



5 Port Pilot Solenoid Valve Rubber Seal Series *VFR*

Variations

Series	Port size Rc (PT) Effective area (mm ²) (N/min)	Configuration	Voltage	Electrical entry	Option (With indicator light and surge voltage suppressor)	Manual override	
Base mounted	VFR2000 Plug-in Non plug-in	1/8, 1/4: P→A, B 13.0 (706.68) A, B→EA, EB 16.2 (883.35)	2 position single VFR2000/3000/4000 		Plug-in Conduit terminal Non plug-in DIN connector (D), (Y) 	<input type="checkbox"/> With indicator light and surge voltage suppressor <ul style="list-style-type: none">• Plug-in Conduit terminal (FZ)• Non plug-in DIN connector (DZ) (YZ)	
	VFR3000 Plug-in Non plug-in	1/4: 37.8 (2061.15) 3/8: 41.4 (2257.45)	VFR5000/6000 2 position double 	(Standard) 100V AC ^{50/60} Hz 200V AC ^{50/60} Hz 24V DC (Option) 110 to 120V AC ^{50/60} Hz 220V AC ^{50/60} Hz 240V AC ^{50/60} Hz 12V DC 100V DC	Plug-in Conduit terminal (F) Non Plug-in (VER3□10, 4□10) DIN connector (D) 	<input type="checkbox"/> With indicator light and surge voltage suppressor <ul style="list-style-type: none">• Plug-in Conduit terminal (FZ)• Non plug-in DIN connector (DZ) (YZ)	Non-locking push style Non-locking push style A (Extended) Locking style B (Slotted) Locking style C (Lever)
	VFR4000 Plug-in Non plug-in	3/8: 65 (3533.4) 1/2: 67 (3631.55)	3 position closed center 3 position exhaust center 		Non Plug-in (VER3□40, 4□40) DIN connector (D), (Y) 	<input type="checkbox"/> With surge voltage suppressor <ul style="list-style-type: none">• Non plug-in (VFR3□40, 4□40)	
	VFR5000 Plug-in Non plug-in	3/8: 79.2 (4318.6) 1/2: 100.8 (5496.4) 3/4: 102.6 (5594.55)	3 position pressure center 		Plug-in Conduit terminal (F) Non Plug-in DIN connector (D) 	<input type="checkbox"/> With indicator light and surge voltage suppressor <ul style="list-style-type: none">• Plug-in Conduit terminal (FZ)• Non plug-in DIN connector (DZ)	
	VFR6000 Plug-in Non plug-in	3/4: 171 (9324.25) 1: 191 (10403.9)			Plug-in Conduit terminal (F) Non Plug-in DIN connector (D) 	<input type="checkbox"/> With indicator light and surge voltage suppressor <ul style="list-style-type: none">• Plug-in Conduit terminal (FZ)• Non plug-in DIN connector (DZ)	Non-locking push style

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

*2 position

VFR2000/3000/4000/5000/6000

Manifold Variations

		Base Mounted Plug-in Type			
		VFR2000	VFR3000	VFR4000	VFR5000
Manifold	With multi-connector				
	With terminal block				
	With D-sub connector				

		Base Mounted Non Plug-in Type			
		VFR2000	VFR3000	VFR4000	VFR5000
Manifold	Common electrical entry • Grommet terminal • DIN terminal	—			
	Individual electrical entry • Grommet • Grommet terminal • Conduit terminal • DIN terminal • L plug connector ^{Note)} • M plug connector ^{Note)}				

Note) Series VFR2000 only

Manifold Option Parts	Individual SUP spacer	●	●	●	●
	Individual EXH spacer	●	●	●	●
	SUP block disk	●	●	●	●
	EXH block disk	●	●	●	●
	Throttle valve spacer	●	●	●	●
	Interface regulator	●	●	●	●
	Blanking plate	●	●	●	●
	Air release valve spacer	●	●	●	
	SUP stop valve spacer	● ⁽¹⁾	●		

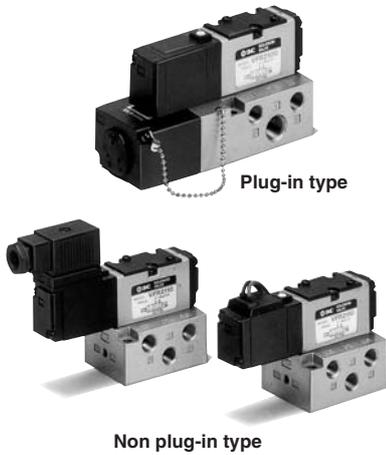
Note 1) Used with the manifold base. Please contact SMC for details.

Note 2) There is no manifold base in Series VFR6000.

Manifold Option		With exhaust cleaner Plug-in type, Non plug-in type • High noise reduction effect: 35 dB or more • Collects oil mist: collecting rate 99.9% or more • Piping work is reduced.
		With control unit ^{Note)} Plug-in type, Non plug-in type • Filter, regulator, pressure switch and air release valve in one unit • Piping work eliminated

Note) There is no option with control unit in Series VFR5000.

5 Port Pilot Operated Solenoid Valve Rubber Seal, Plug-in/Non Plug-in Series VFR2000



Symbol

2 position		3 position	
Single		Closed center	
	(A)4 2(B) (EA)5 1 3(EB) (P)		(A)4 2(B) (EA)5 1 3(EB) (P)
Double		Exhaust center	
	(A)4 2(B) (EA)5 1 3(EB) (P)		(A)4 2(B) (EA)5 1 3(EB) (P)
		Pressure center	
			(A)4 2(B) (EA)5 1 3(EB) (P)

Standard Specifications

Valve specifications		Air	
Fluid	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)	
Lubrication		Not required ⁽¹⁾	
Manual override		Non-locking push type	
Mounting orientation		Unrestricted	
Impact/Vibration resistance		300/50 m/s ² ⁽²⁾	
Enclosure		Dustproof	
Electricity specifications		100, 200 VAC (50/60 Hz), 24 VDC	
Coil rated voltage		-15 to -10% of rated voltage	
Allowable voltage fluctuation		5.6 VA/50 Hz, 5.0 VA/60 Hz	
Apparent power (AC) ⁽³⁾	Inrush	3.4 VA (2.1 W)/50 Hz, 2.3 VA (1.5 W)/60 Hz	
	Holding	1.8 W (2.04 W: With light/surge voltage suppressor)	
Power consumption (DC) ⁽³⁾		Plug-in type	Conduit terminal
Electrical entry		Non plug-in type	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

Pilot type	External pilot ^(Note)
Manual override	Non-locking push type A (Extended), Locking type B (Tool required), Looking type C (Lever)
Coil rated voltage	110 to 120, 220, 240 VAC 50/60 Hz 12 VDC
Porting specifications	Bottom ported
Option	With light/surge voltage suppressor

Note) Operating pressure: 0 to 0.9 MPa

Pilot pressure: 2 position single/3 position 0.2 to 0.9 MPa

2 position double 0.1 to 0.9 MPa

Model

Type of actuation	Model		Port size Rc	Flow characteristics ⁽¹⁾								⁽²⁾ Max. operating cycle (Hz)	⁽³⁾ Response time (ms)	⁽⁴⁾ Weight (kg)	
	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	Cv	Q ⁽⁵⁾ [l/min(ANR)]	C [dm ³ /(s·bar)]	b	Cv	Q ⁽⁵⁾ [l/min(ANR)]				
2 position	Single	VFR2100	VFR2110	1/8	2.5	0.18	0.58	592	3.0	0.27	0.70	749	10	20 or less	0.34 (0.32)
				1/4	2.8	0.24	0.62	686	3.0	0.27	0.70	749			
2 position	Double	VFR2200	VFR2210	1/8	2.4	0.21	0.56	578	3.1	0.28	0.74	778	10	20 or less	0.42 (0.44)
				1/4	2.6	0.27	0.62	649	3.1	0.28	0.74	778			
3 position	Closed center	VFR2300	VFR2310	1/8	1.3	0.45	0.36	367	1.4	0.46	0.41	398	5	30 or less	0.43 (0.45)
				1/4	1.3	0.45	0.36	367	1.4	0.46	0.41	398			
	Exhaust center	VFR2400	VFR2410	1/8	0.79	0.53	0.24	238	3.1 [0.89]	0.24 [0.51]	0.74 [0.27]	760 [264]	5	30 or less	0.43 (0.45)
				1/4	0.79	0.53	0.24	238	3.1 [0.89]	0.24 [0.51]	0.74 [0.27]	760 [264]			
	Pressure center	VFR2500	VFR2510	1/8	2.8 [0.65]	0.24 [0.60]	0.68 [0.21]	686 [209]	0.89	0.53	0.27	268	5	30 or less	0.43 (0.45)
				1/4	3.2 [0.75]	0.26 [0.55]	0.73 [0.23]	794 [230]	0.89	0.53	0.27	268			

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. (0.5 MPa, Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)

Note 4) For VFR2□00-□FZ₀₁⁰¹, (): VFR2□10-□DZ₀₁⁰¹

Note 5) These valves have been calculated according to the ISO6358 and indicate the follow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

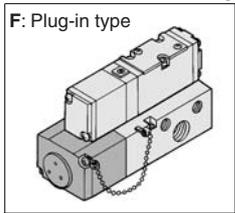
How to Order



Plug-in

Electrical entry

F: Plug-in type



Option

—	None
Z	With light/surge voltage suppressor

Port size (P, A, B port)

—	Without sub-plate
01	1/8
02	1/4

EA, EB port: Rc 1/8

Thread type

—	Rc
F	G
N	NPT
T	NPTF

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

—	Side ported
B*	Bottom ported

* Semi-standard

Symbol

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

Pilot type

—	Internal pilot
R	External pilot

External pilot is available only on sub-plate type.

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 (Note)

For other rated voltages, please consult with SMC.

Pilot valve manual override

—: Non-locking push type	A*: Non-locking push type A (Extended)	B*: Locking type B (Tool required)	C*: Locking type C (Lever)
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* Semi-standard

Option

—	None
Z	With light/surge voltage suppressor

Electrical entry

D: DIN connector	Y: DIN terminal (DIN43650B)
DO: Without connector	YO: Without connector

Ordering Examples:

Plug-in: VFR2 1 00 [] - 5 F [] [] - [] 01 [] - Q

Non plug-in: VFR2 1 10 [] - 1 D [] [] - [] 02 [] - Q

How to Order Pilot Valve Assembly

SF4- 1 DZ [] -60-Q

Manual override

—	Non-locking push type
A	Non-locking push type A (Extended)
B	Locking type B (Tool required)
C	Locking type C (Lever)

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 (Note)

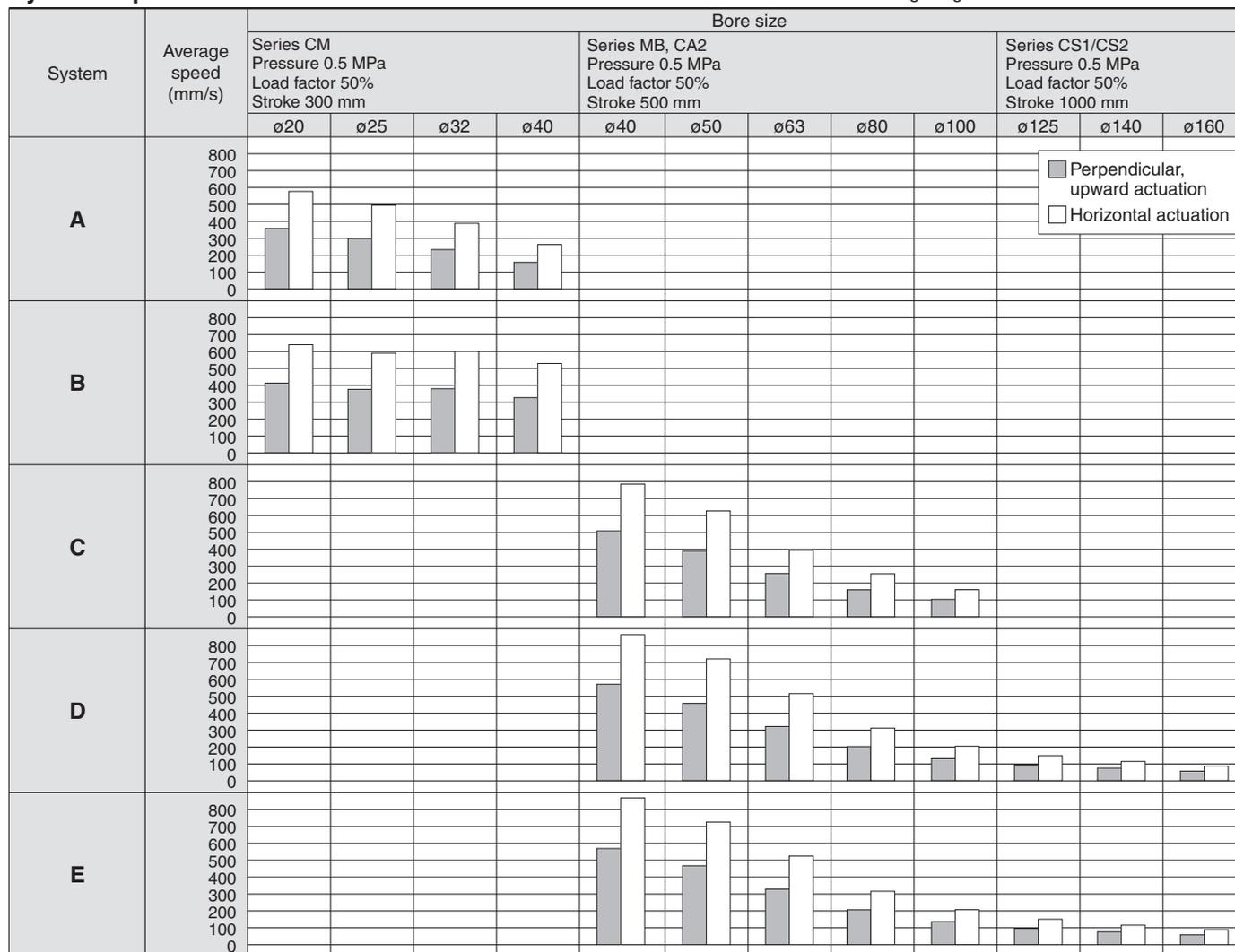
For other rated voltages, please consult with SMC.

Electrical entry, Light/Surge voltage suppressor

Symbol	Electrical entry	Indicator light	With surge voltage suppressor	Body type
F	Plug-in	—	—	Plug-in type
D	DIN terminal	With connector	—	Non plug-in type
DZ		Without connector	—	
DO		With connector	●	
DOZ	Without connector	●	●	
Y	DIN terminal (DIN43650B)	With connector	—	
YZ		Without connector	—	
YO		With connector	●	
YOZ	Without connector	●	●	

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

Cylinder Speed Chart

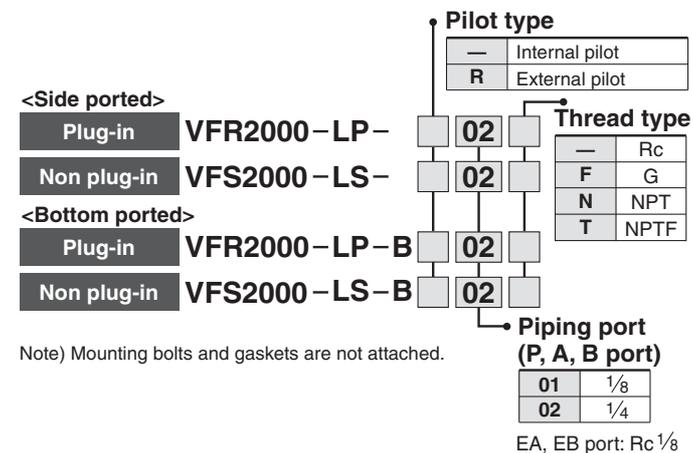


* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
* The average velocity of the cylinder is what the stroke is divided by the total stroke time.
* Load factor: ((Load mass x 9.8)/Theoretical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

System Components

System	Solenoid valve	Speed controller	Silencer	Tube bore x Length
A	Series VFR2000 Rc 1/8	AS2000-01	AN110-01	T0425 x 1 m
B		AS3000-02	AN110-01	T0604 x 1 m
C		AS3000-02	AN110-01	T0806 x 1 m
D	Series VFR2000 Rc 1/4	AS4000-02	AN110-01	T1075 x 1 m
E		AS4000-02	AN110-01	T1209 x 1 m

How to Order Sub-plate Assembly



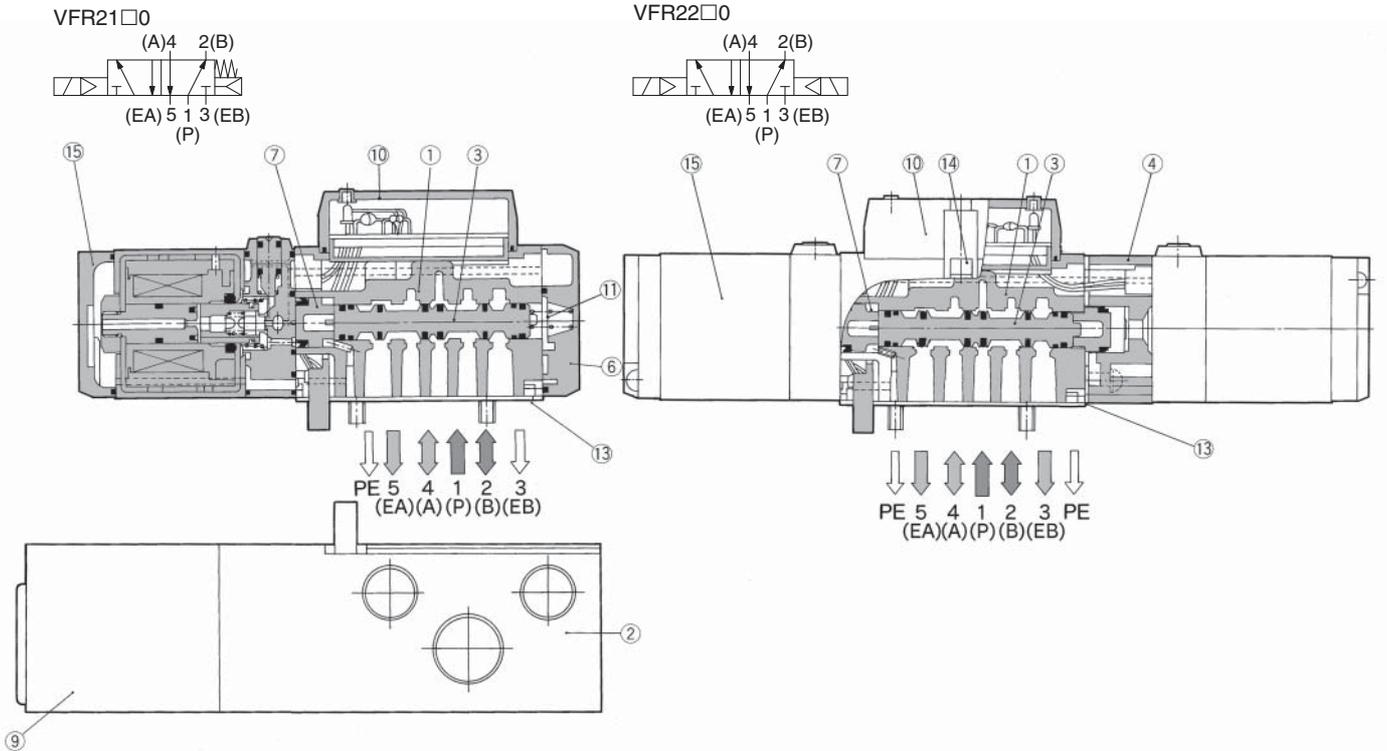
Note) Mounting bolts and gaskets are not attached.

VFR2000

Construction

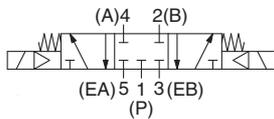
2 position single

2 position double

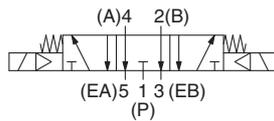


3 position closed centre/exhaust centre/pressure centre

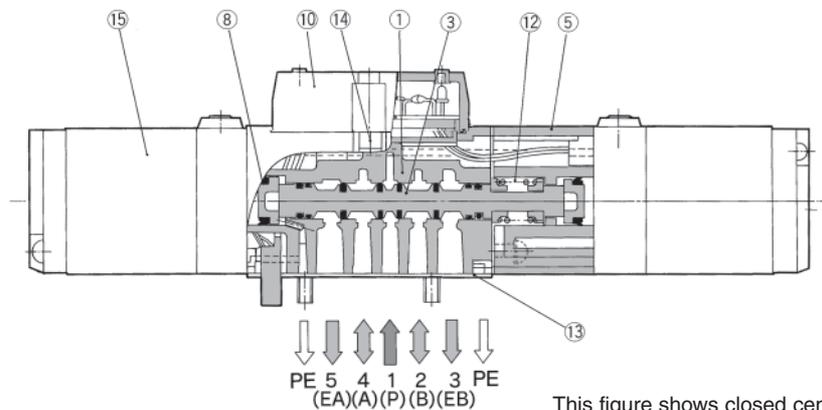
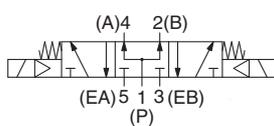
Closed centre/VFR2300



Exhaust centre/VFR2400



Pressure centre/VFR2500



This figure shows closed centre.

Component Parts

No.	Description	Material	Note
①	Body	Aluminium die cast	Platinum silver
②	Sub-plate	Aluminium die cast	Platinum silver
③	Spool valve	Aluminium, NBR	
④	Adapter plate	Aluminium die cast	Platinum silver
⑤	Adapter plate	Aluminium die cast	Platinum silver
⑥	End plate	Resin	Black

Component Parts

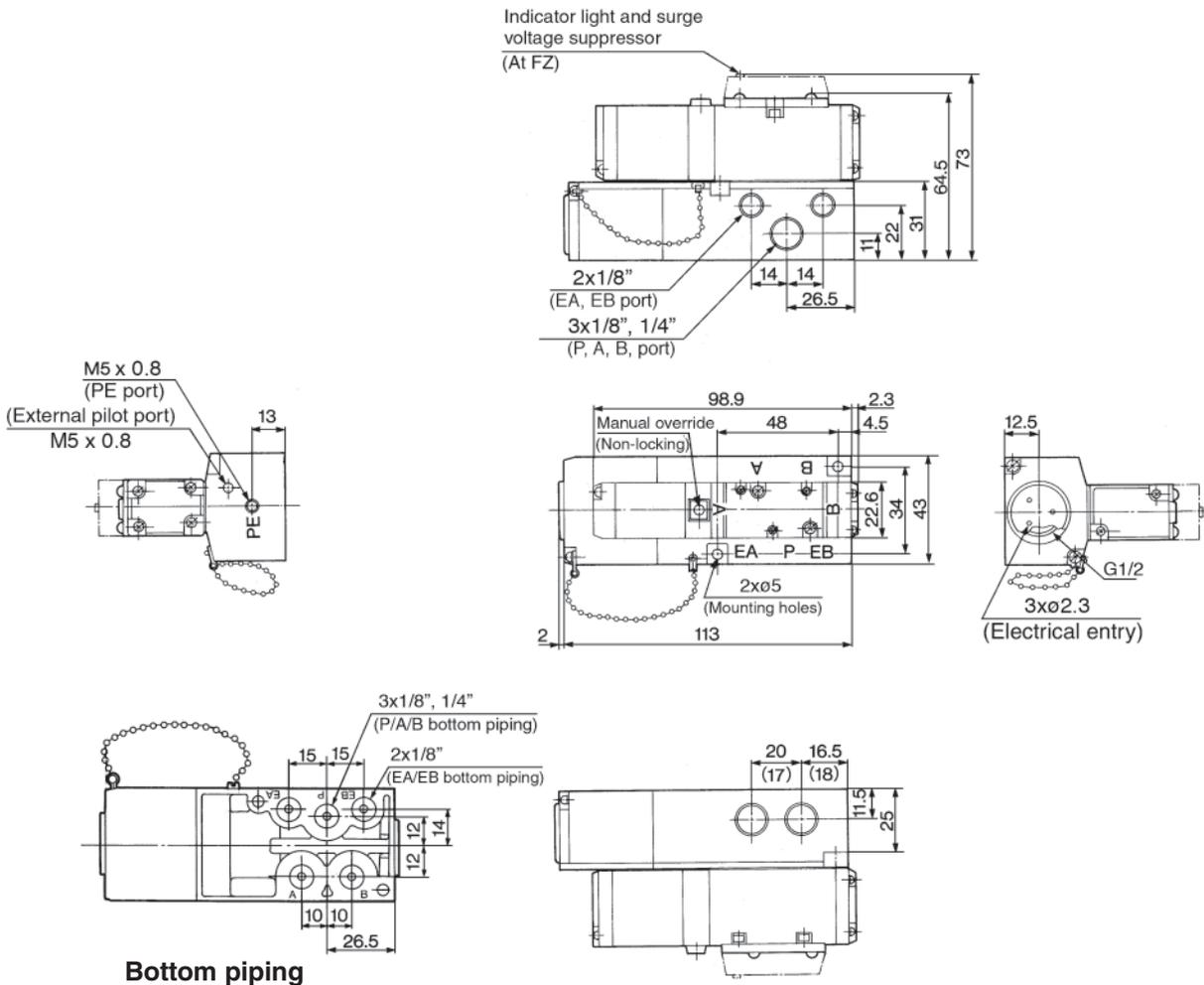
No.	Description	Material	Note
⑦	Piston	Resin	
⑧	Piston	Resin	
⑨	Junction cover	Resin	
⑩	Light cover ass'y	Resin	
⑪	Spool spring	Stainless steel	
⑫	Return spring	Stainless steel	

Replacement Parts

No.	Description	Material	Part No.		
			VFR2100	VFR2200	VFR2300, 2400, 2500
⑬	Gasket	NBR	AXT624-20-2	AXT624-20-2	AXT624-20-2
⑭	Hex. socket head cap screw	Steel	AXT624-26 (M3 X 31)	AXT624-26 (M3 X 31)	AXT624-26 (M3 X 31)
⑮	Pilot valve assembly	-	Refer to "How to Order Pilot Valve Assembly on p.1.8-4"		
	Sub-plate assembly	-	Refer to "How to Order Sub-plate Assembly on p.1.8-5"		

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

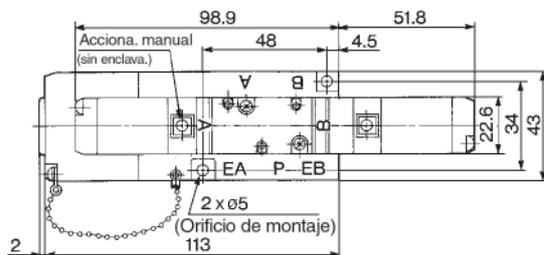
2 position single: VFR2100-□F-⁰¹/₀₂ □-Q



Bottom piping

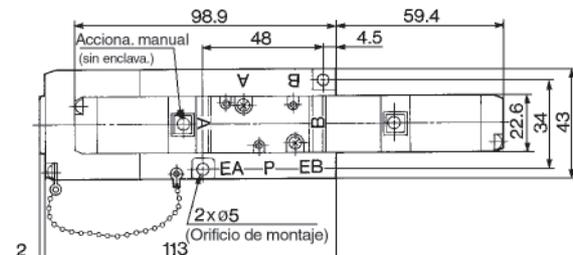
(): Rc 1/8

2 position double: VFR2200-□F-⁰¹/₀₂ □-Q



*Other dimensions are the same as single style.

3 position closed centre: VFR2300-□F-⁰¹/₀₂ □-Q
 3 position exhaust centre: VFR2400-□F-⁰¹/₀₂ □-Q
 3 position pressure centre: VFR2500-□F-⁰¹/₀₂ □-Q



*Other dimensions are the same as single style.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

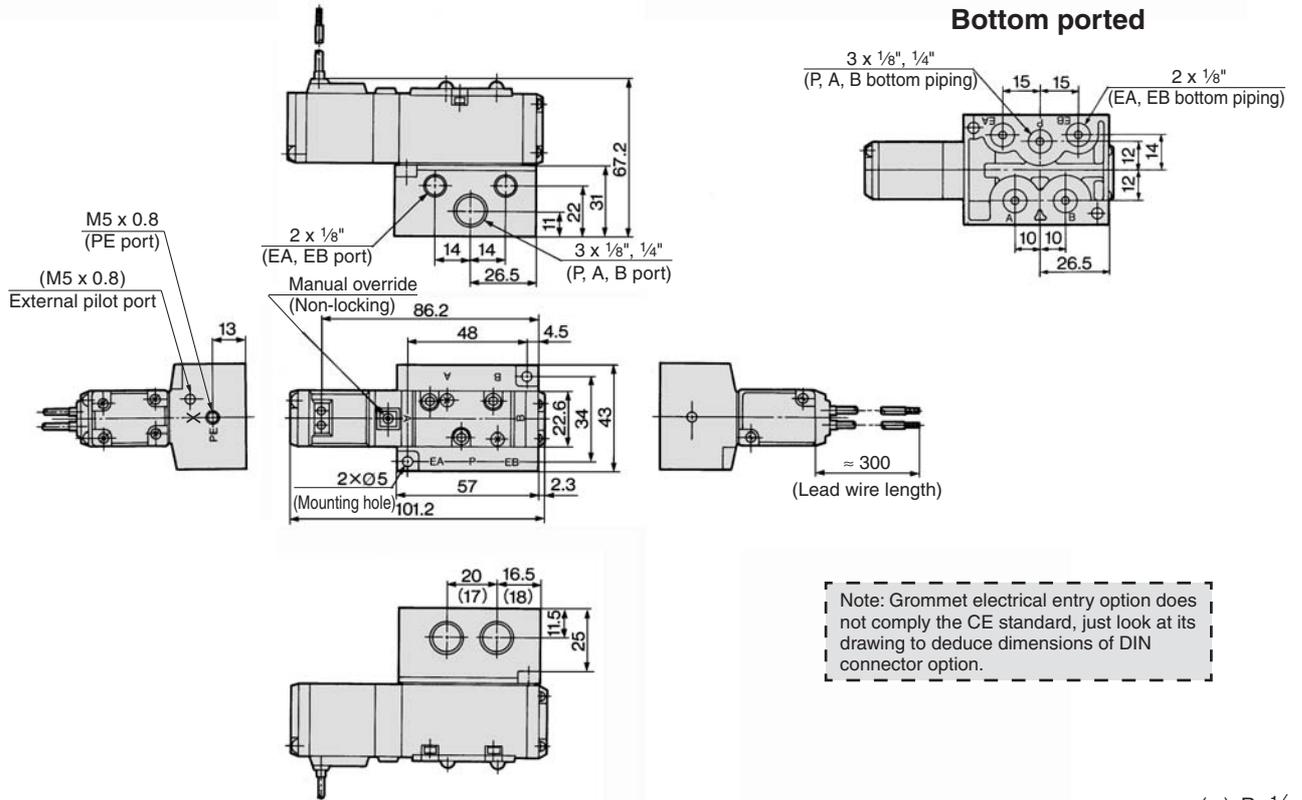
VS7

VQ7

VFR2000

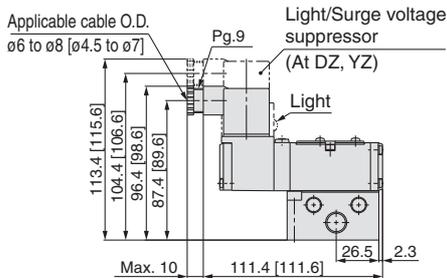
Non Plug-in: 2 Position Single

Grommet: VFR2110-□G-01
02



() : Rc 1/8

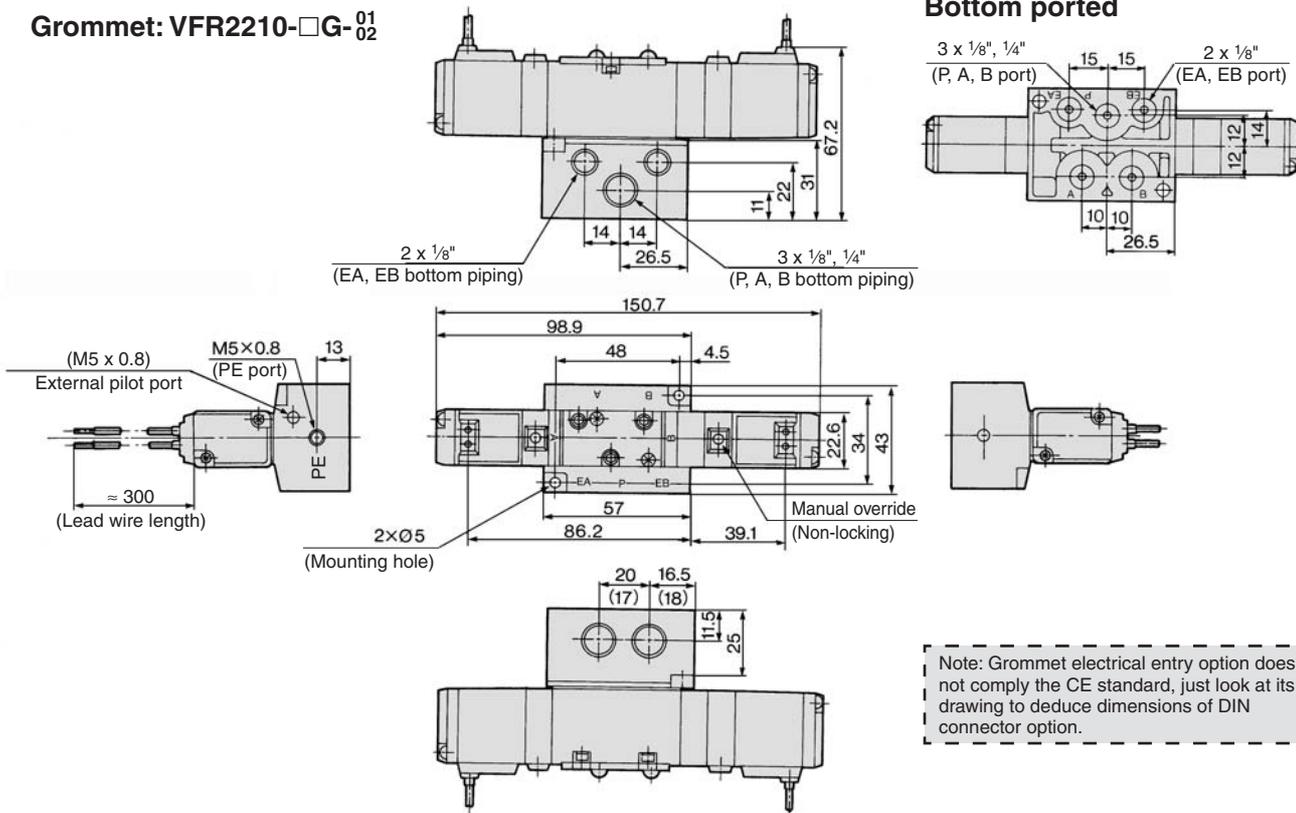
DIN terminal: VFR2110-□D-01
Y-02 -Q



* [] : Type Y
* Other dimensions are the same as the grommet type.

Non Plug-in: 2 Position Double

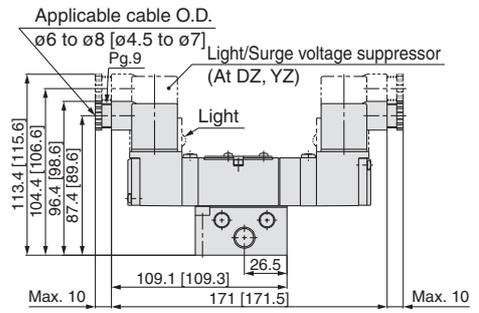
Grommet: VFR2210-□G-⁰¹/₀₂



Note: Grommet electrical entry option does not comply the CE standard, just look at its drawing to deduce dimensions of DIN connector option.

() : Rc 1/8

DIN terminal: VFR2210-□D-⁰¹/₀₂-Q



* [] : Type Y
* Other dimensions are the same as the grommet type.

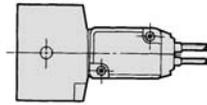
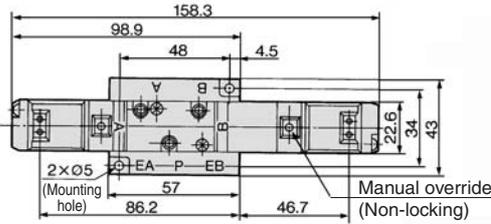
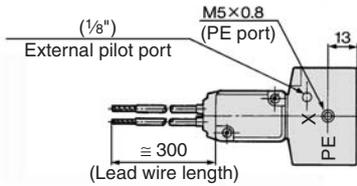
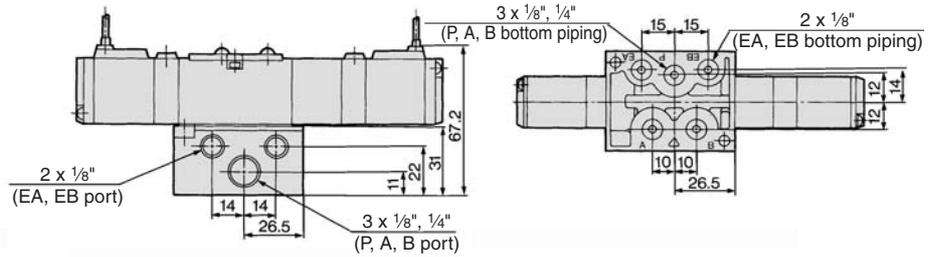
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VFR2000

Non Plug-in: 3 Position Closed Center/Exhaust Center/Pressure Center

Grommet

Closed center: VFR2310-□G-⁰¹/₀₂
 Exhaust center: VFR2410-□G-⁰¹/₀₂
 Pressure center: VFR2510-□G-⁰¹/₀₂

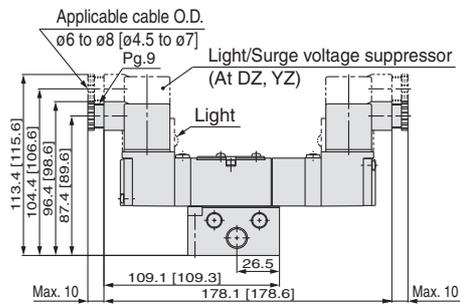


Note: Grommet electrical entry option does not comply the CE standard, just look at its drawing to deduce dimensions of DIN connector option.

() : Rc 1/8

DIN terminal

Closed center: VFR2310-□D-⁰¹/₀₂-Q
 Exhaust center: VFR2410-□D-⁰¹/₀₂-Q
 Pressure center: VFR2510-□D-⁰¹/₀₂-Q



* [] : Type Y
 * Other dimensions are the same as the grommet type.

Series VFR2000

Manifold Specifications

Manifold Specifications

Base model	Wiring	Porting specifications		Port size		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B	A, B		
Plug-in type VV5FR2-01□-Q	<ul style="list-style-type: none"> • With terminal block • With multi-connector • With D-sub connector 					2 to 15	VFR2□00-□F-Q
						2 to 8	
Non plug-in type VV5FR2-10-Q	<ul style="list-style-type: none"> • DIN terminal 	(Note) Side/Bottom	1/4	1/8, 1/4 C6, C8		2 to 15	VFR2□10-□D/Y-Q

(Note) Side ported and bottom ported cannot be taken at the same time.

How to Order Manifold Assembly

<Example> Plug-in type with terminal block (6 stations, one-piece junction cover)

VV5FR2-01T1-061-02-Q	1 set (Manifold base part no.)
*VFR2100-5FZ-Q	3 sets (2 position single part no.)
*VFR2200-5FZ-Q	2 sets (2 position double part no.)
*VVFS2000-10A	1 set (Blanking plate assembly part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type: 6 stations

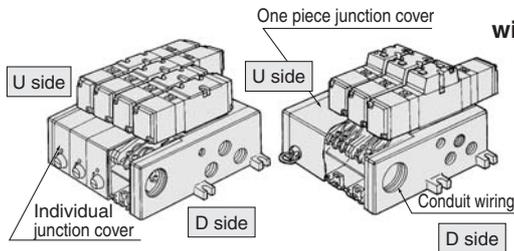
VV5FR2-10-061-01-Q	1 set (Manifold base part no.)
*VFR2110-5D-Q	5 sets (2 position single part no.)
*VFR2410-5D-Q	1 set (3 position exhaust part no.)
*VVFS2000-R-01-2	1 set (Individual EXH spacer part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

Plug-in Type: With Terminal Block

- Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block corresponding lead wires from power source can be wired at the bottom of terminal block.



(Note) P port or EA/EB port of symbol "3" to "8" can be individual port with block plate. Therefore, if using individual SUP spacer or individual EXH spacer for individual port, its symbol is "1".

VV5FR2-01T 1-08 1-02 □-Q

Series VFR2000 Manifold

Plug-in type with terminal block Junction cover

—	Individual junction cover
1	One-piece junction cover

Stations

02	2 stations
:	:
15	15 stations

Symbol *2, *3

Symbol	Passage *1		Porting specification A, B
	P	EA, EB	
1	Common	Common	Side
2 *	Common	Common	Bottom
3 *	Common	Individual	Side
4 *	Common	Individual	Bottom
5 *	Individual	Common	Side
6 *	Individual	Common	Bottom
7 *	Individual	Individual	Side
8 *	Individual	Individual	Bottom

* Semi-standard

* 1 When an individual passage is used, P, EA and EB ports will be bottom ported.

