

5 Port Pilot Operated Solenoid Valve Rubber Seal, Plug-in/Non Plug-in Series **VFR6000**



Plug-in type



Non plug-in type

Standard Specifications

Valve specifications	Fluid		Air	
	Operating pressure range	2 position single/3 position	0.2 to 0.9 MPa	
	2 position double	0.1 to 0.9 MPa		
Ambient and fluid temperature	-10 to 50°C (No freezing. Refer to page 5.)			
Lubrication	Non-lube ⁽¹⁾			
Manual override	Non-locking push type			
Shock/Vibration resistance	300/50m/s ² ⁽²⁾			
Enclosure	Dustproof			
Coil rated voltage	100, 200 VAC (50/60 Hz), 24 VDC			
Allowable voltage fluctuation	-15 to -10% of rated voltage			
Apparent power (AC) ⁽³⁾	Inrush	5.6 VA/50 Hz, 5.0 VA/60 H		
	Holding	3.4 VA/50 Hz, 2.3 VA/60 Hz		
Power consumption (DC) ⁽³⁾	1.8 W			
Electrical entry	Plug-in type	Conduit terminal		
	Non plug-in type	Grommet terminal, DIN terminal		

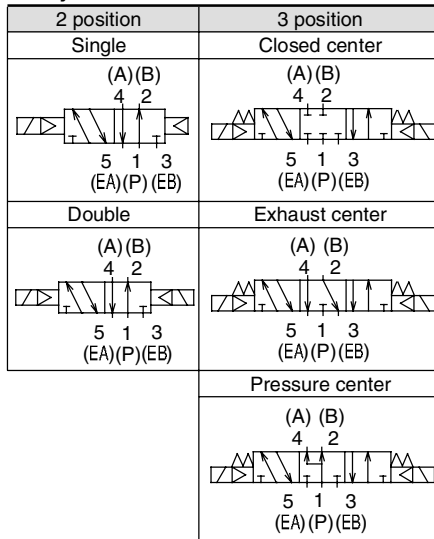


- Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated. Note 3) At rated voltage
- Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every 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)

Option Specifications

Main valve manual override	Direct manual override
Coil rated voltage	110 to 120, 220, 240 VAC 50/60 Hz
	12 VDC
Option	With light/surge voltage suppressor

JIS Symbol



Caution

When double solenoid is used, spool valve should be mounted horizontally. If there are vibrations, spool valve should be mounted perpendicular to the vibration direction.

Model

Type of actuation	Model		Port size	Flow characteristics ⁽¹⁾						Max. operating cycle (Hz) ⁽²⁾	Response time (ms) ⁽³⁾	Mass (kg) ⁽⁴⁾
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)		4/2 → 5/3 (A/B → EA/EB)		C [dm ³ /(s·bar)]	b			
2 position	Single	VFR610□ VFR611□	3/4	40	0.12	9.1	41	0.15	9.6	2	100 or less	4.73 (4.56)
	Double	VFR620□ VFR621□	3/4	40	0.14	9.2	41	0.17	9.7	2	100 or less	4.78 (4.61)
3 position	Closed center	VFR630□ VFR631□	3/4	39	0.17	9.3	39	0.15	9.3	1	150 or less	4.72 (4.55)
	Exhaust center	VFR640□ VFR641□	3/4	38	0.14	8.9	42 [40]	0.12 [0.15]	9.6 [9.4]	1	150 or less	4.72 (4.55)
	Pressure center	VFR650□ VFR651□	3/4	38 [20]	0.10 [0.44]	8.7 [5.7]	40	0.16	9.3	1	150 or less	4.72 (4.55)

Type of actuation	Model		Port size	Effective area (mm ²)
	Plug-in	Non plug-in		
2 position	Single	VFR610□ VFR611□	1	191
	Double	VFR620□ VFR621□	1	191
3 position	Closed center	VFR630□ VFR631□	1	180
	Exhaust center	VFR640□ VFR641□	1	P → A, B: 178 A, B → EA, EB: 212 Normal position: 193
	Pressure center	VFR650□ VFR651□	1	P → A, B: 183 Normal position: 82 A, B → EA, EB: 199



