

Valve Mounted Cylinder

Double Acting

Series CV3

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

How to Order

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDV3LN50-100-1

Suffix for cylinder

Nil	Rod extended when energized
B	Rod retracted when energized

* Symbol "B" is not required for double solenoid.

Electrical entry

Nil	Grommet
D	DIN terminal

Solenoid valve

Nil	2 position single
W	2 position double

Solenoid valve voltage

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

For other rated voltages, please consult with SMC.

Cylinder stroke (mm)

Refer to page 1765 for standard strokes.

CV3 **L** **50** **-100**

With auto switch

CDV3 **L** **50** **-100** **-M9BW** **1**

With Auto Switch (Built-in magnet)

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

Type

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

* Auto switch is not mountable.

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Auto switch

Nil	Without auto switch
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* For the applicable auto switch model, refer to the table below.

Suffix for cylinder

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

Number of auto switches

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

Made to Order
Refer to page 1765 for details.

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

Type	Special function	Electrical entry	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load	
				DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
Solid state auto switch	—	Grommet	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	G59***	●	●	●	○	○	IC circuit	Relay, PLC
			3-wire (PNP)				M9P	G5P***	●	●	●	○	○		
		2-wire	M9B				K59***	●	●	●	○	○			
		Terminal conduit	3-wire (NPN)	24 V	12 V	G39C	G39	—	—	—	—	IC circuit			
	2-wire		K39C			K39	—	—	—	—					
	Diagnostic indication (2-color indication)	Grommet	3-wire (NPN)			24 V	5 V, 12 V	M9NW	—	●	●		●	○	
			3-wire (PNP)	—	G59W***			●	—	●	○	○			
		Terminal conduit	2-wire	24 V	12 V			M9PW	—	●	●	●	○	○	
			3-wire (NPN)			—	G5PW***	●	●	●	○	○			
	Water resistant (2-color indication)	Grommet	3-wire (PNP)			24 V	5 V, 12 V	M9BW	—	●	●	●	○	○	
			2-wire	—	K59W***			●	—	●	○	○			
		Terminal conduit	3-wire (NPN)	24 V	12 V			M9NA*1	—	○	○	○	○	○	
3-wire (PNP)			M9PA*1			—	○	○	○	○	○				
With diagnostic output (2-color indication)	Grommet	2-wire	24 V			5 V, 12 V	M9BA*1	—	○	○	○	○	○		
		4-wire (NPN)		F59F	G59F***		●	—	●	○	○				
	Terminal conduit	3-wire (NPN equivalent)		24 V	12 V		A96 [Z76]***	—	●	●	●	●	—		
		100 V or less	A93 [Z73]***			—	●	●	●	●	—				
Reed auto switch	—	Grommet	2-wire			24 V	12 V	100 V or less	A90 [Z80]***	—	●	●	●	●	IC circuit
				100 V, 200 V or less	A54			B54***	●	—	●	—			
		Terminal conduit		200 V or less	A64			B64***	●	—	●	—			
			—	A33C	A33	—	—	—	—	—					
	Diagnostic indication (2-color indication)	Grommet	2-wire	24 V	12 V	100 V, 200 V	A34C	A34	—		—	—	—		
						—	A44C	A44	—	—	—	—			
		Terminal conduit				—	A59W	B59W***	●	—	●	—	—		
			—	—	—	—	—	—	—						

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

* For details about auto switches with pre-wired connector, refer to pages 1960 and 1961.

*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NLW
5 m Z (Example) M9NZW

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

** D-G5C/W/K59W/G59F cannot be mounted on $\varnothing 40$ and $\varnothing 50$ lube style cylinder.

*** D-B5C/B64/G5/K5□ types are mountable only upon a receipt of order. (Not mountable after the time of shipment)

**** D-A9□ cannot be mounted on $\varnothing 50$. Select auto switches in brackets.

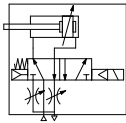
* Since there are other applicable auto switches than listed, refer to page 1783 for details.

* For details about auto switches with pre-wired connector, refer to pages 1960 and 1961.
* D-A9□/M9□/M9C/W/M9□ auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

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



Symbol
Air cushion



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

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC7	Tie-rod, cushion valve, and tie-rod nut and similar parts made of stainless steel
-XC15	Change of tie-rod length
-XC22	Fluororubber seals
-XC29	Double knuckle joint with spring pin
-XC65	-XC6 + -XC7

⚠ 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 pages 1780 and 1781.)

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

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

Specifications

Applicable bore size (mm)	40	50	63	80	100
Lubrication	Lube/Non-lube				
Action	Double acting				
Fluid	Air				
Proof pressure	1.35 MPa				
Maximum operating pressure	0.9 MPa				
Minimum operating pressure	0.15 MPa				
Ambient and fluid temperature	-10 to 50°C (No freezing)				
Cushion	Air cushion				
Stroke length tolerance	Up to 250 st -1.0 / 0 , 251 to 1000 st -1.4 / 0				
Port size	Rc 1/4				
Piston speed	50 to 500 mm/s* 50 to 350 mm/s*				
Mouting	Basic style, Axial foot style, Rod side flange style Single clevis style, Double clevis style, Center trunnion style				
Allowable kinetic energy	2.4 J	4.4 J	7.8 J	11.7 J	20.5 J

* Operate within the range of absorbed energy.

Solenoid Valve Specifications

Applicable solenoid valve model		V3□08		
Coil rated voltage		100/200 VAC (50/60 Hz), 24 VDC		
Effective area of valve (Cv factor)		18 mm ² (1.00)		
Electrical entry		Grommet, DIN terminal		
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 pages 1780 and 1781. The minimum stroke length is different in the trunnion style. For further information, refer to pages 1780 and 1781.

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.

* Refer to page 1773 for dimensions and part numbers of the option.

Refer to page 1770 for dimensions of the rod boot.

Series CV3

Weight

(kg)

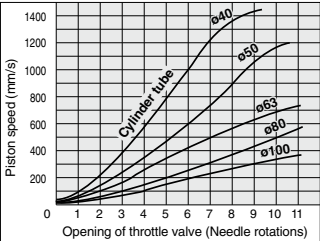
Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	1.30 (1.35)	1.73 (1.77)	2.57 (2.61)	4.29 (4.44)	6.01 (6.21)
	Axial foot style	1.47 (1.52)	1.93 (1.97)	2.86 (2.9)	5.08 (5.23)	6.94 (7.14)
	Rod side flange style	1.56 (1.61)	2.14 (2.18)	3.19 (3.23)	5.39 (5.54)	7.40 (7.6)
	Single clevis style	—	2.46 (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.

