	2.46 (2.5)	3.68 (3.72)	6.23 (6.38)	8.66 (8.86)
	Double clevis style	—	2.51 (2.55)	3.73 (3.77)	6.29 (6.44)	8.73 (8.93)
	Trunnion style	1.95 (2.05)	2.52 (3.52)	3.96 (4.16)	6.67 (6.96)	9.58 (9.97)
Additional weight per each 50 mm of stroke	All mounting brackets (Except trunnion style of iron tube)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Trunnion style of steel	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
Accessory bracket	Single knuckle	0.23	0.26	0.26	0.60	0.83
	Double knuckle (with pin)	0.37	0.43	0.43	0.87	1.27

Calculation: (Example) CV3L40-100-1

*(): Steel tube type.

- Basic weight.....1.47 (kg)
- Additional weight.....0.22 (kg/50 st)
- Cylinder stroke.....100 (st) $1.47 + 0.22 \times 100 \div 50 = 1.9$ kg

Opening Range of Throttle Valve and Driving Speed



Conditions: Operating pressure 0.5 MPa, Horizontal mounting, No load, Spring return side

- Driving speeds indicated above are for reference.

Mounting Bracket Part No.

Mounting Bracket Part No.

Bore size (mm)	40	50	63	80	100
Axial foot *	CA1-L04	CA1-L05	CA1-L06	CA1-L08	CA1-L10
Flange	CA1-F04	CA1-F05	CA1-F06	CA1-F08	CA1-F10
Single clevis	—	CV3-C05	CV3-C06	CV3-C08	CV3-C10
Double clevis **	—	CV3-D05	CV3-D06	CV3-D08	CV3-D10

* Order two foot brackets per cylinder.

** For double clevis style, pin for clevis, plain washer and split pin are shipped together.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A5□/A6□/A59W/F5□/J5□ D-F5□W/J59W/F5NTL/F59F	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□/A44/G39/K39	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64/B59W/G5□/K59 D-G5□W/K59W/G59F/G5NTL	BA-04	BA-05	BA-06	BA-08	BA-10
D-A3□C/A44C/G39C/K39C*	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80/Y59□/Y69□/Y7P D-Y7PV/Y7□W/Y7□WV	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080

* Mounting brackets are provided with D-A3□C/A44C/G39C/K39C. When ordering, indicate as described below, in accordance with the cylinder size.

- Ex.) ø40.....D-A3□C-4 ø80.....D-A3□C-8
 ø50.....D-A3□C-5 ø100.....D-A3□C-10
 ø63.....D-A3□C-6

Mounting of Auto Switch

D-B5□, B64, G5□, D-K5□ types are mountable only upon a receipt of order. (Not mountable after the time of shipment)

Precautions

Be sure to read before handling. Refer to pages 10-24-3 to 10-24-6 for Safety Instructions and Actuator Precautions.

Precautions

Warning

- Do not loosen the cushion valve more than 2 turns from the fully closed state.**

Do not loosen it more than 2 turns because this could cause the cushion valve to be ejected.

Caution

- Do not use an air cylinder as an air-hydro cylinder, because this could result in oil leakage.**

- Do not twist the rod boot during installation.**
If the cylinder is installed with its bellows twisted, it could damage the bellows.

- Use a socket wrench when replacing mounting brackets.**

The use of other tools could cause parts such as nuts to become deformed or affect their ease of service. For the sockets to be used, refer to the table below.

Bore size (mm)	Nut	Width across flats	Socket
40, 50	JIS B 1181 Class 3 Intermediate M8 x 1.25	13	JIS B 4636 + 2 point angle socket 13
63	JIS B 1181 Class 3 Intermediate M10 x 1.25	17	JIS B 4636 + 2 point angle socket 17
80, 100	JIS B 1181 Class 3 Intermediate M12 x 1.75	19	JIS B 4636 + 2 point angle socket 19

- Do not replace the bushings or the cushion seals.**

The bushings and the cushion seals are press-fitted. To replace them, they must be replaced together as a cover assembly.

- To replace a seal, apply grease to the new seal before installing it.**

If the cylinder is put into operation without applying grease to the seal, it could cause the seal to wear significantly, leading to premature air leakage.

- Do not disassemble a trunnion style cylinder.**

It is extremely difficult to align the axial center of the trunnion with the axial center of the cylinder. Thus, if this style of cylinder is disassembled and reassembled, there is the likelihood that the required dimensional accuracy cannot be attained, which could lead to a malfunction.

- Operate the cylinder at a drive speed within the range of 50 and 500 mm/s.**

(Operate within the range of absorbed energy. Refer to page.)
"Air Cylinders/Model Selection" in Best Pneumatics Vol. 6/7.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹/₅-S

CV

MVGQ

CC

RB

J

D-

-X

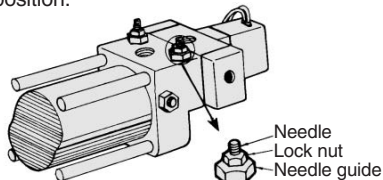
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Data

Series CV3

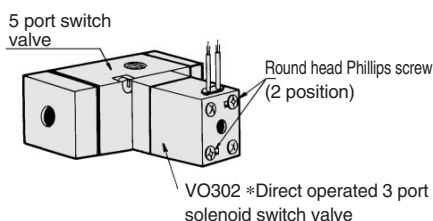
Piston Speed Adjustment

1. To slow down the piston speed, screw in the needle of the silencer exhaust throttle valve clockwise, to reduce the amount of air that is discharged.
2. The throttle valve needle opens fully when it is loosened 11 turns from its fully closed position.



3. After the specified speed has been set, secure the needle with the lock nut.

Change of Voltage Specifications



<Step>

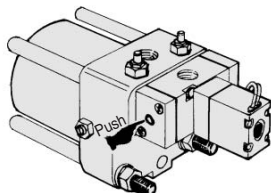
1. Loosen the Phillips screw with a screwdriver.
2. Detach the VO302* direct operated 3 port solenoid valve switch* from the 5 port solenoid valve (V3108, V3208) and replace it.

How to order pilot valve:

1. For single solenoid valve
 - 1-1. Pilot valve only
VO302A-00** 1 pc.
 - 1-2. With gasket
VO302S-00** 1 pc.
2. For double solenoid valve
 - 2-1. Pilot valve only
VO302A-00** 2 pcs.
 - 2-2. With gasket
VO302D-00** 2 pcs.

Manual Operation

Manual operation (non-locking) is possible by pushing the manual button about 3 mm.



Changing between Rod Extended when Energized and Rod Retracted when Energized

Ex.) From rod extended when energized to rod retracted when energized

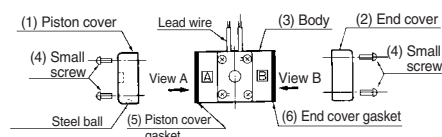


Fig. 1

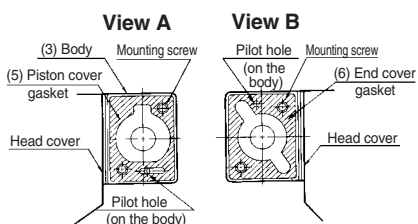


Fig. 2

<Step>

1. Loosen small screw (4) and remove piston cover (1) and end cover (2) from body (3). See Fig. 1. Leave piston cover gasket (5) and end cover gasket (6) attached to body (3). The installed position of the gasket at this time is shown in Fig. 2.
2. Push spool valve (7) and spool spring (8) out from the end cover side (the letter "B" side of the body) of body (3). (Do not push them out from the opposite direction. Fig. 3)

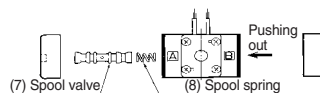


Fig. 3

3. Invert the spool valve 180° and insert it from the piston cover side (the side of the body marked "A") of body e. (Fig. 4)

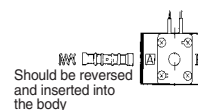


Fig. 4

4. Interchange piston cover gasket (5) and end cover gasket (6). (Fig. 5)

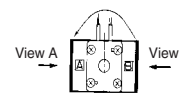


Fig. 5

The positions for gaskets after replacement are like the Fig. 6.

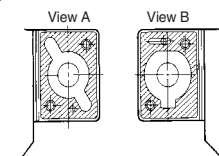


Fig. 6

5. Interchange piston cover (1) and end cover (2). The installation must be performed from the piston cover side (the letter "B" side of the body). (Refer to Fig. 7.)

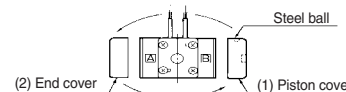
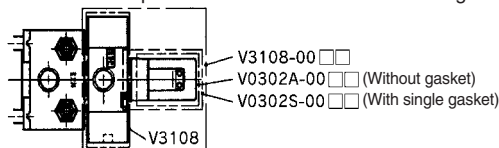


Fig. 7

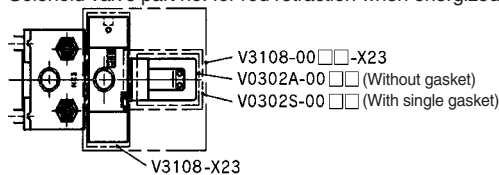
At this time, install so that the steel ball of the piston cover faces the surface from which the lead wires protrude.

Solenoid Valve for CV3, Pilot Valve Part No.

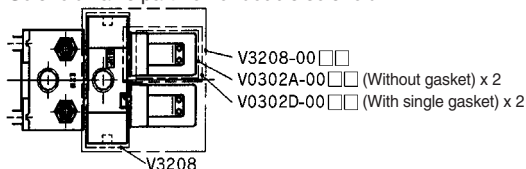
Solenoid valve part no. for rod extension when energized



Solenoid valve part no. for rod retraction when energized



Solenoid valve part no. for double solenoid

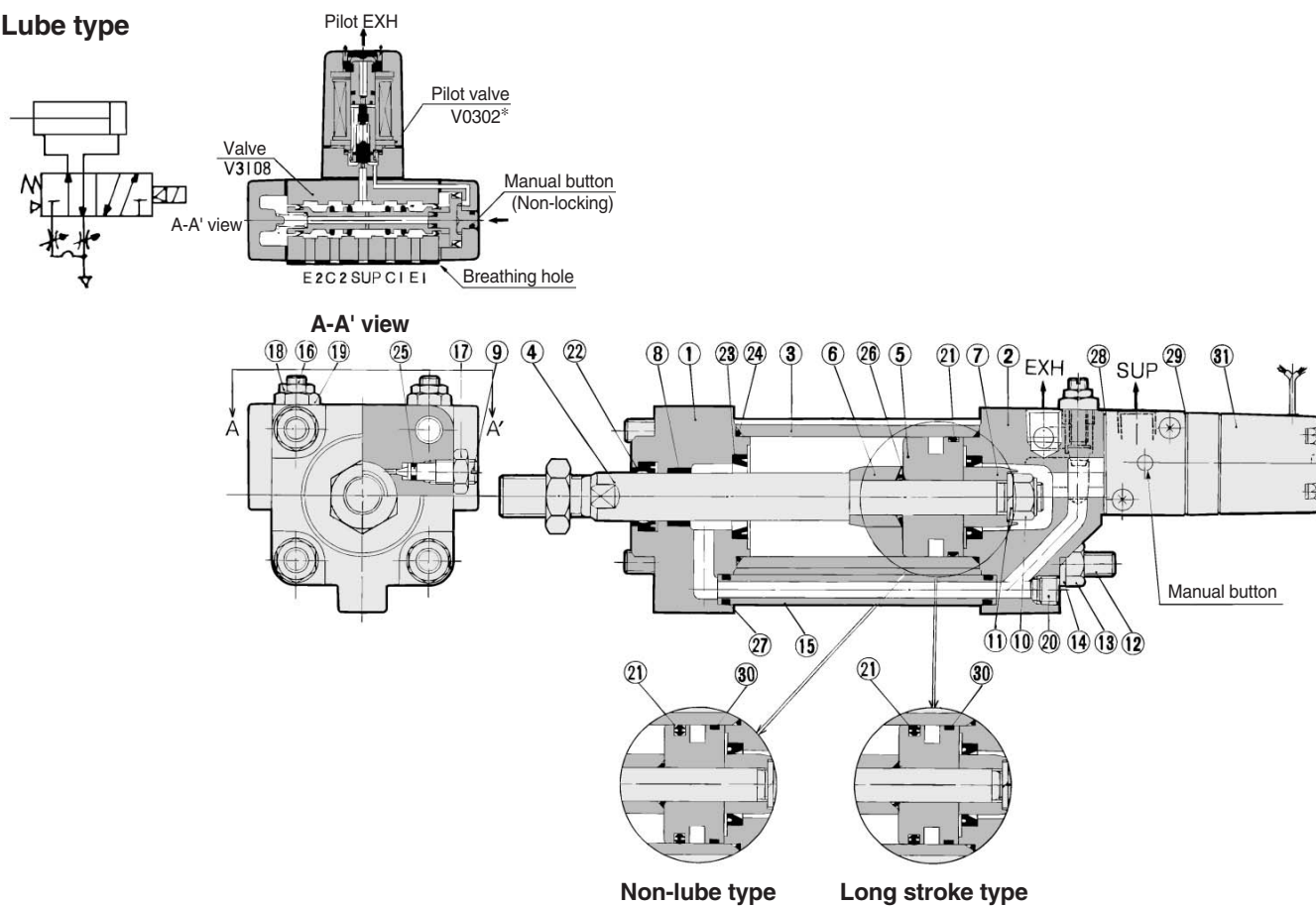


Note) Part number for the plate name of pilot valve is all V0302A.

Valve Mounted Cylinder Double Acting, Single Rod Series CV3

Construction

Lube type



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Matt black painted
②	Head cover	Aluminum alloy	Matt black painted
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring A	Rolled steel	Zinc chromated
⑦	Cushion ring B	Rolled steel	Zinc chromated
⑧*	Bushing	Lead-bronze casted	
⑨	Cushion valve	Rolled steel	Electroless nickel plated
⑩	Piston nut	Rolled steel	Zinc chromated
⑪	Spring washer	Steel wire	Zinc chromated
⑫	Tie-rod	Carbon steel	Chromated
⑬	Tie-rod nut	Carbon steel	Black zinc chromated
⑭	Spring washer	Steel wire	Black zinc chromated
⑮	Pipe	Carbon steel tube	Chromated
⑯	Valve	Sulfur easy chipping steel	Electroless nickel plated
⑰	Lock nut	Carbon steel	Nickel plated
⑱	Lock nut	Carbon steel	Nickel plated
⑲	Needle guide	Sulfur easy chipping steel	Electroless nickel plated
⑳	Plug	Chromium molybdenum steel	Black zinc chromated
㉑	Wear ring	Resin	

No.	Description	No. of solenoids	Rod extended when energized	Rod retracted when energized
㉓	Solenoid valve	Single	(1)	(2)
		Double		(3)

* How to order solenoid valves

Note 1) V3108-00 [Voltage](#) [Electrical entry](#)

Note 2) V3108-00 [Voltage](#) [Electrical entry](#) x 23

Note 3) V3208-00 [Voltage](#) [Electrical entry](#)

No.	Description	Material	Note
㉒	Piston seal	NBR	
㉔	Rod seal	NBR	
㉕*	Cushion seal	NBR	
㉖	Cylinder tube gasket	NBR	
㉗	Cushion valve seal	NBR	
㉘*	Piston gasket	NBR	
㉙	Pipe gasket	NBR	
㉚	Head cover gasket	NBR	
㉛	Single solenoid gasket	NBR	
	Double solenoid gasket	NBR	

* Not replaceable.

Replacement Parts: Seal Kit

Lube Type

Bore size (mm)	40	50	63	80	100
Kit no.	CV3-40-PS	CV3-50-PS	CV3-63-PS	CV3-80-PS	CV3-100-PS
Contents	Set of nos. above ㉒, ㉔, ㉕, ㉖, ㉘, ㉙, ㉚				

Non-lube Type

Bore size (mm)	40	50	63	80	100
Kit no.	CV3N40-PS	CV3N50-PS	CV3N63-PS	CV3N80-PS	CV3N100-PS
Contents	Set of nos. above ㉒, ㉔, ㉕, ㉖, ㉘, ㉙, ㉚				

* Seal kit includes ㉒, ㉔, ㉕, ㉖, ㉘, ㉙, ㉚. Order the seal kit, based on each bore size. (The parts indicated with numbers ㉕ and ㉘ are not replaceable.)

For the dimensions of DIN terminal, refer to page 10-15-59.

