

5 Port Solenoid Valve

New



RoHS

Reduced power consumption:

0.55 W [With power saving circuit]
1.55 W [Standard]
 (Conventional: 2.0 W) Note) With DC light

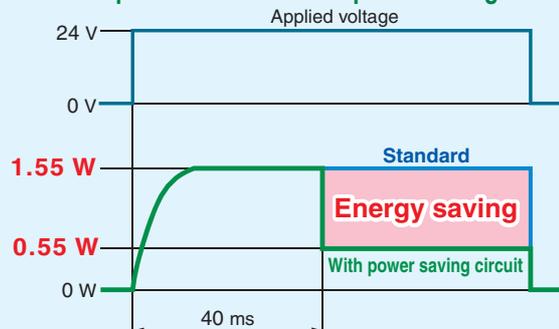


Series VF3000

Power consumption is reduced by power saving circuit.

Power consumption is decreased by approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 40 ms at 24 VDC.) Refer to electrical power waveform as shown below.

Electrical power waveform with power saving circuit



■ Built-in full-wave rectifier (AC)

● Noise reduction

Noise is considerably reduced by changing it to DC mode with a full-wave rectifier.

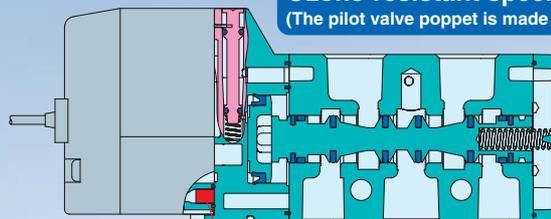
● Reduced apparent power

Conventional: 5.6 VA → 1.55 VA

■ Built-in strainer in the pilot valve

Unexpected troubles due to foreign matter can be prevented.
 Note) Be sure to mount an air filter on the inlet side.

Rubber material: HNBR
 Ozone-resistant specification
 (The pilot valve poppet is made of FKM)



Strainer



New Low wattage specification added
 * VF1000/3000

Power consumption **0.35 w** (Without light)
0.4 w (With light)



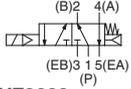
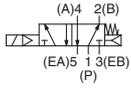
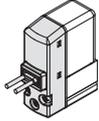
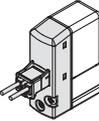
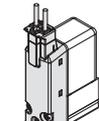
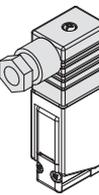
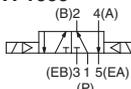
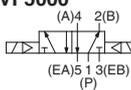
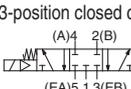
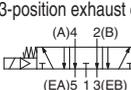
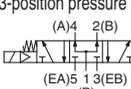
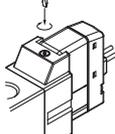
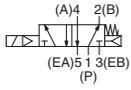
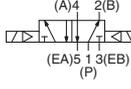
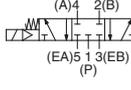
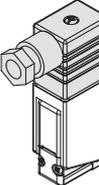
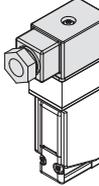
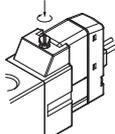
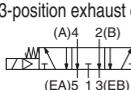
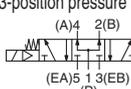
Series **VF1000/3000/5000**



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Model Selection by Operating Conditions 1

Single Unit

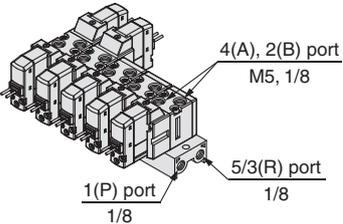
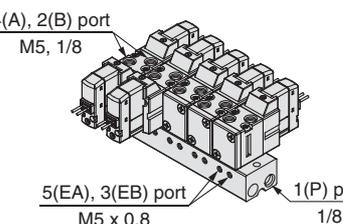
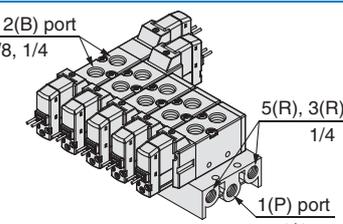
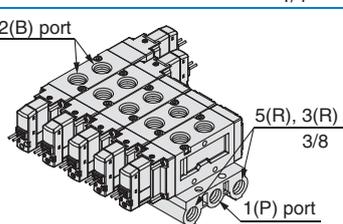
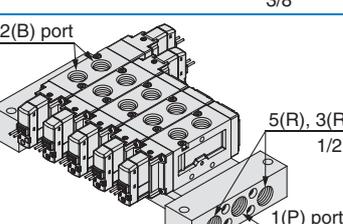
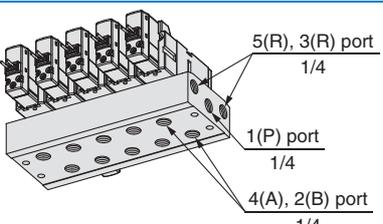
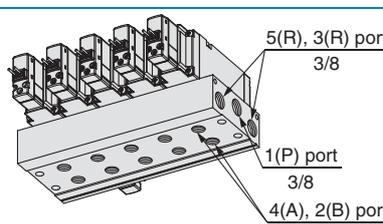
Series	Sonic conductance C [dm ³ /(s·bar)]	Type of actuation	Port size	Voltage	Electrical entry	Light/Surge voltage suppressor	Manual override
Body ported	VF1000 	2-position single VF1000  VF3000 VF5000 	M5 x 0.8 1/8	12 VDC 24 VDC 24 VAC 100 VAC 200 VAC 110 VAC 220 VAC 240 VAC	Grommet  L-type plug connector  M-type plug connector  DIN terminal 	DC ■ With surge voltage suppressor ■ With light/surge voltage suppressor ■ With surge voltage suppressor (Non-polar) ■ With light/surge voltage suppressor (Non-polar) AC ■ With light/surge voltage suppressor	Manual override
		2-position double VF1000  VF3000 VF5000 					
	3-position closed centre  3-position exhaust centre  3-position pressure centre 	1/4 3/8	Push-turn locking slotted type 				
Base mounted	VF3000 	2-position single  2-position double  3-position closed centre 	1/4 3/8	DIN (EN1753 01-803) terminal  Conduit terminal 	DC ■ With light/surge voltage suppressor	Push-turn locking lever type 	
		VF5000 					3-position exhaust centre  3-position pressure centre 
		9.4					

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Model Selection by Operating Conditions 2

Manifold

Series	EXH port type	Manifold base model	Applicable valve	Applicable stations
VF1000	Common EXH	VV5F1-30 	VF1□30 VF1□33	2 to 20 stations
	Individual EXH	VV5F1-31 		
VF3000	Common EXH	VV5F3-30 	VF3□30 VF3□33	2 to 20 stations
VF5000	Common EXH	VV5F5-20 	VF5□20 VF5□23	2 to 10 stations
	Common EXH	VV5F5-21 		2 to 15 stations
VF3000	Common EXH	VV5F3-40 	VF3□40 VF3□43	2 to 20 stations
VF5000	Common EXH	VV5F5-40 	VF5□44	2 to 10 stations

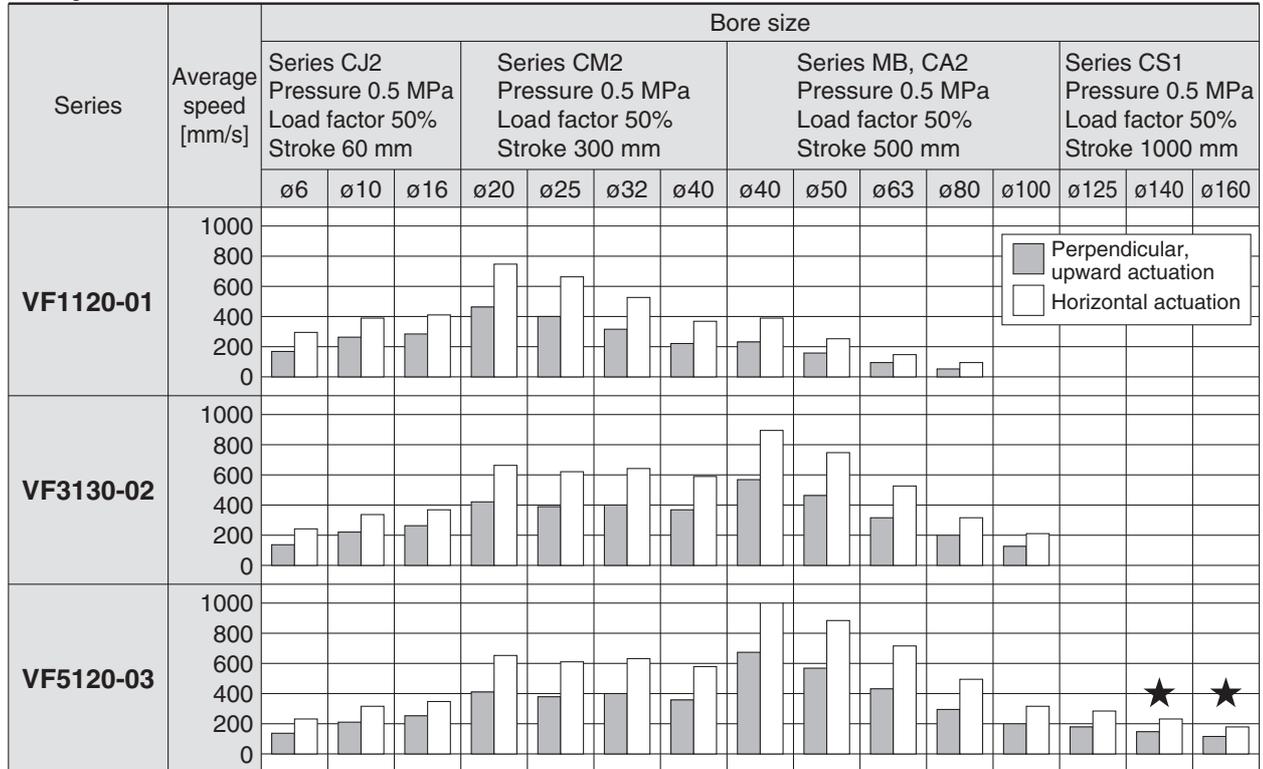
Body ported

Base mounted

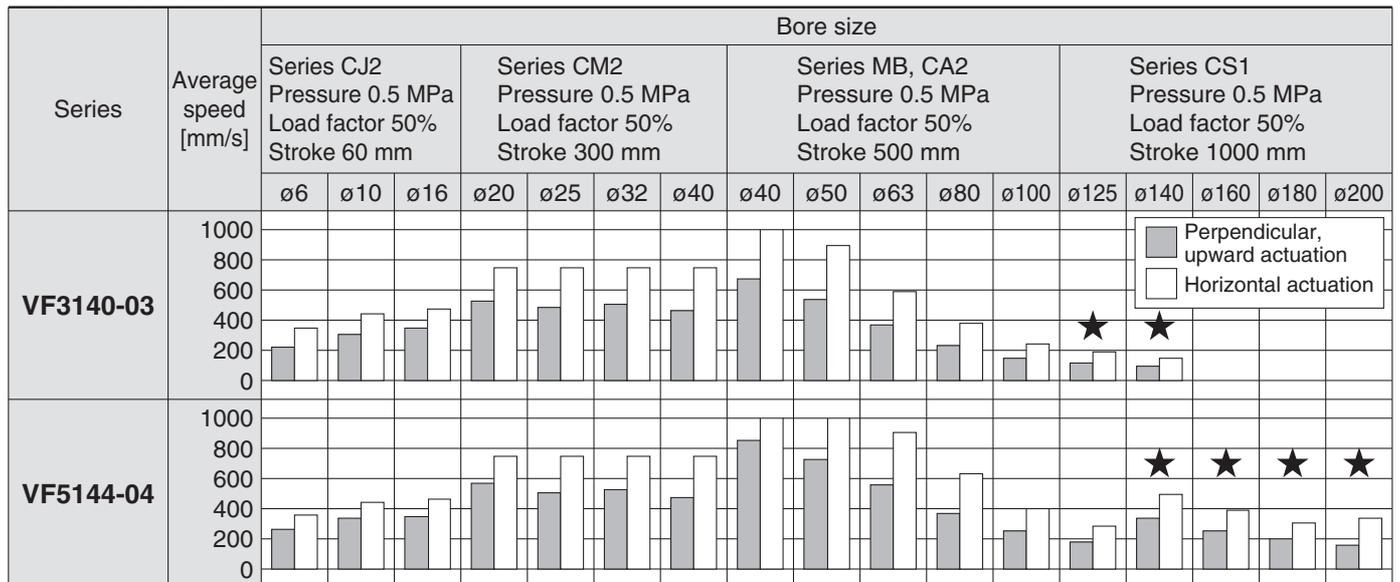
Cylinder Speed Chart 1

Use as a guide for selection.
Please check the actual conditions with SMC
Model Selection Program.

Body Ported



Base Mounted



Cylinder Speed Chart 2

Use as a guide for selection.
Please check the actual conditions with SMC
Model Selection Program.

Conditions

Body Ported

Body ported		Series CJ2	Series CM2	Series MB, CA2	Series CS1
VF1120-01	Tubing x Length	T0604 x 1 m	T0806 x 1 m		—
	Speed controller	AS3002F-06	AS3002F-08		—
	Silencer	AN101-01			—
VF3130-02	Tubing x Length	T0604 x 1 m	T1075 x 1 m		—
	Speed controller	AS3002F-06	AS4002F-10		—
	Silencer	AN110-01			—
VF5120-03	Tubing x Length	T0604 x 1 m	T1075 x 1 m	T1209 x 1 m	
	Speed controller	AS3002F-06	AS4002F-10	AS4002F-12	
	Silencer	AN30-03			AN302-03

Body Ported [when using SGP (Steel Piping)]

Body ported		Series CS1
VF5120-03	Tubing x Length	SGP10A x 1 m
	Speed controller	AS420-03
	Silencer	AN30-03

Base Mounted

Base mounted		Series CJ2	Series CM2	Series MB, CA2	Series CS1
VF3140-03	Tubing x Length	T0604 x 1 m	T1075 x 1 m	T1209 x 1 m	—
	Speed controller	AS3002F-06	AS4002F-10	AS4002F-12	—
	Silencer	AN30-03			—
VF5144-04	Tubing x Length	T0604 x 1 m	T1075 x 1 m	T1209 x 1 m	
	Speed controller	AS3002F-06	AS4002F-10	AS4002F-12	
	Silencer	AN40-04			

Base Mounted [when using SGP (Steel Piping)]

Base mounted		Series CS1
VF3140-03	Tubing x Length	SGP10A x 1 m
	Speed controller	AS420-03
	Silencer	AN30-03
VF5144-04	Tubing x Length	SGP15A x 1 m
	Speed controller	AS420-04
	Silencer	AN40-04

Pilot Operated 5 Port Solenoid Valve

Series VF1000/3000/5000

Single Unit

Body Ported



Note) Only DIN and conduit terminal types are available with AC mode. Refer to the electrical entry for details.



How to Order Valve

Body ported **VF 3 1 3 0** **- 5 G** **1-01**

Series

1	VF1000
3	VF3000
5	VF5000

Type of actuation

1	2-position single
2	2-position double
3	3-position closed centre
4	3-position exhaust centre
5	3-position pressure centre

Note) Only 1 and 2 are available with the VF1000.

Body model

Symbol	VF1000	VF3000	VF5000
2	○	—	○
3	—	○	—

Pressure specifications

—	Standard (0.7 MPa)
K	High-pressure type (1 MPa)

Body option

0: Pilot valve individual exhaust

PE port Note) EA/EB port

VF1000	VF3000	VF5000
○	○	○

3: Main/Pilot valve common exhaust

PE port EA/EB port

VF1000	VF3000	VF5000
—	○	○

Coil specifications

—	Standard
T	With power saving circuit (DC only)

Note 1) Be sure to select the power saving circuit type when it is continuously energized for long periods of time. (Refer to page 51 for details.)

Note 2) T type is available with DC mode only. When T is selected, only Z type of light/surge voltage suppressor is available. (Note that when the electrical entry of DIN terminal type without connector is selected, only DOS and YOS options are available.)

Rated voltage

DC		AC (50/60 Hz)	
5	24 VDC	1	100 VAC
6	12 VDC	2	200 VAC
		3	110 VAC [115 VAC]
		4	220 VAC [230 VAC]
		7	240 VAC
		B	24 VAC

Note) Refer to "Made to Order" (Page 14) when piping to PE port is required.

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Note) M5 is only available with "—" option.

Bracket

—	Without bracket
F	With bracket

VF1000/3000 Single type (The bracket cannot be connected after delivered.)

VF1000 Double type only

Note) Not available with the VF5000.

Made to Order

—	—
X500	Pilot exhaust port with piping thread (M3) specification (Refer to page 14.)
X600	TRIAC output specification (Refer to page 14.)

A, B port size

Symbol	Port size	VF1000	VF3000	VF5000
M5	M5 x 0.8	○	—	—
01	1/8	○	○	—
02	1/4	—	○	○
03	3/8	—	—	○

Electrical entry

	Grommet	L-type plug connector	M-type plug connector	DIN terminal	DIN (EN175301-803) terminal	Conduit terminal
	G: Lead wire length 300 mm H: Lead wire length 600 mm	L: With lead wire (length 300 mm)	M: With lead wire (length 300 mm)	D: With connector	Y: With connector	T: Conduit terminal
	G: Lead wire length 300 mm H: Lead wire length 600 mm DC Without light/surge voltage suppressor	LN: Without lead wire	MN: Without lead wire	DO: Without connector	YO: Without connector	
		LO: Without connector	MO: Without connector			
DC	●	●	●	●	●	●
AC (Note 5)	—	—	—	●	●	●

Manual override

—: Non-locking push type	D: Push-turn locking slotted type	E: Push-turn locking lever type

Light/Surge voltage suppressor

Symbol	Light/Surge voltage suppressor	DC	AC
—	Without light/surge voltage suppressor	○	○
S	With surge voltage suppressor	○	— (Note 1)
Z	With light/surge voltage suppressor	○	○
R	With surge voltage suppressor (Non-polar)	○	—
U	With light/surge voltage suppressor (Non-polar)	○	—

Note 1) S type is not available with AC mode, since a rectifier prevents surge voltage generation.

Note 2) In the DIN terminal type, since a light is installed in the connector, DOZ, DOU, YOZ, YOU options are not available.



Caution
When using the surge voltage suppressor type, residual voltage will remain. Refer to page 51 for details.

Note 1) LN and MN types are with 2 sockets.

Note 2) Refer to page 49 when different length of lead wire for L/M-type plug connector is required.

Note 3) Refer to page 50 for details on the DIN (EN175301-803) terminal.

Note 4) When using IP65, select the main/pilot valve common exhaust type. (Except VF1000)

Note 5) With the same specifications as the DC type, all electrical entries for the 24 VAC type are available.

Pilot Operated 5 Port Solenoid Valve *Series VF1000/3000/5000*

Body Ported/Single Unit



Specifications

Model		VF1000	VF3000	VF5000
Fluid		Air		
Operating pressure range [MPa]	Standard	2-position single/3-position	0.15 to 0.7	
		2-position double	0.1 to 0.7	
	High-pressure type	2-position single/3-position	0.15 to 1.0	
		2-position double	0.1 to 1.0	
Ambient and fluid temperature [°C]		-10 to 50 (No freezing)		
Max. operating frequency [Hz]	2-position single/double	10	10	5
	3-position	—	3	3
Manual override		Non-locking push type Push-turn locking slotted type Push-turn locking lever type		
Pilot exhaust type		Individual exhaust, Main/Pilot valve common exhaust (Except VF1000)		
Lubrication		Not required		
Mounting orientation		Unrestricted		
Impact/Vibration resistance [m/s²] <small>Note 1)</small>		300/50		
Enclosure		Dustproof (IP65 <small>Note 2)</small> for D, Y, T)		

Note 1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 2) Based on IEC 60529. When using IP65, select the main/pilot valve common exhaust type.



Made to Order
(Refer to page 14 for details.)

Symbol	Specification
X500	Pilot exhaust port with piping thread (M3) specification
X600	TRIAC output specification

Solenoid Specifications

Electrical entry		Grommet (G), (H) L-type plug connector (L) M-type plug connector (M)	DIN terminal (D) DIN (EN175301-803) terminal (Y) Conduit terminal (T)	
		G, H, L, M	D, Y, T	
Coil rated voltage [V]	DC	24, 12		
	AC (50/60 Hz)	—	24, 100, 110, 200, 220, 240	
Allowable voltage fluctuation		±10% of rated voltage <small>Note 1,2,3)</small>		
Power consumption [W]	DC	Standard	1.5 (With light: 1.55)	
		With power saving circuit	0.55 (With light only)	
Apparent power [VA]	AC	24 V	1.5 (With light: 1.55)	
		100 V	1.55 (With light: 1.65)	
		110 V [115 V]		1.55 (With light: 1.7)
		200 V		
		220 V [230 V]		
240 V				
Surge voltage suppressor		Diode (Non-polar type: Varistor)		
Indicator light		LED (Neon light is used for AC mode of D, Y, T.)		

Note 1) It is in common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

Note 2) Allowable voltage fluctuation is -15% to +5% of the rated voltage for 115 VAC or 230 VAC.

Note 3) Since voltage drops due to the internal circuit in S, Z, T types (with power saving circuit), the allowable voltage fluctuation should be within the following range.

24 VDC: -7% to +10%
12 VDC: -4% to +10%

Response Time

Series	Type of actuation	Pressure specifications	Operating pressure range [MPa]	Response time [ms] (at 0.5 MPa)			
				Without light/surge voltage suppressor	With light/surge voltage suppressor		AC
					S, Z type	R, U type	
VF1000	2-position	Standard	0.15 to 0.7	20	45	23	45
			0.1 to 0.7	12	12	12	
		High-pressure type	0.15 to 1.0	23	48	26	48
			0.1 to 1.0	15	15	15	15
VF3000	2-position	Standard	0.15 to 0.7	20	45	23	45
			0.1 to 0.7	12	12	12	
	3-position	Standard	0.15 to 0.7	30	55	33	55
			0.15 to 1.0	23	48	26	48
	2-position	High-pressure type	0.1 to 1.0	15	15	15	15
			0.15 to 1.0	33	58	36	58
VF5000	2-position	Standard	0.15 to 0.7	30	55	33	55
			0.1 to 0.7	15	15	15	15
	3-position	Standard	0.15 to 0.7	50	75	53	75
			0.15 to 1.0	33	58	36	58
	2-position	High-pressure type	0.1 to 1.0	18	18	18	18
			0.15 to 1.0	53	78	56	78

Note) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage)

Series VF1000/3000/5000

Flow-rate Characteristics/Weight

Valve model	Type of actuation		Port size		Flow-rate characteristics ^{Note 1)}								Weight [g] ^{Note 2)}	
			1, 4, 2 (P, A, B)	5, 3 (EA, EB)	1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)					
					C [dm ³ / (s/bar)]	b	Cv	Q [l/min] (ANR) ^{Note 3)}	C [dm ³ / (s/bar)]	b	Cv	Q [l/min] (ANR) ^{Note 3)}	Grommet	DIN terminal
VF1□20-M5	2-position	Single	M5 x 0.8		0.49	0.40	0.13	133	0.52	0.35	0.13	137	140	176
		Double			0.49	0.40	0.13	133	0.52	0.35	0.13	137	200	272
VF1□20-01	2-position	Single	1/8	M5 x 0.8	0.76	0.22	0.17	184	0.53	0.28	0.13	133	136	172
		Double			0.76	0.22	0.17	185	0.53	0.28	0.13	133	196	268
VF3□30-01	2-position	Single	1/8		3.0	0.38	0.78	805	2.8	0.30	0.67	712	182	218
		Double			3.0	0.38	0.78	805	2.8	0.30	0.67	712	243	315
	3-position	Closed centre			2.4	0.31	0.64	614	1.8	0.37	0.46	479	260	332
		Exhaust centre			2.6	0.37	0.70	692	3.0 [2.5]	0.32 [0.28]	0.76 [0.62]	773 [628]	260	332
		Pressure centre			3.0 [1.4]	0.42 [0.44]	0.83 [0.39]	828 [392]	2.4	0.27	0.59	599	260	332
VF3□30-02	2-position	Single	1/4	1/8	4.0	0.36	1.0	1058	3.1	0.32	0.75	798	178	214
		Double			4.0	0.36	1.0	1058	3.1	0.32	0.75	798	239	311
	3-position	Closed centre			2.4	0.45	0.68	678	1.9	0.37	0.47	506	256	328
		Exhaust centre			3.0	0.42	0.82	828	3.1 [2.7]	0.36 [0.29]	0.79 [0.66]	820 [682]	256	328
		Pressure centre			5.5 [1.4]	0.37 [0.50]	1.4 [0.40]	1465 [412]	2.6	0.32	0.64	670	256	328
VF5□20-02	2-position	Single	1/4		7.1	0.46	1.9	2021	7.7	0.51	2.2	2282	313	349
		Double			7.1	0.46	1.9	2021	7.7	0.51	2.2	2282	368	440
	3-position	Closed centre			6.7	0.46	1.8	1907	6.6	0.41	1.8	1880	406	478
		Exhaust centre			7.1	0.42	1.9	1960	8.0 [7.4]	0.45 [0.47]	2.2 [2.1]	2259 [2123]	406	478
		Pressure centre			6.8 [2.7]	0.51 [0.50]	2.0 [0.78]	2016 [794]	5.7	0.37	1.4	1518	406	478
VF5□20-03	2-position	Single	3/8		8.8	0.44	2.4	2466	10.0	0.49	2.9	2915	299	335
		Double			8.8	0.44	2.4	2466	10.0	0.49	2.9	2915	354	426
	3-position	Closed centre			7.5	0.43	2.0	2086	7.5	0.38	1.9	2011	391	463
		Exhaust centre			8.3	0.40	2.2	2258	10.0 [8.7]	0.48 [0.46]	3.0 [2.4]	2892 [2476]	391	463
		Pressure centre			9.2 [3.0]	0.50 [0.49]	2.6 [0.85]	2704 [875]	6.1	0.35	1.6	1603	391	463

Note 1) []: Normal position

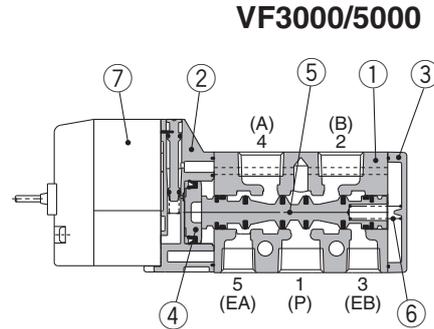
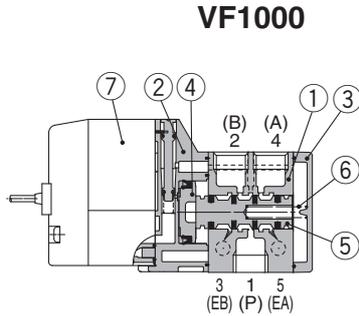
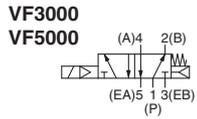
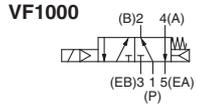
Note 2) Values without bracket

Note 3) These valves have been calculated according to ISO6358 and indicate the flow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

Construction: Body Ported

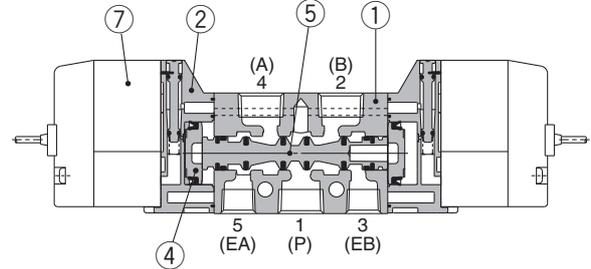
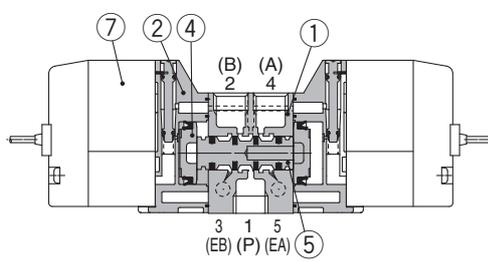
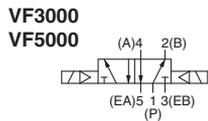
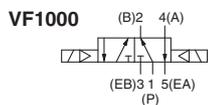
2-position single

Symbol
2-position single



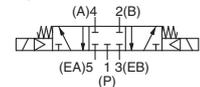
2-position double

Symbol
2-position double

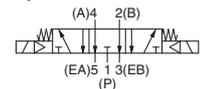


3-position closed centre/exhaust centre/pressure centre

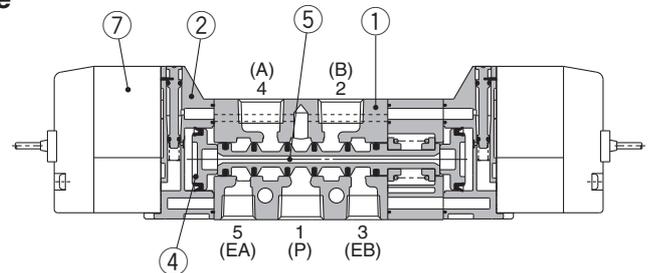
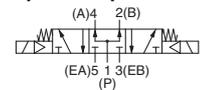
Symbol
3-position closed centre



3-position exhaust centre



3-position pressure centre



(Drawing shows a closed centre type.)

Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted	White
2	Adapter plate	Resin	Gray
3	End plate	Resin (VF313□-F: Aluminum die-casted) VF1120-F)	White
4	Piston	Resin	
5	Spool valve	Aluminum, HNBR	
6	Spring	Stainless steel	

Replacement Parts

No.	Description	Part no.	Note
7	Pilot valve assembly	Refer to "How to Order Pilot Valve Assembly" on page 5.	Built-in strainer

Bracket Assembly Part No.

Description	Part no.
Bracket (for VF1000 double)	DXT144-8-1A (With 2 mounting screws)

Series VF1000/3000/5000

How to Order Pilot Valve Assembly (With a gasket and two mounting screws)

⚠ Caution

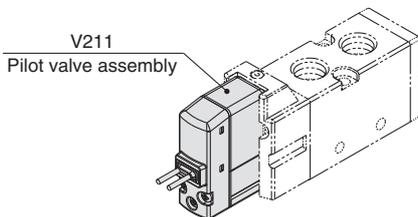
When only the pilot valve assembly is replaced, it is not possible to change from V211 (Grommet or L/M-type) to V212 (DIN or Conduit type), or vice versa.

Valve model: VF□□□□□□ - 5 G Z □ 1 - □□□

Note) Select from below in accordance with the valve used.

■ Grommet or L/M-type

V 2 1 1 □ □ - 5 G Z



● Light/Surge voltage suppressor

		DC	AC
—	Without light/surge voltage suppressor	○	○
S	With surge voltage suppressor	○	— ^{Note)}
Z	With light/surge voltage suppressor	○	○
R	With surge voltage suppressor (Non-polar)	○	—
U	With light/surge voltage suppressor (Non-polar)	○	—

Note) S type is not available with AC mode, since a rectifier prevents surge voltage generation. When T is selected, only Z type of light/surge voltage suppressor is available.

⚠ Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to page 51 for details.