** Accessories for each mounting bracket are as follows.

Foot, Flange: Body mounting bolts, Spring washer

Single clevis: Body mounting bolts, Nut, Spring washer

Double clevis: Body mounting bolts, Nut, Spring washer, Clevis pin, Flat washer, Cotter pin



Series CV3

Specific Product Precautions

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

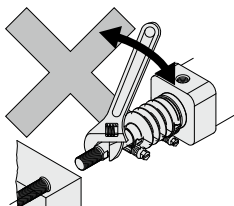
Precautions

⚠ Warning

1. **Do not 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

1. **Do not use an air cylinder as an air-hydro cylinder, because this could result in oil leakage.**
2. **Do not turn the piston rod with the rod boot kept locked.**
When turning the piston rod, loosen the band once and do not twist the rod boot.
3. **Set the breathing hole in the rod boot downward or in the direction that prevents entry of dust or water content.**



4. **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	DA00180 (M8 x 1.25, Hexagon nut 3 types)	13	JIS B 4636 + 2 point angle socket 13
63	DA00008 (M10 x 1.25, Hexagon nut 3 types)	17	JIS B 4636 + 2 point angle socket 17
80, 100	DA00013 (M12 x 1.75, Hexagon nut 3 types)	19	JIS B 4636 + 2 point angle socket 19

5. **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.
6. **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.
7. **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.
8. **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 the front matters (Air cylinder model selection) of Best Pneumatics No. 2.)

Selection

⚠ Warning

1. **Confirm the specifications.**
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)
2. **Energizing continuously for a long period of time**
When the valve is continuously energized for a long period of time, the performance may deteriorate or effect peripheral equipment adversely since temperature rises when coils generate heat.

CVQ

CVQM

CVJ ☐

CVM ☐

CV3

CVS1

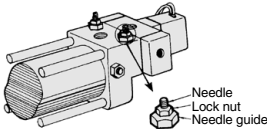
MVGQ

D- ☐

-X ☐

Piston Speed Adjustment

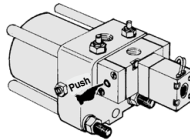
1. To slow down the piston speed, screw in the needle of the silencer exhaust throttle valve clockwise, to reduce the amount of air that is discharged.
2. The throttle valve needle opens fully when it is loosened 11 turns from its fully closed position.



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

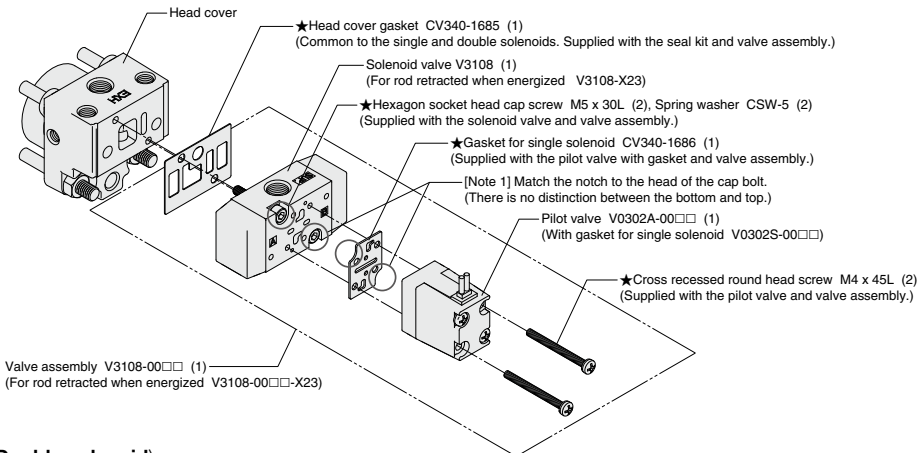
Manual Operation

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

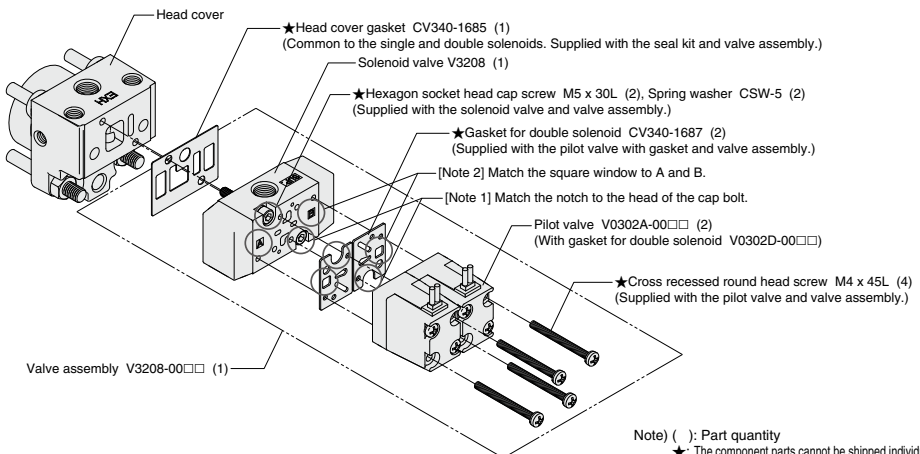


Solenoid Valve Replacement and Order No.

〈Single solenoid〉



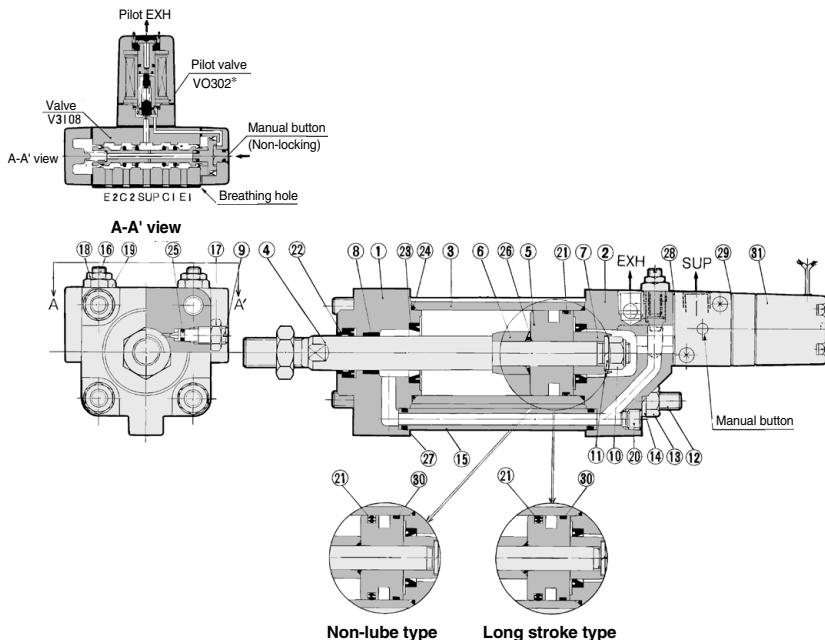
〈Double solenoid〉



Note) (): Part quantity

★: The component parts cannot be shipped individually.

Construction



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	Zinc 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	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
30	Wear ring	Resin	

No.	Description	No. of solenoids	Rod extended when energized	Rod retracted when energized
31	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]

Component Parts

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

* Not replaceable.