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C₅-S

CV

MVGQ

CC

RB

J

D-

-X

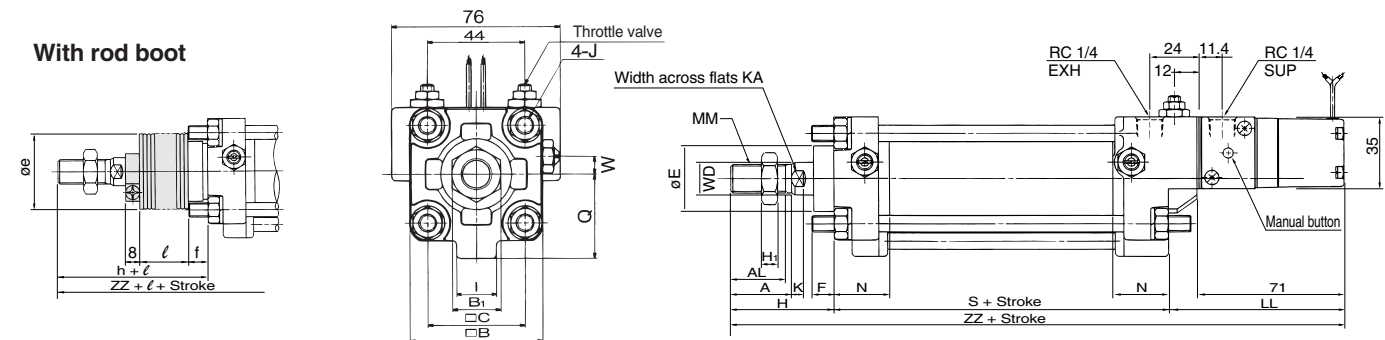
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Data

Series CV3

Basic Style: CV3B□

Lube type (CV3B), Non-lube type (CV3BN)



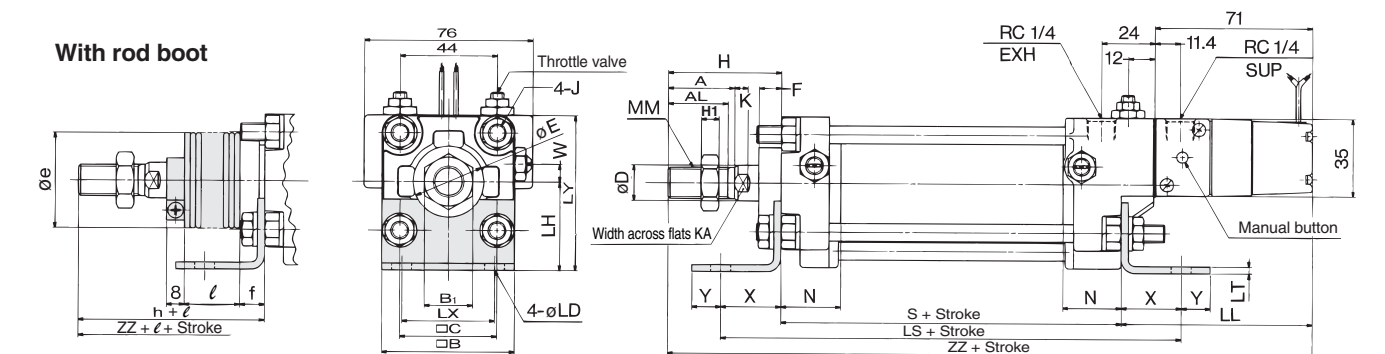
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	I	J	K	KA	LL	MM	N	Q	S
40	Up to 500	30	27	60	22	44	16	32	10	8	18	M8 x 1.25	6	14	86	M14 x 1.5	27	38	84
50	Up to 600	35	32	70	27	52	20	40	10	11	18	M8 x 1.25	7	18	83	M18 x 1.5	30	43.5	90
63	Up to 600	35	32	85	27	64	20	40	10	11	18	M10 x 1.25	7	18	83	M18 x 1.5	31	49	98
80	Up to 750	40	37	102	32	78	25	52	14	13	20	M12 x 1.75	11	22	84	M22 x 1.5	37	63	116
100	Up to 750	40	37	116	41	92	30	52	14	16	20	M12 x 1.75	11	26	85	M26 x 1.5	40	73	126

Bore size (mm)	W	Without rod boot		With rod boot				
		H	ZZ	e	f	h	l	ZZ
40	8	51	221	43	11.2	59	1/4 stroke	229
50	0	58	231	52	11.2	66	1/4 stroke	239
63	0	58	239	52	11.2	66	1/4 stroke	247
80	0	71	271	65	12.5	80	1/4 stroke	280
100	0	72	283	65	14.0	81	1/4 stroke	292

* The minimum stroke of the one with rod boot is 20 mm or more.

Axial Foot Style: CV3L□

Lube type (CV3L), Non-lube type (CV3LN)



Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	J	K	LD	LH	LL	LS	LT	LX	LY
40	Up to 500 501 to 800*	30	27	60	22	44	16	32	10	8	M8 x 1.25	6	9	40	86	138	3.2	42	70
50	Up to 600 601 to 1000*	35	32	70	27	52	20	40	10	11	M8 x 1.25	7	9	45	83	144	3.2	50	80
63	Up to 600 601 to 1000*	35	32	85	27	64	20	40	10	11	M10 x 1.25	7	11.5	50	83	166	3.2	59	93
80	Up to 750 751 to 1000*	40	37	102	32	78	25	52	14	13	M12 x 1.75	11	13.5	65	84	204	4.5	76	116
100	Up to 750 751 to 1000*	40	37	116	41	92	30	52	14	16	M12 x 1.75	11	13.5	75	85	212	6	92	133

Bore size (mm)	MM	N	S	W	X	Y	Without rod boot		With rod boot				
							H	ZZ	e	f	h	l	ZZ
40	M14 x 1.5	27	84	8	27	13	51	221	43	11.2	59	1/4 stroke	229
50	M18 x 1.5	30	90	0	27	13	58	231	52	11.2	66	1/4 stroke	239
63	M18 x 1.5	31	98	0	34	16	58	239	52	11.2	66	1/4 stroke	247
80	M22 x 1.5	37	116	0	44	16	71	271	65	12.5	80	1/4 stroke	280
100	M26 x 1.5	40	126	0	43	17	72	283	65	14.0	81	1/4 stroke	292

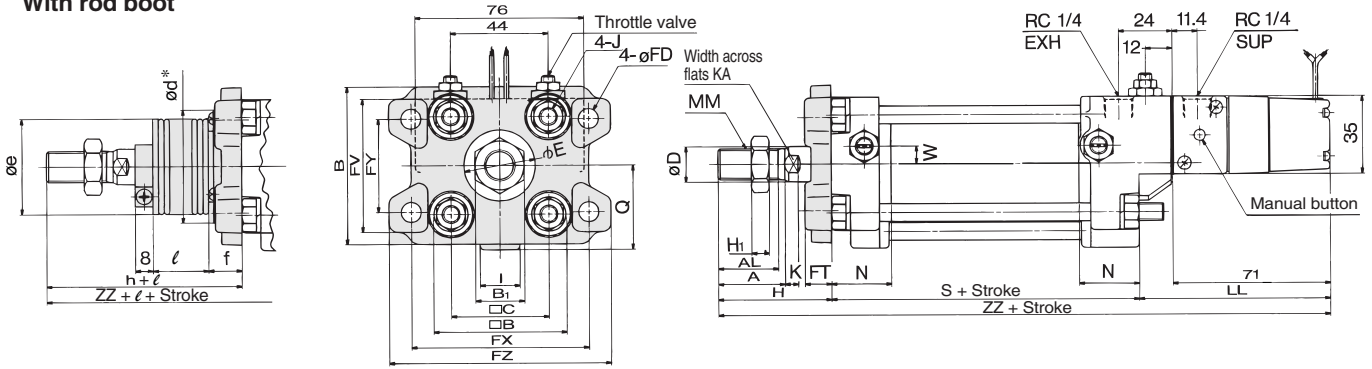
* The minimum stroke of the one with rod boot is 20 mm or more. * Long stroke

Valve Mounted Cylinder Double Acting, Single Rod Series CV3

Rod Side Flange Style: CV3F

Lube type (CV3F), Non-lube type (CV3FN)

With rod boot



Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	FD	FT	FV	FX	FY	FZ	H ₁	I	J	K	
40	Up to 500 501 to 800**	30	27	71	60	22	44	16	32	9	12	60	80	42	100	8	18	M8 x 1.25	6
50	Up to 600 601 to 1000**	35	32	81	70	27	52	20	40	9	12	70	90	50	110	11	18	M8 x 1.25	7
63	Up to 600 601 to 1000**	35	32	101	85	27	64	20	40	11.5	15	86	105	59	130	11	18	M10 x 1.25	7
80	Up to 750 751 to 1000**	40	37	119	102	32	78	25	52	13.5	18	102	130	76	160	13	20	M12 x 1.75	11
100	Up to 750 751 to 1000**	40	37	133	116	41	92	30	52	13.5	18	116	150	92	180	16	20	M12 x 1.75	11

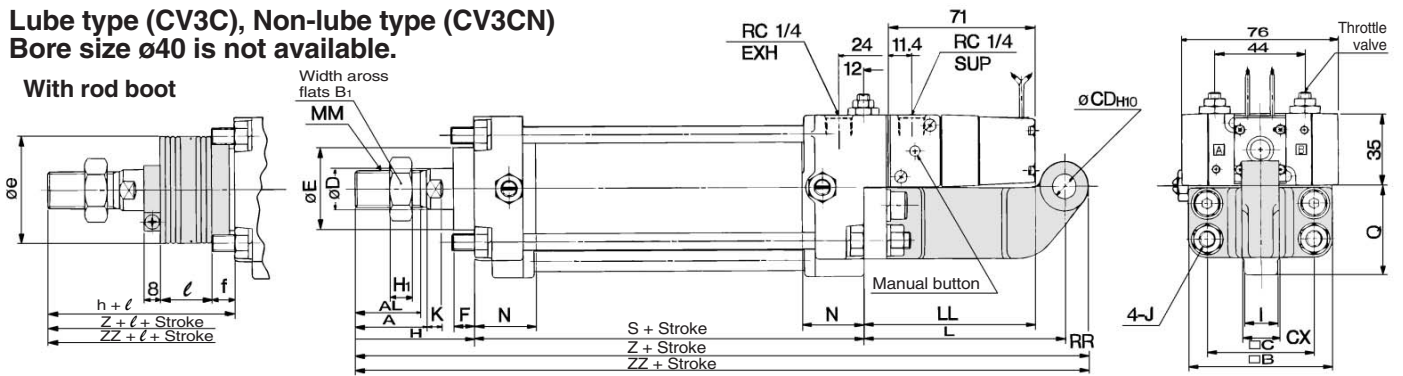
Bore size (mm)	LL	MM	N	Q	S	W	Without rod boot		With rod boot						
							H	ZZ	d**	e	f	h	ℓ	ZZ	
40	86	M14 x 1.5	27	38	84	8	51	221	52	43	15	59	1/4 stroke	229	
50	83	M18 x 1.5	30	43.5	90	0	58	231	58	52	15	66	1/4 stroke	239	
63	83	M18 x 1.5	31	49	98	0	58	239	58	52	17.5	66	1/4 stroke	247	
80	84	M22 x 1.5	37	63	116	0	71	271	80	65	21.5	80	1/4 stroke	280	
100	85	M26 x 1.5	40	73	126	0	72	283	80	65	21.5	81	1/4 stroke	292	

* The minimum stroke of the one with rod boot is 20 mm or more. ** Long stroke
** When drilling holes to get through the rod boot for the purpose of mounting, make the holes larger than the outer diameter (ød) of the rod boot mounting bracket.

Single Clevis Style: CV3C

Lube type (CV3C), Non-lube type (CV3CN)
Bore size ø40 is not available.

With rod boot



** Bore size ø40 is not available.

Bore size** (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	øCD _{H10}	CX	D	E	F	H ₁	I	J	K	L	LL
50	Up to 600	35	32	70	27	52	12 ^{+0.070} ₀	18 ^{-0.1} _{-0.3}	20	40	10	11	18	M8 x 1.25	7	98	83
63	Up to 600	35	32	85	27	64	16 ^{+0.070} ₀	25 ^{-0.1} _{-0.3}	20	40	10	11	18	M10 x 1.25	7	100	83
80	Up to 750	40	37	102	32	78	20 ^{+0.084} ₀	31.5 ^{-0.1} _{-0.3}	25	52	14	13	20	M12 x 1.75	11	105	84
100	Up to 750	40	37	116	41	92	25 ^{+0.084} ₀	35.5 ^{-0.1} _{-0.3}	30	52	14	16	20	M12 x 1.75	11	110	85

Bore size** (mm)	MM	N	Q	RR	S	Without rod boot			With rod boot						
						H	Z	ZZ	e	f	h	ℓ	Z	ZZ	
50	M18 x 1.5	30	43.5	12	90	58	246	258	52	11.2	66	1/4 stroke	254	266	
63	M18 x 1.5	31	49	16	98	58	256	272	52	11.2	66	1/4 stroke	264	280	
80	M22 x 1.5	37	63	20	116	71	292	312	65	12.5	80	1/4 stroke	301	321	
100	M26 x 1.5	40	73	25	126	72	308	333	65	14.0	81	1/4 stroke	317	342	

* The minimum stroke of the one with rod boot is 20 mm or more.

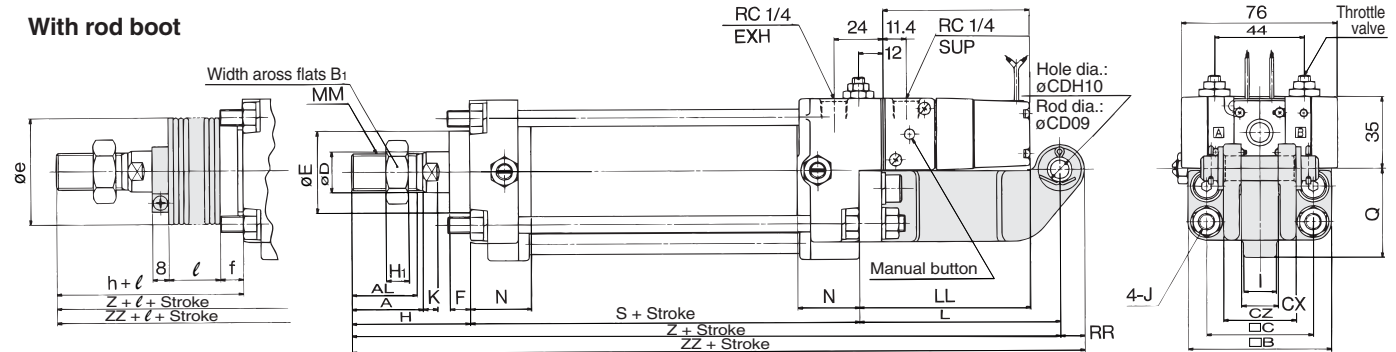
- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹/₅-S
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CV3

Double Clevis Style: CV3D□

Lube type (CV3D), Non-lube type (CV3DN)
Bore size $\phi 40$ is not available.

With rod boot



** Bore size $\phi 40$ is not available.

Bore size** (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	CD	CX	CZ	D	E	F	H ₁	I	J	K	L
50	Up to 600	35	32	70	27	52	12	18 ^{+0.3} _{+0.1}	35.5	20	40	10	11	18	M8 x 1.25	7	98
63	Up to 600	35	32	85	27	64	16	25 ^{+0.3} _{+0.1}	50	20	40	10	11	18	M10 x 1.25	7	100
80	Up to 750	40	37	102	32	78	20	31.5 ^{+0.3} _{+0.1}	63	25	52	14	13	20	M12 x 1.75	11	105
100	Up to 750	40	37	116	41	92	25	35.5 ^{+0.3} _{+0.1}	71	30	52	14	16	20	M12 x 1.75	11	110

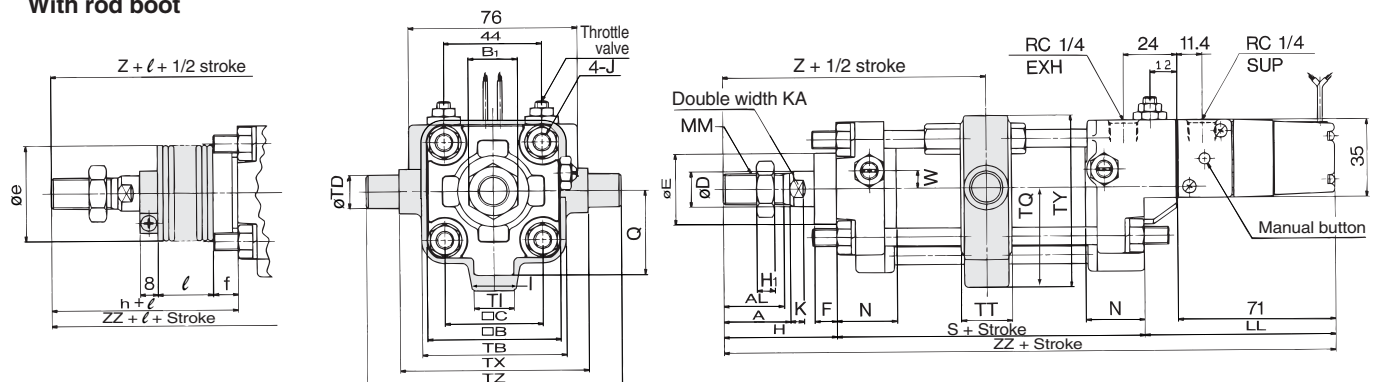
Bore size** (mm)	LL	MM	N	Q	RR	S	Without rod boot			With rod boot					
							H	Z	ZZ	e	f	h	ℓ	Z	ZZ
50	83	M18 x 1.5	30	43.5	12	90	58	246	258	52	11.2	66	1/4 stroke	254	266
63	83	M18 x 1.5	31	49	16	98	58	256	272	52	11.2	66	1/4 stroke	264	280
80	84	M22 x 1.5	37	63	20	116	71	292	312	65	12.5	80	1/4 stroke	301	321
100	85	M26 x 1.5	40	73	25	126	72	308	333	65	14.0	81	1/4 stroke	317	342

* Clevis pin and snap ring (cotter pin for 40) are shipped together. The minimum stroke with rod boot is 20 mm or more.

Center Trunnion Style: CV3T□

Lube type (CV3T), Non-lube type (CV3TN)

With rod boot



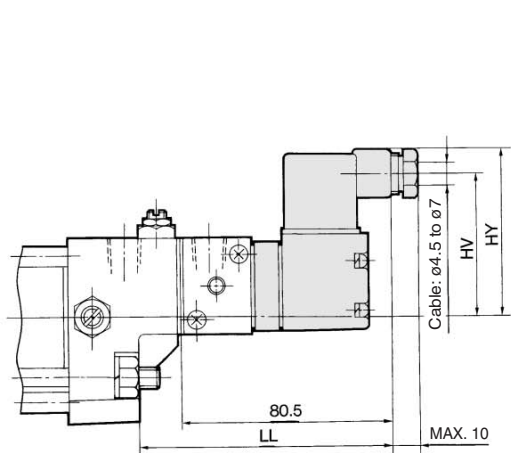
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	J	K	LL	MM	N	S	TB
40	25 to 500	30	27	60	22	44	16	32	10	8	M8 x 1.25	6	86	M14 x 1.5	27	84	65
50	25 to 600	35	32	70	27	52	20	40	10	11	M8 x 1.25	7	83	M18 x 1.5	30	90	75
63	50 to 600	35	32	85	27	64	20	40	10	11	M10 x 1.25	7	83	M18 x 1.5	31	98	90
80	50 to 750	40	37	102	32	78	25	52	14	13	M12 x 1.75	11	84	M22 x 1.5	37	116	110
100	50 to 750	40	37	116	41	92	30	52	14	16	M12 x 1.75	11	85	M26 x 1.5	40	126	130

Bore size (mm)	øTD _{es}	TI	TQ	TT	TX	TY	TZ	W	I	Q	Without rod boot			With rod boot					
											H	Z	ZZ	e	f	h	ℓ	Z	ZZ
40	15 ^{-0.032} _{-0.059}	20	45	23	85	77.5	115	8	18	38	51	93	221	43	11.2	59	1/4 stroke	101	229
50	15 ^{-0.032} _{-0.059}	20	50	23	95	87.5	125	0	18	43.5	58	103	231	52	11.2	66	1/4 stroke	111	239
63	18 ^{-0.032} _{-0.059}	20	57	28	110	102	146	0	18	49	58	107	239	52	11.2	66	1/4 stroke	115	247
80	25 ^{-0.040} _{-0.073}	24	69.5	35	140	124.5	190	0	20	63	71	129	271	65	12.5	80	1/4 stroke	138	280
100	25 ^{-0.040} _{-0.073}	24	79.5	43	162	144.5	212	0	20	73	72	135	283	65	14.0	81	1/4 stroke	144	292

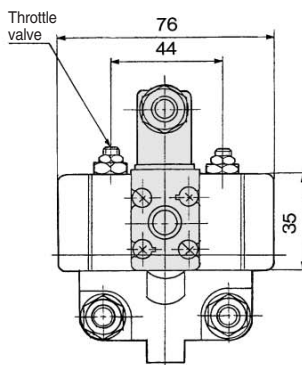
* The minimum stroke of the one with rod boot is 20 mm or more.