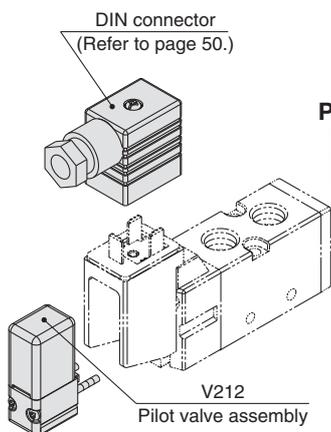
● Electrical entry

G	Grommet (Lead wire length 300 mm)	
H	Grommet (Lead wire length 600 mm)	
L	L-type plug connector	With lead wire
LN		Without lead wire
LO		Without connector
M	M-type plug connector	With lead wire
MN		Without lead wire
MO		Without connector

Note 1) LN and MN types are with 2 sockets.

Note 2) Refer to page 49 when different length of lead wire for L/M-type plug connector is required.

■ DIN or Conduit type



V 2 1 2 □ □ - 5

● Pressure specifications

—	Standard (0.7 MPa)
K	High-pressure type (1 MPa)

● Coil specifications

—	Standard
T	With power saving circuit (DC only)

Note) T type is available with DC mode only.

● Rated voltage

DC

5	24 VDC
6	12 VDC

AC (50/60 Hz)

1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]
7	240 VAC
B	24 VAC

⚠ Caution

For V212 (DIN or Conduit type), the coil specifications and voltage (including light/surge voltage suppressor) cannot be changed by replacing the pilot valve assembly.

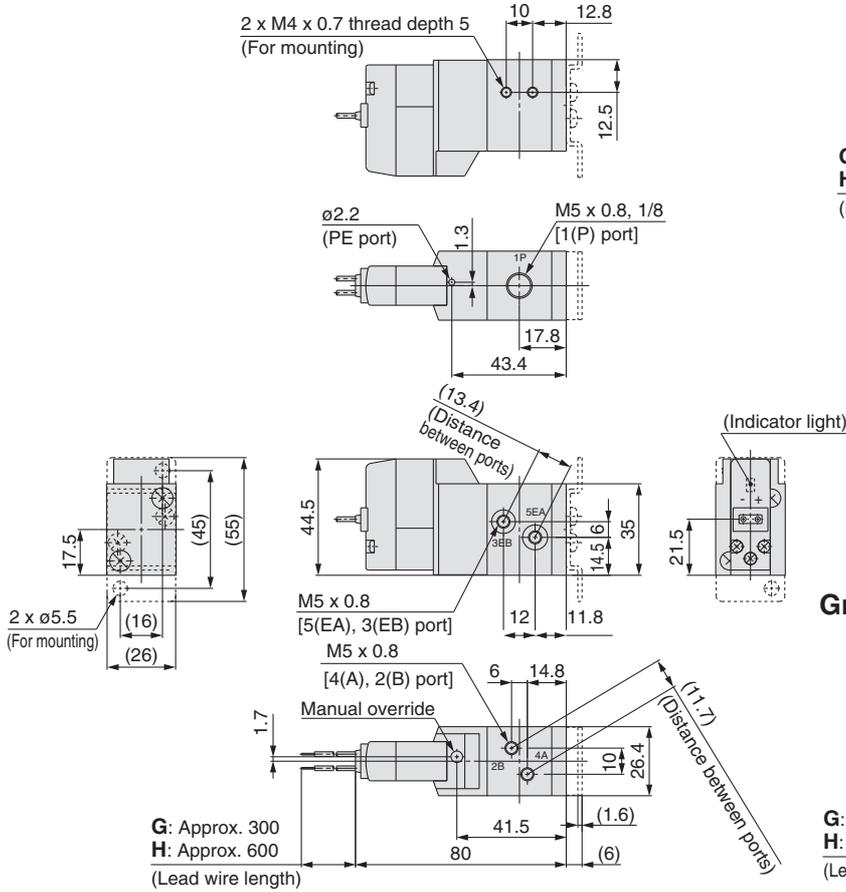
⚠ Caution

Tightening torque of the pilot valve assembly mounting screw
M2.5: 0.32 N·m

Dimensions: Series VF1000/Body Ported

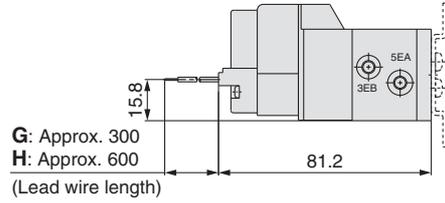
2-position single

Grommet (G) (H): VF1120-□_G□□1-M5□(-F)

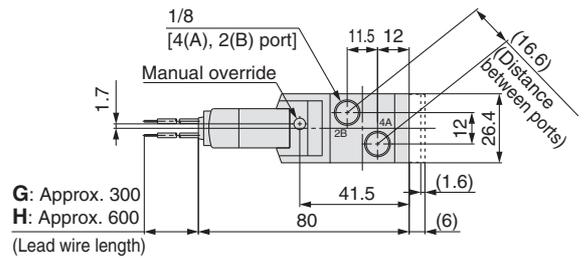


Grommet (G) (H)

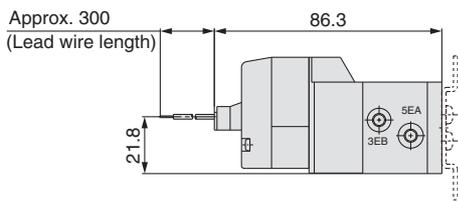
DC without light/surge voltage suppressor



Grommet (G) (H): VF1120-□_G□□1-01□(-F)

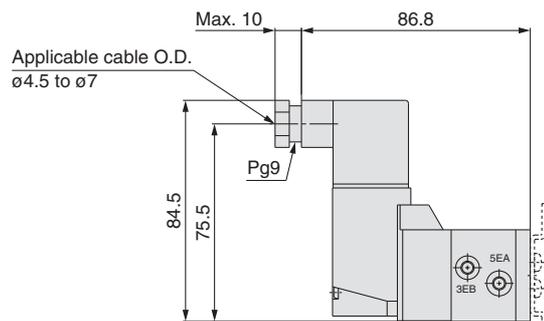


L-type plug connector (L): VF1120-□_L□□1-M5₀₁□(-F)



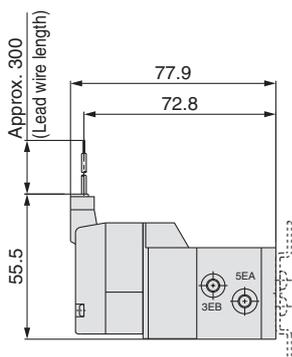
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF1120-□_D□□1-M5₀₁□(-F)



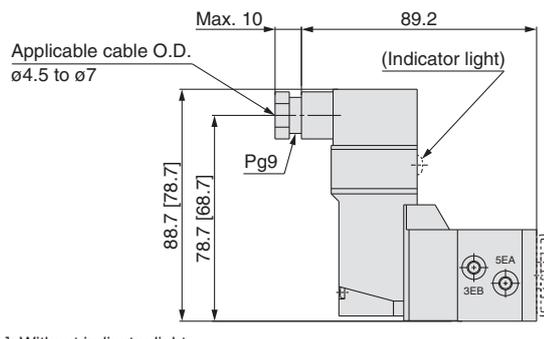
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF1120-□_M□□1-M5₀₁□(-F)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF1120-□_T□□1-M5₀₁□(-F)



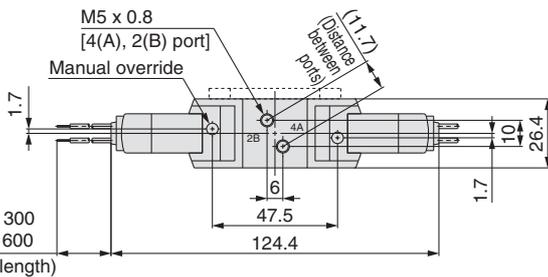
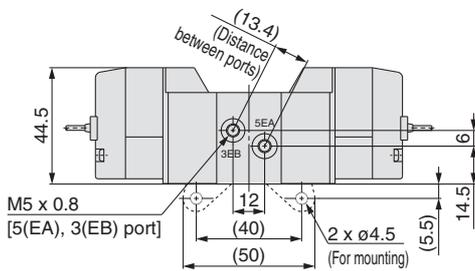
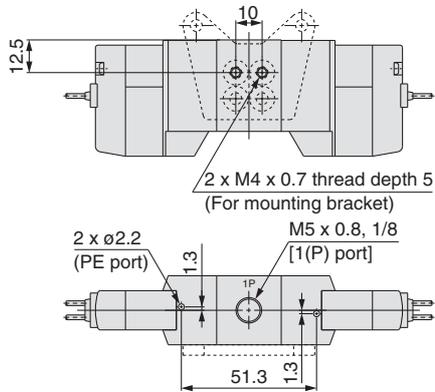
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

Dimensions: Series VF1000/Body Ported

2-position double

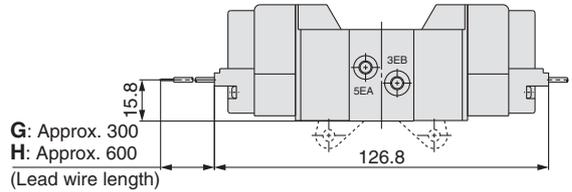
Grommet (G) (H): VF1220-□_G□□1-M5□



G: Approx. 300
H: Approx. 600
(Lead wire length)

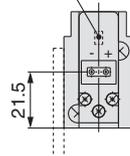
Grommet (G) (H)

DC without light/surge voltage suppressor

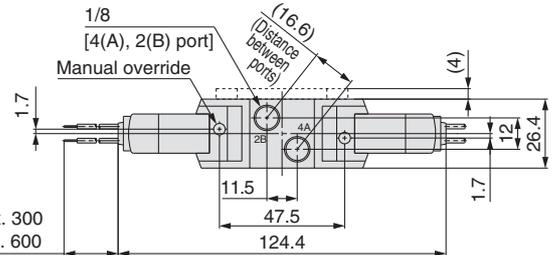


G: Approx. 300
H: Approx. 600
(Lead wire length)

(Indicator light)

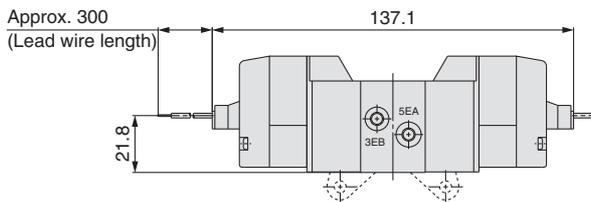


Grommet (G) (H): VF1220-□_G□□1-01□



G: Approx. 300
H: Approx. 600
(Lead wire length)

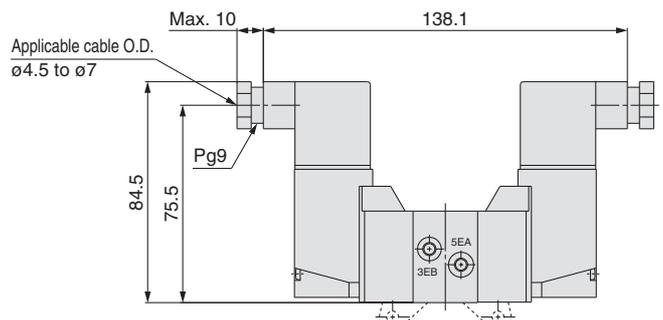
L-type plug connector (L): VF1220-□_L□□1-M5₀₁□



Approx. 300
(Lead wire length)

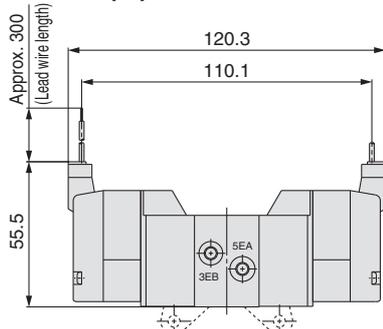
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF1220-□_D□□1-M5₀₁□



Unless otherwise indicated, dimensions are the same as Grommet (G).

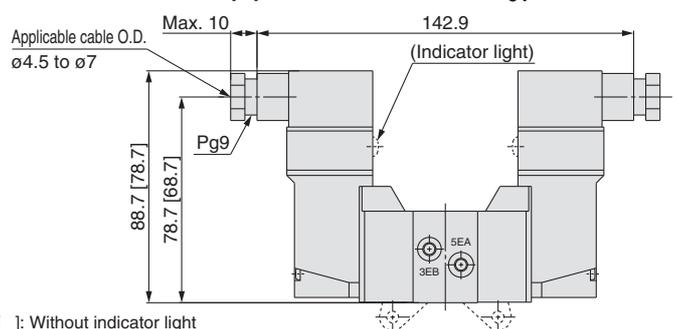
M-type plug connector (M): VF1220-□_M□□1-M5₀₁□



Approx. 300
(Lead wire length)

Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF1220-□_T□□1-M5₀₁□

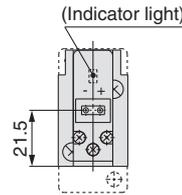
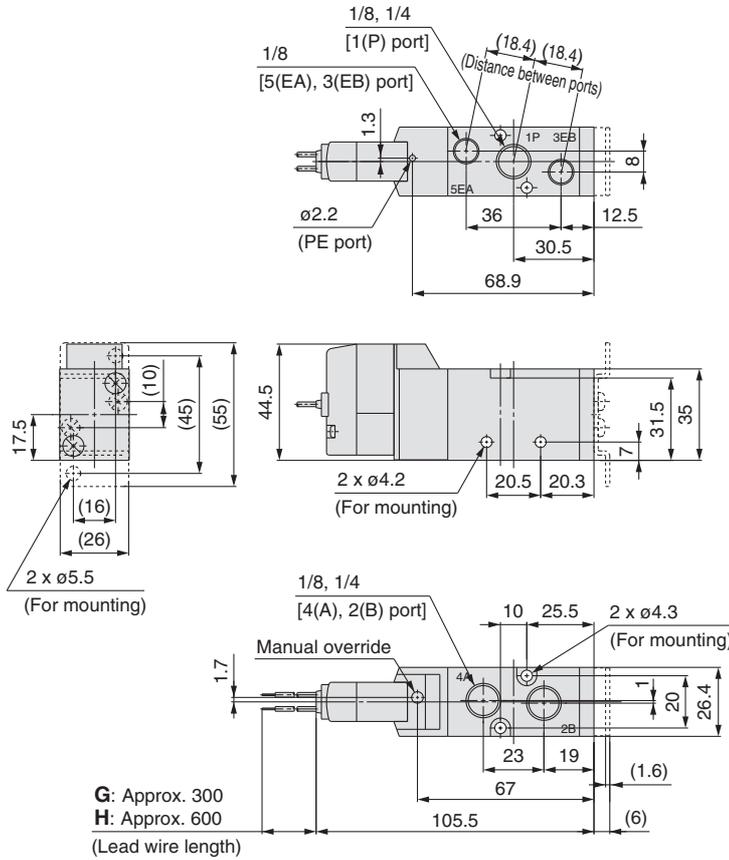


[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

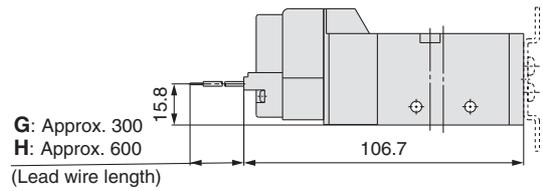
Dimensions: Series VF3000/Body Ported

2-position single

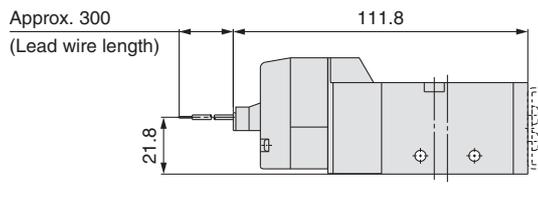
Grommet (G) (H): VF3130-□_G□□1-01□ (-F)



Grommet (G) (H)
DC without light/surge voltage suppressor

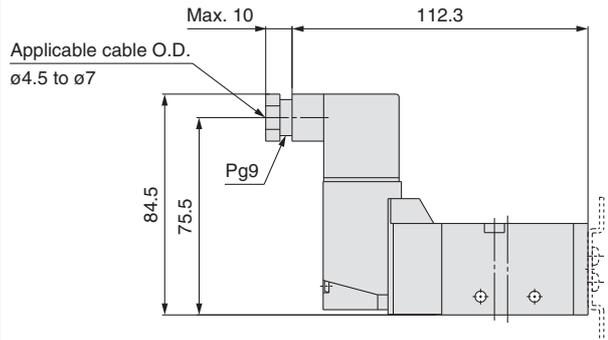


L-type plug connector (L): VF3130-□L□□1-01□ (-F)



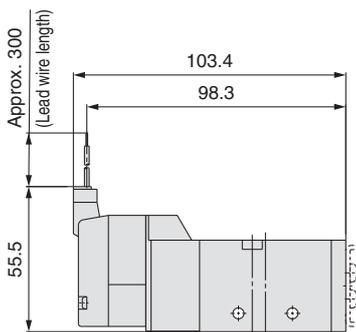
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF3130-□_D□□1-01□ (-F)



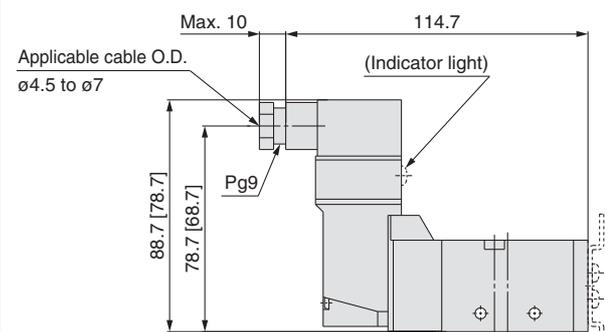
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF3130-□M□□1-01□ (-F)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF3130-□T□□1-01□ (-F)

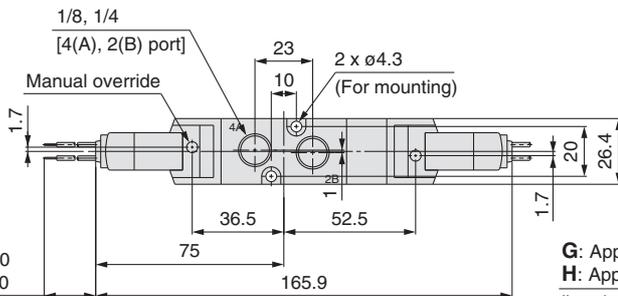
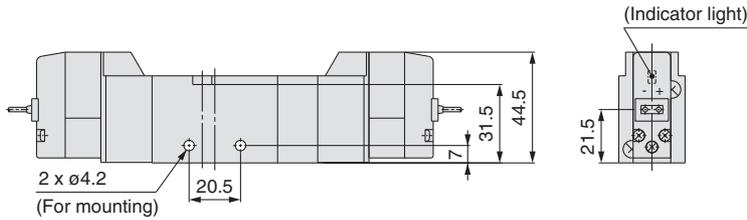
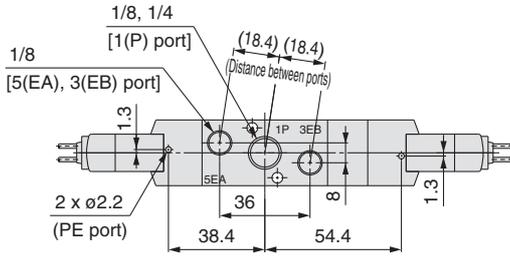


[]: Without indicator light
 Unless otherwise indicated, dimensions are the same as Grommet (G).

Dimensions: Series VF3000/Body Ported

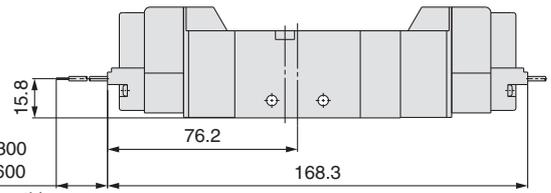
3-position closed centre/exhaust centre/pressure centre

Grommet (G) (H): VF3³₄30-□^G□□1-01□₅



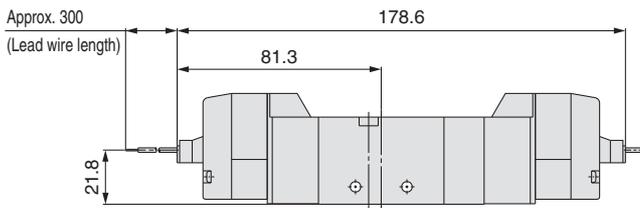
G: Approx. 300
H: Approx. 600
(Lead wire length)

Grommet (G) (H)
DC without light/surge voltage suppressor



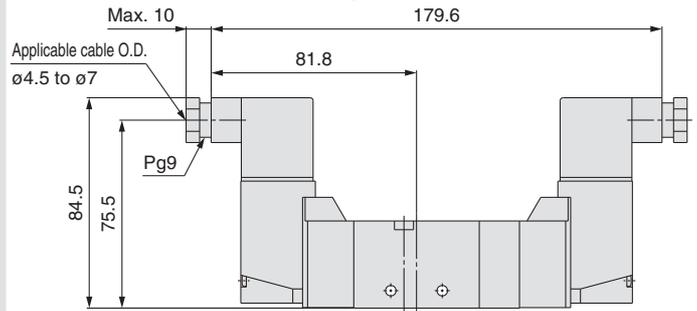
G: Approx. 300
H: Approx. 600
(Lead wire length)

L-type plug connector (L): VF3³₄30-□L□□1-01□₅



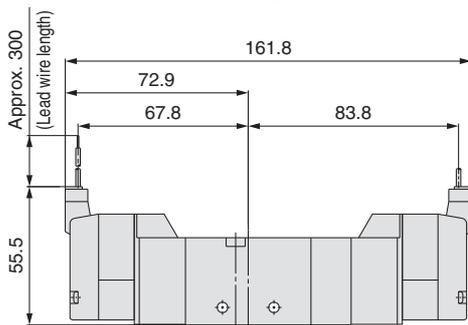
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF3³₄30-□^D□□1-01□₅



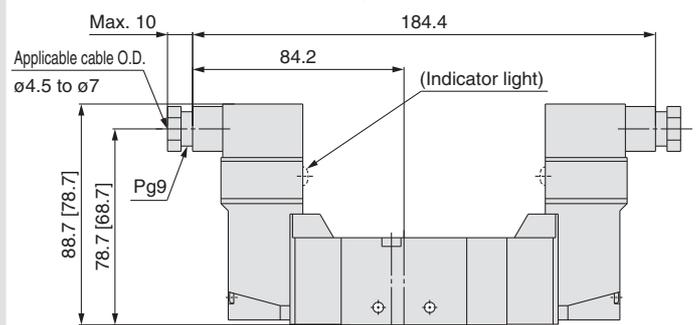
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF3³₄30-□M□□1-01□₅



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF3³₄30-□T□□1-01□₅



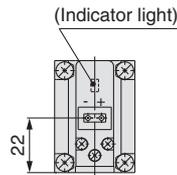
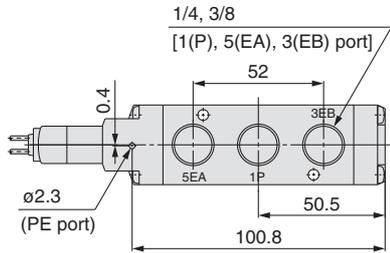
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

Dimensions: Series VF5000/Body Ported

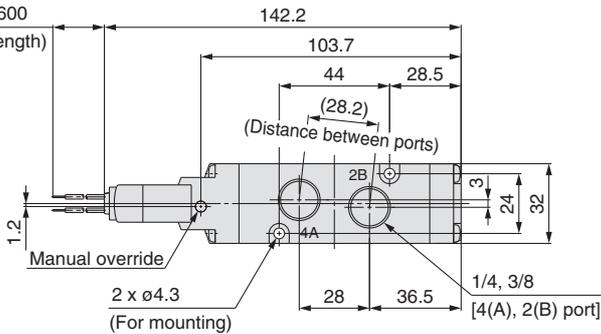
2-position single

Grommet (G) (H): VF5120-□^G_H□□1-02□



G: Approx. 300
H: Approx. 600

(Lead wire length)

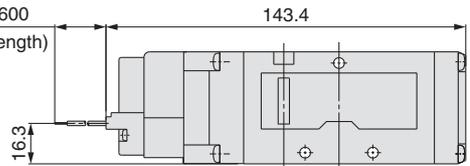


Grommet (G) (H)

DC without light/surge voltage suppressor

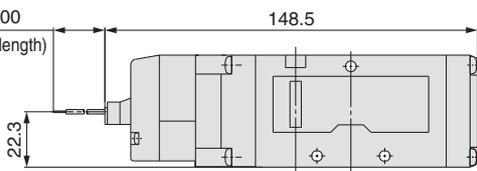
G: Approx. 300
H: Approx. 600

(Lead wire length)



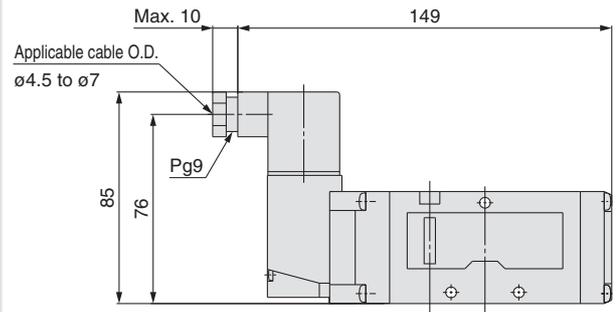
L-type plug connector (L): VF5120-□L□□1-02□

Approx. 300
(Lead wire length)



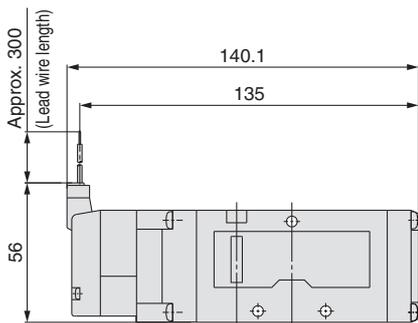
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF5120-□^D_Y□□1-02□



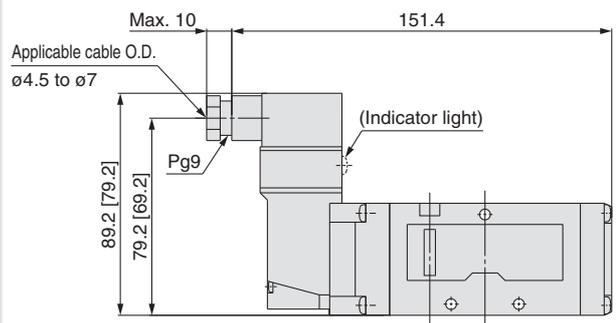
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF5120-□M□□1-02□



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF5120-□T□□1-02□



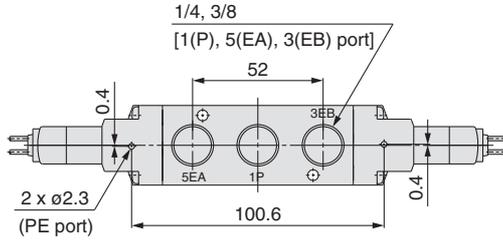
[]: Without indicator light

Unless otherwise indicated, dimensions are the same as Grommet (G).

Dimensions: Series VF5000/Body Ported

2-position double

Grommet (G) (H): VF5220-□^G□□1-02□



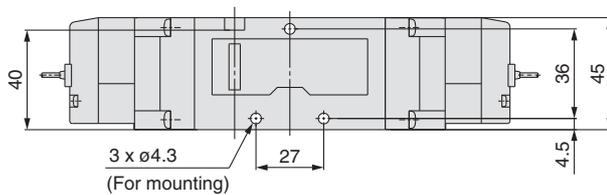
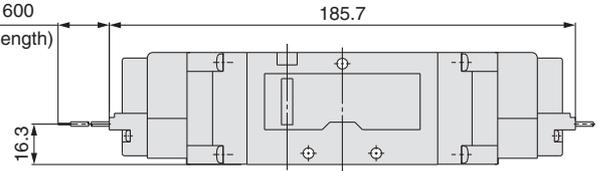
Grommet (G) (H)

DC without light/surge voltage suppressor

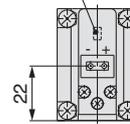
G: Approx. 300

H: Approx. 600

(Lead wire length)



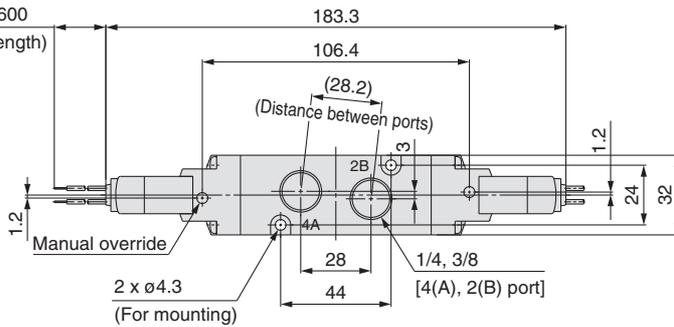
(Indicator light)



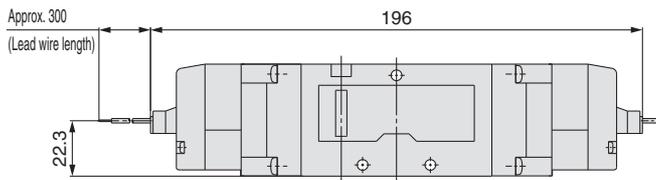
G: Approx. 300

H: Approx. 600

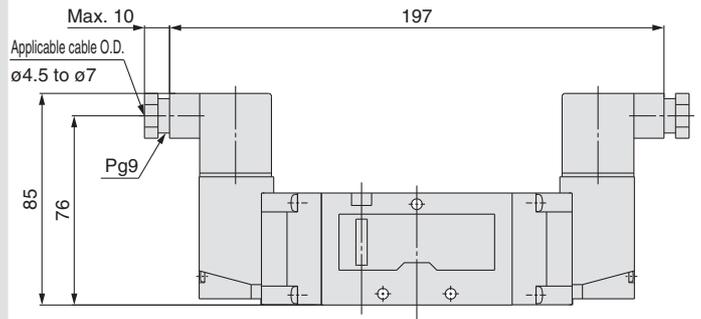
(Lead wire length)



L-type plug connector (L): VF5220-□L□□1-02□



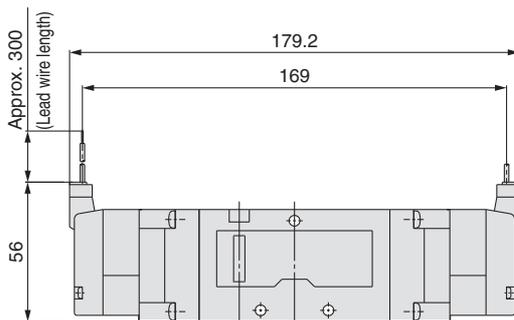
DIN terminal (D) (Y): VF5220-□^D□□1-02□



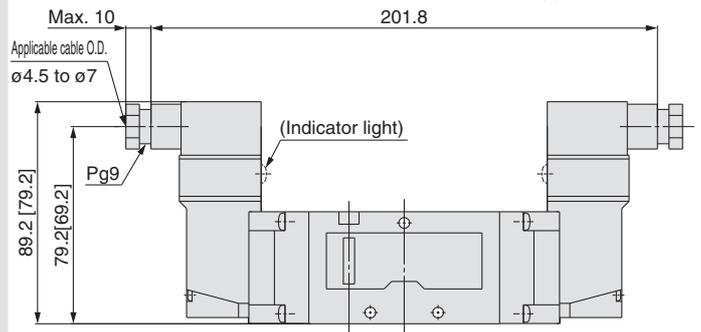
Unless otherwise indicated, dimensions are the same as Grommet (G).

Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF5220-□M□□1-02□



Conduit terminal (T): VF5220-□T□□1-02□



Unless otherwise indicated, dimensions are the same as Grommet (G).

[]: Without indicator light

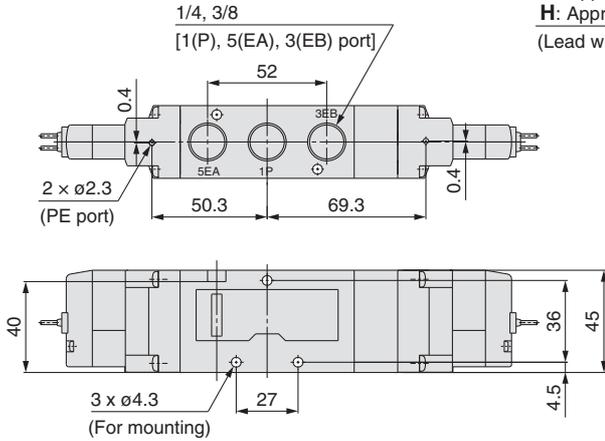
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

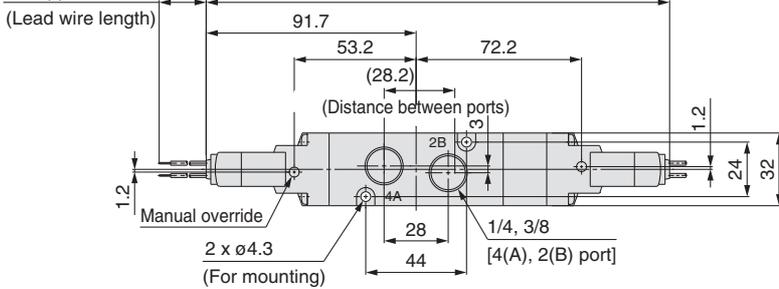
Dimensions: Series VF5000/Body Ported

3-position closed centre/exhaust centre/pressure centre

Grommet (G) (H): VF5 $\frac{3}{4}$ 20-□ $\frac{G}{H}$ □□1-0 $\frac{2}{03}$ □



G: Approx. 300
H: Approx. 600

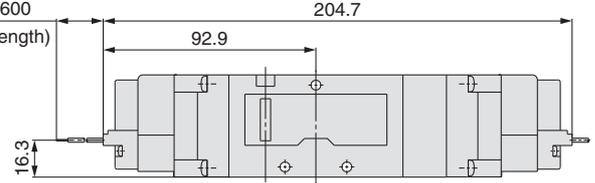


Grommet (G) (H)

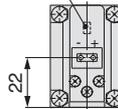
DC without light/surge voltage suppressor

G: Approx. 300
H: Approx. 600

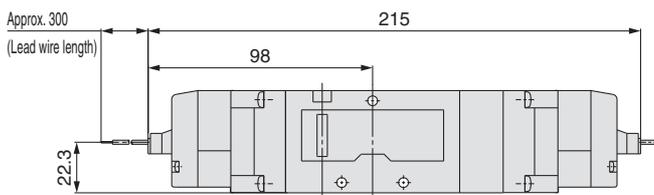
(Lead wire length)



(Indicator light)

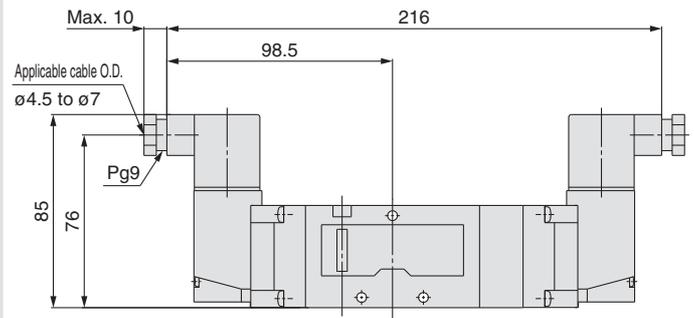


L-type plug connector (L): VF5 $\frac{3}{4}$ 20-□L□□1-0 $\frac{2}{03}$ □



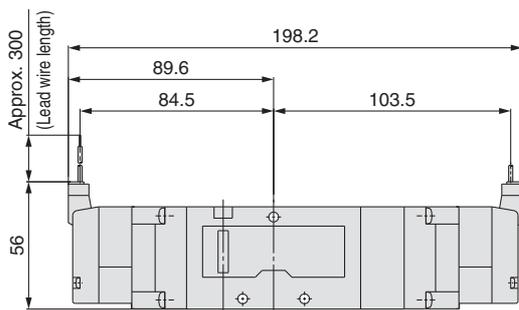
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF5 $\frac{3}{4}$ 20-□ $\frac{D}{Y}$ □□1-0 $\frac{2}{03}$ □



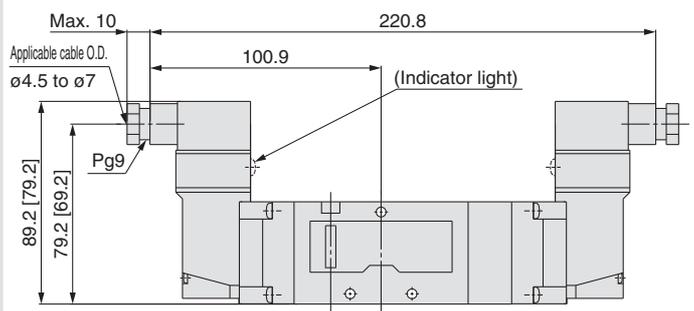
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF5 $\frac{3}{4}$ 20-□M□□1-0 $\frac{2}{03}$ □



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF5 $\frac{3}{4}$ 20-□T□□1-0 $\frac{2}{03}$ □



[]: Without indicator light

Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

Made to Order

Please contact SMC for detailed dimensions, specifications, and lead times.



1 Body Ported Pilot Exhaust Port with Piping Thread (M3) Specification

In this specification, piping to the pilot exhaust port (PE port) is available when the valve is used in an environment where the exhaust from the pilot valve is not allowable, or intrusion of ambient dust should be prevented. Combination with low wattage specification is not possible.

How to Order Valve

VF 3 **3 0** - **1** - - - **X500**

Series

1	VF1000
3	VF3000
5	VF5000

Type of actuation

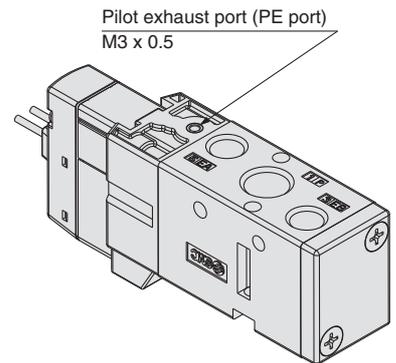
1	2-position single
2	2-position double
3	3-position closed centre
4	3-position exhaust centre
5	3-position pressure centre

Body model

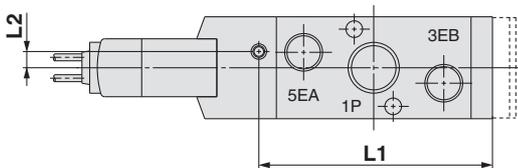
Symbol	VF1000	VF3000	VF5000
2	○	—	○
3	—	○	—

Note) Not available for the base mounted type.

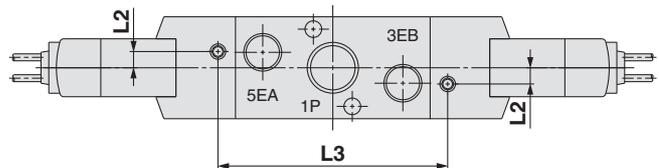
• Entry is the same as standard products. The specifications and performance are the same as those of standard products.



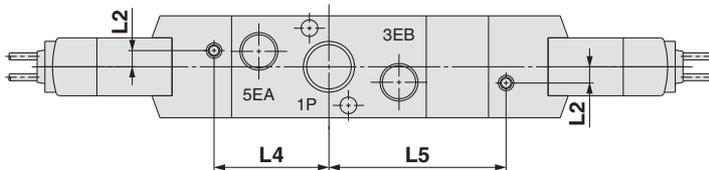
• 2-position single



• 2-position double



• 3-position closed centre/exhaust centre/pressure centre



Series	L1	L2	L3	L4	L5
VF1000	34.5	4.2	33.4	—	—
VF3000	60	4.2	59	29.5	45.5
VF5000	95	3.45	89	44.5	63.5

2 TRIAC Output Specification

For AC type valve, use this specification when the pilot valve is not recovered even though valve power supply is turned OFF at the equipment using output unit with large leakage voltage over 8% of the rated voltage (TRIAC output such as PLC or SSR, etc.). Combination with low wattage specification is not possible.

How to Order Valve

VF 3 - **1** - - - - **X600**

Series

1	VF1000
3	VF3000
5	VF5000

Type of actuation

1	2-position single
2	2-position double
3	3-position closed centre
4	3-position exhaust centre
5	3-position pressure centre

• Entry is the same as standard products.
Note) Rated voltage: AC type only

Pilot Operated 5 Port Solenoid Valve

Series VF3000/5000

Single Unit

Base Mounted



Note) Only DIN and conduit terminal types are available with AC mode. Refer to the electrical entry for details.



How to Order Valve

Base mounted (VF1000: Not available)

VF 3 1 4 0 K T - 5 G Z D 1 - 02

Series

3	VF3000
5	VF5000

Note) Not available with the VF1000.

Type of actuation

1	2-position single
2	2-position double
3	3-position closed centre
4	3-position exhaust centre
5	3-position pressure centre

Body model

Body option

0: Pilot valve individual exhaust

VF3000	VF5000
○	—

3: Main/Pilot valve common exhaust

VF3000	VF5000
○	—

4: Pilot valve base exhaust

VF3000	VF5000
—	○

Pressure specifications

—	Standard (0.7 MPa)
K	High-pressure type (1 MPa)

Coil specifications

—	Standard
T	With power saving circuit (DC only)

Note 1) Be sure to select the power saving circuit type when it is continuously energized for long periods of time. (Refer to page 51 for details.)
 Note 2) T type is available with DC mode only. When T is selected, only Z type of light/surge voltage suppressor is available. (Note that when the electrical entry of DIN terminal type without connector is selected, only DOS and YOS options are available.)

Rated voltage

DC		AC (50/60 Hz)	
5	24 VDC	1	100 VAC
6	12 VDC	2	200 VAC
		3	110 VAC [115 VAC]
		4	220 VAC [230 VAC]
		7	240 VAC
		B	24 VAC

Made to Order

—	—
X600	TRIAC output specification (Refer to page 14.)

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size (Sub-plate)

Symbol	Port size	VF3000	VF5000
—	Without sub-plate		
02	1/4	○	○
03	3/8	○	○
04	1/2	—	○

Note) Without the sub-plate, two mounting screws and a gasket are included.

Manual override

—: Non-locking push type	D: Push-turn locking slotted type	E: Push-turn locking lever type

Light/Surge voltage suppressor

Symbol	Light/Surge voltage suppressor	DC	AC
—	Without light/surge voltage suppressor	○	○
S	With surge voltage suppressor	○	— ^{Note 1)}
Z	With light/surge voltage suppressor	○	○
R	With surge voltage suppressor (Non-polar)	○	—
U	With light/surge voltage suppressor (Non-polar)	○	—

Note 1) S type is not available with AC mode, since a rectifier prevents surge voltage generation.
 Note 2) In the DIN terminal type, since a light is installed in the connector, DOZ, DOU, YOZ, YOU options are not available.

Electrical entry

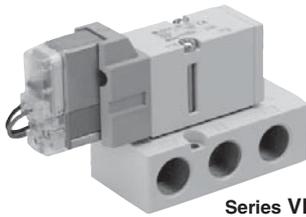
	Grommet	L-type plug connector	M-type plug connector	DIN terminal	DIN (EN175301-803) terminal	Conduit terminal
	G: Lead wire length 300 mm H: Lead wire length 600 mm	L: With lead wire (length 300 mm)	M: With lead wire (length 300 mm)	D: With connector	Y: With connector	T: Conduit terminal
	G: Lead wire length 300 mm H: Lead wire length 600 mm DC Without light/surge voltage suppressor	LN: Without lead wire	MN: Without lead wire	DO: Without connector	YO: Without connector	
DC	●	●	●	●	●	●
AC (Note 5)	—	—	—	●	●	●

Caution

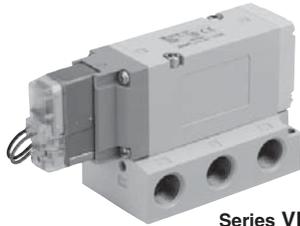
When using the surge voltage suppressor type, residual voltage will remain. Refer to page 51 for details.

Note 1) LN and MN types are with 2 sockets.
 Note 2) Refer to page 49 when different length of lead wire for L/M-type plug connector is required.
 Note 3) Refer to page 50 for details on the DIN (EN175301-803) terminal.
 Note 4) When using IP65, select the main/pilot valve common exhaust type. (Except VF1000)
 Note 5) With the same specifications as the DC type, all electrical entries for the 24 VAC type are available.

Pilot Operated 5 Port Solenoid Valve Base Mounted/Single Unit *Series VF3000/5000*



Series VF3000



Series VF5000



Made to Order
(Refer to page 14 for details.)

Symbol	Specification
X600	TRIAC output specification

Specifications

Model		VF3000	VF5000
Fluid		Air	
Operating pressure range [MPa]	Standard	2-position single/3-position	0.15 to 0.7
		2-position double	0.1 to 0.7
	High-pressure type	2-position single/3-position	0.15 to 1.0
		2-position double	0.1 to 1.0
Ambient and fluid temperature [°C]		-10 to 50 (No freezing)	
Max. operating frequency [Hz]	2-position single/double	10	5
	3-position	3	3
Manual override		Non-locking push type Push-turn locking slotted type Push-turn locking lever type	
Pilot exhaust type		Individual exhaust, Main/ Pilot valve common exhaust	Pilot valve base exhaust
Lubrication		Not required	
Mounting orientation		Unrestricted	
Impact/Vibration resistance [m/s ²] <small>Note 1)</small>		300/50	
Enclosure		Dustproof (IP65 <small>Note 2)</small> for D, Y, T)	

Note 1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 2) Based on IEC 60529. When using IP65, select the main/pilot valve common exhaust type.

Solenoid Specifications

Electrical entry		Grommet (G), (H) L-type plug connector (L) M-type plug connector (M)	DIN terminal (D) DIN (EN175301-803) terminal (Y) Conduit terminal (T)	
		G, H, L, M	D, Y, T	
Coil rated voltage [V]	DC	24, 12		
	AC (50/60 Hz)	—	24, 100, 110, 200, 220, 240	
Allowable voltage fluctuation		±10% of rated voltage*		
Power consumption [W]	DC	Standard	1.5 (With light: 1.55)	
		With power saving circuit	0.55 (With light only)	
Apparent power [VA]*	AC	24 V	1.5 (With light: 1.55)	
		100 V	1.55 (With light: 1.65)	
		110 V [115 V]		1.55 (With light: 1.7)
		200 V		
		220 V [230 V]		
		240 V		
Surge voltage suppressor		Diode (Non-polar type: Varistor)		
Indicator light		LED (Neon light is used for AC mode of D, Y, T.)		

Note 1) It is in common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

Note 2) Allowable voltage fluctuation is -15% to +5% of the rated voltage for 115 VAC or 230 VAC.

Note 3) Since voltage drops due to the internal circuit in S, Z, T types (with power saving circuit), the allowable voltage fluctuation should be within the following range.

24 VDC: -7% to +10%

12 VDC: -4% to +10%

Response Time

Series	Type of actuation		Pressure specifications	Operating pressure range [MPa]	Response time [ms] (at 0.5 MPa)			
					Without light/surge voltage suppressor	With light/surge voltage suppressor		AC
						S, Z type	R, U type	
VF1000	2-position	Single	Standard	0.15 to 0.7	20	45	23	45
		Double		0.1 to 0.7	12	12	12	12
		Single	High-pressure type	0.15 to 1.0	23	48	26	48
		Double		0.1 to 1.0	15	15	15	15
VF3000	2-position	Single	Standard	0.15 to 0.7	20	45	23	45
		Double		0.1 to 0.7	12	12	12	12
	3-position		High-pressure type	0.15 to 0.7	30	55	33	55
	2-position	Single		0.15 to 1.0	23	48	26	48
		Double	0.1 to 1.0	15	15	15	15	
	3-position			0.15 to 1.0	33	58	36	58
VF5000	2-position	Single	Standard	0.15 to 0.7	30	55	33	55
		Double		0.1 to 0.7	15	15	15	15
	3-position		High-pressure type	0.15 to 0.7	50	75	53	75
	2-position	Single		0.15 to 1.0	33	58	36	58
		Double	0.1 to 1.0	18	18	18	18	
	3-position			0.15 to 1.0	53	78	56	78

Note) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage)

Series VF3000/5000

Flow-rate Characteristics/Weight

Valve model	Type of actuation		Port size	Flow-rate characteristics ^{Note 1)}								Weight [g] ^{Note 2)}	
				1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)				Grommet	DIN terminal
				C [dm ³ /s/bar]	b	Cv	Q [l/min] (ANR) ^{Note 3)}	C [dm ³ /s/bar]	b	Cv	Q [l/min] (ANR) ^{Note 3)}		
VF3□40-02	2-position	Single	1/4	2.8	0.14	0.64	649	2.5	0.18	0.57	592	344 (192)	380 (228)
		Double		2.8	0.14	0.64	649	2.5	0.18	0.57	592	405 (252)	477 (324)
	3-position	Closed centre		2.1	0.22	0.49	509	1.6	0.26	0.41	397	422 (270)	494 (342)
		Exhaust centre		2.3	0.21	0.53	554	2.8 [2.1]	0.23 [0.26]	0.66 [0.50]	682 [521]	422 (270)	494 (342)
		Pressure centre		2.9 [1.1]	0.16 [0.45]	0.67 [0.32]	679 [311]	2.1	0.23	0.49	512	422 (270)	494 (342)
VF3□40-03	2-position	Single	3/8	3.1	0.24	0.76	760	2.6	0.23	0.62	634	327 (192)	363 (228)
		Double		3.1	0.24	0.76	760	2.6	0.23	0.62	634	388 (252)	460 (324)
	3-position	Closed centre		2.2	0.33	0.57	570	1.6	0.34	0.40	418	405 (270)	477 (342)
		Exhaust centre		2.6	0.27	0.61	649	2.8 [2.3]	0.30 [0.28]	0.68 [0.55]	712 [578]	405 (270)	477 (342)
		Pressure centre		3.4 [1.3]	0.29 [0.48]	0.80 [0.38]	859 [376]	2.2	0.31	0.52	563	405 (270)	477 (342)
VF5□44-02	2-position	Single	1/4	7.3	0.49	2.1	2128	7.3	0.50	2.0	2146	486 (297)	522 (333)
		Double		7.3	0.49	2.1	2128	7.3	0.50	2.0	2146	541 (352)	613 (424)
	3-position	Closed centre		6.6	0.35	1.7	1734	6.3	0.31	1.6	1612	578 (390)	650 (462)
		Exhaust centre		7.4	0.33	1.9	1918	8.1 [7.4]	0.35 [0.34]	2.1 [1.9]	2128 [1931]	578 (390)	650 (462)
		Pressure centre		8.0 [2.9]	0.35 [0.48]	2.1 [0.85]	2102 [839]	5.6	0.31	1.5	1433	578 (390)	650 (462)
VF5□44-03	2-position	Single	3/8	8.4	0.34	2.2	2192	8.9	0.29	2.3	2249	473 (297)	509 (333)
		Double		8.4	0.34	2.2	2192	8.9	0.29	2.3	2249	529 (352)	601 (424)
	3-position	Closed centre		7.3	0.34	2.0	1905	7.1	0.28	1.8	1783	566 (390)	638 (462)
		Exhaust centre		8.1	0.27	2.0	2022	14.0 [8.3]	0.26 [0.31]	3.4 [2.2]	3473 [2124]	566 (390)	638 (462)
		Pressure centre		8.1 [2.5]	0.33 [0.48]	2.0 [0.74]	2100 [723]	5.7	0.31	1.4	1459	566 (390)	638 (462)
VF5□44-04	2-position	Single	1/2	9.4	0.43	2.7	2614	12.0	0.32	3.0	3091	545 (297)	581 (333)
		Double		9.4	0.43	2.7	2614	12.0	0.32	3.0	3091	600 (352)	672 (424)
	3-position	Closed centre		7.1	0.41	2.1	1945	7.4	0.32	2.0	1906	638 (390)	710 (462)
		Exhaust centre		8.6	0.39	2.4	2323	13.0 [8.9]	0.21 [0.40]	3.1 [2.5]	3132 [2421]	638 (390)	710 (462)
		Pressure centre		11.0 [2.6]	0.18 [0.47]	2.6 [0.78]	2606 [746]	6.1	0.35	1.6	1603	638 (390)	710 (462)

Note 1) []: Normal position

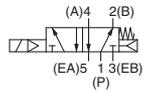
Note 2) Values without bracket

Note 3) These valves have been calculated according to ISO6358 and indicate the flow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

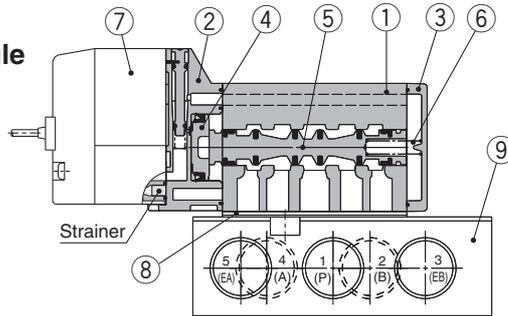
Construction: Base Mounted

VF3000/5000

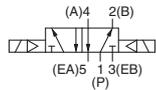
Symbol
2-position single



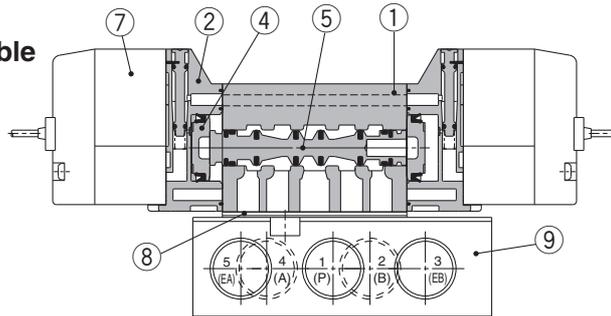
2-position single



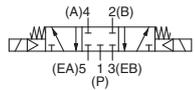
Symbol
2-position double



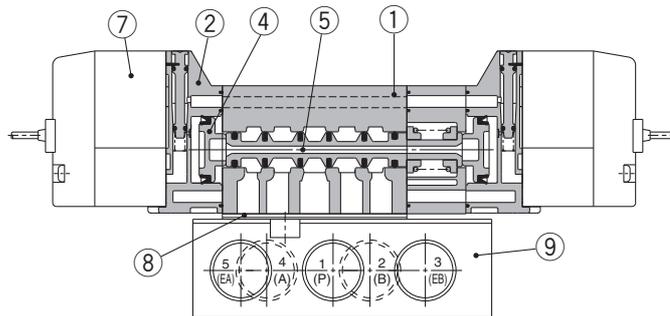
2-position double



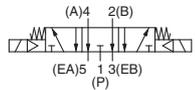
Symbol
3-position closed centre



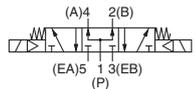
3-position closed centre/exhaust centre/pressure centre



3-position exhaust centre



3-position pressure centre



(Drawing shows a closed centre type.)

Sub-plate part no.

VF 3 000-71-1

Series

3	VF3000
5	VF5000

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size

Symbol	Port size	VF3000	VF5000
1	1/4	○	○
2	3/8	○	○
3	1/2	—	○

Component Parts

No.	Description	Material	Note
1	Body	Aluminium die-casted	White
2	Adapter plate	Resin	Grey
3	End plate	Resin	White
4	Piston	Resin	
5	Spool valve	Aluminium, HNBR	
6	Spring	Stainless steel	

Replacement Parts

No.	Description	Part no.		Note
		VF3000	VF5000	
7	Pilot valve assembly	Refer to "How to Order Pilot Valve Assembly" on page 19.		Built-in strainer
8	Gasket	DXT031-30-11	DXT156-9-8	HNBR
9	Sub-plate	1/4: VF3000-71-1□ 3/8: VF3000-71-2□	1/4: VF5000-71-1□ 3/8: VF5000-71-2□ 1/2: VF5000-71-3□	Aluminium die-casted
—	Round head combination screw (1 pc.)	DXT031-44-1 (M4 x 39.5, With spring washer)	—	For mounting valve
—	Hexagon socket head cap screw (1 pc.)	—	AXT620-32-1 (M4 x 48, With spring washer)	For mounting valve

Caution

Tightening Torque for Mounting Valve

M4: 1.4 N·m

Series VF3000/5000

How to Order Pilot Valve Assembly (With a gasket and two mounting screws)

⚠ Caution

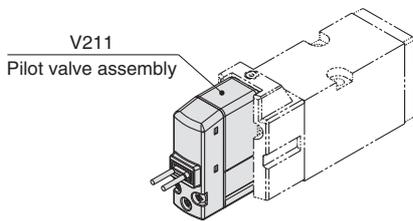
When only the pilot valve assembly is replaced, it is not possible to change from V211 (Grommet or L/M-type) to V212 (DIN or Conduit type), or vice versa.

Valve model: VF□□□□□□ - 5 G Z □ 1 - □□□

* Select from the below in accordance with the valve used.

■ Grommet or L/M-type

V 2 1 1 □ □ - 5 G Z



● Light/Surge voltage suppressor

		DC	AC
—	Without light/surge voltage suppressor	○	○
S	With surge voltage suppressor	○	— ^(Note)
Z	With light/surge voltage suppressor	○	○
R	With surge voltage suppressor (Non-polar)	○	—
U	With light/surge voltage suppressor (Non-polar)	○	—

Note) S type is not available with AC mode, since a rectifier prevents surge voltage generation. When T is selected, only Z type of light/surge voltage suppressor is available.

⚠ Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to page 51 for details.

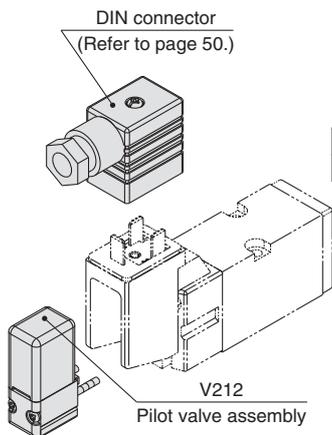
● Electrical entry

G	Grommet (Lead wire length 300 mm)	
H	Grommet (Lead wire length 600 mm)	
L	L-type plug connector	With lead wire
LN		Without lead wire
LO		Without connector
M	M-type plug connector	With lead wire
MN		Without lead wire
MO		Without connector

Note 1) LN and MN types are with 2 sockets.

Note 2) Refer to page 49 when different length of lead wire for L/M-type plug connector is required.

■ DIN or Conduit type



V 2 1 2 □ □ - 5

● Pressure specifications

—	Standard (0.7 MPa)
K	High-pressure type (1 MPa)

● Coil specifications

—	Standard
T	With power saving circuit (DC only)

Note) T type is available with DC mode only.

● Rated voltage

DC

5	24 VDC
6	12 VDC

AC (50/60 Hz)

1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]
7	240 VAC
B	24 VAC

⚠ Caution

For V212 (DIN or Conduit type), the coil specifications and voltage (including light/surge voltage suppressor) cannot be changed by replacing the pilot valve assembly.

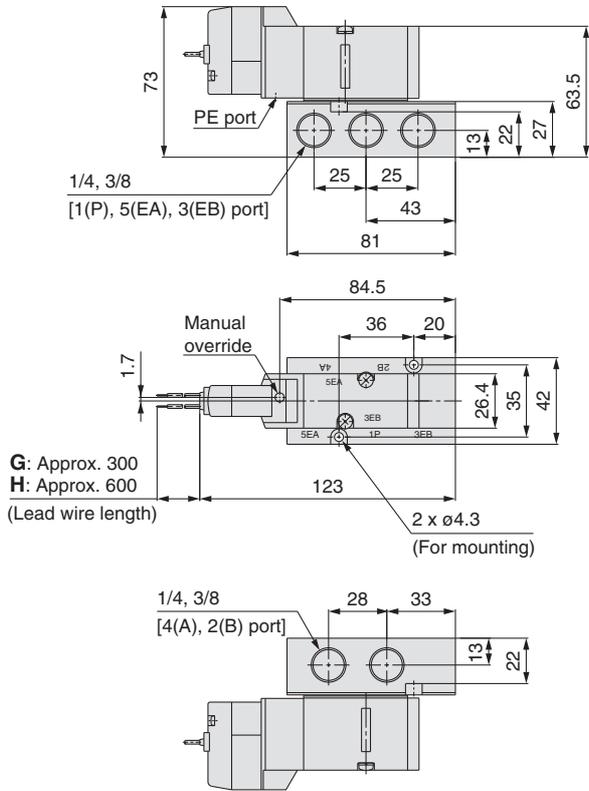
⚠ Caution

Tightening torque of the pilot valve assembly mounting screw
M2.5: 0.32 N·m

Dimensions: Series VF3000/Base Mounted

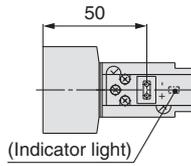
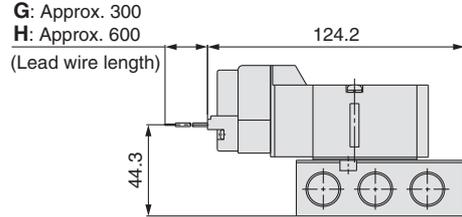
2-position single

Grommet (G) (H): VF3140-□_G□_H□1-02□₀₃

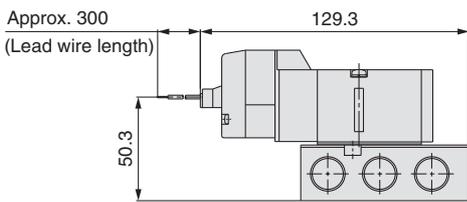


Grommet (G) (H)

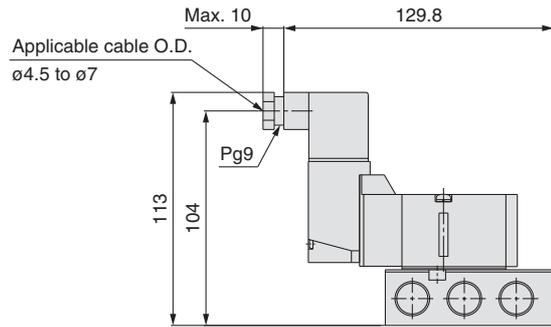
DC without light/surge voltage suppressor



L-type plug connector (L): VF3140-□L□□1-02□₀₃



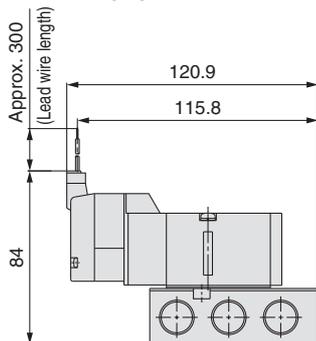
DIN terminal (D) (Y): VF3140-□_D□_Y□1-02□₀₃



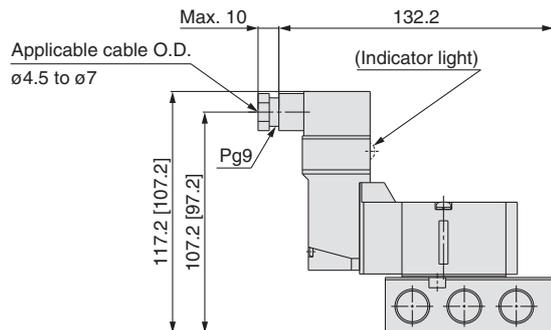
Unless otherwise indicated, dimensions are the same as Grommet (G).

Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF3140-□M□□1-02□₀₃



Conduit terminal (T): VF3140-□T□□1-02□₀₃



[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

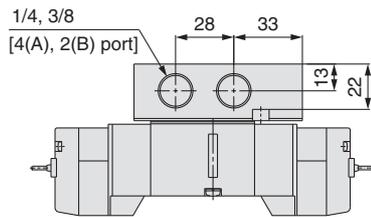
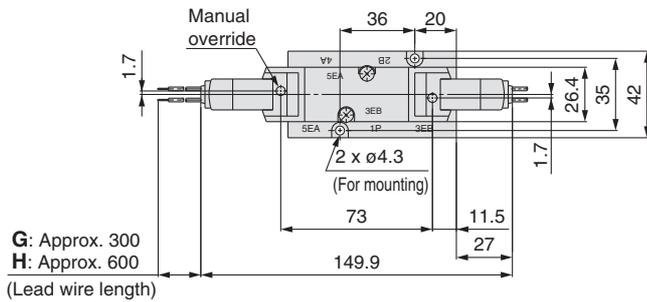
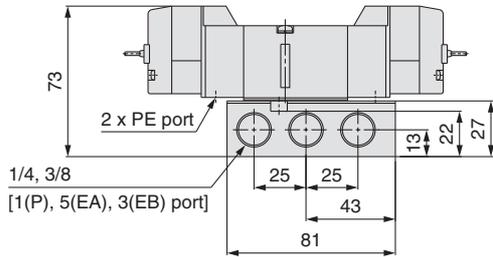
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF3000/5000

Dimensions: Series VF3000/Base Mounted

2-position double

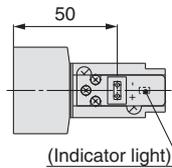
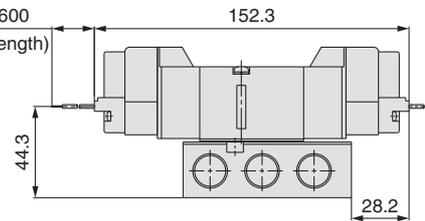
Grommet (G) (H): VF3240-□_G□□1-02□₀₃□



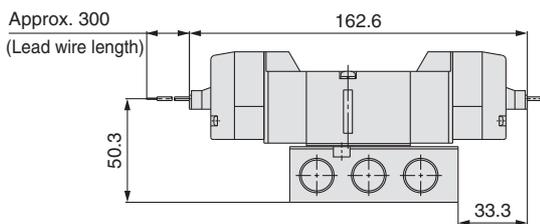
Grommet (G) (H)

DC without light/surge voltage suppressor

G: Approx. 300
H: Approx. 600
(Lead wire length)

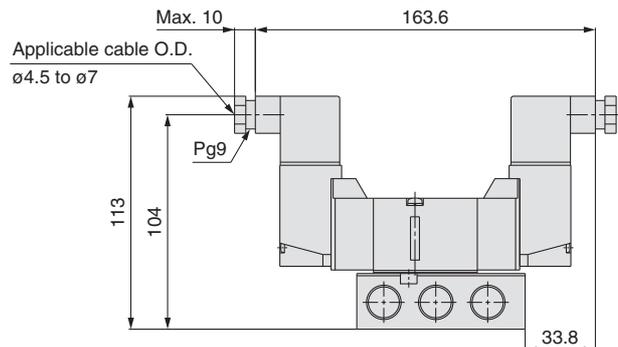


L-type plug connector (L): VF3240-□L□□1-02□₀₃□



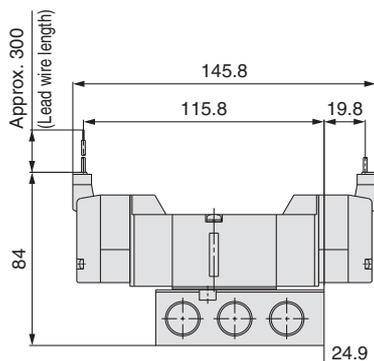
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF3240-□_D□□1-02□₀₃□



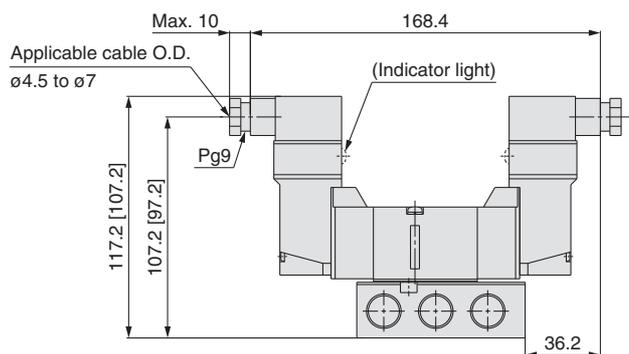
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF3240-□M□□1-02□₀₃□



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF3240-□T□□1-02□₀₃□

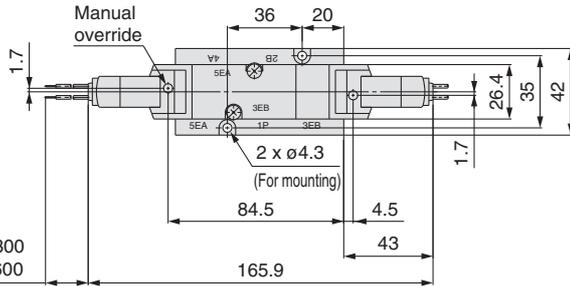
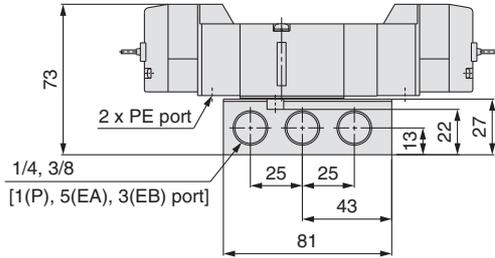


[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

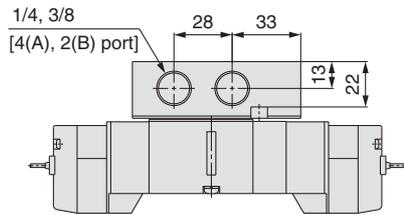
Dimensions: Series VF3000/Base Mounted

3-position closed centre/exhaust centre/pressure centre

Grommet (G) (H): VF3³₄40-□_G□□1-02₀₃□



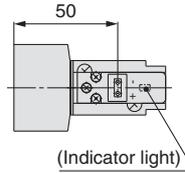
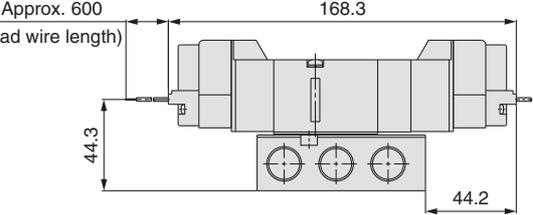
G: Approx. 300
H: Approx. 600
(Lead wire length)



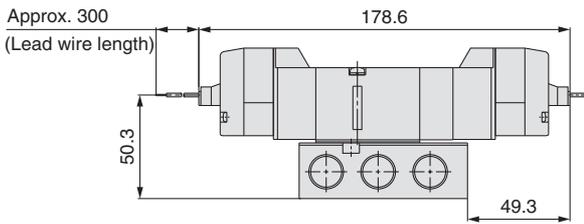
Grommet (G) (H)

DC without light/surge voltage suppressor

G: Approx. 300
H: Approx. 600
(Lead wire length)

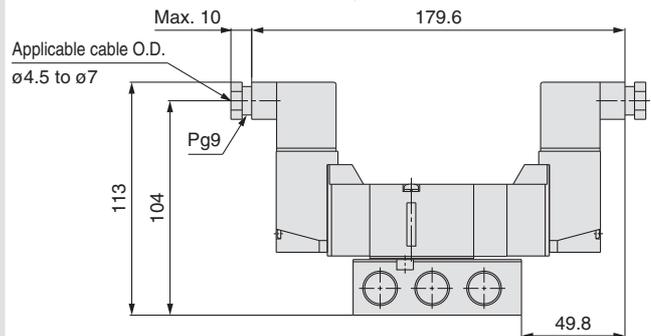


L-type plug connector (L): VF3³₄40-□_L□□1-02₀₃□



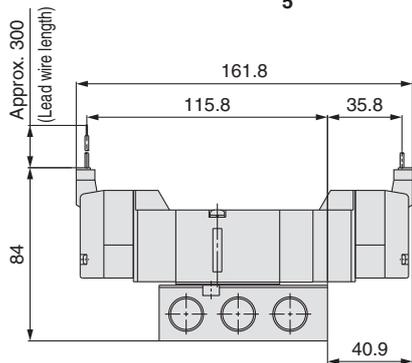
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y): VF3³₄40-□_D□□1-02₀₃□



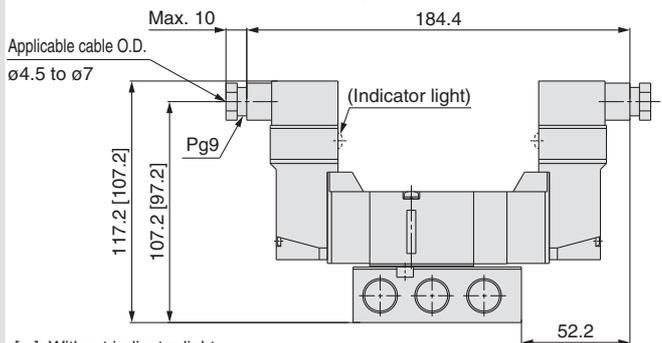
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M): VF3³₄40-□_M□□1-02₀₃□



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T): VF3³₄40-□_T□□1-02₀₃□



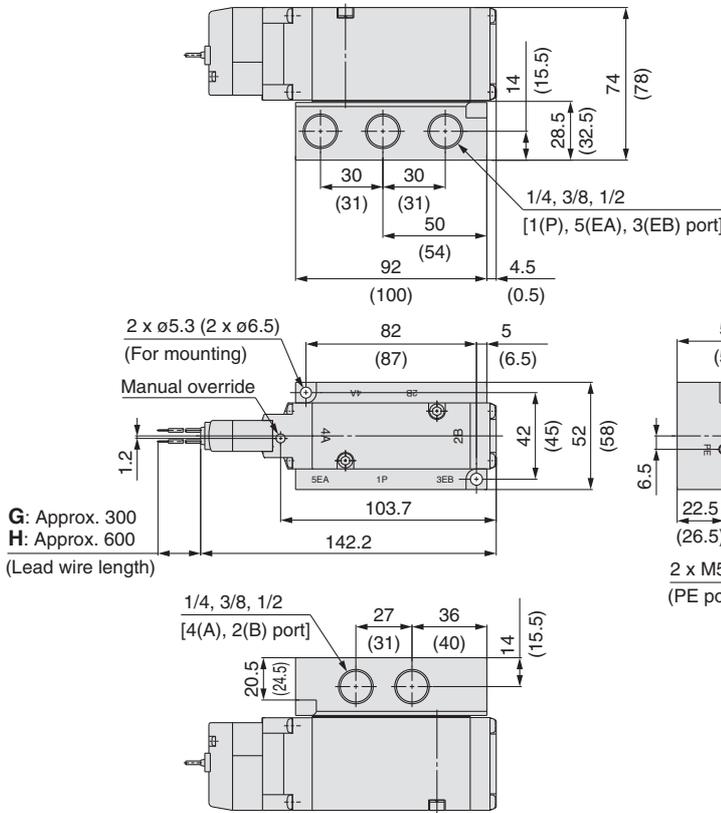
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF3000/5000

Dimensions: Series VF5000/Base Mounted

2-position single

Grommet (G) (H): VF5144-□_G□□□1-⁰²₀₃□₀₄



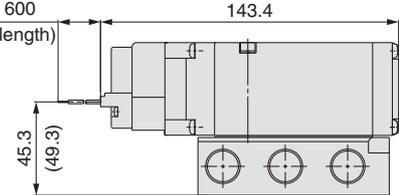
Grommet (G) (H)

DC without light/surge voltage suppressor

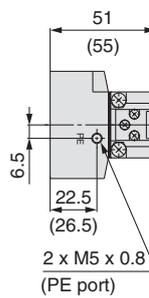
G: Approx. 300

H: Approx. 600

(Lead wire length)

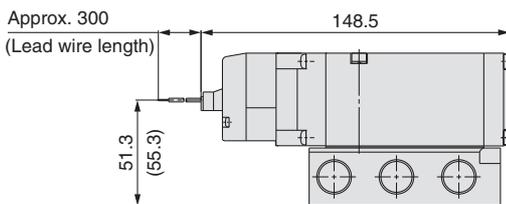


(Indicator light)



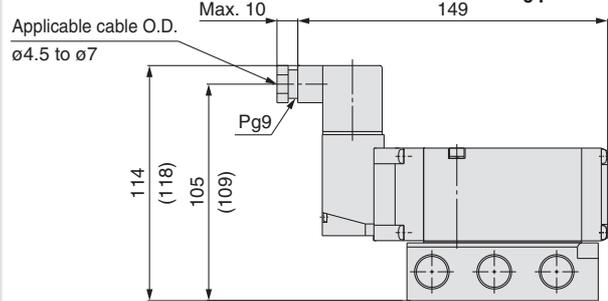
The dimensions in () are for 1/2 piping port size.

L-type plug connector (L): VF5144-□L□□□1-⁰²₀₃□₀₄



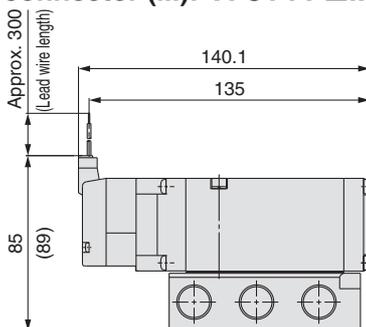
Unless otherwise indicated, dimensions are the same as Grommet (G). The dimensions in () are for 1/2 piping port size.

DIN terminal (D) (Y): VF5144-□_D□□□1-⁰²₀₃□₀₄



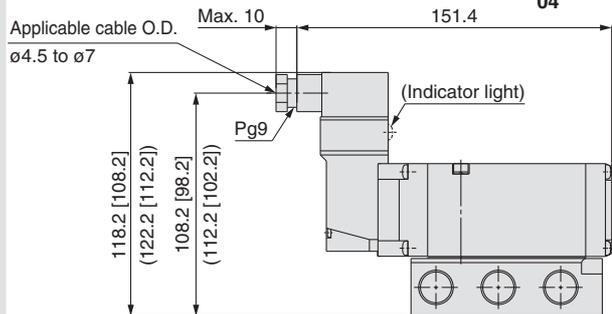
Unless otherwise indicated, dimensions are the same as Grommet (G). The dimensions in () are for 1/2 piping port size.

M-type plug connector (M): VF5144-□M□□□1-⁰²₀₃□₀₄



Unless otherwise indicated, dimensions are the same as Grommet (G). The dimensions in () are for 1/2 piping port size.

Conduit terminal (T): VF5144-□T□□□1-⁰²₀₃□₀₄

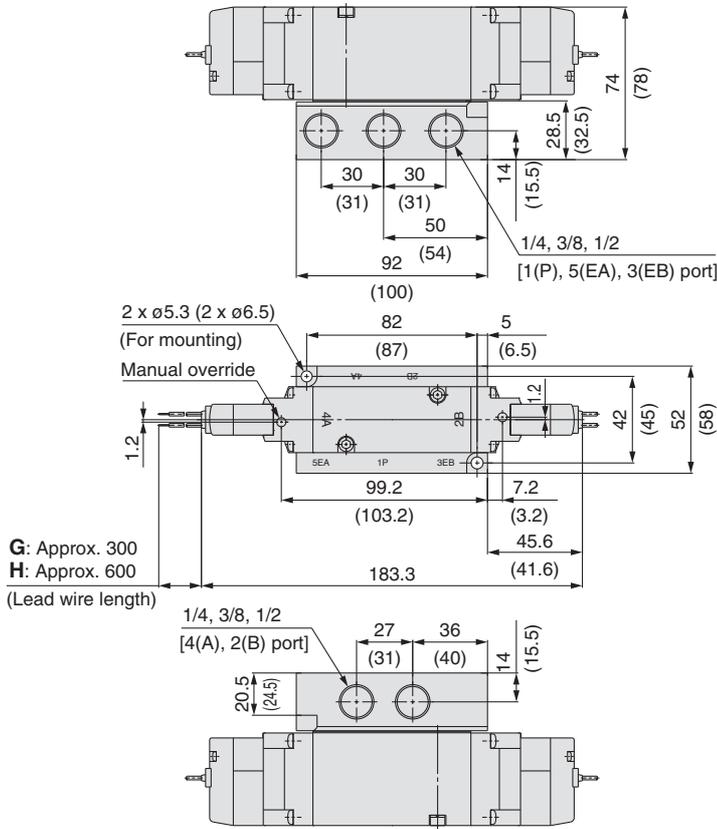


Unless otherwise indicated, dimensions are the same as Grommet (G). []: Without indicator light The dimensions in () are for 1/2 piping port size.

Dimensions: Series VF5000/Base Mounted

2-position double

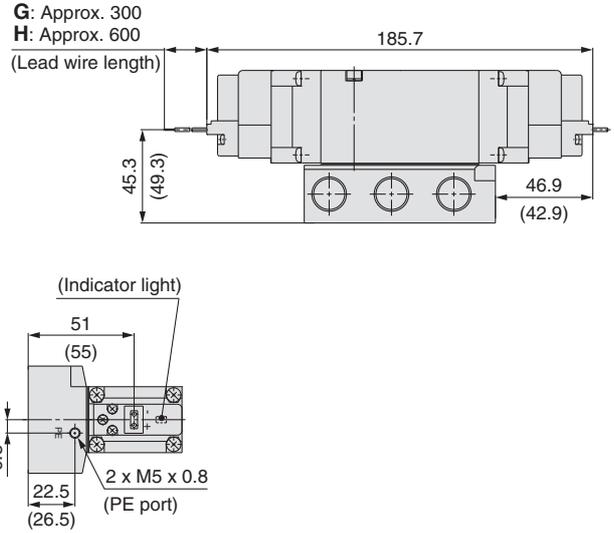
Grommet (G) (H): VF5244-□^G□^H□□1-⁰²₀₃□₀₄



G: Approx. 300
H: Approx. 600
(Lead wire length)

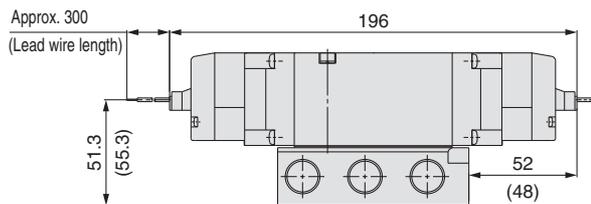
The dimensions in () are for 1/2 piping port size.

Grommet (G) (H)
DC without light/surge voltage suppressor



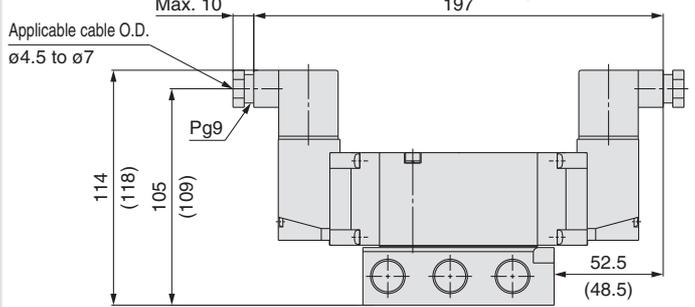
G: Approx. 300
H: Approx. 600
(Lead wire length)

L-type plug connector (L): VF5244-□L□□1-⁰²₀₃□₀₄



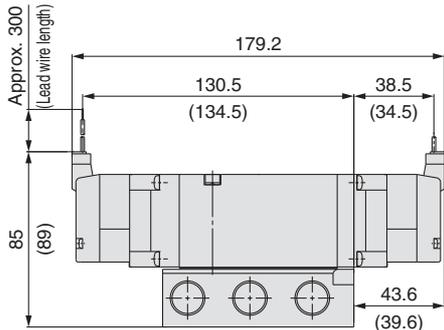
Unless otherwise indicated, dimensions are the same as Grommet (G).
The dimensions in () are for 1/2 piping port size.

DIN terminal (D) (Y): VF5244-□^D□□1-⁰²₀₃□₀₄



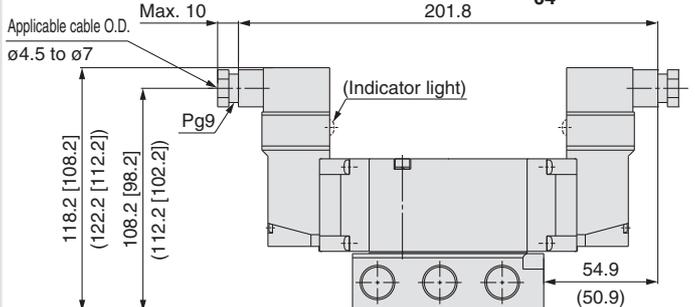
Unless otherwise indicated, dimensions are the same as Grommet (G).
The dimensions in () are for 1/2 piping port size.

M-type plug connector (M): VF5244-□M□□1-⁰²₀₃□₀₄



Unless otherwise indicated, dimensions are the same as Grommet (G).
The dimensions in () are for 1/2 piping port size.

Conduit terminal (T): VF5244-□T□□1-⁰²₀₃□₀₄



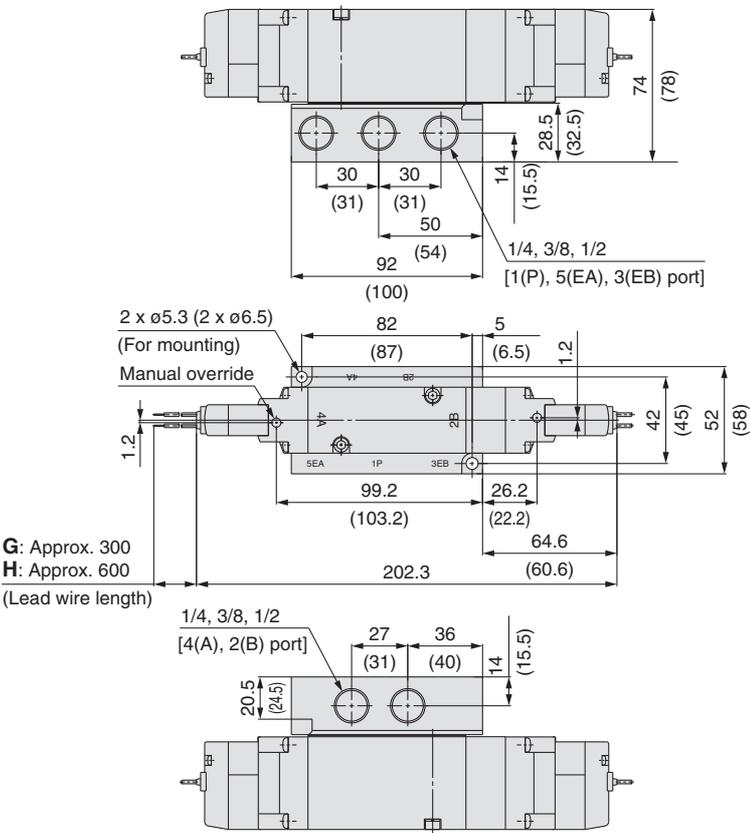
Unless otherwise indicated, dimensions are the same as Grommet (G).
[] : Without indicator light
The dimensions in () are for 1/2 piping port size.

Series VF3000/5000

Dimensions: Series VF5000/Base Mounted

3-position closed centre/exhaust centre/pressure centre

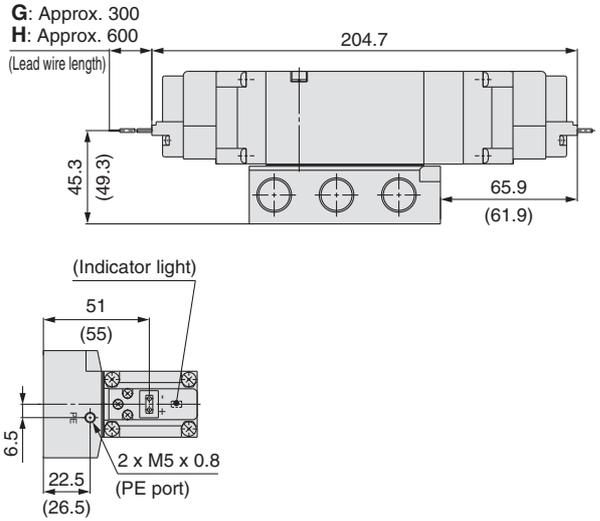
Grommet (G) (H): VF5³₄44-□^G□□1-0⁰²₃□⁰⁴



G: Approx. 300
H: Approx. 600
(Lead wire length)

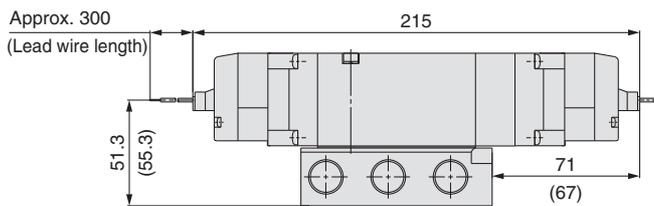
The dimensions in () are for 1/2 piping port size.

Grommet (G) (H)
DC without light/surge voltage suppressor



G: Approx. 300
H: Approx. 600
(Lead wire length)

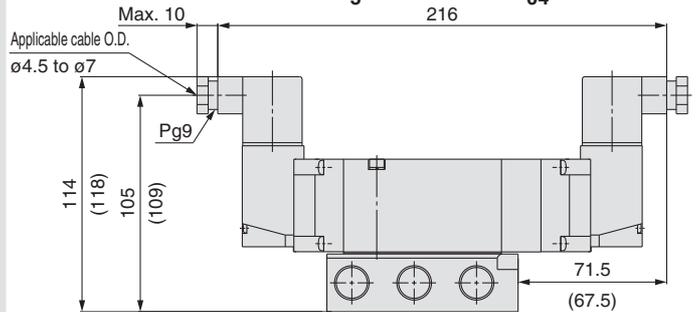
L-type plug connector (L): VF5³₄44-□^L□□1-0⁰²₃□⁰⁴



Approx. 300
(Lead wire length)

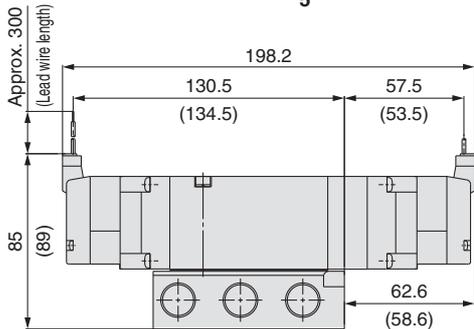
Unless otherwise indicated, dimensions are the same as Grommet (G).
The dimensions in () are for 1/2 piping port size.

DIN terminal (D) (Y): VF5³₄44-□^D□□1-0⁰²₃□⁰⁴



Unless otherwise indicated, dimensions are the same as Grommet (G).
The dimensions in () are for 1/2 piping port size.

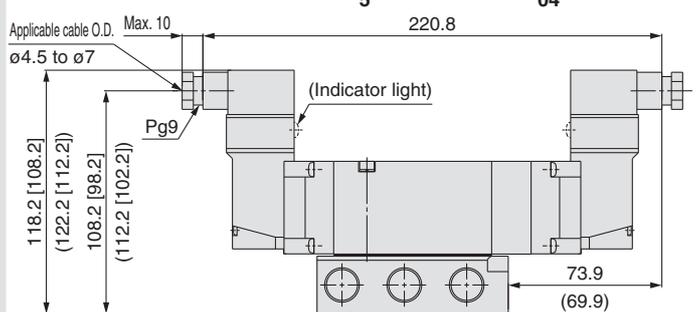
M-type plug connector (M): VF5³₄44-□^M□□1-0⁰²₃□⁰⁴



Approx. 300
(Lead wire length)

Unless otherwise indicated, dimensions are the same as Grommet (G).
The dimensions in () are for 1/2 piping port size.

Conduit terminal (T): VF5³₄44-□^T□□1-0⁰²₃□⁰⁴



Unless otherwise indicated, dimensions are the same as Grommet (G).
[]: Without indicator light
The dimensions in () are for 1/2 piping port size.

Low Wattage Specification

Series VF1000/3000 C €

Single Unit

Body Ported
Base Mounted

RoHS

How to Order Valve

VF 3 1 3 0 Y - 5 G [] [] 1 - 02 [] - []

Series

1	VF1000
3	VF3000

Type of actuation

1	2-position single
2	2-position double
3	3-position closed centre
4	3-position exhaust centre
5	3-position pressure centre

Note) Only 1 and 2 are available with the VF1000.

Body model

	Mountable manifold	Mountable manifold		
		30	31	40
2	VF1000 Body ported	—	—	—
3	VF1000 Base mounted	● Note 1)	● Note 1)	—
	VF3000 Body ported	● Note 1)	—	—
4	VF3000 Base mounted	—	—	● Note 2)

Note 1) Refer to page 30.

Note 2) Refer to page 41.

Body option

0: Pilot valve individual exhaust	
	PE port EA/EB port
VF1000	VF3000
○	○
3: Main/Pilot valve common exhaust	
	PE port EA/EB port
VF1000	VF3000
—	○

Low wattage type

Rated voltage

1	100 VAC
2	200 VAC
3	110 VAC
4	220 VAC
5	24 VDC
6	12 VDC

Bracket

—	Without bracket
F	With bracket Available with the VF1120, VF1220 and VF3130 only.

Thread type

—	Rc, M5
F	G
N	NPT
T	NPTF

<Body ported> A, B port size

M5	M5 x 0.8 (VF1000)
01	1/8 (VF1000, VF3000)
02	1/4 (VF3000)

<Base mounted> Sub-plate port size

—	Without sub-plate
02	Port size: 1/4
03	Port size: 3/8

Manual override

—	Non-locking push type
D	Push-turn locking slotted type
E	Push-turn locking lever type

Light/Surge voltage suppressor and common specifications

—	Without light/surge voltage suppressor	—
R	With surge voltage suppressor (DC only, Non-polar)	D and Y are not available
U	With light/surge voltage suppressor (DC only, Non-polar)	D and Y are not available
S	With surge voltage suppressor (DC only)	—
Z	With light/surge voltage suppressor	DOZ and YOZ are not available

Electrical entry

24 VDC, 12 VDC				24 VDC, 12 VDC 100 VAC, 110 VAC, 200 VAC, 220 VAC	
Grommet	L-type plug connector	M-type plug connector	DIN terminal		
G: Lead wire length 300 mm	L: With lead wire (length 300 mm)	M: With lead wire (length 300 mm)	MN: Without lead wire	[IP65 compatible] D: With connector	[IP65 compatible] Y: With connector
H: Lead wire length 600 mm	LN: Without lead wire	LO: Without connector	MO: Without connector	DO: Without connector	YO: Without connector

Note 1) LN and MN types are with 2 sockets.