Replacement Parts: Seal Kit

Lube Type

Bore size (mm)	Kit no.	Contents	Bore size (mm)	Kit no.	Contents
40	CV3-40-PS	Set of nos. above 21, 22, 24, 25, 27, 28	40	CV3N40-PS	Set of nos. above 21, 22, 24, 25, 27, 28
50	CV3-50-PS		50	CV3N50-PS	
63	CV3-63-PS		63	CV3N63-PS	
80	CV3-80-PS		80	CV3N80-PS	
100	CV3-100-PS		100	CV3N100-PS	

* Seal kit includes 21, 22, 24, 25, 27, 28. Order the seal kit, based on each bore size.

(The parts indicated with numbers 23 and 26 are not replaceable.)

* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63, ø80: 20 g, ø100: 30 g).

Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g), GR-S-020 (20 g)

CVQ

CVQM

CVJ□

CVM□

CV3

CVS1

MVGQ

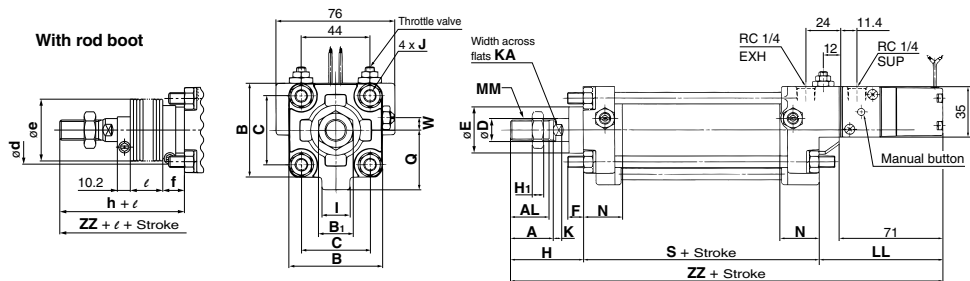
D-□

-X□

Series CV3

Basic Style: CV3B□

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



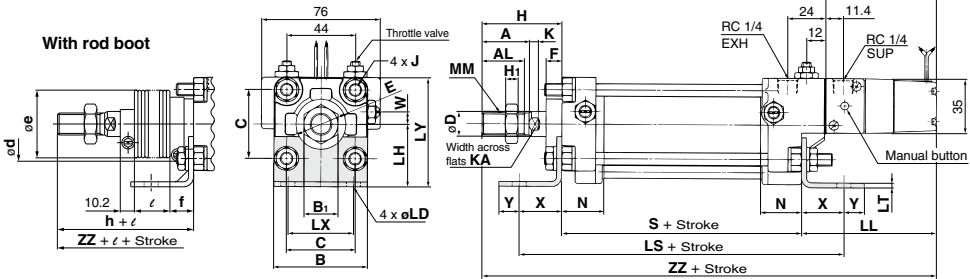
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	I	J	K	KA	LL	MM	N	Q	S
40	Up to 500	30	27	60	22	44	16	32	10	8	18	M8 x 1.25	6	14	86	M14 x 1.5	27	38	84
50	Up to 600	35	32	70	27	52	20	40	10	11	18	M8 x 1.25	7	18	83	M18 x 1.5	30	43.5	90
63	Up to 600	35	32	85	27	64	20	40	10	11	18	M10 x 1.25	7	18	83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

Bore size (mm)	W	Without rod boot		With rod boot					
		H	ZZ	d	e	f	h	ℓ	ZZ
40	8	51	221	56	43	11.2	59	1/4 stroke	229
50	0	58	231	64	52	11.2	66	1/4 stroke	239
63	0	58	239	64	52	11.2	66	1/4 stroke	247
80	0	71	271	76	65	12.5	80	1/4 stroke	280
100	0	72	283	76	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)



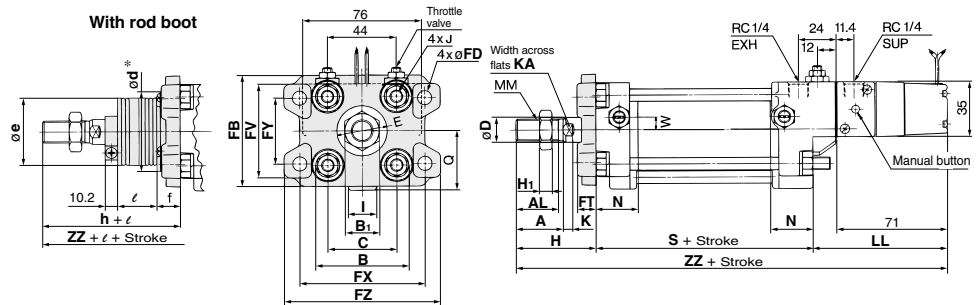
Bore size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	J	K	KA	LD	LH	LL	LS	LT	LX	LY
40	Up to 500+ 501 to 600+	30	27	60	22	44	16	32	10	8	M8 x 1.25	6	14	9	40	86	138	3.2	42	70
50	Up to 600+ 601 to 1000+	35	32	70	27	52	20	40	10	11	M8 x 1.25	7	18	9	45	83	144	3.2	50	80
63	Up to 600+ 611 to 1000+	35	32	85	27	64	20	40	10	11	M10 x 1.25	7	18	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	10	22	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	10	26	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	d	e	f	h	ℓ	ZZ
40	M14 x 1.5	27	84	8	27	13	51	221	56	43	11.2	59	1/4 stroke	229
50	M18 x 1.5	30	90	0	27	13	58	231	64	52	11.2	66	1/4 stroke	239
63	M18 x 1.5	31	98	0	34	16	58	239	64	52	11.2	66	1/4 stroke	247
80	M22 x 1.5	37	116	0	44	16	71	271	76	65	12.5	80	1/4 stroke	280
100	M26 x 1.5	40	126	0	43	17	72	283	76	65	14.0	81	1/4 stroke	292

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

Rod Side Flange Style: CV3F□

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



Bore size (mm)	Stroke range* (mm)	A	AL	FB	B	B ₁	C	D	E	FD	FT	FV	FX	FY	FZ	H ₁	I	J	K	KA
40	Up to 500+ 501 to 600+*	30	27	71	60	22	44	16	32	9	12	60	80	42	100	8	18	M8 x 1.25	6	14
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	18
63	Up to 600+ 611 to 1000+*	35	32	101	85	27	64	20	40	11.5	15	86	105	59	130	11	18	M10 x 1.25	7	18
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	10	22
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	10	26

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.

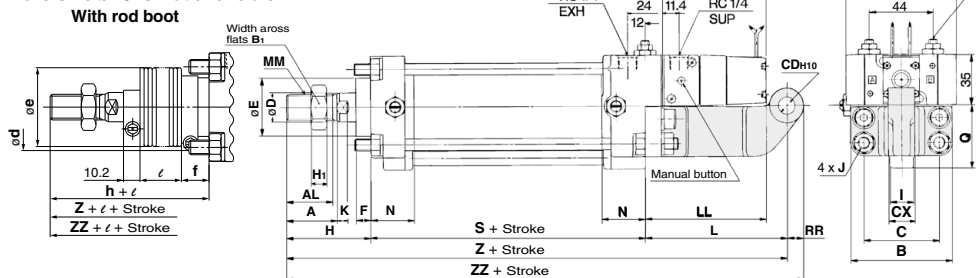
** Long stroke

* 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.