Valve Mounted Cylinder Double Acting, Single Rod Series CV3

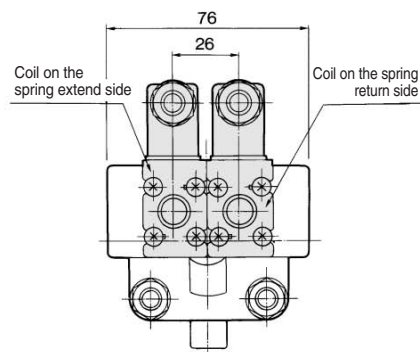
Electrical Entry: Dimensions for DIN



Single



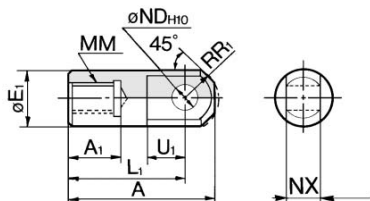
Double



Bore size (mm)	LL	HV	HY
40	95.5	55	64
50	92.5	60	69
63	92.5	68	77
80	93.5	76	85
100	94.5	83	92

Accessory Dimensions

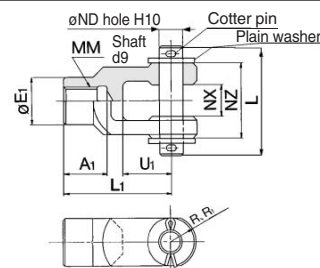
I Type Single Knuckle Joint



Material: Free cutting sulfur steel

Part no.	Applicable bore size (mm)	A	A ₁	øE ₁	L ₁	MM	R ₁	U ₁	øND _{H10}	NX
I-04	40	69	22	24	55	M14 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}
I-05	50, 63	74	27	28	60	M18 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}
I-08	80	91	37	36	71	M22 x 1.5	22.5	26	18 ^{+0.070} ₀	28 ^{-0.1} _{-0.3}
I-10	100	105	37	40	83	M26 x 1.5	24.5	28	20 ^{+0.084} ₀	30 ^{-0.1} _{-0.3}

Y Type Double Knuckle Joint

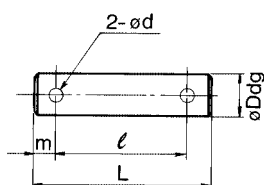


Material: Cast iron

Part no.	Applicable bore size (mm)	A ₁	E ₁	L ₁	MM	RR1	U ₁	ND	NX	NZ	L	Coter pin size	Plain washer size
Y-04C	40	22	24	55	M14 x 1.5	13	25	12	16 ^{+0.3} _{0.1}	38	55.5	ø3 x 18ℓ	Polished round 12
Y-05C	50, 63	27	28	60	M18 x 1.5	15	27	12	16 ^{+0.3} _{0.1}	38	55.5	ø3 x 18ℓ	Polished round 12
Y-08C	80	37	36	71	M22 x 1.5	19	28	18	28 ^{+0.3} _{0.1}	55	76.5	ø4 x 25ℓ	Polished round 18
Y-10C	100	37	40	83	M26 x 1.5	21	38	20	30 ^{+0.3} _{0.1}	61	83	ø4 x 30ℓ	Polished round 20

* Knuckle pin, cotter pin, and plain washer are shipped together.

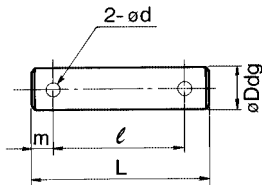
Clevis Pin



Material: Carbon steel

Part no.	Applicable bore size (mm)	øDd9	L	ød	ℓ	m	Applicable plain washer	Applicable cotter pin
CDP-3A	50	12 ^{-0.050} _{-0.093}	55.5	3	47.5	4.0	Polished round 12	3 x 18
CVD-06	63	16 ^{-0.050} _{-0.093}	75	4	65	5.0	Polished round 16	4 x 22
CVD-08	80	20 ^{-0.065} _{-0.117}	94	5	79	7.5	Polished round 20	5 x 30
CVD-10	100	25 ^{-0.085} _{-0.117}	105	5	90	7.5	Polished round 24	5 x 35

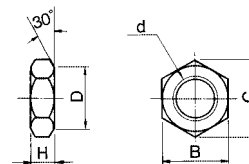
Knuckle Pin



Material: Carbon steel

Part no.	Applicable bore size (mm)	øDd9	L	ℓ	m	ød (Drill through)	Applicable plain washer	Applicable cotter pin
CDP-3A	40, 50, 63	12 ^{-0.050} _{-0.093}	55.5	47.5	4	3	Polished round 12	ø3 x 18ℓ
CDP-5A	80	18 ^{-0.050} _{-0.093}	76.5	66.5	5	4	Polished round 18	ø4 x 25ℓ
CDP-6A	100	20 ^{-0.065} _{-0.117}	83	73	5	4	Polished round 20	ø4 x 30ℓ

Rod End Nut



Material: Rolled steel

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37	31
NT-10	100	M26 x 1.5	16	41	47.3	39

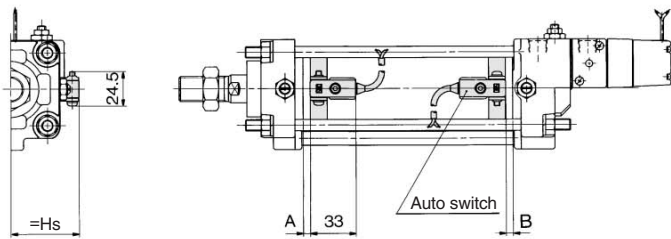
- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CV3

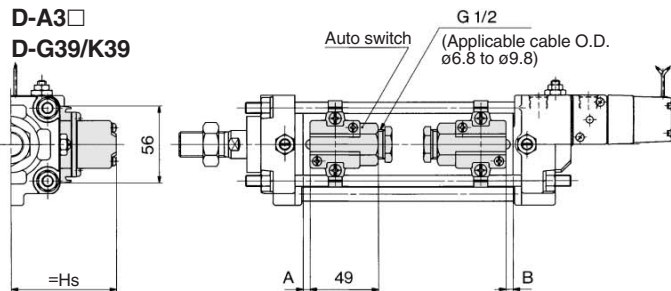
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting style>

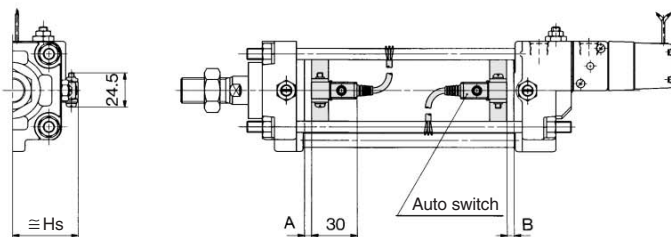
D-B5□/B64/B59W



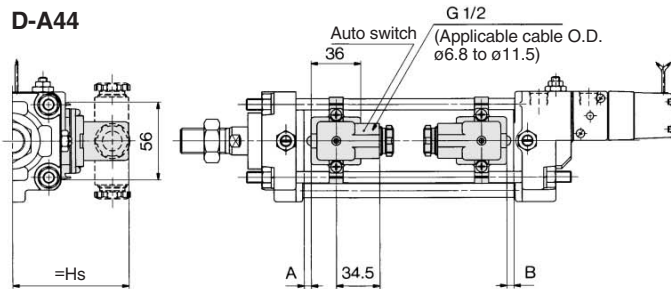
D-A3□
D-G39/K39



D-G5□/K59
D-G5□W/K59W
D-G59F/G5NTL

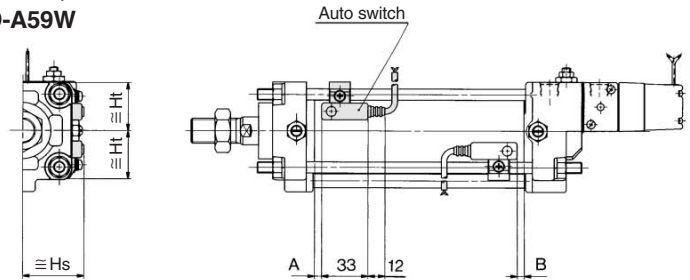


D-A44

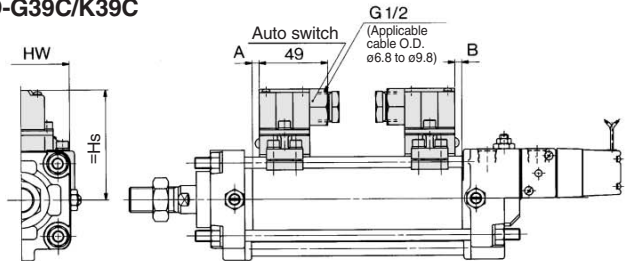


<Tie-rod mounting style>

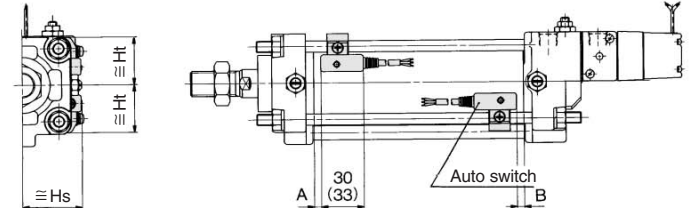
D-A5□, D-A6□
D-A59W



D-A3□C
D-G39C/K39C

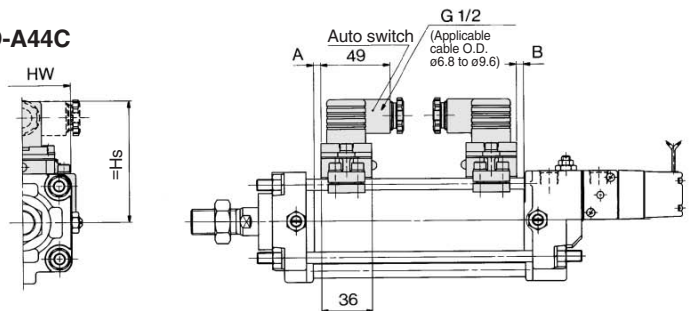


D-F5□/J5□
D-F5NTL
D-F5□W/J59W
D-F59F

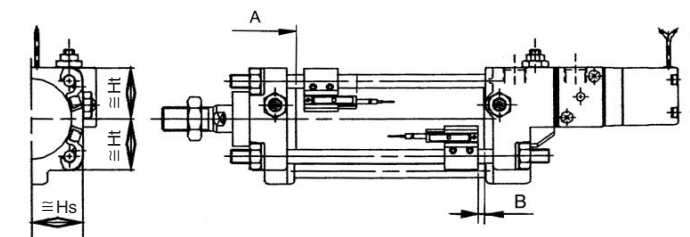


() : Denotes the values of D-F5LF.

D-A44C



D-Z7/Z8
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV



Valve Mounted Cylinder Double Acting, Single Rod Series CV3

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

Proper Auto Switch Mounting Position

Auto switch model	D-A5□, D-A6□ D-A3□/A3□C D-A44/A44C D-G39/G39C D-K39/K39C		D-B5□/B64 D-G5□W D-K59W D-G59F		D-F5□ D-J5□ D-F5□W D-J59W D-F59F		D-G5□ D-K59 D-G5NTL		D-A59W		D-F5NTL		D-B59W D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	0 (0)	1 (0)	0 (0.5)	1.5 (0)	3.5 (6.5)	7.5 (4.5)	0 (2)	3 (0)	1 (4)	5 (2)	8.5 (11.5)	12.5 (9.5)	0.5 (3.5)	4.5 (1.5)
50	0 (0)	1 (0)	0 (0.5)	1.5 (0)	3.5 (6.5)	7.5 (4.5)	0 (2)	3 (0)	1 (4)	5 (2)	8.5 (11.5)	12.5 (9.5)	0.5 (3.5)	4.5 (1.5)
63	0 (2.5)	5.5 (1.5)	0 (3)	6 (2)	5.5 (9)	12 (8)	1 (4.5)	7.5 (3.5)	3 (6.5)	9.5 (5.5)	10.5 (14)	17 (13)	2.5 (6)	9 (5)
80	2 (6)	8.5 (4)	2.5 (6.5)	9 (4.5)	8.5 (12.5)	15 (10.5)	4 (8)	10.5 (6)	6 (10)	12.5 (8)	13.5 (17.5)	20 (15.5)	5.5 (9.5)	12 (7.5)
100	4 (7.5)	10.5 (6.5)	4.5 (8)	11 (7)	10.5 (14)	17 (13)	6 (9.5)	12.5 (8.5)	8 (11.5)	14.5 (10.5)	15.5 (19)	22 (18)	7.5 (11)	14 (10)

- Note 1) (): Denotes the values of non-lube type.
 Note 2) D-G5□W, K59W, G58A and G59F can not be attached on ø40 and ø50 lube type cylinder.
 Note 3) D-B5□ type, D-G5□ type, D-K5□ type are mountable only upon a receipt of order. (Not mountable after the time of shipment)

Auto Switch Mounting Height

Auto switch model	D-B5□/B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G59F		D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F5□W D-J59W D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C		D-Z7□/Z80 D-Y59□ D-Y7P D-Y7□W		D-Y69□ D-Y7PV D-Y7IWV	
	Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw	Hs	Ht	Hs	Ht			
40	38	72.5	80.5	40	31	38.5	31	73	69	81	69	30	30	30.5	30			
50	43.5	78	86	43.5	35	42.5	35	78.5	77	86.5	77	34	34	35	34			
63	50.5	85	93	49	42	48	42	85.5	91	93.5	91	41	41	42.5	41			
80	59	93.5	101.5	55.5	50	54	50	94	107	102	107	49.5	48.5	51	48.5			
100	69.5	104	112	63	57.5	62	57.5	104	121	112	121	58.5	56	59	56			

Operating Range

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-Z7□/Z80	8	7	9	9.5	10.5
D-A3□/A44 D-A3□C/D-A44C	9	10	11	11	11
D-A5□/A6□					
D-B5□/B64					
D-A59W	13	13	14	14	15
D-B59W	14	14	17	16	18
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	8	7	5.5	6.5	6.5
D-F5□/J5□ D-F5□W/J59W D-F5NTL/F59F	4	4	4.5	4.5	4.5
D-G5□/K59 D-G5□W/K59W D-G5NTL/G59F	5	6	6.5	6.5	7
D-G39/K39 D-G39C, D-K39C	9	9	10	10	11

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)
 There may be the case it will vary substantially depending on an ambient environment.

Other than the models listed in "How to Order", the following auto switches are applicable.

For detailed specifications, refer to page 10-20-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	Without indicator light
	D-A64/A67		
	D-B64		
	D-Z80		
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		
	D-F5NTL		2-color indication
	D-G5NTL		With timer
	D-Y69A/Y7PV/Y69B D-Y7NWV/Y7PWV/Y7BWV		Grommet (Perpendicular)
		2-color indication	

* With pre-wire connector is also available in solid state auto switches.
 For details, refer to page 10-20-66.

* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 10-20-41.

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C_G¹/5-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series CV3

Minimum Stroke For Auto Switch Mounting

n: Number of auto switches

Auto switch model	No. of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-A5□/A6□ D-F5□/J5□ D-F5□W/J59W D-F59F	2 (Different sides, Same side), 1	15	90		100	110	120
	n (Same side)	$15 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-A59W	2 (Different sides, Same side)	20	90		100	110	120
	n (Same side)	$20 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
	1	15	90		100	110	120
D-F5NTL	2 (Different sides, Same side), 1	25	110		120	130	140
	n (Same side)	$25 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$140 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G59F D-G5NTL	2	Different sides	15	90		100	110
		Same side	75	90		100	110
	n	Different sides	$15 + 50 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16, ...
		Same side	$75 + 50 (n-2)$ n = 2, 3, 4...	$90 + 50 (n-2)$ n = 2, 4, 6, 8...		$100 + 50 (n-2)$ n = 2, 4, 6, 8...	$110 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	10	90		100	110	
D-B59W	2	Different sides	20	90		100	110
		Same side	75	90		100	110
	n	Different sides	$20 + 50 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
		Same side	$75 + 50 (n-2)$ n = 2, 3, 4...	$90 + 50 (n-2)$ n = 2, 4, 6, 8...		$100 + 50 (n-2)$ n = 2, 4, 6, 8...	$110 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	15	90		100	110	
D-A3□ D-G39 D-K39	2	Different sides	35	100		100	110
		Same side	100	100		100	110
	n	Different sides	$35 + 30 (n-2)$ n = 2, 3, 4...	$100 + 30 (n-2)$ n = 2, 4, 6, 8...		$100 + 30 (n-2)$ n = 2, 4, 6, 8...	$110 + 30 (n-2)$ n = 2, 4, 6, 8...
		Same side	$100 + 100 (n-2)$ n = 2, 3, 4...	$100 + 100 (n-2)$ n = 2, 4, 6, 8...			$110 + 100 (n-2)$ n = 2, 4, 6, 8...
1	10	100		100	110		
D-A44	2	Different sides	35	90		100	110
		Same side	55	90		100	110
	n	Different sides	$35 + 30 (n-2)$ n = 2, 3, 4...	$90 + 30 (n-2)$ n = 2, 4, 6, 8...		$100 + 30 (n-2)$ n = 2, 4, 6, 8...	$110 + 30 (n-2)$ n = 2, 4, 6, 8...
		Same side	$55 + 50 (n-2)$ n = 2, 3, 4...	$90 + 50 (n-2)$ n = 2, 4, 6, 8, ...		$100 + 50 (n-2)$ n = 2, 4, 6, 8...	$110 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	10	90		100	110	
D-A3□C D-G39C D-K39C	2	Different sides	20	100		100	110
		Same side	100	100		100	110
	n	Different sides	$20 + 35 (n-2)$ n = 2, 3, 4...	$100 + 35 (n-2)$ n = 2, 4, 6, 8...		$100 + 35 (n-2)$ n = 2, 4, 6, 8...	$110 + 35 (n-2)$ n = 2, 4, 6, 8...
		Same side	$100 + 100 (n-2)$ n = 2, 3, 4, 5...	$100 + 100 (n-2)$ n = 2, 4, 6, 8...			$110 + 100 (n-2)$ n = 2, 4, 6, 8...
1	10	100		100	110		
D-A44C	2	Different sides	20	90		100	110
		Same side	55	90		100	110
	n	Different sides	$25 + 35 (n-2)$ n = 2, 3, 4...	$90 + 35 (n-2)$ n = 2, 4, 6, 8...		$100 + 35 (n-2)$ n = 2, 4, 6, 8...	$110 + 35 (n-2)$ n = 2, 4, 6, 8...
		Same side	$55 + 50 (n-2)$ n = 2, 3, 4...	$90 + 50 (n-2)$ n = 2, 4, 6, 8...		$100 + 50 (n-2)$ n = 2, 4, 6, 8...	$110 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	10	90		100	110	
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	2 (Different sides, Same side), 1	15	80	85	90	95	105
	n	$15 + 40 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$80 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$85 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$90 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$95 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$105 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-Y69□/Y7PV D-Y7□WV	2 (Different sides, Same side), 1	10	65		75	80	90
	n	$10 + 30 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$65 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$75 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$80 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$90 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...