* 2 For bottom ported, A/B port size is 1/8 (Symbol 01) only.

* 3 Symbol "1" is only applicable to One-touch fittings (C6, C8).

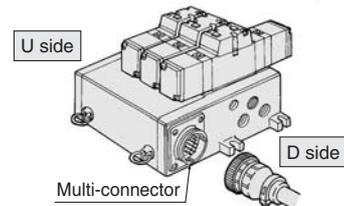
Port size *2, *3

Symbol	P, EA, EB		A, B
	P, EA, EB	A, B	
01			1/8
02			1/4
C6	1/4		One-touch fitting for ø6
C8	1/4		One-touch fitting for ø8
M			Mixed

—	Rc
F	G
N	NPT
T	NPTF

Plug-in Type: With Multi-connector

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.



(Note) P port or EA/EB port of symbol "3" to "8" can be individual port with block plate. Therefore, if using individual SUP spacer or individual EXH spacer for individual port, its symbol is "1".

VV5FR2-01C D 1-05 1-01 □-Q

Series VFR2000 Manifold

Plug-in type with multi-connector Connector mounting direction

D	D side mounting
U	U side mounting

Junction cover

1	One-piece junction cover
---	--------------------------

Stations

02	2 stations
:	:
08	8 stations

* Max. 8 stations

Symbol *2, *3

Symbol	Passage *1		Porting specification A, B
	P	EA, EB	
1	Common	Common	Side
2 *	Common	Common	Bottom
3 *	Common	Individual	Side
4 *	Common	Individual	Bottom
5 *	Individual	Common	Side
6 *	Individual	Common	Bottom
7 *	Individual	Individual	Side
8 *	Individual	Individual	Bottom

* Semi-standard

* 1 When an individual passage is used, P, EA and EB ports will be bottom ported.

* 2 For bottom ported, A/B port size is 1/8 (Symbol 01) only.

* 3 Symbol "1" is only applicable to One-touch fittings (C6, C8).

Port size *2, *3

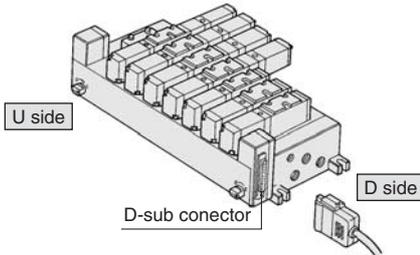
Symbol	P, EA, EB		A, B
	P, EA, EB	A, B	
01			1/8
02			1/4
C6	1/4		One-touch fitting for ø6
C8	1/4		One-touch fitting for ø8
M			Mixed

—	Rc
F	G
N	NPT
T	NPTF

VFR2000

Plug-in Type: With D-sub Connector

- Wide range of interchangeability (D-sub connector (25P) conforming to MIL standard)
- Quick wiring permits easier installation.



VV5FR2 - 01F U 1 - 06 1 - 01 - Q

Series VFR2000 Manifold

Plug-in type with D-sub connector

Connector mounting direction

D	D side mounting
U	U side mounting

Junction cover

1	One-piece junction cover
---	--------------------------

Stations

02	2 stations
⋮	⋮
08	8 stations

* Max. 8 stations

Symbol *2, *3

Symbol	Passage *1		Porting specification A, B
	P	EA, EB	
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

* Semi-standard

* 1 When an individual passage is used, P, EA and EB ports will be bottom ported.

* 2 For bottom ported, A/B port size is 1/8 (Symbol 01) only.

* 3 Symbol "1" is only applicable to One-touch fittings (C6, C8).

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size *2, *3

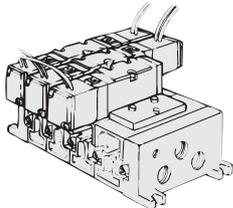
Symbol	P, EA, EB		A, B
	1/4		
01			1/8
02			1/4
C6			One-touch fitting for ø6
C8			One-touch fitting for ø8
M			Mixed

Note) P port or EA/EB port of symbol "3" to "8" can be individual port with block plate.

Therefore, if using individual SUP spacer or individual EXH interface for individual port, its symbol is "1".

Non Plug-in Type: DIN Terminal

- Wiring for every valve.



VV5FR2 - 10 - 05 1 - 01 - Q

Series VFR2000 Manifold

Non plug-in type

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol *2, *3

Symbol	Passage *1		Porting specification A, B
	P	EA, EB	
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

* Semi-standard

* 1 When an individual passage is used, P, EA and EB ports will be bottom ported.

* 2 For bottom ported, A/B port size is 1/8 (Symbol 01) only.

* 3 Symbol "1" is only applicable to One-touch fittings (C6, C8).

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size *2, *3

Symbol	P, EA, EB		A, B
	1/4		
01			1/8
02			1/4
C6			One-touch fitting for ø6
C8			One-touch fitting for ø8
M			Mixed

Note) P port or EA/EB port of symbol "3" to "8" can be individual port with block plate.

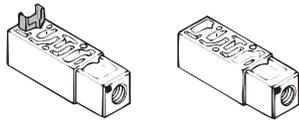
Therefore, if using individual SUP spacer or individual EXH spacer for individual port, its symbol is "1".

Manifold/Option Parts Assembly

Individual SUP spacer

Setting individual SUP spacer on the manifold block enables individual SUP port for each valve.

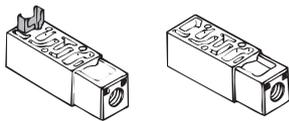
Body type	Plug-in type	Non plug-in type	
Part no.	Rc 1/8	VVFS2000-P-01-1	VVFS2000-P-01-2
	Rc 1/4	VVFS2000-P-02-1	VVFS2000-P-02-2



Individual EXH spacer

Setting individual EXH spacer on the manifold block enables individual EXH port for each valve.

Body type	Plug-in type	Non plug-in type	
Part no.	Rc 1/8	VVFS2000-R-01-1	VVFS2000-R-01-2
	Rc 1/4	VVFS2000-R-02-1	VVFS2000-R-02-2



SUP block disk

When supplying manifold with more than two different kinds of pressure, high and low, insert a block disk in between stations subjected to different pressures.

Body type	Plug-in type	Non plug-in type
Part no.		AXT625-12A

EXH block disk

When valve exhaust affects the other stations in the circuit, insert EXH block disk in between stations to separate valve exhaust.

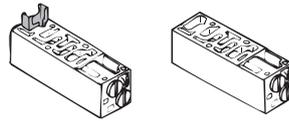
Body type	Plug-in type	Non plug-in type
Part no.		AXT625-12A



Throttle valve spacer

Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

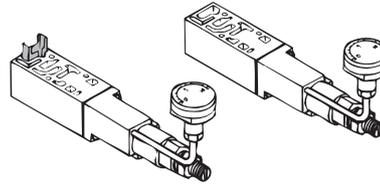
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-20A-1	VVFS2000-20A-2



Interface regulator

Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to "Flow Characteristics")

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF2000-00-P-1	ARBF2000-00-P-2

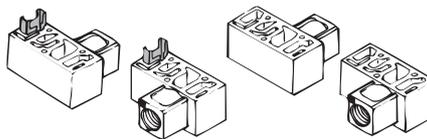


Air release valve spacer

Valve VFR21□0 (single) can be used as air release valve by combining with release valve spacer.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-24A-1 _R	VVFS2000-24A-2 _R

Note) L: U side mount R: D side mount



SUP stop valve spacer ^{Note)}

If SUP stop valve spacer is set, valve can be removed for maintenance without stopping air pressure supply for other valves.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-37A-1	VVFS2000-37A-2

(Height will be 23.2 mm higher.)

Note) Used with manifold base.

Please contact SMC for details.

Blanking plate

It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

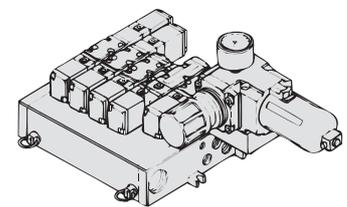
Body type	Plug-in type	Non plug-in type
Part no.		VVFS2000-10A

Manifold Option

With control unit

Plug-in/Non plug-in type

- Filter, regulation valve, pressure switch and air release valve all combine to form one unit.
- Piping processes are eliminated.



For details, refer to page 1.8-18.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

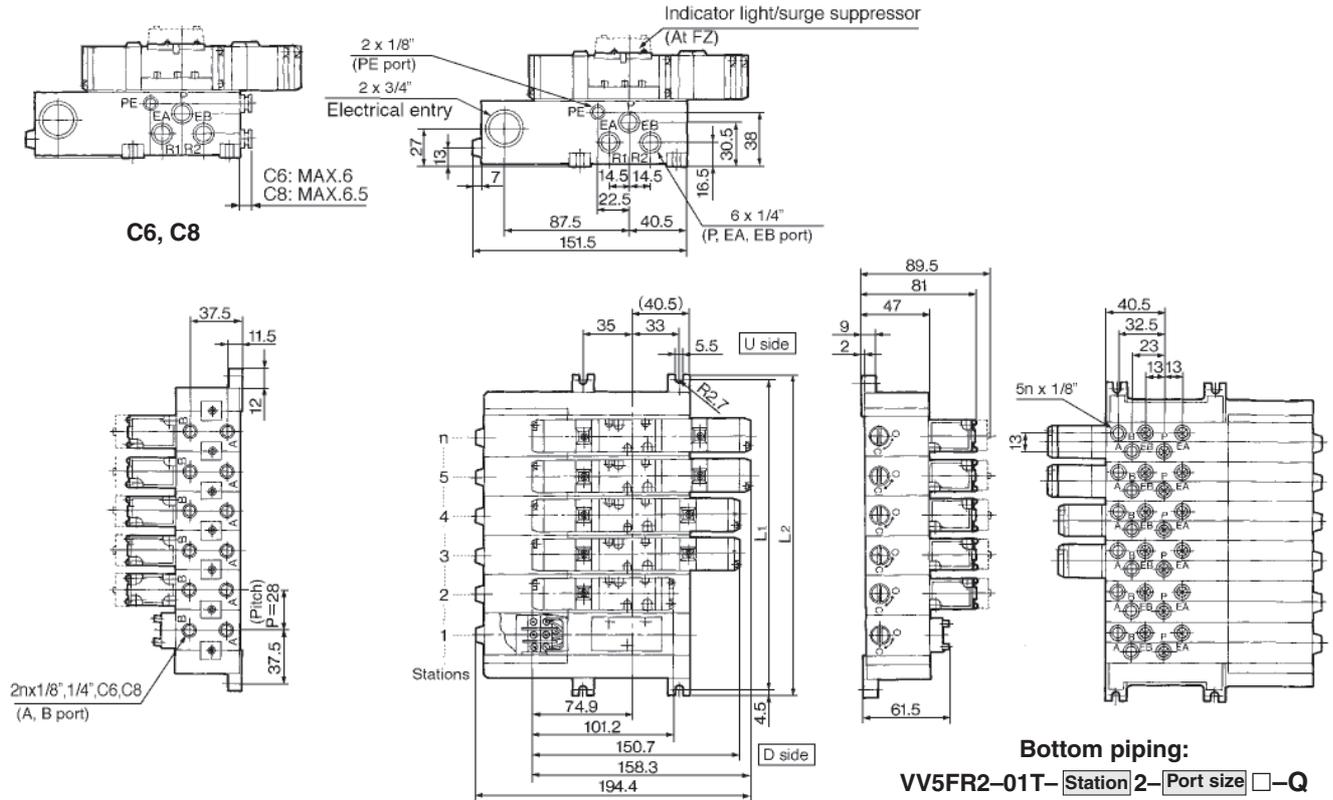
VS7

VQ7

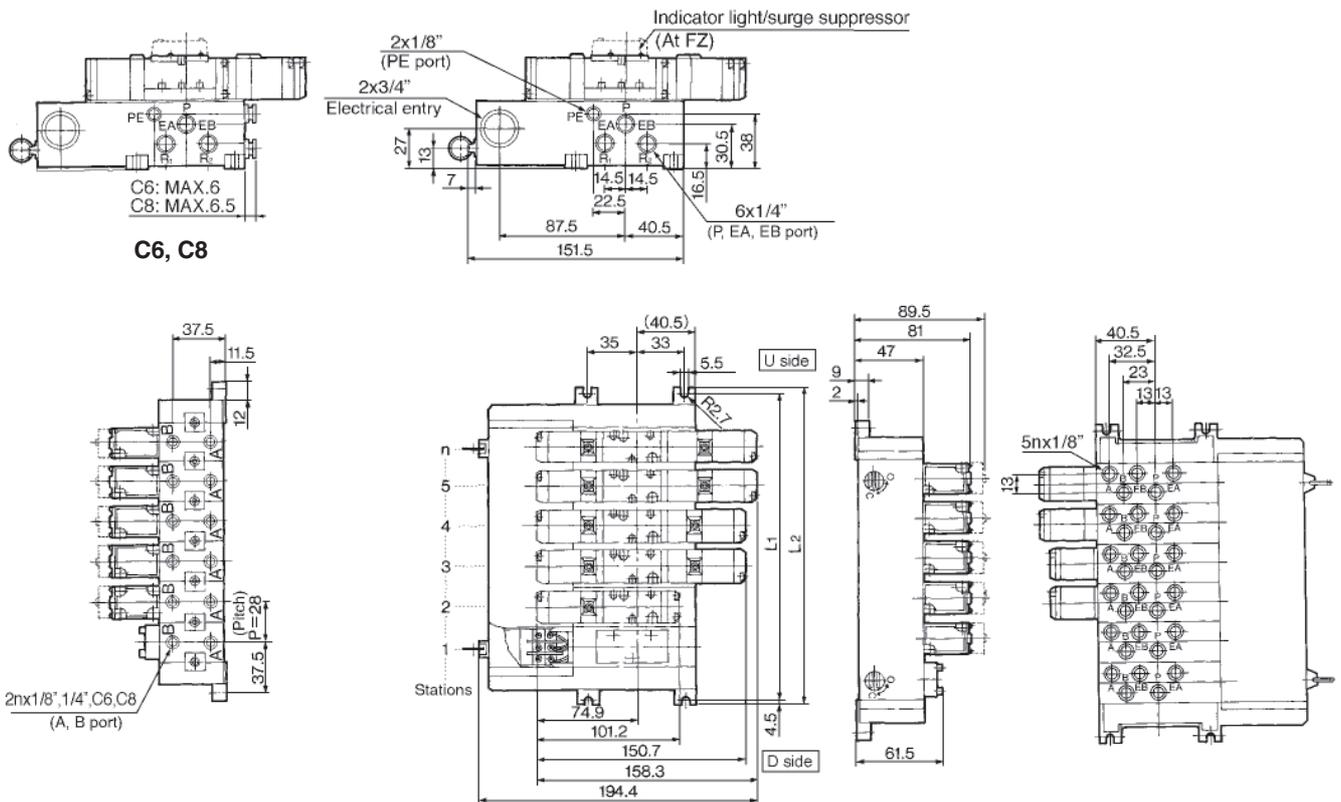
VFR2000

Manifold Plug-in

With terminal block(Individual junction cover): VV5FR2-01T-Station 1-Port size □-Q



With terminal block(One-piece junction cover): VV5FR2-01T1-Station 1-Port size □-Q



n: Station

n	1	2	3	4	5	6	7	8	9	10	Equation
L1	75	103	131	159	187	215	243	271	299	327	$L_1=28 \times n+47$
L2	84	112	140	168	196	224	252	280	308	336	$L_2=28 \times n+56$

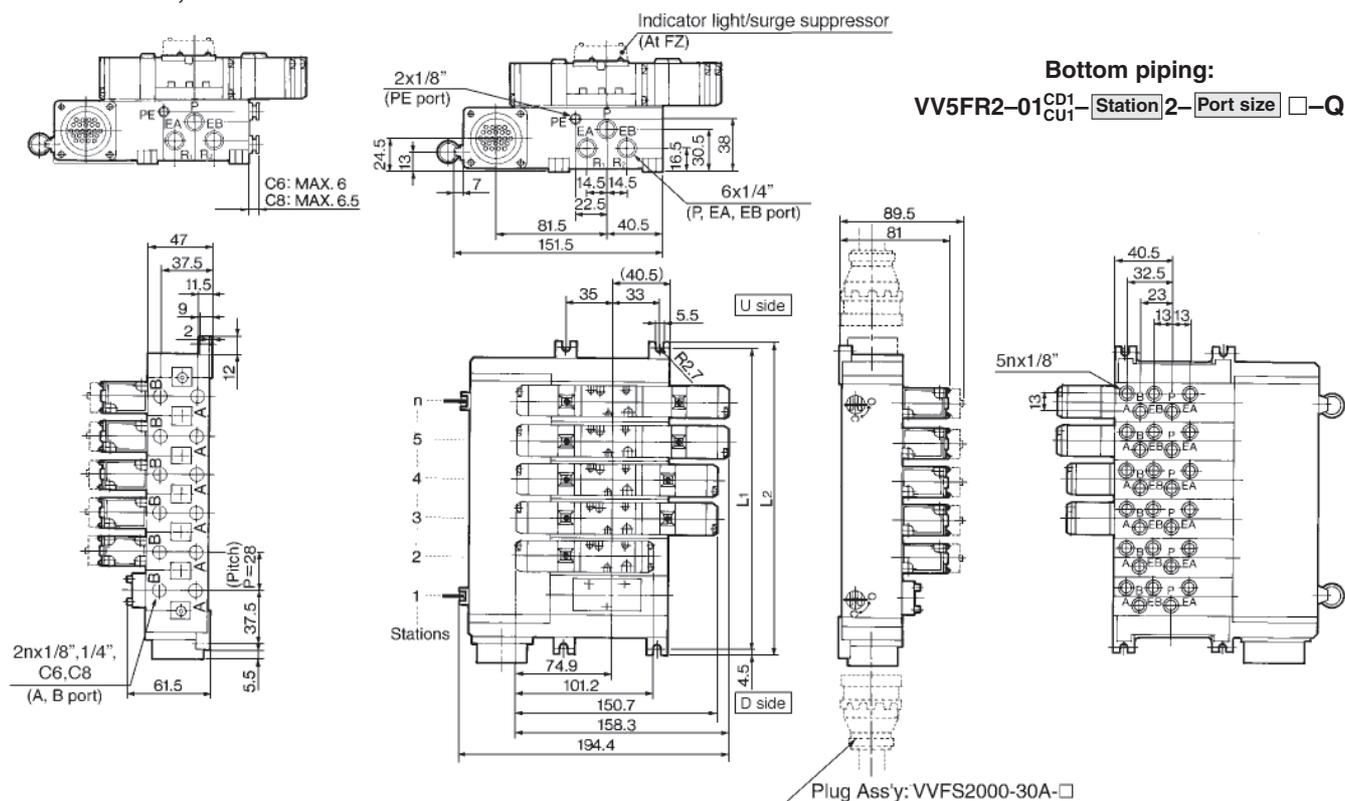
Bottom piping:

VV5FR2-01T1-Station 2-Port size □-Q

Manifold Plug-in

With multi-connector: VV5FR2-01CD1-Station 1-Port size □-Q, VV5FR2-01CU1-Station 1-Port size □-Q

C6, C8

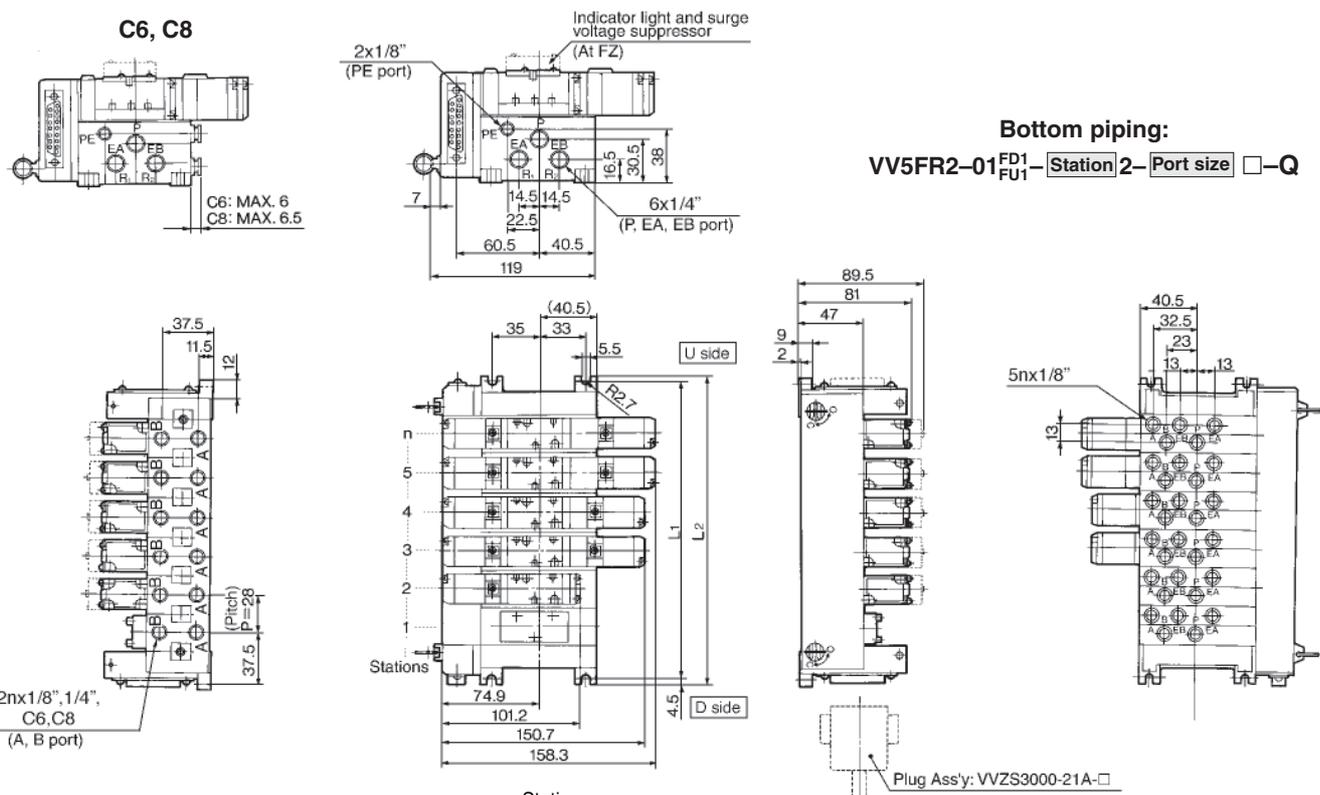


- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

- VQC
- SQ

With D-sub connector: VV5FR2-01FD1-Station 1-Port size □-Q, VV5FR2-01FU1-Station 1-Port size □-Q

C6, C8



- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

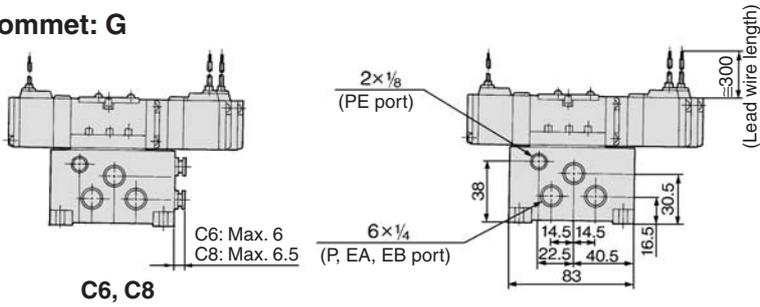
n: Stations

L	n	1	2	3	4	5	6	7	8	Equation
L1		75	103	131	159	187	215	243	271	$L_1 = 28 \times n + 47$
L2		84	112	140	168	196	224	252	280	$L_2 = 28 \times n + 56$

VFR2000

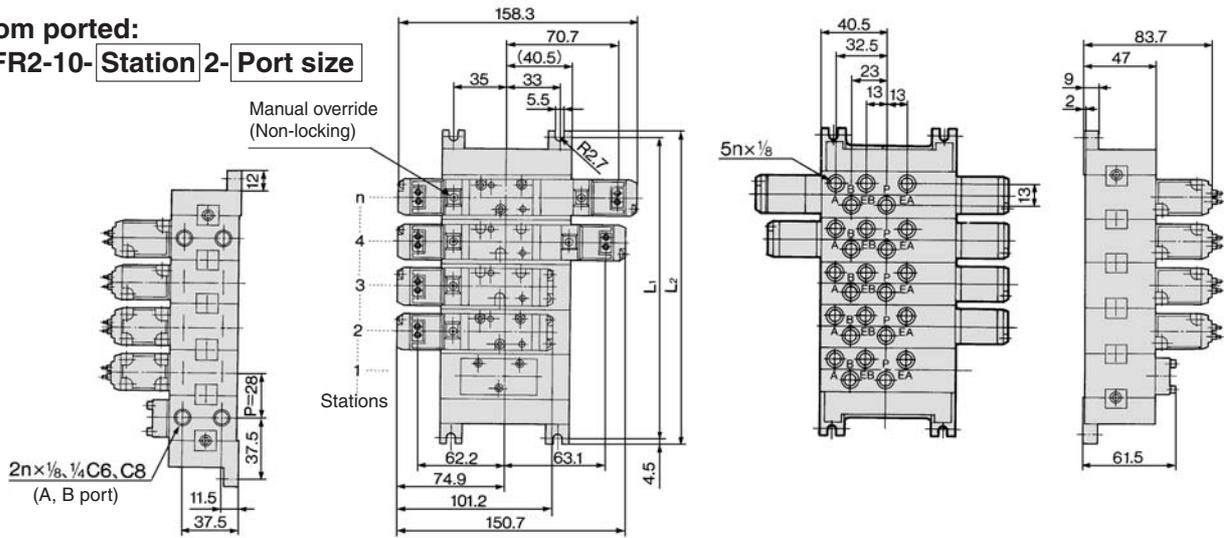
Manifold/Non plug-in type: VV5FR2-10-Station 1-Port size

Grommet: G

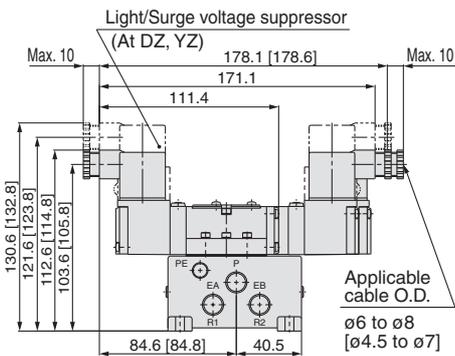


Note: Grommet electrical entry option does not comply the CE standard, just look at its drawing to deduce dimensions of DIN connector option.

Bottom ported:
VV5FR2-10-Station 2-Port size



DIN terminal: D, Y



* []: Type Y

n: Stations

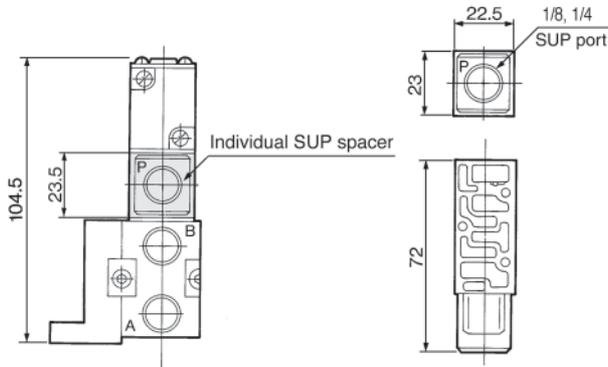
Stations	1	2	3	4	5	6	7	8	9	10	Formula
L ₁	75	103	131	159	187	215	243	271	299	327	L ₁ = 28 x n + 47
L ₂	84	112	140	168	196	224	252	280	308	336	L ₂ = 28 x n + 56

Manifold Option Parts Assembly Plug-in/Non Plug-in

Individual SUP spacer:

VVFS2000-P-01-1(Plug-in)

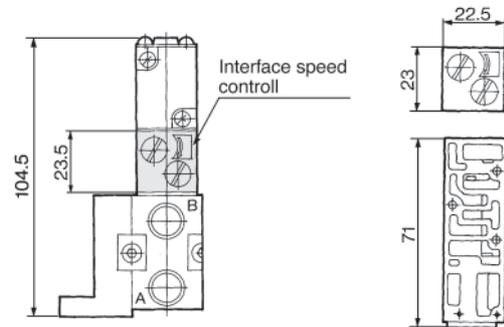
VVFS2000-P-01-2(Non plug-in)



Interface speed control:

VVFS2000-20A-1(Plug-in)

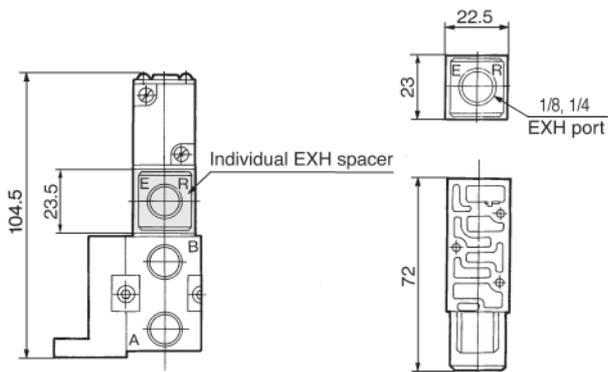
VVFS2000-20A-2(Non plug-in)



Individual EXH spacer:

VVFS2000-R-01-1(Plug-in)

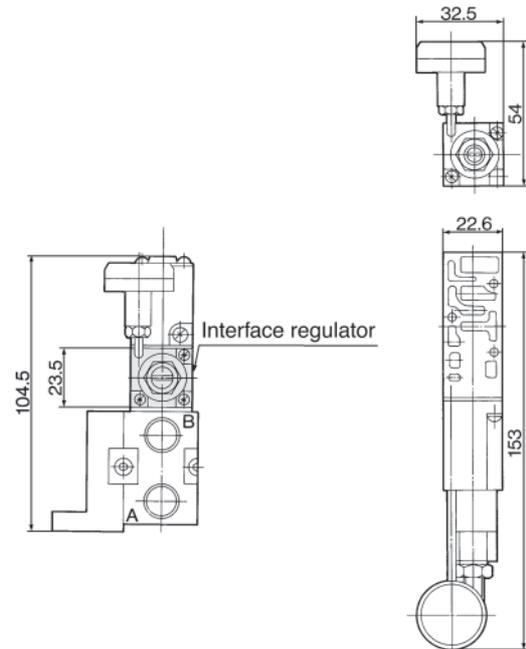
VVFS2000-R-01-2(Non plug-in)



Interface regulator

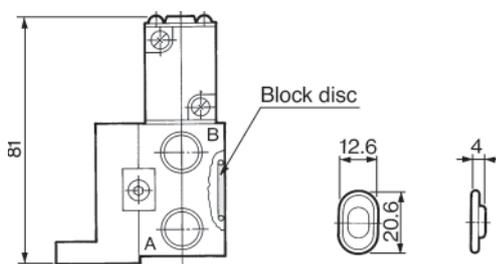
ARBF2000-00-P-1(Plug-in)

ARBF2000-00-P-2(Non plug-in)



SUP block disc: AXT625-12A

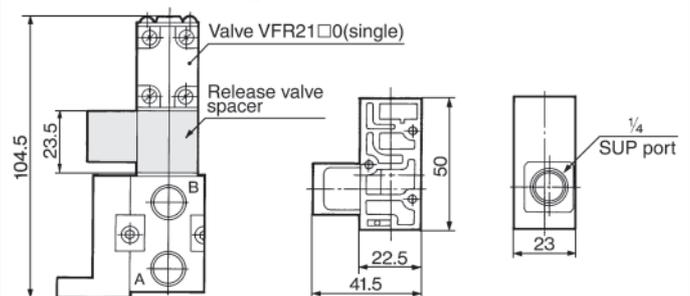
EXH block disc: AXT625-12A



Release valve spacer

VVFS2000-24A-1^R(Plug-in)

VVFS2000-24A-2^R(Non plug-in)



Note) VVFS2000-24A-1/2R (D side mounting)

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

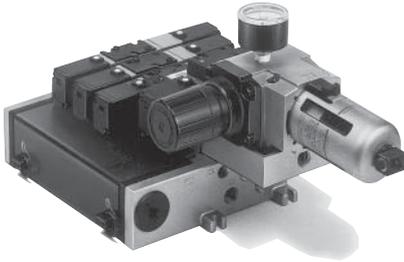
VS7

VQ7

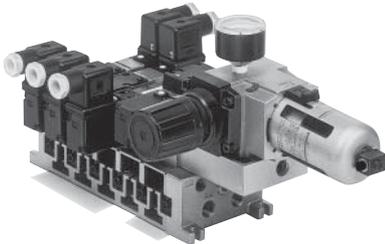
VFR2000

Manifold with Control Unit

- Controlling equipment (filter, regulator, pressure switch and air release valve) is all in one standard unit, possible for directly mounted to the manifold base.
- Piping work eliminated



Plug-in



Non plug-in

Caution

Air filter with auto drain or manual drain must be mounted with the air filter at the bottom.

Manifold Specifications

Manifold	Plug-in: VV5FR2-01□-Q	Non plug-in: VV5FR2-10-Q
Connection	With terminal block With multi-connector With D-sub connector	DIN connector
Applicable solenoid valve	VFR2□00-□F-Q	VFR2□10-□D/Y-Q
Piping	Common SUP, Common EXH	
	A, B port	Side: Rc 1/8, 1/4, C6, C8, Bottom: Rc 1/8 (Option)
	P, EA, EB port	Side: Rc 1/4, Bottom: Rc 1/8 (Option)
Stations	2 to 15 stations* (With multi-connector/D-sub connector: 2 to 8 stations)	



* Including station of control unit

Control Unit Specifications

Air filter (With auto drain/manual drain)	
Filtration degree	5~μm
Regulator	
Set pressure (Secondary pressure)	0.05 to 0.85MPa
Pressure switch	
Set pressure (Secondary pressure)	0.1 to 0.6MPa
Hysteresis	0.08MPa
Contact	1a
Light	LED light: Red
Max. contact capacity	2VAAC, 2WDC
Max. current	At 24VAC/DC or less: 50mA At 100VAC/DC: 20mA
Inside voltage fall	4V or less
Air release valve (single only)	
Operating press. range	0.2 to 0.9MPa

Control Unit Option

Release valve spacer ⁽¹⁾	<Plug-in> VVFS2000-24A-1R (D side mounting) VVFS2000-24A-1L (U side mounting)	
	<Non plug-in> VVFS2000-24A-2R (D side mounting) VVFS2000-24A-2L (U side mounting)	
Pressure switch ⁽²⁾	IS1000P-2-1	
Blank plate	For filter regulator	MP2-2
	For pressure switch	MP3-2
	For air release valve	AXT625-18A
Filter element	111511-5B	



Note 1) Refer to "Manifold Option" on p.1.8-17.

Note 2) Pressure switch cannot be mounted later on non plug-in.

How to Order

VV5FR2 - **10** - **08** **1** - **01** - **AP** - **Q**

Series VFR2000
Manifold

Base model

Symbol	Electrical entry	Connector mounting direction	Junction cover
01T	Plug-in type terminal block	—	Stacking type
01T1	Plug-in type terminal block	—	Integrated type
01CD1	Plug-in type multi-connector	D side	Integrated type
01CU1	Plug-in type multi-connector	U side	Integrated type
01FD1	Plug-in type D-sub connector	D side	Integrated type
01FU1	Plug-in type D-sub connector	U side	Integrated type
10	Non plug-in type	—	—

Stations

02	2 stations
⋮	⋮
15 (Note)	15 stations

Note) • 01CD1, 01CU1, 01FD1, 01FU1:
Max. 8 stations
• 01T, 01T1, 10:
Max. 15 stations
• Including station of control unit

Symbol *2, *3

Symbol	Passage *1		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2*			Bottom
3*	Common	Individual	Side
4*			Bottom
5*	Individual	Common	Side
6*			Bottom
7*	Individual	Individual	Side
8*			Bottom

* Semi-standard

* 1 When an individual passage is used, P, EA and EB ports will be bottom ported.

* 2 For bottom ported, A/B port size is 1/8 (Symbol 01) only.

* 3 Symbol "1" is only applicable to One-touch fittings (C6, C8).

Note) P port or EA/EB port of symbol "3" to "8" can be individual port with block disk.

Therefore, if using individual SUP spacer or individual EXH spacer for individual port, its symbol is "1".

How to Order Manifold Assembly

<Example> Plug-in type with terminal block

VV5FR2-01T1-091-02-MP5-Q 1 set (Manifold base part no.)
*VFR2100-5FZ-Q 5 sets (2 position single part no.)
*VFR2200-5FZ-Q 2 sets (2 position double part no.)

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

The 1st and 2nd station are used for control unit mounting.
When ordering, specify the part nos. in order from the 3rd. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type

VV5FR2-10-071-01-M5-Q 1 set (Manifold base part no.)
*VFR2110-5D-Q 5 sets (2 position single part no.)

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

The 1st and 2nd station are used for control unit mounting.
When ordering, specify the part nos. in order from the 3rd. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

Air release valve coil rating

—	None
1	100 VAC, 50/60 Hz
5	24 VDC

For other rated voltages, please consult with SMC.

Control unit type

Symbol	—	MP	AP	M	A	G	F	C	E
Control equipment									
Air release valve		●	●	●	●			●	●
Air filter regulator with manual drain		●		●		●			
Air filter regulator with auto-drain			●		●		●		
Pressure switch		●	●						
Blanking plate (Air release valve)						●	●		
Blanking plate (Filter regulator)								●	
Blanking plate (Pressure switch)				●	●	●	●	●	
Required stations		2 stations							1 station

Note) Control unit is D side mounting only.

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size *2, *3

Symbol	P, EA, EB	A, B
01	1/4	1/8
02		1/4
C6		One-touch fitting for ø6
C8		One-touch fitting for ø8
M		Mixed

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

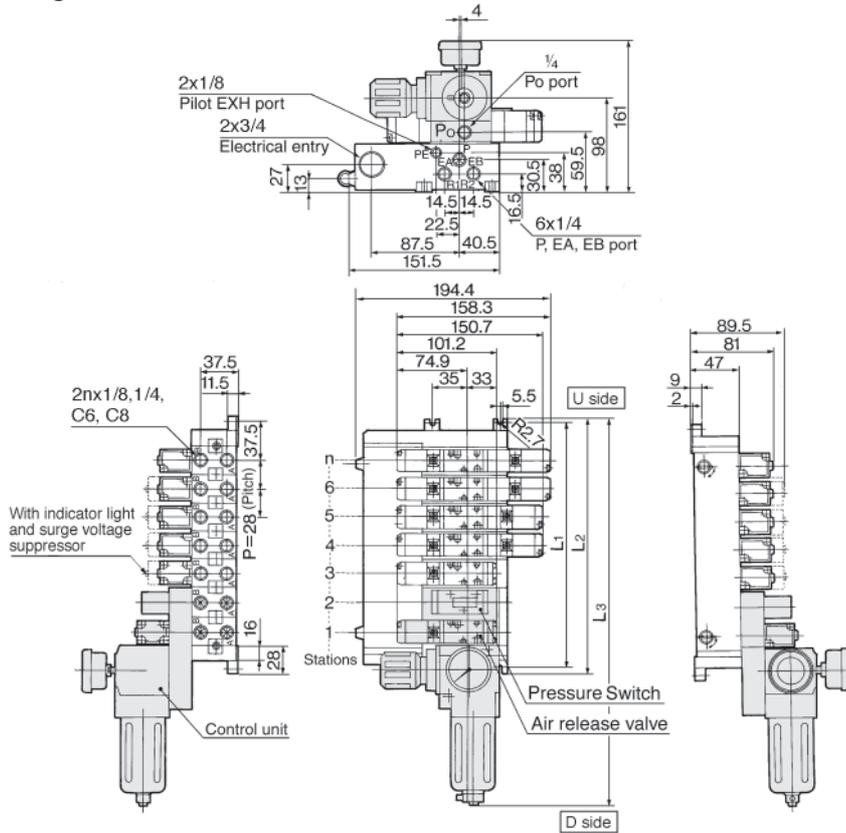
VS7

VQ7

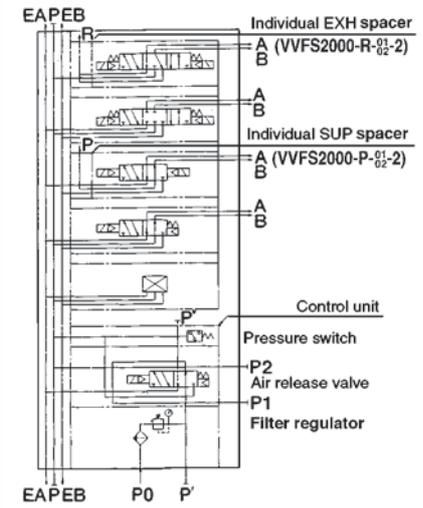
VFR2000

Manifold with Control Unit Plug-in/Non Plug-in

Plug-in: VV5FR2-01T-Station 1-Port size- Control unit-Q

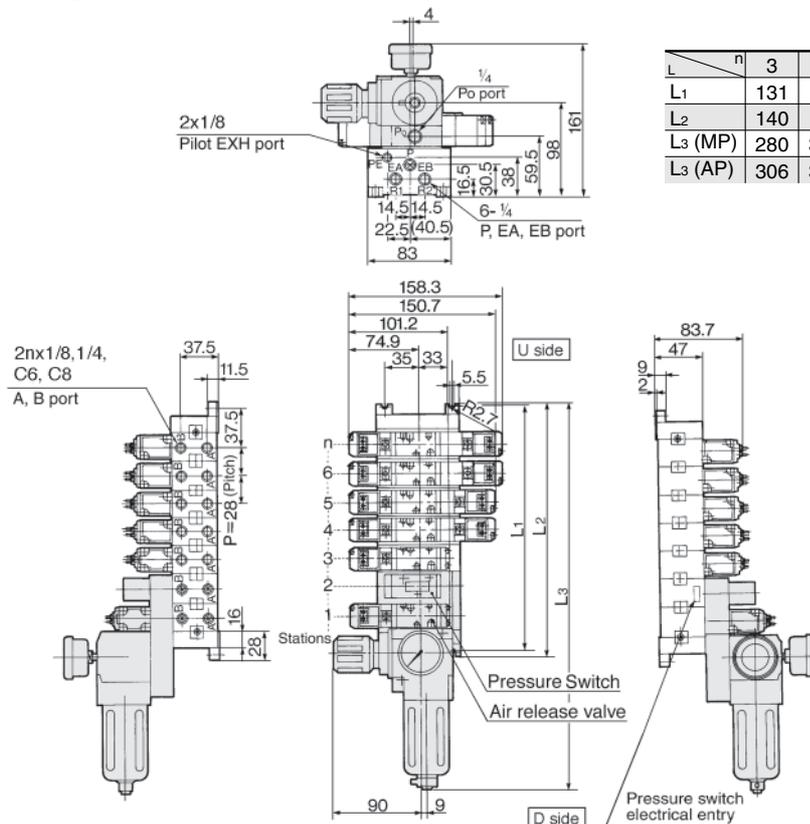


Manifold application example



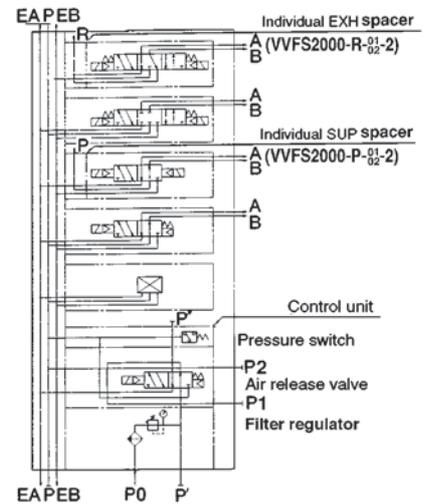
Note: Grommet electrical entry option does not comply the CE standard, just look at its drawing to deduce dimensions of DIN connector option.