** Bore size ø40 is not available.

Bore size** (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	CDH10	CX	D	E	F	H ₁	I	J	K	KA	L	LL
50	Up to 600	35	32	70	27	52	12 ^{+0.070} _{-0.3}	18 ^{+0.1} _{-0.3}	20	40	10	11	18	M8 x 1.25	7	18	98	83
63	Up to 600	35	32	85	27	64	16 ^{+0.070} _{-0.3}	25 ^{+0.1} _{-0.3}	20	40	10	11	18	M10 x 1.25	7	18	100	83
80	Up to 750	40	37	102	32	78	20 ^{+0.084} _{-0.1}	31.5 ^{+0.1} _{-0.3}	25	52	14	13	20	M12 x 1.75	10	22	105	84
100	Up to 750	40	37	116	41	92	25 ^{+0.084} _{-0.1}	35.5 ^{+0.1} _{-0.3}	30	52	14	16	20	M12 x 1.75	10	26	110	85

Bore size** (mm)	MM	N	Q	RR	S	Without rod boot		With rod boot									
						H	Z	ZZ	d	e	f	h	ℓ	Z	ZZ		
50	M18 x 1.5	30	43.5	12	90	58	246	258	64	52	11.2	66	1/4 stroke	254	266		
63	M18 x 1.5	31	49	16	98	58	256	272	64	52	11.2	66	1/4 stroke	264	280		
80	M22 x 1.5	37	63	20	116	71	292	312	76	65	12.5	80	1/4 stroke	301	321		
100	M26 x 1.5	40	73	25	126	72	308	333	76	65	14.0	81	1/4 stroke	317	342		

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

CVQ

CVQM

CVJ□

CVM□

CV3

CVS1

MVGQ

D-□

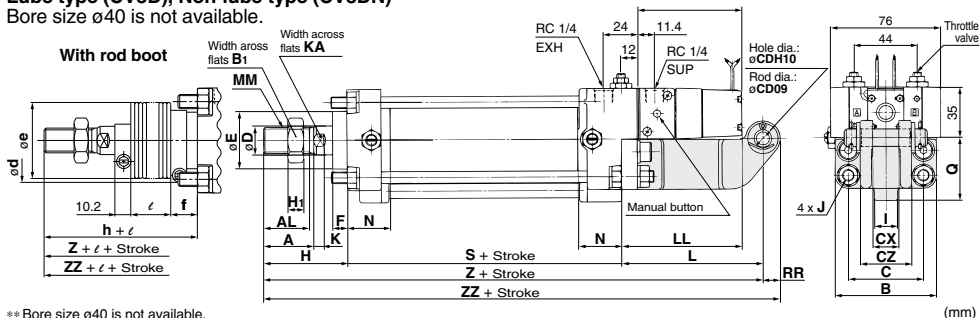
-X□

Series CV3

Double Clevis Style: CV3D

Lube type (CV3D), Non-lube type (CV3DN)

Bore size $\varnothing 40$ is not available.



※※ Bore size ø40 is not available.

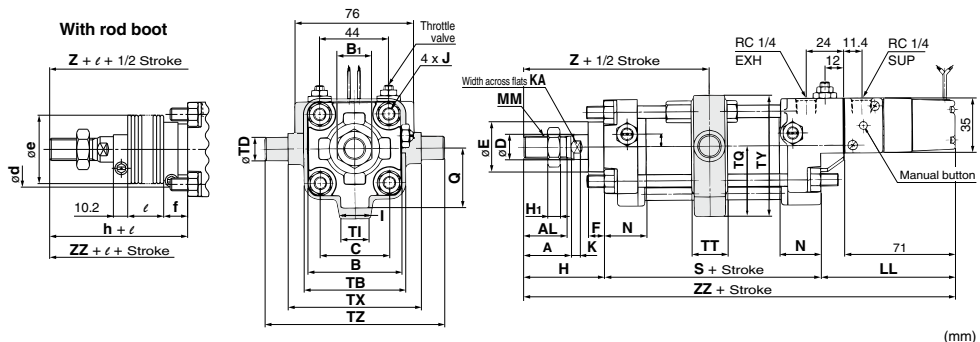
Bore size (mm)	** Stroke range (mm)	A	AL	B	B ₁	C	CD	CX	CZ	D	E	F	H ₁	I	J	K	KA	L
50	Up to 600	35	32	70	27	52	12	18 ^{+0.3 -0.1}	35.5	20	40	10	11	18	M8 x 1.25	7	18	98
63	Up to 600	35	32	85	27	64	16	25 ^{+0.3 -0.1}	50	20	40	10	11	18	M10 x 1.25	7	18	100
80	Up to 750	40	37	102	32	78	20	31.5 ^{+0.3 -0.1}	63	25	52	14	13	20	M12 x 1.75	10	22	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	10	26	111

Bore size ⁹⁸ (mm)	LL	MM	N	Q	RR	S	Without rod boot			With rod boot						
							H	Z	ZZ	d	e	f	h	ℓ	Z	ZZ
50	83	M18 x 1.5	30	43.5	12	90	58	246	258	64	52	11.2	66	1/4 stroke	254	266
63	83	M18 x 1.5	31	49	16	98	58	256	272	64	52	11.2	66	1/4 stroke	264	280
80	84	M22 x 1.5	37	63	20	116	71	292	312	76	65	12.5	80	1/4 stroke	301	321
100	85	M26 x 1.5	40	73	25	126	72	308	333	76	65	14.0	81	1/4 stroke	317	342

* Clevis pin, flat washer and cotter pin 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)

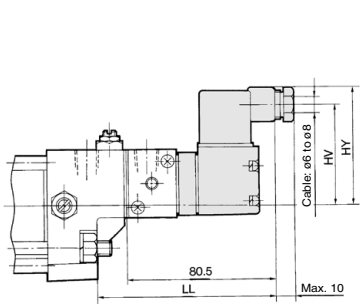


Boze size (mm)	Stroke range* (mm)	A	AL	B	B ₁	C	D	E	F	H ₁	J	K	KA	LL	MM	N	S	TB
40	25 to 500	30	27	60	22	44	16	32	10	8	M8 x 1.25	6	14	86	M14 x 1.5	27	84	65
50	25 to 600	35	32	70	27	52	20	40	10	11	M8 x 1.25	7	18	83	M18 x 1.5	30	90	75
63	50 to 600	35	32	85	27	64	20	40	10	11	M10 x 1.25	7	18	83	M18 x 1.5	31	98	90
80	50 to 750	40	37	102	32	78	25	52	14	13	M12 x 1.75	10	22	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	10	26	85	M26 x 1.5	40	126	130