Valve Mounted Cylinder: Non-rotating Rod Type

Double Acting, Single Rod

Series CV3K

Non-lube Type: ø40, ø50, ø63

How to Order

Built-in Magnet Cylinder Model

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil".
(Example) CDV3KL40-100-1

Suffix for cylinder	
Rod boot	J Nylon tarpaulin
	K Heat resistant tarpaulin
Cushion	N Without cushion
	R With cushion on rod end
	H With cushion on head end
	Nil With cushion on both ends

* When specifying symbol more than one, combine symbols alphabetically.

Solenoid valve voltage

1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
5	24 VDC
9	Other

Solenoid valve

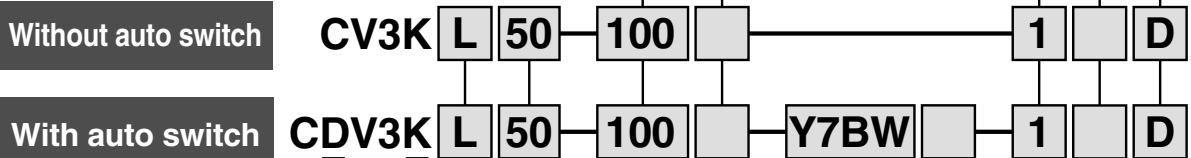
Nil	2 position single
W	2 position double

Electrical entry

Nil	Grommet
D	DIN terminal

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 10-15-64.)



Without auto switch

With auto switch

Built-in magnet
Non-rotating rod type

Mounting style	
B	Basic style
L	Axial foot style
F	Rod side flange style
C*	Single clevis style
D*	Double clevis style
T	Center trunnion style

* Except tubing I.D. ø40

Bore size	
40	40 mm
50	50 mm
63	63 mm

Number of auto switches	
Nil	2 pcs.
3	3 pcs.
S	1 pc.
n	"n" pcs.

Auto switch	
Nil	Without auto switch

* For the applicable auto switch model, refer to the table below.
* D-Z7/Z80/Y59□/Y69□/Y7□ types are shipped together, (not assembled). (But, only the mounting bracket for the above models is assembled at the time of shipment.)

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *			Pre-wire connector	Applicable load										
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)												
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	Z76	—	●	●	—	—	IC circuit	—								
								—	100 V	Z73	—	●				●	●						
									—	B53***	—	●				●	●						
		Terminal conduit		—	—	2-wire	24 V	12 V	100 V, 200 V	—	A54	B54***	●	●	●	—	Relay, PLC						
											—	A33C	A33	—	—			—					
											100 V	A34C	A34	—	—			—					
DIN terminal	—	—	2-wire	24 V	12 V	200 V	—	A44C	A44	—	—	—	—	Relay, PLC									
								—	A59W	B59W***	●	●			—								
								—	—	—	—	—			—								
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V	—	Y59A	G59***	●	●	○	—	IC circuit									
								3-wire (PNP)	12 V	—	Y7P	G5P***			●	●	○						
				2-wire	—	—	100 V, 200 V	12 V	—	—	J51	—	●	●	○	—	—						
											—	Y59B	K59***	●	●			○					
				Terminal conduit	—	—	3-wire (NPN)	24 V	5 V, 12 V	—	—	G39C	G39	—	—	—	—	IC circuit					
		2-wire										12 V	—	—	—	—			K39C	K39	—	—	—
																			—	—	—	—	—
		Grommet		Diagnostic indication (2-color indication)	—	3-wire (NPN)	24 V	5 V	—	—	Y7NW	G59W***	●	●	○	—	IC circuit						
											3-wire (PNP)	12 V	—	—	—			—	Y7PW	G5PW***	●	●	○
																			2-wire	12 V	—	—	—
With diagnostic output (2-color indication)	—	—	4-wire (NPN)	24 V	5 V, 12 V	—	—	F59F	G59F***	●	●	○	—	IC circuit									
								—	—	—	—	—			—	—	—						

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

* Solid state switches marked with "○" are produced upon receipt of order.
*** D-B5□/G5□/K5□ types are mountable only upon a receipt of order.
(Not mountable after the time of shipment)
(Not mountable after the time of shipment)

• Since there are other applicable auto switches than listed, refer to page 10-15-61 for details.
• For details about auto switches with pre-wire connector, refer to page 10-20-66.

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CV3K

Adjustable speed.

Built-in throttle valves are provided to enable speed adjustments in each direction.

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

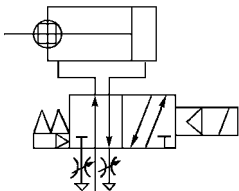
A manual operation mechanism is provided as standard equipment (non-locking).

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



PAT.PEND.

JIS Symbol



Made to Order Specifications (For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC15	Change of tie-rod length

Related things about auto switches and the mounting brackets part numbers are the same as these of Series CV3.
For details, refer to pages 10-15-59 to 10-15-62.

Specifications

Applicable bore size (mm)	40	50	63
Action	Double acting		
Type	Non-lube		
Fluid	Air		
Proof pressure	1.35 MPa		
Maximum operating pressure	0.9 MPa		
Minimum operating pressure	0.15 MPa		
Ambient & fluid temperature	-10 to 50°C (No freezing)		
Cushion	Interchangeable		
Thread tolerance	JIS Class 2		
Stroke length tolerance	Up to 250 st ^{+1.0} / ₀ , 251 to 600 st ^{+1.4} / ₀		
Effective area of valve (Cv factor)	18 mm ² (1.0)		
Port size	Rc 1/4		
Lubrication	Not required (Non-lube)		
Electrical entry	Grommet, DIN terminal		
Piston speed	50 to 500 mm/s *		
Rod non-rotating accuracy	±0.5°		
Allowable rotational torque	0.44 N·m or less		
Mounting	Basic style, Axial foot style, Rod side flange style, Single clevis style, Double clevis style, Center trunnion style		

* Operate within the range of absorbed energy.

Allowable Kinetic Energy

(J)

Bore size (mm)	40	50	63
Allowable kinetic energy	2.4	4.4	7.8

Solenoid Valve Specifications

Applicable solenoid valve model	V3□08			
Coil rated voltage	100/200 VAC (50/60 Hz), 24 VDC			
Allowable voltage	-15 to 10% of the rated voltage			
Coil insulation	Class B or equivalent (130°C)			
Apparent power ^{Note)}	AC	Inrush	50 Hz	8.5 VA
			60 Hz	7.5 VA
	Holding		50 Hz	7.0 VA
			60 Hz	5.5 VA
Power consumption ^{Note)}	DC	6 W		

Note) At the rated voltage.

Standard Stroke

Bore size (mm)	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500*
50, 63	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600*

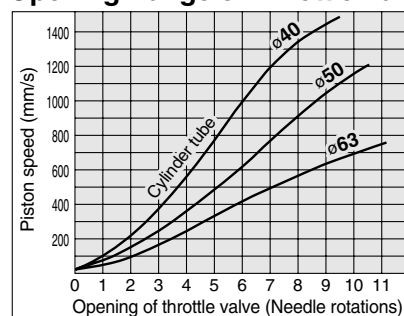
Note) The cylinders with the standard strokes indicated above can be delivered in a short term. Intermediate stroke except mentioned above is manufactured upon receipt of order.

- When the auto switch is attached, the minimum stroke is going to be different. Refer to page 10-15-62.

The minimum stroke length is different in the trunnion style. Refer to page 10-15-62 for further information.

Please consult with SMC for longer strokes than the strokes marked with *.

Opening Range of Throttle Valve and Driving Speed



Conditions: Operating pressure 0.5 MPa, Horizontal mounting, No load, Spring return side

- The speeds shown in the graph are for reference.

Rod Boot Material

Symbol	Rod boot material	Max. 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, Single Rod Series CV3K

Weight (kg)

Bore size (mm)		40	50	63
Basic weight	Basic style	1.30	1.73	2.57
	Foot style	1.47	1.93	2.86
	Rod side flange style	1.56	2.14	3.19
	Single clevis style	—	2.46	3.68
	Double clevis style	—	2.51	3.73
	Trunnion style	1.95	2.52	3.96
Additional weight per each 50 mm of stroke		0.22	0.28	0.37
Accessory bracket	Single knuckle	0.23	0.26	0.26
	Double knuckle (with pin)	0.37	0.43	0.43

Calculation: (Example) CV3KL40-100-1

- Basic weight.....1.47 (kg)
- Additional weight.....0.22 (kg/50 st)
- Cylinder stroke.....100 (st) $1.47 + 0.22 \times 100 = 1.9 \text{ kg}$

Accessory

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

* Pin, plain washer and cotter pin are shipped together with double clevis and double knuckle joint.

Handling

1. Adjusting of the piston speed
2. Change of voltage specifications
3. Manual override
4. Changing between rod extended when energized and rod retracted when energized.

Since the operations above 1. to 4. are the same as Series CV3, refer to page 10-15-54.

⚠ Precautions

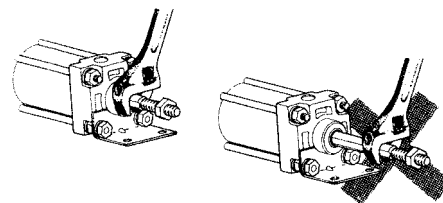
Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6. For Series CV3K, refer to page 10-15-54.

Operating Precautions

⚠ 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 become deformed, 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.



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.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C_G5-S

CV

MVGQ

CC

RB

J

D-

-X

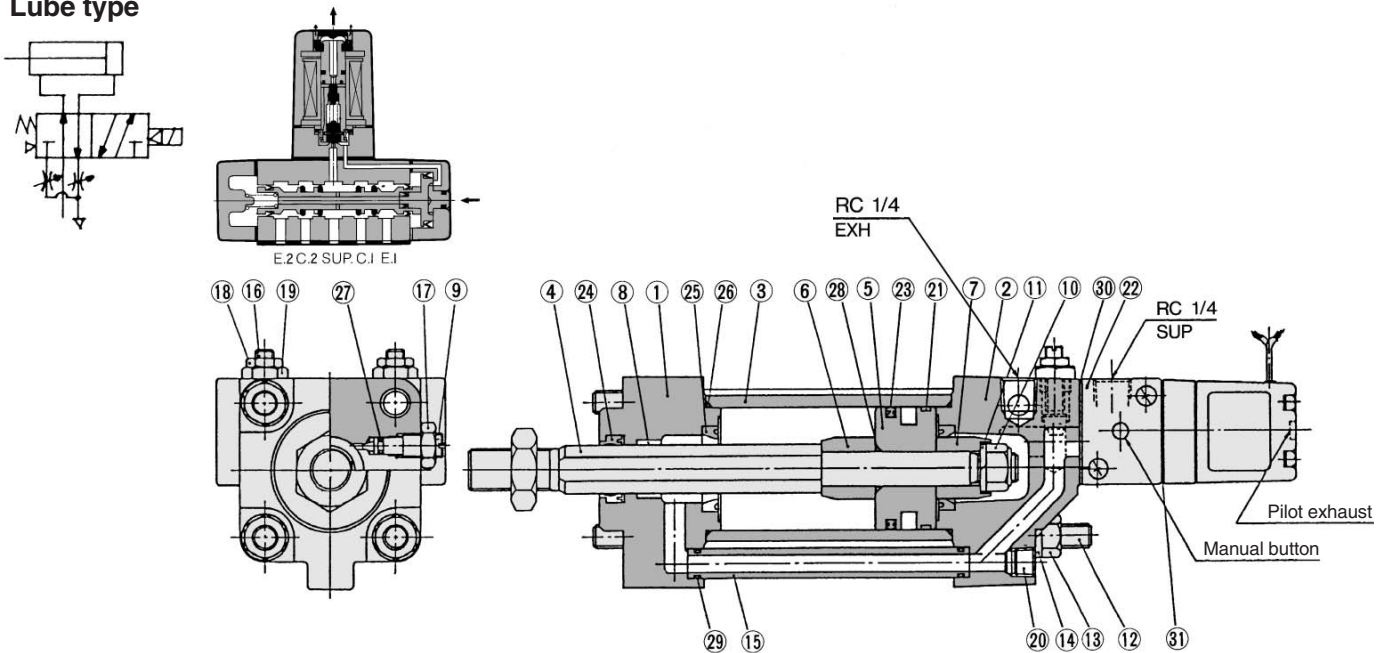
20-

Data

Series CV3K

Construction

Lube type



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Matt black painted
②	Head cover	Aluminum alloy	Matt black painted
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring A	Rolled steel	Zinc chromated
⑦	Cushion ring B	Rolled steel	Zinc chromated
⑧*	Non-rotating guide	Oil impregnated sintered alloy	
⑨	Cushion valve	Rolled steel	Electroless nickel plated
⑩	Piston nut	Rolled steel	Zinc chromated
⑪	Spring washer	Steel wire	Zinc chromated
⑫	Tie-rod	Carbon steel	Uni-chromated
⑬	Tie-rod nut	Carbon steel	Black zinc chromated

No.	Description	Material	Note
⑭	Spring washer	Steel wire	Black zinc chromated
⑮	Pipe	Carbon steel tube	Uni-chromated
⑯	Needle	Sulfur easy chipping steel	Electroless nickel plated
⑰	lock nut	Carbon steel	Nickel plated
⑱	lock nut	Carbon steel	Nickel plated
⑲	Needle guide	Sulfur easy chipping steel	Electroless nickel plated
⑳	Plug	Chromium molybdenum steel	Black zinc chromated
㉑	Wear ring	Resin	

No.	Description	No. of solenoids	Rod extended when energized	Rod retracted when energized
㉒	Solenoid valve	Single	(1)	(2)
		Double		(3)

* How to order solenoid valves

- Note 1) V3108-00 Voltage [Electrical entry]
 Note 2) V3108-00 Voltage [Electrical entry]-X23
 Note 3) V3208-00 Voltage [Electrical entry]

No.	Description	Material	Note
㉓	Piston seal	NBR	
㉔	Rod seal	NBR	
㉕*	Cushion seal	NBR	
㉖	Cylinder tube gasket	NBR	
㉗	Cushion valve seal	NBR	
㉘*	Piston gasket	NBR	
㉙	Pipe gasket	NBR	
㉚	Head cover gasket	NBR	
㉛	Single solenoid gasket	NBR	
	Double solenoid gasket	NBR	

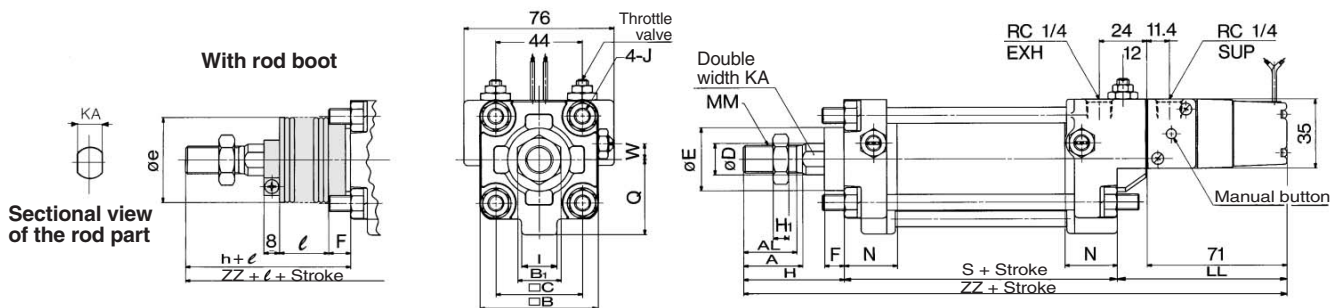
* Not replaceable.

Replacement Parts: Seal Kit

Bore size (mm)	40	50	63
Kit no.	CV3K40-PS	CV3K50-PS	CV3K63-PS
Contents	Set of nos. above ㉓, ㉔, ㉖, ㉗, ㉙, ㉚.		

* Seal kit includes ㉓, ㉔, ㉖, ㉗, ㉙, ㉚. Order the seal kit, based on each bore size. (Not possible to replace ㉕, ㉘.)

Basic Style: CV3KB□



Bore size (mm)	Stroke range (mm)*	A	AL	B	B ₁	C	D	E	F	H ₁	I	J	KA	LL	MM	N	Q	S
40	Up to 500	30	27	60	22	44	16	32	10	8	18	M8 x 1.25	14	86	M14 x 1.5	27	38	84
50	Up to 600	35	32	70	27	52	20	40	10	11	18	M8 x 1.25	18	83	M18 x 1.5	30	43.5	90
63	Up to 600	35	32	85	27	64	20	40	10	11	18	M10 x 1.25	18	83	M18 x 1.5	31	49	98

Bore size (mm)	W	Without rod boot		With rod boot				
		H	ZZ	e	f	h	I	ZZ
40	8	51	221	43	11.2	59	1/4 stroke	229
50	0	58	231	52	11.2	66	1/4 stroke	239
63	0	58	239	52	11.2	66	1/4 stroke	247



* The minimum stroke of the one with rod boot is 20 mm or more.
 ** For dimensions of DIN terminal, refer to page 10-15-59.

- External dimensions of each mounting bracket other than basic style are the same, except KA dimension. Refer to pages 10-15-71 to 10-15-73.
- For accessory, refer to page 10-15-59.

Valve Mounted Cylinder Double Acting, Single Rod Series **CVS1**

Lube/Non-lube Type: $\varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$

How to Order

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 10-15-58.)

Bore size

40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Cushion

Nil	Lube type
N	Non-lube type
F*	Steel tube

Note) Auto switches are not available with steel tube.