Non plug-in: VV5FR2-10-Station 1-Port size- Control unit-Q

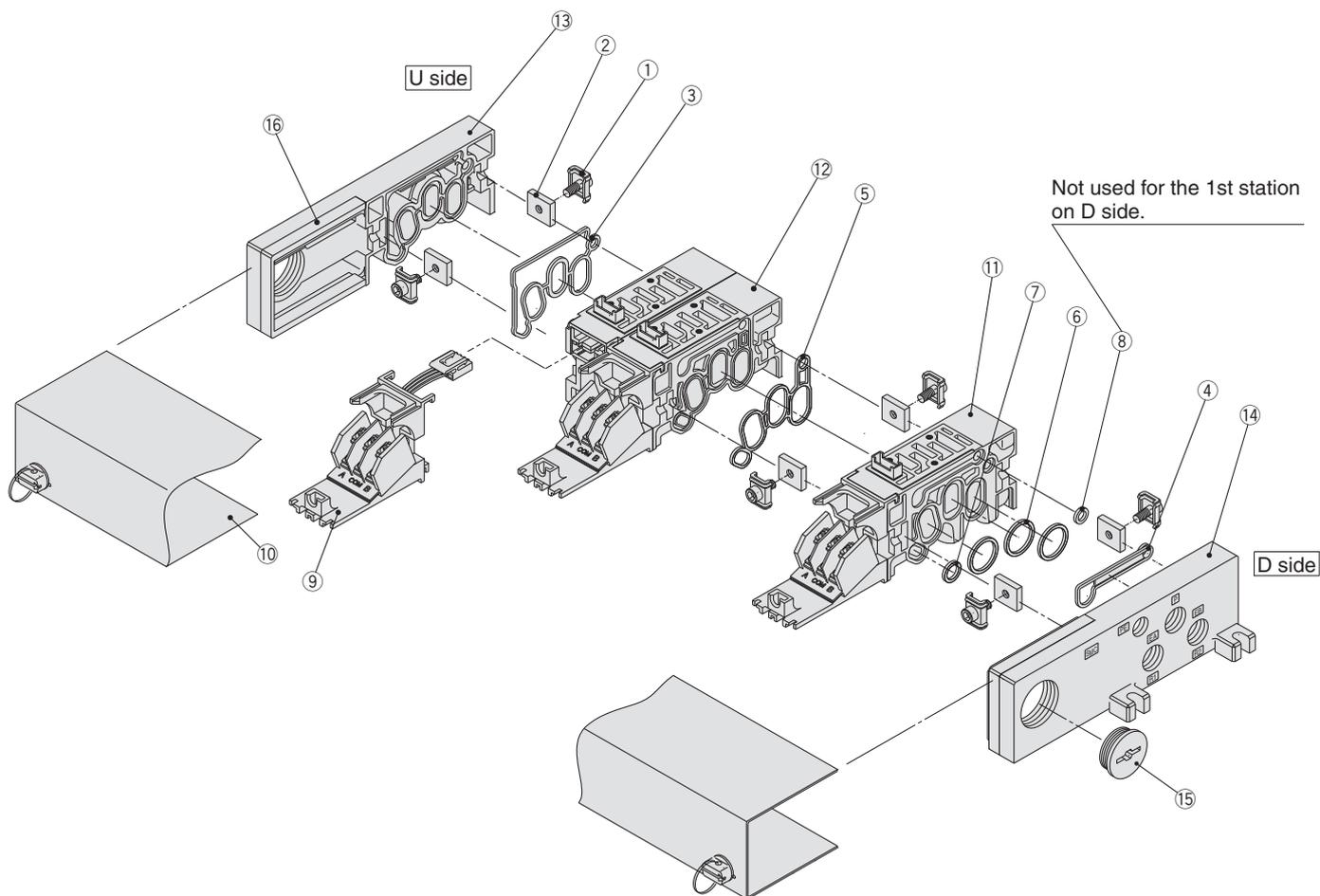


L	n: Station									Equation
	3	4	5	6	7	8	9	10		
L1	131	159	187	215	243	271	299	327	$L_1=28 \times n+47$	
L2	140	168	196	224	252	280	308	336	$L_2=28 \times n+56$	
L3 (MP)	280	308	336	364	392	420	448	476	$L_3=28 \times n+196$	
L3 (AP)	306	334	362	390	418	446	474	502	$L_3=28 \times n+222$	

Manifold application example



Manifold Base Construction — Plug-in Type, Non Plug-in Type



SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7
VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

* Manifold Base/Construction: Plug-in type with terminal block (01T1).

• For increasing the manifold bases, please order the manifold block assembly number of the principle number assembly ⑪ and ⑫.
For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the ⑩ junction cover assembly.

• Manifold base is consisted of the junction of 2 and 3 station bases.

Example) U side ①-----②-----③-----④-----⑤-----⑥-----⑦ D side

<5 stations (Odd number)> 2 stations | 2 stations | 1 station

<6 stations (Even number)> 2 stations | 2 stations | 1 station | 1 station

VFR2000

Replacement Parts

No.	Description	Material	Part no.	
1	Connection fitting assembly	Steel plate		AXT625-4-1A
2	Connection fitting B	Steel plate		AXT625-5
3	Gasket A	NBR		AXT625-17
4	Gasket B	NBR		AXT625-16
5	Gasket	HNBR		VVFS2000-32-1H
6	O-ring	NBR		18 x 15 x 1.5
7	O-ring	NBR		10.5 x 7.5 x 1.5
8	O-ring	NBR		8 x 5 x 1.5
9	Adapter plate	Resin	For 01	AXT625-6
	Adapter plate assembly	—	For 01T For 01T1	AXT625-28-13A (Terminal section with adapter plate and lead wire assembly)
	Adapter plate	Resin	For 01C For 01F	AXT625-28-1 VV2000-26-6
10	Junction cover assembly	—	For 01	AXT625-7A
			For 01T	AXT625-28-3A
			For 01T1	AXT625-28-7A-[Stations]
			For 01C	VVF2000-26-5A-[Stations]
15	Rubber plug	NBR	For 01	AXT333-12
			For 01T (1)	AXT625-22
16	Guard	Resin	For ⁰¹ _{01T(1)}	AXT625-28-4

Replacement Parts: Sub Assembly

No.	Description	Part no.	Component parts	Applicable manifold base
11	Manifold block assembly (for 1 station)	AXT625-01A- $\frac{1}{2}$ (-B) ^{Note)}	Manifold block ①, Metal joint ①, ②, O-ring ⑥, ⑦, ⑧, Junction cover ⑩, Adapter plate ⑨, Pin housing, Guide, Insert plug lead wire	Plug-in type With attachment plug lead wire
		AXT625-20A- $\frac{1}{2}$ (-B) ^{Note)}	Manifold block ①, Metal joint ①, ②, O-ring ⑥, ⑦, ⑧, Junction cover ⑩, Adapter plate assembly (with terminal) ⑨, Pin housing, Guide	Plug-in type With terminal block
		AXT625-10A- $\frac{1}{2}$ (-B) ^{Note)}	Manifold block ①, Metal joint ①, ②, O-ring ⑥, ⑦, ⑧	Non plug-in type
12	Manifold block assembly (for 2 stations)	AXT625-01A2- $\frac{1}{2}$ ^{Note)}	Manifold block ⑫, Metal joint ①, ②, Gasket ⑤, Junction cover ⑩, Adapter plate ⑨, Pin housing, Guide, Insert plug lead wire	Plug-in type With attachment plug lead wire
		AXT625-20A2- $\frac{1}{2}$ ^{Note)}	Manifold block ⑫, Metal joint ①, ②, Gasket ⑤, Junction cover ⑩, Adapter plate assembly (with terminal) ⑨, Pin housing, Guide	Plug-in type With terminal block
		AXT625-10A2- $\frac{1}{2}$ ^{Note)}	Manifold block ①, Metal joint ①, ②, Gasket ⑤	Non plug-in type
13	End plate (U side) assembly	AXT625-2A	End plate (U) ⑬, Metal joint ①, ②, Gasket A ③, Guard ⑯	Plug-in type With attachment plug lead wire
		AXT625-2A-20	End plate (U) ⑬, Metal joint ①, ②, Gasket A ③, Guard ⑯	Plug-in type With terminal block
		AXT625-2A-10	End plate (U) ⑬, Metal joint ①, ②, Gasket A ③	Non plug-in type
14	End plate (D side) assembly	AXT625-3A	End plate (D) ⑭, Metal joint ①, ②, Gasket B ④, Guard ⑯, Steel ball	Plug-in type With attachment plug lead wire
		AXT625-3A-20	End plate (D) ⑭, Metal joint ①, ②, Gasket B ④, Guard ⑯, Steel ball	Plug-in type With terminal block
		AXT625-3A-10	End plate (D) ⑭, Metal joint ①, ②, Gasket B ④, Steel ball	Non plug-in type

Note) 1: A, B port size Rc 1/8, 2: A, B port size Rc 1/4, (-B): A, B port bottom ported

5 Port Pilot Operated Solenoid Valve Rubber Seal, Plug-in/Non Plug-in Series VFR3000



Plug-in type



Non plug-in type

Symbol

2 position	3 position
Single	Closed center
(A)4 2(B) (EA)5 1 3(EB) (P)	(A)4 2(B) (EA)5 1 3(EB) (P)
Double	Exhaust center
(A)4 2(B) (EA)5 1 3(EB) (P)	(A)4 2(B) (EA)5 1 3(EB) (P)
	Pressure center
	(A)4 2(B) (EA)5 1 3(EB) (P)

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)
Lubrication			Not required ⁽¹⁾
Manual override			Non-locking push type
Mounting orientation			Unrestricted
Impact/Vibration resistance			300/50 m/s ² ⁽²⁾
Enclosure			Dustproof
Electricity specifications	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 Hz
		Holding	3.4 VA (2.1 W)/50 Hz, 2.3 VA (1.5 W)/60 Hz
	Power consumption (DC) ⁽³⁾		1.8 W (2.04 W: With light/surge voltage suppressor)
Electrical entry	Plug-in type	Conduit terminal	
	Non plug-in type	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

Pilot type	External pilot ^{Note)}	
Manual override	Main valve	Direct manual override
	Pilot valve	Non-locking push type A (Extended), Locking type B (Tool required), Locking type C (Lever)
Coil rated voltage		110 to 120, 220, 240 VAC 50/60 Hz
		12 VDC
Porting specifications		Bottom ported
Option		With light/surge voltage suppressor

Note) Operating pressure: 0 to 0.9 MPa

Pilot pressure: 2 position single/3 position 0.2 to 0.9 MPa

2 position double 0.1 to 0.9 MPa

Model

Type of actuation	Model		Port size Rc	Flow characteristics ⁽¹⁾								⁽²⁾ Max. operating cycle (Hz)	⁽³⁾ Response time (ms)	⁽⁴⁾ Weight (kg)	
	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	Cv	Q ⁽⁵⁾ [l/min(ANR)]	C [dm ³ /(s·bar)]	b	Cv	Q ⁽⁵⁾ [l/min(ANR)]				
2 position	Single	VFR310□	VFR311□	1/4	7.5	0.38	1.9	2011	7.5	0.34	1.9	1957	5	30 or less	0.61 (0.64) <0.58>
		VFR310□	VFR314□	3/8	8.4	0.39	2.2	2269	8.7	0.38	2.2	2333			
2 position	Double	VFR320□	VFR321□	1/4	7.1	0.41	1.9	1945	7.4	0.40	1.9	2013	5	30 or less	0.71 (0.74) <0.69>
		VFR320□	VFR324□	3/8	7.9	0.36	2.0	2090	8.6	0.37	2.2	2290			
3 position	Closed center	VFR330□	VFR331□	1/4	6.8	0.40	1.8	1850	6.3	0.38	1.6	1690	3	50 or less	0.72 (0.75) <0.71>
		VFR330□	VFR334□	3/8	7.2	0.39	1.9	1945	6.5	0.40	1.7	1768			
	Exhaust center	VFR340□	VFR341□	1/4	6.5	0.42	1.7	1794	7.9 [3.4]	0.41 [0.47]	2.0 [0.96]	2165 [975]	3	50 or less	0.72 (0.75) <0.71>
VFR340□	VFR344□	3/8	6.9	0.42	1.8	1905	9.5 [3.4]	0.39 [0.46]	2.4 [0.96]	2566 [968]					
3 position	Pressure center	VFR350□	VFR351□	1/4	7.6 [2.4]	0.33 [0.48]	1.9 [0.69]	1970 [694]	6.1	0.36	1.5	1613	3	50 or less	0.72 (0.75) <0.71>
		VFR350□	VFR354□	3/8	9.3 [2.4]	0.34 [0.47]	2.2 [0.69]	2427 [688]	6.5	0.41	1.7	1781			

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. (0.5 MPa, Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)

Note 4) For VFR3□00-□FZ-□□, (): VFR3□10-DZ□□, < >: VFR3□40-□G-□□

Note 5) These valves have been calculated according to the ISO6358 and indicate the follow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

How to Order

Electrical entry

F: Plug-in type, conduit terminal

Option

—	None
Z	With light/surge voltage suppressor

Porting specifications (P, A, EA, EB port)

—	Side ported
B	Bottom ported *

* Semi-standard

Port size (P, A, B, EA, EB port)

—	Without sub-plate
02	1/4
03	3/8

* For bottom ported: Rc1/4

Thread type

—	Rc
F	G
T	NPTF

Plug-in VFR3 1 0 0 □ - 5 F □ □ - □ 02 □ - □ - Q

Non plug-in VFR3 1 1 1 □ - 1 D □ □ - □ 02 □ - □ - Q **Common electrical entry**

Non plug-in VFR3 1 4 0 □ - 1 G □ □ - □ 02 □ - □ - Q **Individual electrical entry**

Symbol

Body option

0	Standard
1*	Direct manual override

* Semi-standard

Pilot type

—	Internal pilot
R	External pilot

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

For other rated voltages, please consult with SMC.

Option/VFR3□1□

—	None
Z	With light/surge voltage suppressor

Option/VFR3□4□

—	None
Z*	With light/surge voltage suppressor

Electrical entry: VFR3□1□

D: DIN terminal
DO: Without connector

Electrical entry: VFR3□4□

D: DIN terminal
DO: Without connector
Y: DIN terminal (DIN43650B)
YO: Without connector

Pilot valve manual override

—: Non-locking push type

A*: Non-locking push type A (Extended)

B*: Locking type B (Tool required)

C*: Locking type C (Lever)

* Semi-standard

How to Order Pilot Valve Assembly

SF4- 1 F □ - 70 - □ - Q

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

For other rated voltages, please consult with SMC.

Electrical entry, Light/Surge voltage suppressor

Symbol	Electrical entry	Indicator light	With surge voltage suppressor	Applicable valve model
F*	Plug-in	—	—	VFR3□0□ VFR3□1□
D	DIN terminal	—	—	VFR3□4□
DZ		●	●	
Y	DIN terminal (DIN43650B type)	—	—	VFR3□4□
YZ		●	●	

* "VFR3□0□", "VFR3□1□": Pilot valve assembly is all plug-in (F).

Manual override

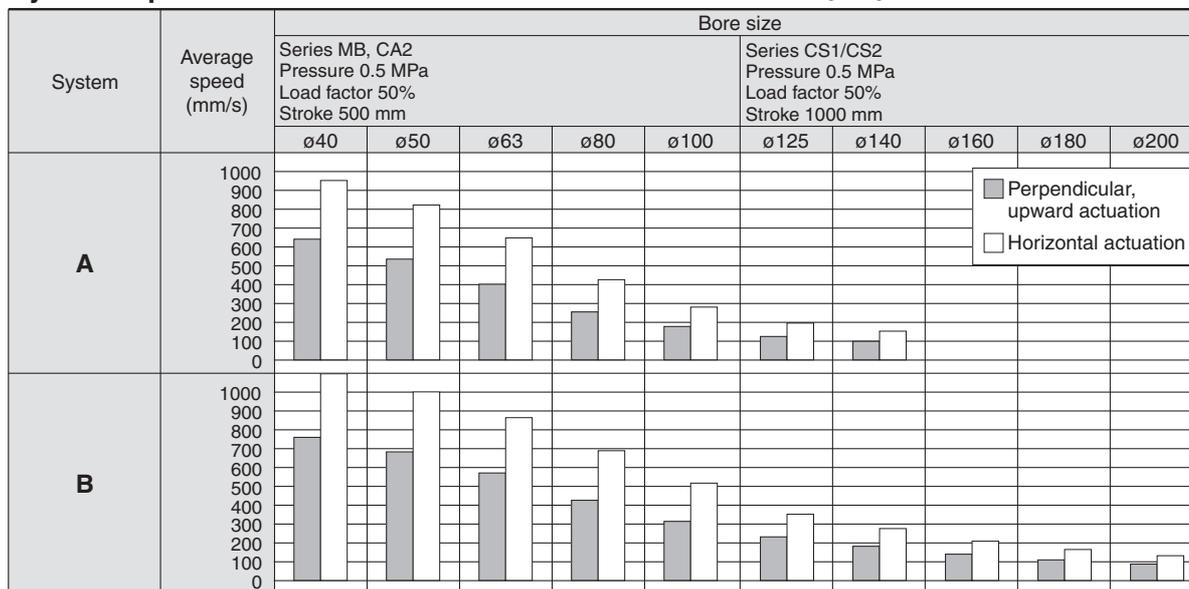
—	Non-locking push type
A	Non-locking push type A (Extended)
B	Locking type B (Tool required)
C	Locking type C (Lever)

Symbol

Symbol	Applicable valve model
—	VFR3□0□ VFR3□1□
1	VFR3□4□

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.

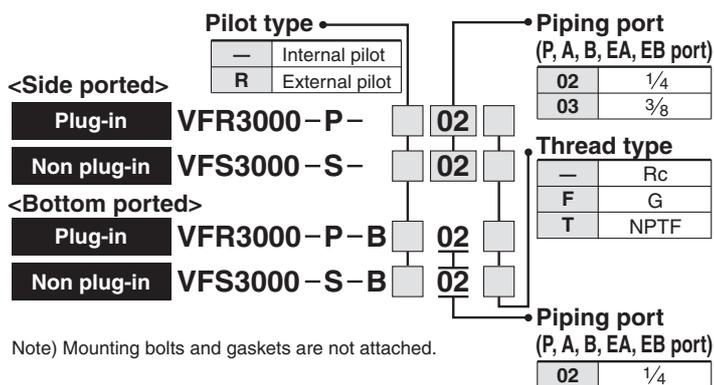
* The average velocity of the cylinder is what the stroke is divided by the total stroke time.

* Load factor: $((\text{Load mass} \times 9.8) / \text{Theoretical force}) \times 100\%$

System Components

System	Solenoid valve	Speed controller	Silencer	SPG (Steel pipe) dia. x Length
A	Series VFR3000 Rc 1/4	AS4000-02	AN20-02	6A x 1 m
B	Series VFR3000 Rc 3/8	AS420-03	AN30-03	10A x 1 m

How to Order Sub-plate Assembly



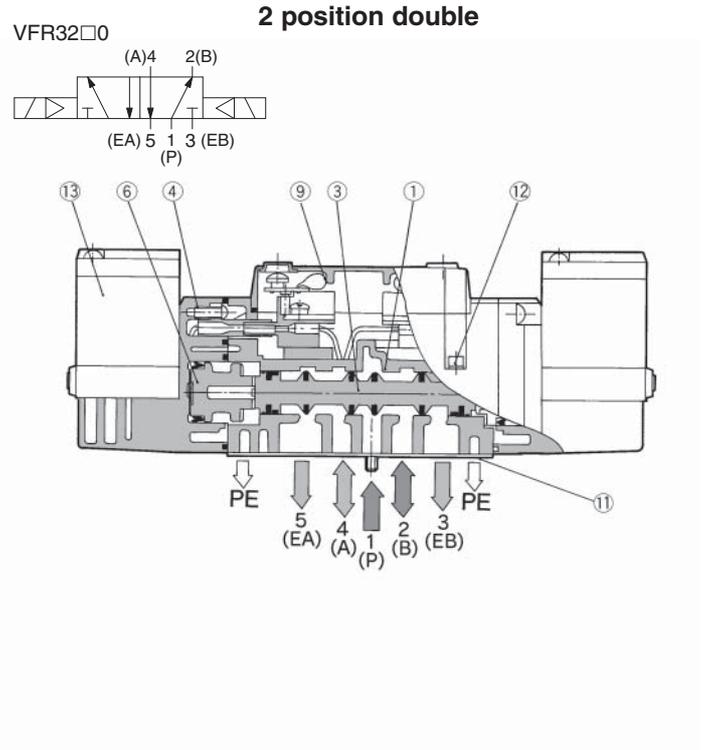
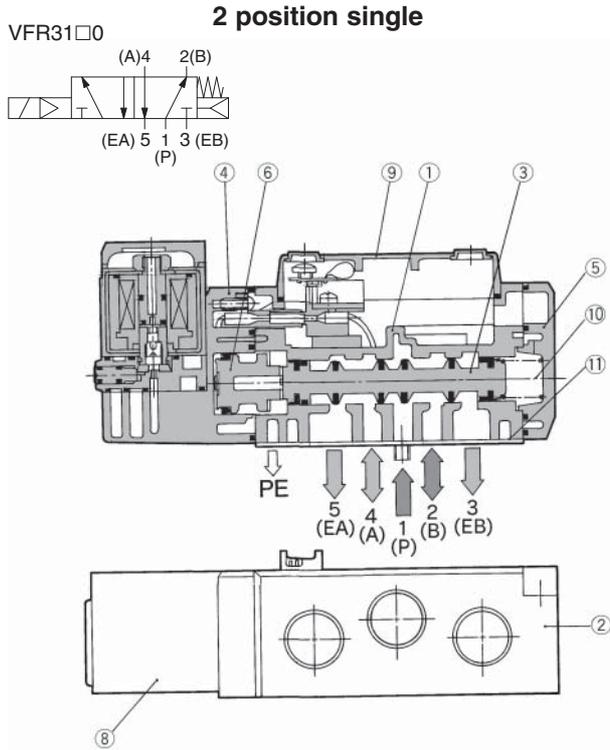
Note) Mounting bolts and gaskets are not attached.

SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7

VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

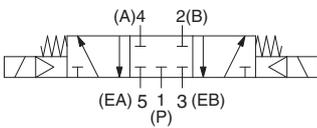
VFR3000

Construction

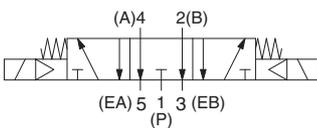


3 position closed centre/exhaust centre/pressure centre

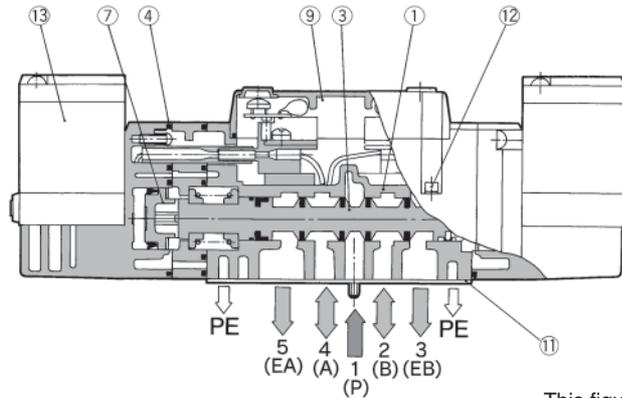
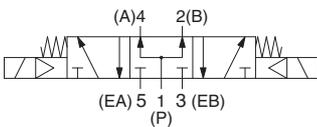
Closed centre/VFR33□□0



Exhaust centre/VFR34□□0



Pressure centre/VFR35□□0



This figure shows closed centre.

Component Parts

No.	Description	Material	Note
1	Body	Aluminium die cast	Platinum silver
2	Sub-plate	Aluminium die cast	Platinum silver
3	Spool valve	Aluminium, NBR	
4	Adaptor plate	Resin	Black
5	End plate	Resin	Black

Component Parts

No.	Description	Material	Note
6	Piston	Resin	
7	Piston	Resin	
8	Junction cover	Resin	
9	Light cover	Resin	
10	Return spring	Stainless steel	

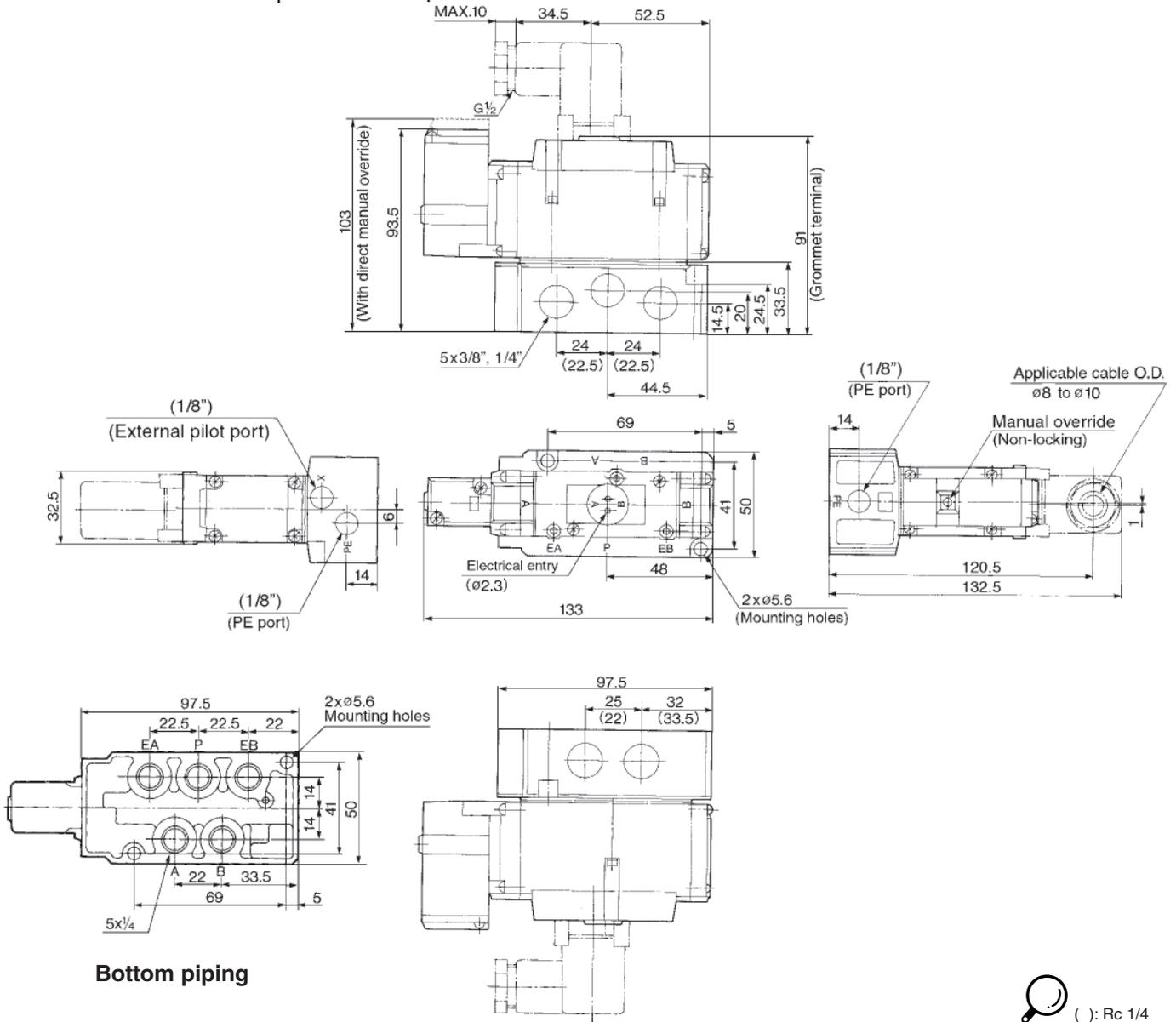
Replacement Parts

No.	Description	Material	Part No.		
			VFR31□□	VFR32□□	VFR33□□, 34□□, 35□□
11	Gasket	NBR	VFR3000-26-4	VFR3000-26-4	VFR3000-26-4
12	Hex. socket head cap screw	Steel	AXT632-3(M3 X 32)	AXT632-3(M3 X 32)	AXT632-3(M3 X 32)
	Pilot valve assembly	-	Refer to "How to Order Pilot Valve Assembly on p.1.8-24.		
	Sub-plate assembly	-	Refer to "How to Order Sub plate Assembly on p.1.8-25.		

VFR3000

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

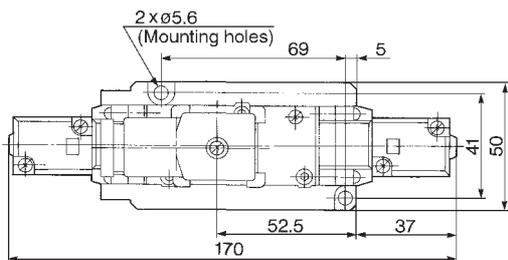
2 position single: VFR311⁰-□E/VFR311⁰-□DZ



Bottom piping

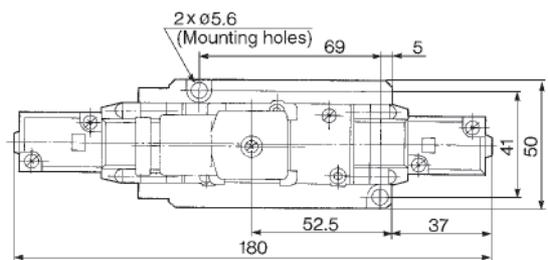
() : Rc 1/4

2 position double:
VFR321⁰-□E/VFR321⁰-□DZ



*Other dimensions are the same as single.

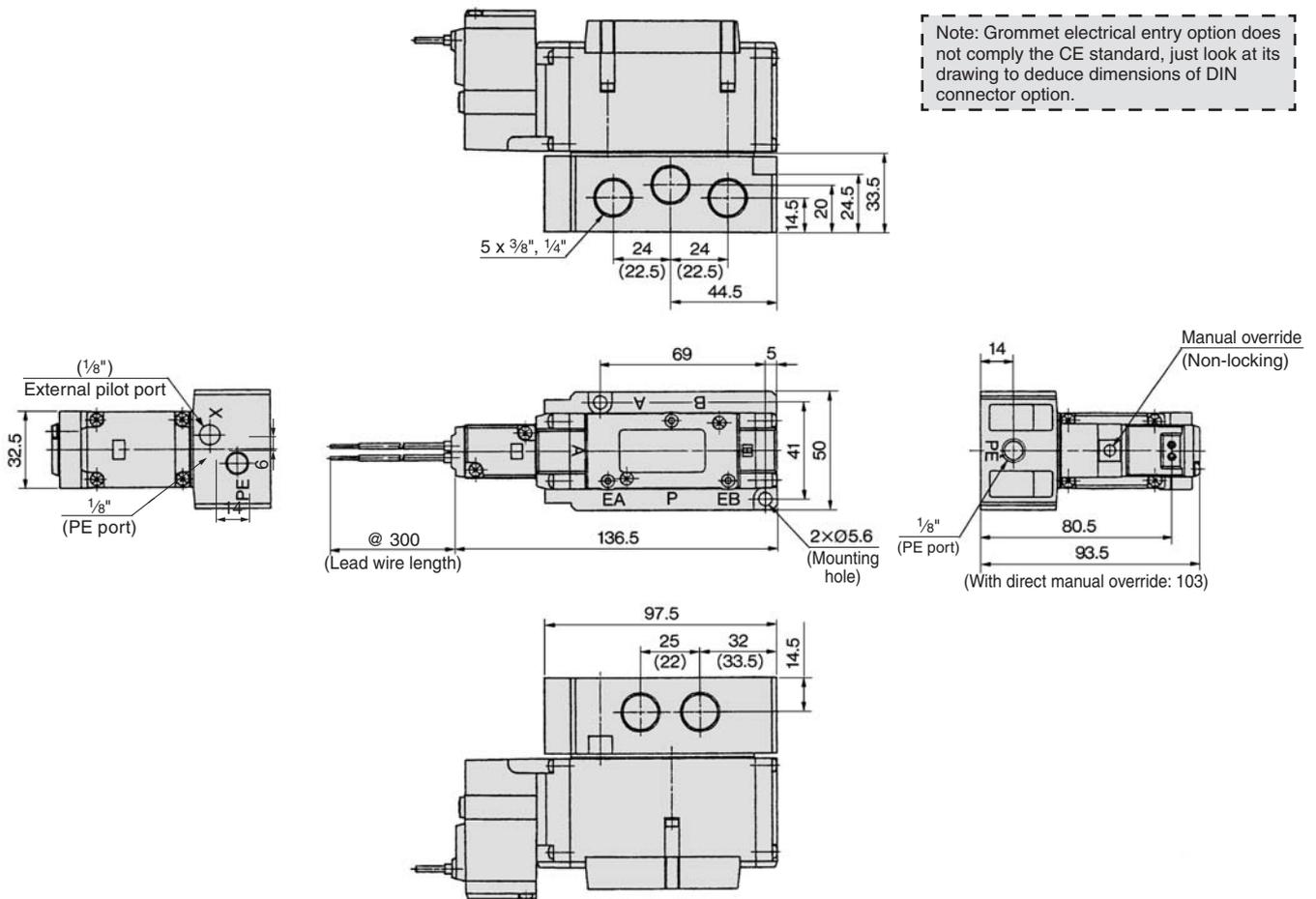
3 position closed centre: VFR331⁰-□E/VFR331⁰-□DZ
3 position exhaust centre: VFR341⁰-□E/VFR341⁰-□DZ
3 position pressure centre: VFR351⁰-□E/VFR351⁰-□DZ



*Other dimensions are the same as single.

Non Plug-in: 2 Position Single

2 position single: VFR314 $\frac{0}{1}$ -□G

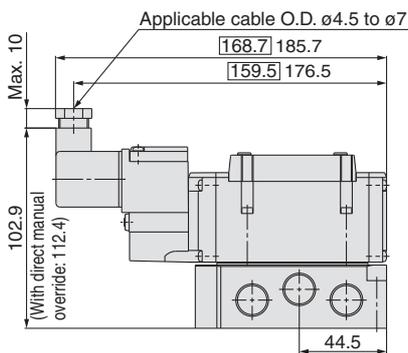


- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

() : Rc 1/4

D, Y: DIN terminal



□ : With light/surge voltage suppressor

VFR3000

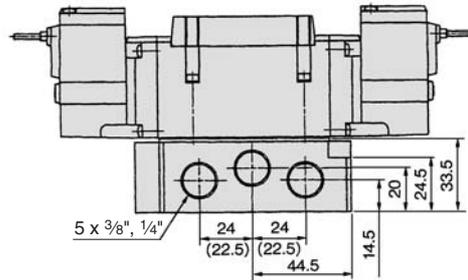
Non Plug-in: 2 Position Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position double: VFR324 \square - \square G

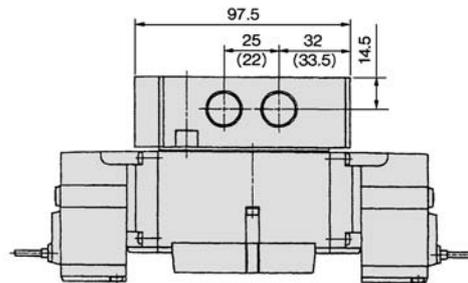
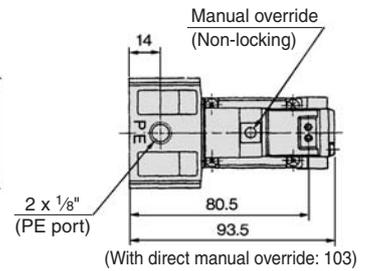
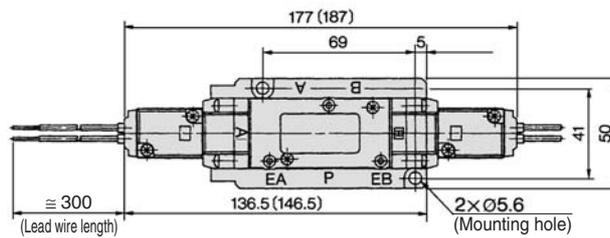
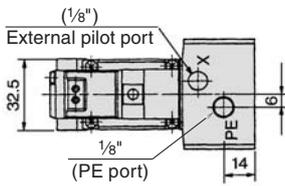
3 position closed center: VFR334 \square - \square G

3 position exhaust center: VFR344 \square - \square G

3 position pressure center: VFR354 \square - \square G

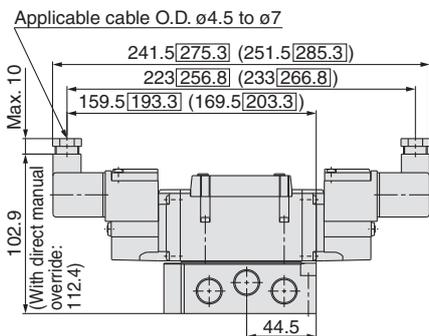


Note: Grommet electrical entry option does not comply the CE standard, just look at its drawing to deduce dimensions of DIN connector option.



[] : 3 position
() : Rc 1/4

D, Y: DIN terminal



[] : 3 position
□ : With light/surge voltage suppressor

Series VFR3000 Manifold Specifications

Manifold Specifications

Base mounted	Wiring	Porting specifications		Port size		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B	A, B		
Plug-in type VV5FR3-01□-Q	• With terminal block • With multi-connector • With D-sub connector	Side/Bottom	Note) 1/2	1/4, 3/8 C8, C10	2 to 10	2 to 10	VFR3□00-□F-Q
						2 to 8	
Non plug-in type VV5FR3-10-Q	• DIN terminal					2 to 10	VFR3□1□-□D/Y-Q
						Non plug-in type VV5FR3-40-Q	• DIN terminal	2 to 10	VFR3□4□-□D/Y-Q

Note) If silencer is mounted to EA/EB port, use silencer "AN403-04" (O.D. ø27).

How to Order Manifold Assembly

<Example> Plug-in type with terminal block: 6 stations

VV5FR3-01T-061-02-Q	1 set (Manifold base part no.)
*VFR3100-5FZ-Q	3 sets (2 position single part no.)
*VFR3200-5FZ-Q	2 sets (2 position double part no.)
*VVFS3000-10A	1 set (Blanking plate)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type: 6 stations

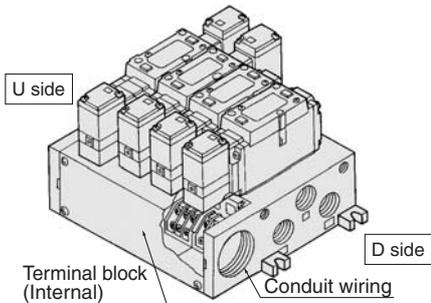
VV5FR3-10-061-03-Q	1 set (Manifold base part no.)
*VFR3110-5D-Q	5 sets (2 position single part no.)
*VFR3410-5D-Q	1 set (3 position exhaust center part no.)
*VVFS3000-R-03-2	1 set (Individual EXH spacer part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

Plug-in Type: With Terminal Block

- Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block, corresponding lead wires from power source can be wired at the bottom of terminal block.