Note 2) Y type DIN terminal complies with EN-175301-803C (former DIN 43650C).

Refer to page 50 for details.

Note 3) When using IP65, select the main/pilot valve common exhaust type. (Except VF1000)



Specifications

Model		VF1000	VF3000
Fluid		Air	
Internal pilot operating pressure range [MPa]	2-position single/3-position	0.15 to 0.7	
	2-position double	0.1 to 0.7	
Ambient and fluid temperature [°C]		-10 to 50 (No freezing)	
Max. operating frequency [Hz]	2-position single/double	5	5
	3-position	3	3
Manual override		Non-locking push type Push-turn locking slotted type Push-turn locking lever type	
Pilot exhaust type		Main/Pilot valve common exhaust	
Lubrication		Not required	
Mounting orientation		Unrestricted	
Impact/Vibration resistance [m/s²] <small>Note 2)</small>		150/30	
Enclosure		Dustproof (IP65 <small>Note 1)</small> for DIN terminal)	

Note 1) Based on IEC 60529.

Note 2) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Solenoid Specifications

Electrical entry		Grommet (G), (H) L-type plug connector (L) M-type plug connector (M)		DIN terminal (D), (Y)	
		G, H, L, M		D, Y	
Coil rated voltage [V]	DC	24, 12			
	AC (50/60 Hz)	—	100, 110, 200, 220		
Allowable voltage fluctuation		±10% of rated voltage <small>Note 1,2,3)</small>			
Power consumption [W]	DC	Standard	0.35 (With light: 0.4 (With light of DIN terminal: 0.45))		
	<small>Note 1,2,3)</small> Apparent power [VA]	AC	100 V	—	0.78 (With light: 0.87)
110 V [115 V]			—	0.86 (With light: 0.97) [0.94 (With light: 1.07)]	
200 V			—	1.15 (With light: 1.30)	
220 V [230 V]			—	1.27 (With light: 1.46) [1.39 (With light: 1.60)]	
Surge voltage suppressor		Diode (DIN terminal, Non-polar type: Varistor)			
Indicator light		LED (Neon light is used for AC mode of DIN terminal.)			

Note 1) It is in common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

Note 2) Allowable voltage fluctuation is -15% to +5% of the rated voltage for 115 VAC or 230 VAC.

Note 3) Since voltage drops due to the internal circuit in S and Z types, the allowable voltage fluctuation should be within the following range.

24 VDC: -7% to +10%

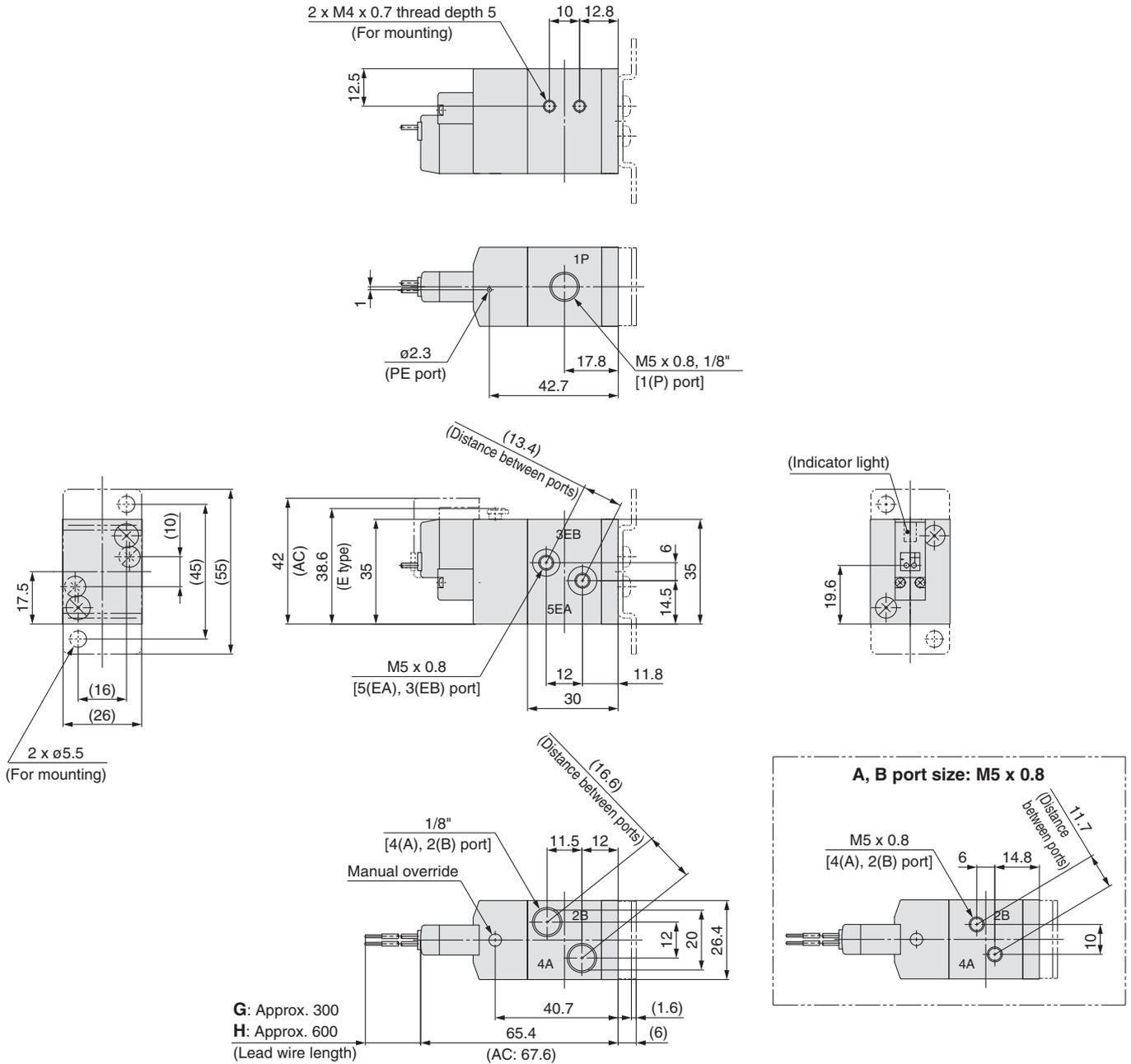
12 VDC: -4% to +10%

Response Time

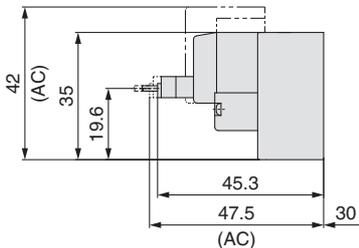
Series	Type of actuation	Response time [ms] (at 0.5 MPa)			
		Without light/surge voltage suppressor	With light/surge voltage suppressor		AC
			S, Z type	R, U type	
VF1000	2-position single	45	55	45	45
	2-position double	12	12	12	12
VF3000	2-position single	55	63	55	50
	2-position double	14	14	14	16
	3-position	100	100	90	90

Dimensions

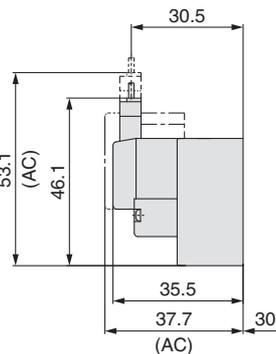
VF1000



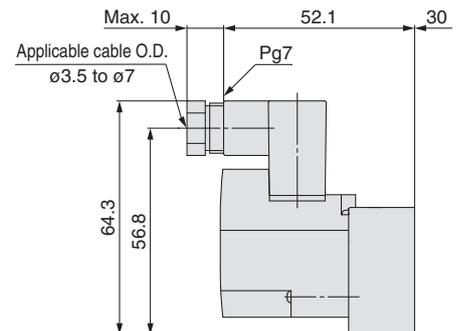
L-type plug connector (L)



M-type plug connector (M)



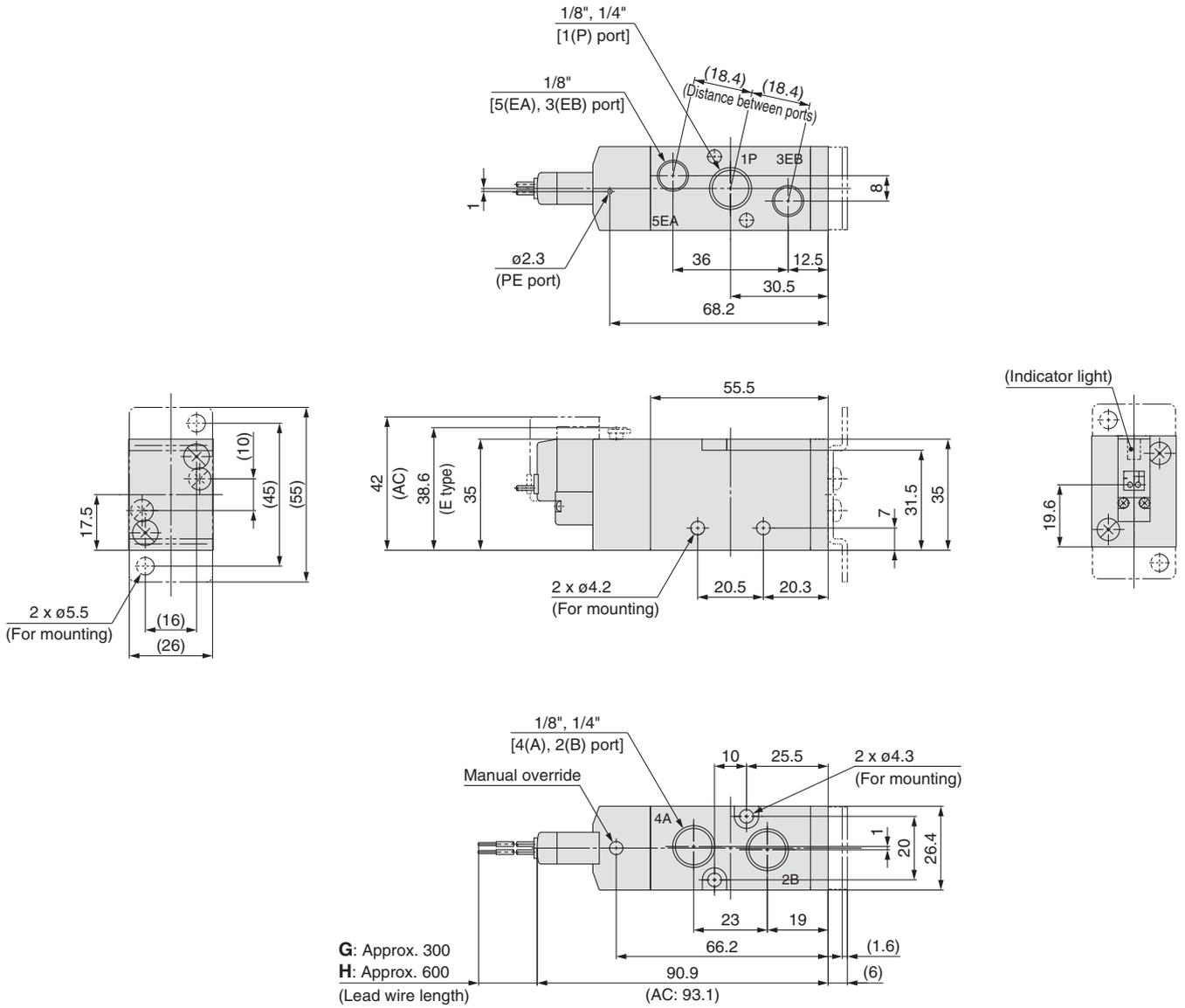
DIN terminal (D) (Y)



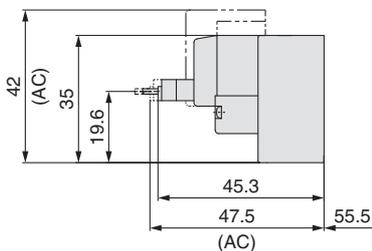
Series VF1000/3000

Dimensions

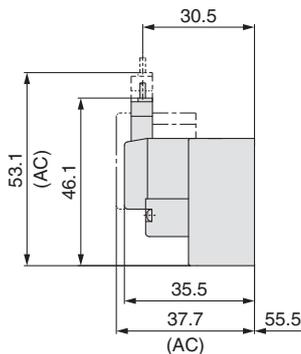
VF3000



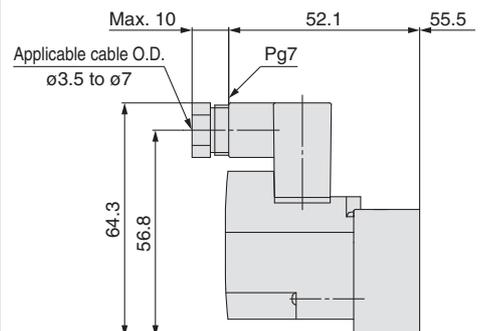
L-type plug connector (L)



M-type plug connector (M)



DIN terminal (D) (Y)



Pilot Operated 5 Port Solenoid Valve Series VF1000/3000/5000 Manifold

Body Ported



Note) Only DIN and conduit terminal types are available with AC mode.
Refer to the electrical entry for details.

How to Order Manifold

Common exhaust

VV5F 1 - 30 - 04 1 -

Series	1	VF1000
	3	VF3000
	5	VF5000

Manifold model				
Symbol	P, R port size	VF1000	VF3000	VF5000
30	1/8	○	—	—
	1/4	—	○	—
20	3/8	—	—	○
21	1/2	—	—	○

Stations

02	2 stations
⋮	⋮
20	20 stations

Note) Up to 10 stations for VV5F5-20, and up to 15 stations for VV5F5-21.

Thread type

—	Rc
00F	G
00N	NPT
00T	NPTF

Individual exhaust (VF1000 only)

VV5F1 - 31 - 04 3 -

Stations			
02	2 stations		
⋮	⋮		
20	20 stations		

Thread type		
—	Rc	
00F	G	
00N	NPT	
00T	NPTF	

Manifold model			
Symbol	P, R port size	EA, EB port size	
31	1/8	M5	

Note) When placing an order for body ported valve as a single unit, mounting screws for manifold and gasket are not attached. Order them separately, if necessary. (Refer to page 32 for details)

How to Order Valve

Note) For low wattage specification, refer to "How to Order Valve" on page 26.

VF 3 1 3 0 - 5 G - 1 - 01 -

Series	1	VF1000
	3	VF3000
	5	VF5000

Type of actuation		
1	2-position single	
2	2-position double	
3	3-position closed centre	
4	3-position exhaust centre	
5	3-position pressure centre	

Note) Only 1 and 2 are available with the VF1000.

Coil specifications

—	Standard
T	With power saving circuit (DC only)

Note 1) Be sure to select the power saving circuit type when it is continuously energized for long periods of time. (Refer to page 51 for details.)

Note 2) T type is available with DC mode only. When T is selected, only Z type of light/surge voltage suppressor is available. (Note that when the electrical entry of DIN terminal type without connector is selected, only DOS and YOS are available.)

Pressure specifications

—	Standard (0.7 MPa)
K	High-pressure type (1 MPa)

Rated voltage

DC	AC (50/60 Hz)
5	24 VDC
6	12 VDC
1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]
7	240 VAC
B	24 VAC

Body model

Symbol	VF1000	VF3000	VF5000
2	—	—	○
3	○ (Note)	—	—

Note) Manifold only.

Body option

0: Pilot valve individual exhaust	3: Main/Pilot valve common exhaust
PE port EA/EB port	PE port EA/EB port
VF1000 VF3000 VF5000	VF1000 VF3000 VF5000
○ ○ ○	○ ○ ○

Made to order

Refer to page 14 for details.
Combination with low wattage specification is not possible.

A, B port size

Symbol	Port size	VF1000	VF3000	VF5000
M5	M5 x 0.8	○	—	—
01	1/8	○	○	—
02	1/4	—	○	○
03	3/8	—	—	○

—	Rc
F	G
N	NPT
T	NPTF

Note) M5 is only available with "—" option.

Light/Surge voltage suppressor

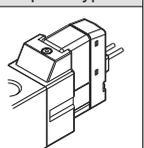
Symbol	Light/Surge voltage suppressor	DC	AC
—	Without light/surge voltage suppressor	○	○
S	With surge voltage suppressor	○	Note 1)
Z	With light/surge voltage suppressor	○	○
R	With surge voltage suppressor (Non-polar)	○	—
U	With light/surge voltage suppressor (Non-polar)	○	—

Note 1) S type is not available with AC mode, since a rectifier prevents surge voltage generation.

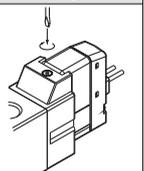
Note 2) In the DIN terminal type, since a light is installed in the connector, DOZ, DOU, YOZ, YOU are not available.

Manual override

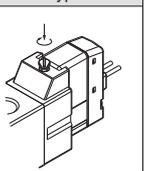
—: Non-locking push type



D: Push-turn locking slotted type



E: Push-turn locking lever type



Electrical entry

Grommet	L-type plug connector	M-type plug connector	DIN terminal [IP65 compatible]	DIN (EN175301-803) terminal [IP65 compatible]	Conduit terminal [IP65 compatible]
G: Lead wire length 300 mm H: Lead wire length 600 mm	L: With lead wire (length 300 mm) LN: Without lead wire LO: Without connector	M: With lead wire (length 300 mm) MN: Without lead wire MO: Without connector	D: With connector DO: Without connector	Y: With connector YO: Without connector	T: Conduit terminal
DC	●	●	●	●	●
AC (Note 5)	—	—	●	●	●

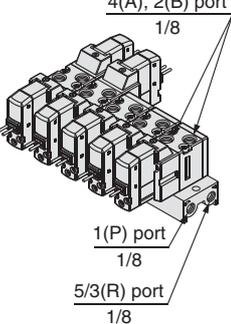
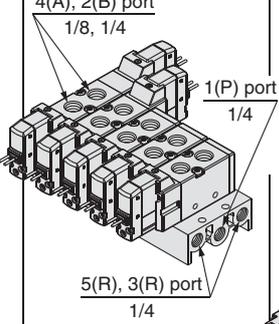
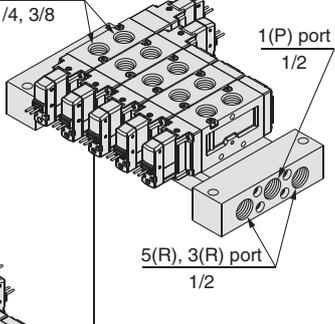
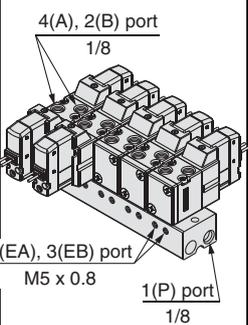
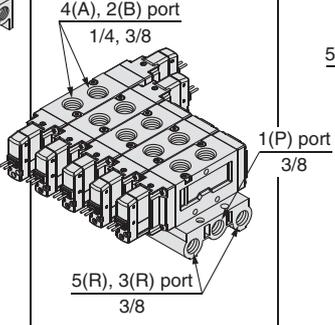
Note 1) LN and MN types are with 2 sockets. Note 2) Refer to page 49 when different length of lead wire for L/M-type plug connector is required.
Note 3) Refer to page 50 for details on the DIN (EN175301-803) terminal.
Note 4) When using IP65, select the main/pilot valve common exhaust type.
Note 5) With the same specifications as the DC type, all electrical entries for the 24 VAC type are available.

Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to page 51 for details.

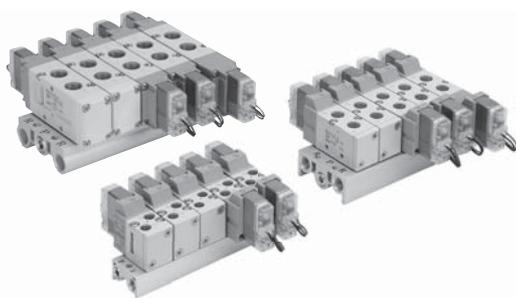
Series VF1000/3000/5000

Manifold Specifications

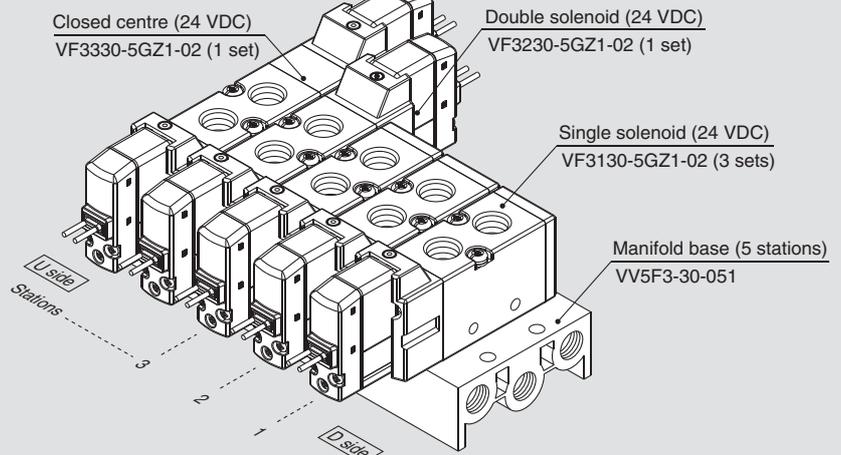
Series	VF1000		VF3000	VF5000	
Manifold base model	VV5F1-30 		VV5F3-30 	VV5F5-21 	
	VV5F1-31 		VV5F5-20 		
EXH port type	Common EXH	Individual EXH	Common EXH	Common EXH	Common EXH
Applicable valve model	VF1□30 VF1□33		VF3□30 VF3□33	VF5□20 VF5□23	
Applicable stations	2 to 20 stations		2 to 20 stations	2 to 10 stations	2 to 15 stations
Manifold base Weight: W [g] Stations: n	W = 29n + 21	W = 51n + 35	W = 63n + 64	W = 97n + 80	W = 139n + 550

Note) Supply pressure to 1(P) ports and exhaust pressure from R ports on both sides for 10 stations or more (5 stations or more for the VF5000).

How to Order Manifold Assembly



Example (VV5F3-30)



VV5F3-30-051 1 set (Type 30, 5-station manifold base part no.)

* **VF3130-5GZ1-02** 3 sets (Single solenoid part no.)

* **VF3230-5GZ1-02** 1 set (Double solenoid part no.)

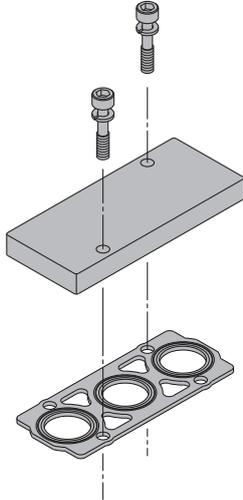
* **VF3330-5GZ1-02** 1 set (Closed centre part no.)

↳ The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

- The valve arrangement is numbered as the 1st station from D side.
- Under the manifold base part number, state the valves to be mounted in order from the 1st station as shown in the figure above. If the arrangement becomes complicated, specify on the manifold specification sheet.

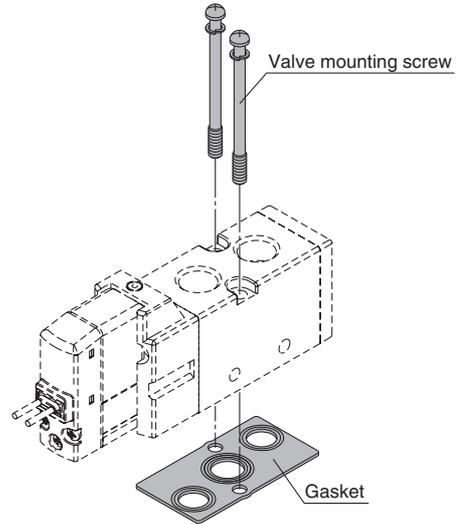
Manifold Options

■ For body ported Blanking plate assembly



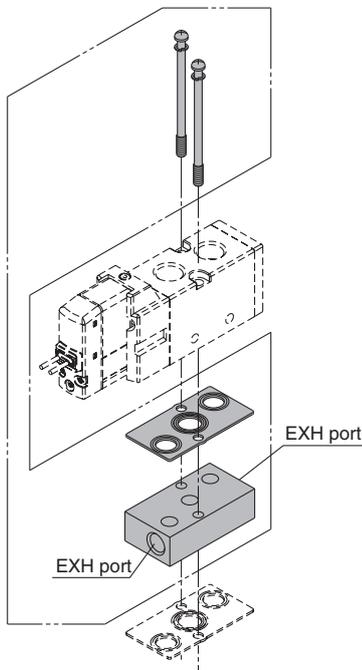
Series	Blanking plate assembly part no.
VF1000	DXT144-13-3A
VF3000	DXT031-38-5A
VF5000	VF5000-70-1A

■ Mounting screw, gasket part no.



Series	Valve mounting screw (1 pc.)	Gasket
VF1000	Round head combination screw DXT031-44-1	DXT144-12-2
VF3000	(M4 x 39.5, With spring washer)	DXT155-25-7
VF5000	Hexagon socket head cap screw AXT620-32-1	DXT156-9-6
	(M4 x 48, With spring washer)	

■ Individual EXH spacer assembly



⚠ Caution

Tightening Torque for Mounting Screw

M4: 1.4 N·m

⚠ Warning

When mounting a valve or spacer on the manifold base or sub-plate, etc., the mounting orientation is already decided. If mounted in a wrong direction, the equipment to be connected may result in a malfunction. Refer to the dimensions for mounting.

VF 3 000-75-1 A

• Series

Symbol	Series	Port size
3	VF3000	1/8
5	VF5000	1/4

• Thread type

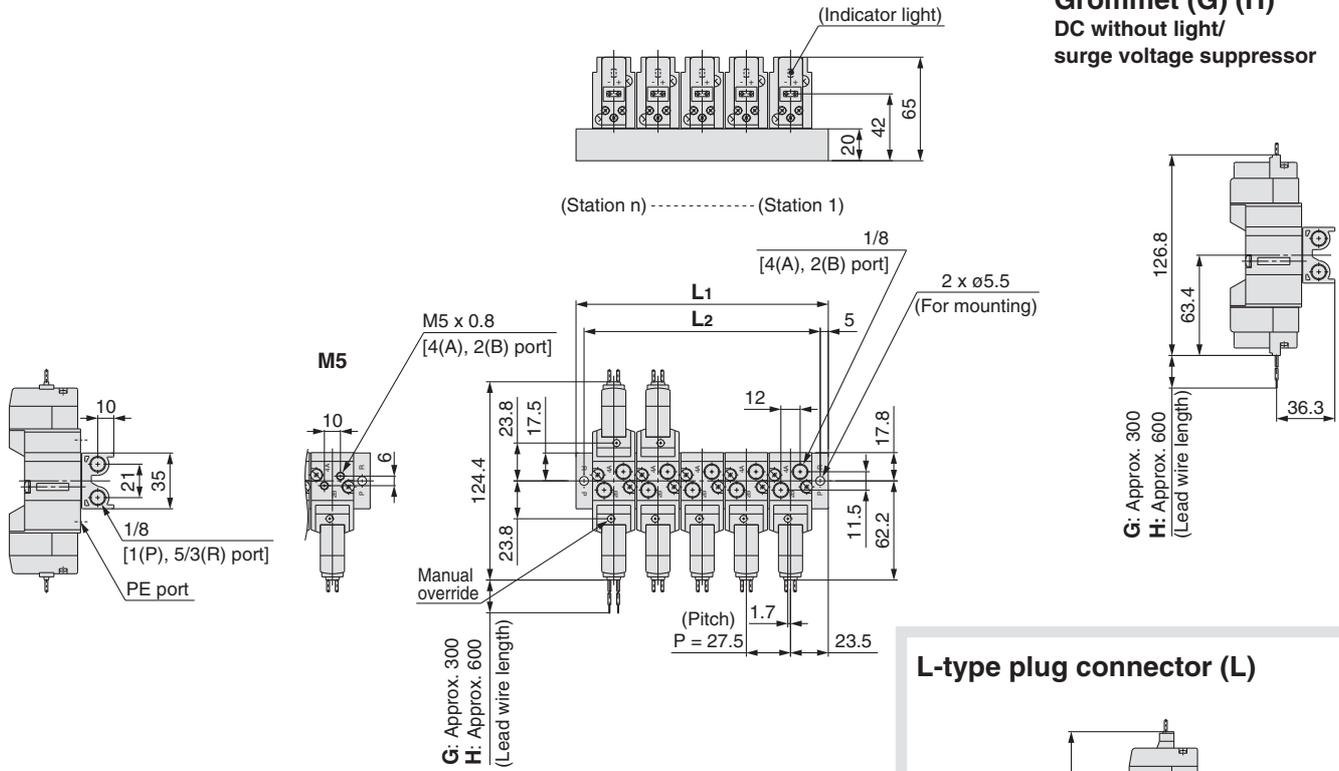
—	Rc
F	G
N	NPT
T	NPTF

Series VF1000/3000/5000

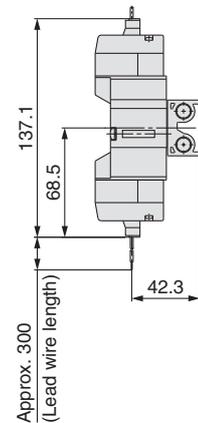
Dimensions: Series VF1000

Type 30/VV5F1-30-□□1-□: Common exhaust
Grommet (G) (H)

Grommet (G) (H)
DC without light/
surge voltage suppressor



L-type plug connector (L)



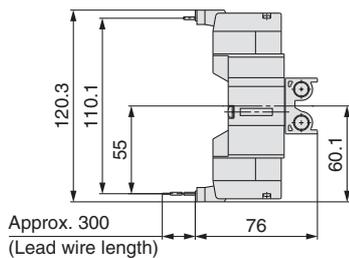
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n	2	3	4	5	6	7	8	9	10	11	12	13	14
L1	74.5	102	129.5	157	184.5	212	239.5	267	294.5	322	349.5	377	404.5
L2	64.5	92	119.5	147	174.5	202	229.5	257	284.5	312	339.5	367	394.5

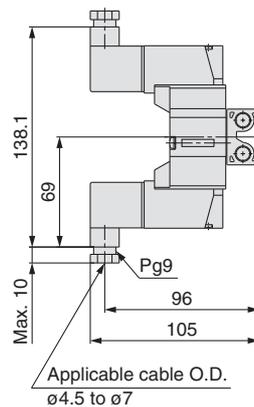
n	15	16	17	18	19	20
L1	432	459.5	487	514.5	542	569.5
L2	422	449.5	477	504.5	532	559.5

M-type plug connector (M)



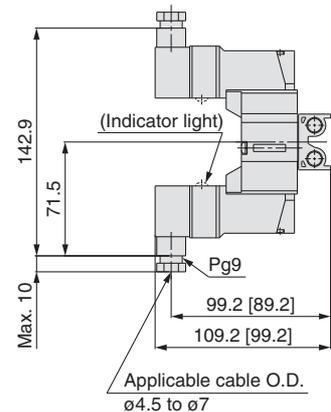
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