Electrical entry

Nil	Grommet
T	Conduit terminal
D	DIN terminal
DL	DIN terminal with indicator light
TZ	Conduit terminal with surge voltage suppressor

Solenoid valve

Nil	2 position single (VS4124-00□□-X46)
W	2 position double (VS4224-00□□)
Y	3 position closed center (VS4324-00□□)
Z	3 position exhaust center (VS4424-00□□)

Without auto switch
CVS1 L N 40 100 JN 1 W D

With auto switch
CDVS1 L N 40 100 JN Y7BW 1 W D

Built-in magnet

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	Center trunnion style

Suffix for cylinder

Rod boot	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	N	Without cushion
	R	With cushion on rod end
	H	With cushion on head end
	Nil	With cushion on both ends

* When specifying symbol more than one, combine symbols alphabetically.

Auto switch

Nil	Without auto switch
-----	---------------------

* For the applicable auto switch model, refer to the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ types are shipped together, (not assembled). (But, only the mounting bracket for the above models is assembled when shipping.)

Solenoid valve voltage

1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
5	24 VDC
9	Other

Number of auto switches

Nil	2 pcs.
3	3 pcs.
S	1 pc.
n	"n" pcs.

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *			Pre-wire connector	Applicable load														
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)		IC circuit	Relay, PLC													
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	Z76	—	●	●	—	—	IC circuit	—												
								2-wire	100 V	Z73	—	●				●	●										
									24 V	12 V	—	B53				●	●	●									
										100 V, 200 V	A54	B54				●	●	●									
										100 V, 200 V	A33C	A33				—	—	—									
Solid state switch	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	G59	●	●	○	—	IC circuit	—												
								3-wire (PNP)	Y7P	G5P	●	●				○											
								2-wire	100 V, 200 V	J51	—	●				●	○										
										12 V	Y59B	K59				●	●	○									
								3-wire (NPN)	24 V	5 V, 12 V	—	G39C				G39	—	—	—	—	IC circuit						
												2-wire				K39C	K39	—	—			—					
								With timer	2-color indication	Grommet	Yes	3-wire (NPN)				24 V	5 V, 12 V	—	Y7NW	G59W **	●	●	○	—	IC circuit	—	
																			3-wire (PNP)	Y7PW	G5PW **	●	●				○
																			2-wire	Y7BW	K59W **	●	●				○
																			3-wire (NPN)	F5NT	G5NT	—	●				○
With diagnostic output (2-color indication)	—	Grommet	Yes	4-wire (NPN)	24 V	5 V, 12 V	—	F59F	G59F **	●	●	○	—	IC circuit	—												
								—	—	—	—	—															

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

** Solid state switches marked with "○" are produced upon receipt of order.
** D-G5□W/K59W/G59F types cannot be mounted on bore sizes $\varnothing 40$ and $\varnothing 50$ lubrication type cylinder.

• Since there are other applicable auto switches than listed, refer to page 10-15-76 for details.
• For details about auto switches with pre-wire connector, refer to page 10-20-66.

- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CVS1

Speed controller installed

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

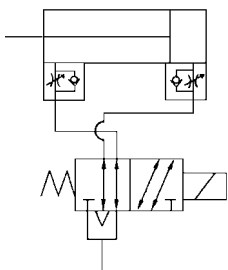
A selection of solenoid valves is possible.

Single, double and 3 position solenoid valves are mountable.

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



JIS Symbol



Made to Order Specifications (For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC6	Piston rod and rod end nut made of stainless steel
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC22	Fluoro rubber seals
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC28	Compact flange made of SS400
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper

Specifications

Applicable bore size (mm)	40, 50, 63, 80, 100	
Type	Lube	Non-lube
Series	CVS1	CVS1□N
Action	Double acting	
Fluid	Air	
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.05 MPa	
Ambient & fluid temperature	-10 to 60°C (No freezing)	
Cushion	Air cushion	
Thread tolerance	JIS Class 2	
Stroke length tolerance	Up to 250 ^{st.} +1.0 ₀ , 251 to 1,000 ^{st.} -1.4 ₀	
Effective area of valve (Cv factor)	Single: 26.5 mm ² (1.47)	
Port size	Rc 1/4	
Electrical entry	Grommet, Conduit terminal, DIN terminal, DIN terminal with indicator light, Conduit terminal with surge voltage suppressor	
Piston speed	50 to 500 mm/s * Note)	
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style	

* Operate within the range of absorbed energy.

Note) For operating piston speed for each size, refer to page 10-15-69.

Allowable Kinetic Energy

Bore size (mm)	40	50	63	80	100
Allowable kinetic energy	2.4	4.4	7.8	11.7	20.5

Solenoid Valve Specifications

Applicable solenoid valve model	VS4□24			
Coil rated voltage	100/200 VAC (50/60 Hz), 24 VDC			
Allowable voltage	-15 to 10% of the rated voltage			
Coil insulation	Class B or equivalent (130°C)			
Apparent power ^{Note)}	AC	Inrush	50 Hz	100 VA
			60 Hz	90 VA
	Holding		50 Hz	20 VA
			60 Hz	14 VA
Power consumption ^{Note)}	DC	13.2 W		

Note) At the rated voltage.

Standard Stroke

Bore size (mm)	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500
50, 63	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600
80, 100	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Common Precautions, refer to pages 10-24-3 to 6. For Actuator Precautions on Series CVS1, refer to page 10-15-53 because they are the same as those for Series CV3.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

- Each switch and mounting style of cylinder has different minimum mountable stroke. Be careful especially of the center trunnion style. (For further information, refer to page 10-15-77.)

Valve Mounted Cylinder

Double Acting, Single Rod Series CVS1

Accessory

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

* Pin, plain washer and cotter pin are packaged together with double clevis and double knuckle joint.

Weight

(kg)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	2.48 (2.53)	3.04 (3.08)	4.12 (4.16)	5.81 (5.96)	7.66 (7.86)
	Axial foot style	2.65 (2.7)	3.24 (3.28)	4.41 (4.45)	6.6 (6.75)	8.59 (8.79)
	Rod side flange style	2.88 (2.93)	3.64 (3.68)	5.08 (5.12)	7.65 (7.8)	9.98 (10.18)
	Head side flange style	2.98 (3.03)	3.78 (3.82)	5.08 (5.12)	7.65 (7.8)	9.98 (10.18)
	Single clevis style	2.74 (2.79)	3.48 (3.52)	4.87 (4.91)	7.19 (7.34)	9.96 (10.16)
	Double clevis style	2.73 (2.78)	3.46 (3.5)	4.89 (4.93)	7.18 (7.33)	9.98 (10.18)
	Trunnion style	3.08 (3.18)	3.78 (3.88)	5.46 (5.66)	8.14 (8.43)	11.18 (11.57)
Additional weight per each 50 mm of stroke	All mounting brackets (Except trunnion style of iron tube)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Steel tube trunnion	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
Accessory bracket	Single knuckle	0.23	0.26	0.26	0.60	0.83
	Double knuckle (with pin)	0.37	0.43	0.43	0.87	1.27

Calculation: (Example) CVS1L40-100-1

* (): Steel tube type

- Basic weight.....2.65 (kg)
- Additional weight.....0.22 (kg/50 st)
- Cylinder stroke.....100 (st) $2.65 + 0.22 \times 100 \div 50 = 3.09$ kg
- * Add 0.34 kg for the double solenoid style.

Mounting Bracket Part No.

Bore size (mm)	40	50	63	80	100
Axial foot *	CA1-L04	CA1-L05	CA1-L06	CA1-L08	CA1-L10
Flange	CA1-F04	CA1-F05	CA1-F06	CA1-F08	CA1-F10
Single clevis	CA1-C04	CA1-C05	CA1-C06	CA1-C08	CA1-C10
Double clevis **	CA1-D04	CA1-D05	CA1-D06	CA1-D08	CA1-D10

* Order two foot brackets per cylinder.

** For double clevis style, pin for clevis, plain washer and split pin are shipped together.

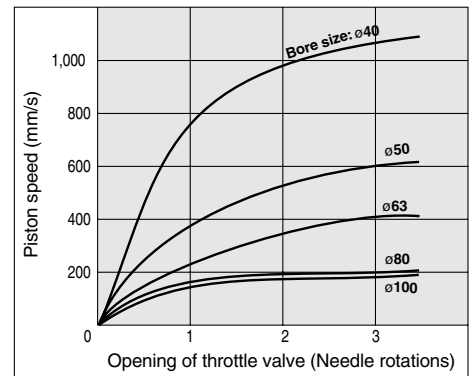
Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A5□/A6□/A59W/F5□/J5□ D-F5□W/J59W/F5NTL/F59F	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□/A44/G39/K39	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64/B59W/G5□/K59 D-G5□W/K59W/G59F/G5NTL	BA-04	BA-05	BA-06	BA-08	BA-10
D-A3□C/A44C/G39C/K39C*	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80/Y59□/Y69□/Y7P D-Y7PV/Y7□W/Y7□WV	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080

* Mounting bracket belongs to D-A3□C/A44C/G39C/K39C. When the mounting bracket is needed separately, order with the above part number. Besides, when ordering an auto switch alone, specify like the below according to the cylinder size.

- Ex.) $\phi 40$D-A3□C-4 $\phi 80$D-A3□C-8
 $\phi 50$D-A3□C-5 $\phi 100$D-A3□C-10
 $\phi 63$D-A3□C-6

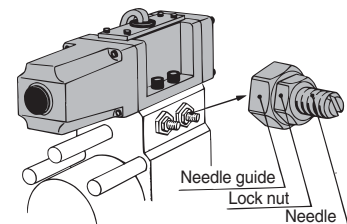
Opening Range of Throttle Valve and Driving Speed



Conditions: Operating pressure 0.5 MPa,
Horizontal mounting, No load, Extending stroke
• The speed shown above are for reference.

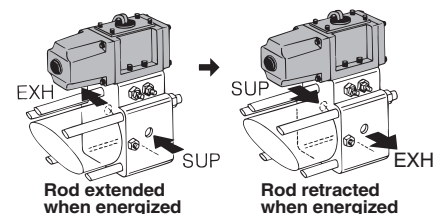
Piston Speed Adjustment Procedure

1. To slow down the piston speed, screw in the speed controller needle clockwise, which reduces the amount of air that is discharged.
2. The speed controller needle opens fully when it is loosened 3 1/2 turns from its fully closed position. After the specified speed has been set, secure the needle with the lock nut.

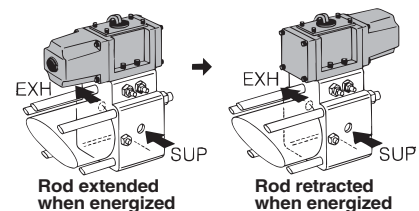


Changing between Rod Extended when Energized and Rod Retracted when Energized

1. This is possible by reversing the SUP port and EXH port piping.

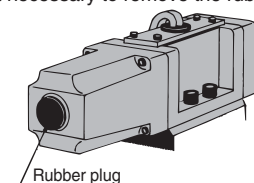


2. This is possible by inverting the solenoid valve direction 180°.



Manual Operation

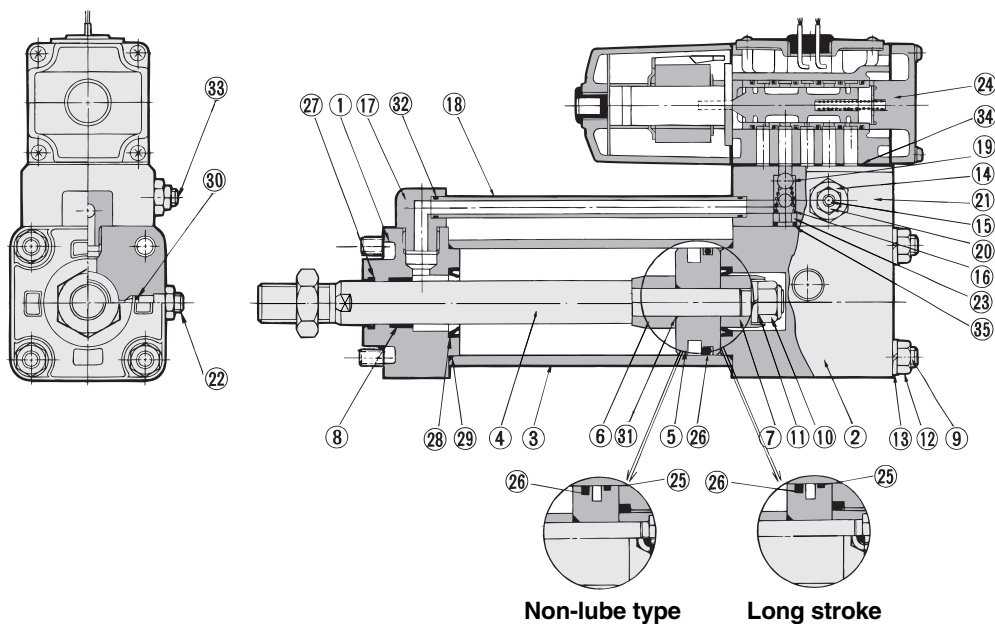
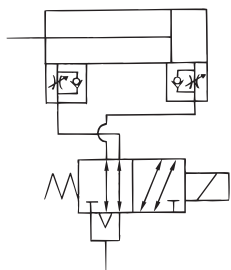
Using a screwdriver or its equivalent, push the center of the rubber plug on the head of the solenoid cap of the solenoid valve.
(It is not necessary to remove the rubber plug.)



Series CVS1

Construction

Lube type



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Matt black painted
②	Head cover	Aluminum alloy	Matt black painted
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring A	Rolled steel	Zinc chromated
⑦	Cushion ring B	Rolled steel	Zinc chromated
⑧*	Bushing	Lead-bronze casted	
⑨	Tie-rod	Carbon steel	Uni Chromated
⑩	Piston nut	Rolled steel	Zinc chromated
⑪	Spring washer	Steel wire	Zinc chromated
⑫	Tie-rod nut	Carbon steel	Black zinc chromated
⑬	Spring washer	Steel wire	Black zinc chromated
⑭	Needle guide	Carbon steel	Electroless nickel plated
⑮	Speed adjustment needle	Carbon steel	Electroless nickel plated
⑯	Check spring	Steel wire	Zinc chromated
⑰	Guide tube fitting	Aluminum alloy	Platinum silver
⑱	Pipe	Carbon steel tube	Uni Chromated
⑲*	Check ball	Polyurethane rubber	⁹ / ₃₂
⑳	lock nut	Carbon steel	Nickel plated
㉑	Sub-plate	Aluminum alloy	Platinum silver
㉒	Cushion valve port	Rolled steel	Electroless nickel plated
㉓*	Valve	Brass	
㉔	Solenoid valve (Note)	—	Refer to the note below.
㉕	Wear ring	Resin	

Note) Add "-X46" to the end of the part numbers for single solenoid type.

• How to order solenoid valves/VS4□24-00 | Voltage | Electrical entry

* Not replaceable.

No.	Description	Material	Note
㉖	Piston seal	NBR	
㉗	Rod seal	NBR	
㉘*	Cushion seal	NBR	
㉙	Cylinder tube gasket	NBR	
㉚	Cushion valve seal	NBR	
㉛*	Piston gasket	NBR	
㉜	Pipe gasket	NBR	
㉝	Speed adjustment valve seal	NBR	
㉞	Gasket	NBR	
㉟	Valve port gasket	NBR	

Replacement Parts: Seal Kit

Lube Type

Bore size (mm)	40	50	63	80	100
Kit no.	CVS1-40-PS	CVS1-50-PS	CVS1-63-PS	CVS1-80-PS	CVS1-100-PS
Contents	Set of nos. above ㉖, ㉗, ㉙, ㉚, ㉛, ㉜, ㉞.				

Non-lube Type

Bore size (mm)	40	50	63	80	100
Kit no.	CVS1N40-PS	CVS1N50-PS	CVS1N63-PS	CVS1N80-PS	CVS1N100-PS
Contents	Set of nos. above ㉖, ㉗, ㉙, ㉚, ㉛, ㉜, ㉞.				

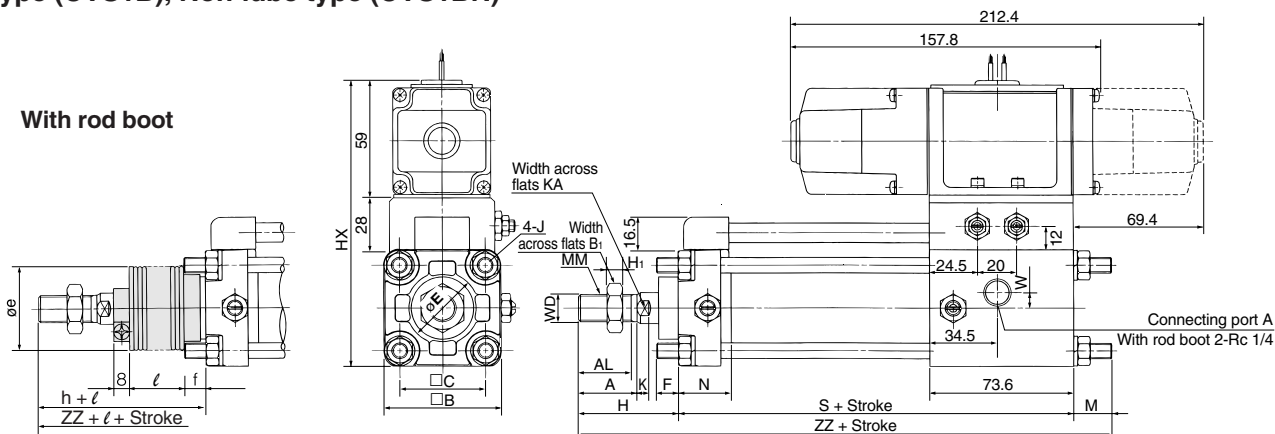
* Seal kit includes ㉖, ㉗, ㉙, ㉚, ㉛, ㉜, ㉞. Order the seal kit, based on each bore size.

(The parts indicated with numbers ㉘ and ㉛ are not replaceable.)