VV5FR3 - 01T - 06 1 - 02 □ - Q

Series VFR3000
Manifold

Plug-in type with
terminal block

Stations

02	2 stations
⋮	⋮
10	10 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2	Common	Common	Bottom*

* Semi-standard

Port size

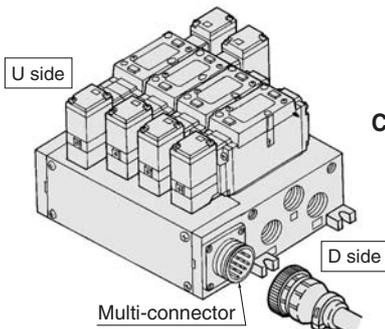
Symbol	P, EA, EB	A, B *
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10		One-touch fitting for ø10
M		Mixed

* For bottom ported: Rc1/4, 3/8 only.
* For C8 and C10, the thread type is only Rc.

—	Rc
F	G
T	NPTF

Plug-in Type: With Multi-connector

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.



VV5FR3 - 01C D - 05 1 - 02 □ - Q

Series VFR3000
Manifold

Plug-in type with
multi-connector

Connector mounting
direction

D	D side mounting
U	U side mounting

Stations

02	2 stations
⋮	⋮
08*	8 stations

* Max: 8 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2	Common	Common	Bottom*

* Semi-standard

Port size

Symbol	P, EA, EB	A, B *
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10		One-touch fitting for ø10
M		Mixed

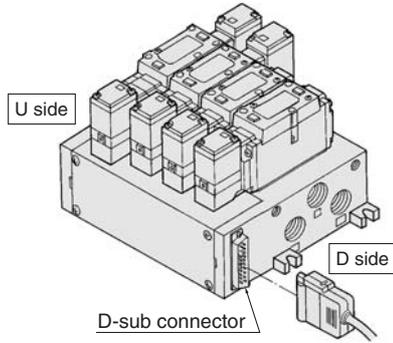
* For bottom ported: Rc1/4, 3/8 only.
* For C8 and C10, the thread type is only Rc.

—	Rc
F	G
T	NPTF

VFR3000

Plug-in Type: With D-sub Connector

- Wide range of interchangeability (25 pin D-sub connector conforms to MIL standard)
- Quick wiring permits easier installation.



VV5FR3-01F D-06 1-02-Q

Series VFR3000 Manifold

Plug-in type with D-sub connector

Connector mounting direction

D	D side mounting
U	U side mounting

Stations

02	2 stations
⋮	⋮
08	* 8 stations

* Max: 8 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Port size

Symbol	P, EA, EB	A, B *
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10	One-touch fitting for ø10	
M		Mixed

Thread type

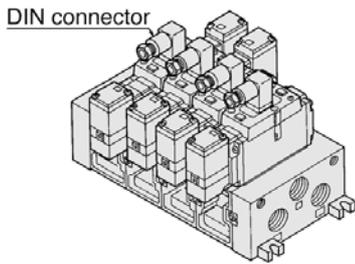
—	Rc
F	G
T	NPTF

Note) Electrical entry and light/surge voltage suppressor: F, FZ only

* For bottom ported: Rc 1/4, 3/8 only.
* For C8 and C10, the thread type is only Rc.

Non Plug-in Type: DIN Terminal (Common electrical entry)

- Individual wiring for every valve



VV5FR3-10-05 1-02-Q

Series VFR3000 Manifold

Non plug-in type Common electrical

Stations

02	2 stations
⋮	⋮
10	10 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Port size

Symbol	P, EA, EB	A, B *
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10	One-touch fitting for ø10	
M		Mixed

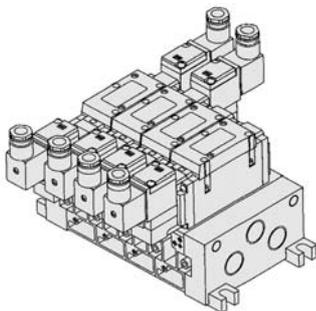
Thread type

—	Rc
F	G
T	NPTF

* For bottom ported: Rc 1/4, 3/8 only.
* For C8 and C10, the thread type is only Rc.

Non Plug-in Type: DIN Terminal (Individual electrical entry)

- Individual wiring for every valve



VV5FR3-40-05 1-02-Q

Series VFR3000 Manifold

Non plug-in type Individual electrical entry

Stations

02	2 stations
⋮	⋮
10	10 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Port size

Symbol	P, EA, EB	A, B *
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10	One-touch fitting for ø10	
M		Mixed

Thread type

—	Rc
F	G
T	NPTF

Note) Manifold base is in common with "VV5FR3-10".

* For bottom ported: Rc 1/4, 3/8 only.
* For C8 and C10, the thread type is only Rc.

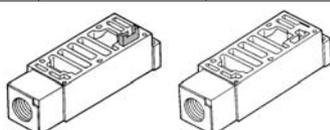
Note) Manifold base is in common with Series VFS3000.

Manifold/Option Parts Assembly

Individual SUP spacer

Setting individual SUP spacer on the manifold block enables individual SUP port for each valve.

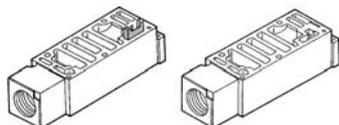
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-P-03-1	VVFS3000-P-03-2



Individual EXH spacer

Setting individual EXH spacer on the manifold block enables individual EXH port for each valve.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-R-03-1	VVFS3000-R-03-2



SUP block disk

When supplying manifold with more than two different pressures, high and low, insert a block disk in between stations subjected to different pressures.

Body type	Plug-in type	Non plug-in type
Part no.	AXT636-1A	

EXH block disk

When valve exhaust affects the other stations on the circuit, insert EXH block disk in between stations to separate valve exhaust.

Body type	Plug-in type	Non plug-in type
Part no.	AXT636-1A	

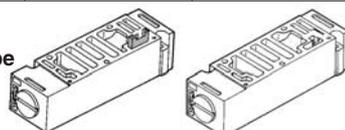


Throttle valve spacer

Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-20A-1	VVFS3000-20A-2

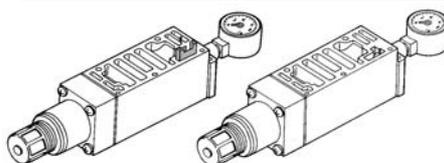
Shape



Interface regulator

Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to "Flow Characteristics").

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF3050-00-P-1	ARBF3050-00-P-2
A port regulation	ARBF3050-00-A-1	ARBF3050-00-A-2
B port regulation	ARBF3050-00-B-1	ARBF3050-00-B-2



SUP stop valve spacer

If SUP stop valve spacer is set, valve can be removed for maintenance without stopping air pressure supply for other valves.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-37A-1	VVFS3000-37A-2

(Height will be 27.5 mm higher.)

Blanking plate

It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-10A	

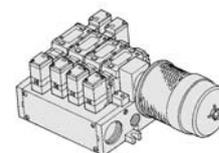
* Mounting screws: 4 positions

Manifold Option

With exhaust cleaner

Plug-in type/Non plug-in type

- Valve exhaust noise dampening: 35 dB or more.
- Collects oil mist: collecting rate 99.9% or more
- Piping process reduced.

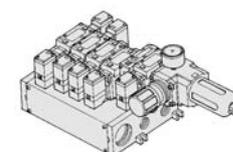


For details, refer to page 1.8-38

With control unit

Plug-in type/Non plug-in type

- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.



For details, refer to page 1.8-41

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

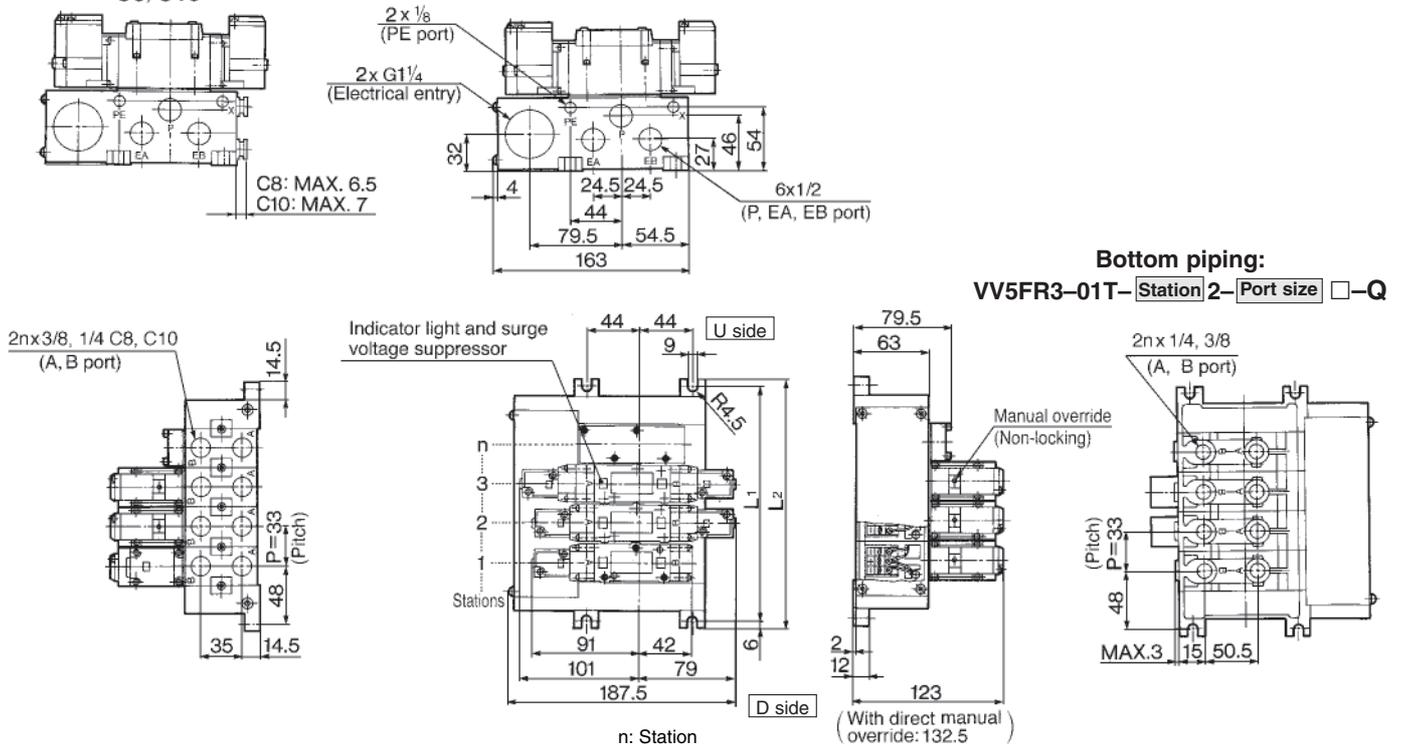
VQ7

VFR3000

Manifold Plug-in

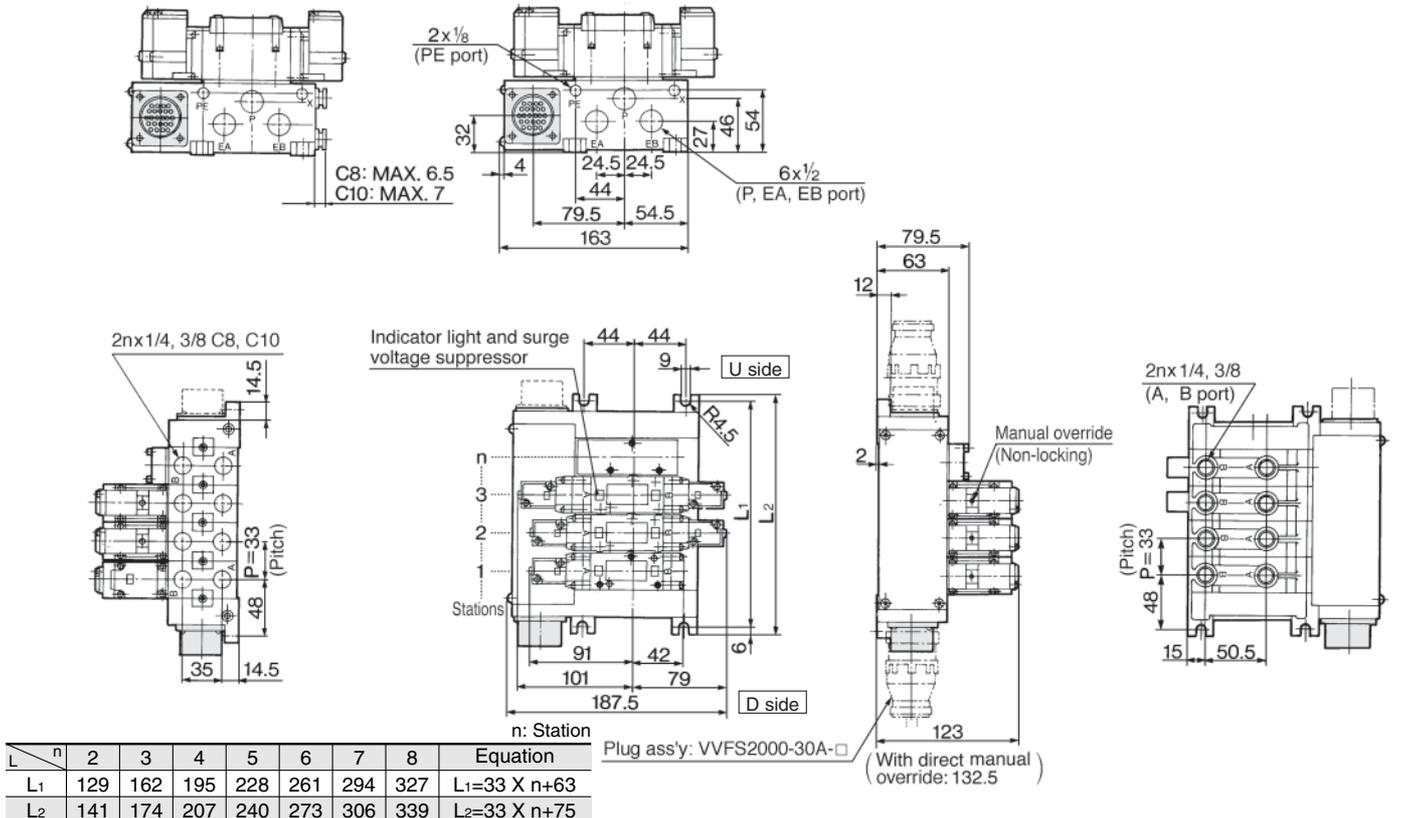
With terminal block: VV5FR3-01T-Station 1-Port size □-Q

C8, C10



L \ n	2	3	4	5	6	7	8	9	10	Equation
L ₁	129	162	195	228	261	294	327	360	393	L ₁ =33 X n+63
L ₂	141	174	207	240	273	306	339	372	405	L ₂ =33 X n+75

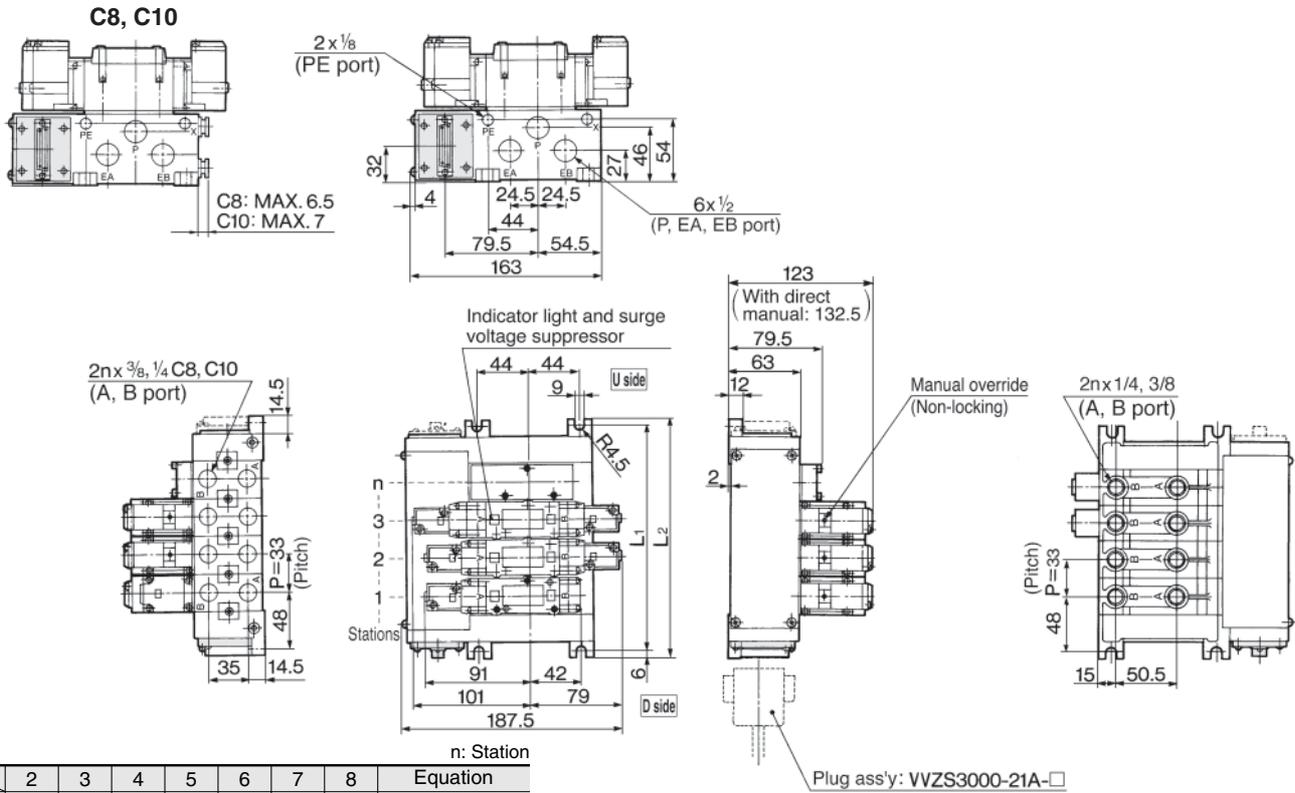
With multi-connector: VV5FR3-01CD-Station 1-Port size □-Q , VV5FR3-01CU-Station 1-Port size □-Q
C8, C10



L \ n	2	3	4	5	6	7	8	Equation
L ₁	129	162	195	228	261	294	327	L ₁ =33 X n+63
L ₂	141	174	207	240	273	306	339	L ₂ =33 X n+75

Manifold Plug-in

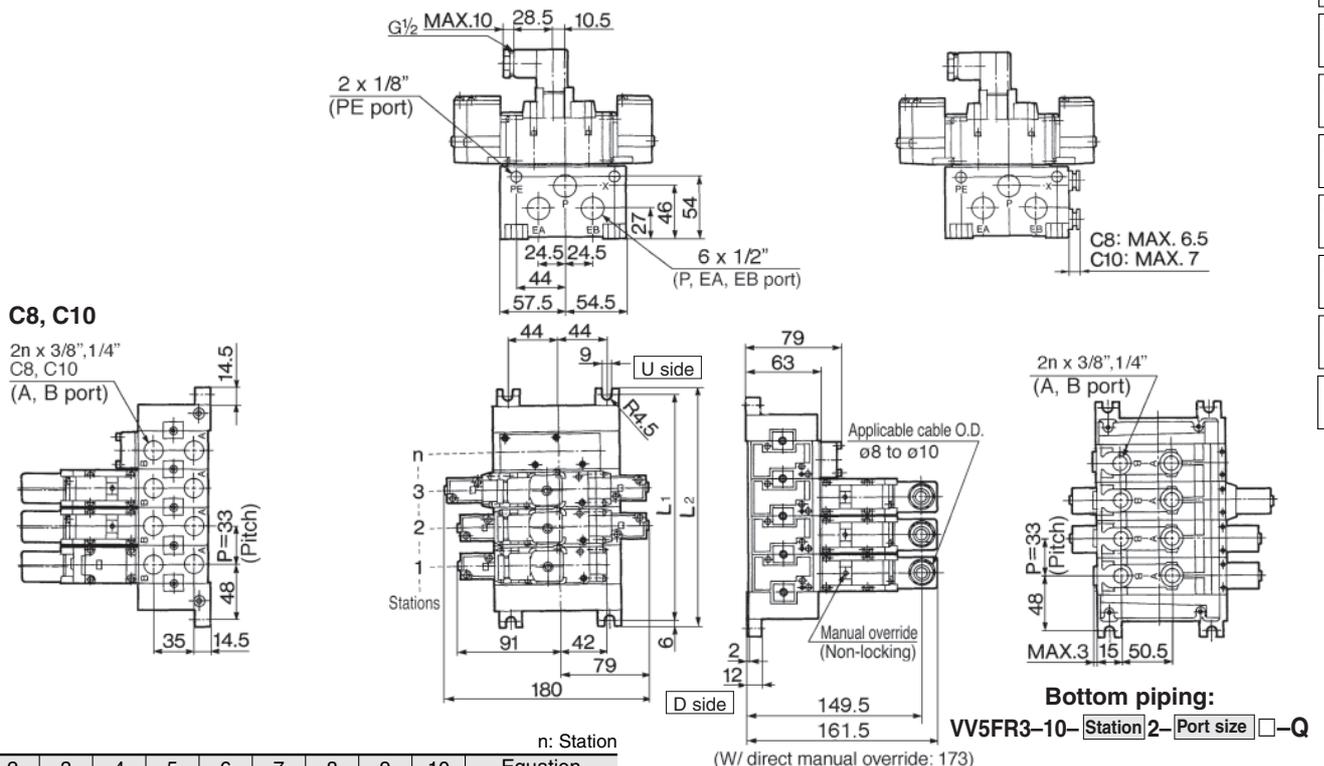
With D-sub connector: VV5FR3-01FD-Station 1-Port size □-Q , VV5FR3-01FU-Station 1-Port size □-Q



L \ n	2	3	4	5	6	7	8	Equation
L1	129	162	195	228	261	294	327	L1=33 X n+63
L2	141	174	207	240	273	306	339	L2=33 X n+75

Manifold Non Plug-in

VV5FR3-10-Station 1-Port size □-Q



L \ n	2	3	4	5	6	7	8	9	10	Equation
L1	129	162	195	228	261	294	327	360	393	L1=33 X n+63
L2	141	174	207	240	273	306	339	372	405	L2=33 X n+75

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

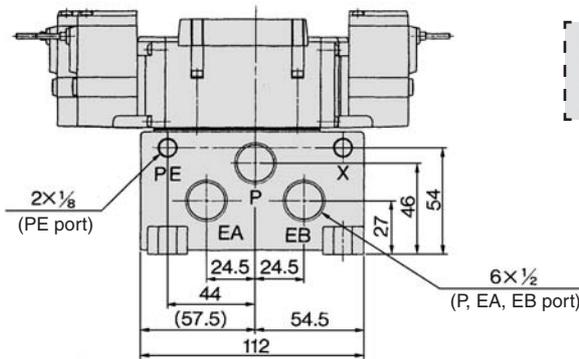
VQ7

VFR3000

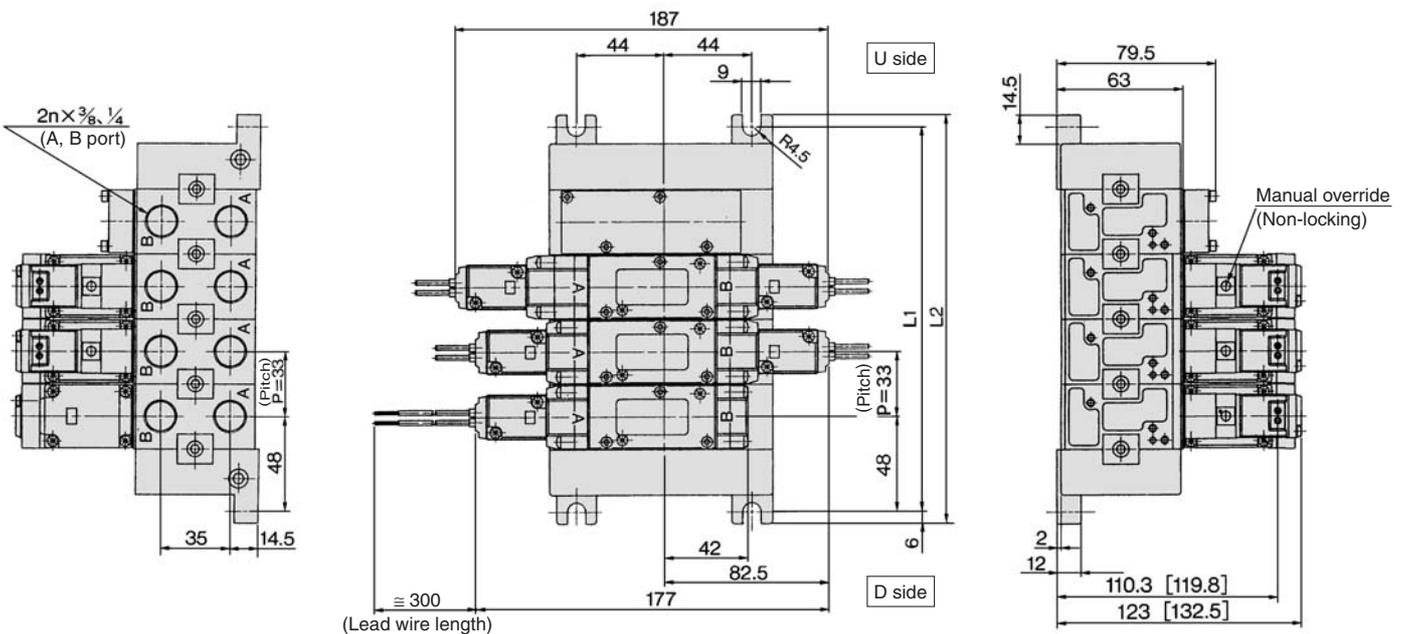
Manifold: Plug-in Type

VV5FR3-40-Station 1-Port size □-Q

G: Grommet



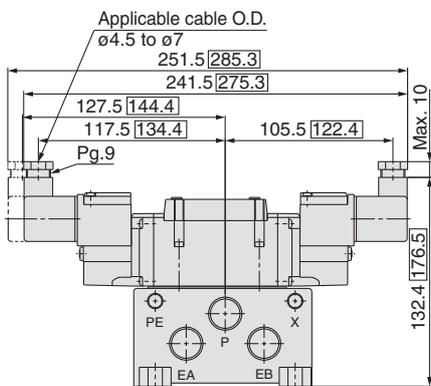
Note: Grommet electrical entry option does not comply the CE standard, just look at its drawing to deduce dimensions of DIN connector option.



[]: With direct manual override

n: Station										
Stations	2	3	4	5	6	7	8	9	10	Formula
L ₁	129	162	195	228	261	294	327	360	393	L ₁ = 33 x n + 63
L ₂	141	174	207	240	273	306	339	372	405	L ₂ = 33 x n + 75

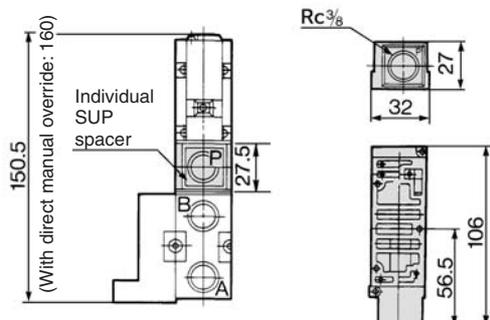
D, Y: DIN terminal



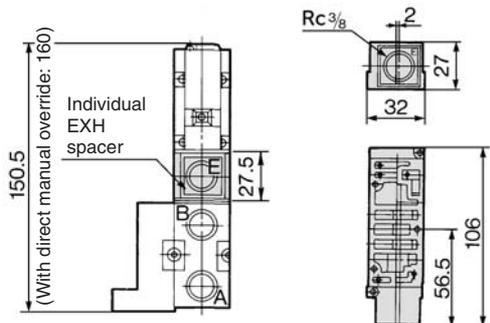
[]: With light/surge voltage suppressor

Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

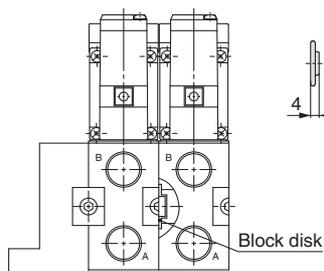
Individual SUP spacer:
VVFS3000-P-03-1 (Plug-in type)
VVFS3000-P-03-2 (Non plug-in type)



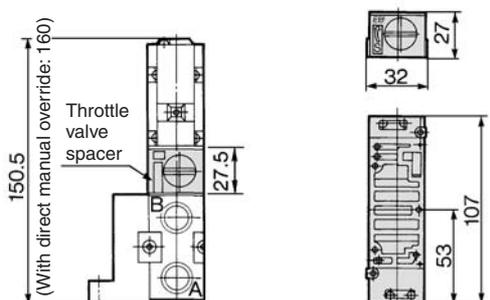
Individual EXH spacer:
VVFS3000-R-03-1 (Plug-in type)
VVFS3000-R-03-2 (Non plug-in type)



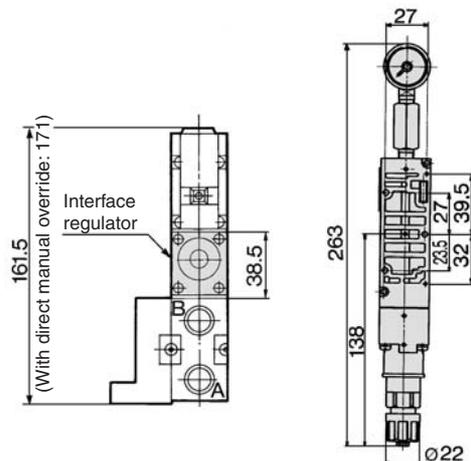
SUP/EXH block disk: AXT636-1A



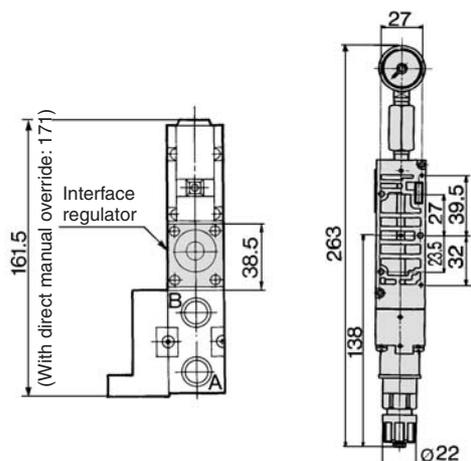
Throttle valve spacer:
VVFS3000-20A-1 (Plug-in type)
VVFS3000-20A-2 (Non plug-in type)



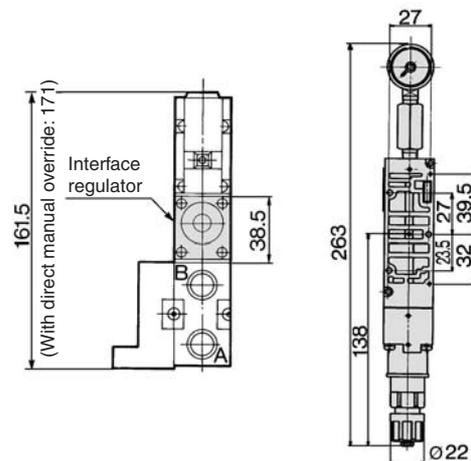
Interface regulator/P port regulation:
ARBF3050-00-P-1 (Plug-in type)
ARBF3050-00-P-2 (Non plug-in type)



Interface regulator/A port regulation:
ARBF3050-00-A-1 (Plug-in type)
ARBF3050-00-A-2 (Non plug-in type)



Interface regulator/B port regulation:
ARBF3050-00-B-1 (Plug-in type)
ARBF3050-00-B-2 (Non plug-in type)



- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VFR3000

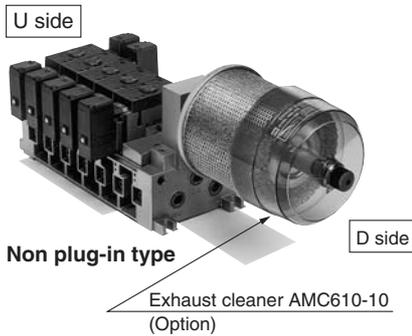
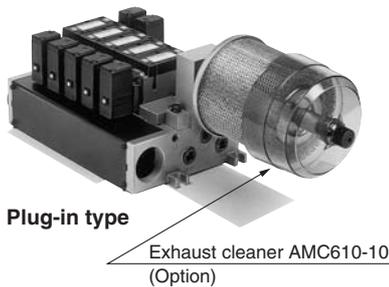
Manifold with Exhaust Cleaner

- Serves to protect working environment.
- Valve exhaust noise dampening: 35 dB or more.
- Collection rate of drainage and oil mist: 99.9% or more
- Piping work is reduced.

Manifold Specifications

Manifold	Plug-in type: VV5FR3-01□-Q	Non plug-in type: VV5FR3-10-Q	Non plug-in type: VV5FR3-40-Q
Wiring	With terminal block With multi-connector With D-sub connector	DIN terminal	DIN terminal
Applicable valve model	VFR3□0□-□F-Q	VFR3□1□-□D/Y-Q	VFR3□4□-□D/Y-Q
Porting specifications	Common SUP, Common EXH		
	A, B port	Side: Rc1/4, 3/8, C8, C10 Bottom: Rc1/4, 3/8 (Option)	
Rc	P port	Side: Rc1/2 EXH port: R1	
Stations	2 to 10 stations (With multi-connector/D-sub connector: 2 to 8 stations)		
Applicable exhaust cleaners	AMC610-10 (Port size: R1) ^{Note}		

Note) Exhaust cleaner "AMC610-10" is not included.



How to Order

VV5FR3 - 10 - 06 1 - 03 - CD - Q

Series VFR3000
Manifold

Base type/ Electrical entry

01T	Plug-in type with terminal block
01C	Plug-in type with multi-connector
01F	Plug-in type with D-sub connector
10	Non plug-in type Common electrical entry
40	Non plug-in type Individual electrical entry

Connector mounting direction

Symbol	With connector	Applicable base
—	None	01T, 10, 40
D	D side mounting	01C, 01F
U	U side mounting	

Stations

02	2 stations
⋮	⋮
10 ^{Note)}	10 stations

Note) • Base 01T/10/40: 2 to 10 stations
• Base 01C/01F: 2 to 8 stations

Thread type

—	Rc
F	G
T	NPTF

Exhaust cleaner mounting direction

Symbol	Exhaust cleaner mounting direction
CD	D side D side mounting
CU	U side U side mounting

Port size

Symbol	P, EA, EB	A, B *
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10	One-touch fitting for ø10	
M	Mixed	

* For bottom ported: Rc1/4, 3/8

* For C8 and C10, the thread type is only Rc.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

How to Order Manifold Assembly

<Example> Plug-in type with terminal block (6 stations)

VV5FR3-01T-061-03-CD-Q 1 set (Manifold base part no.)
 *VFR3100-5FZ-Q 3 sets (2 position single part no.)
 *VFR3200-5FZ-Q 2 sets (2 position double part no.)
 *VFVS3000-10A 1 set (Blanking plate assembly part no.)
 *AMC610-10 1 set (Exhaust cleaner part no.)

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

Valve arrangement is counted from the D side.

When ordering, specify the part nos. in order from the 1st. station in the D side.

When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

⚠ Caution

When using an exhaust cleaner, mount it downwards.

<Example> Non plug-in type: 6 stations

VV5FR3-10-061-03-CU-Q 1 set (Manifold base part no.)
 *VFR3110-5E-Q 3 sets (2 position single part no.)
 *VFR3210-5E-Q 2 sets (2 position double part no.)
 *VVFS3000-10A 1 set (Blanking plate assembly part no.)
 *AMC610-10 1 set (Exhaust cleaner part no.)

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

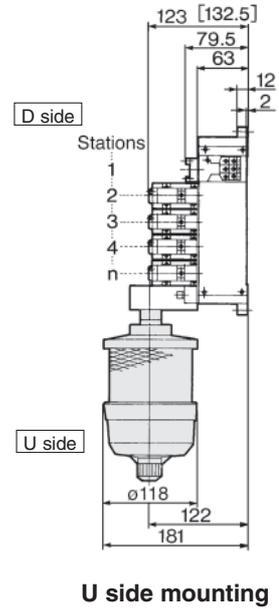
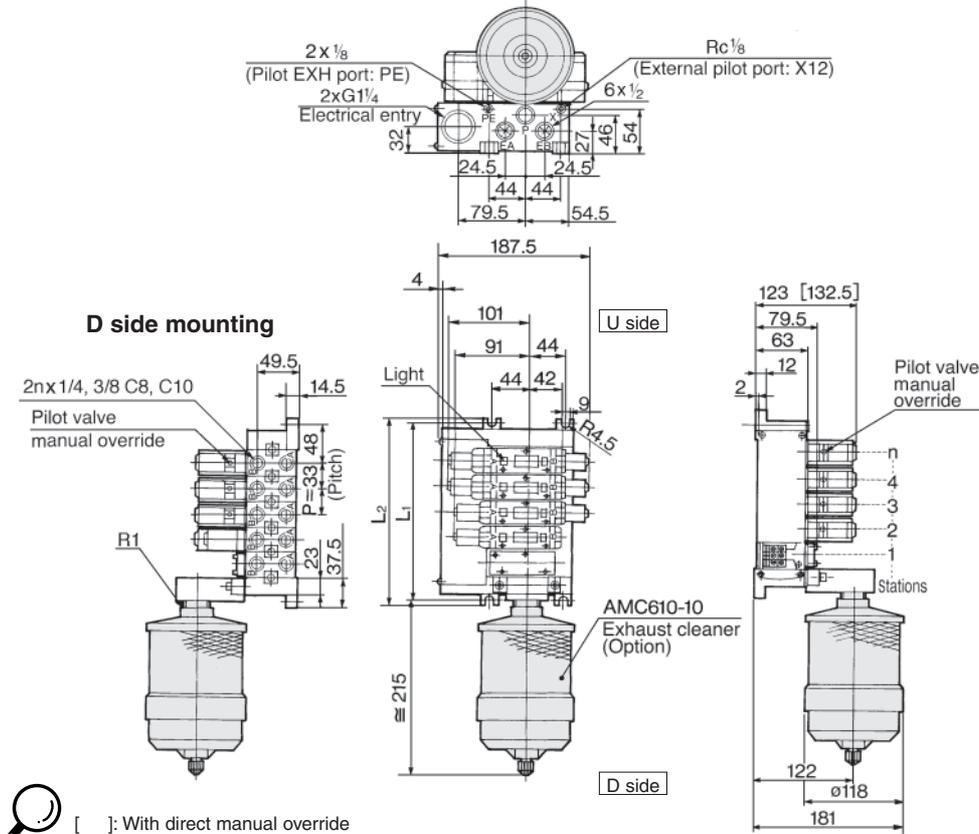
Valve arrangement is counted from the D side.

When ordering, specify the part nos. in order from the 1st. station in the D side.