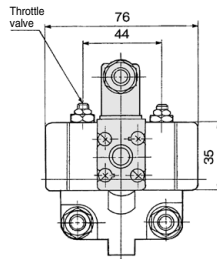
Bore size (mm)		σT_{DE}	TI	TQ	TT	TX	TY	TZ	W	I	Q	Without rod boot			With rod boot						
												H	Z	ZZ	d	e	f	h	ℓ	Z	ZZ
40	15	-0.032 -0.059	20	45	23	85	77.5	115	8	18	38	51	93	221	56	43	11.2	59	1/4 stroke	101	229
50	15	-0.032 -0.059	20	50	23	95	87.5	125	0	18	43.5	58	103	231	64	52	11.2	66	1/4 stroke	111	239
63	18	-0.032 -0.059	20	57	28	110	102	146	0	18	49	58	107	239	64	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	76	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	76	65	14.0	81	1/4 stroke	144	292

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

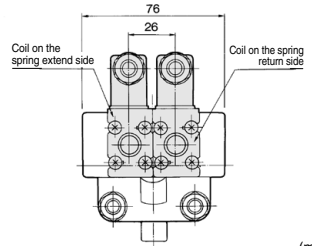
Electrical Entry: Dimensions for DIN Terminal



Single



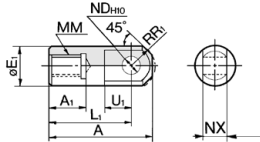
Double



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

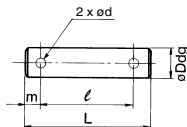
I Type Single Knuckle Joint



Material: Free cutting sulfur steel (mm)

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}

Clevis Pin

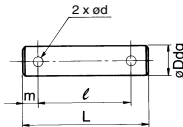


Material: Carbon steel (mm)

Part no.	Applicable bore size (mm)	øDdg	L	ød	ℓ	Applicable plain washer	Applicable cotter pin
CDP-3A	50	12 ^{-0.090} _{-0.080}	55.5	3	47.5	4.0	3 x 18
CVD-06	63	16 ^{-0.060} _{-0.050}	75	4	65	5.0	Polished round 12
CVD-08	80	20 ^{-0.117} _{-0.110}	94	5	79	7.5	4 x 22
CVD-10	100	25 ^{-0.095} _{-0.117}	105	5	90	7.5	5 x 30

* Cotter pins and flat washers are included.

Knuckle Pin

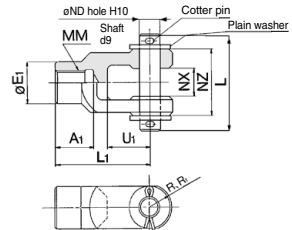


Material: Carbon steel (mm)

Part no.	Applicable bore size (mm)	øDdg	L	ℓ	m	ød (Drill through)	Applicable cotter pin	Applicable plain washer
CDP-3A	40, 50, 63	12 ^{-0.090} _{-0.080}	55.5	47.5	4	3	ø3 x 18 L	Polished round 12
CDP-5A	80	18 ^{-0.090} _{-0.080}	76.5	66.5	5	4	ø4 x 25 L	Polished round 18
CDP-6A	100	20 ^{-0.117} _{-0.110}	83	73	5	4	ø4 x 30 L	Polished round 20

* Cotter pins and flat washers are included.

Y Type Double Knuckle Joint

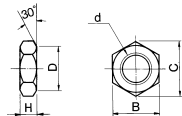


Material: Cast iron (mm)

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

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

Rod End Nut



Material: Rolled steel (mm)

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: Non-rotating Rod Type Double Acting

Series CV3K

Non-lube Type: $\varnothing 40$, $\varnothing 50$, $\varnothing 63$

How to Order

Built-in Magnet Cylinder Model

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

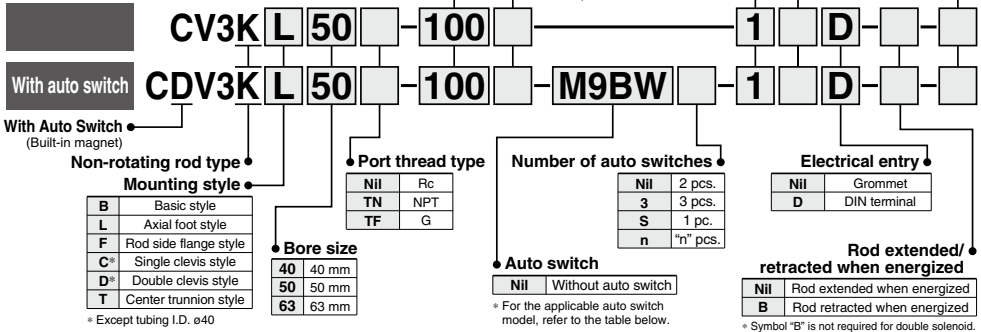
Solenoid valve	
Nil	2 position single
W	2 position double

Solenoid valve voltage	
1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
5	24 VDC

For other rated voltages, please consult with SMC.

Made to Order
Refer to page 1775 for details.

Cylinder stroke (mm)
Refer to page 1775 for standard strokes.



Applicable Auto Switches

Refer to pages 1893 to 2007 for further information on auto switches.

Type	Special function	Electrical entry	Wiring (Output)	Load voltage	Auto switch model	Lead wire length (m)	Pre-wired connector	Applicable load
				DC	AC	0.5 (Nil) 1 (M) 3 (L) 5 (Z)		
Solid state auto switch	Diagnostic indication (2-color indication)	Grommet	3-wire (NPN)	24 V	5 V, 12 V	M9N	● ● ● ● ●	IC circuit
			3-wire (PNP)	12 V	—	G59***	● ● ● ● ●	—
		Terminal conduit	2-wire	12 V	—	M9P	● ● ● ● ●	—
			3-wire (NPN)	12 V	—	G5P***	● ● ● ● ●	—
		Grommet	2-wire	24 V	—	M9B	● ● ● ● ●	—
			3-wire (PNP)	5 V, 12 V	—	K59***	● ● ● ● ●	—
	Water resistant (2-color indication) (With diagnostic output (2-color indication))	Grommet	3-wire (NPN)	24 V	5 V, 12 V	G39C	● ● ● ● ●	IC circuit
			3-wire (PNP)	12 V	—	K39C	● ● ● ● ●	—
		Terminal conduit	2-wire	12 V	—	M9NW	● ● ● ● ●	—
			3-wire (NPN)	5 V, 12 V	—	G59W***	● ● ● ● ●	—
		Grommet	3-wire (PNP)	12 V	—	M9PW	● ● ● ● ●	—
			4-wire (NPN)	5 V, 12 V	—	G5PW***	● ● ● ● ●	—
Reed auto switch	Diagnostic indication (2-color indication)	Grommet	3-wire (NPN equivalent)	—	5 V	M9BA ⁻¹	● ● ● ● ●	IC circuit
			2-wire	24 V	12 V	F59F	● ● ● ● ●	—
		Terminal conduit	—	—	—	A96 Z76***	● ● ● ● ●	—
			—	—	—	A93 Z73***	● ● ● ● ●	—
		Grommet	—	—	—	A90 Z80***	● ● ● ● ●	—
			—	—	—	A54	● ● ● ● ●	—
	—	Grommet	—	—	—	B54***	● ● ● ● ●	—
			—	—	—	A64	● ● ● ● ●	—
		Terminal conduit	—	—	—	B64***	● ● ● ● ●	—
			—	—	—	A33C	● ● ● ● ●	—
		Grommet	—	—	—	A34C	● ● ● ● ●	—
			—	—	—	A44C	● ● ● ● ●	—
	—	Grommet	—	—	—	A59W	● ● ● ● ●	—
			—	—	—	B59W***	● ● ● ● ●	—
		Terminal conduit	—	—	—	A44C	● ● ● ● ●	—
			—	—	—	A59W	● ● ● ● ●	—
		Grommet	—	—	—	A59W	● ● ● ● ●	—
			—	—	—	B59W***	● ● ● ● ●	—

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

* Consult with SMC regarding water resistant types with the above model numbers.