Valve Mounted Cylinder Double Acting, Single Rod Series CVS1

Basic Style: CVS1B□

Lube type (CVS1B), Non-lube type (CVS1BN)



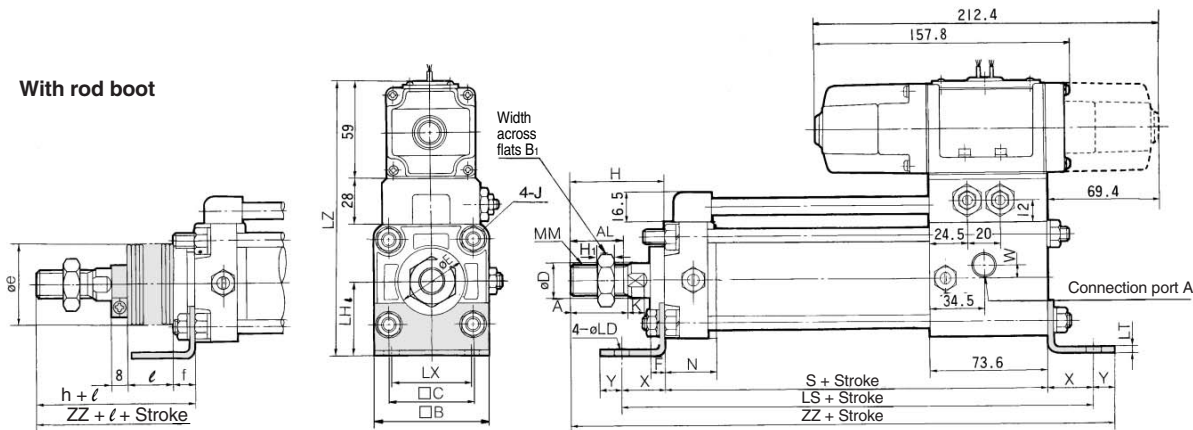
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	HX	J	K	KA	M	MM	N	S
40	Up to 500	30	27	60	22	44	16	32	10	8	147	M8 x 1.25	6	14	19.4	M14 x 1.5	27	130.6
50	Up to 600	35	32	70	27	52	20	40	10	11	157	M8 x 1.25	7	18	16.4	M18 x 1.5	30	133.6
63	Up to 600	35	32	86	27	64	20	40	10	11	173	M10 x 1.25	7	18	18.4	M18 x 1.5	31	140.6
80	Up to 750	40	37	102	32	78	25	52	14	13	189	M12 x 1.75	11	22	21.4	M22 x 1.5	37	152.6
100	Up to 750	40	37	116	41	92	30	52	14	16	203	M12 x 1.75	11	26	21.4	M26 x 1.5	40	159.6

Bore size (mm)	W	Without rod boot		With rod boot				
		H	ZZ	e	f	h	l	ZZ
40	8	51	201	43	11.2	59	1/4 stroke	209
50	8	58	208	52	11.2	66	1/4 stroke	216
63	8	58	217	52	11.2	66	1/4 stroke	225
80	0	71	245	65	12.5	80	1/4 stroke	254
100	0	72	253	65	14	81	1/4 stroke	262

* The minimum stroke of the one with rod boot is 20 mm or more.

Axial Foot Style: CVS1L□

Lube type (CVS1L), Non-lube type (CVS1LN)



Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	H ₁	F	J	K	LD	LH	LS	LT	LX	LZ	MM
40	Up to 500, 501 to 800*	30	27	60	22	44	16	32	8	10	M8 x 1.25	6	9	40	184.6	3.2	42	157	M14 x 1.5
50	Up to 600, 601 to 1000*	35	32	70	27	52	20	40	11	10	M8 x 1.25	7	9	45	187.6	3.2	50	167	M18 x 1.5
63	Up to 600, 601 to 1000*	35	32	86	27	64	20	40	11	10	M10 x 1.25	7	11.5	50	208.6	3.2	59	180	M18 x 1.5
80	Up to 750, 751 to 1000*	40	37	102	32	78	25	52	13	14	M12 x 1.75	11	13.5	65	240.6	4.5	76	203	M22 x 1.5
100	Up to 750, 751 to 1000*	40	37	116	41	92	30	52	16	14	M12 x 1.75	11	13.5	75	245.6	6	92	220	M26 x 1.5

Bore size (mm)	N	S	W	X	Y	Without rod boot		With rod boot				
						H	ZZ	e	f	h	l	ZZ
40	27	130.6	8	27	13	51	221.6	43	11.2	59	1/4 stroke	229.6
50	30	133.6	8	27	13	58	231.6	52	11.2	66	1/4 stroke	239.6
63	31	140.6	8	34	16	58	248.6	52	11.2	66	1/4 stroke	256.6
80	37	152.6	0	44	16	71	283.6	65	12.5	80	1/4 stroke	292.6
100	40	159.6	0	43	17	72	291.6	65	14	81	1/4 stroke	300.6



* Long stroke
** The minimum stroke of the one with rod boot is 20 mm or more.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C₆-5-S

CV

MVGQ

CC

RB

J

D-

-X

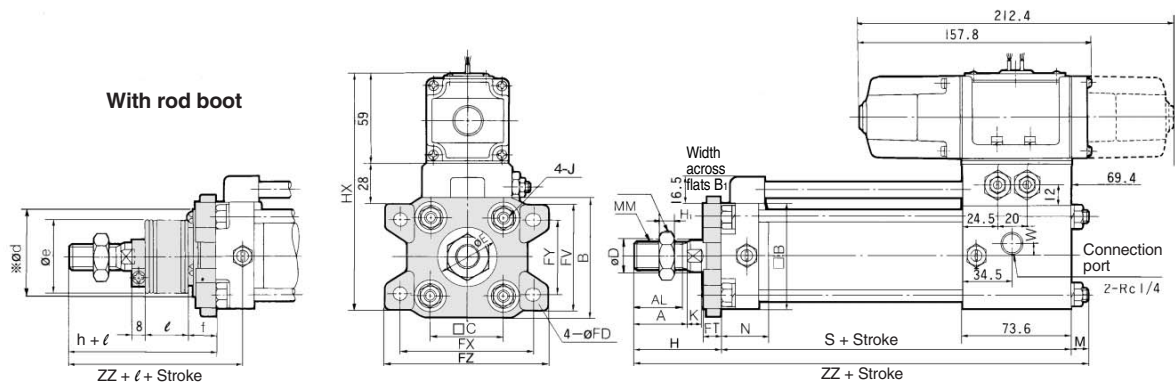
20-

Data

Series CVS1

Rod Side Flange Style: CVS1F□

Lube type (CVS1F), Non-lube type (CVS1FN)



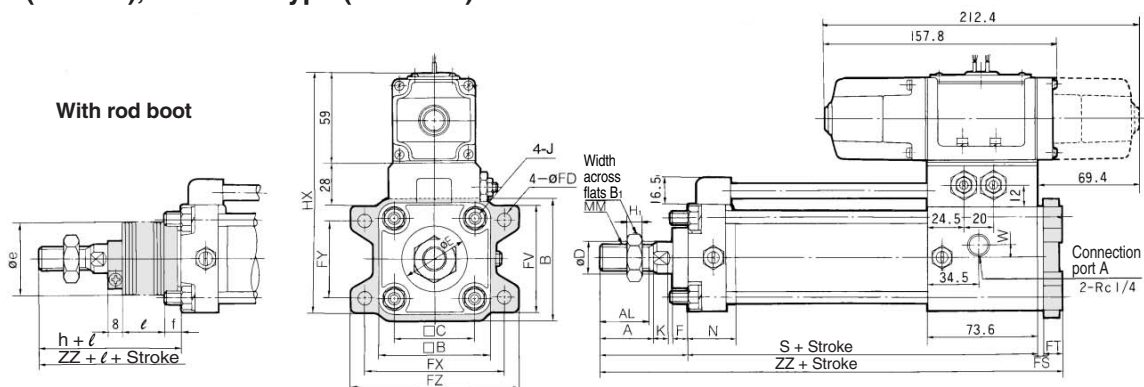
Bore size (mm)	Stroke range* (mm)	A	AL	B	B	B ₁	C	D	E	FD	FT	FV	FX	FY	FZ	H ₁	HX	J	K
40	Up to 500 501 to 800*	30	27	71	60	22	44	16	32	9	12	60	80	42	100	8	147	M8 x 1.25	6
50	Up to 600 601 to 1000*	35	32	81	70	27	52	20	40	9	12	70	90	50	110	11	157	M8 x 1.25	7
63	Up to 600 601 to 1000*	35	32	101	86	27	64	20	40	11.5	15	86	105	59	130	11	173	M10 x 1.25	7
80	Up to 750 751 to 1000*	40	37	119	102	32	78	25	52	13.5	18	102	130	76	160	13	189	M12 x 1.75	11
100	Up to 750 751 to 1000*	40	37	133	116	41	92	30	52	13.5	18	116	150	92	180	16	203	M12 x 1.75	11

Bore size (mm)	M	MM	N	S	W	Without rod boot			With rod boot				
						H	ZZ	d*	e	f	h	ℓ	ZZ
40	19.4	M14 x 1.5	27	130.6	8	51	201	52	43	15	59	1/4 stroke	209
50	16.4	M18 x 1.5	30	133.6	8	58	208	58	52	15	66	1/4 stroke	216
63	18.4	M18 x 1.5	31	140.6	8	58	217	58	52	17.5	66	1/4 stroke	225
80	21.4	M22 x 1.5	37	152.6	0	71	245	80	65	21.5	80	1/4 stroke	254
100	21.4	M26 x 1.5	40	159.6	0	72	253	80	65	21.5	81	1/4 stroke	262

- * Long stroke
 * The minimum stroke of the one with rod boot is 20 mm or more.
 * Machine larger holes than the outside diameter øD of the mounting bracket for rod boot when mounting the rod boot part to the through for mounting.

Rear Flange Style: CVS1G□

Lube type (CVS1G), Non-lube type (CVS1GN)



Bore size (mm)	Stroke range* (mm)	A	AL	B	B	B ₁	C	D	E	F	FD	FS	FT	FV	FX	FY	FZ	H ₁	HX	J
40	Up to 500	30	27	71	60	22	44	16	32	10	9	4	12	60	80	42	100	8	147	M8 x 1.25
50	Up to 600	35	32	81	70	27	52	20	40	10	9	4	12	70	90	50	110	11	157	M8 x 1.25
63	Up to 600	35	32	101	86	27	64	20	40	10	11.5	0	15	86	105	59	130	11	173	M10 x 1.25
80	Up to 750	40	37	119	102	32	78	25	52	14	13.5	0	18	102	130	76	160	13	189	M12 x 1.75
100	Up to 750	40	37	133	116	41	92	30	52	14	13.5	0	18	116	150	92	180	16	203	M12 x 1.75

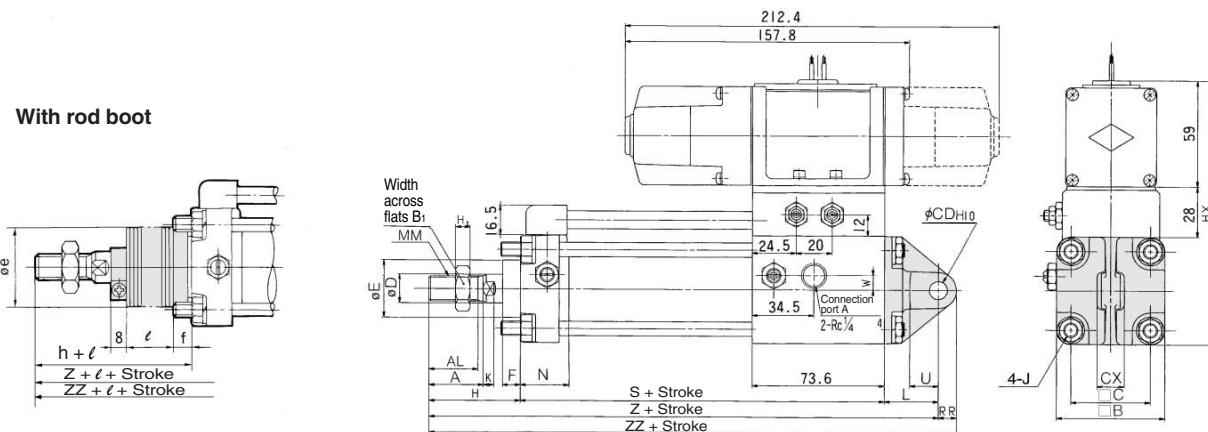
Bore size (mm)	K	MM	N	S	W	Without rod boot			With rod boot				
						H	ZZ	e	f	h	ℓ	ZZ	
40	6	M14 x 1.5	27	130.6	8	51	197.6	43	11.2	59	1/4 stroke	205.6	
50	7	M18 x 1.5	30	133.6	8	58	207.6	52	11.2	66	1/4 stroke	215.6	
63	7	M18 x 1.5	31	140.6	8	58	213.6	52	11.2	66	1/4 stroke	221.6	
80	11	M22 x 1.5	37	152.6	0	71	241.6	65	12.5	80	1/4 stroke	250.6	
100	11	M26 x 1.5	40	159.6	0	72	249.6	65	14	81	1/4 stroke	258.6	

- * The minimum stroke of the one with rod boot is 20 mm or more.

Valve Mounted Cylinder Double Acting, Single Rod Series CVS1

Single Clevis Style: CVS1C□

Lube type (CVS1C), Non-lube type (CVS1CN)



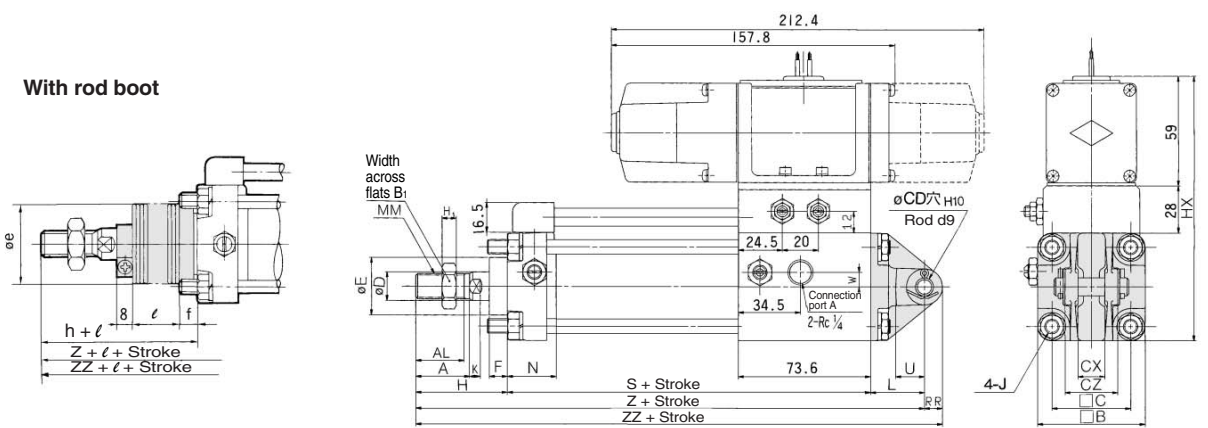
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	CD _{H10}	CX	D	E	F	H ₁	HX	J	K	L	MM
40	Up to 500	30	27	60	22	44	10 ₀ ^{+0.058}	15 _{-0.3} ^{-0.1}	16	32	10	8	147	M8 x 1.25	6	30	M14 x 1.5
50	Up to 600	35	32	70	27	52	12 ₀ ^{+0.070}	18 _{-0.3} ^{-0.1}	20	40	10	11	157	M8 x 1.25	7	35	M18 x 1.5
63	Up to 600	35	32	86	27	64	16 ₀ ^{+0.070}	25 _{-0.3} ^{-0.1}	20	40	10	11	173	M10 x 1.25	7	40	M18 x 1.5
80	Up to 750	40	37	102	32	78	20 ₀ ^{+0.084}	31.5 _{-0.3} ^{-0.1}	25	52	14	13	189	M12 x 1.75	11	48	M22 x 1.5
100	Up to 750	40	37	116	41	92	25 ₀ ^{+0.084}	35.5 _{-0.3} ^{-0.1}	30	52	14	16	203	M12 x 1.75	11	58	M26 x 1.5

Bore size (mm)	N	RR	S	U	W	Without rod boot			With rod boot					
						H	Z	ZZ	e	f	h	l	Z	ZZ
40	27	10	130.6	16	8	51	211.6	221.6	43	11.2	59	1/4 stroke	219.6	229.6
50	30	12	133.6	19	8	58	226.6	238.6	52	11.2	66	1/4 stroke	234.6	246.6
63	31	16	140.6	23	8	58	238.6	254.6	52	11.2	66	1/4 stroke	246.6	262.6
80	37	20	152.6	28	0	71	271.6	291.6	65	12.5	80	1/4 stroke	280.6	300.6
100	40	25	159.6	36	0	72	289.6	314.6	65	14	81	1/4 stroke	298.6	323.6

*The minimum stroke of the one with rod boot is 20 mm or more.

Double Clevis Style: CVS1D□

Lube type (CVS1D), Non-lube type (CVS1DN)



Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	CD _{H10}	CX	CZ	D	E	F	H ₁	HX	J	K	L
40	Up to 500	30	27	60	22	44	10 ₀ ^{+0.059}	15 _{-0.1} ^{+0.3}	29.5	16	32	10	8	147	M8 x 1.25	6	30
50	Up to 600	35	32	70	27	52	12 ₀ ^{+0.070}	18 _{-0.1} ^{+0.3}	38	20	40	10	11	157	M8 x 1.25	7	35
63	Up to 600	35	32	86	27	64	16 ₀ ^{+0.070}	25 _{-0.1} ^{+0.3}	49	20	40	10	11	173	M10 x 1.25	7	40
80	Up to 750	40	37	102	32	78	20 ₀ ^{+0.084}	31.5 _{-0.1} ^{+0.3}	61	25	52	14	13	189	M12 x 1.75	11	48
100	Up to 750	40	37	116	41	92	25 ₀ ^{+0.084}	35.5 _{-0.1} ^{+0.3}	64	30	52	14	16	203	M12 x 1.75	11	58

Bore size (mm)	MM	N	RR	S	U	W	Without rod boot			With rod boot					
							H	Z	ZZ	e	f	h	l	Z	ZZ
40	M14 x 1.5	27	10	130.6	16	8	51	211.6	221.6	43	11.2	59	1/4 stroke	219.6	229.6
50	M18 x 1.5	30	12	133.6	19	8	58	226.6	238.6	52	11.2	66	1/4 stroke	234.6	246.6
63	M18 x 1.5	31	16	140.6	23	8	58	238.6	254.6	52	11.2	66	1/4 stroke	246.6	262.6
80	M22 x 1.5	37	20	152.6	28	0	71	271.6	291.6	65	12.5	80	1/4 stroke	280.6	300.6
100	M26 x 1.5	40	25	159.6	36	0	72	289.6	314.6	65	14	81	1/4 stroke	298.6	323.6

* The minimum stroke of the one with rod boot is 20 mm or more.

* Clevis pin, flat washer and cotter pin are shipped together.