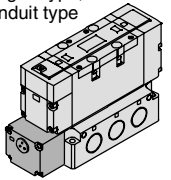
- Note 1) []: Denotes the normal position.
- Note 2) Min. operating frequency is once in 30 days.
- Note 3) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
- Note 4) For VFR6□00-□FZ-06, (): VFR6□10-□DZ-06

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How to Order

Electrical entry

F: Plug-in type, conduit type



Option

Nil	None
Z	With light/surge voltage suppressor

Port size

Nil	Without sub-plate
06	3/4
10	1

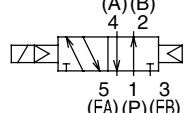
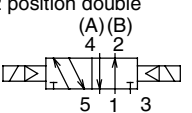
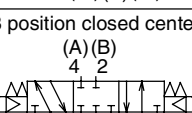
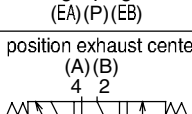
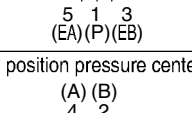
Plug-in

Non plug-in

VFR6 0 0 - 5 F - 10 -

VFR6 1 1 - 1 D - 10 -

Symbol

1	2 position single (A)(B)  5 1 3 (EA)(P)(EB)
2	2 position double (A)(B)  5 1 3 (EA)(P)(EB)
3	3 position closed center (A)(B)  5 1 3 (EA)(P)(EB)
4	3 position exhaust center (A)(B)  5 1 3 (EA)(P)(EB)
5	3 position pressure center (A)(B)  5 1 3 (EA)(P)(EB)

Body option

0	Standard
1*	Direct manual override

* Option

Coil rated voltage

1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 to 120 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz
9*	Other

* Option

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

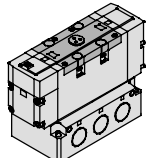
CE-compliant

Nil	—
Q	CE-compliant*

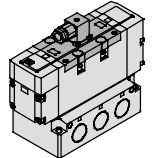
* Electrical entry: D and F only

Electrical entry

E: Grommet terminal



D: DIN terminal



How to Order Pilot Valve Assembly

SF4 - 1 F - 22 -

Coil rated voltage

Symbol	Rated voltage
1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 to 120 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz
9*	Other

* Option

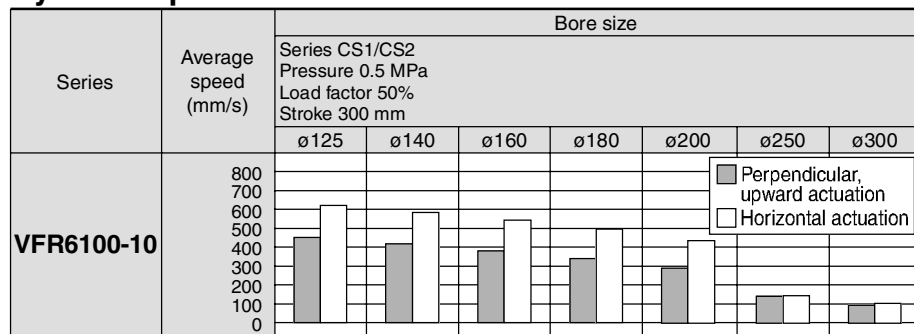
CE-compliant

Nil	—
Q	CE-compliant

Series VFR6000

Use as a guide for selection.
Please confirm the actual conditions with SMC Sizing Program.

Cylinder Speed Chart





- * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- * The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- * Load factor: $((\text{Load weight} \times 9.8) / \text{Theoretical force}) \times 100\%$

Conditions

		Series CS1/CS2
VFR6110-10	Tube x Length	SGP25A x 1 m
	Speed controller	AS600-10
	Silencer	AN600-10

How to Order Sub-plate Assembly

Plug-in VFR6000-P-10 

Non plug-in VFS6000-S-10 

Note) • Not applicable for external pilot.
• Not applicable for bottom ported.
• Mounting bolt and gasket are not included.