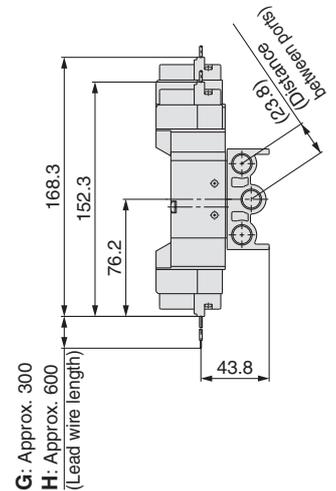
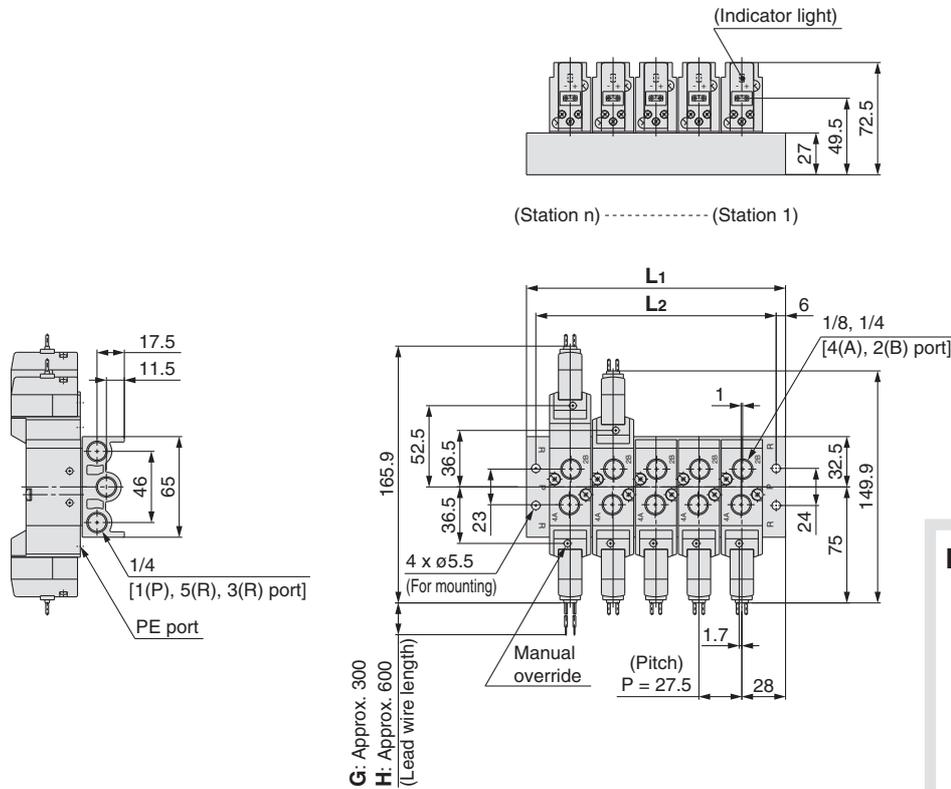
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

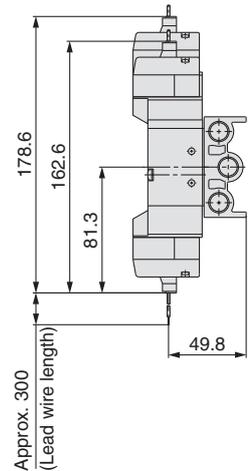
Dimensions: Series VF3000

Type 30/VV5F3-30-□□1-□: Common exhaust
Grommet (G) (H)

Grommet (G) (H)
DC without light/
surge voltage suppressor



L-type plug connector (L)



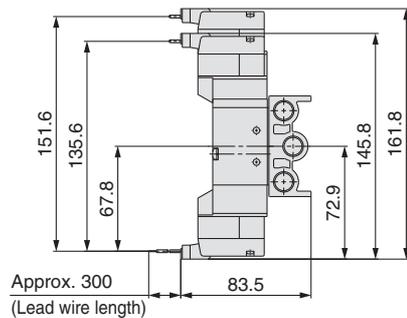
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n	2	3	4	5	6	7	8	9	10	11	12	13	14	n: Stations
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	331	358.5	386	413.5	
L2	71.5	99	126.5	154	181.5	209	236.5	264	291.5	319	346.5	374	401.5	

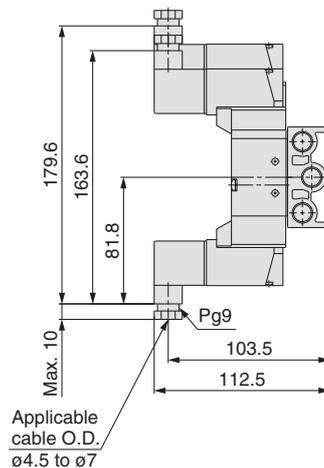
n	15	16	17	18	19	20
L1	441	468.5	496	523.5	551	578.5
L2	429	456.5	484	511.5	539	566.5

M-type plug connector (M)



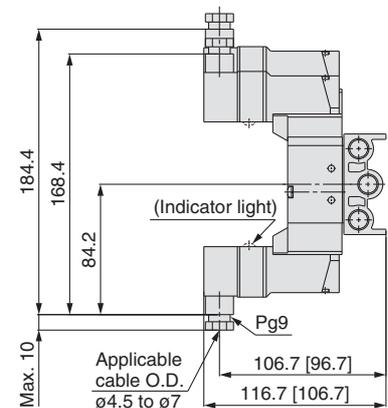
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)

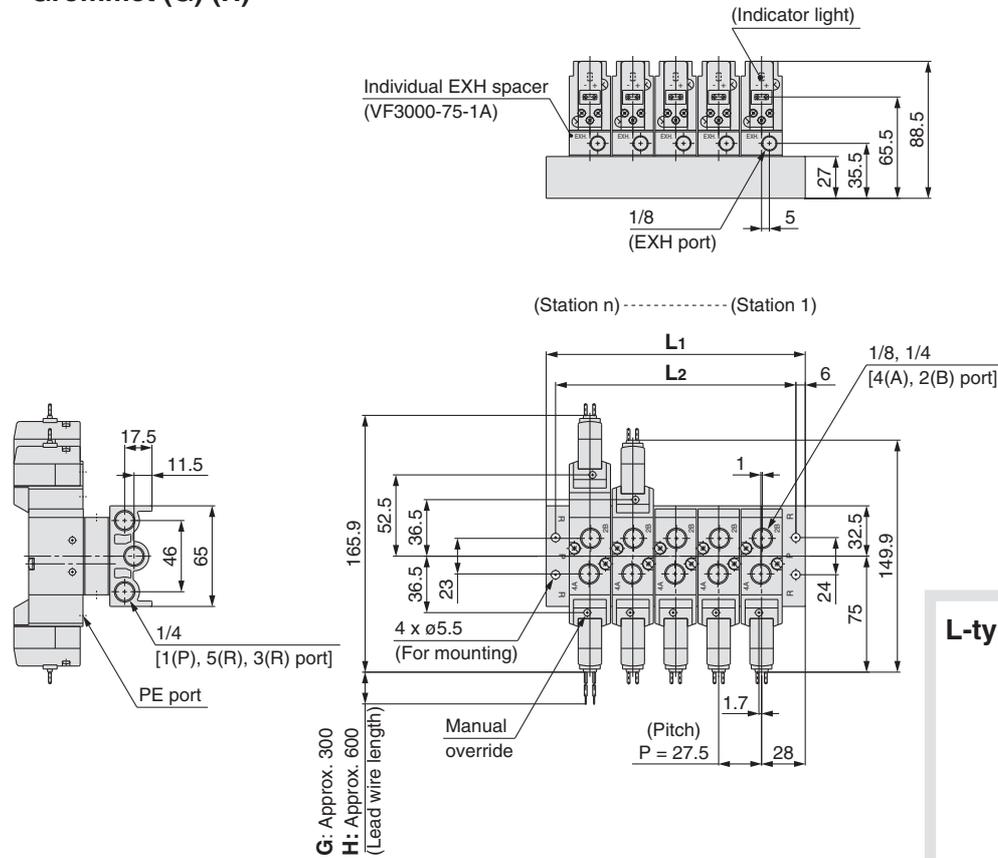


[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

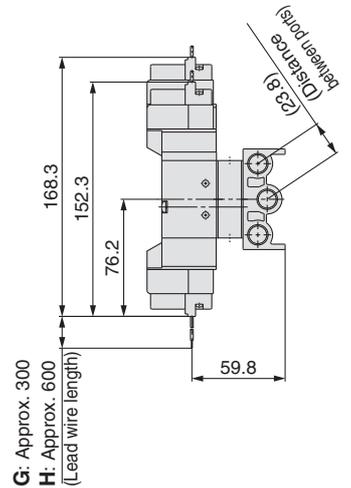
Dimensions: Series VF3000

Type 30/VV5F3-30-□□1-□: When the individual EXH spacer (VF3000-75-1A) is mounted.

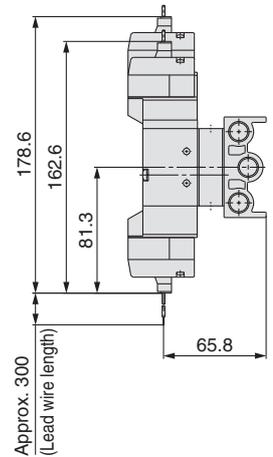
Grommet (G) (H)



Grommet (G) (H)
DC without light/
surge voltage suppressor



L-type plug connector (L)



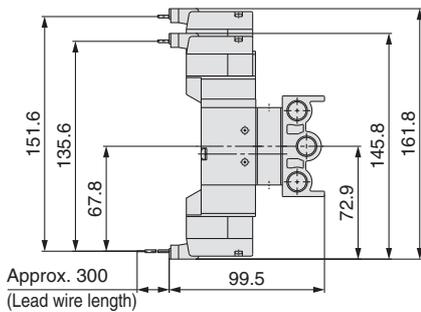
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n	2	3	4	5	6	7	8	9	10	11	12	13	14
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	331	358.5	386	413.5
L2	71.5	99	126.5	154	181.5	209	236.5	264	291.5	319	346.5	374	401.5

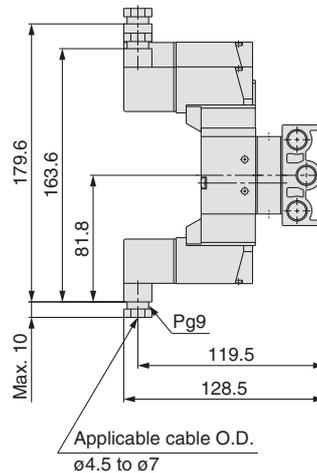
n	15	16	17	18	19	20
L1	441	468.5	496	523.5	551	578.5
L2	429	456.5	484	511.5	539	566.5

M-type plug connector (M)



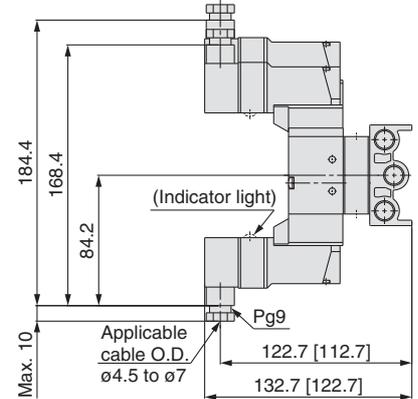
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



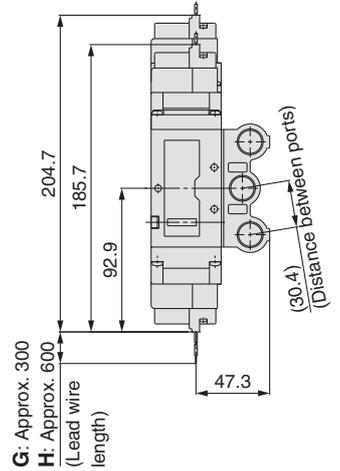
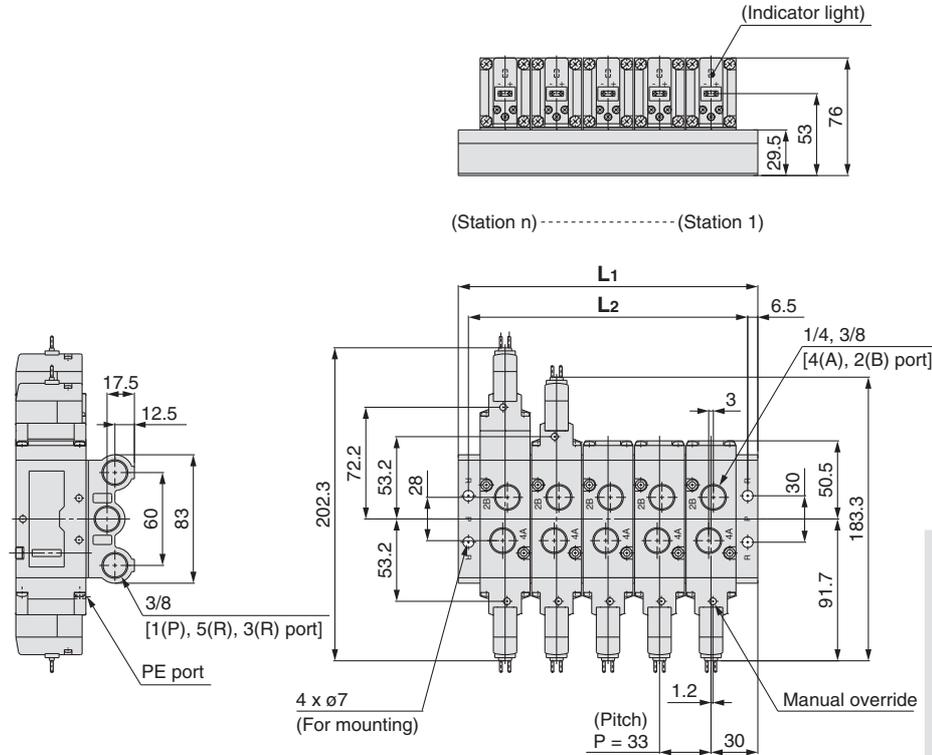
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

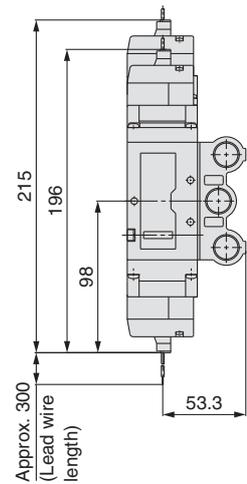
Dimensions: Series VF5000

Type 20/VV5F5-20-□□1-□: Common exhaust
Grommet (G)

Grommet (G) (H)
DC without light/
surge voltage suppressor



L-type plug connector (L)



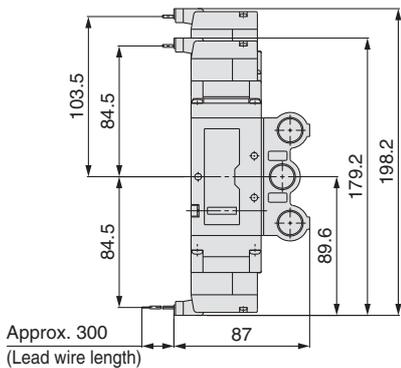
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n	2	3	4	5	6	7	8	9	10
L1	93	126	159	192	225	258	291	324	357
L2	80	113	146	179	212	245	278	311	344

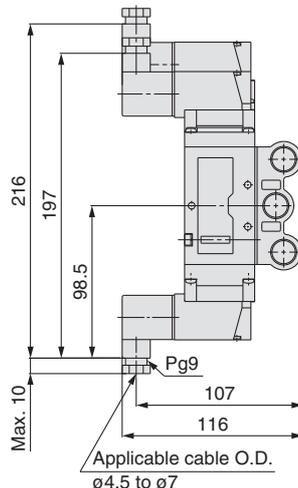
n: Stations

M-type plug connector (M)



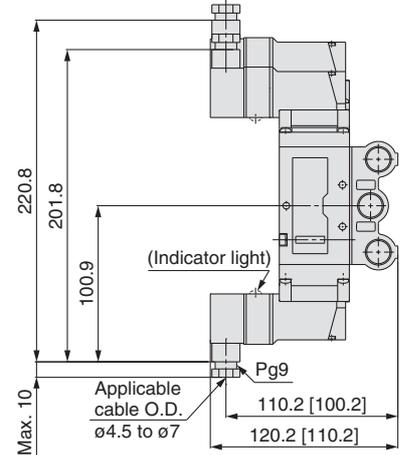
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

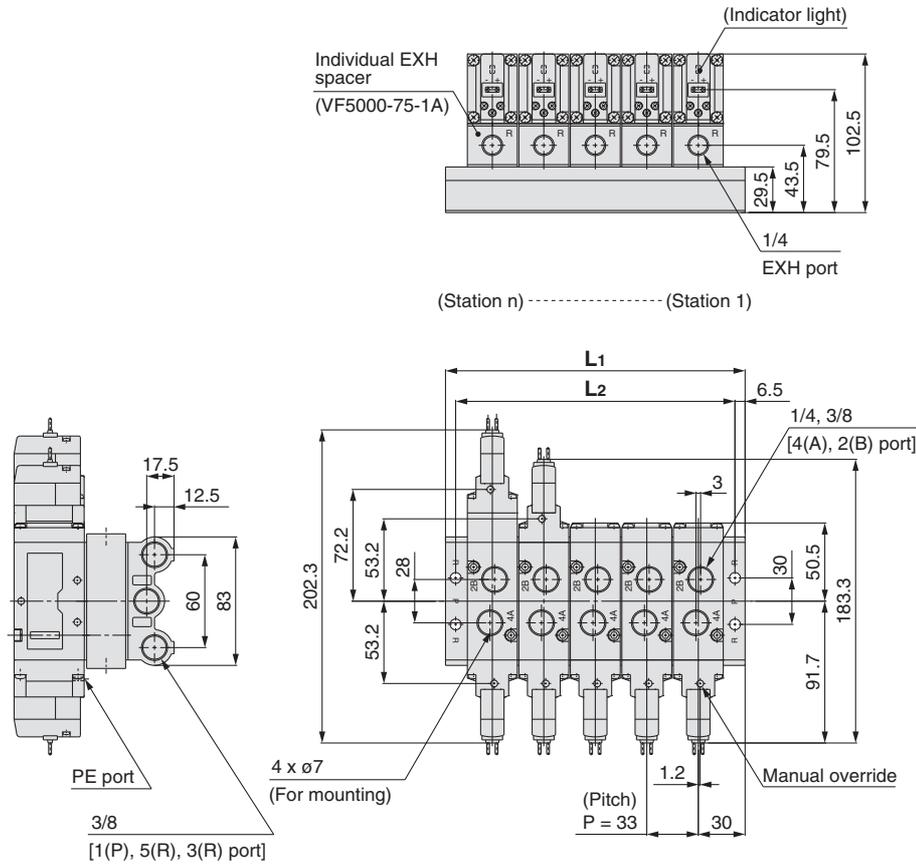
Conduit terminal (T)



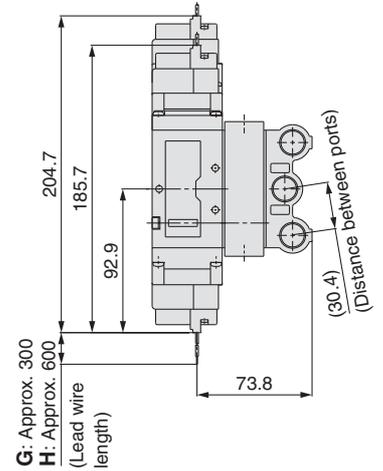
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Dimensions: Series VF5000

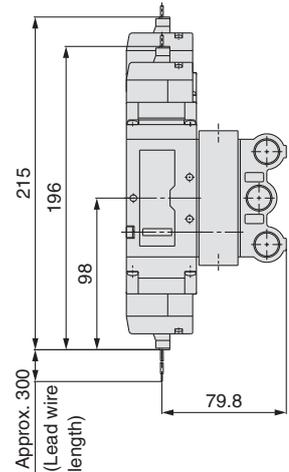
Type 20/VV5F5-20-□□1-□: When the individual EXH spacer (VF5000-75-1A) is mounted.
Grommet (G)



Grommet (G) (H)
DC without light/
surge voltage suppressor



L-type plug connector (L)



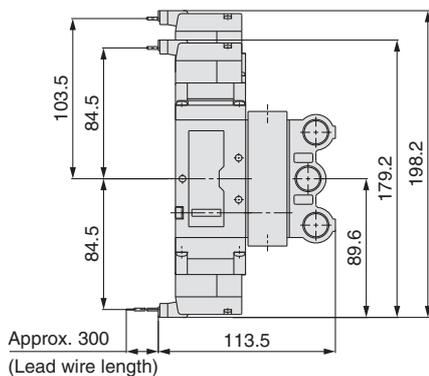
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n	2	3	4	5	6	7	8	9	10
L1	93	126	159	192	225	258	291	324	357
L2	80	113	146	179	212	245	278	311	344

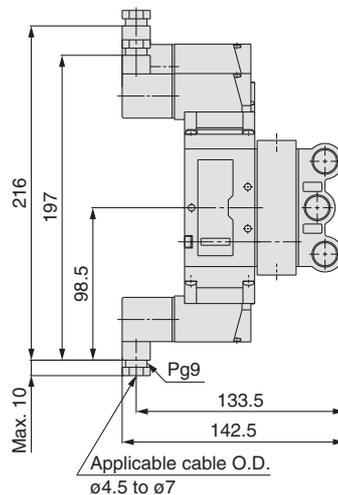
n: Stations

M-type plug connector (M)



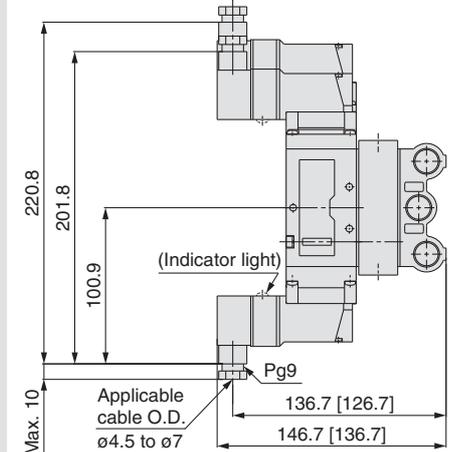
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



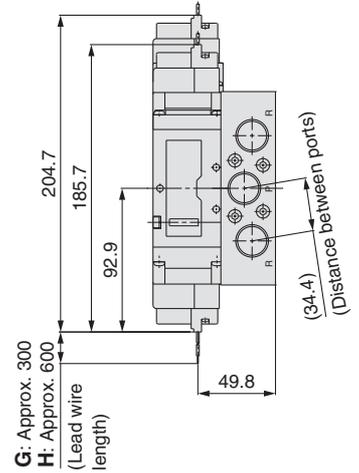
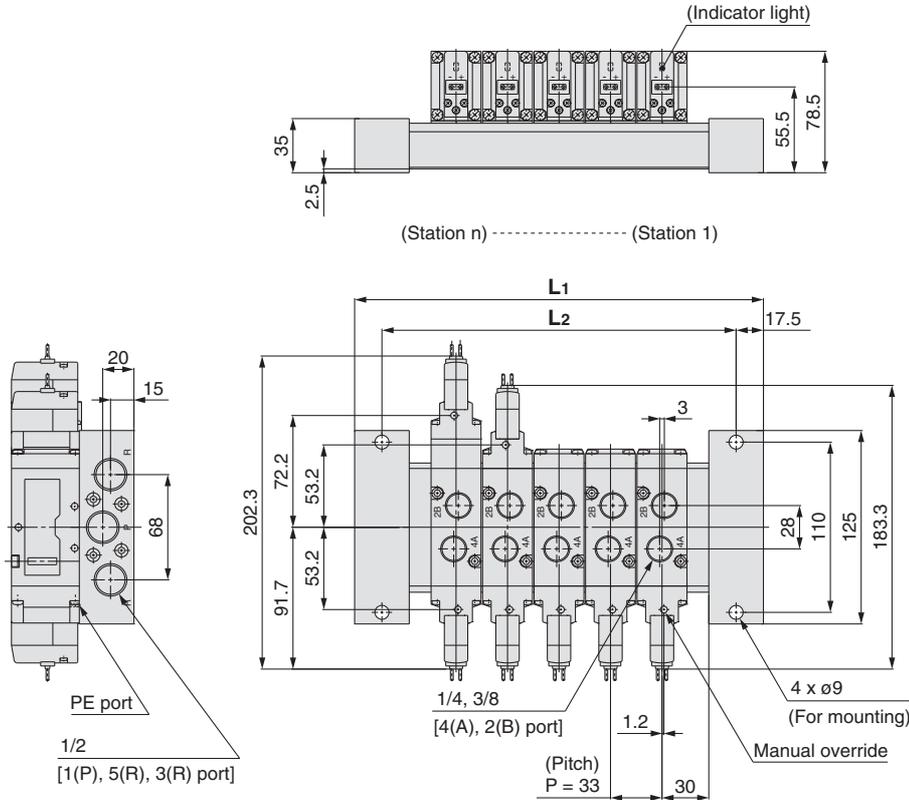
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF1000/3000/5000

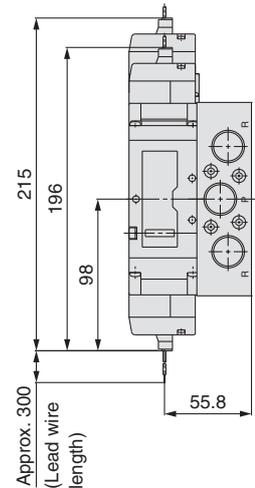
Dimensions: Series VF5000

Type 21/VV5F5-21-□□1-□: Common exhaust Grommet (G)

Grommet (G) (H) DC without light/ surge voltage suppressor



L-type plug connector (L)

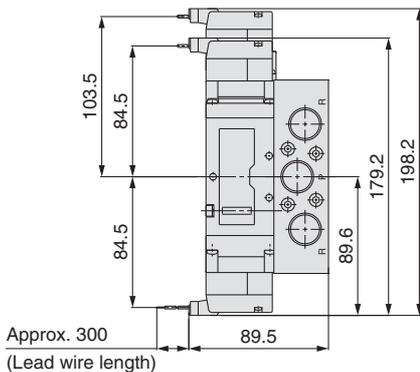


Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

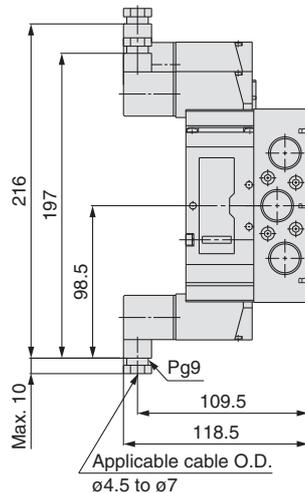
L	n	n: Stations														
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	
L1		163	196	229	262	295	328	361	394	427	460	493	526	559	592	
L2		128	161	194	227	260	293	326	359	392	425	458	491	524	557	

M-type plug connector (M)



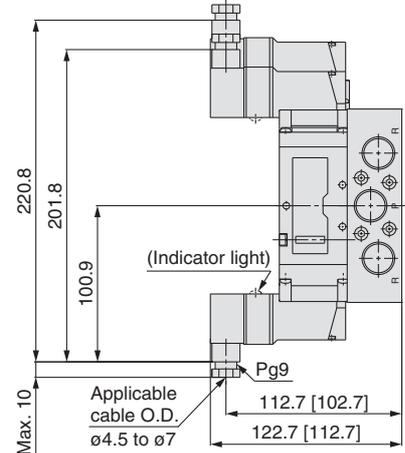
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)

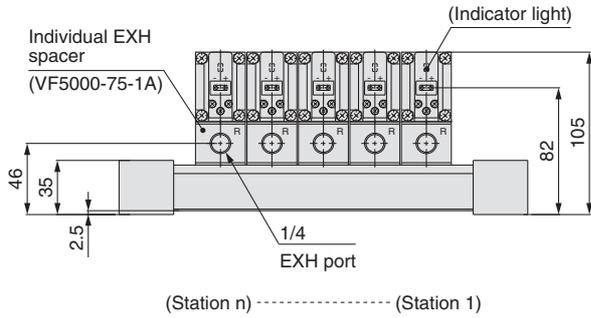


[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

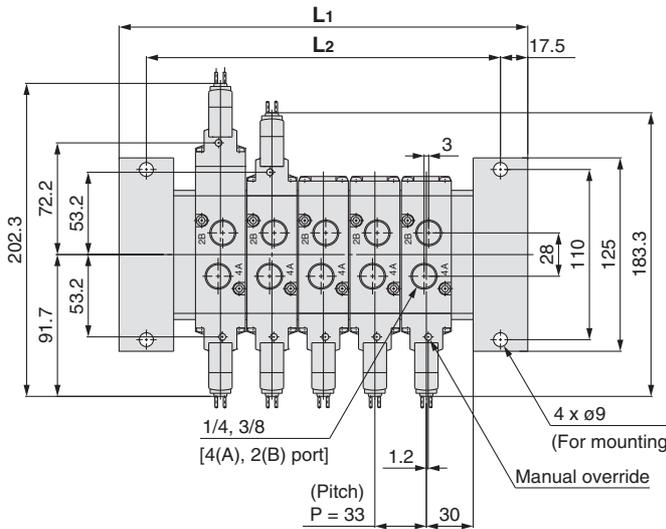
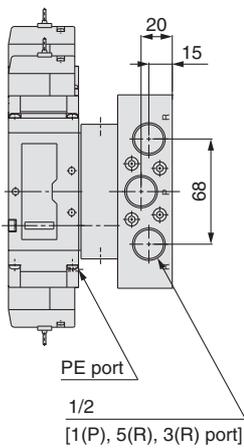
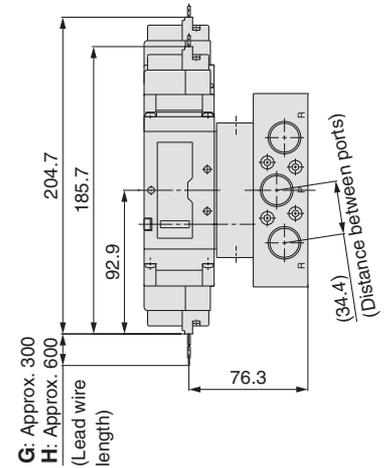
Dimensions: Series VF5000

Type 21/VV5F5-21-□□1-□: When the individual EXH spacer (VF5000-75-1A) is mounted.