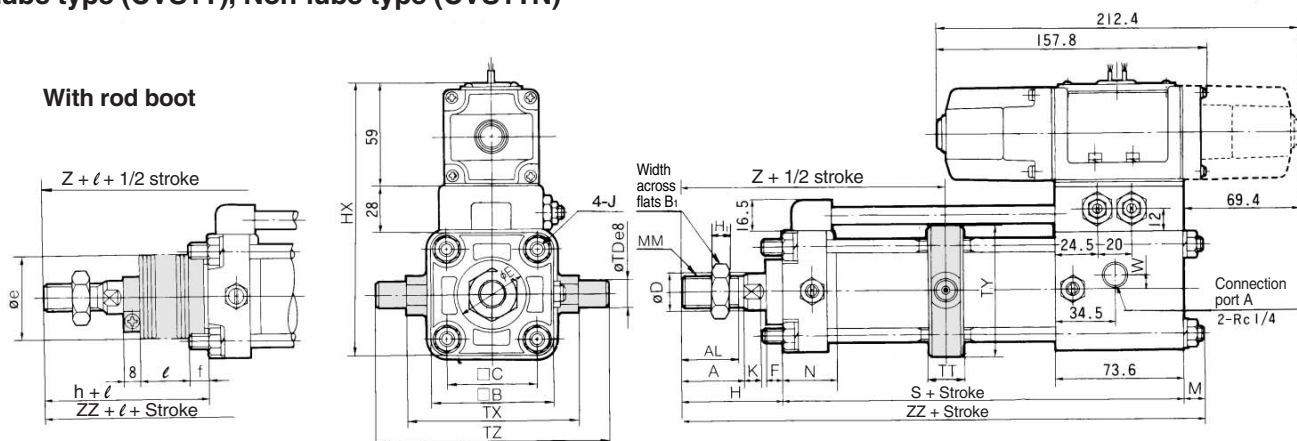


- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹_{5-S}
- CV
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CVS1

Center Trunnion Style: CVS1T□

Lube type (CVS1T), Non-lube type (CVS1TN)



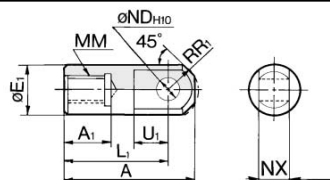
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H	HX	J	K	M	MM	N	S	TDe8
40	Up to 500	30	27	60	22	44	16	32	10	8	147	M8 x 1.25	6	11.4	M14 x 1.5	27	130.6	15 ^{-0.032} _{-0.059}
50	Up to 600	35	32	70	27	52	20	40	10	11	157	M8 x 1.25	7	11.4	M18 x 1.5	30	133.6	15 ^{-0.032} _{-0.059}
63	Up to 600	35	32	86	27	64	20	40	10	11	173	M10 x 1.25	7	13.4	M18 x 1.5	31	140.6	18 ^{-0.032} _{-0.059}
80	Up to 750	40	37	102	32	78	25	52	14	13	189	M12 x 1.75	11	18.4	M22 x 1.5	37	152.6	25 ^{-0.040} _{-0.073}
100	Up to 750	40	37	116	41	92	30	52	14	16	203	M12 x 1.75	11	16.4	M26 x 1.5	40	159.6	25 ^{-0.040} _{-0.073}

Bore size (mm)	TT	TX	TY	TZ	W	Without rod boot			With rod boot					
						H	Z	ZZ	e	f	h	l	Z	ZZ
40	22	85	62	117	8	51	93	193	43	11.2	59	1/4 stroke	101	201
50	22	95	74	127	8	58	103	203	52	11.2	66	1/4 stroke	111	211
63	28	110	90	148	8	58	107	212	52	11.2	66	1/4 stroke	115	220
80	34	140	110	192	0	71	129	242	65	12.5	80	1/4 stroke	138	251
100	40	162	130	214	0	72	135	248	65	14	81	1/4 stroke	144	257

* The minimum stroke of the one with rod boot is 20 mm or more.

Accessory Dimensions

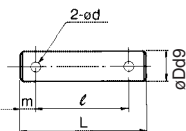
I Type Single Knuckle Joint



Material: Free cutting sulfur steel

Part no.	Applicable bore size (mm)	A	A ₁	øE ₁	L ₁	MM	R ₁	U ₁	øNDH ₁₀	NX
I-04	40	69	22	24	55	M14 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{+0.1} _{-0.3}
I-05	50, 63	74	27	28	60	M18 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{+0.1} _{-0.3}
I-08	80	91	37	36	71	M22 x 1.5	22.5	26	18 ^{+0.070} ₀	28 ^{+0.1} _{-0.3}
I-10	100	105	37	40	83	M26 x 1.5	24.5	28	20 ^{+0.084} ₀	30 ^{+0.1} _{-0.3}

Knuckle Pin, Clevis Pin

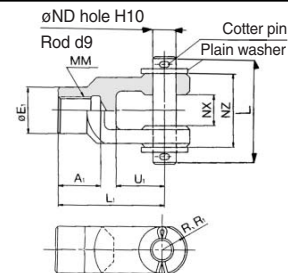


Material: Carbon steel

Part no.	Applicable bore size (mm)		øDd9	L	l	m	ød (Drill through)	Applicable cotter pin
	Clevis	Knuckle						
CDP-2A	40	—	10 ^{-0.046} _{-0.076}	46	38	4	3	ø3 x 18l
CDP-3A	50	40, 50, 63	12 ^{-0.050} _{-0.093}	55.5	47.5	4	3	ø3 x 18l
CDP-4A	63	—	16 ^{-0.050} _{-0.093}	71	61	5	4	ø4 x 25l
CDP-5A	—	80	18 ^{-0.050} _{-0.093}	76.5	66.5	5	4	ø4 x 25l
CDP-6A	80	100	20 ^{-0.065} _{-0.117}	83	73	5	4	ø4 x 30l
CDP-7A	100	—	25 ^{-0.065} _{-0.117}	88	78	6	4	ø4 x 36l

Y Type Double Knuckle Joint

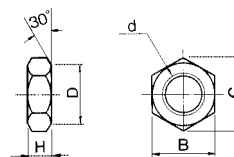
* Knuckle pin, cotter pin, and plain washer are shipped together.



Material: Cast iron

Part no.	Applicable bore size (mm)	A ₁	E ₁	L ₁	MM	RR ₁	U ₁	ND	NX	NZ	L	Cotter pin size	flat washer size
Y-04C	40	22	24	55	M14 x 1.5	13	25	12	16 ^{+0.3} _{+0.1}	38	55.5	ø3 x 18l	Polished round 12
Y-05C	50, 63	27	28	60	M18 x 1.5	15	27	12	16 ^{+0.3} _{+0.1}	38	55.5	ø3 x 18l	Polished round 12
Y-08C	80	37	36	71	M22 x 1.5	19	28	18	28 ^{+0.3} _{+0.1}	55	76.5	ø4 x 25l	Polished round 18
Y-10C	100	37	40	83	M26 x 1.5	21	38	20	30 ^{+0.3} _{+0.1}	61	83	ø4 x 30l	Polished round 20

Rod End Nut



Material: Rolled steel

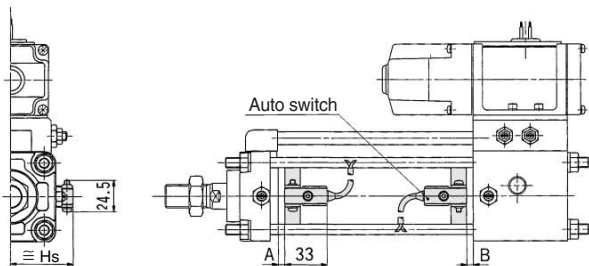
Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37	31
NT-10	100	M26 x 1.5	16	41	47.3	39

Valve Mounted Cylinder Double Acting, Single Rod Series CVS1

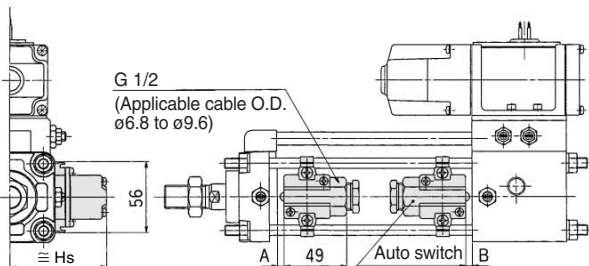
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting style>

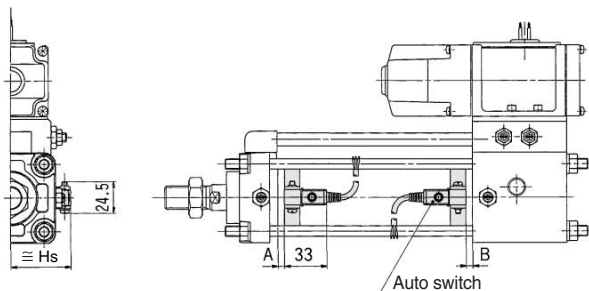
D-B5□/B64/B59W



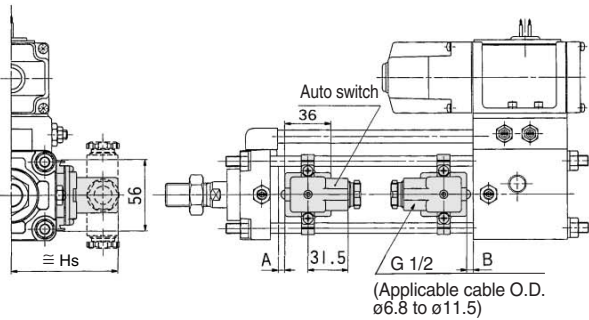
D-A3□/G39/K39



D-G5□/K59/G5□W/K59W
D-G59F/G5NTL

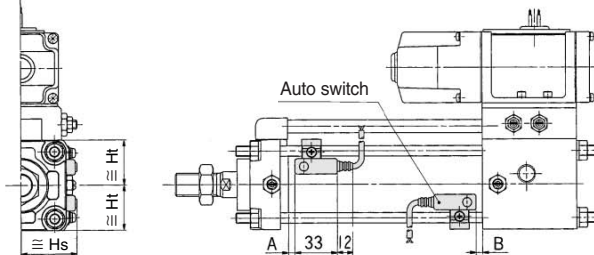


D-A44

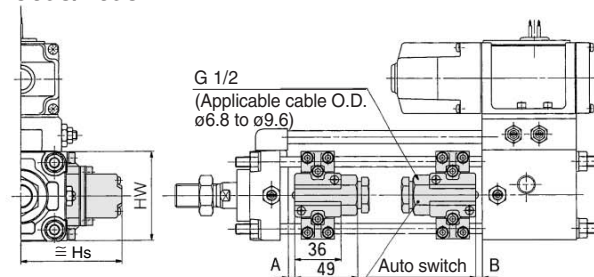


<Tie-rod mounting style>

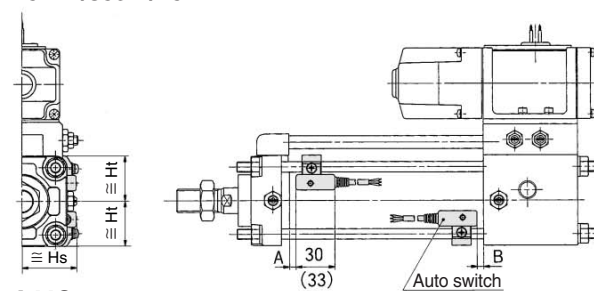
D-A5□/A6□/A59W



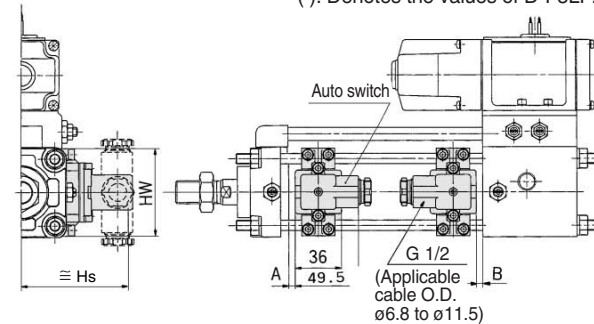
D-A3□C
D-G39C/K39C



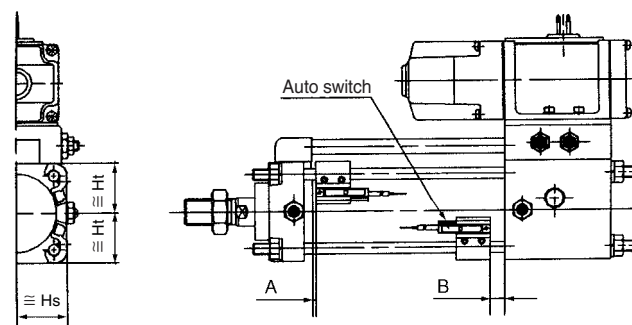
D-F5□/J5□
D-F5NTL
D-F5□W/J59W/F5□F



D-A44C



D-Z7/Z8
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV



- RE^A_B
- REC
- C□X
- C□Y
- MQ^Q_M
- RHC
- MK(2)
- RS^Q_G
- RS^H_A
- RZQ
- MI^W_S
- CEP1
- CE1
- CE2
- ML2B
- C¹/₆5-S
- CV**
- MVGQ
- CC
- RB
- J
- D-
- X
- 20-
- Data

Series CVS1

Proper Auto Switch Mounting position (Detection at stroke end) and Its Mounting Height

Proper Auto Switch Mounting Position

Auto switch model	D-A5□, D-A6□ D-A3□/A3□C D-A44/A44C D-G39/G39C D-K39/K39C		D-B5□/B64		D-F5□ D-J5□ D-F5□W D-J59W D-F59F		D-G5□W D-K59W D-G59F D-G5□ D-K59 D-G5NTL		D-A59W		D-F5NTL		D-B59W D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W D-Y7□WV	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	0 (0)	1 (0)	0 (0.5)	1.5 (0)	3.5 (6.5)	7.5 (4.5)	0 (2)	3 (0)	1 (4)	5 (2)	8.5 (11.5)	12.5 (9.5)	0.5 (3.5)	4.5 (1.5)
50	0 (0)	1 (0)	0 (0.5)	1.5 (0)	3.5 (6.5)	7.5 (4.5)	0 (2)	3 (0)	1 (4)	5 (2)	8.5 (11.5)	12.5 (9.5)	0.5 (3.5)	4.5 (1.5)
63	0 (2.5)	5.5 (1.5)	0 (3)	6 (2)	5.5 (9)	12 (8)	1 (4.5)	7.5 (3.5)	3 (6.5)	9.5 (5.5)	10.5 (14)	17 (13)	2.5 (6)	9 (5)
80	2 (6)	8.5 (4)	2.5 (6.5)	9 (4.5)	8.5 (12.5)	15 (10.5)	4 (8)	10.5 (6)	6 (10)	12.5 (8)	13.5 (17.5)	20 (15.5)	5.5 (9.5)	12 (7.5)
100	4 (7.5)	10.5 (6.5)	4.5 (8)	11 (7)	10.5 (14)	17 (13)	6 (9.5)	12.5 (8.5)	8 (11.5)	14.5 (10.5)	15.5 (19)	22 (18)	7.5 (11)	14 (10)

Note 1) (): Denotes the values of non-lube type.

Note 2) D-G5□W, K59W, G58A and G59F can not be attached on ø40 and ø50 lube type cylinder.

Note 3) D-B5□ type, D-G5□type, D-K5□type are mountable only upon a receipt of order. (Not mountable after the time of shipment)

Auto Switch Mounting Height

Auto switch model	D-B5□/B64 D-B59W D-G5□ D-K59 D-G5NTL D-G5□W D-K59W D-G59F		D-A3□ D-G39 D-K39		D-A44		D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F5□W D-J59W D-F59F D-F5NTL		D-A3□C D-G39C D-K39C		D-A44C		D-Z7□/Z80 D-Y59□ D-Y7P D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV	
	Hs	Hs	Hs	Hs	Ht	Hs	Ht	Hs	Hw	Hs	Hw	Hs	Ht	Hs	Ht	Hs	Ht	
40	38	72.5	80.5	40	31	38.5	31	73	69	81	69	30	30	30.5	30			
50	43.5	78	86	43.5	35	42.5	35	78.5	77	86.5	77	34	34	35	34			
63	50.5	85	93	49	42	48	42	85.5	91	93.5	91	41	41	42.5	41			
80	59	93.5	101.5	55.5	50	54	50	94	107	102	107	49.5	48.5	51	48.5			
100	69.5	104	112	63	57.5	62	57.5	104	121	112	121	58.5	56	59	56			

Operating Range

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-Z7□/Z80	8	7	9	9.5	10.5
D-A3□/A44 D-A3□C, D-A44C	9	10	11	11	11
D-A5□/A6□ D-B5□/B64					
D-A59W D-B59W					
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	8	7	5.5	6.5	6.5
D-F5□/J5□ D-F5□W/J59W D-F5NTL/F59F	4	4	4.5	4.5	4.5
D-G5□/K59 D-G5□W/K59W D-G5NTL/G59F	5	6	6.5	6.5	7
D-G39/K39 D-G39C, D-K39C	9	9	10	10	11

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.

Other than the models listed in "How to Order", the following auto switches are applicable.

For detailed specifications, refer to page 10-20-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	Without indicator light
	D-A64/A67		
	D-B64		
Solid state switch	D-Z80	Grommet (In-line)	2-color indication
	D-F59/F5P/J59		
	D-F59W/F5PW/J59W		
	D-F5NTL		With timer
	D-G5NTL		
D-Y69A/Y7PV/Y69B D-Y7NWV/Y7PWV/Y7BWV	Grommet (Perpendicular)	2-color indication	

* With pre-wire connector is also available in solid state auto switches.

For details, refer to page 10-20-66.

* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 10-20-41.