Piping port (P, A, B, EA, EB port)

06	3/4
10	1

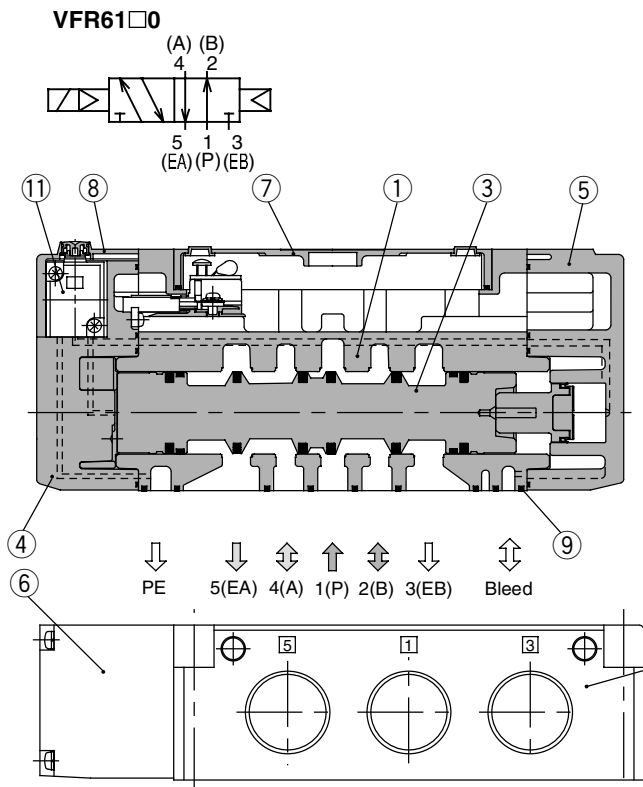
Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

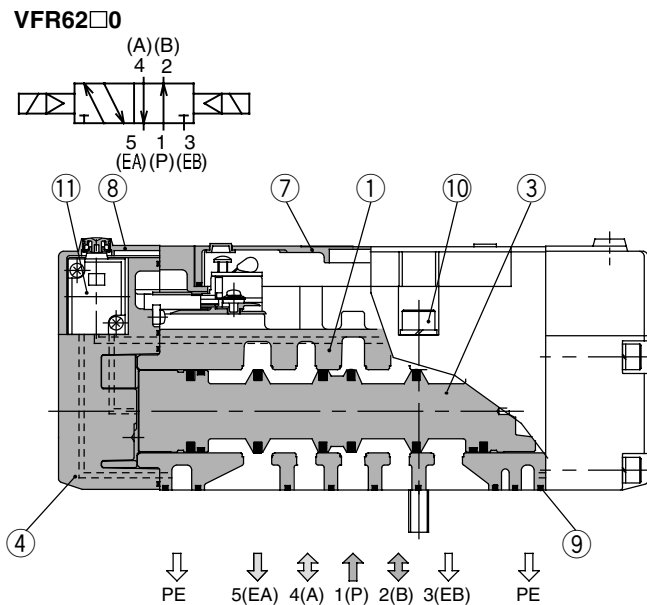
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Construction

2 position single

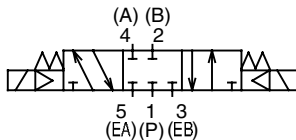


2 position double

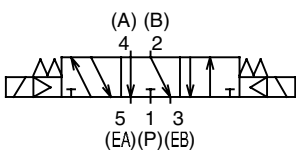


3 position closed center/exhaust center/pressure center

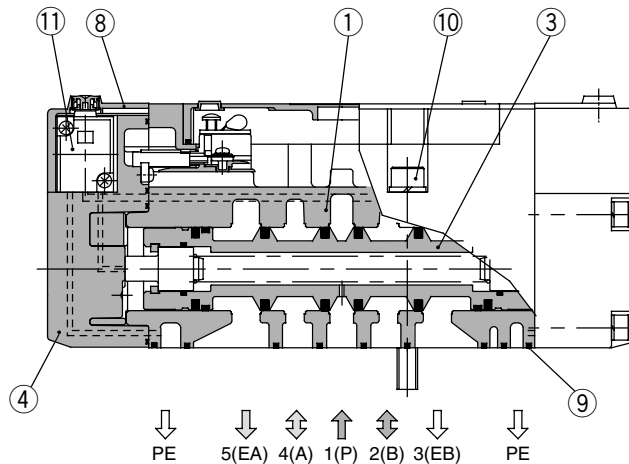
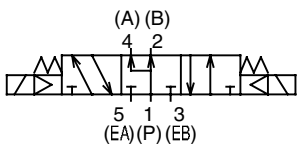
Closed center: VFR63□□



Exhaust center: VFR64□□



Pressure center: VFR65□□



This figure shows a closed center type.

Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted	Platinum silver
2	Sub-plate	Aluminum die-casted	Platinum silver
3	Spool valve	Aluminum, NBR	
4	Adapter plate	Aluminum die-casted	Black

Component Parts

No.	Description	Material	Note
5	End plate	Aluminum die-casted	Black
6	Junction cover	Resin	Black
7	Light cover	Resin	
8	Pilot valve cover	Resin	Black

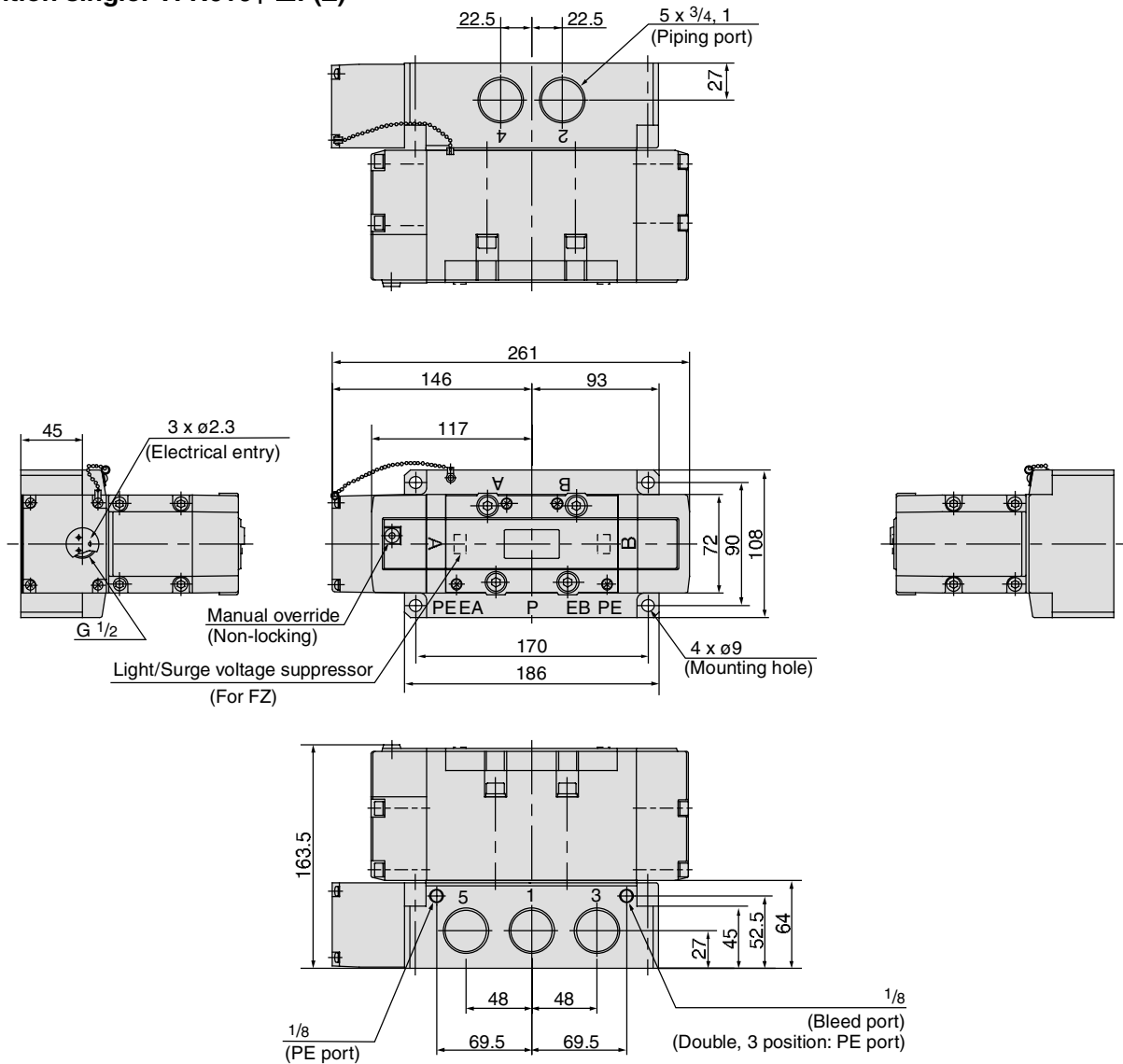
Replacement Parts

No.	Description	Material	Part no.		
			VFR61□□	VFR62□□	VFR63□□/64□□/65□□