*2 2 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m Nil
1 m M
3 m L
5 m Z

(Example) M9NW
(Example) M9NWM
(Example) M9NL
(Example) M9NWZ

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

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

*** D-A9□ cannot be mounted on e50. Select auto switches in brackets.

* Since there are other applicable auto switches than listed, refer to page 1783 for details.

* For details about auto switches with pre-wired connector, refer to pages 1960 and 1961.

* D-A9□/M9□/M9□/M9□/A auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

Valve Mounted Cylinder: Non-rotating Rod Type

Double Acting *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.

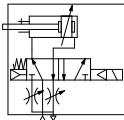
A manual operation mechanism is provided as standard equipment (non-locking).

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



Symbol

Air cushion



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

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

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

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

Specifications

Applicable bore size (mm)	40	50	63
Action	Double acting		
Fluid	Air		
Proof pressure	1.35 MPa		
Maximum operating pressure	0.9 MPa		
Minimum operating pressure	0.15 MPa		
Ambient and fluid temperature	-10 to 50°C (No freezing)		
Cushion	Air cushion		
Stroke length tolerance	Up to 250 st $^{+1.0}_0$, 251 to 600 st $^{+1.4}_0$		
Port size	Rc 1/4		
Lubrication	Not required (Non-lube)		
Piston speed	50 to 500 mm/s *		
Rod non-rotating accuracy	±0.8°		
Allowable rotational torque	0.44 N·m or less		
Mouting	Basic style, Axial foot style, Rod side flange style, Single clevis style, Double clevis style, Center trunnion style		
Allowable kinetic energy	2.4 J	4.4 J	7.8 J

* Operate within the range of absorbed energy.

Solenoid Valve Specifications

Applicable solenoid valve model		V3□08		
Coil rated voltage		100/200 VAC (50/60 Hz), 24 VDC		
Effective area of valve (Cv factor)		18 mm ² (1.0)		
Electrical entry		Grommet, DIN terminal		
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.

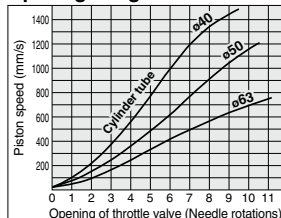
Standard Stroke

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 pages 1780 and 1781.
 The minimum stroke length is different in the trunnion style. Refer to pages 1780 and 1781 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.

CVQ

CVQM

CVJ□

CVM□

CV3

CVS1

MVGQ

D-□

-X□

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) $1.47 + 0.22 \times 100 \div 50 = 1.91$ kg

Accessory

Mounting		Basic style	Foot style	Rod side flange style	Single clevis style	Double *	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.
- * Refer to page 1773 for dimensions and part numbers of the option.

Refer to page 1777 for dimensions of the rod boot.

Handling

1. Adjusting of the piston speed
2. Change of voltage specifications
3. Manual operation
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 1768.

⚠ Precautions

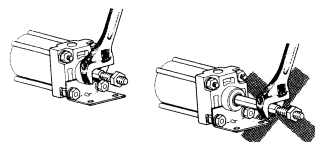
Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to front matter 39. For Series CV3K, refer to page 1767.

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.

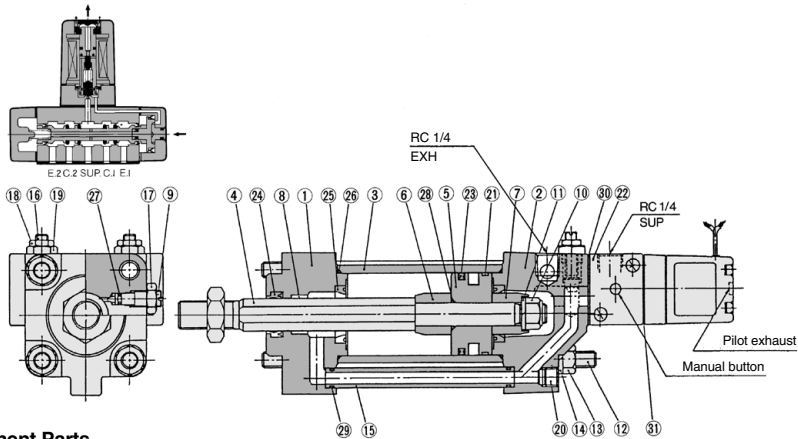
Selection

⚠ Warning

1. Confirm the specifications.
Products in this catalog are designed to be used for compressed air systems. If not operated within the designated pressure or temperature, it may damage the products or cause malfunction. (Refer to specifications.)
2. Energizing continuously for a long period of time
When the valve is continuously energized for a long period of time, the performance may deteriorate or effect peripheral equipment adversely since temperature rises when coils generate heat.

Valve Mounted Cylinder: Non-rotating Rod Type Double Acting *Series CV3K*

Construction



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	Zinc chromated
13	Tie-rod nut	Carbon steel	Black zinc chromated
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

No.	Description	Material	Note
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	Single	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	-X23
Note 2) V3108-00	Voltage	Electrical entry	
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	

No.	Description	Material	Note
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)	Kit no.	Contents
40	CV3K40-PS	Set of nos. above 23, 24, 25, 26, 27, 28, 29, 30.
50	CV3K50-PS	
63	CV3K63-PS	

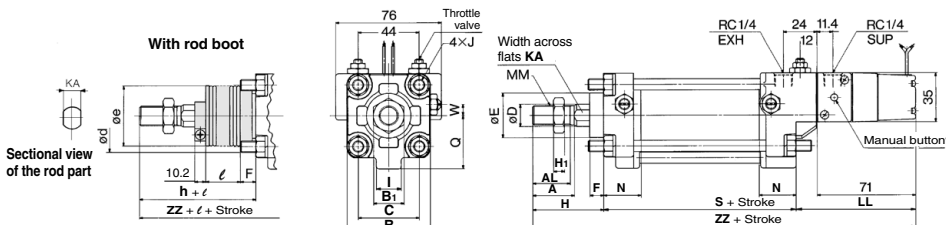
* Seal kit includes 23, 24, 25, 26, 27, 28, 29, 30. Order the seal kit, based on each bore size. (Not possible to replace 25, 28.)