When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

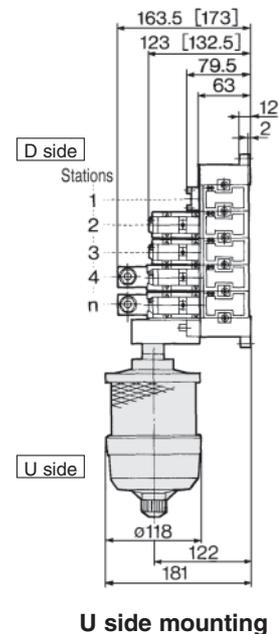
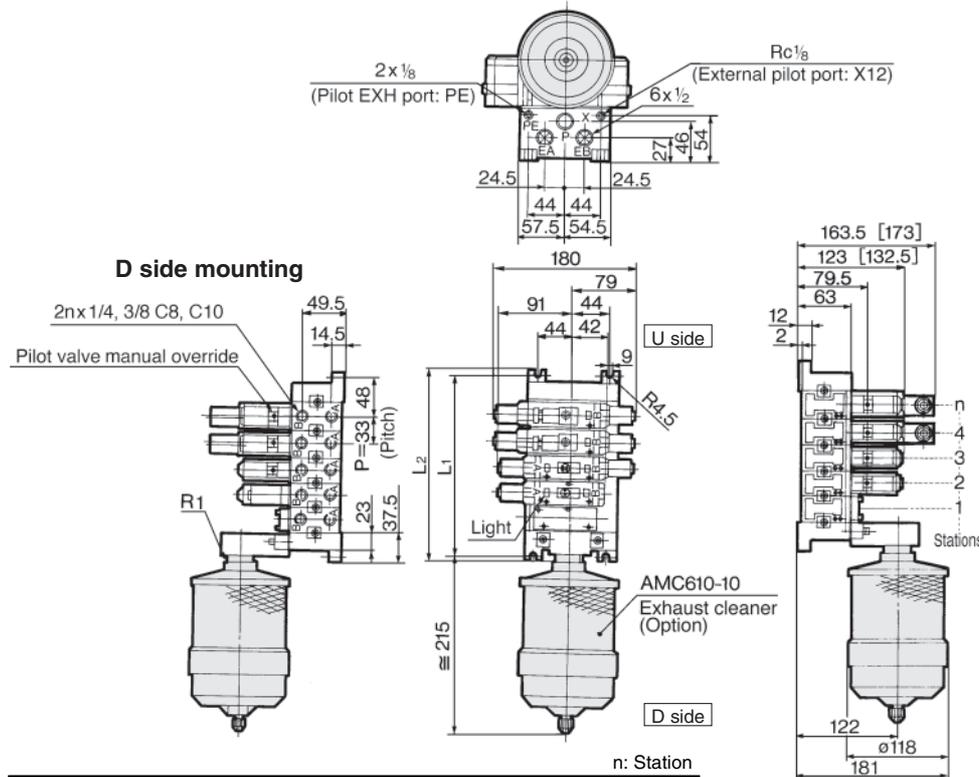
Manifold with Exhaust Cleaner Plug-in/Non Plug-in

Plug-in: VV5FR3-01T- [Station] 1- [Port size] - $\frac{CD}{CU}$ - Q



[]: With direct manual override

Non plug-in: VV5FR3-10- [Station] 1- [Port size] - $\frac{CD}{CU}$ - Q



		n: Station									
L	n	2	3	4	5	6	7	8	9	10	Equation
L1		129	162	195	228	261	294	327	360	393	L1=33 X n+63
L2		141	174	207	240	273	306	339	372	405	L2=33 X n+75

[]: With direct manual override

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

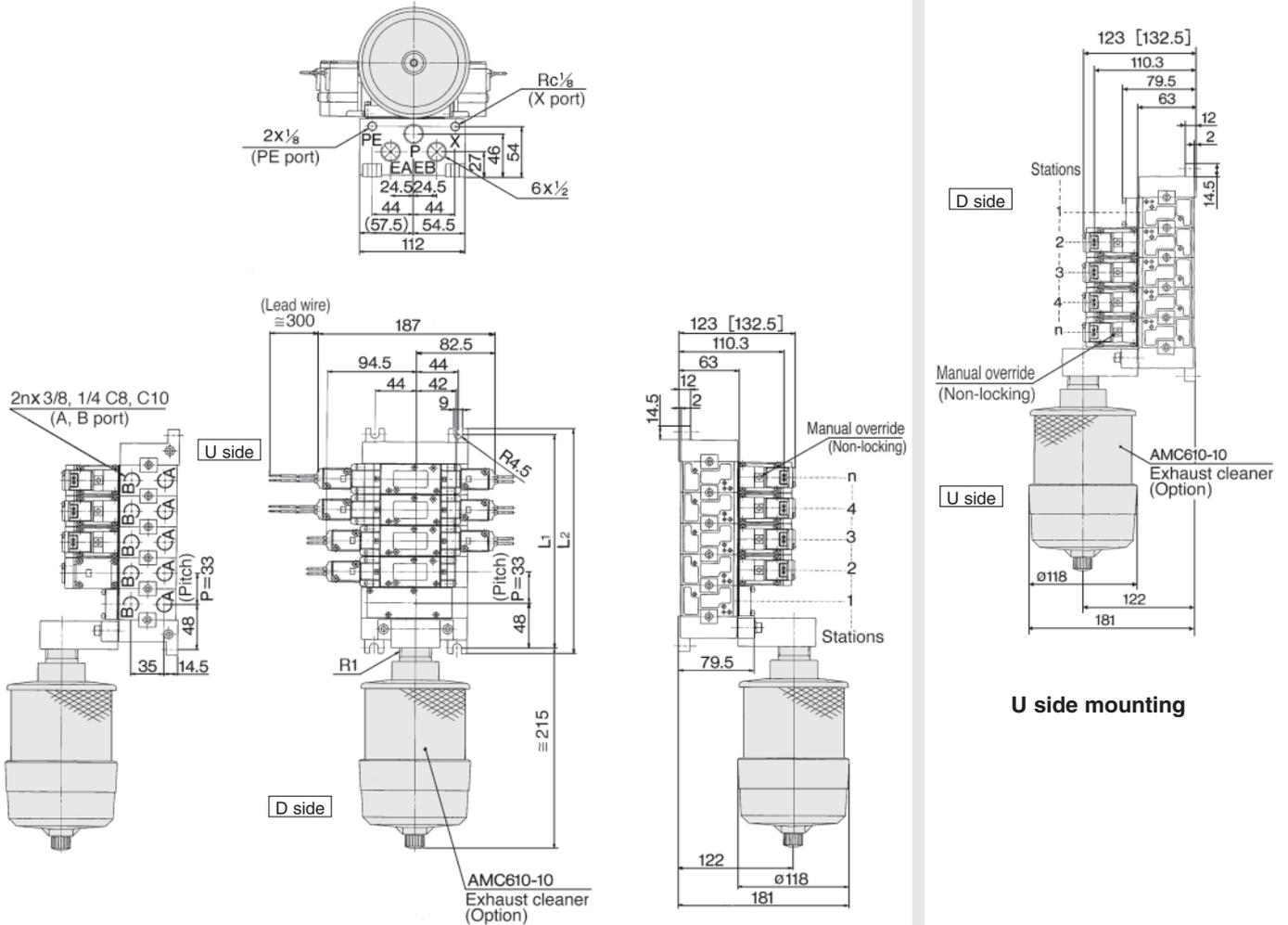
- VQC
- SQ

- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VFR3000

Manifold with Exhaust Cleaner Non plug-in

Non plug-in: VV5FR3-40-Station 1-Port size- $\frac{CD}{CU}$ -Q

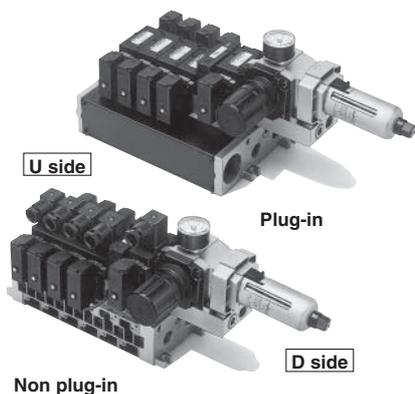


[]: With direct manual override

		n: Station									
L	n	2	3	4	5	6	7	8	9	10	Equation
L1		129	162	195	228	261	294	327	360	393	L1=33 X n+63
L2		141	174	207	240	273	306	339	372	405	L2=33 X n+75

Manifold with Control Unit

- Controlling equipment (filter, regulator, pressure switch and air release valve) is all in one standard unit, possible for direct mounting to manifold base.
- Piping work eliminated.



Caution

Air filter with auto drain or manual drain must be mounted with the air filter at the bottom.

Manifold Specifications

Manifold	Plug-in: VV5FR3-01□-Q	Non plug-in: VV5FR3-10-Q	Non plug-in: VV5FR3-40-Q
Connection	With terminal block With multi-connector With D-sub connector	DIN connector	DIN connector
Applicable solenoid valve	VFR3□0□-□F-Q	VFR3□1□-□D/Y-Q	VFR3□4□-□D/Y-Q
Piping	Common SUP, Common EXH		
	A, B port	Side: Rc1/4, 3/8, C8, C10 Bottom: Rc1/4, 3/8 (Option)	
	P, EA, EB port	Side: Rc1/2	
Stations	2 to 10* (With multi-connector/D-sub 3 connector: 2 to 8)		



* Including station of control unit

Control Unit Specifications

Air filter (With auto drain/manual drain)	
Filtration degree	5μm
Regulator	
Set pressure (Secondary pressure)	0.05 to 0.85MPa
Pressure switch	
Set pressure range (in de-energized state)	0.1 to 0.6MPa
Hysteresis	0.08MPa
Contact	1a
Light	LED light: Red
Max. contact capacity	2VAAC, 2WDC
Max. current	At 24V AC/DC or less: 50mA At 100V AC/DC: 20mA
Inside voltage drop	4V or less
Air release valve (single only)	
Operating pressure range	0.2 to 0.9MPa

Control Unit Option

Release valve spacer ⁽¹⁾	Plug-in	VVFS3000-24A-1R(D side mounting)
	Non plug-in	VVFS3000-24A-2R(D side mounting)
Pressure switch ⁽²⁾	IS1000P-2-1	
Blank plate	For filter regulator	MP2-3
	For pressure switch	MP3-2
	For air release valve	VVFS3000-24A-10
Filter element	INA-13-854-12-40B	



Note 1) Combining valve "VFR31□□" (single) and release valve spacer makes it possible to use this as a air release valve.

Note 2) Pressure switch cannot be mounted later in non plug-in.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

VFR3000

How to Order

VV5FR3 - 10 - 08 1 - 02 - AP - Q

Series VFR3000
Manifold

Base type/Electrical entry

01T	Plug-in with terminal block
01C	Plug-in with multi-connector
01F	Plug-in type with D-sub connector
10	Non plug-in type (Common entry)
40	Non plug-in type (Individual entry)

Connector mounting direction

Symbol	With connector	Applicable base
—	None	01T, 10, 40
D	D side mounting	01C, 01F
U	U side mounting	

Stations

02	2 stations
⋮	⋮
10 ^{Note)}	10 stations

- Note) • Base 01T/10/40: 2 to 10 stations
 • Base 01C/01F: 2 to 8 stations
 • Including stations of control unit.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Port size

Symbol	P, EA, EB	A, B
02	1/2	1/4
03		3/8
C8		One-touch fitting for ø8
C10		One-touch fitting for ø10
M		Mixed

* For bottom ported: only 1/4, 3/8

* For C8 and C10, the thread type is only Rc.

Control unit type

—	None
1	100 VAC, 50/60 Hz
5	24 VDC

For other rated voltages, please consult with SMC.

Control unit type

Control equipment	Symbol								
	—	MP	AP	M	A	G	F	C	E
Air release valve		●	●	●	●			●	●
Air filter regulator with manual drain		●		●		●			
Air filter regulator with auto-drain			●		●		●		
Pressure switch		●	●						
Blanking plate (Air release valve)						●	●		
Blanking plate (Filter regulator)								●	
Blanking plate (Pressure switch)				●	●	●	●	●	
Required stations		2 stations							1 station

Note) Control unit is D side mounting only.

Thread type

—	Rc
F	G
T	NPTF

How to Order Manifold Assembly

<Example> Plug-in type with terminal block

VV5FR3-01T-081-03-AP5-Q 1 set (Manifold base part no.)
 *VFR3100-5FZ-Q 4 sets (2 position single part no.)
 *VFR3200-5FZ-Q 2 sets (2 position double part no.)

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

The 1st and 2nd station are used for control unit mounting.

When ordering, specify the part nos. in order from the 3rd. station in the D side.

When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type

VV5FR3-10-061-03-A5-Q 1 set (Manifold base part no.)
 *VFR3110-5D-Q 4 sets (2 position single part no.)

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

The 1st and 2nd station are used for control unit mounting.

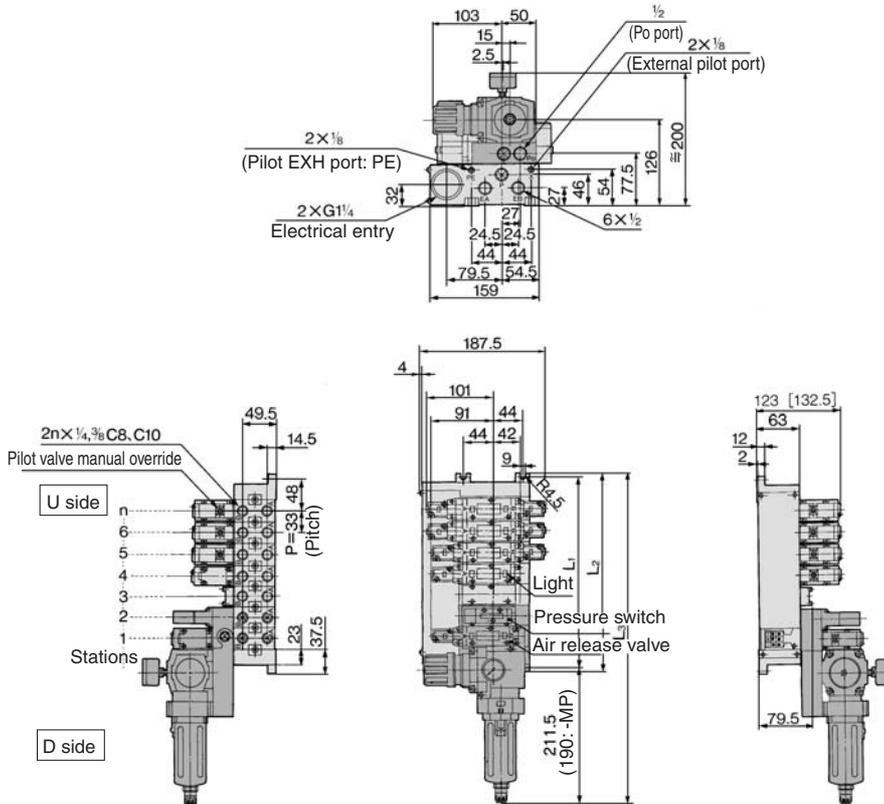
When ordering, specify the part nos. in order from the 3rd. station in the D side.

When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

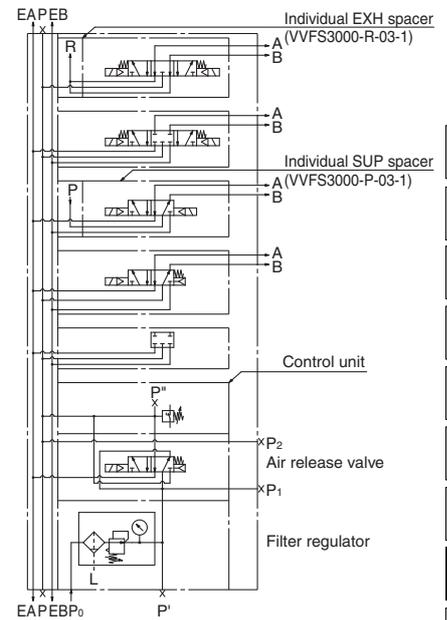
Manifold with Control Unit: Plug-in Type/Non Plug-in Type

Plug-in type:

VV5FR3-01T- Station 1- Port size -AP Voltage of air release valve -Q



Example for manifold

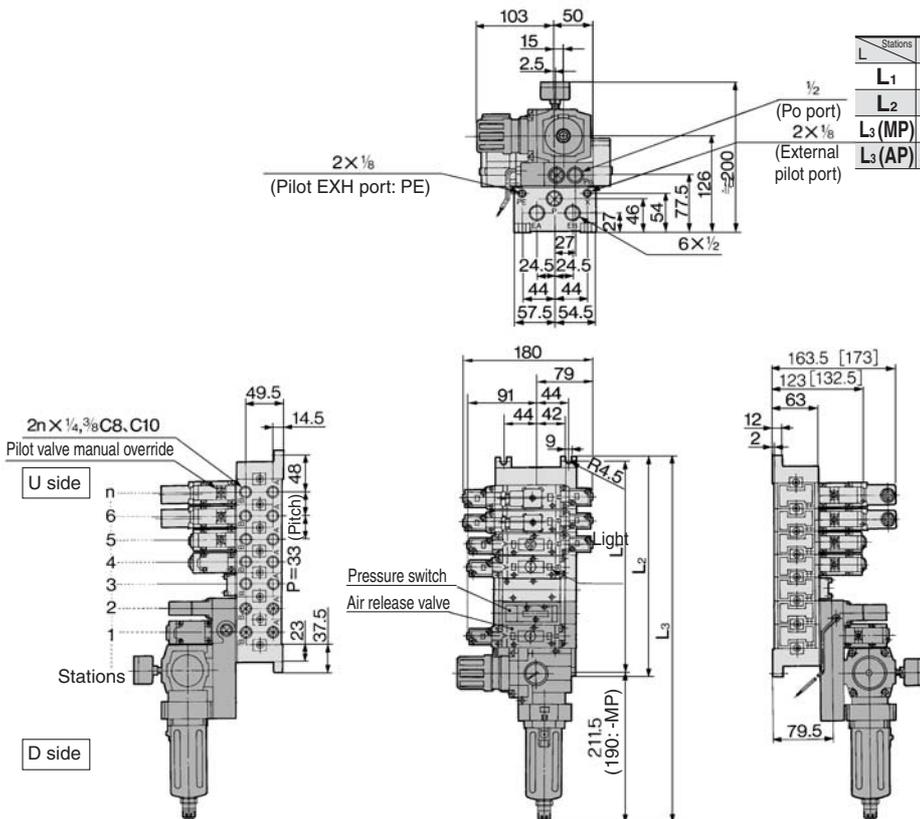


- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

[] : With direct manual override

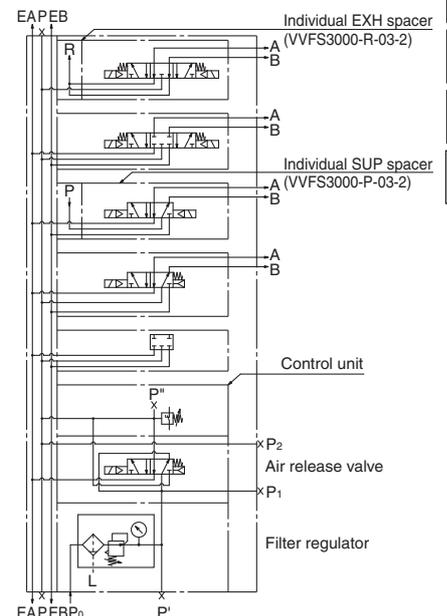
Non plug-in type:

VV5FR3-10- Station 1- Port size -AP Voltage of air release valve -Q



Stations	3	4	5	6	7	8	9	10	Formula
L ₁	162	195	228	261	294	327	360	393	L ₁ = 33 x n + 63
L ₂	174	207	240	273	306	339	372	405	L ₂ = 33 x n + 75
L ₃ (MP)	363	396	429	462	495	528	561	594	L ₃ = 33 x n + 264
L ₃ (AP)	384.5	417.5	450.5	483.5	516.5	549.5	582.5	615.5	L ₃ = 33 x n + 285.5

Example for manifold



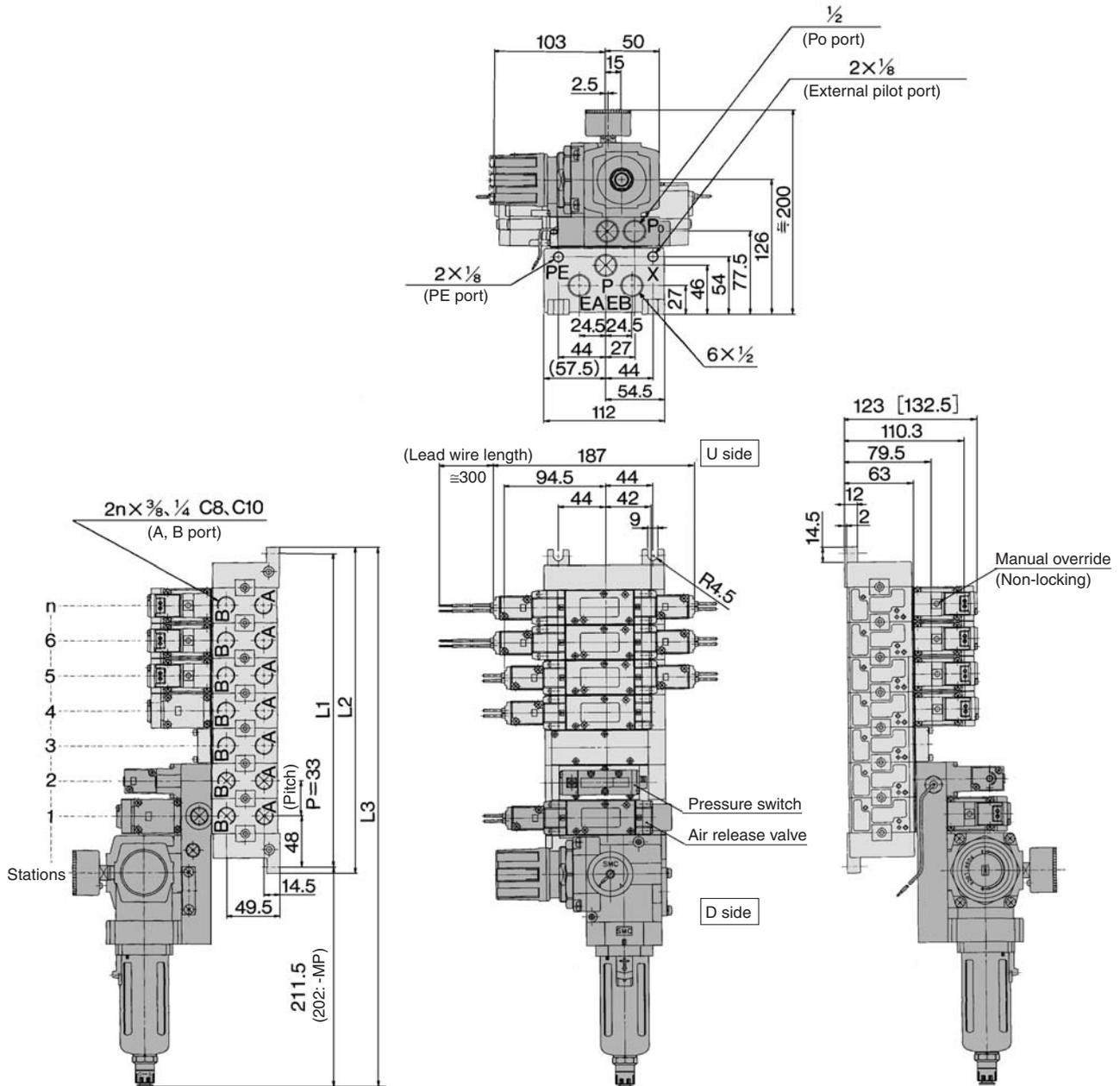
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

[] : With direct manual override

VFR3000

Manifold with Control Unit Non Plug-in

Non plug-in: VV5FR3-40- Station 1- Port size -AP Voltage of air release valve -Q

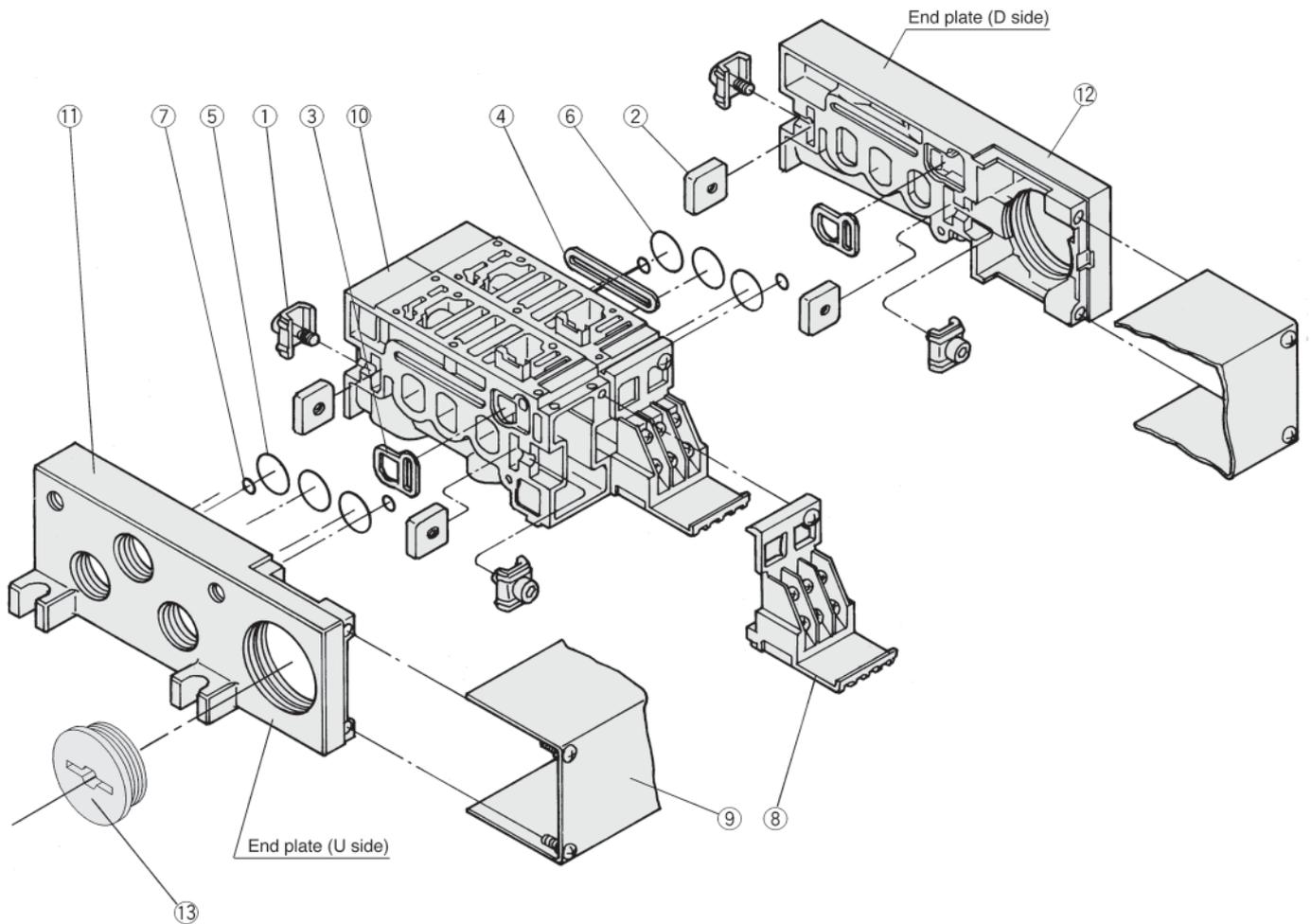


Stations	3	4	5	6	7	8	9	10	Formula
L ₁	162	195	228	261	294	327	360	393	L ₁ = 33 x n + 63
L ₂	174	207	240	273	306	339	372	405	L ₂ = 33 x n + 75
L ₃ (MP)	363	396	429	462	495	528	561	594	L ₃ = 33 x n + 264
L ₃ (AP)	384.5	417.5	450.5	483.5	516.5	549.5	582.5	615.5	L ₃ = 33 x n + 285.5

() : MP

[] : With direct manual override

Manifold Exploded View Plug-in/Non Plug-in



SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7

VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

Replacement Parts

No.	Description	Material	Part No.
①	Connection bracket A	Steel plate	VVFS3000-5-1A
②	Connection bracket B	Steel plate	VVFS3000-5-2
③	Gasket	NBR	VVFS3000-7
④	Gasket	NBR	VVFS3000-8
⑤	O ring	NBR	19.8 X 16.6 X 1.6(for end plate)
⑥	O ring	NBR	20 X 16 X 2(for manifold block)
⑦	O ring	NBR	6.2 X 3 X 1.6
⑧	Terminal assembly	-	VVFS3000-6A
⑨	Junction cover assembly	-	For 01T VVFS3000-4A-[Station] For 01SU AZ738-22A-[Station]
⑬	Rubber plug	NBR	AXT336-9



Note) Manifold base construction: plug-in with terminal block manifold

Replacement Parts: Sub Assembly

No.	Description	Part No.	Component parts	Applicable manifold base
⑩	Manifold block assembly ⁽¹⁾	VVFS3000-1A-1- ⁰² ₀₃ ⁰⁸ _{C10}	Manifold block ⑩, Terminal ⑧, Connection bracket ①②, Gasket ③④, O ring ⑥⑦, Receptacle assembly	Plug-in
		VVFS3000-1A-2- ⁰² ₀₃ ⁰⁸ _{C10}	Manifold block ⑨, Connection bracket ①②, Gasket ③④, O ring ⑥⑦	Non plug-in
⑪	End plate (U side) assembly	VVFS3000-2A-1	End plate(U) ⑪, Connection bracket ①②, Gasket ④, O ring ⑤⑦	Plug-in
		VVFS3000-2A-2	End plate(U) ⑪, Connection bracket ①②, Gasket ④, O ring ⑤⑦	Non plug-in
⑫	End plate (D side) assembly	VVFS3000-3A-1	End plate(D) ⑫, Connection bracket ①②, Gasket ③	Plug-in
		VVFS3000-3A-2	End plate(D) ⑫, Connection bracket ①②, Gasket ③	Non plug-in

Note 1) Side piping

5 Port Pilot/Rubber Seal Plug-in, Non Plug-in

Series VFR4000



Plug-in type



Non plug-in type

Symbol

2 position	3 position
Single (A)4 2(B) (EA)5 1 3(EB) (P)	Closed center (A)4 2(B) (EA)5 1 3(EB) (P)
Double (A)4 2(B) (EA)5 1 3(EB) (P)	Exhaust center (A)4 2(B) (EA)5 1 3(EB) (P)
	Pressure center (A)4 2(B) (EA)5 1 3(EB) (P)

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)
	Lubrication		Non-lube ⁽¹⁾
	Manual override		Non-locking push type
Mounting orientation		Unrestricted	
Impact/Vibration resistance		300/50 m/s ² ⁽²⁾	
Enclosure		Dustproof	
Electricity specifications	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 Hz
		Holding	3.4 VA (2.1 W)/50 Hz, 2.3 VA (1.5 W)/60 Hz
	Power consumption (DC) ⁽³⁾		1.8 W (2.04 W: With light/surge voltage suppressor)
	Electrical entry	Plug-in type	Conduit terminal
Non plug-in type		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

Pilot type	External pilot ^{Note)}	
Manual override	Main valve	Direct manual override
	Pilot valve	Non-locking push type A (Extended), Locking type B (Tool required), Locking type C (Lever)
Coil rated voltage	110 to 120, 220, 240 VAC 50/60 Hz	
	12 VDC	
Porting specifications	Bottom ported	
Option	With light/surge voltage suppressor	

Note) Operating pressure: 2 position 0 to 0.9 MPa
3 position 0.15 to 0.9 MPa

Pilot pressure: 2 position single 0.2 to 0.9 MPa
2 position double 0.1 to 0.9 MPa
3 position 0.5 x P + 0.1 to 0.9 MPa
(P: Operating pressure)

Model

Type of actuation	Plug-in	Non plug-in	Port size ⁽¹⁾	Flow characteristics ⁽²⁾								Max. ⁽³⁾ operating cycle (Hz)	Response time ⁽⁴⁾ (ms)	Weight ⁽⁵⁾ (kg)
				1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)						
				C [dm ³ /(s·bar)]	b	Cv	Q ⁽⁶⁾ [l/min(ANR)]	C [dm ³ /(s·bar)]	b	Cv	Q ⁽⁶⁾ [l/min(ANR)]			
2 position	Single	VFR410□	3/8	13	0.30	3.2	3306	14	0.28	3.4	3516	5	50 or less	1.10 (1.04) <1.04>
		VFR411□ VFR414□	1/2	15	0.30	3.8	3814	14	0.30	3.8	3560			
2 position	Double	VFR420□	3/8	14	0.31	3.4	3583	14	0.26	3.4	3473	5	50 or less	1.20 (1.16) <1.16>
		VFR421□ VFR424□	1/2	15	0.30	4.0	3814	14	0.30	3.7	3560			
3 position	Closed center	VFR430□	3/8	13	0.32	3.2	3348	13	0.25	3.0	3205	3	70 or less	1.20 (1.16) <1.16>
		VFR431□ VFR434□	1/2	14	0.28	3.5	3516	13	0.29	3.4	3285			
	Exhaust center	VFR440□	3/8	13	0.31	3.2	3327	14 [13]	0.32 [0.30]	3.6 [3.2]	3606 [3306]	3	70 or less	1.20 (1.16) <1.16>
		VFR441□ VFR444□	1/2	14	0.30	3.7	3560	14 [13]	0.32 [0.30]	3.6 [3.2]	3606 [3306]			
	Pressure center	VFR450□	3/8	13 [5.0]	0.27 [0.42]	3.2 [1.3]	3244 [1380]	13	0.28	3.1	3264	3	70 or less	1.20 (1.16) <1.16>
VFR451□ VFR454□	1/2	15 [5.3]	0.22 [0.42]	3.7 [1.5]	3634 [1463]	13	0.28	3.3	3264					

Note 1) EA, EB port: Rc 3/8

Note 2) []: Normal position

Note 3) Min. operating frequency is once in 30 days.

Note 4) Based on dynamic performance test, JIS B 8375-1981. (0.5 MPa, Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)

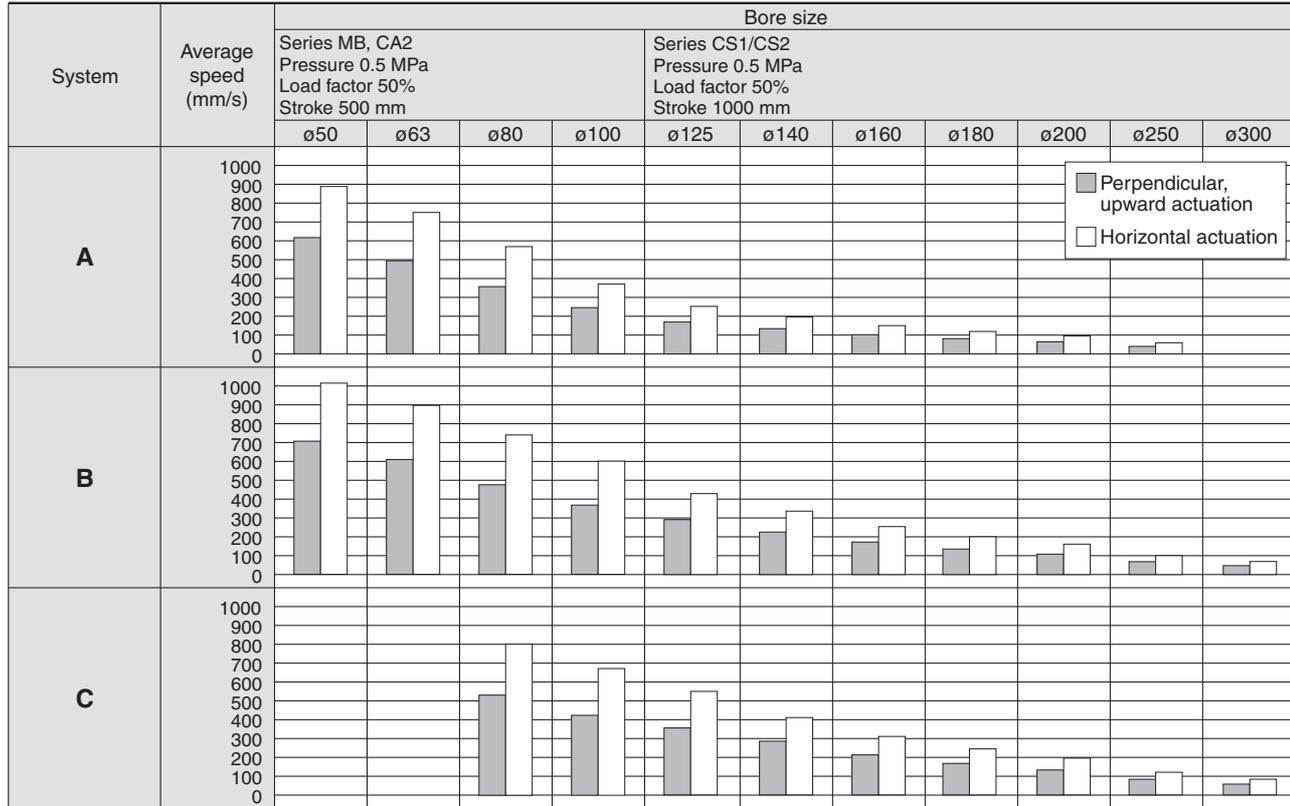
Note 5) For VFR4□00-□FZ-□□, (): VFR4□10- DZ□-□□, < >: VFR4□40-□G-□□

Note 6) These valves have been calculated according to the ISO6358 and indicate the follow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

VFR4000

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

Cylinder Speed Chart

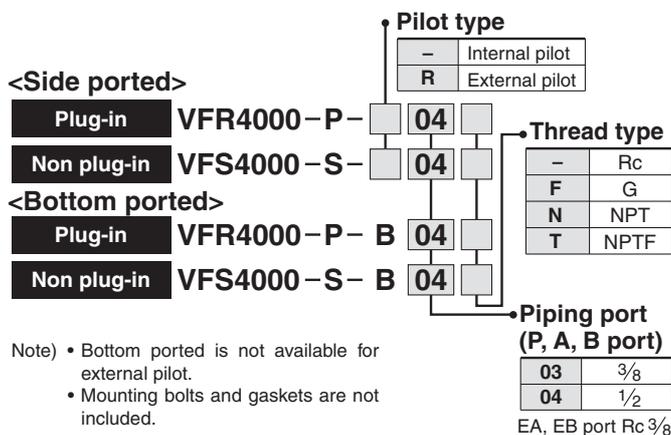


- * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- * The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- * Load factor: $((\text{Load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

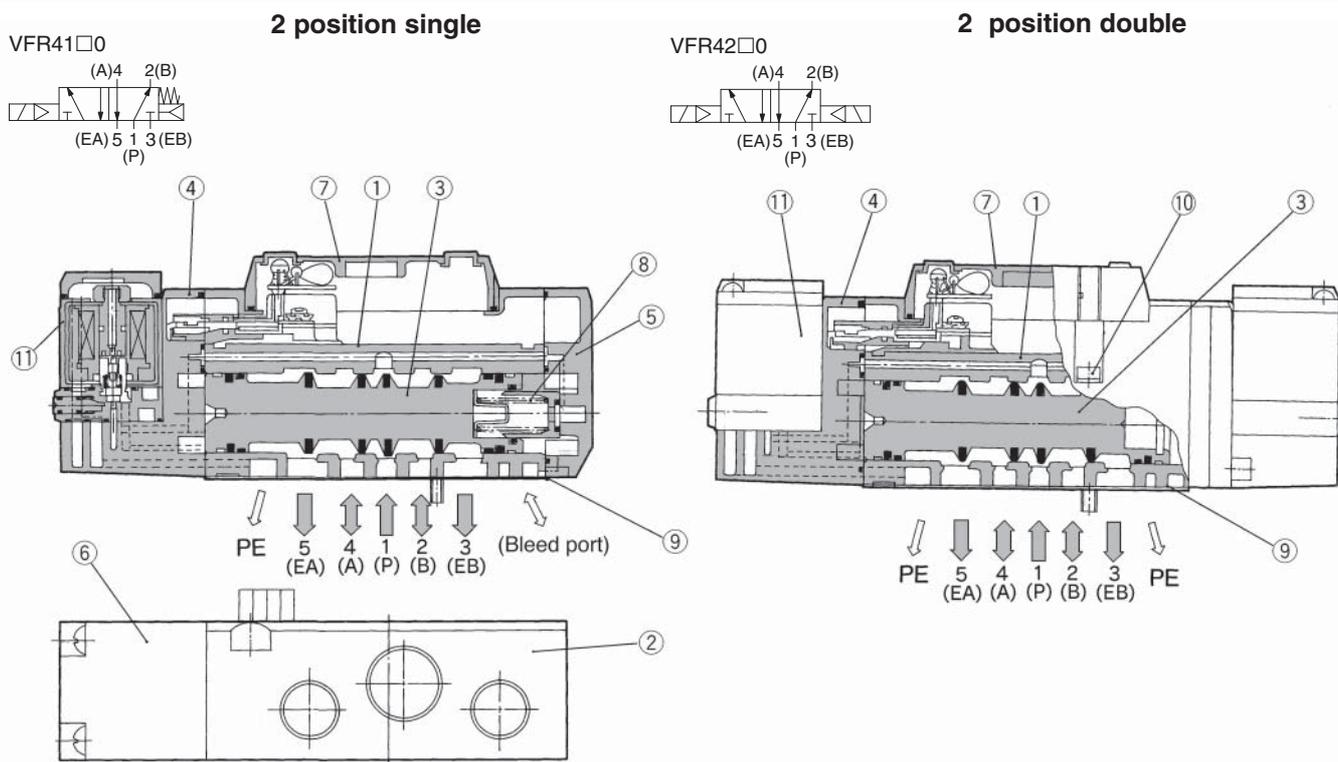
System Components

System	Solenoid valve	Speed controller	Silencer	SPG (Steel pipe) dia. x Length
A	Series VFR4000 Rc 3/8	AS4000-03	AN30-03	10A x 1 m
B	Series VFR4000 Rc 3/8	AS420-03	AN30-03	10A x 1 m
C	Series VFR4000 Rc 1/2	AS420-04	AN40-04	15A x 1 m

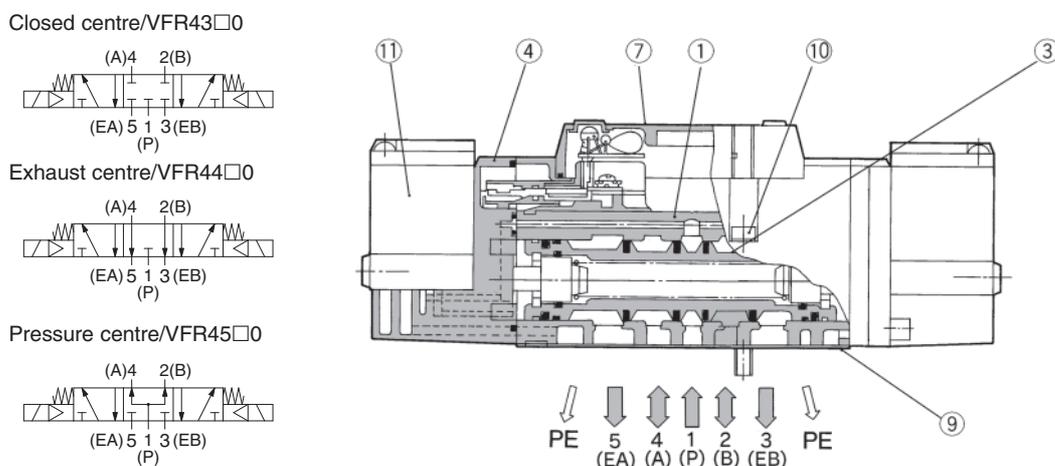
How to Order Sub-plate Assembly



Construction



3 position closed centre/exhaust centre/pressure centre



This figure shows closed centre.