9	Gasket	NBR	VFS6000-15	VFS6000-15	VFS6000-15
10	Hexagon socket head screw	Steel	M8 x 80	M8 x 80	M8 x 80
11	Pilot valve assembly	—	Refer to "How to Order Pilot Valve Assembly" on page 1313.		

Series VFR6000

Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR610⁰₁-□F(Z)

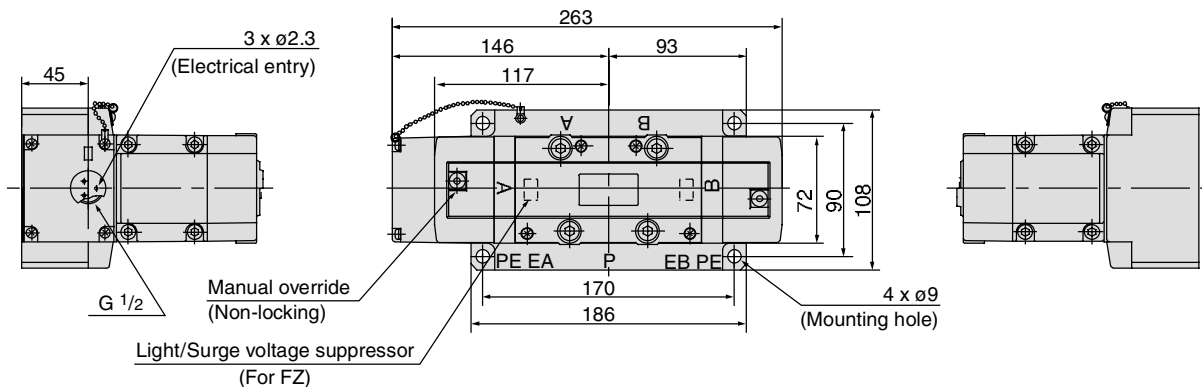


2 position double: VFR620⁰₁-□F(Z)

3 position closed center: VFR630⁰₁-□F(Z)

3 position exhaust center: VFR640⁰₁-□F(Z)

3 position pressure center: VFR650⁰₁-□F(Z)