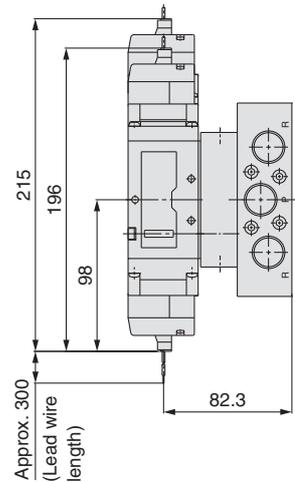
Grommet (G)



Grommet (G) (H)
DC without light/
surge voltage suppressor



L-type plug connector (L)



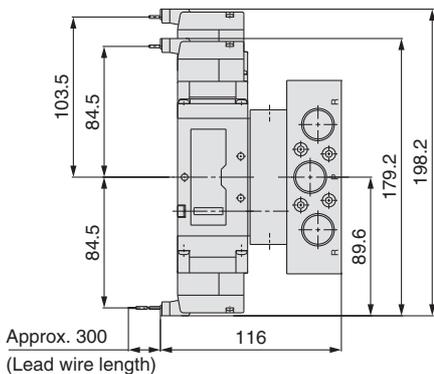
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n	2	3	4	5	6	7	8	9	10	11	12	13	14	15
L1	163	196	229	262	295	328	361	394	427	460	493	526	559	592
L2	128	161	194	227	260	293	326	359	392	425	458	491	524	557

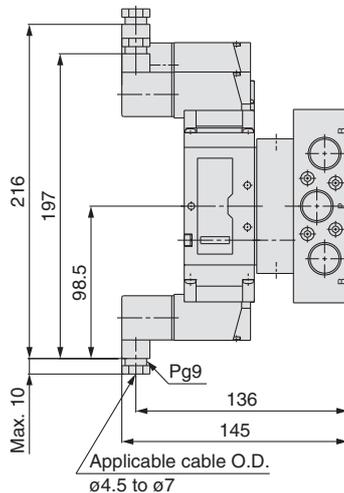
n: Stations

M-type plug connector (M)



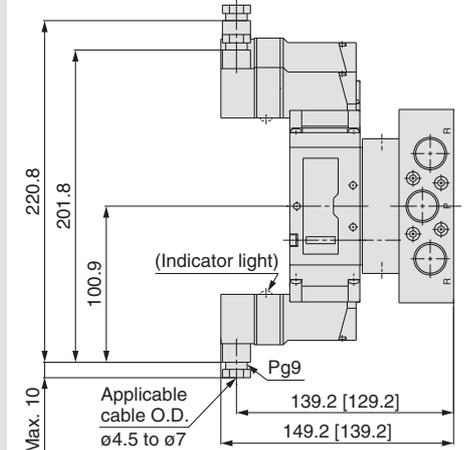
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Pilot Operated 5 Port Solenoid Valve Series VF3000/5000 Manifold

Base Mounted

How to Order Manifold



Note) Only DIN and conduit terminal types are available with AC mode. Refer to the electrical entry for details.

Common exhaust

VV5F **3** - 40 - **05** 2 - 02 **F**

Symbol	Series	P, R port size	A, B port size
3	VF3000	1/4	1/4
5	VF5000	3/8	1/4

Note) The A and B ports are made on the bottom.

Symbol	Stations
02	2 stations
:	:
20	20 stations

Note) Up to 10 stations for VV5F5.

Symbol	Thread type
—	Rc
F	G
N	NPT
T	NPTF

How to Order Valve (With a gasket and two mounting screws)

Note) For low wattage specification, refer to "How to Order Valve" on page 26.

VF **3** **1** **4** **0** **—** **—** - **5** **G** **—** **—** **1** - **—**

Symbol	Series
3	VF3000
5	VF5000

Note) Not available with the VF1000.

Symbol	Type of actuation
1	2-position single
2	2-position double
3	3-position closed centre
4	3-position exhaust centre
5	3-position pressure centre

Body model

Body option

0: Pilot valve individual exhaust		PE port EA/EB port	VF3000	VF5000
3: Main/Pilot valve common exhaust		PE port EA/EB port	VF3000	VF5000
4: Pilot valve base exhaust		PE port	VF3000	VF5000

Pressure specifications

—	Standard (0.7 MPa)
K	High-pressure type (1 MPa)

Rated voltage

DC	AC (50/60 Hz)
5 24 VDC	1 100 VAC
6 12 VDC	2 200 VAC
	3 110 VAC [115 VAC]
	4 220 VAC [230 VAC]
	7 240 VAC
	B 24 VAC

Made to Order

Refer to page 14 for details. Combination with low wattage specification is not possible.

Manual override

—: Non-locking push type	D: Push-turn locking slotted type	E: Push-turn locking lever type

Light/Surge voltage suppressor

Symbol	Light/Surge voltage suppressor	DC	AC
—	Without light/surge voltage suppressor	○	○
S	With surge voltage suppressor	○	○ ^{Note 1)}
Z	With light/surge voltage suppressor	○	○
R	With surge voltage suppressor (Non-polar)	○	—
U	With light/surge voltage suppressor (Non-polar)	○	—

Note 1) S type is not available with AC mode, since a rectifier prevents surge voltage generation.

Note 2) In the DIN terminal type, since a light is installed in the connector, DOZ, DOU, YOZ, YOU are not available.



Caution
When using the surge voltage suppressor type, residual voltage will remain. Refer to page 51 for details.

Electrical entry

	Grommet	L-type plug connector	M-type plug connector	DIN terminal	DIN (EN175301-803) terminal	Conduit terminal
	G: Lead wire length 300 mm H: Lead wire length 600 mm	L: With lead wire (length 300 mm) LN: Without lead wire LO: Without connector	M: With lead wire (length 300 mm) MN: Without lead wire MO: Without connector	D: With connector DO: Without connector	Y: With connector YO: Without connector	T: Conduit terminal
DC	●	●	●	●	●	●
AC ^{Note 5)}	—	—	—	●	●	●

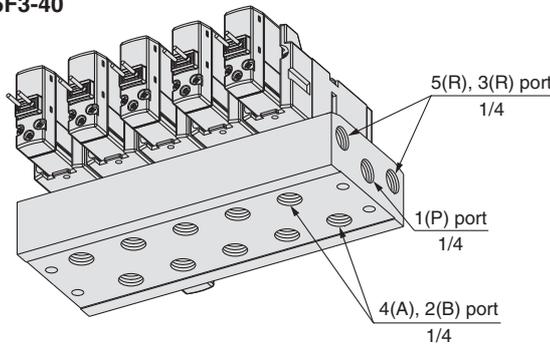
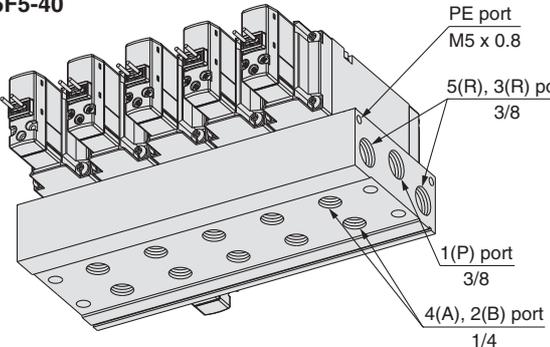
Note 1) LN and MN types are with 2 sockets. Note 2) Refer to page 49 when different length of lead wire for L/M-type plug connector is required.

Note 3) Refer to page 50 for details on the DIN (EN175301-803) terminal.

Note 4) When using IP65, select the main/pilot valve common exhaust type.

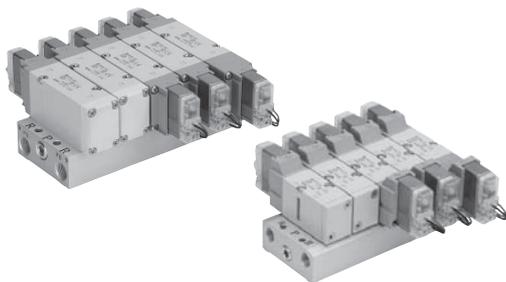
Note 5) With the same specifications as the DC type, all electrical entries for the 24 VAC type are available.

Manifold Specifications

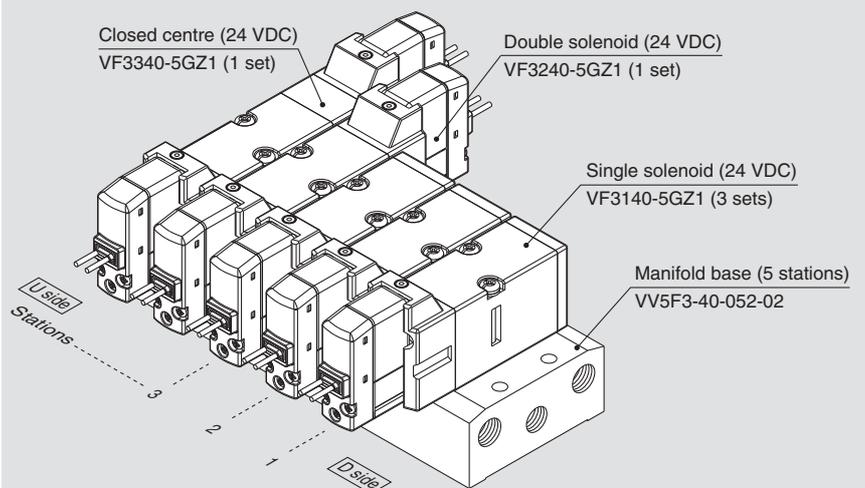
Series	Manifold base model	EXH port type	Applicable valve model	Applicable stations	Manifold base Weight: W [g] Stations: n
VF3000	VV5F3-40 	Common EXH	VF3□40 VF3□43	2 to 20 stations	W = 110n + 116
VF5000	VV5F5-40 	Common EXH	VF5□44	2 to 10 stations	W = 161n + 128

Note) Supply pressure to 1(P) ports and exhaust pressure from R ports on both sides for 10 stations or more (5 stations or more for the VF5000).

How to Order Manifold Assembly



Example (VV5F3-40)



VV5F3-40-052-02 1 set (Type 40, 5-station manifold base part no.)

* VF3140-5GZ1 3 sets (Single solenoid part no.)

* VF3240-5GZ1 1 set (Double solenoid part no.)

* VF3340-5GZ1 1 set (Closed centre part no.)

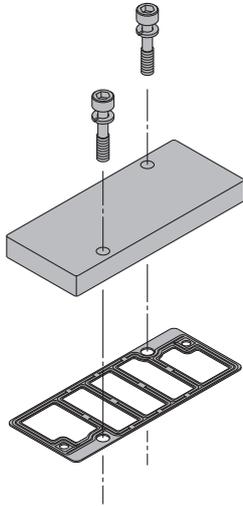
↳ The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

- The valve arrangement is numbered as the 1st station from D side.
- Under the manifold base part number, state the valves to be mounted in order from the 1st station as shown in the figure above. If the arrangement becomes complicated, specify on the manifold specification sheet.

Series VF3000/5000

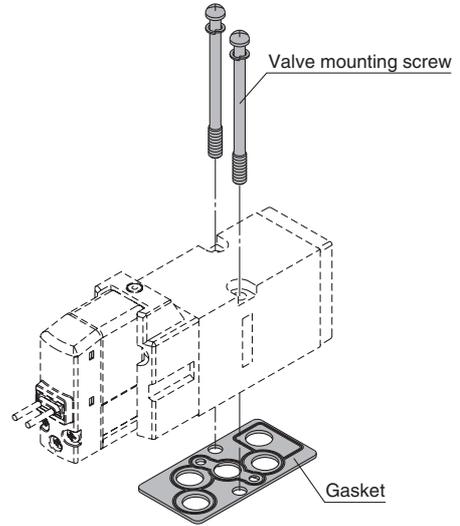
Manifold Options

■ For base mounted Blanking plate assembly



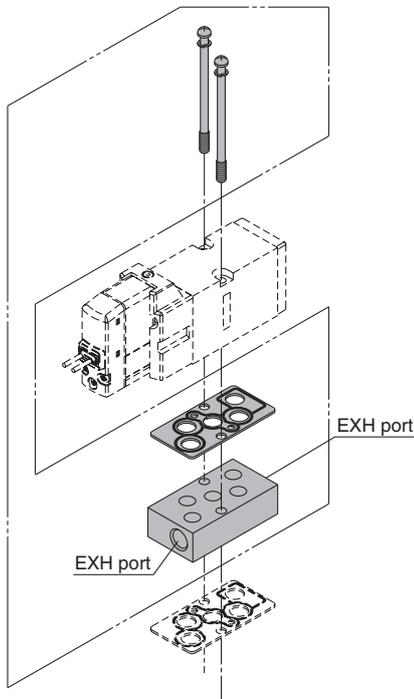
Series	Blanking plate assembly part no.
VF3000	DXT031-38-5A
VF5000	VF5000-70-2A

■ Mounting screw, gasket part no.



Series	Valve mounting screw (1 pc.)	Gasket
VF3000	Round head combination screw DXT031-44-1 (M4 x 39.5, With spring washer)	DXT031-30-11
VF5000	Hexagon socket head cap screw AXT620-32-1 (M4 x 48, With spring washer)	DXT156-9-8

■ Individual EXH spacer assembly



⚠ Caution

Tightening Torque for Mounting Screw

M4: 1.4 N·m

⚠ Warning

When mounting a valve or spacer on the manifold base or sub-plate, etc., the mounting orientation is already decided. If mounted in a wrong direction, the equipment to be connected may result in a malfunction. Refer to the dimensions for mounting.

VF 3 000-75-2 A

• Series

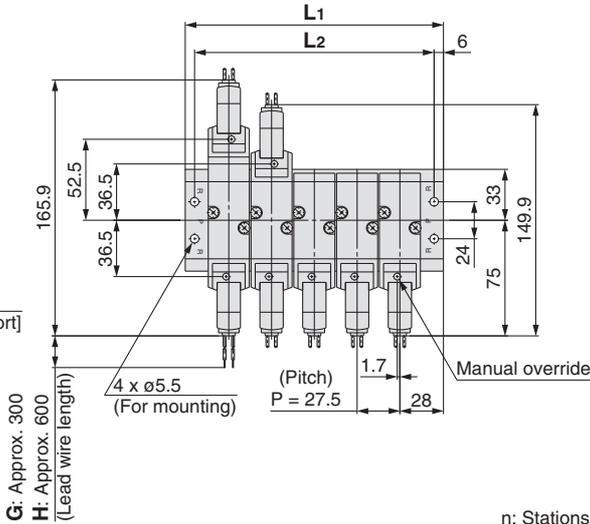
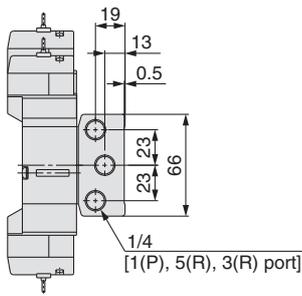
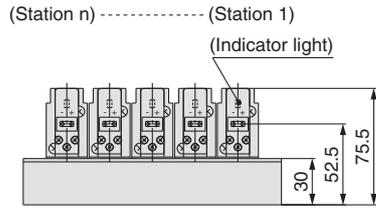
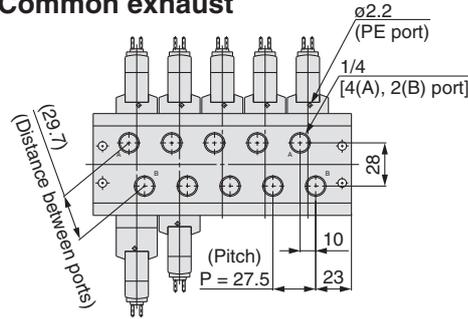
Symbol	Series	Port size
3	VF3000	1/8
5	VF5000	1/4

• Thread type

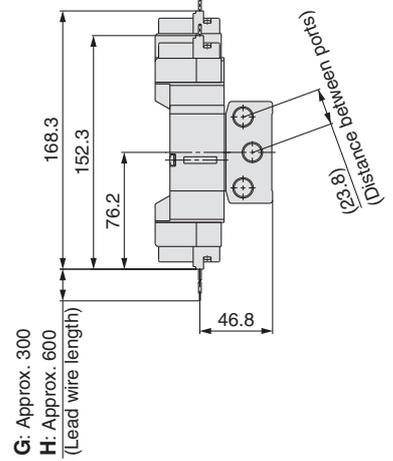
—	Rc
F	G
N	NPT
T	NPTF

Dimensions: Series VF3000

Type 40/VV5F3-40-□□2-02□: Common exhaust
Grommet (G) (H)



Grommet (G) (H)
DC without light/
surge voltage suppressor



L: Dimensions

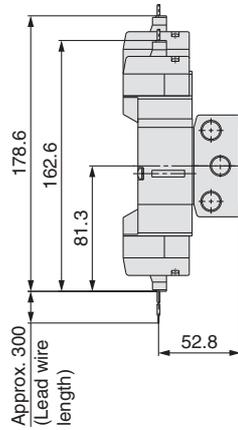
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	331	358.5	386	413.5
L2	71.5	99	126.5	154	181.5	209	236.5	264	291.5	319	346.5	374	401.5

L \ n	15	16	17	18	19	20
L1	441	468.5	496	523.5	551	578.5
L2	429	456.5	484	511.5	539	566.5

G: Approx. 300
H: Approx. 600
(Lead wire length)

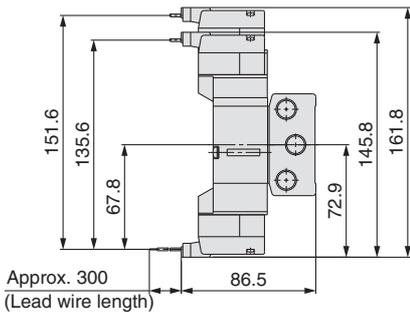
n: Stations

L-type plug connector (L)



Unless otherwise indicated, dimensions are the same as Grommet (G).

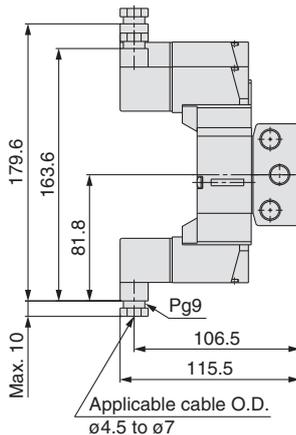
M-type plug connector (M)



Approx. 300
(Lead wire length)

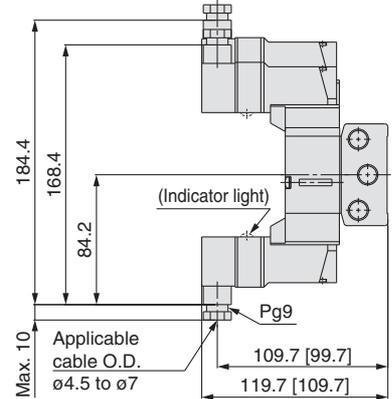
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

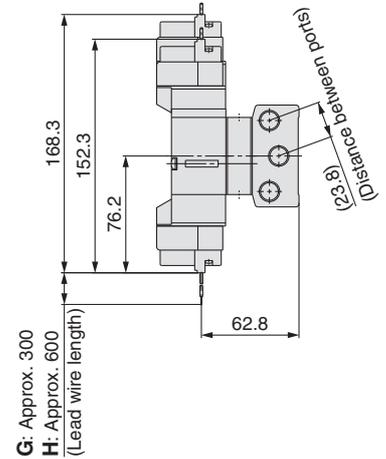
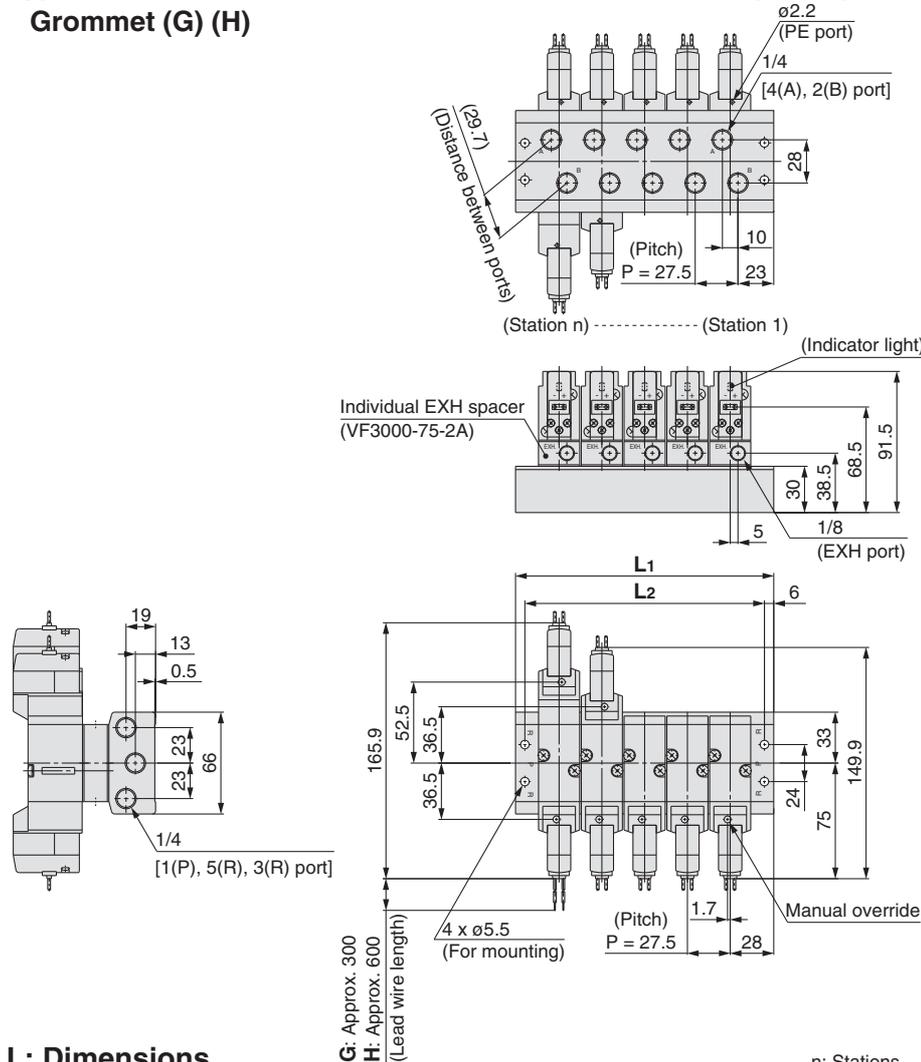
Series VF3000/5000

Dimensions: Series VF3000

Type 40/VV5F3-40-□□2-02□: When the individual EXH spacer (VF3000-75-2A) is mounted.

Grommet (G) (H)

Grommet (G) (H)
DC without light/
surge voltage suppressor

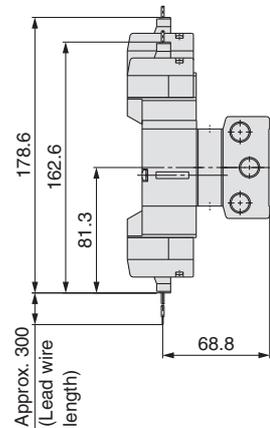


L: Dimensions

L	n	2	3	4	5	6	7	8	9	10	11	12	13	14
L1		83.5	111	138.5	166	193.5	221	248.5	276	303.5	331	358.5	386	413.5
L2		71.5	99	126.5	154	181.5	209	236.5	264	291.5	319	346.5	374	401.5

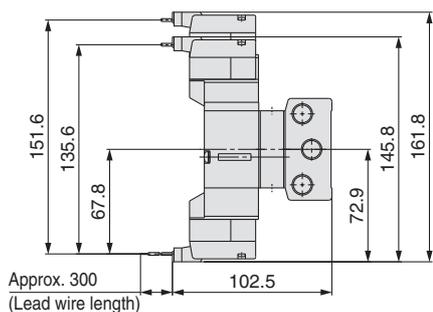
L	n	15	16	17	18	19	20
L1		441	468.5	496	523.5	551	578.5
L2		429	456.5	484	511.5	539	566.5

L-type plug connector (L)



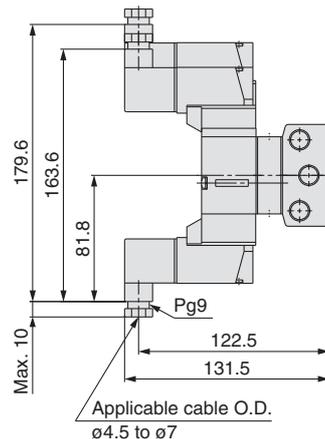
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M)



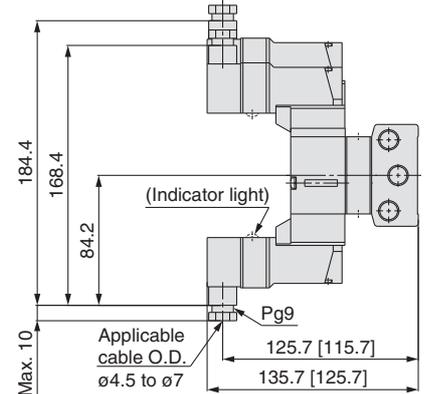
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

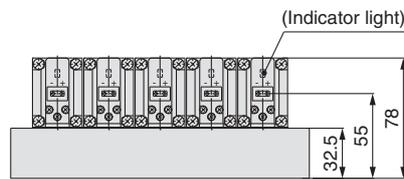
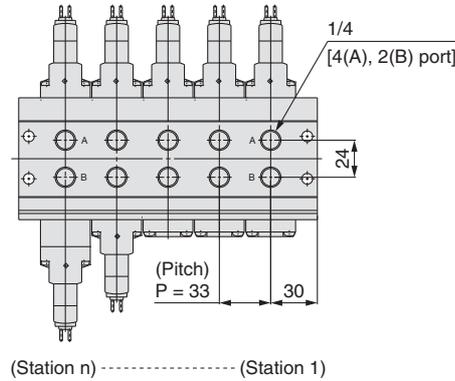
Conduit terminal (T)



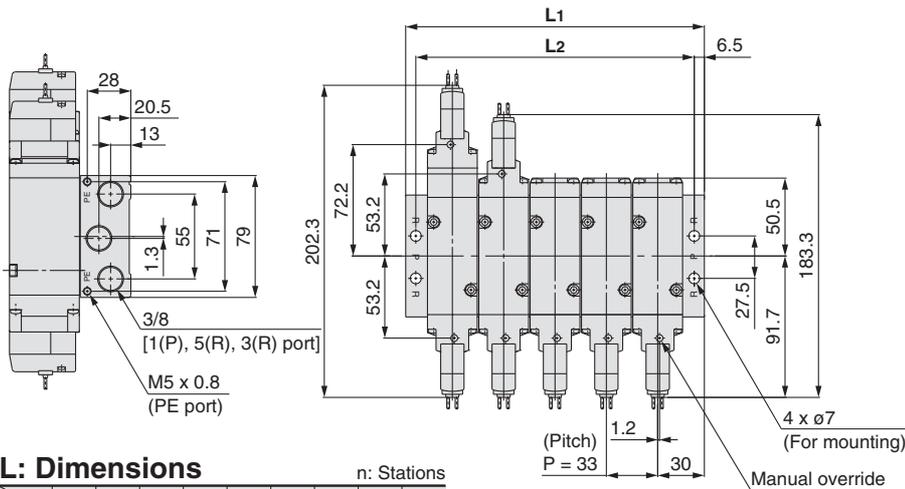
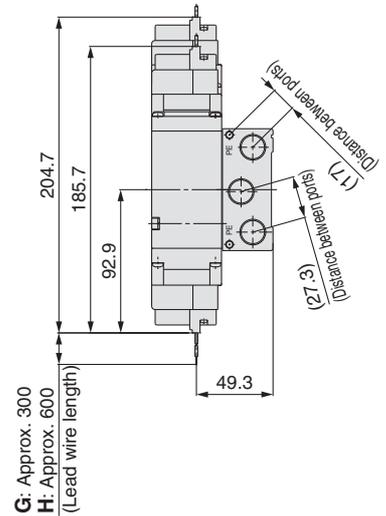
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Dimensions: Series VF5000

Type 40/VV5F5-40-□□2-02□: Common exhaust
Grommet (G)



Grommet (G) (H)
DC without light/
surge voltage suppressor

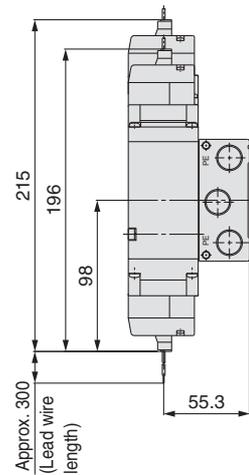


L: Dimensions

n: Stations

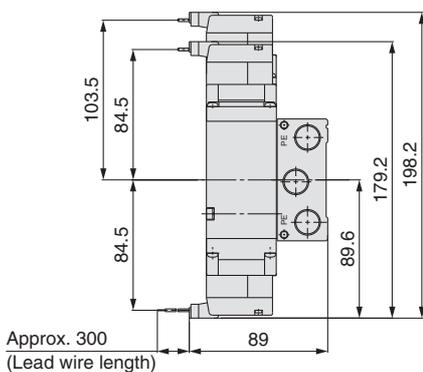
L	n	2	3	4	5	6	7	8	9	10
L1		93	126	159	192	225	258	291	324	357
L2		80	113	146	179	212	245	278	311	344

L-type plug connector (L)



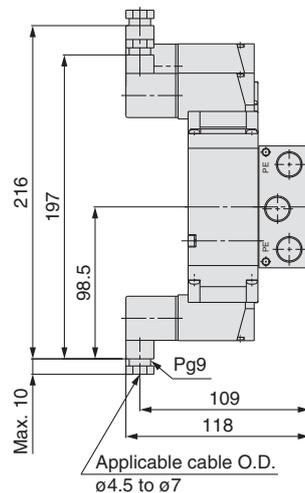
Unless otherwise indicated, dimensions are the same as Grommet (G).

M-type plug connector (M)



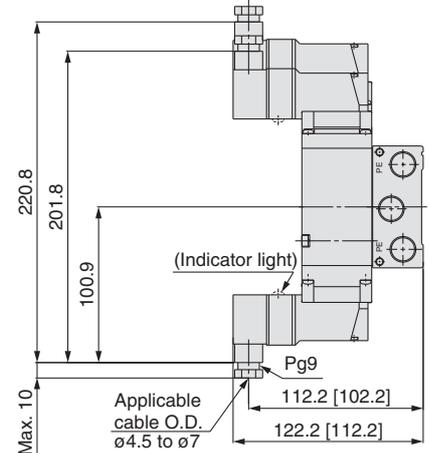
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



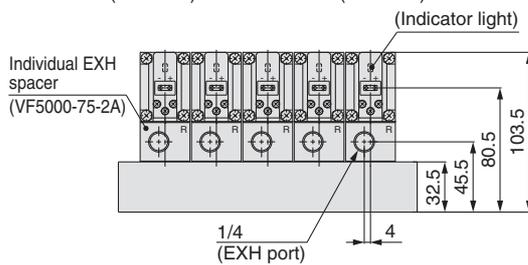
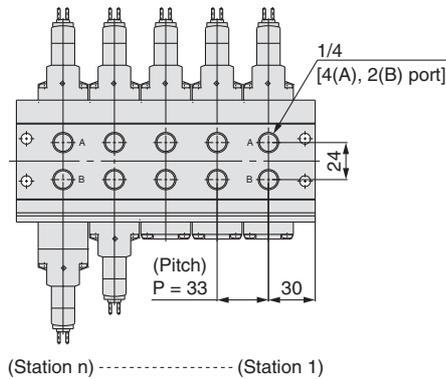
[]: Without indicator light
Unless otherwise indicated, dimensions are the same as Grommet (G).

Series VF3000/5000

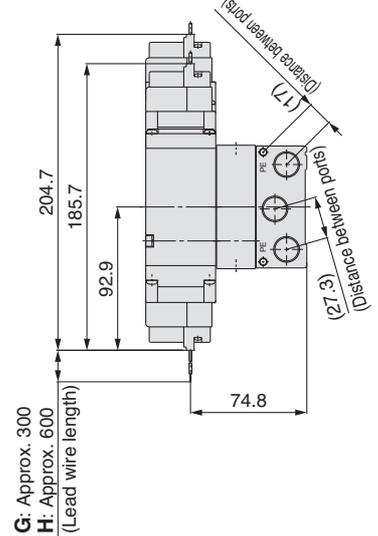
Dimensions: Series VF5000

Type 40/VV5F5-40-□□2-02□: When the individual EXH spacer (VF5000-75-2A) is mounted.