Component Parts

No.	Description	Material	Note
①	Body	Aluminium die cast	Platinum silver
②	Subplate	Aluminium die cast	Platinum silver
③	Spool valve	Aluminium, NBR	
④	Adapter plate	Resin	Black

Component Parts

No.	Description	Material	Note
⑤	End plate	Resin	Black
⑥	Junction cover	Resin	
⑦	Light cover	Resin	
⑧	Spool spring	Stainless steel	

Replacement Parts

No.	Description	Material	Part No.		
			VFR41□□	VFR42□□	VFR43□□, 44□□, 45□□
⑨	Gasket	NBR	VF4000-20-1	VF4000-20-1	VF4000-20-1
⑩	Hex. socket head cap screw	Steel	AXT335-1-11(M4 X 40)	AXT335-1-11(M4 X 40)	AXT335-1-11(M4 X 40)
⑪	Pilot valve assembly	-	Refer to "How to Order Pilot Valve Assembly on p.1.8-47.		
-	Sub-plate assembly	-	Refer to "How to Order Sub-plate Assembly on p.1.8-48.		

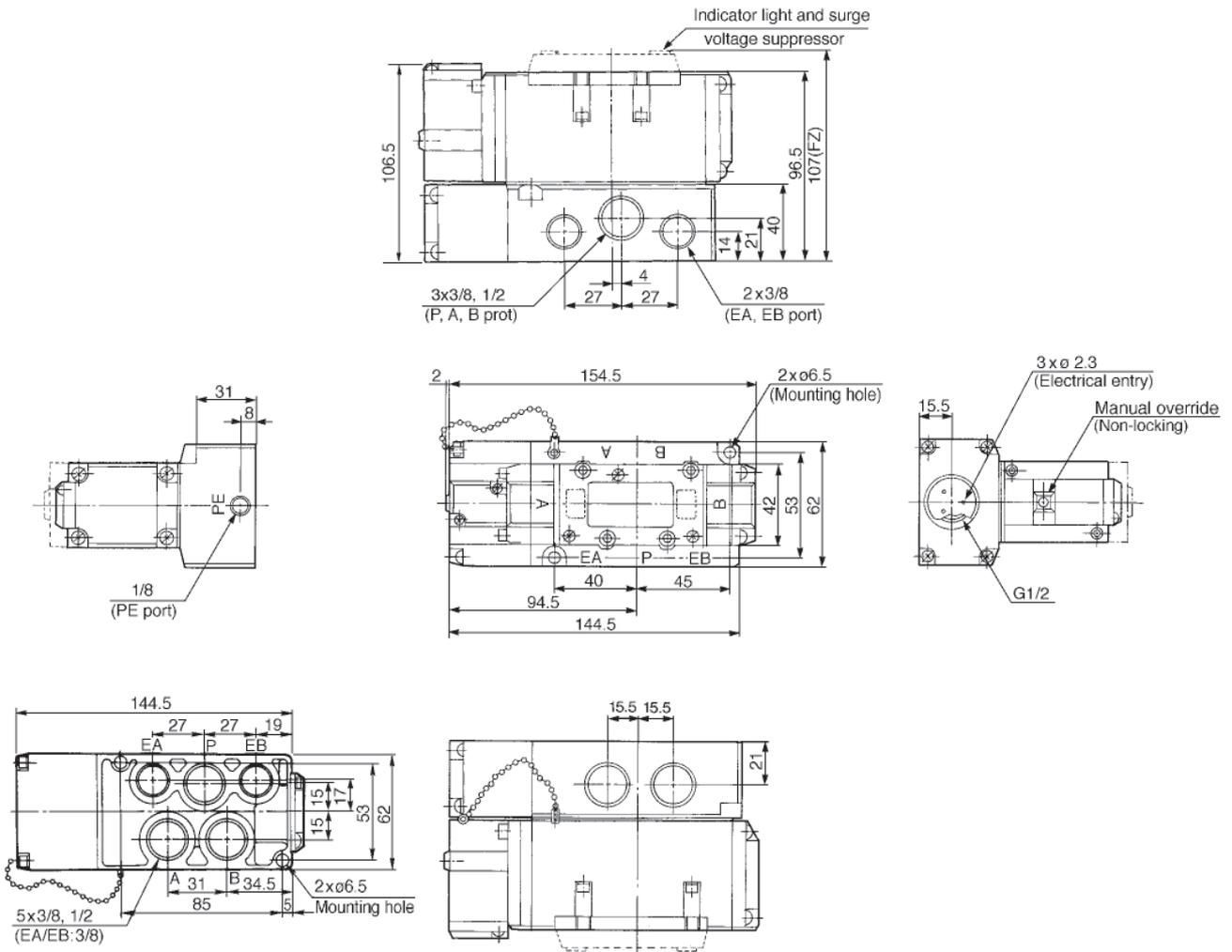
SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7

VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

VFR4000

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

2 position single: VFR410⁰₁-□F



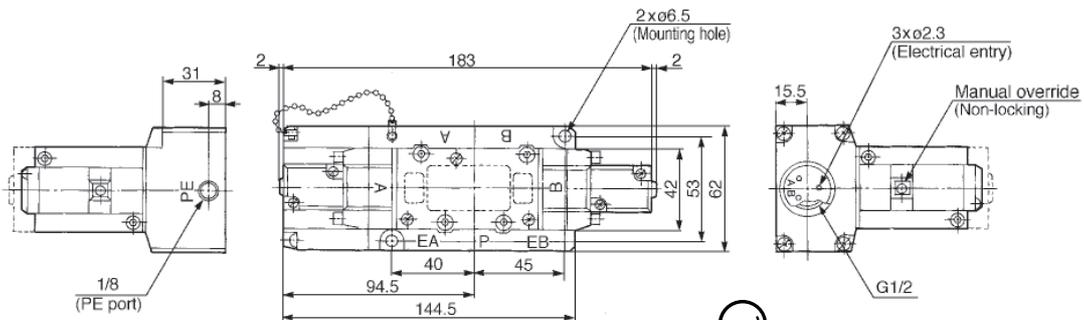
Bottom piping

2 position double: VFR420⁰₁-□F

3 position closed centre: VFR430⁰₁-□F

3 position exhaust centre: VFR440⁰₁-□F

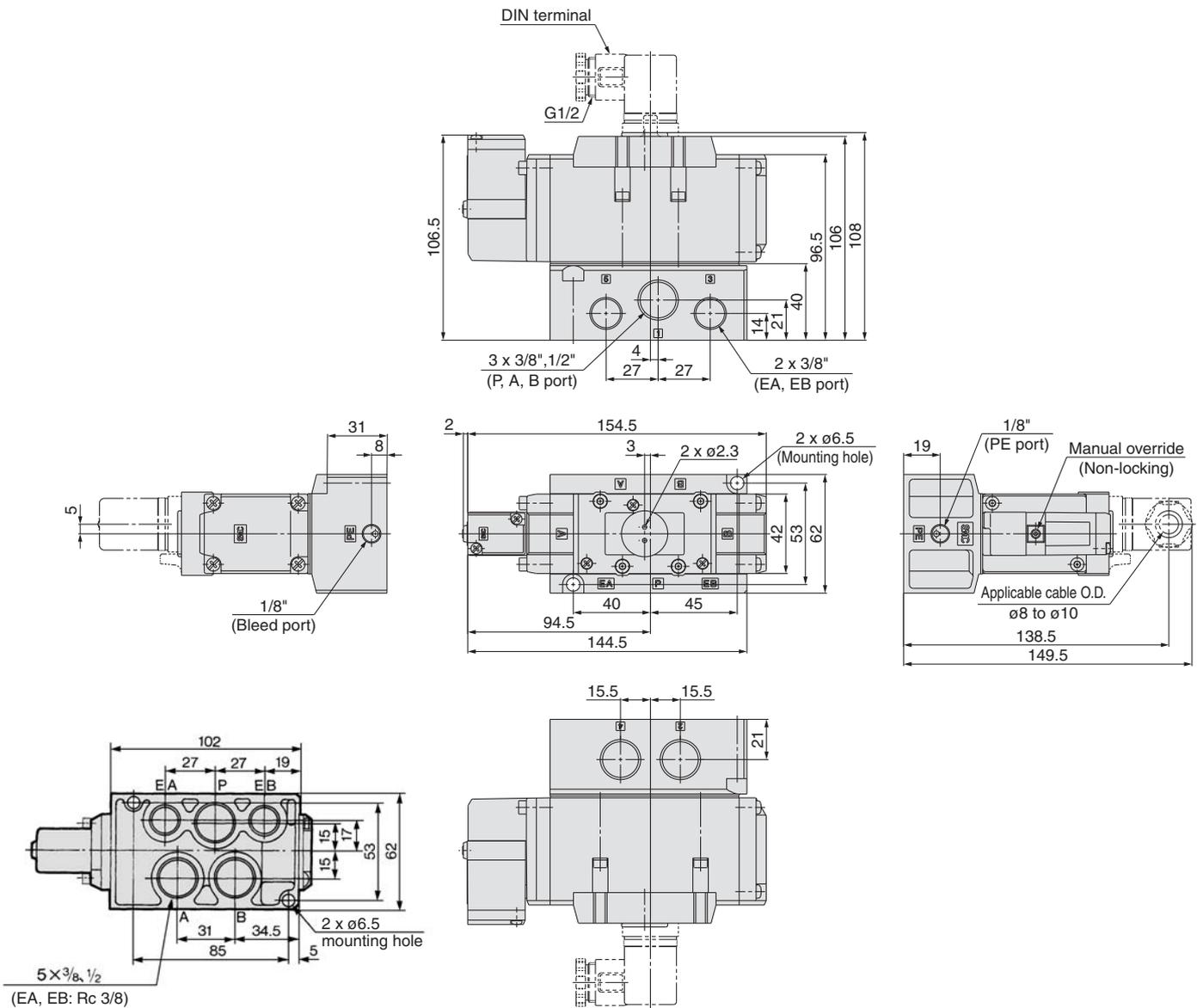
3 position pressure centre: VFR450⁰₁-□F



⦿ *Other dimensions are the same as single style.

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

2 position single: VFR411⁰-□E/VFR411⁰-□D



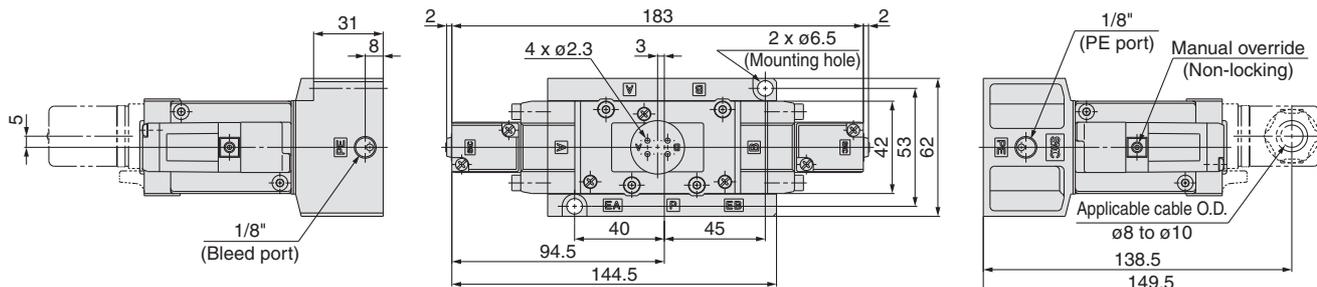
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VF
VFR
VP7
VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

2 position double: VFR421⁰-□E, VFR421⁰-□D

3 position closed center: VFR431⁰-□E, VFR431⁰-□D

3 position exhaust center: VFR441⁰-□E, VFR441⁰-□D

3 position pressure center: VFR451⁰-□E, VFR451⁰-□D

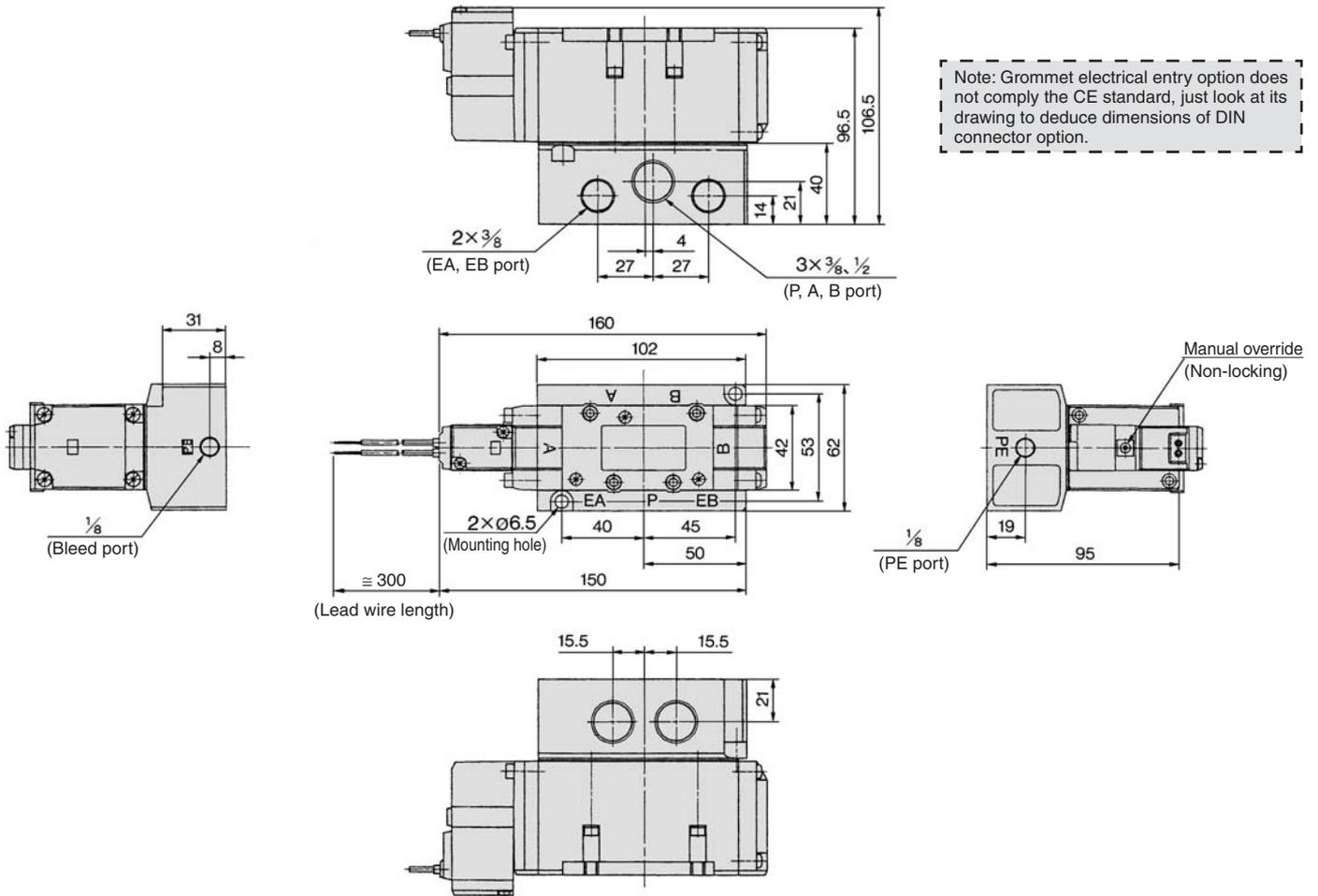


* Other dimensions are the same as the single type.

VFR4000

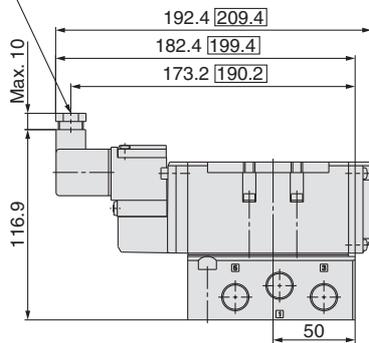
Non Plug-in 2 Position Single

2 position single: VFR414⁰₁-□G



D, Y: DIN terminal

Applicable cable O.D.: $\phi 4.5$ to $\phi 7$



□: With light/surge voltage suppressor

Series VFR4000 Manifold

Manifold Specifications

Base model	Wiring	Porting specifications		Port size		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B	A, B		
Plug-in type VV5FR4-01□-Q	<ul style="list-style-type: none"> • With terminal block • With multi-connector • With D-sub connector 	Side/Bottom	1/2	3/8, 1/2	2 to 10	2 to 10	VFR4□0□-□F-Q
						2 to 8	
Non plug-in type VV5FR4-10-Q	• DIN terminal					2 to 10	VFR4□1□-□D/Y-Q
Non plug-in type VV5FR4-40-Q	• DIN terminal							VFR4□4□-□D/Y-Q

How to Order Manifold Assembly

<Example> Plug-in type with terminal block: 6 stations

VV5FR4-01T-061-03-Q	.....	1 set (Manifold base part no.)
*VFR4100-5FZ-Q	.....	3 sets (2 position single part no.)
*VFR4200-5FZ-Q	.....	2 sets (2 position double part no.)
*VVFS4000-10A	.....	1 set (Blanking plate assembly part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type: 6 stations

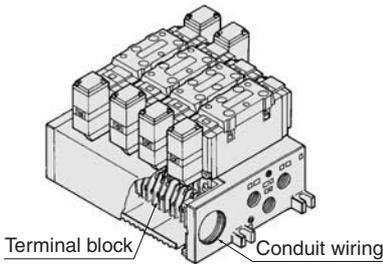
VV5FR4-10-061-03-Q	.....	1 set (Manifold base part no.)
*VFR4110-5D-Q	.....	5 sets (2 position single part no.)
*VFR4410-5D-Q	.....	1 set (3 position exhaust center part no.)
*VVFS4000-R-04-2	.....	1 set (Individual EXH spacer part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

Plug-in Type: With Terminal Block

- Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block corresponding lead wires from power source can be wired at the bottom of terminal block.



VV5FR4-01T-061-03□-Q

Series VFR4000
Manifold
Plug-in type with
terminal block

Stations

02	2 stations
⋮	⋮
10	10 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2	Common	Common	Bottom *

* Semi-standard

Thread type

—	Rc
F	G
N	NPT
T	NPTF

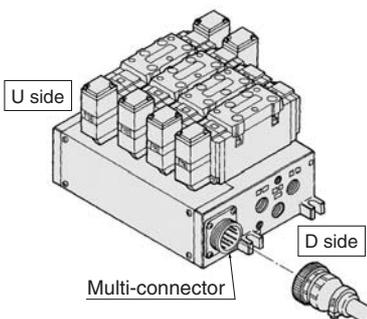
Port size

Symbol	P, EA, EB	A, B *
03	1/2	3/8
04		1/2
M		Mixed

* For bottom ported:
Rc 3/8 only.

Plug-in Type: With Multi-connector

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.



VV5FR4-01C D-051-03□-Q

Series VFR4000
Manifold
Plug-in type with
multi-connector

Connector mounting
direction

D	D side mounting
U	U side mounting

Stations

02	2 stations
⋮	⋮
08 *	8 stations

* Max: 8 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2	Common	Common	Bottom *

* Semi-standard

Thread type

—	Rc
F	G
N	NPT
T	NPTF

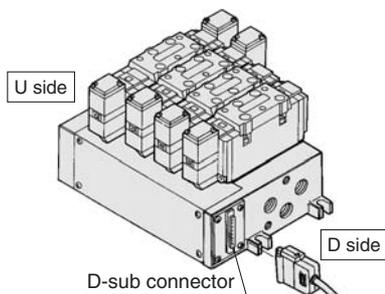
Port size

Symbol	P, EA, EB	A, B *
03	1/2	3/8
04		1/2
M		Mixed

* For bottom ported:
Rc 3/8 only.

Plug-in Type: With D-sub Connector

- Wide range of interchangeability (D-sub connector (25P) conforming to MIL standard)
- Quick wiring permits easier installation.



VV5FR4-01F D-06 1-03 -Q

Series VFR4000 Manifold

Plug-in type with D-sub connector

Connector mounting direction

D	D side mounting
U	U side mounting

Stations

02	2 stations
⋮	⋮
08*	8 stations

* Max: 8 stations

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size

Symbol	P, EA, EB	A, B *
03		3/8
04	1/2	1/2
M		Mixed

* For bottom ported: Rc 3/8 only.

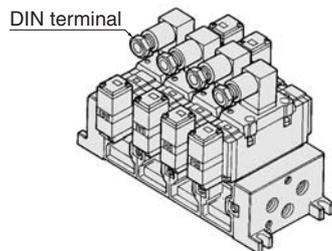
Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Non Plug-in Type: DIN Terminal (Common electrical entry)

- Individual wiring for every valve



VV5FR4-10-05 1-03 -Q

Series VFR4000 Manifold

Non plug-in type
Common electrical entry

Stations

02	2 stations
⋮	⋮
10	10 stations

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size

Symbol	P, EA, EB	A, B *
03		3/8
04	1/2	1/2
M		Mixed

* For bottom ported: Rc 3/8 only.

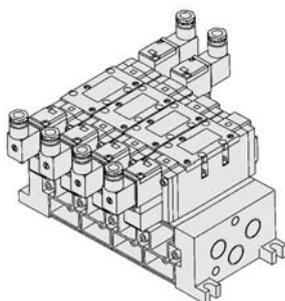
Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Non Plug-in Type: DIN Terminal (Individual electrical entry)

- Individual wiring for every valve



VV5FR4-40-05 1-03 -Q

Series VFR4000 Manifold

Non plug-in type
Individual electrical entry

Stations

02	2 stations
⋮	⋮
10	10 stations

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size

Symbol	P, EA, EB	A, B *
03		3/8
04	1/2	1/2
M		Mixed

* For bottom ported: Rc 3/8 only.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Note) Manifold base is in common with VV5FR4-10.

Note) Manifold base is in common with Series VFS4000 but the connection of terminal block for plug-in type is different.

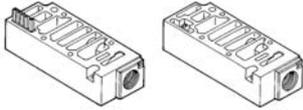
VFR4000

Manifold/Option Parts Assembly

Individual SUP spacer

Setting individual SUP spacer on the manifold block enables individual SUP port for each valve.

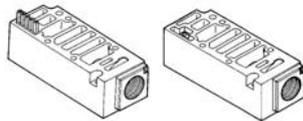
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-P-03-1	VVFS4000-P-03-2



Individual EXH spacer

Setting individual EXH spacer on the manifold block enables individual EXH port for each valve.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-R-04-1	VVFS4000-R-04-2



SUP block disk

When supplying manifold with more than two different pressures, high and low, insert a block disk in between stations subjected to plug-in different pressures.

Body type	Plug-in type	Non plug-in type
Part no.	AXT634-10A	

EXH block disk

When valve exhaust affects the other stations on the circuit, insert EXH block disk in between stations to separate valve exhaust.

Body type	Plug-in type	Non plug-in type
Part no.	AXT634-11A	



EXH block disk

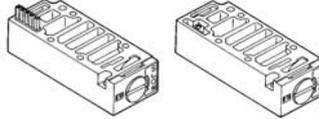


SUP block disk

Throttle valve spacer

Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

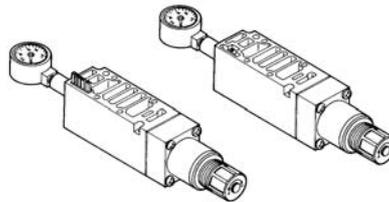
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-20A-1	VVFS4000-20A-2



Interface regulator

Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to "Flow Characteristics").

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF4050-00-P-1	ARBF4050-00-P-2
A port regulation	ARBF4050-00-A-1	ARBF4050-00-A-2
B port regulation	ARBF4050-00-B-1	ARBF4050-00-B-2



Blanking plate

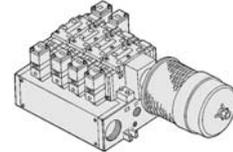
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-10A	

Manifold Option

With exhaust cleaner

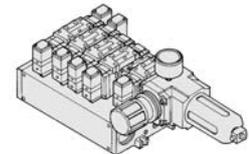
- Valve exhaust noise dampening: 35 dB or more.
- Collects oil mist: collecting rate 99.9% or more
- Piping process reduced.



For details, refer to page 1.8-38

With control unit

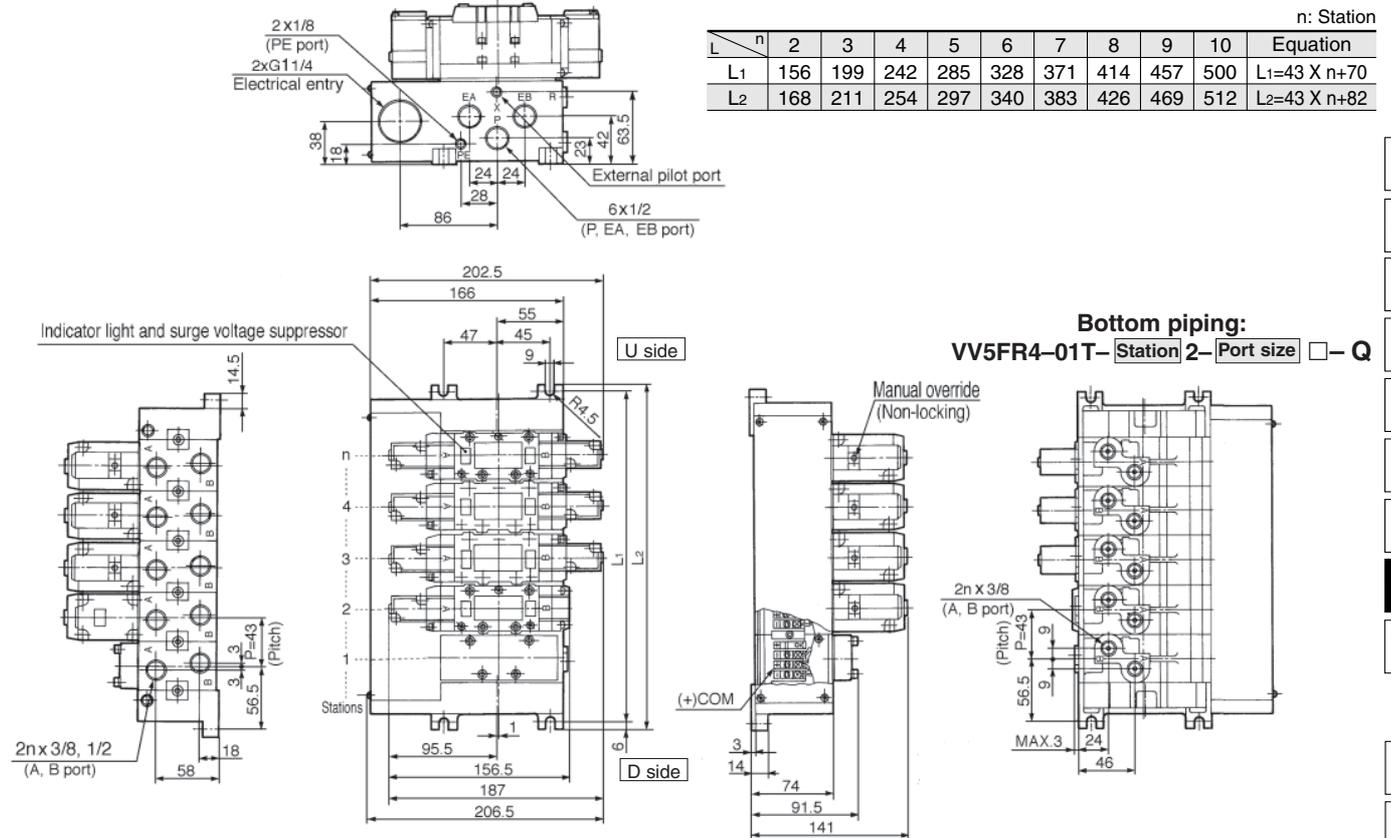
- Plug-in type/Non plug-in type
- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
 - Piping processes are eliminated.



For details, refer to page 1.8-41

Manifold Plug-in

With terminal block: VV5FR4-01T-Station 1-Port size □-Q



SV

SY

SYJ

SX

VK

VZ

VF

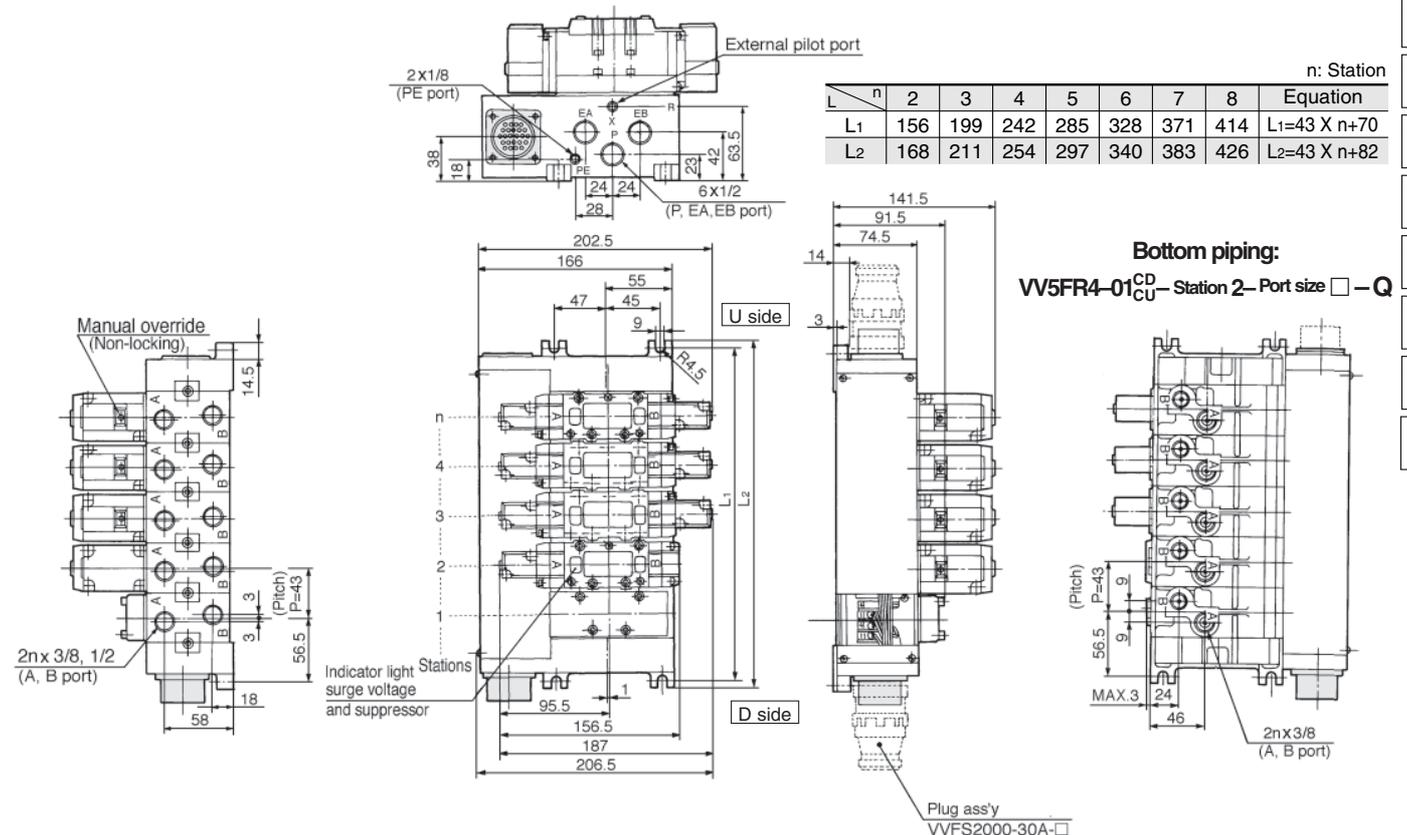
VFR

VP7

VQC

SQ

With multi-connector: VV5FR4-01CD-Station 1-Port size □-Q, VV5FR4-01CU-Station 1-Port size □-Q



VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

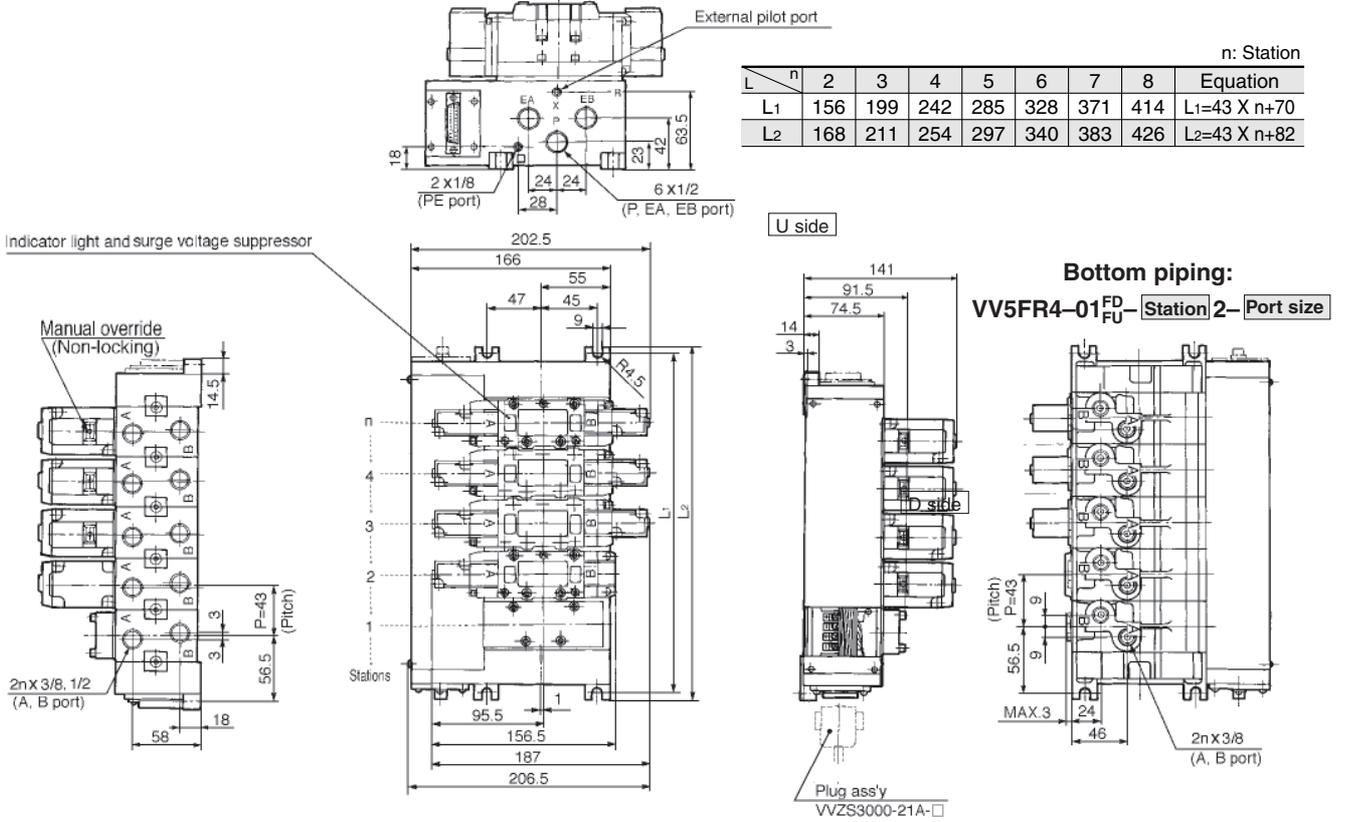
VS7

VQ7

VFR4000

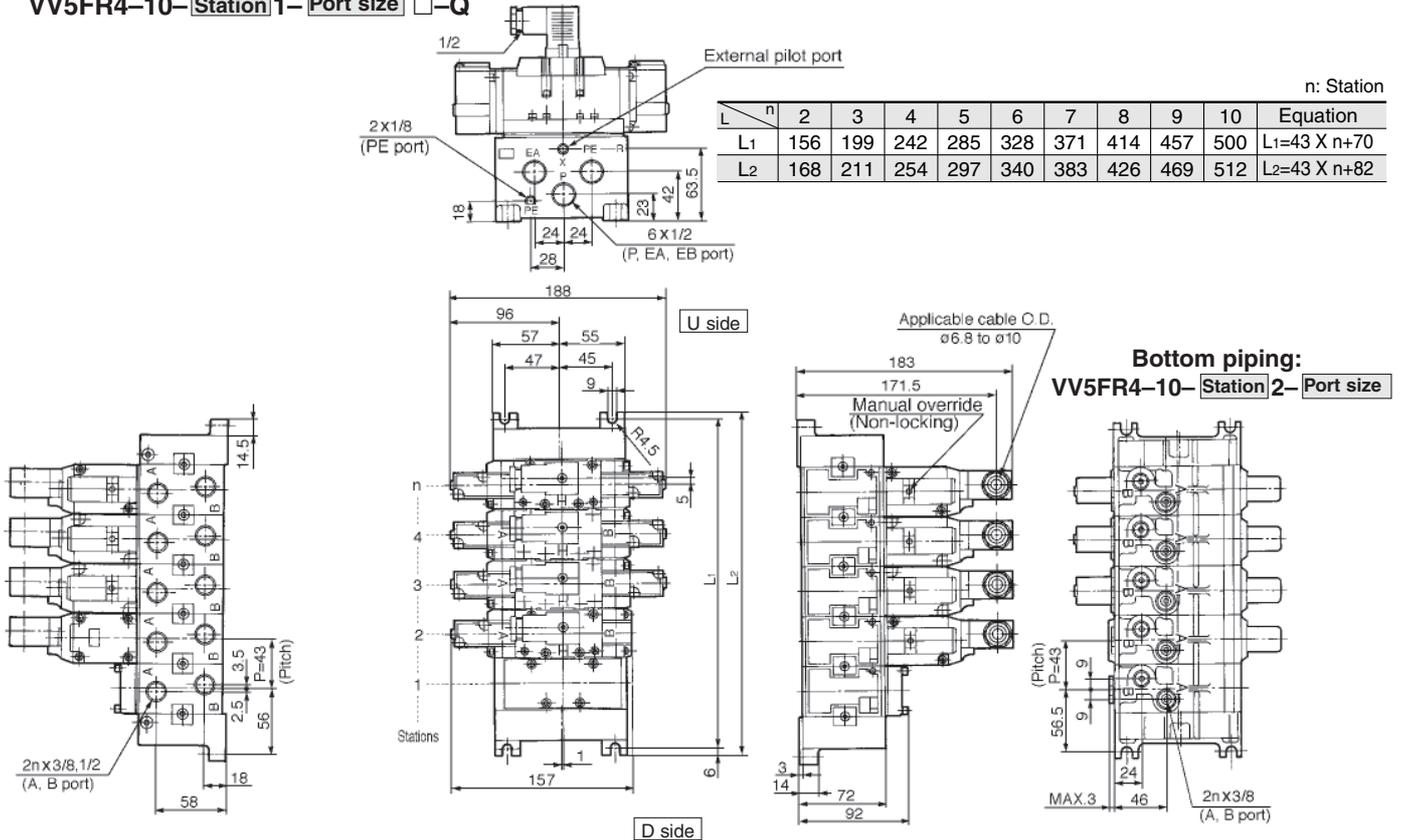
Manifold Plug-in

With D-sub connector: VV5FR4-01FD-Station 1-Port size □-Q, VV5FR4-01FU-Station 1-Port size □-Q