* Seal kit includes a grease pack (ø40, ø50: 10 g, ø63 or more: 20 g).

Order with the following part number when only the grease pack is needed.

Grease pack part no.: GR-S-010 (10 g), GR-S-020 (20 g)

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	d	e	f	h	l	ZZ
40	8	51	221	56	43	11.2	59	1/4 stroke	229
50	0	58	231	64	52	11.2	66	1/4 stroke	239
63	0	58	239	64	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 1773.

• External dimensions of each mounting bracket other than basic style are the same, except KA dimension. Refer to pages 1770 to 1773.

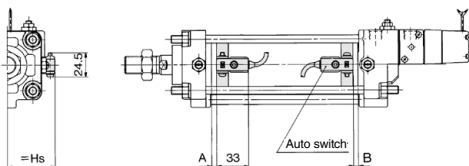
• For accessory, refer to page 1773.

Auto Switch Mounting 1

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

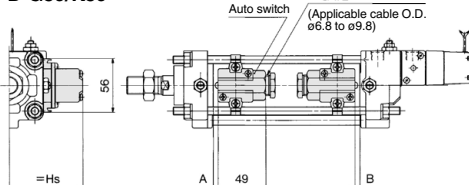
<Band mounting style>

D-B5□/B64/B59W



D-A3□

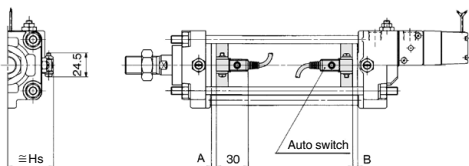
D-G39/K39



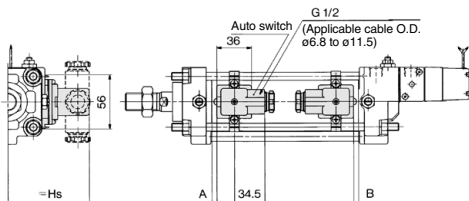
D-G5□/K59

D-G5□W/K59W

D-G59F/G5NT



D-A44



<Tie-rod mounting style>

D-A9□/A9□V

D-M9□/M9□V

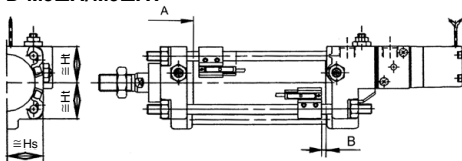
D-M9□W/M9□WV

D-M9□A/M9□AV

D-Z7□/Z80

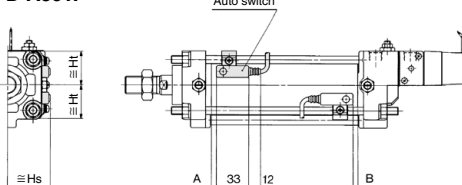
D-Y59□/Y69□/Y7P/Y7PV

D-Y7□W/Y7□WV



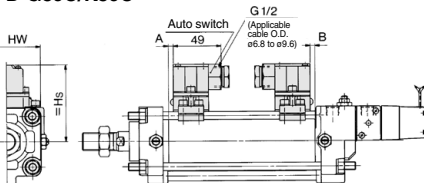
D-A5□/A6□

D-A59W



D-A3□C

D-G39C/K39C

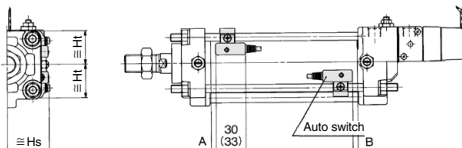


D-F5□/J59

D-F5NT

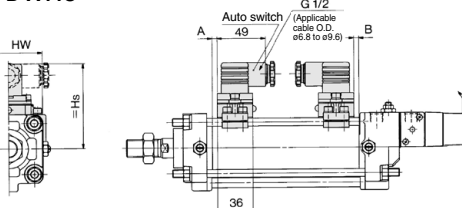
D-F5□W/J59W

D-F59F



(): Denotes the values of D-F5LF.

D-A44C



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

(mm)

Auto switch model Bore size (mm)	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□A D-M9□AV		D-A5□ D-A6□ D-A3□ D-A3□C D-A44/A44C D-G39/G39C D-K39/K39C		D-B5□ D-B64		D-F5□ D-J59 D-F5□W D-J59W D-F59F		D-G5□W D-K59W D-G59F D-G5□ D-K59 D-G5NT		D-A59W		D-F5NT		D-B59W D-Z7□ D-Z80 D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
40	3 (6)	7 (4)	7 (10)	11 (8)	0 (0)	1 (0.5)	0 (0)	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	—	—	7 (10)	11 (8)	0 (0)	1 (0.5)	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	5 (8.5)	11 (7.5)	9 (12.5)	15 (11.5)	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	8 (12)	14 (10)	12 (16)	18 (14)	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	10 (13.5)	16 (12.5)	14 (17.5)	20 (16.5)	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/G59F types cannot be mounted on the ø40 or ø50 lube type.

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

Note 4) D-A9□ and D-A9□V types cannot be mounted on ø50

Note 5) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model

* D-A9□ and D-A9□V types cannot be mounted on ø50

CVQ**CVQM****CVJ□****CVM□****CV3****CVS1****MVGQ****D-□****-X□**

Auto Switch Mounting 2

Minimum Stroke For Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	No. of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-A9□	2 (Different surfaces, Same surface), 1	15	80	—	90	105	115
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
D-A9□V	2 (Different surfaces, Same surface), 1	10	80	—	90	105	115
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$105 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$115 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
D-M9□ D-M9□W D-M9□A	2 (Different surfaces, Same surface), 1	15	85		100	115	120
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$120 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
D-M9□V D-M9□WV D-M9□AV	2 (Different surfaces, Same surface), 1	10	85		100	115	120
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$100 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$115 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$120 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
D-A5□/A6□ D-F5□/J59 D-F5□W/J59W D-F59F	2 (Different surfaces, Same surface), 1	15	90		100	110	120
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
D-A59W	2 (Different surfaces, Same surface)	20	90		100	110	120
	n (Same surface)	$20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$90 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$100 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
	1	15	90		100	110	120
D-F5NT	2 (Different surfaces, Same surface), 1	25	110		120	130	140
	n (Same surface)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$110 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$120 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$130 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$140 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
D-B5□/B64 D-G5□/K59 D-G5□W D-K59W D-G59F D-G5NT	2	Different surfaces	15	90		100	110
		Same surface	75				
	n	Different surfaces	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
		Same surface	$75 + 50 (n-2)$ (n = 2, 4, 6, 8...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)		$100 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)
		1	10	90		100	110
D-B59W	2	Different surfaces	20	90		100	110
		Same surface	75				
	n	Different surfaces	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8... Note 1)	$90 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)		$100 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)	$110 + 50 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16... Note 2)
		Same surface	$75 + 50 (n-2)$ (n = 2, 3, 4, ...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)		$100 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)
		1	15	90		100	110
D-A3□ D-G39 D-K39	2	Different surfaces	35	100		100	110
		Same surface	100				
	n	Different surfaces	$35 + 30 (n-2)$ (n = 2, 3, 4, ...)	$100 + 30 (n-2)$ (n = 2, 4, 6, 8... Note 1)		$100 + 30 (n-2)$ (n = 2, 4, 6, 8... Note 1)	$110 + 30 (n-2)$ (n = 2, 4, 6, 8... Note 1)
		Same surface	$100 + 100 (n-2)$ (n = 2, 3, 4, ...)	$100 + 100 (n-2)$ (n = 2, 4, 6, 8... Note 1)			$110 + 100 (n-2)$ (n = 2, 4, 6, 8... Note 1)
		1	10	100		100	110
D-A44	2	Different surfaces	35	90		100	110
		Same surface	55				
	n	Different surfaces	$35 + 30 (n-2)$ (n = 2, 3, 4, ...)	$90 + 30 (n-2)$ (n = 2, 4, 6, 8... Note 1)		$100 + 30 (n-2)$ (n = 2, 4, 6, 8... Note 1)	$110 + 30 (n-2)$ (n = 2, 4, 6, 8... Note 1)
		Same surface	$55 + 50 (n-2)$ (n = 2, 3, 4, ...)	$90 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)		$100 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)	$110 + 50 (n-2)$ (n = 2, 4, 6, 8... Note 1)
		1	10	90		100	110