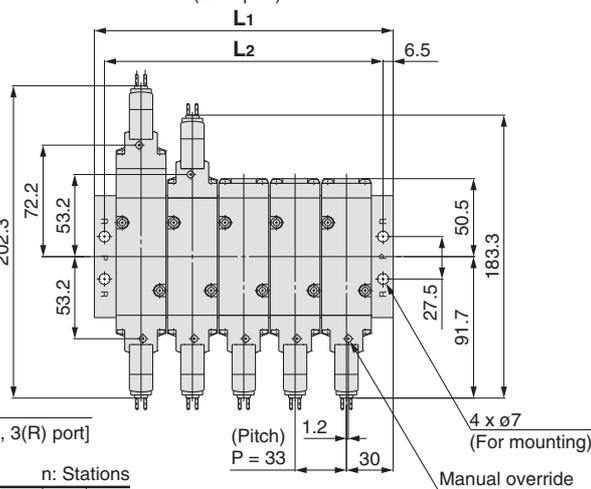
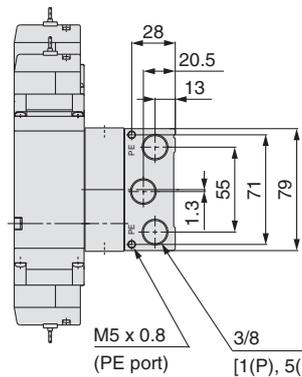
Grommet (G)



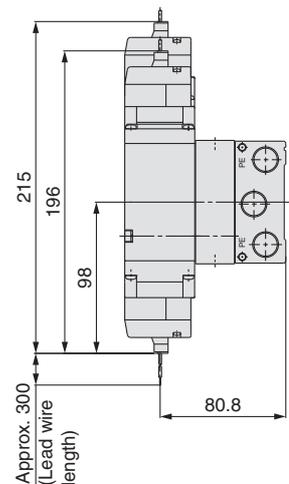
Grommet (G) (H) DC without light/ surge voltage suppressor



G: Approx. 300
H: Approx. 600
(Lead wire length)



L-type plug connector (L)



Approx. 300
(Lead wire length)

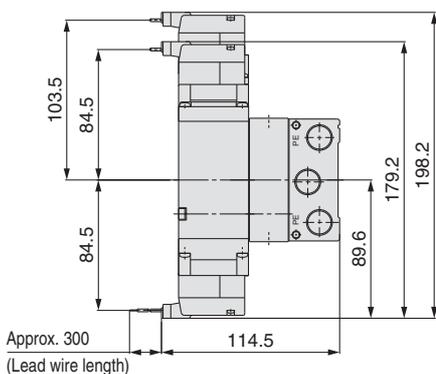
Unless otherwise indicated, dimensions are the same as Grommet (G).

L: Dimensions

n: Stations

L	n	2	3	4	5	6	7	8	9	10
L1		93	126	159	192	225	258	291	324	357
L2		80	113	146	179	212	245	278	311	344

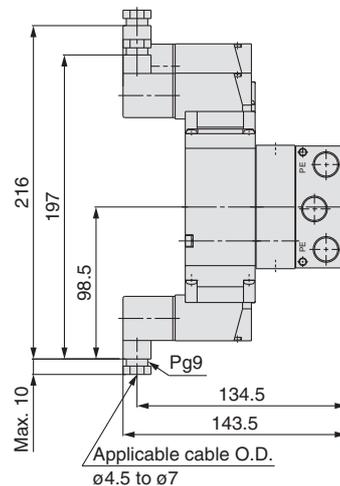
M-type plug connector (M)



Approx. 300
(Lead wire length)

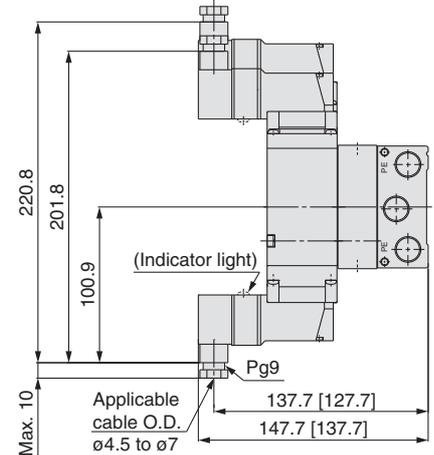
Unless otherwise indicated, dimensions are the same as Grommet (G).

DIN terminal (D) (Y)



Unless otherwise indicated, dimensions are the same as Grommet (G).

Conduit terminal (T)



[]: Without indicator light

Unless otherwise indicated, dimensions are the same as Grommet (G).



Series VF Specific Product Precautions 1

Be sure to read before handling.

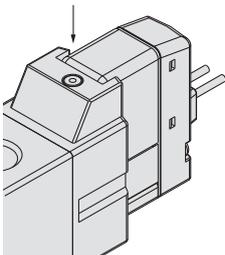
Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Manual Override

Warning

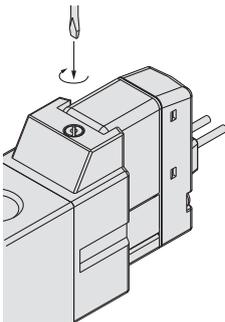
Regardless of an electric signal for the solenoid valve, the manual override is used for switching the main valve. Connected actuator is started by manual operation. Use the manual override after confirming that there is no danger.

■ Non-locking push type

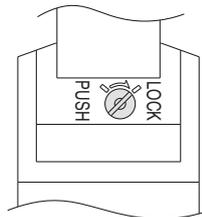


Push down on the manual override with a small screwdriver until it stops. Release the screwdriver and the manual override will return.

■ Push-turn locking slotted type

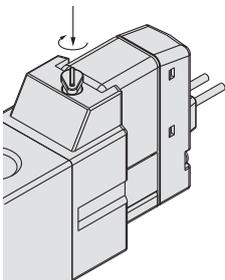


Locked position

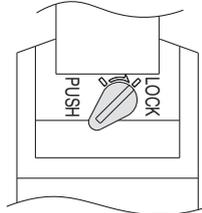


Push down on the manual override with a small flat head screwdriver until it stops. Turn it clockwise by 90° to lock it. Turn it counterclockwise to release it.

■ Push-turn locking lever type



Locked position



After pushing down, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking push type.

Caution

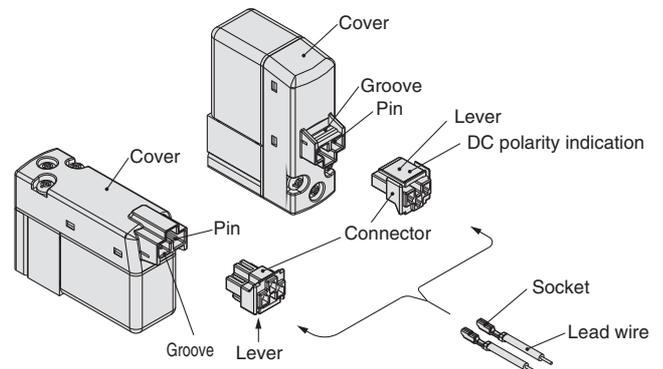
When locking the manual override on the push-turn locking type (D or E type), be sure to push it down before turning. Turning without first pushing it down can cause damage to the manual override and other trouble such as air leakage, etc. Do not apply excessive torque when turning the locking type manual override. (0.1 N·m)

How to Use L/M-Type Plug Connector

Caution

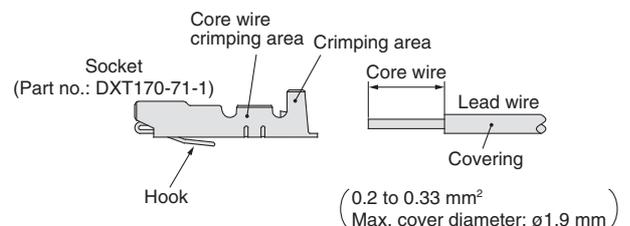
1. Connector attachment/detachment

- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.



2. Crimping lead wire and socket connection

Not necessary if ordering the lead wire pre-connected model. Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area. (Please contact SMC for details on the crimping tool.)



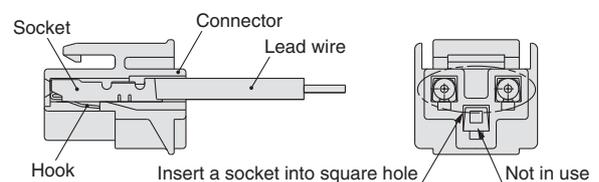
3. Socket with lead wire attachment/detachment

• Attachment

Insert the sockets into the square holes of the connector (with +, - indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then, confirm that they are locked by pulling lightly on the lead wires.

• Detachment

To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (approx. 1 mm). If the socket will be used again, first spread the hook outward.





Series VF

Specific Product Precautions 2

Be sure to read before handling.

Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Plug Connector Lead Wire Length

Caution

Plug connector lead wires have a standard length of 300 mm, however, the following lengths are also available.

How to Order Connector Assembly

DC	: V200-30-4A-	
100 VAC	: V200-30-1A-	
200 VAC	: V200-30-2A-	
Other AC voltages	: V200-30-3A-	

Without lead wire : V200-30-A
(With a connector and 2 sockets)

Lead wire length

—	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

How to Order

Specify the connector assembly part number together with the part number for the plug connector type solenoid valve without connector.

(Example) Lead wire length: 2000 mm

DC	AC
VF3130-5LO1-02	VF3130-1LO1-02
V200-30-4A-20	V200-30-1A-20

How to Use DIN Terminal Connector

The DIN terminal with an IP65 (enclosure) is protected against dust and water, however, it must not be used in water.

Caution

Connection

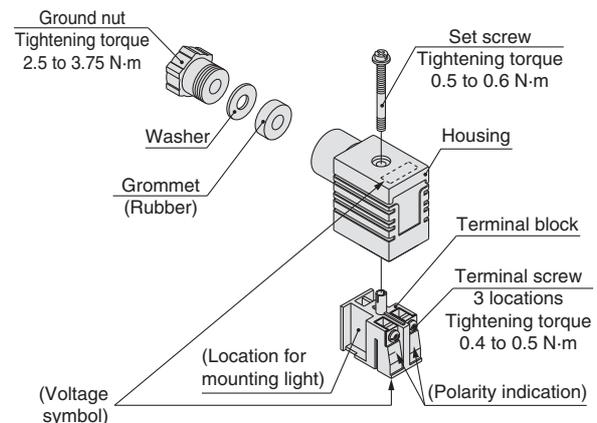
- 1) Loosen the set screw and pull the connector out of the solenoid valve terminal block.
- 2) After removing the set screw, insert a flat head screwdriver, etc. into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
- 3) Loosen the terminal screws on the terminal block, insert the core of the lead wire into the terminal, and attach securely with the terminal screws.

In addition, when using the DC mode type with a surge voltage suppressor (polar: S and Z types), connect wires corresponding to the polarity (+ or -) that is printed on the terminal block.

- 4) Secure the cord by fastening the ground nut.

In the case of connecting wires, select cable cords carefully because if those out of the specified range ($\phi 4.5$ to $\phi 7$) are used, it will not be able to satisfy IP65 (enclosure).

Tighten the ground nut and set screw within the specified range of torque.



* Refer to page 50 for the DIN connector part no.

Changing the entry direction

After separating the terminal block and housing, the cord entry direction can be changed by attaching the housing in the opposite direction.

Note) Make sure not to damage elements, etc., with the lead wires of the cord.

Precautions

Plug in and pull out the connector vertically without tilting to one side.

Applicable cable

Cable O.D.: $\phi 4.5$ to $\phi 7$

(Reference) 0.5 mm^2 to 1.5 mm^2 , 2-core or 3-core, equivalent to JIS C 3306

Applicable crimped terminal

O terminal: R1.25-4M that is specified in JIS C 2805

Y terminal: 1.25-3L, which is released by JST Mfg. Co., Ltd.

Stick terminal: Size 1.5 or shorter



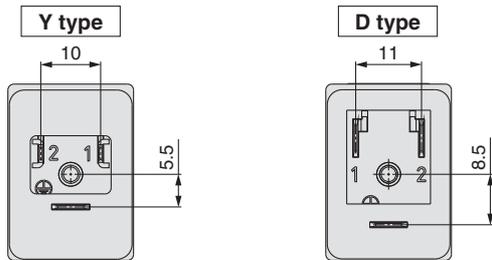
Series VF Specific Product Precautions 3

Be sure to read before handling.

Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

DIN (EN175301-803) Terminal

Y type DIN terminal corresponds to the DIN connector with terminal pitch 10 mm, which complies with EN175301-803B. Since the terminal pitch is different from the D type DIN connector, these two types are not interchangeable.



How to Order DIN Connector

Caution

Without indicator light

DC, AC, Other voltages: V200-□-1

With indicator light

DC

Polar type (□Z) : V200-□-3-□

Non-polar type (□U) : V200-□-5-□

Rated voltage

05	24 VDC
06	12 VDC

AC (□Z) : V200-□-5-B (Rated voltage 24 VAC)

: V200-□-7-□

Connector specification

61	D type
63	Y type

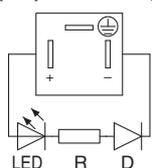
Rated voltage

01	100/110 VAC [115 VAC]
02	200/220 VAC [230 VAC]
07	240 VAC

Note) For 24 VAC, the part no. is V200-61-5-B.
63

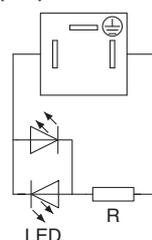
Circuit diagram with light (Built-in connector)

DC (□Z) circuit diagram



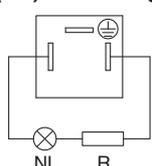
LED: Light emitting diode
D: Protective diode
R: Resistor

DC (□U) circuit diagram



LED: Light emitting diode
R: Resistor

AC (□Z) circuit diagram



NL: Neon light, R: Resistor

Note) The 24 VAC specification is the same as those in the DC (□U) circuit diagram.

How to Use Conduit Terminal

Caution

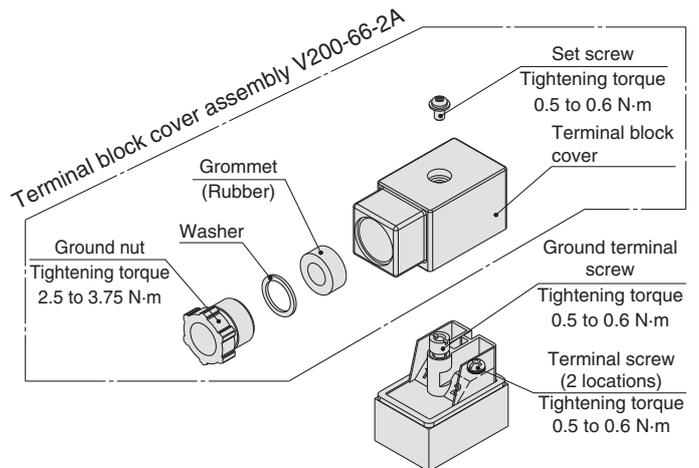
Connection

- 1) Loosen the set screw and remove the terminal block cover from the terminal block.
- 2) Loosen the terminal screws on the terminal block, insert the core of the lead wire or crimped terminal into the terminal, and attach securely with the terminal screws.
In addition, when using the DC mode type with a surge voltage suppressor (polar: S and Z types), connect wires to terminal 1 and 2 corresponding to the polarity (+ or -) as shown on the right figure.
- 3) Secure the cord by fastening the ground nut.



In the case of connecting wires, select cable cords carefully because if those out of the specified range ($\phi 4.5$ to $\phi 7$) are used, it will not be able to satisfy IP65 (enclosure).

Tighten the ground nut and set screw within the specified range of torque.



Applicable cable

Cable O.D.: $\phi 4.5$ to $\phi 7$

(Reference) 0.5 mm² to 1.5 mm², 2-core or 3-core, equivalent to JIS C 3306

Applicable crimped terminal

O terminal: Equivalent to R1.25-3 that is specified in JIS C 2805
Y terminal: Equivalent to 1.25-3, which is released by JST Mfg. Co., Ltd.

Note) Use O terminal when a ground terminal is used.



Series VF Specific Product Precautions 4

Be sure to read before handling.

Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

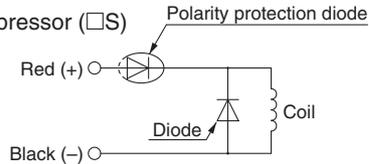
Light/Surge Voltage Suppressor

Caution

<DC>

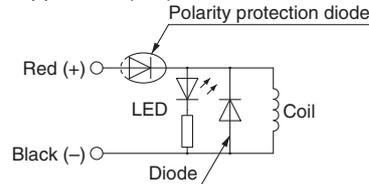
■ Polar type

With surge voltage suppressor (□S) Polarity protection diode



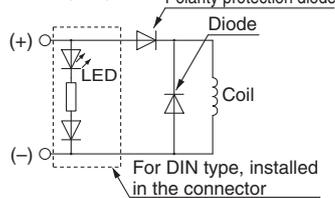
● Grommet or L/M-type plug connector

With light/surge voltage suppressor (□Z) Polarity protection diode



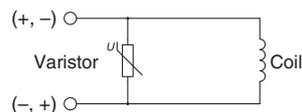
● DIN or Conduit terminal

With light/surge voltage suppressor (□Z) Polarity protection diode



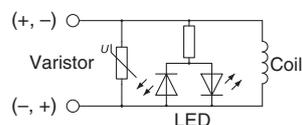
■ Non-polar type

With surge voltage suppressor (□R)



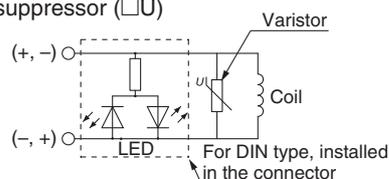
● Grommet or L/M-type plug connector

With light/surge voltage suppressor (□U)



● DIN or Conduit terminal

With light/surge voltage suppressor (□U) Varistor



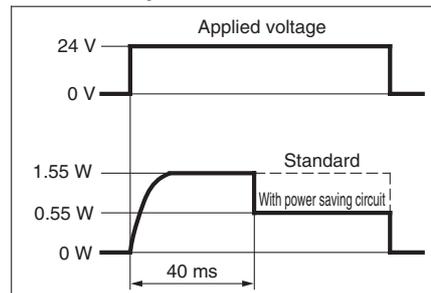
- Please connect correctly the lead wires to + (positive) and - (negative) indications on the connector. (For non-polar type, the lead wires can be connected to either one.)
- When the valve with polarity protection diode is used, the voltage will drop by approx. 1 V. Therefore, pay attention to the allowable voltage fluctuation (For details, refer to the solenoid specifications of each type of valve).
- Solenoids, whose lead wires have been pre-wired: + (positive) side red and - (negative) side black.

■ With power saving circuit

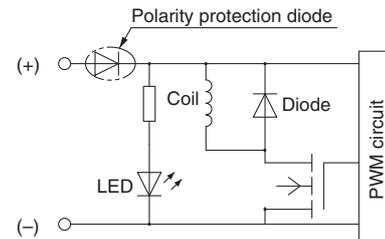
Power consumption is decreased by approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 40 ms at 24 VDC.)

Refer to the electrical power waveform as shown below.

<Electrical power waveform of energy saving type>



- Since the voltage will drop by approx. 0.5 V due to the transistor, pay attention to the allowable voltage fluctuation. (For details, refer to the solenoid specifications of each type of valve.)

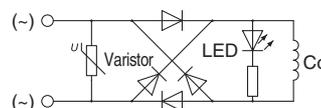


<AC>

S type is not available, since a rectifier prevents surge voltage generation.

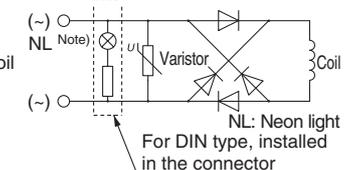
● Grommet or L/M-type plug connector

With light/surge voltage suppressor (□Z)



● DIN or Conduit terminal

With light/surge voltage suppressor (□Z)



Note) LED for 24 VAC.

Residual voltage of the surge voltage suppressor

Note) If a varistor or diode surge voltage suppressor is used, there is some residual voltage to the protection element and rated voltage. Therefore, refer to the table below and pay attention to the surge voltage protection on the controller side. Also, since the response time does change, refer to the specifications on pages 2 and 16.

Residual Voltage

Surge voltage suppressor	DC		AC
	24 V	12 V	
S, Z	Approx. 1 V		Approx. 1 V
R, U	Approx. 47 V	Approx. 32 V	—

Continuous Duty

For applications such as mounting a valve on a control panel, incorporate measure to limit the heat radiation so that it is within the operating temperature range. Furthermore, do not touch it while it is being energized or right after it is energized.



Series VF Specific Product Precautions 5

Be sure to read before handling.

Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

One-touch Fittings Precautions

Caution

When fittings are used, they may interfere with one another depending on their types and sizes. Therefore, the dimensions of the fittings to be used should first be confirmed in their respective catalogues.

Fittings whose compliance with the VF series is already confirmed are stated below. If the fitting within the applicable range is selected, there will not be any interference.

Applicable Fittings: Series KQ2H, KQ2S

Series	Model	Piping port	Port size	Applicable tubing O.D.					
				ø3.2	ø4	ø6	ø8	ø10	ø12
VF1000	VF1□20-□□1-M5	4(A), 2(B)	M5	[Shaded bar]					
		5(EA), 3(EB)	M5	[Shaded bar]					
	VF1□20-□□1-01	4(A), 2(B)	1/8	[Shaded bar]					
		5(EA), 3(EB)	M5	[Shaded bar]					
	VF1□3□-□□1-M5	4(A), 2(B)	M5	[Shaded bar]					
	VF1□3□-□□1-01	4(A), 2(B)	1/8	[Shaded bar]					
	Type 30 manifold base	1(P), 5/3(R)	1/8	[Shaded bar]					
	Type 31 manifold base	1(P)	1/8	[Shaded bar]					
5(EA), 3(EB)		M5	[Shaded bar]						

Series	Model	Piping port	Port size	Applicable tubing O.D.					
				ø3.2	ø4	ø6	ø8	ø10	ø12
VF3000	VF3□3□-□□1-01	4(A), 2(B)	1/8	[Shaded bar]					
		1(P), 5(EA), 3(EB)	1/8	[Shaded bar]					
	VF3□3□-□□1-02	4(A), 2(B)	1/4	[Shaded bar]					
		1(P), 5(EA), 3(EB)	P: 1/4, EA, EB: 1/8	[Shaded bar]					
	VF3□4□-□□1-02	4(A), 2(B)	1/4	[Shaded bar]					
		1(P), 5(EA), 3(EB)	1/4	[Shaded bar]					
	VF3□4□-□□1-03	4(A), 2(B)	3/8	[Shaded bar]					
		1(P), 5(EA), 3(EB)	3/8	[Shaded bar]					
	Type 30 manifold base	1(P), 5(R), 3(R)	1/4	[Shaded bar]					
	Type 40 manifold base	4(A), 2(B)	1/4	[Shaded bar]					
1(P), 5(R), 3(R)		1/4	[Shaded bar]						

Series	Model	Piping port	Port size	Applicable tubing O.D.					
				ø3.2	ø4	ø6	ø8	ø10	ø12
VF5000	VF5□2□-□□1-02	4(A), 2(B)	1/4	[Shaded bar]					
		1(P), 5(EA), 3(EB)	1/4	[Shaded bar]					
	VF5□2□-□□1-03	4(A), 2(B)	3/8	[Shaded bar]					
		1(P), 5(EA), 3(EB)	3/8	[Shaded bar]					
	VF5□44-□□1-02	4(A), 2(B)	1/4	[Shaded bar]					
		1(P), 5(EA), 3(EB)	1/4	[Shaded bar]					
	VF5□44-□□1-03	4(A), 2(B)	3/8	[Shaded bar]					
		1(P), 5(EA), 3(EB)	3/8	[Shaded bar]					
	VF5□44-□□1-04	4(A), 2(B)	1/2	[Shaded bar]					
		1(P), 5(EA), 3(EB)	1/2	[Shaded bar]					
	Type 20 manifold base	1(P), 5(R), 3(R)	3/8	[Shaded bar]					
	Type 21 manifold base	1(P), 5(R), 3(R)	1/2	[Shaded bar]					
	Type 40 manifold base	4(A), 2(B)	1/4	[Shaded bar]					
		1(P), 5(R), 3(R)	3/8	[Shaded bar]					



Low Wattage Specification (VF1000/3000) Specific Product Precautions 6

Be sure to read before handling.

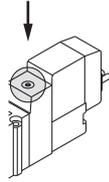
Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Manual Override

Warning

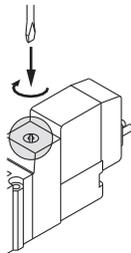
1. Non-locking push type [Standard]

Press in the direction of the arrow.



2. Push-turn locking slotted type [D type]

After pushing down, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking push type.



Locked position



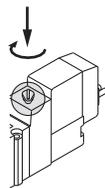
Caution

When operating the D type, use a watchmakers' screwdriver and turn lightly.

[Torque: Less than 0.1 N·m]

3. Push-turn locking lever type [E type]

After pushing down, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking push type.



Locked position



Caution

When locking the manual override with the push-turn locking type (D or E type), be sure to push it down before turning. Turning without first pushing it down can cause damage to the manual override and other trouble such as air leakage, etc.

Solenoid Valve for 200/220 VAC Specification

Warning

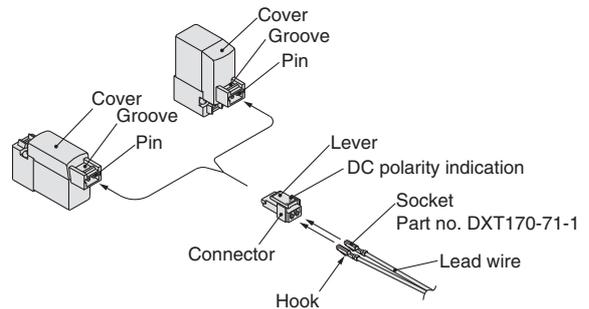
AC specification solenoid valves with grommet or L/M-type plug connector have a built-in rectifier circuit in the pilot section to operate the DC coil. With 200/220VAC specification pilot valves, this built-in rectifier generates heat when energized. The surface may become hot depending on the energized condition; therefore, do not touch the solenoid valves.

How to Use L/M-Type Plug Connector

Caution

1. Connector attachment/detachment

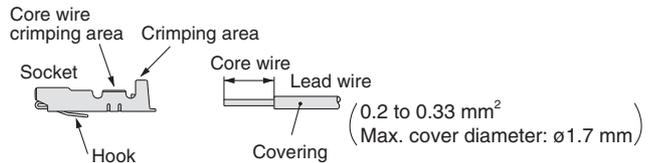
- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.



2. Crimping lead wire and socket connection

Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.

(Crimping tool: Part no. DXT170-75-1)



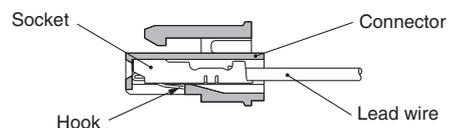
3. Socket with lead wire attachment/detachment

• Attachment

Insert the sockets into the square holes of the connector (with +, - indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then, confirm that they are locked by pulling lightly on the lead wires.

• Detachment

To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (approx. 1 mm). If the socket will be used again, first spread the hook outward.





Low Wattage Specification (VF1000/3000) Specific Product Precautions 7

Be sure to read before handling.

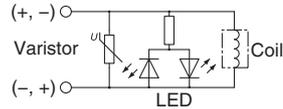
Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Light/Surge Voltage Suppressor

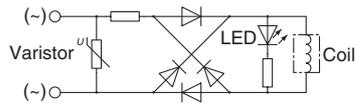
Caution

1. L/M-type plug connector

<DC>



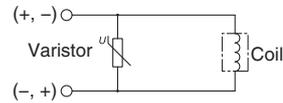
<AC>



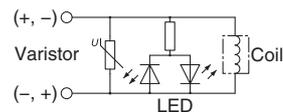
2. DIN terminal

<DC>

With surge voltage suppressor (DS, DOS, YS, YOS)

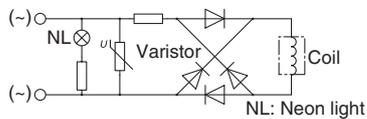


With light/surge voltage suppressor (DZ, YZ)



<AC>

With indicator light (DZ, YZ)



Note) If a varistor surge voltage suppressor is used, there is some residual voltage to the protection element and rated voltage. Therefore, pay attention to the surge voltage protection on the controller side.

How to Use DIN Terminal

1. ISO#: Conforming to EN-175301-803C (former DIN 43650C) (Distance between pins: 8 mm)

The DIN terminal type with an IP65 (enclosure) is protected against dust and water, however, it must not be used in water.

2. Connection

- Loosen the set screw and pull the connector out of the solenoid valve terminal block.
- After removing the set screw, insert a flat head screwdriver, etc. into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
- Loosen the terminal screws (slotted head screw) on the terminal block, insert the core of the lead wire into the terminal according to wiring connection, and attach securely with the terminal screws.
- Tighten the ground nut to secure the wire.

3. Changing the entry direction

After separating the terminal block and housing, the cord entry direction can be changed by attaching the housing in a different direction (four directions at 90° intervals).

* Make sure not to damage a light, etc., with the lead wires of the cord.

How to Use DIN Terminal

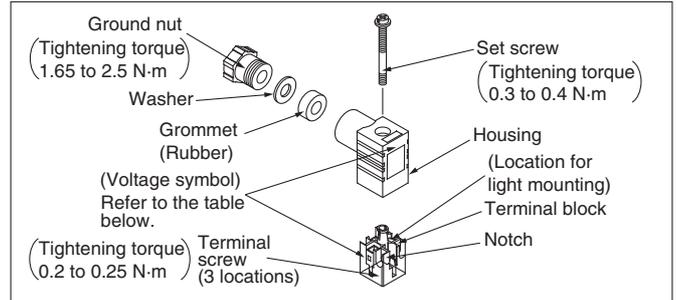
4. Precautions

Plug in and pull out the connector vertically without tilting to one side.

5. Applicable cable

Cable O.D: $\phi 3.5$ to $\phi 7$

(Reference) 0.5 mm^2 , 2-core or 3-core, equivalent to JIS C 3306



DIN Connector Part No.

Caution

DIN terminal (D)

Without indicator light	SY100-61-1
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With indicator light

Rated voltage	Voltage symbol	Part no.
24 VDC	24 V	SY100-61-3-05
12 VDC	12 V	SY100-61-3-06
100 VAC	100 V	SY100-61-2-01
200 VAC	200 V	SY100-61-2-02
110 VAC	110 V	SY100-61-2-03
220 VAC	220 V	SY100-61-2-04

DIN terminal (Y)

Without indicator light

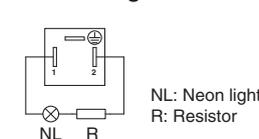
Rated voltage	Voltage symbol	Part no.
Common to all voltages	None	SY100-82-1

With indicator light

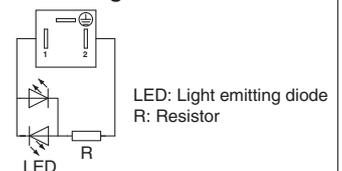
Rated voltage	Voltage symbol	Part no.
24 VDC	24 V	SY100-82-3-05
12 VDC	12 V	SY100-82-3-06
100 VAC	100 V	SY100-82-2-01
200 VAC	200 V	SY100-82-2-02
110 VAC (115VAC)	110 V	SY100-82-2-03
220 VAC (230 VAC)	220 V	SY100-82-2-04

Circuit diagram with light

AC circuit diagram



DC circuit diagram



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Caution:** Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger:** Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

- The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
- When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
- Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

- Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
- Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
- An application which could have negative effects on people, property, or animals requiring special safety analysis.
- Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

- For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

- The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.