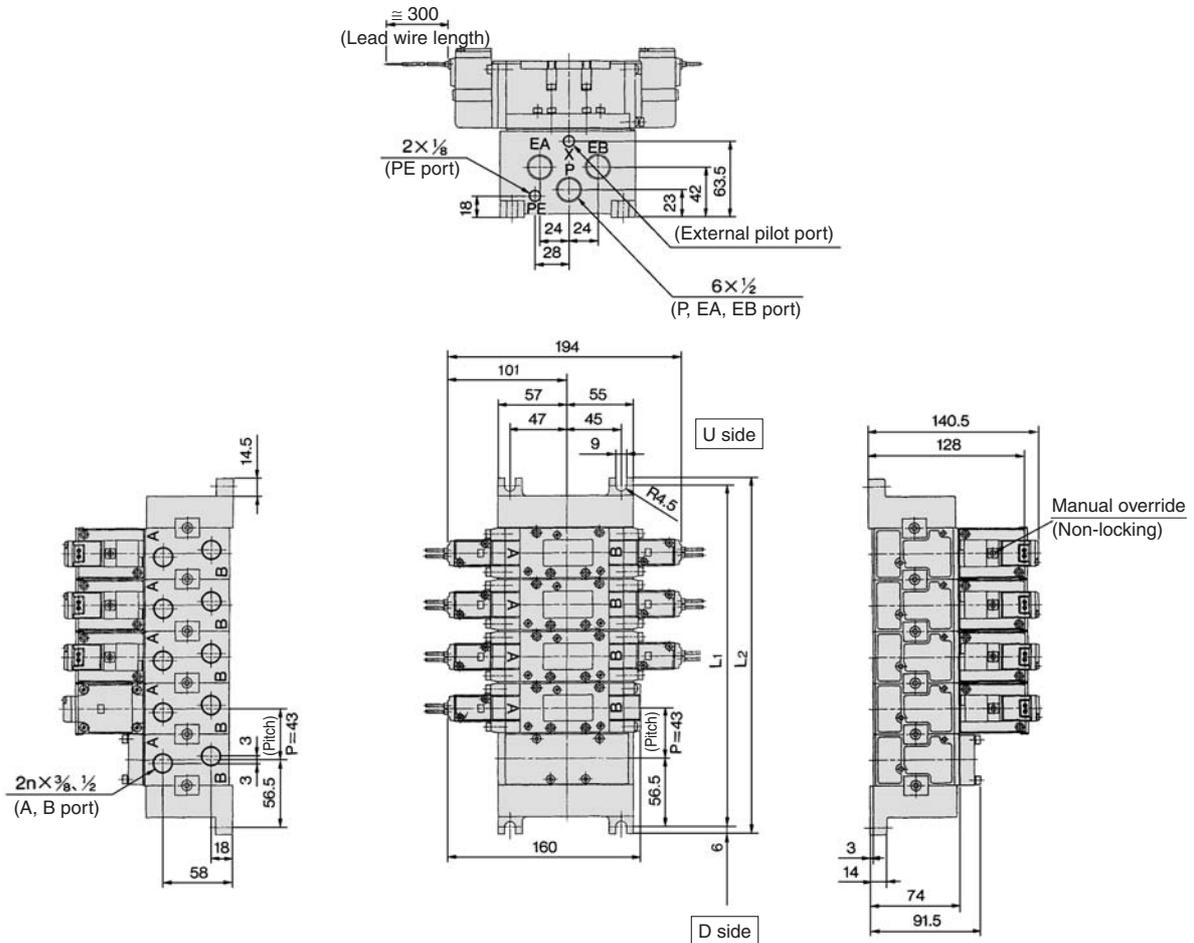
Manifold Non Plug-in

VV5FR4-10-Station 1-Port size □-Q



Manifold Non Plug-in

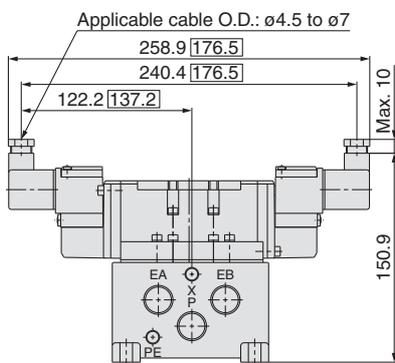
VV5FR4-40- Station 1- Port size -Q



n: Stations

Stations	2	3	4	5	6	7	8	9	10	Formula
L ₁	156	199	242	285	328	371	414	457	500	L ₁ = 43 x n + 70
L ₂	168	211	254	297	340	383	426	469	512	L ₂ = 43 x n + 82

D, Y: DIN terminal



: With light/surge voltage suppressor

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

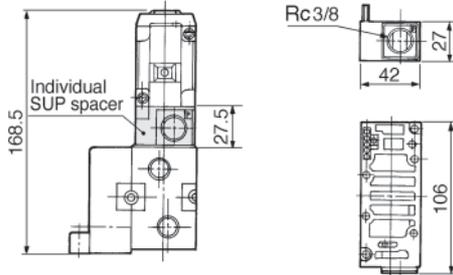
VS7

VQ7

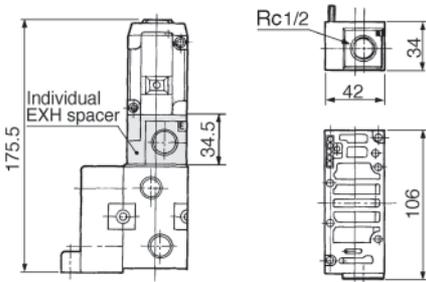
VFR4000

Manifold Option Parts Assembly Plug-in/Non Plug-in

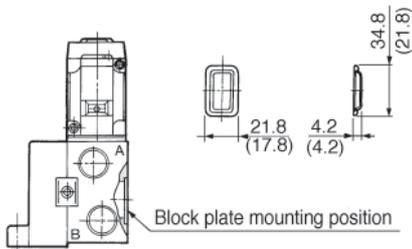
Individual SUP spacer:
VVFS4000-P-03-1(Plug-in)
VVFS4000-P-03-2(Non plug-in)



Individual EXH spacer:
VVFS4000-R-04-1(Plug-in)
VVFS4000-R-04-2(Non plug-in)



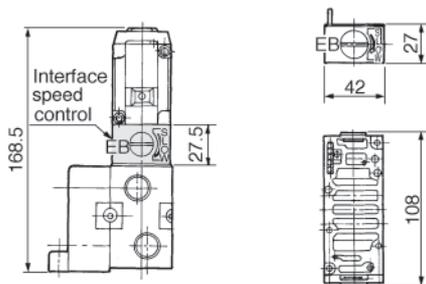
SUP block disc: AXT634-10A
EXH block disc: AXT634-11A



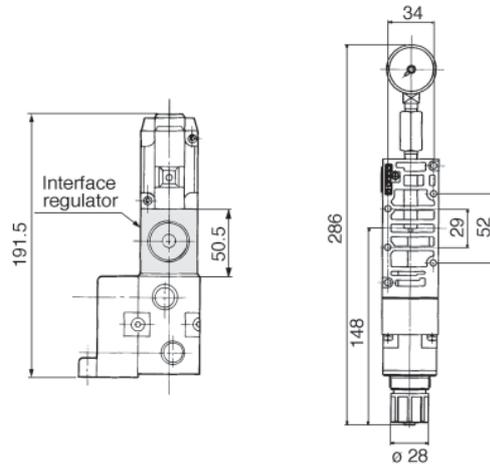
Note) Used with exclusive manifold block

() : EXH block disk

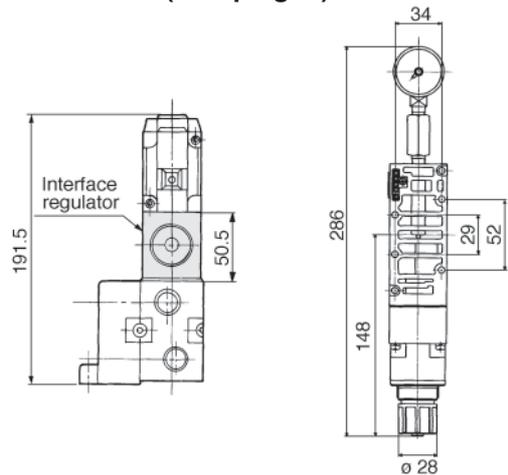
Interface speed control:
VVFS4000-20A-1(Plug-in)
VVFS4000-20A-2(Non plug-in)



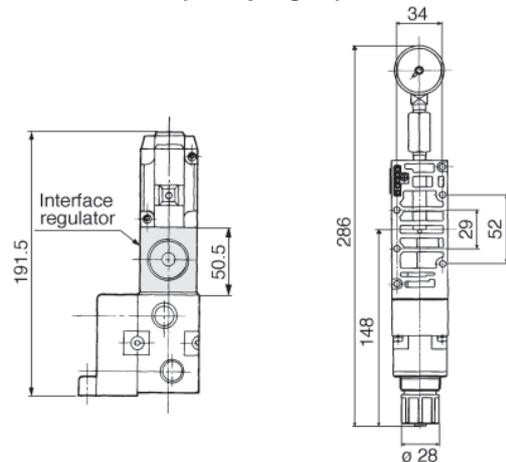
Interface regulator/P port regulation:
ARBF4050-00-P-1(Plug-in)
ARBF4050-00-P-2(Non plug-in)



Interface regulator/A port regulation:
ARBF4050-00-A-1(Plug-in)
ARBF4050-00-A-2(Non plug-in)



Interface regulator/B port regulation:
ARBF4050-00-B-1(Plug-in)
ARBF4050-00-B-2(Non plug-in)



*Dimensions: FZ type Dimensions of direct manual style are also the same.

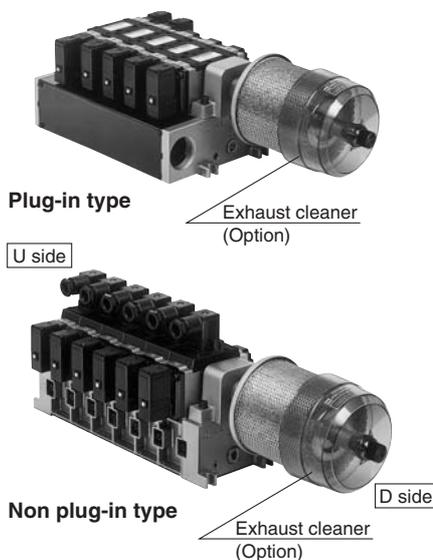
Manifold with Exhaust Cleaner

- Serves to protect working environment.
- Valve exhaust noise dampening: 35 dB or more.
- Collection rate of drainage and oil mist: 99.9% or more.
- Piping work is reduced.

Manifold Specifications

Manifold	Plug-in type: VV5FR4-01□-Q	Non plug-in type: VV5FR4-10-Q	Non plug-in type: VV5FR4-40-Q
Wiring	With terminal block With multi-connector With D-sub connector	DIN terminal	DIN terminal
Applicable valve model	VFR4□0□-□F-Q	VFR4□1□-□D/Y-Q	VFR4□4□-□D/Y-Q
Porting specifications	Common SUP, Common EXH		
	A, B port	Side: 3/8, 1/2 Bottom: 3/8 (Option)	
	P port	Side: 1/2 EXH 1 1/2	
Stations	2 to 10 stations (With multi-connector/D-sub connector: 2 to 8 stations)		
Applicable exhaust cleaners	AMC610-10 (Port size: R1), AMC810-14 (Port size: R1 1/2) ⁽¹⁾		

Note 1) Use "AMC810-14" when used with 5 or more stations or in high frequency.
Exhaust cleaner "AMC610-10" and "AMC810-14" are not attached.



How to Order

VV5FR4 - 10 - 06 1 - 03 - CD - Q

Series VFR4000 Manifold

Base type/Electrical entry

01T	Plug-in type with terminal block
01C	Plug-in type with multi-connector
01F	Plug-in type with D-sub connector
10	Non plug-in type Common electrical entry
40	Non plug-in type Individual electrical entry

Connector mounting direction

Symbol	With connector	Applicable base
—	None	01T, 10, 40
D	D side mounting	01C, 01F
U	U side mounting	01C, 01F

Stations

02	2 stations
⋮	⋮
10 ^(Note)	10 stations

Note) • Base 01T/10/40: 2 to 10 stations
• Base 01C/01F: 2 to 8 stations

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Exhaust cleaner mounting direction

Symbol	Exhaust cleaner mounting direction
CD	D side D side mounting
CU	U side U side mounting

* Please indicate size or port size of exhaust cleaner.

Port size

Symbol	P, EA, EB	A, B *
03		3/8
04	1/2	1/2
M		Mixed

* For bottom ported:
Rc 3/8 only.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

How to Order Manifold Assembly

<Example> Plug-in type with terminal block (6 stations)

VV5FR4-01T-061-03-CD-Q	1 set (Manifold base part no.)
*VFR4100-5FZ-Q	3 sets (2 position single part no.)
*VFR4200-5FZ-Q	2 sets (2 position double part no.)
*VVFS4000-10A	1 set (Blanking plate assembly part no.)
*AMC610-10	1 set (Exhaust cleaner part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type: 6 stations

VV5FR4-10-061-03-CU-Q	1 set (Manifold base part no.)
*VFR4110-5E-Q	3 sets (2 position single part no.)
*VFR4210-5E-Q	2 sets (2 position double part no.)
*VVFS4000-10A	1 set (Blanking plate assembly part no.)
*AMC810-14	1 set (Exhaust cleaner part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

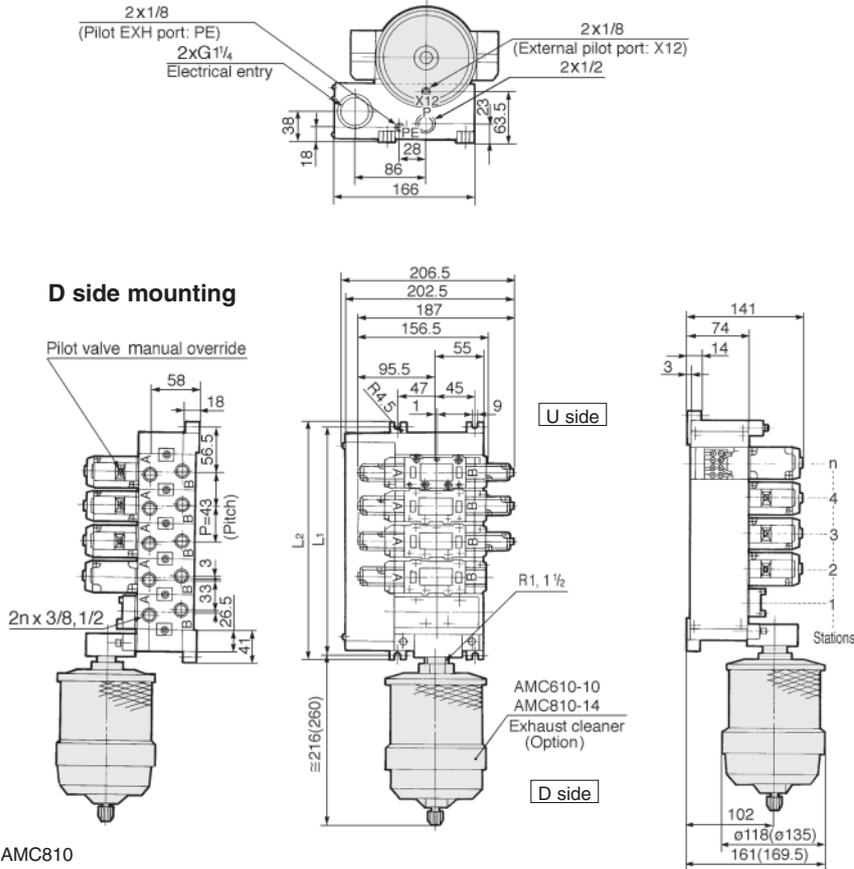
⚠ Caution

When using an exhaust cleaner, mount it downwards.

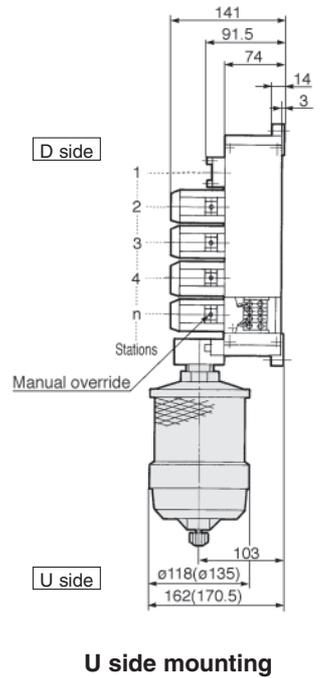
VFR4000

Manifold with Exhaust Cleaner Plug-in/Non Plug-in

Plug-in: VV5FR4-01T-Station 1-Port size- $\frac{CD}{CU}$ -Q

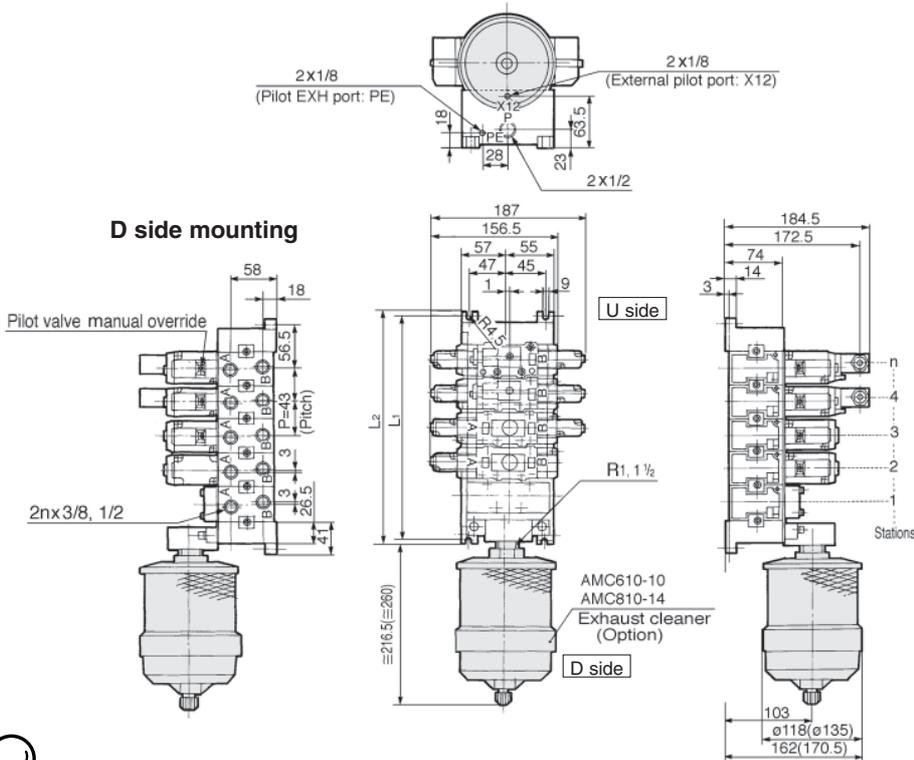


() : AMC810

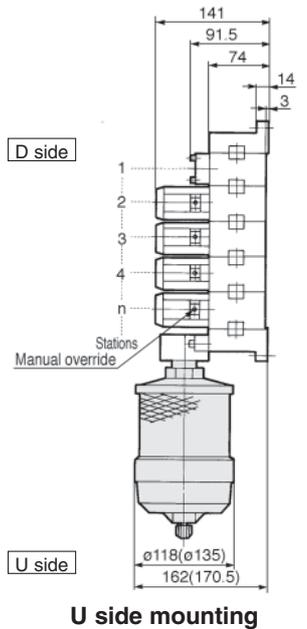


U side mounting

Non plug-in: VV5FR4-10-Station 1-Port size- $\frac{CD}{CU}$ -Q



() : AMC810

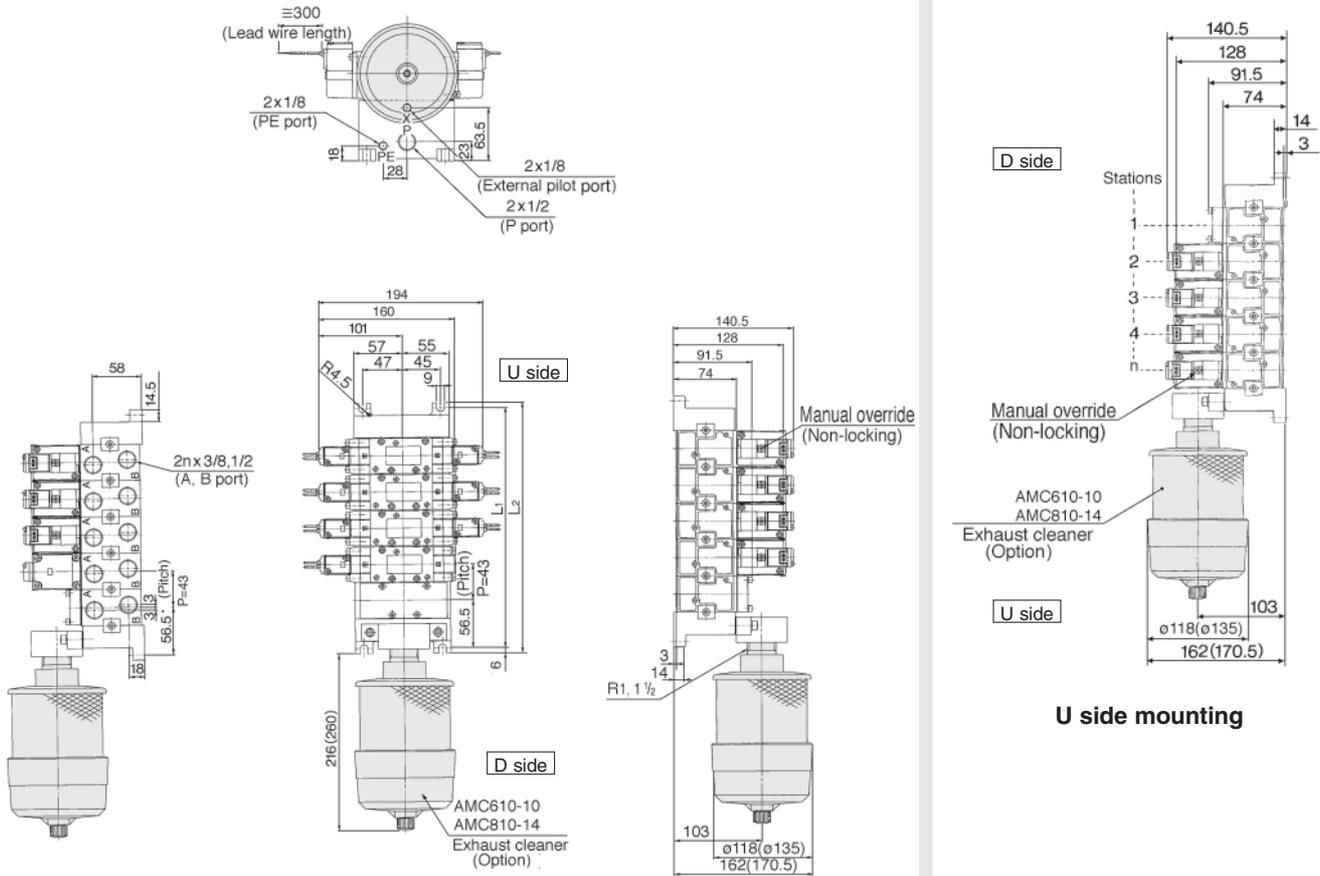


U side mounting

		n: Station									
L	n	2	3	4	5	6	7	8	9	10	Equation
L ₁		156	199	242	285	328	371	414	457	500	L ₁ =43 X n+70
L ₂		168	211	254	297	340	383	426	469	512	L ₂ =43 X n+82

Manifold with Exhaust Cleaner Non plug-in

Non plug-in: VV5FR4-40-Station 1-Port size $\frac{CD}{CU}$ -Q



(): AMC810

		n: Station									
L	n	2	3	4	5	6	7	8	9	10	Equation
L1		156	199	242	285	328	371	414	457	500	$L1=43 \times n+70$
L2		168	211	254	297	340	383	426	469	512	$L2=43 \times n+82$

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

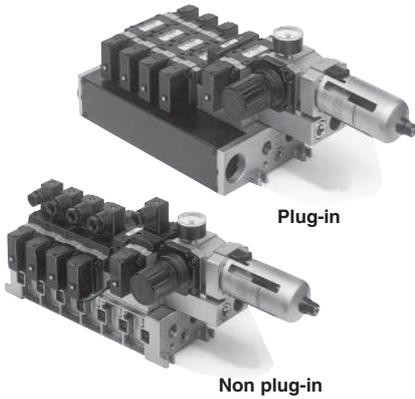
VS7

VQ7

VFR4000

Manifold with Control Unit

- Controlling equipment (filter, regulator, pressure switch and air release valve) is all in one standard unit, possible for direct mounting to manifold base.
- Piping work eliminated.



Manifold Specifications

Manifold	Plug-in: VV5FR4-01□-Q	Non plug-in: VV5FR4-10-Q	Non plug-in: VV5FR4-40-Q
Connection	With terminal block With multi-connector With D-sub connector	DIN connector	DIN connector
Applicable solenoid valve	VFR4□0□-□F-Q	VFR4□1□-□D/Y-Q	VFR4□4□-□D/Y-Q
Piping Rc(PT)	Common SUP, Common EXH		
	A, B port	Side: 3/8, 1/2 Bottom: 3/8	
	P, EA, EB port	Side: 1/2	
Stations	2 to 10 (With multi-connector/D-sub connector: 2 to 8)*		



*Including station of control unit

Control Unit Specifications

Air filter (With auto drain/manual drain)	
Filtration degree	5μm
Regulator	
Set pressure (Secondary pressure)	0.05 to 0.85MPa
Pressure switch	
Set pressure range (in de-energized state)	0.1 to 0.6MPa
Hysteresis	0.08MPa
Contact	1a
Light	LED light: Red
Max. contact capacity	2VAAC, 2WDC
Max. current	At 24V AC, DC or less: 50mA At 48V AC, DC: 40mA At 100V AC, DC: 20mA
Inside voltage drop	4V or less
Air release valve (single only)	
Operating pressure range	0.2 to 0.9MPa

Control Unit Option

Release valve spacer	<Plug-in> VVFS4000-24A-1R (D side mounting)	
	<Non plug-in> VVFS4000-24A-2R (D side mounting)	
Pressure switch	IS1000P-2-1	
Blank plate	For filter regulator	MP2-3
	For pressure switch	MP3-2
	For air release valve	VVFS4000-24A-10
Filter element	11104-5B	



Note1) Combining valve "VFR41□□" (single) and release valve spacer makes it possible to use this as a air release valve.

Note2) Pressure switch cannot be mounted later in non plug-in.

⚠ Cautions

Air filter with auto drain or manual drain must be mounted with the air filter at the bottom.

VV5FR4 - 01C D - 08 1 - 03 - AP - Q

Series VFR4000
Manifold

Base type/Electrical entry

01T	Plug-in type with terminal block
01C	Plug-in type with multi-connector
01F	Plug-in type with D-sub connector
10	Non plug-in type (Common entry)
40	Non plug-in type (Individual entry)

Connector mounting direction

Symbol	With connector	Applicable base
—	None	01T, 10, 40
D	D side mounting	01C, 01F
U	U side mounting	

Stations

02	2 stations
⋮	⋮
10 ^{Note)}	10 stations

- Note) • Base 01T/10/40: 2 to 10 stations
 • Base 01C/01F: 2 to 8 stations
 • Including stations of control unit.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

* Semi-standard

Port size

Symbol	P, EA, EB	A, B
03	1/2	3/8
04		1/2
M		Mixed

* For bottom ported:
only 3/8

Air release valve coil rating

—	None
1	100 VAC, 50/60 Hz
5	24 VDC

For other rated voltages, please consult with SMC.

Control unit type

Control equipment	Symbol								
	—	MP	AP	M	A	G	F	C	E
Air release valve		●	●	●	●			●	●
Air filter regulator with manual drain		●		●		●			
Air filter regulator with auto-drain			●		●		●		
Pressure switch		●	●						
Blanking plate (Air release valve)						●	●		
Blanking plate (Filter regulator)								●	
Blanking plate (Pressure switch)				●	●	●	●	●	
Required stations		2 stations							1 station

Note) Control unit is D side mounting only.

Thread type

—	Rc
F	G
N	NPT
T	NPTF

How to Order Manifold Assembly

<Example> Plug-in type with terminal block

VV5FR4-01T-081-03-AP5-Q 1 set (Manifold base part no.)
 *VFR4100-5FZ-Q 4 sets (2 position single part no.)
 *VFR4200-5FZ-Q 2 sets (2 position double part no.)

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

The 1st and 2nd station are used for control unit mounting.
 When ordering, specify the part nos. in order from the 3rd. station in the D side.
 When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type

VV5FR4-10-061-03-A5-Q 1 set (Manifold base part no.)
 *VFR4110-5D-Q 5 sets (2 position single part no.)

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

The 1st and 2nd station are used for control unit mounting.
 When ordering, specify the part nos. in order from the 3rd. station in the D side.
 When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7

VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD

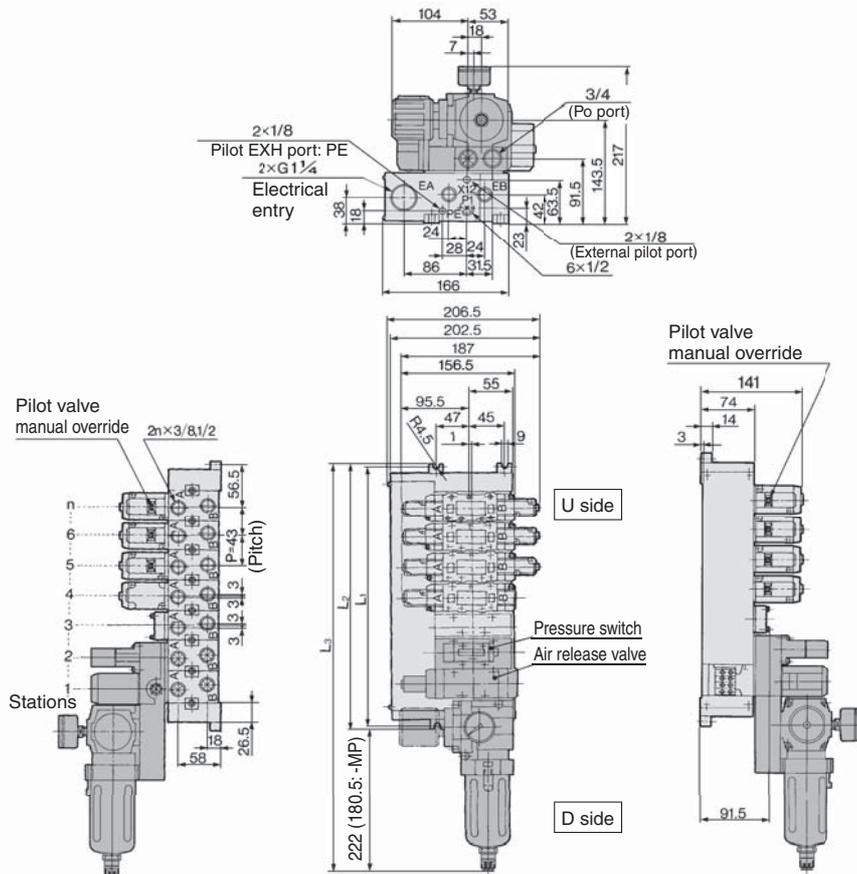
VFS
VS
VS7
VQ7

VFR4000

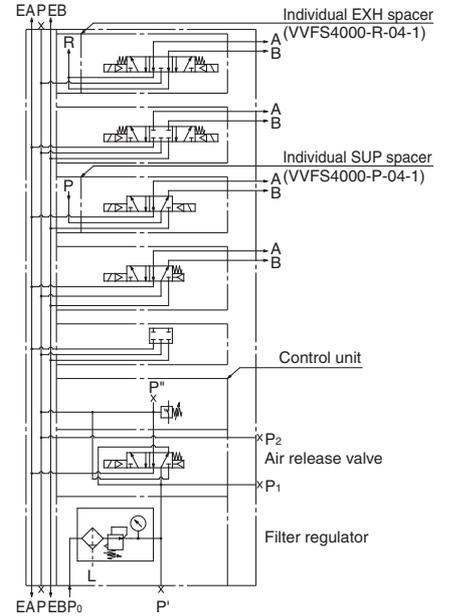
Manifold with Control Unit Plug-in/Non Plug-in

Plug-in type:

VV5FR4-01T-Station 1-Port size -AP Voltage of air release valve -Q

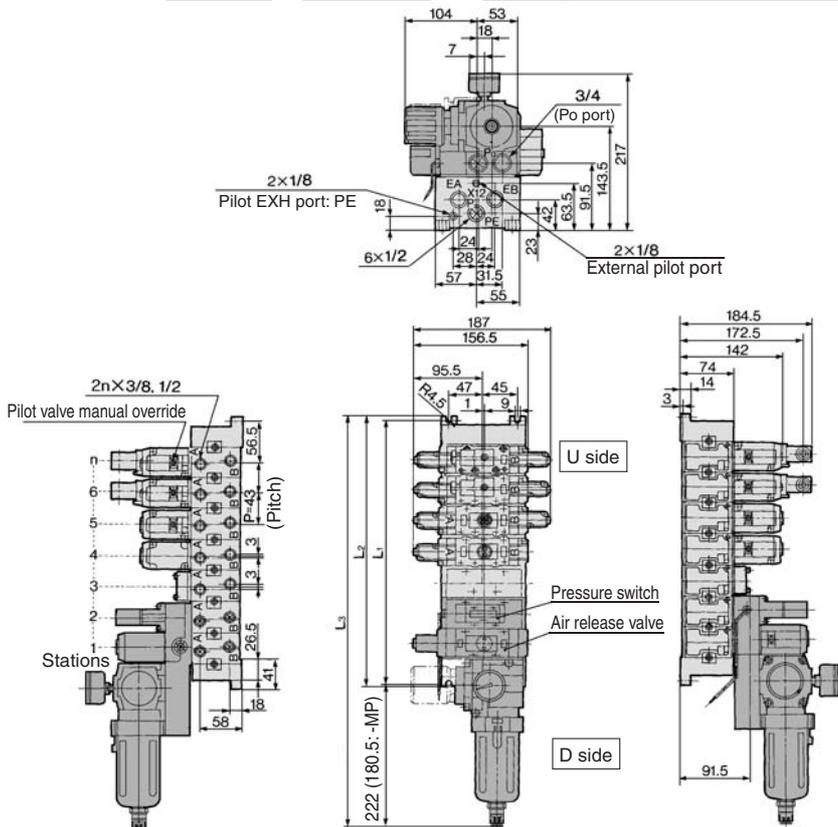


Example for manifold

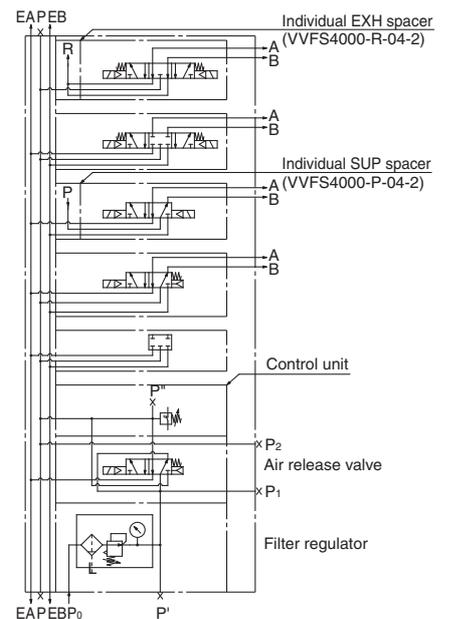


Non plug-in type:

VV5FR4-10-Station 1-Port size -AP Voltage of air release valve -Q



Example for manifold

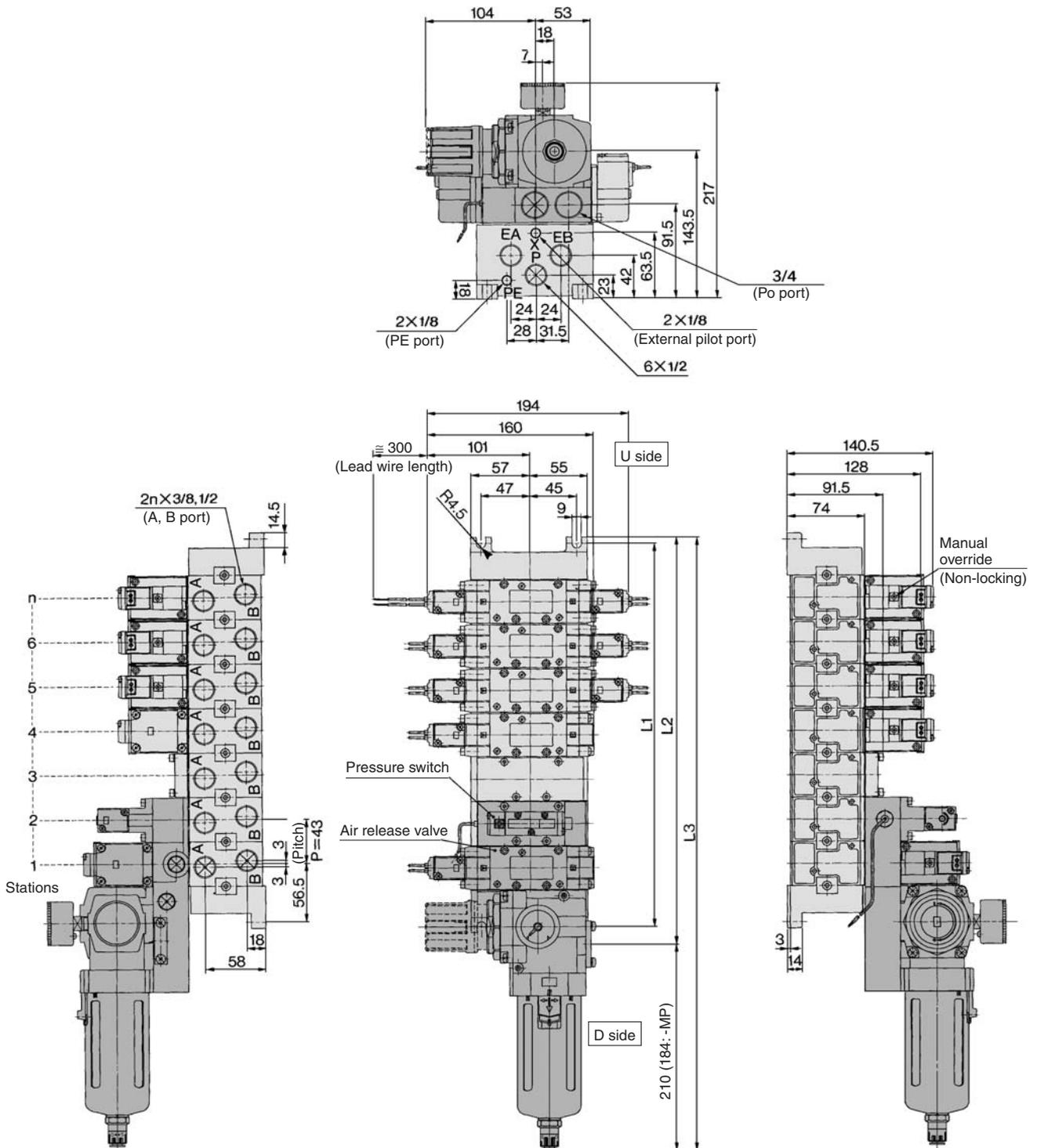


n: Station

L Stations	3	4	5	6	7	8	9	10	Formula
L ₁	199	242	285	328	371	414	457	500	L ₁ = 43 x n + 70
L ₂	211	254	297	340	383	426	469	512	L ₂ = 43 x n + 82
L ₃ (MP)	385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	L ₃ = 43 x n + 256.5
L ₃ (AP)	427	470	513	556	599	642	685	728	L ₃ = 43 x n + 298

Manifold with Control Unit Non Plug-in

Non plug-in type: VV5FR4-40-Station 1-Port size -AP Voltage of air release valve -Q



SY

SYJ

SX

VK

VZ

VF

VFR

VP7

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

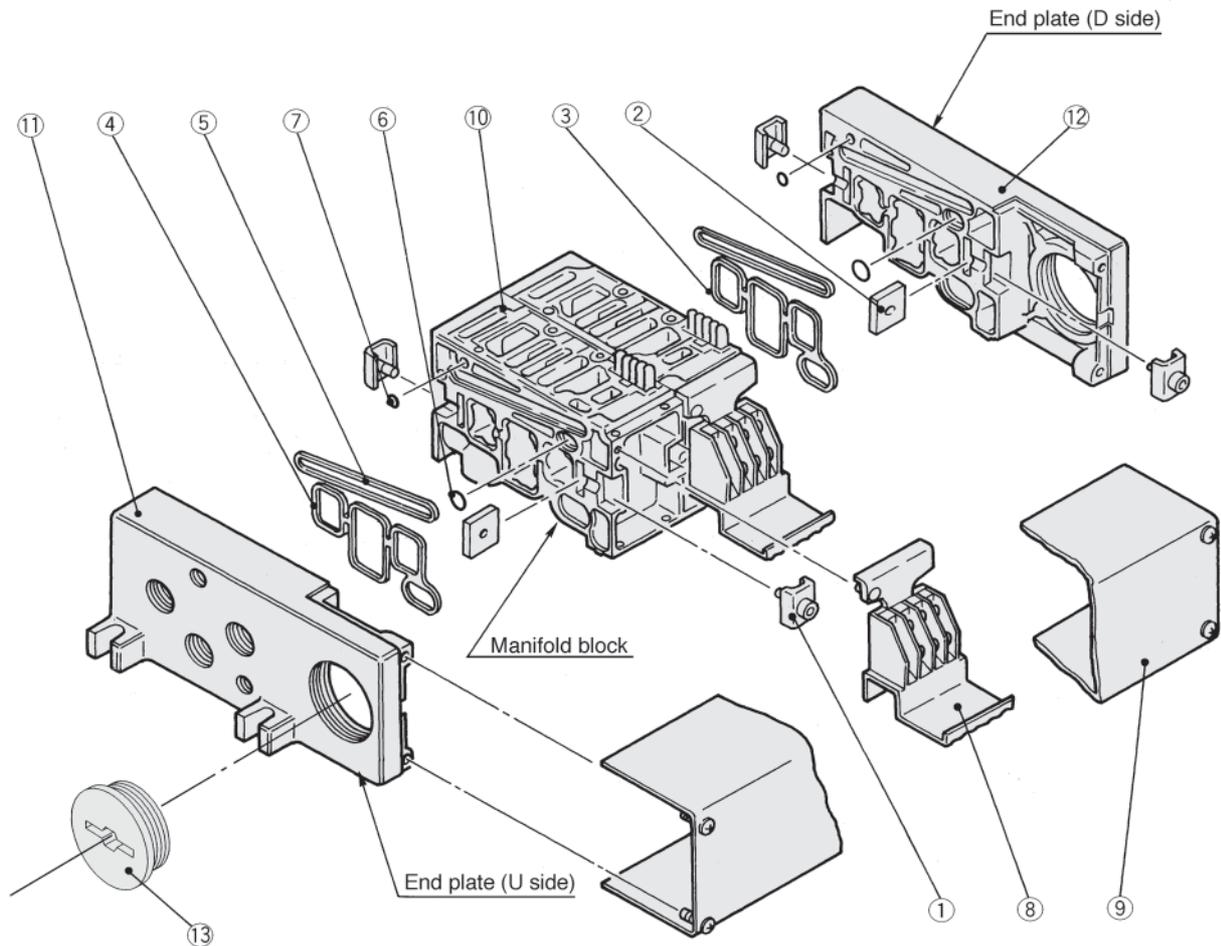
VS7

VQ7

Stations	3	4	5	6	7	8	9	10	Formula
L ₁	199	242	285	328	371	414	457	500	L ₁ = 43 x n + 70
L ₂	211	254	297	340	383	426	469	512	L ₂ = 43 x n + 82
L ₃ (MP)	385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	L ₃ = 43 x n + 256.5
L ₃ (AP)	427	470	513	556	599	642	685	728	L ₃ = 43 x n + 298