Valve Mounted Cylinder Double Acting, Single Rod Series **CVS1**

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches

Auto switch model	No. of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-A5□/A6□ D-F5□/J5□ D-F5□W/J59W D-F59F	2 (Different sides, Same side), 1	15	90		100	110	120
	n (Same side)	$15 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-A59W	2 (Different sides, Same side)	20	90		100	110	120
	n (Same side)	$20 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
	1	15	90		100	110	120
D-F5NTL	2 (Different sides, Same side), 1	25	110		120	130	140
	n (Same side)	$25 + 55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$110 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$120 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$140 + 55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G59F D-G5NTL	2	Different sides	15	90		100	110
		Same side	75	90		100	110
	n	Different sides	$15 + 50 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
		Same side	$75 + 50 (n-2)$ n = 2, 3, 4...	$90 + 50 (n-2)$ n = 2, 4, 6, 8, ...		$100 + 50 (n-2)$ n = 2, 4, 6, 8...	$110 + 50 (n-2)$ n = 2, 4, 6, 8, ...
	1	10	90		100	110	
D-B59W	2	Different sides	20	90		100	110
		Same side	75	90		100	110
	n	Different sides	$20 + 50 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$90 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$100 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$110 + 50 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
		Same side	$75 + 50 (n-2)$ n = 2, 3, 4...	$90 + 50 (n-2)$ n = 2, 4, 6, 8...		$100 + 50 (n-2)$ n = 2, 4, 6, 8...	$110 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	15	90		100	110	
D-A3□ D-G39 D-K39	2	Different sides	35	100		100	100
		Same side	100	100		100	100
	n	Different sides	$35 + 30 (n-2)$ n = 2, 3, 4...	$100 + 30 (n-2)$ n = 2, 4, 6, 8...		$100 + 30 (n-2)$ n = 2, 4, 6, 8...	$100 + 30 (n-2)$ n = 2, 4, 6, 8...
		Same side	$100 + 100 (n-2)$ n = 2, 3, 4...	$100 + 100 (n-2)$ n = 2, 4, 6, 8...			
	1	10	75	80	90		
D-A44	2	Different sides	35	100		100	100
		Same side	55	75		80	90
	n	Different sides	$35 + 30 (n-2)$ n = 2, 3, 4...	$75 + 30 (n-2)$ n = 2, 4, 6, 8...		$80 + 30 (n-2)$ n = 2, 4, 6, 8...	$100 + 30 (n-2)$ n = 2, 4, 6, 8...
		Same side	$55 + 50 (n-2)$ n = 2, 3, 4...	$75 + 50 (n-2)$ n = 2, 4, 6, 8...		$80 + 50 (n-2)$ n = 2, 4, 6, 8...	$90 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	10	75	80	90		
D-A3□C D-G39C D-K39C	2	Different sides	20	100		100	100
		Same side	100	100		100	100
	n	Different sides	$20 + 35 (n-2)$ n = 2, 3, 4...	$100 + 35 (n-2)$ n = 2, 4, 6, 8...		$100 + 35 (n-2)$ n = 2, 4, 6, 8...	$100 + 35 (n-2)$ n = 2, 4, 6, 8...
		Same side	$100 + 100 (n-2)$ n = 2, 3, 4, 5...	$100 + 100 (n-2)$ n = 2, 4, 6, 8...			
	1	10	75	80	90		
D-A44C	2	Different sides	20	75		80	90
		Same side	55	75		80	90
	n	Different sides	$20 + 35 (n-2)$ n = 2, 3, 4...	$75 + 35 (n-2)$ n = 2, 4, 6, 8...		$80 + 35 (n-2)$ n = 2, 4, 6, 8...	$90 + 35 (n-2)$ n = 2, 4, 6, 8...
		Same side	$55 + 50 (n-2)$ n = 2, 3, 4...	$75 + 50 (n-2)$ n = 2, 4, 6, 8...		$80 + 50 (n-2)$ n = 2, 4, 6, 8...	$90 + 50 (n-2)$ n = 2, 4, 6, 8...
	1	10	75	80	90		
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	2 (Different sides, Same side), 1	15	80	85	90	95	105
	n	$15 + 40 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$80 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$85 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$90 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$95 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$105 + 40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-Y69□/Y7PV D-Y7□WV	2 (Different sides, Same side), 1	10	65		75	80	90
	n	$15 + 30 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$65 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...		$75 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$80 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$90 + 30 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C_G5-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



Valve Mounted Cylinder: Non-rotating Rod Type

Double Acting, Single Rod

Series CVS1K

Non-lube Type: ø40, ø50, ø63

How to Order

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 10-15-79.)

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	Center trunnion style

Electrical entry

Nil	Grommet
T	Conduit terminal
D	DIN terminal
DL	DIN terminal with indicator light
TZ	Conduit terminal with surge voltage suppressor

Solenoid valve

Nil	2 position single (VS4124-00□□-X46)
W	2 position double (VS4224-00□□)
Y	3 position closed center (VS4324-00□□)
Z	3 position exhaust center (VS4424-00□□)

Without auto switch **CVS1K** **L** **40** **100** **1**

With auto switch **CDVS1K** **L** **40** **100** **Y7BW** **1**

Bore Size

40	40 mm
50	50 mm
63	63 mm

Sufffix for cylinder

Rod boot	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	N	Without cushion
	R	With cushion on rod end
	H	With cushion on head end
	Nil	With cushion on both ends

Auto switch

Nil	Without auto switch
-----	---------------------

Solenoid valve voltage

1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
5	24 VDC
9	Other

Number of auto switches

Nil	2 pcs.
3	3 pcs.
S	1 pc.
n	"n" pcs.

Built-in Magnet Cylinder Model

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil".
(Example) CDVS1KL40-100-1

* When specifying symbol more than one, combine symbols alphabetically.

* For the applicable auto switch model, refer to the table below.
* D-Z7□/Z80/Y59□/Y69□/Y7□ types are shipped together, (but not assembled). (But, only the mounting bracket for the above models is assembled when shipping.)

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *			Pre-wire connector	Applicable load							
					DC	AC	Tie-rod mounting style	Band mounting style	0.5 (Nil)	3 (L)	5 (Z)		IC circuit	Relay, PLC						
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	Z76	—	●	●	—	—	IC circuit	—					
								2-wire	24 V	12 V	100 V	Z73				—	●	●	●	—
											—	B53				—	●	●	●	
											100 V, 200 V	A54				B54	●	●	●	
											—	A33C				A33	—	—	—	
100 V, 200 V	A34C	A34	—	—	—															
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	G59	●	●	○	—	IC circuit	—					
								3-wire (PNP)	—	100 V, 200 V	Y7P	G5P				●	●	○	○	
											J51	—				●	●	○	—	
								2-wire	—	12 V	Y59B	K59				●	●	○	○	
											3-wire (NPN)	24 V				5 V, 12 V	G39C	G39	—	—
								2-wire	K39C	K39	—						—	—	—	
								3-wire (NPN)	—	5 V, 12 V	Y7NW	G59W				●	●	○	○	IC circuit
											3-wire (PNP)	Y7PW				G5PW	●	●	○	
								2-wire	—	12 V	Y7BW	K59W				●	●	○	○	—
											3-wire (NPN)	24 V				5 V, 12 V	F5NT	G5NT	—	
								4-wire (NPN)	—	5 V, 12 V	F59F						G59F	●	●	○

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

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

- Since there are other applicable auto switches than listed, refer to page 10-15-76 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.



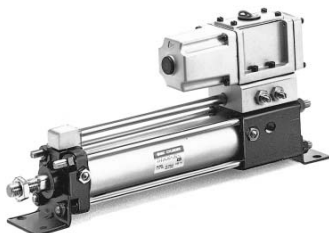
Valve Mounted Cylinder: Non-rotating Rod Type Double Acting, Single Rod Series CVS1K

Speed controller installed

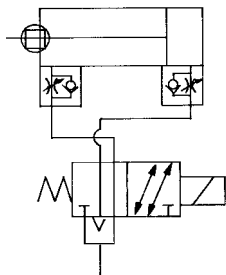
Operation type can be changed to rod extended when energized or rod retracted when energized.

A selection of solenoid valves is possible.

Single, double and 3 position solenoid valves are mountable.



JIS Symbol



Made to Order Made to Order Specifications
(For details, refer to page 10-21-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC15	Change of tie-rod length
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC28	Compact flange made of SS400

Specifications

Applicable bore size (mm)	40	50	63
Type	Non-lube		
Action	Double acting		
Fluid	Air		
Proof pressure	1.5 MPa		
Maximum operating pressure	1.0 MPa		
Minimum operating pressure	0.05 MPa		
Ambient & fluid temperature	-10 to 60°C (No freezing)		
Cushion	Air cushion		
Thread tolerance	JIS Class 2		
Stroke length tolerance	Up to 250 st $^{+1.0}_0$, 251 to 600 st $^{+1.4}_0$		
Effective area of valve (Cv factor)	Single: 26.5 mm ² (1.47)		
Port size	Rc 1/4		
Lubrication	Not required (Non-lube)		
Electrical entry	Grommet, Conduit terminal, DIN terminal, DIN terminal with indicator light, Conduit terminal with surge voltage suppressor		
Rod non-rotating accuracy	±0.5°		
Allowable rotational torque	0.44 N·m or less		
Piston speed	50 to 500 mm/s*		
Mounting style	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style		

* Operate within the range of absorbed energy.

Note) Refer to page 10-15-80 for operating piston speed for each size.

Allowable Kinetic Energy

Bore size (mm)	40	50	63
Allowable kinetic energy	2.4	4.4	7.8

Solenoid Valve Specifications

Applicable solenoid valve model		VS4□24		
Coil rated voltage		100/200 VAC (50/60 Hz), 24 VDC		
Allowable voltage		-15 to 10% of the rated voltage		
Coil insulation		Class B or equivalent (130°C)		
Apparent power ^{Note)}	AC	Inrush	50 Hz	100 VA
			60 Hz	90 VA
		Holding	50 Hz	20 VA
			60 Hz	14 VA
Power consumption ^{Note)}	DC	13.2 W		

Note) Rated voltage

Standard Stroke

Bore size (mm)	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500*
50, 63	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600*

* Please consult with SMC for longer strokes than the strokes marked with .

Rod Boot Material

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

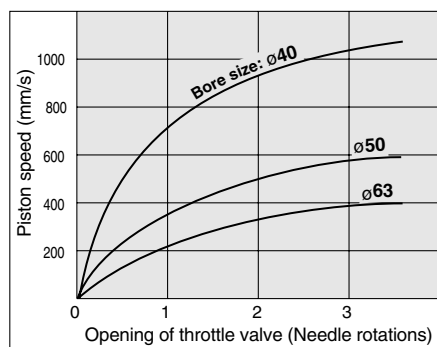
* Maximum ambient temperature for the rod boot itself.

Related things about auto switches and the mounting brackets part numbers are the same as Series CVS1.

For details, refer to pages 10-15-75 to 10-15-77.

Series CVS1K

Opening Range of Throttle Valve and Driving Speed



Conditions: Operating pressure 0.5 MPa, Horizontal mounting,
No load, Spring return side

• The actuating speeds above are for reference.

Handling

1. Adjusting of the piston speed
2. Interchange between the spring return style and the spring extend style

3. Manual override

Since the operations above 1. to 3. are the same as Series CVS1, refer to page 10-15-69.

Accessory

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

* Pin, plain washer and cotter pin are shipped together with double clevis and double knuckle joint.

Weight

(kg)

Bore size (mm)		40	50	63
Basic weight	Basic style	2.48	3.04	4.12
	Foot style	2.65	3.24	4.41
	Rod side flange style	2.88	3.64	5.08
	Head side flange style	2.98	3.78	5.08
	Single clevis style	2.74	3.48	4.87
	Double clevis style	2.73	3.46	4.89
	Trunnion style	3.08	3.78	5.46
Additional weight per each 50 mm of stroke		0.22	0.28	0.37
Accessory bracket	Single knuckle	0.23	0.26	0.26
	Double knuckle (With pin)	0.37	0.43	0.43

Calculation: (Example) CVS1KL40-100-1

- Standard weight.....2.65 (kg)
- Premium weight0.22 (kg/50 st)
- Cylinder stroke.....100 (st) $2.65 + 0.22 \times 100 \div 50 = 3.09$ kg

* Add 0.34 kg for the double solenoid style.

⚠ Precautions

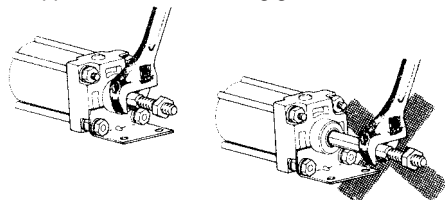
Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 6. For Series CVSK, refer to page 10-15-53.

Operating Precautions

⚠ 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 become deformed, 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 the 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.



Disassembly/Replacement

⚠ Caution

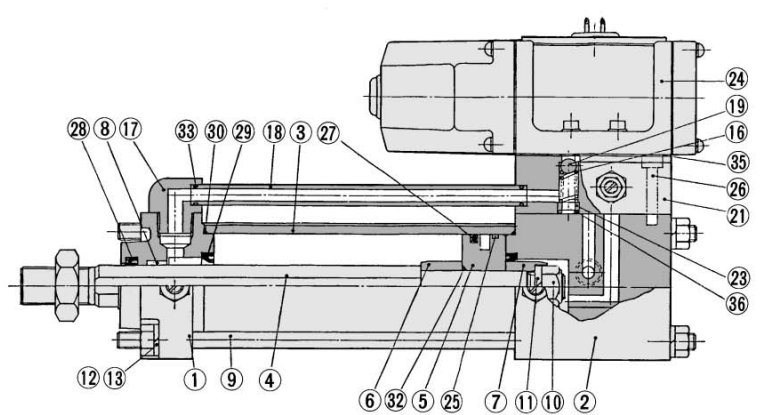
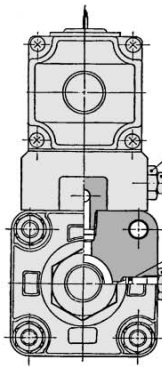
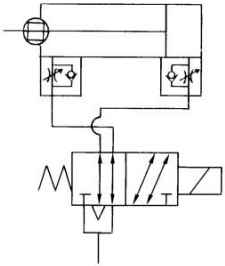
1. When replacing rod seals, please contact SMC.

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

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting, Single Rod Series CVS1K

Construction

Lube type



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Matt black painted
②	Head cover	Aluminum alloy	Matt black painted
③	Cylinder tube	Aluminum alloy	Hard anodized
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Piston	Aluminum alloy	Chromated
⑥	Cushion ring A	Rolled steel	Zinc chromated
⑦	Cushion ring B	Rolled steel	Zinc chromated
⑧*	Non-rotating guide	Oil impregnated sintered alloy	
⑨	Tie-rod	Carbon steel	Chromated
⑩	Piston nut	Rolled steel	Zinc chromated
⑪	Spring washer	Steel wire	Zinc chromated
⑫	Tie-rod nut	Carbon steel	Black zinc chromated
⑬	Spring washer	Steel wire	Black zinc chromated

* Parts of the non-rotating guide, check spring, check ball, valve port, cushion packing and piston gasket are not replaceable.

No.	Description	Material	Note
⑭	Needle guide	Carbon steel	Electroless nickel plated
⑮	Speed adjustment needle	Carbon steel	Electroless nickel plated
⑯*	Check spring	Steel wire	Zinc chromated
⑰	Guide tube fitting	Aluminum alloy	Platinum silver
⑱	Pipe	Carbon steel tube	Chromated
⑲*	Check ball	Polyurethane rubber	9/32
⑳	lock nut	Carbon steel	Nickel plated
㉑	Sub-plate	Aluminum alloy	Platinum silver
㉒	Cushion valve	Rolled steel	Electroless nickel plated
㉓*	Valve port	Brass	
㉔	Solenoid valve	—	Refer to the notes below.*
㉕	Wear ring	Resin	
㉖	Hexagon socket head cap screw	Chromium molybdenum steel	Black zinc chromated

Note 1) Add "X46" at the end of the part number for single solenoid type.

Note) Add "X46" at the end of the part number for single solenoid type.

* How to order solenoid valves
VS4□24- [Voltage] [Electrical entry]

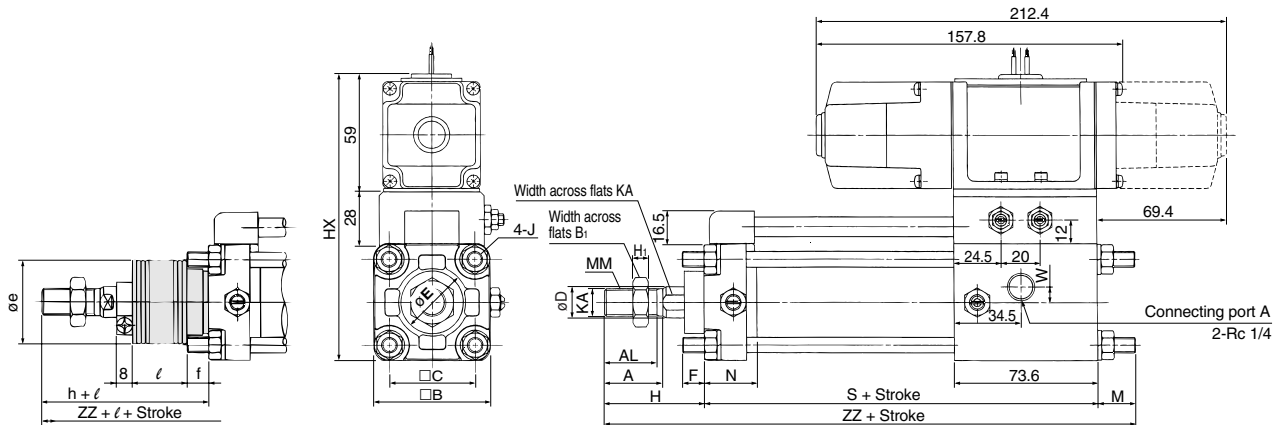
No.	Description	Material	Note
㉗	Piston seal	NBR	
㉘	Rod seal	NBR	
㉙*	Cushion seal	NBR	
㉚	Cylinder tube gasket	NBR	
㉛	Cushion valve seal	NBR	
㉜*	Piston gasket	NBR	
㉝	Pipe gasket	NBR	
㉞	Speed adjustment valve seal	NBR	
㉟	Gasket	NBR	
㊱	Valve port gasket	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	40	50	63
Seal kit no.	CVS1K40-PS	CVS1K50-PS	CVS1K63-PS
Contents	Set of nos. above ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞		

* Seal kit includes ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞. Order the seal kit, based on each bore size.

Basic Style: CVS1K



Bore size (mm)	Stroke range (mm)*	A	AL	B	B ₁	C	D	E	F	H ₁	HX	J	KA	M	MM	N	S	W
40	Up to 500	30	27	60	22	44	16	32	10	8	147	M8 x 1.25	14	19.4	M14 x 1.5	27	130.6	8
50	Up to 600	35	32	70	27	52	20	40	10	11	157	M8 x 1.25	18	16.4	M18 x 1.5	30	133.6	8
63	Up to 600	35	32	86	27	64	20	40	10	11	173	M10 x 1.25	18	18.4	M18 x 1.5	31	140.6	8

Bore size (mm)	Without rod boot		With rod boot				
	H	ZZ	e	f	h	l	ZZ
40	51	201	43	11.2	59	1/4 stroke	209
50	58	208	52	11.2	66	1/4 stroke	216
63	58	217	52	11.2	66	1/4 stroke	225

* The minimum stroke of the one with rod boot is 20 mm or more.

• External dimensions of each mounting bracket other than basic style are the same, except KA dimension. Refer to pages 10-15-71 to 10-15-73.

• For accessory, refer to page 10-15-74.

RE^A_B
REC
C□X
C□Y
MQ^Q_M
RHC
MK(2)
RS^Q_G
RS^H_A
RZQ
MI^W_S
CEP1
CE1
CE2
ML2B
C¹/₅-S
CV
MVGQ
CC
RB
J
D-
-X
20-
Data