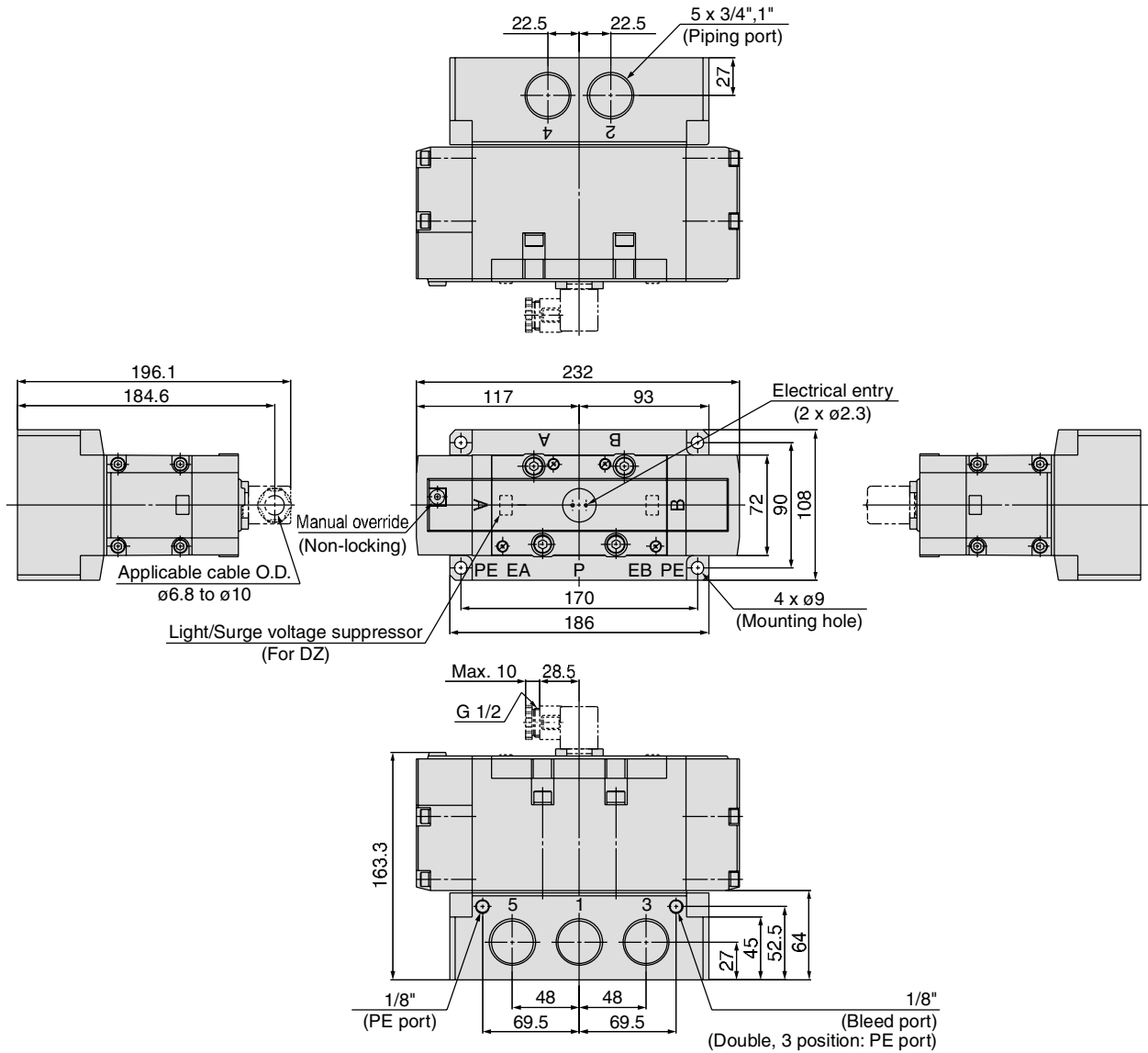
* Other dimensions are the same as the single type.

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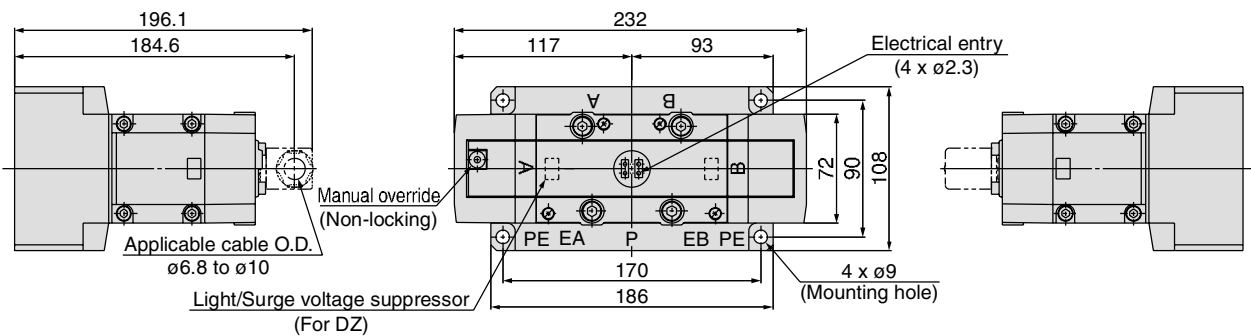
Rubber Seal, Plug-in/Non Plug-in

Non Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR611₁⁰-□E, VFR611₁⁰-□D(Z)



2 position double: VFR621₁⁰-□E, VFR621₁⁰-□D(Z) 3 position closed center: VFR631₁⁰-□E, VFR631₁⁰-□D(Z)
 3 position exhaust center: VFR641₁⁰-□E, VFR641₁⁰-□D(Z)
 3 position pressure center: VFR651₁⁰-□E, VFR651₁⁰-□D(Z)



* Other dimensions are the same as the single type.