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 2) When "n" is an even number, a multiple of 4 that is larger than this odd number is used for the calculation.

Minimum Stroke For Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	No. of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion				
			ø40	ø50	ø63	ø80	ø100
D-A3□C D-G39C D-K39C	2	Different surfaces	100				
		Same surface	100				
	n	Different surfaces	20 + 35 (n - 2) (n = 2, 3, 4, ...)		100 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)	100 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)	110 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)
		Same surface	100 + 100 (n - 2) (n = 2, 3, 4, 5, ...)		100 + 100 (n - 2) (n = 2, 4, 6, 8-...) Note 1)		110 + 100 (n - 2) (n = 2, 4, 6, 8-...) Note 1)
		1	10	100	100	110	
D-A44C	2	Different surfaces	90				
		Same surface	90				
	n	Different surfaces	25 + 35 (n - 2) (n = 2, 3, 4, ...)		100 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)	100 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)	110 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)
		Same surface	55 + 50 (n - 2) (n = 2, 3, 4, ...)		90 + 50 (n - 2) (n = 2, 4, 6, 8-...) Note 1)		100 + 35 (n - 2) (n = 2, 4, 6, 8-...) Note 1)
		1	10	90	100	110	
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	2 (Different surfaces, Same surface), 1	15	80	85	90	95	105
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8-...) Note 1)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)
D-Y69□/Y7PV D-Y7□WV	2 (Different surfaces, Same surface), 1	10	65		75	80	90
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8-...) Note 1)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)		$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16-...) Note 2)

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

CVQ**CVQM****CVJ□****CVM□****CV3****CVS1****MVGQ****D-□****-X□**

Auto Switch Mounting 3

Operating Range

Auto switch model	(mm)				
	Bore size (mm)				
	40	50	63	80	100
D-A9□/A9□V	7	—	9	9	9
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4.5	5	5.5	5	6
D-Z7□/Z80	8	7	9	9.5	10.5
D-A3□/A44 D-A3□C/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□/J59 D-F5□W/J59W D-F5NT/F59F	4	4	4.5	4.5	4.5
D-G5□/K59 D-G5□W/K59W D-G5NT/G59F	5	6	6.5	6.5	7
D-G39/K39 D-G39C/K39C	9	9	10	10	11

* D-A9□ and D-A9□V types cannot be mounted on ø50.

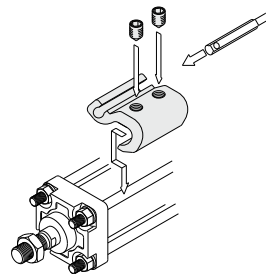
* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)

There may be the case it will vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket Part No.

<Tie-rod mounting style>

Auto switch model	Bore size (mm)				
	ø40	ø50	ø63	ø80	ø100
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	BA7-040	BA7-040	BA7-063	BA7-080	BA7-080
D-A5□/A6□/A59W D-F5□/J59/F5□W/J59W D-F5NT/F59F	BT-04	BT-04	BT-06	BT-08	BT-08
D-A3□C/A44C/G39C/K39C	BA3-040	BA3-050	BA3-063	BA3-080	BA3-100
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	BA4-040	BA4-040	BA4-063	BA4-080	BA4-080



<Band mounting style>

Auto switch model	Bore size (mm)				
	ø40	ø50	ø63	ø80	ø100
D-A3□/A44/G39/K39	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M
D-B5□/B64/B59W D-G5□/K59/G5□W/K59W D-G59F/G5NT	BA-04	BA-05	BA-06	BA-08	BA-10

* D-A9□ and D-A9□V types cannot be mounted on ø50.

* Auto switch mounting brackets are included in D-A3□C/A44C/G39C/K39C. When the auto switch mounting bracket is needed separately, order it with the above part number. When ordering an auto switch alone, specify it as shown below according to the cylinder size.

Ex.) ø40: D-A3□C-4, ø50: D-A3□C-5

ø63: D-A3□C-6, ø80: D-A3□C-8, ø100: D-A3□C-10

• Mounting example of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)

Other than the models listed in "How to Order", the following auto switches are applicable.
For detailed specifications, refer to pages 1893 to 2007.

Auto switch type	Model	Electrical entry (Fetching direction)	Features
Reed	D-A93V, A96V	Grommet (Perpendicular)	—
	D-A90V		Without indicator light
	D-A53, A56, B53, Z73, Z76	Grommet (In-line)	—
	D-A67, Z80		Without indicator light
Solid state	D-M9NV, M9PV, M9BV	Grommet (Perpendicular)	—
	D-Y69A, Y69B, Y7PV		—
	D-M9NWV, M9PWV, M9BWV		Diagnostic indication (2-color indication)
	D-Y7NWW, Y7PWW, Y7BWV		Water resistant (2-color indication)
	D-M9NAV, M9PAV, M9BAV	Grommet (In-line)	—
	D-Y59A, Y59B, Y7P		—
	D-F59, F5P, J59		—
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color indication)
	D-F59W, F5PW, J59W		With timer
	D-F5NT, G5NT		—

* With pre-wired connector is also available in solid state auto switches.
For details, refer to pages 1960 and 1961.

* Normally closed (NC = b contact), solid state auto switch (D-F9G/F9H/Y7G/Y7H type) are also available. For details, refer to pages 1911 and 1913.

* Wide range detection type, solid state auto switches (D-G5NB type) are also available. Refer to page 1953 for details.

CVQ

CVQM

CVJ

CVM

CV3

CVS1

MVGQ

D-

-X