VFR4000

Manifold Exploded View Plug-in/Non Plug-in



Replacement Parts

No.	Name	Material	Part No.
1	Connection bracket A	Steel	VVF4000-5-1A
2	Connection bracket B	Steel	VVF4000-5-2
3	Gasket	NBR	VVF4000-7(for end plate)
4	Gasket	NBR	VVF4000-7-1(for manifold block)
5	Gasket	NBR	VVF4000-8
6	O ring	NBR	AS568-011
7	O ring	NBR	P-3
8	Terminal assembly	-	VFR4000-14-1A
9	Junction cover assembly	-	For 01T VVF4000-4A-Station For 01SU AZ738-30A-Station
13	Rubber plug	NBR	AXT336-9



Note) Manifold base construction: Plug-in with terminal block manifold

Replacement Parts: Sub Assembly

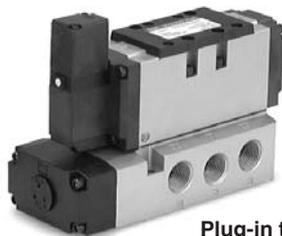
No.	Name	Part No.	Component parts	Applicable manifold base
10	Manifold block ⁽¹⁾ assembly	VFR4000-19-1A- ⁰³ / ₀₄	Manifold block ⑩, Terminal 8, Connection bracket 12, Gasket 34, O ring 67, Receptacle ass'y	Plug-in
		VFR4000-19-2A- ⁰³ / ₀₄	Manifold block 9, Connection bracket 12, Gasket 34, O ring 67	Non plug-in
11	End plate (U side) assembly	VVF4000-2A-1	End plate(U) ⑪, Connection bracket 12=	Plug-in
		VVF4000-2A-2	End plate(U) ⑪, Connection bracket 12	Non plug-in
12	End plate (D side) assembly	VVF4000-3A-1	End plate(D) ⑫, Connection bracket 12, Gasket 34, O ring 67	Plug-in
		VVF4000-3A-2	End plate(D) ⑫, Connection bracket 12, Gasket 35, O ring 67	Non plug-in



Note 1) Side piping

5 Port Pilot/Rubber Seal Plug-in/Non Plug-in

Series VFR5000



Plug-in type



Non plug-in type

Symbol

2 position		3 position	
Single		Closed center	
(A)4 2(B)	(A)4 2(B)	(A)4 2(B)	(A)4 2(B)
(EA)5 1 3(EB)	(EA)5 1 3(EB)	(EA)5 1 3(EB)	(EA)5 1 3(EB)
(P)	(P)	(P)	(P)
Double		Exhaust center	
(A)4 2(B)	(A)4 2(B)	(A)4 2(B)	(A)4 2(B)
(EA)5 1 3(EB)	(EA)5 1 3(EB)	(EA)5 1 3(EB)	(EA)5 1 3(EB)
(P)	(P)	(P)	(P)
		Pressure center	
		(A)4 2(B)	(A)4 2(B)
		(EA)5 1 3(EB)	(EA)5 1 3(EB)
		(P)	(P)

Model

Type of actuation	Model		Port size	Flow characteristics ⁽¹⁾								Max. ⁽²⁾ operating cycle (Hz)	Response ⁽³⁾ time (ms)	Weight ⁽⁴⁾ (kg)	
	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	Cv	Q ⁽⁵⁾ [l/min(ANR)]	C [dm ³ /(s·bar)]	b	Cv	Q ⁽⁵⁾ [l/min(ANR)]				
2 position	Single	VFR510□	VFR511□	3/8	17	0.36	4.7	4497	18	0.40	5.0	4897	5	60 or less	1.77 (1.72)
				1/2	20	0.28	5.2	5022	23	0.32	6.2	5924			
				3/4	23	0.27	5.8	5740	25	0.21	6.2	6022			
	Double	VFR520□	VFR521□	3/8	16	0.37	4.6	4261	18	0.41	5.1	4932	5	60 or less	1.88 (1.83)
				1/2	20	0.27	5.2	4991	23	0.32	6.1	5924			
				3/4	23	0.26	5.8	5705	25	0.20	6.1	5988			
3 position	Closed center	VFR530□	VFR531□	3/8	15	0.38	4.1	4023	16	0.31	4.3	4094	3	80 or less	1.87 (1.82)
				1/2	17	0.31	4.6	4350	20	0.33	5.4	5185			
				3/4	18	0.28	4.7	4520	21	0.30	5.4	5340			
	Exhaust center	VFR540□	VFR541□	3/8	14	0.38	3.6	3755	17 [16]	0.39 [0.35]	4.8 [4.3]	4592 [4203]	3	80 or less	1.87 (1.82)
				1/2	17	0.29	4.6	4295	21 [18]	0.31 [0.34]	5.6 [5.0]	5374 [4697]			
				3/4	18	0.29	4.6	4548	23 [20]	0.27 [0.33]	5.9 [5.2]	5740 [5185]			
	Pressure center	VFR550□	VFR551□	3/8	16 [9.4]	0.39 [0.40]	4.2 [2.6]	4321 [2557]	17	0.36	4.5	4497	3	80 or less	1.87 (1.82)
				1/2	18 [9.7]	0.32 [0.45]	5.0 [2.9]	4636 [2739]	20	0.31	5.3	5118			
				3/4	19 [9.2]	0.35 [0.48]	5.4 [2.8]	4992 [2660]	21	0.29	5.6	5306			

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 VFR5□00-□FZ-06, (): VFR5□10-□DZ-06

Note 5) These valves have been calculated according to the ISO6358 and indicate the follow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

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)
	Lubrication			Non-lube ⁽¹⁾
	Manual override			Non-locking push type
	Mounting orientation			Unrestricted
Impact/Vibration resistance			300/50m/s ² ⁽²⁾	
Electricity specifications	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 Hz	
		Holding	3.4 VA/50 Hz, 2.3 VA/60 Hz	
	Power consumption (DC) ⁽³⁾			1.8 W (2.04 W: With light/surge voltage suppressor)
	Electrical entry	Plug-in type		Conduit terminal
Non plug-in type		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

Pilot type		External pilot Note)	
Manual override	Main valve	Direct manual override	
	Pilot valve	Non-locking push type A (Extended), Locking type B (Tool required), Locking type C (Lever)	
Coil rated voltage		110 to 120, 220, 240 VAC 50/60 Hz	
Porting specifications		12 VDC	
Option		Bottom ported	
		With light/surge voltage suppressor	

Note) Operating pressure:

2 position 0 to 0.9 MPa
3 position 0.15 to 0.9 MPa

Pilot pressure:

2 position single 0.2 to 0.9 MPa
2 position double 0.1 to 0.9 MPa
3 position 0.3 x P + 0.1 to 0.9 MPa
(P: Operating pressure)

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

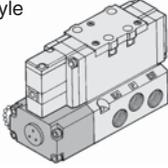
VQ7

VFR5000

How to Order

Electrical entry

F: Plug-in conduit style



Option

—	None
Z	With light and surge voltage suppressor

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

—	Side piping
B*	Bottom piping

* Option not available for external pilot type.

Port size (P, A, B port)

—	Without sub-plate
03	3/8
04	1/2
06	3/4

Plug-in VFR5 0 0 5 F 06 -Q

Non plug-in VFR5 1 1 1 D 06 -Q

Configuration

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

Body option

0	Standard
1*	Direct manual

* Option

Pilot type

—	Internal pilot
R*	External pilot

* Option

Coil rated voltage

1	100V AC, 50/60Hz
2	200V AC, 50/60Hz
3	110V to 120V AC, 50/60Hz
4	220V AC, 50/60Hz
5	24V DC
6	12V DC
7	240V AC 50/60Hz

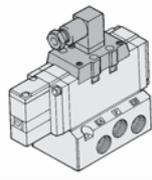
 Contact SMC for other voltages

Thread

—	Rc (PT)
F	G (PF)
N	NPT
T	NPTF

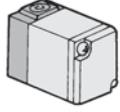
Electrical entry

D: DIN connector
DO: Without connector

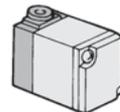


Type of manual override of pilot valve

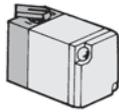
—: Non-locking slotted style



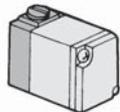
A*: Non-locking slotted A style (Projection)



C*: Locking C style (Lever)



B*: Locking B style (Tool)



* Option

 Protective class class III (Mark: )

How to Order Pilot Valve Assembly

SF4 - 1 F -70-Q

Manual override

—	Non-locking push
A*	Non-locking push A style (Extended)
B*	Locking B style (slotted)
C*	Locking C style (Lever)

* Option

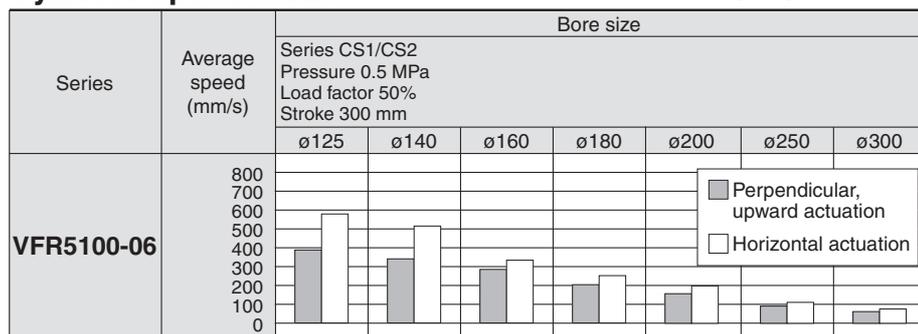
Voltage

No.	Rated voltage
1	100V AC 50/60Hz
2	200V AC 50/60Hz
3	110 to 120V AC 50/60Hz
4	220V AC 50/60Hz
5	24V DC
6	12V DC
7	240V AC 50/60Hz

For other rated voltages, please consult with SMC.

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

Cylinder Speed Chart

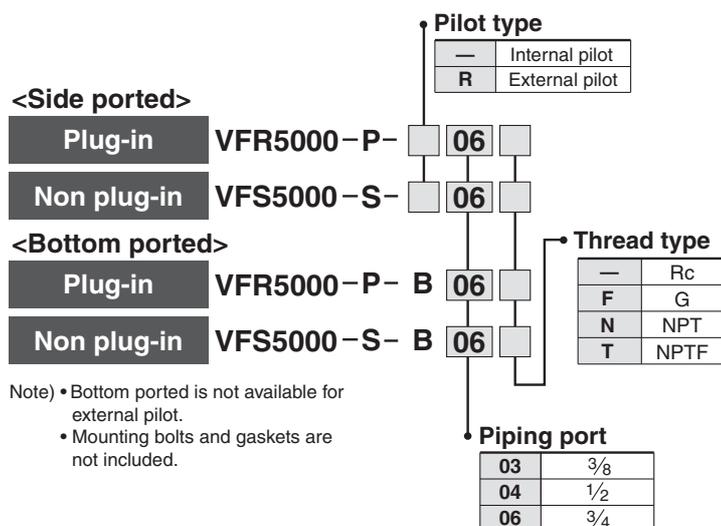


- * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- * The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- * Load factor: ((Load mass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

Conditions

		Series CS1/CS2
VFR5110-06	Tube x Length	SGP20A x 1 m
	Speed controller	AS500-06
	Silencer	AN500-06

How to Order Sub-plate Assembly



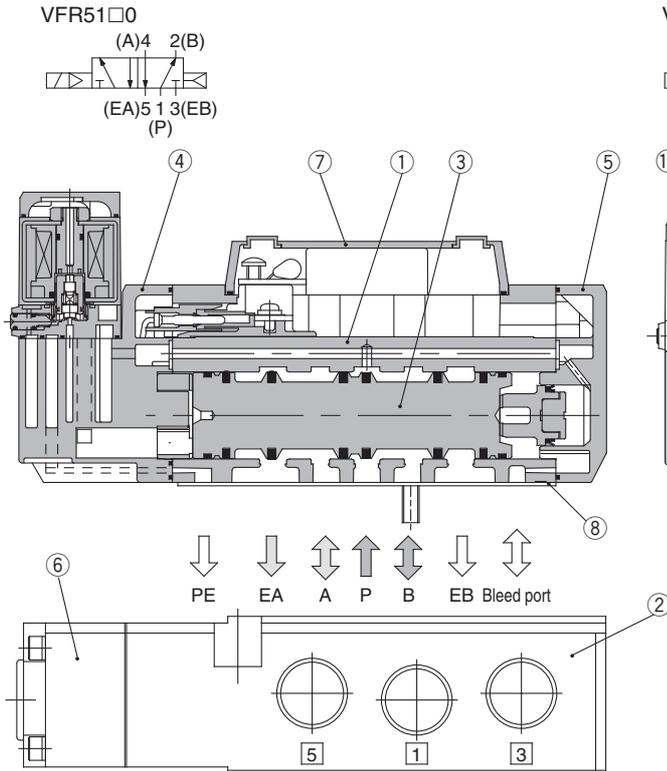
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

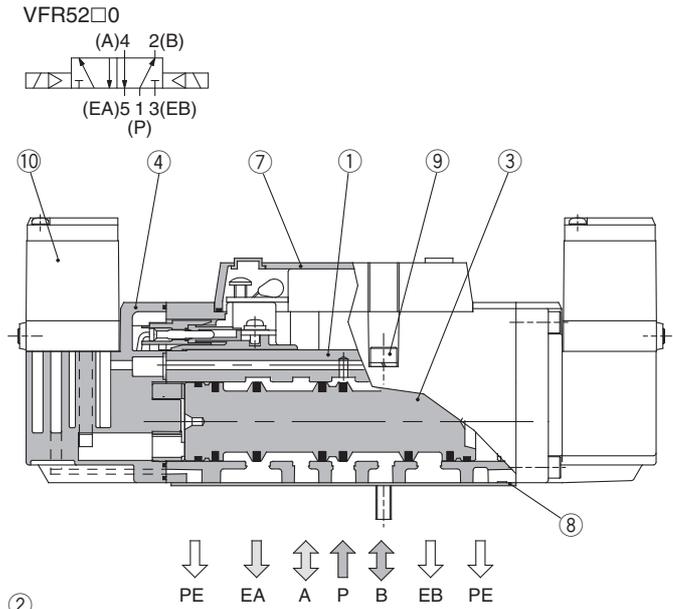
VFR5000

Construction

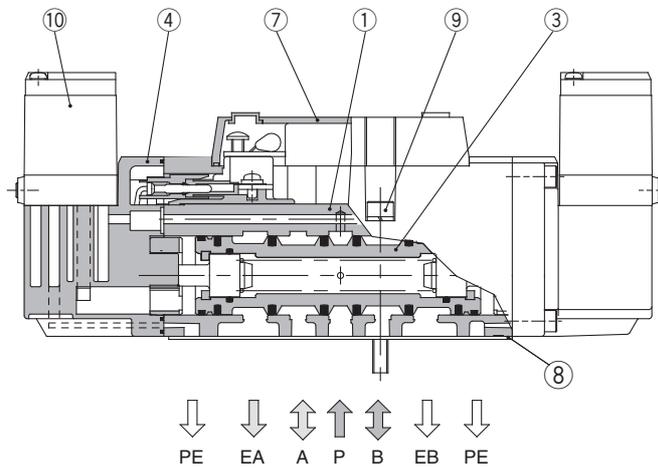
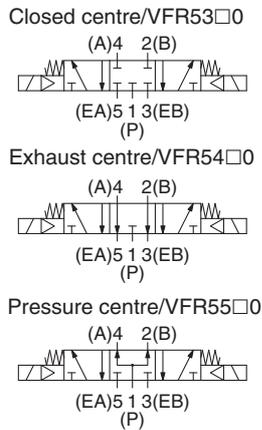
2 position single



2 position double



3 position closed centre/exhaust centre/pressure centre



This figure shows closed centre.

Component Parts

No.	Name	Material	Note
①	Body	Aluminium die cast	Platinum silver
②	Sub-plate	Aluminium die cast	Platinum silver
③	Spool valve	Aluminium, NBR	
④	Adapter plate	Resin	Black

Component Parts

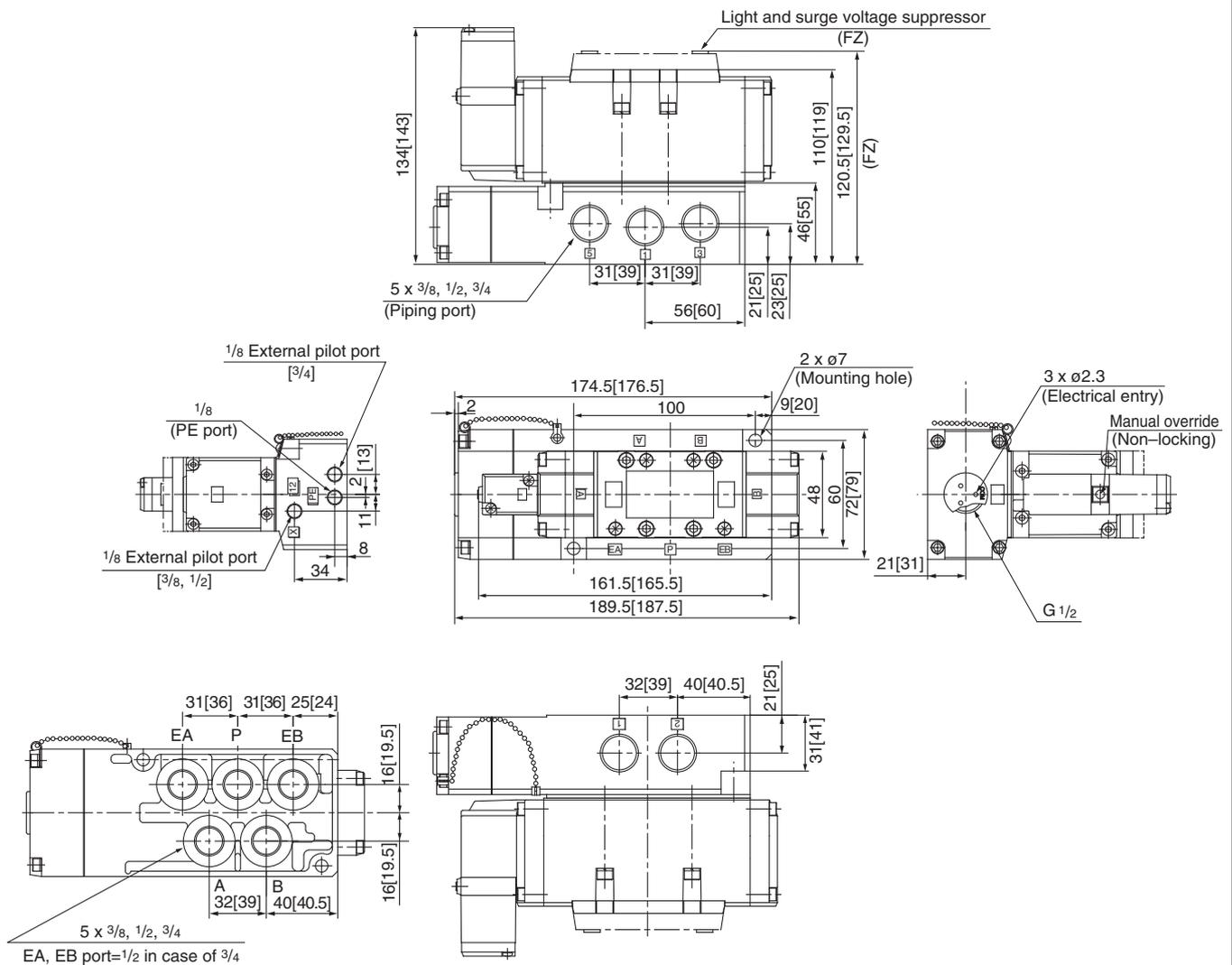
No.	Name	Material	Note
⑤	End plate	Resin	Black
⑥	Junction cover	Resin	Black
⑦	Light cover	Resin	

Replacement Parts

No.	Name	Material	Part No.		
			VFR51□□	VFR52□□	VFR53□□, 54□□, 55□□
⑧	Gasket	NBR	AXT627-10-1	AXT627-10-1	AXT627-10-1
⑨	Hex. socket head cap screw	Brass	AXT627-42-1(M5 X 50)	AXT627-42-1(M5 X 50)	AXT627-42-1(M5 X 50)
⑩	Pilot valve assembly	—	Refer to "How to Order Pilot Valve Assembly" on p.1.8-70.		

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

2 position single: VFR510₁⁰-□F(Z)



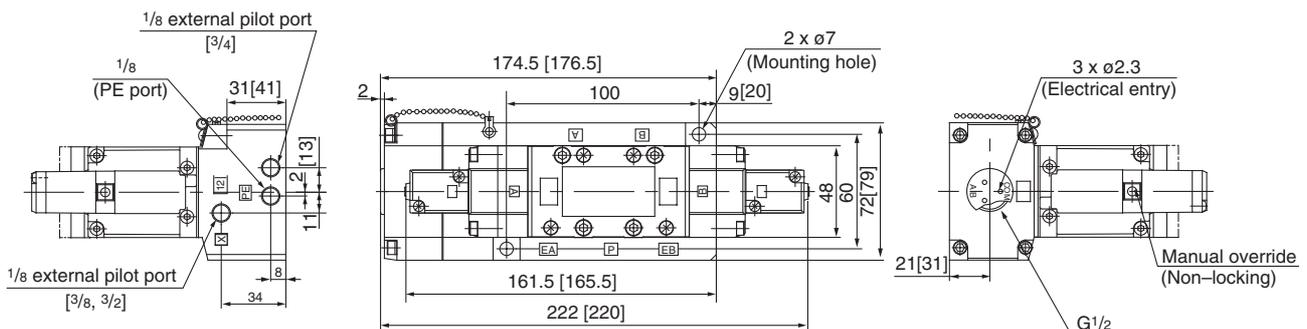
[] = 3/4

2 position double: VFR520₁⁰-□F(Z)

3 position closed centre: VFR530₁⁰-□F(Z)

3 position exhaust centre: VFR540₁⁰-□F(Z)

3 position pressure centre: VFR550₁⁰-□F(Z)



* Other dimensions are same as single style. [] = 3/4

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

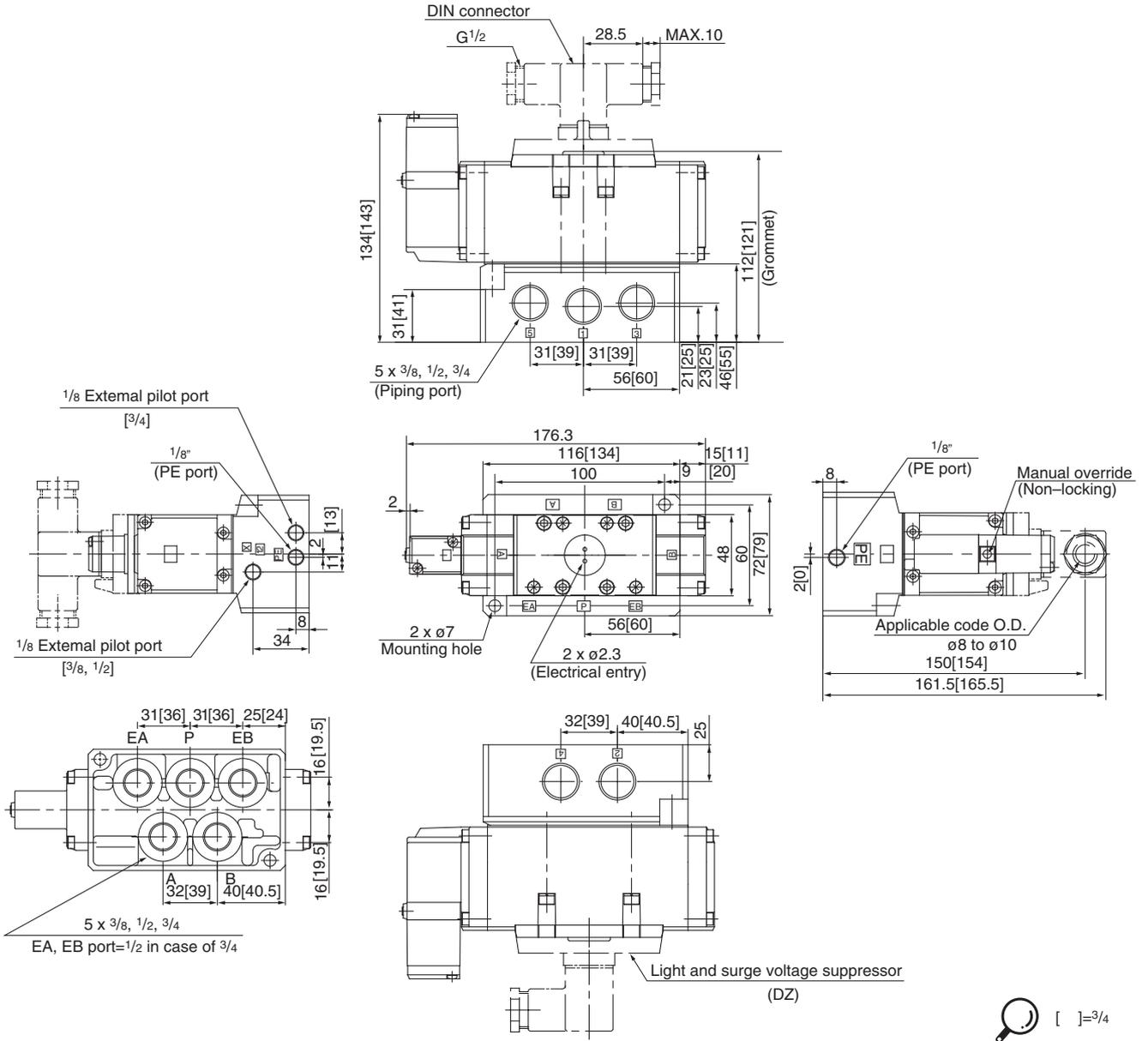
VS7

VQ7

VFR5000

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

2 position single: VFR511⁰-□E/VFR511⁰-□D(Z)

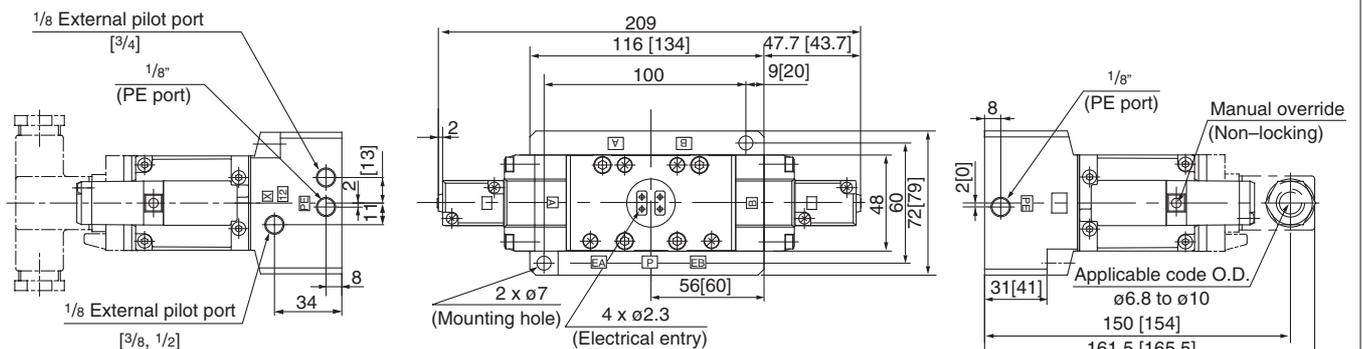


2 position double: VFR521⁰-□E/VFR521⁰-□D(Z)

3 position closed centre: VFR531⁰-□E/VFR531⁰-□D(Z)

3 position exhaust centre: VFR541⁰-□E/VFR541⁰-□D(Z)

3 position pressure centre: VFR551⁰-□E/VFR551⁰-□D(Z)



*Other dimensions are same as single style. []= $\frac{3}{4}$

Series VFR5000

Manifold Specifications



Manifold Specifications

Base model	Wiring	Porting specifications	Port size Rc		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B		
Plug-in type VV5FR5-01□-Q	<ul style="list-style-type: none"> • With terminal block • With multi-connector • With D-sub connector 	Side/Bottom	3/4	1/2, 3/4	2 to 10	VFR5□0□-□F-Q
					2 to 8	
Non plug-in type VV5FR5-10-Q	<ul style="list-style-type: none"> • DIN terminal 				2 to 10	VFR5□1□-□D-Q

How to Order Manifold Assembly

Instruct by specifying the valves, blanking plate and manifold option parts assembly to be mounted on the manifold along with the manifold base model no.

<Example> Plug-in type with terminal block: 6 stations

- VV5FR5-10T-061-04-Q 1 set (Manifold part number)
- *VFR5100-5FZ-Q 3 sets (2 position single)
- *VFR5200-5FZ-Q 2 sets (2 position double)
- *VVFS5000-10A 1 set (Blanking plate assembly part no.)

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

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type: 6 stations

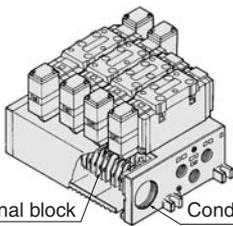
- VV5FR5-10-061-04-Q 1 set (Manifold part number)
- *VFR5110-5D-Q 5 sets (2 position single)
- *VFR5410-5D-Q 1 set (3 position exhaust center)
- *VVFS5000-R-04-2 1 set (Individual EXH spacer)

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

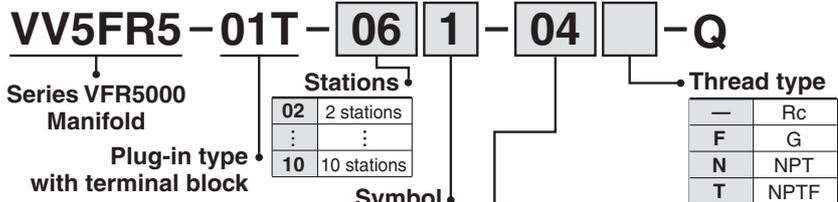
Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

Plug-in Type: With Terminal Block

- Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block corresponding lead wires from power source can be wired at the bottom of terminal block.



Terminal block Conduit porting



Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

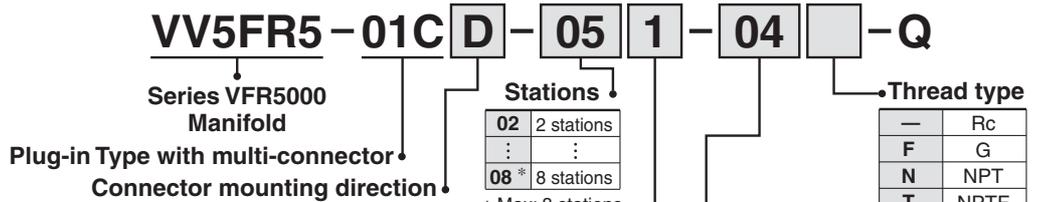
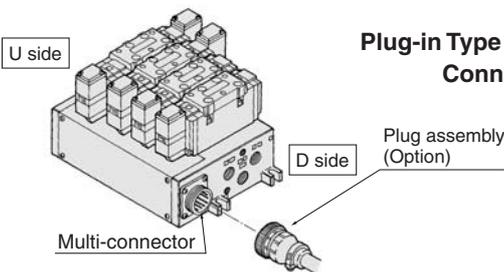
* Semi-standard

Symbol	Port size	
	P, EA, EB	A, B *
04	3/4	1/2
06		3/4
M		Mixed

* For bottom ported: 1/2 only.

Plug-in Type: With Multi-connector

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.



Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

* Semi-standard

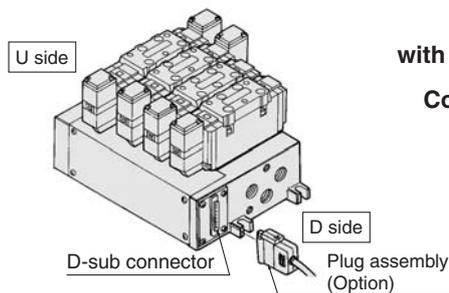
Symbol	Port size	
	P, EA, EB	A, B *
04	3/4	1/2
06		3/4
M		Mixed

* For bottom ported: 1/2 only.

VFR5000

Plug-in Type: With D-sub Connector

- Wide range of interchangeability (D-sub connector (25P) conforming to MIL standard)
- Quick wiring permits easier installation.



VV5FR5-01F D-06 1-04 -Q

Series VFR5000 Manifold
Plug-in type with D-sub connector

Stations

02	2 stations
⋮	⋮
08	8 stations

* Max: 8 stations

Connector mounting direction

D	D side mounting
U	U side mounting

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2	Common	Common	Bottom*

* Semi-standard

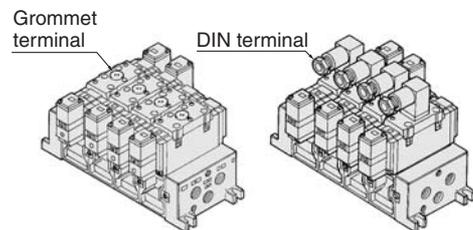
Port size

Symbol	P, EA, EB	A, B *
04		1/2
06	3/4	3/4
M		Mixed

* For bottom ported: 1/2 only.

Non Plug-in Type: Grommet Terminal, DIN Terminal

- Wiring for every valve



VV5FR5-10-05 1-04 -Q

Series VFR5000 Manifold
Non plug-in type

Stations

02	2 stations
⋮	⋮
10	10 stations

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2	Common	Common	Bottom*

* Semi-standard

Port size

Symbol	P, EA, EB	A, B *
04		1/2
06	3/4	3/4
M		Mixed

* For bottom ported: 1/2 only.

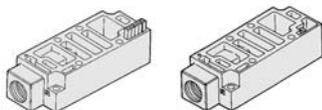
Note) Manifold base is common for Series VFS5000. Terminal block is not required.

Manifold/Option Parts Assembly

Individual SUP spacer

Supply port can be located at each valve individually after individual SUP spacer is mounted on manifold block.

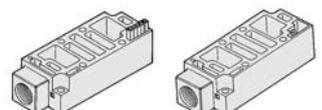
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-P-04-1	VVFS5000-P-04-2



Individual EXH spacer

Exhaust port can be located at each valve individually after individual EXH spacer is mounted on manifold block. (Common EXH type)

Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-R-04-1	VVFS5000-R-04-2



SUP block disk

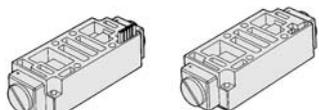
When 2 or more pressures (high and low) are supplied to one manifold, insert a disk between the stations which are supplied different pressures.

Body type	Plug-in type	Non plug-in type
Part no.	AXT628-12A	

Throttle valve spacer

Mount interface speed control on manifold block. Cylinder speed can be controlled by metered out flow.

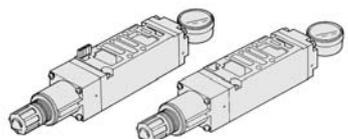
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-20A-1	VVFS5000-20A-2



Interface regulator

When interface regulator is mounted on manifold block, regulation to that valve is possible.

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF5050-00-P-1	ARBF5050-00-P-2
A port regulation	ARBF5050-00-A-1	ARBF5050-00-A-2
B port regulation	ARBF5050-00-B-1	ARBF5050-00-B-2



Blanking plate

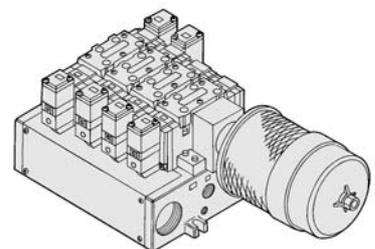
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-10A	

Manifold Option

With exhaust cleaner

- Plug-in type/Non plug-in type
- High noise reduction effect: 35 dB or more
 - Drainage and mist are collected (99.9% or more).
 - Piping work is reduced.



EXH block disk

Use exhaust blocks to eliminate back flow to other stations. Use supply disks to operate two pressures on the same manifold.

Body type	Plug-in type	Non plug-in type
Part no.	AXT512-14-1A	



EXH block disk



SUP block disk

VFR5000

Manifold Plug-in/With Multi-connector, With D-sub Connector

Plug-in/With multi-connector: VV5FR5-01CD-Station 1- Bore size □-Q, VV5FR5-01CU-Station 1- Bore size □-Q

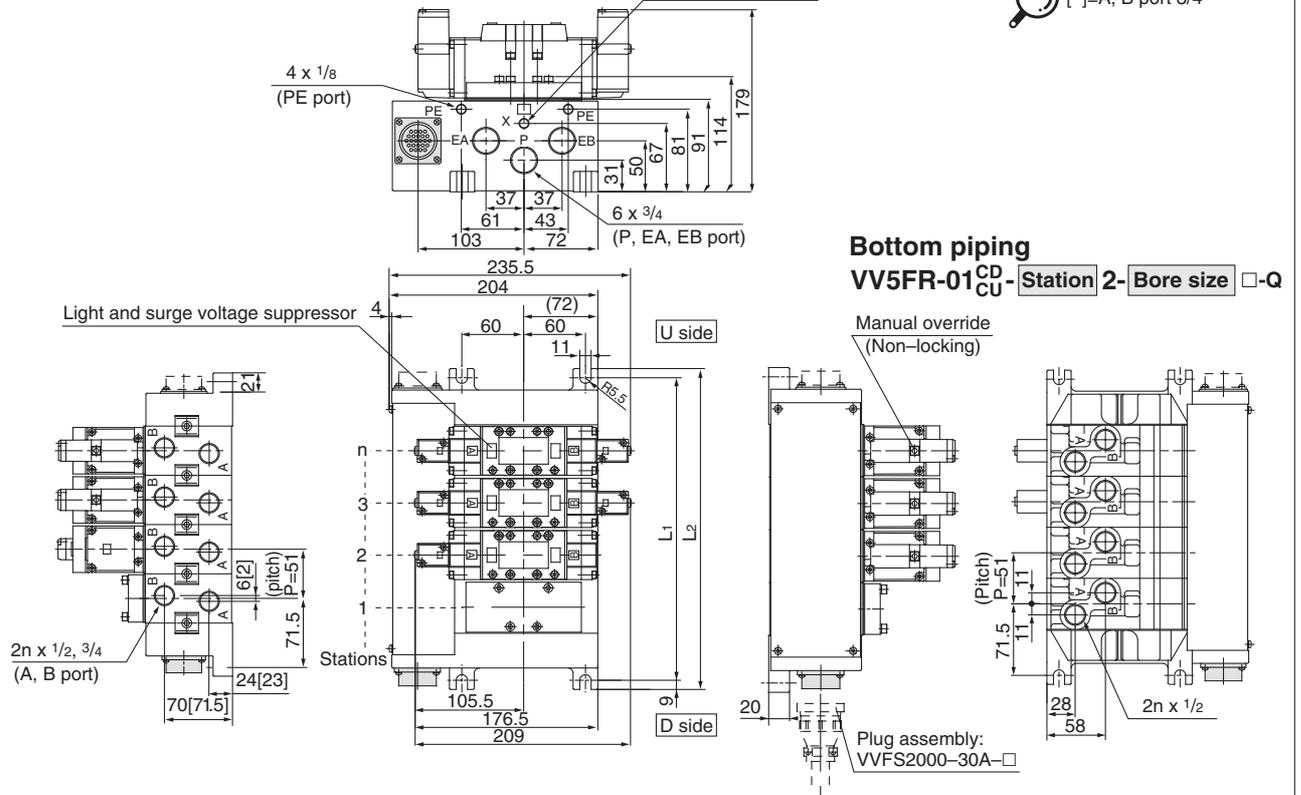


Manifold weight general equation $M=0.916n+1.709$ (kg) n: Stations

External pilot port 1/8



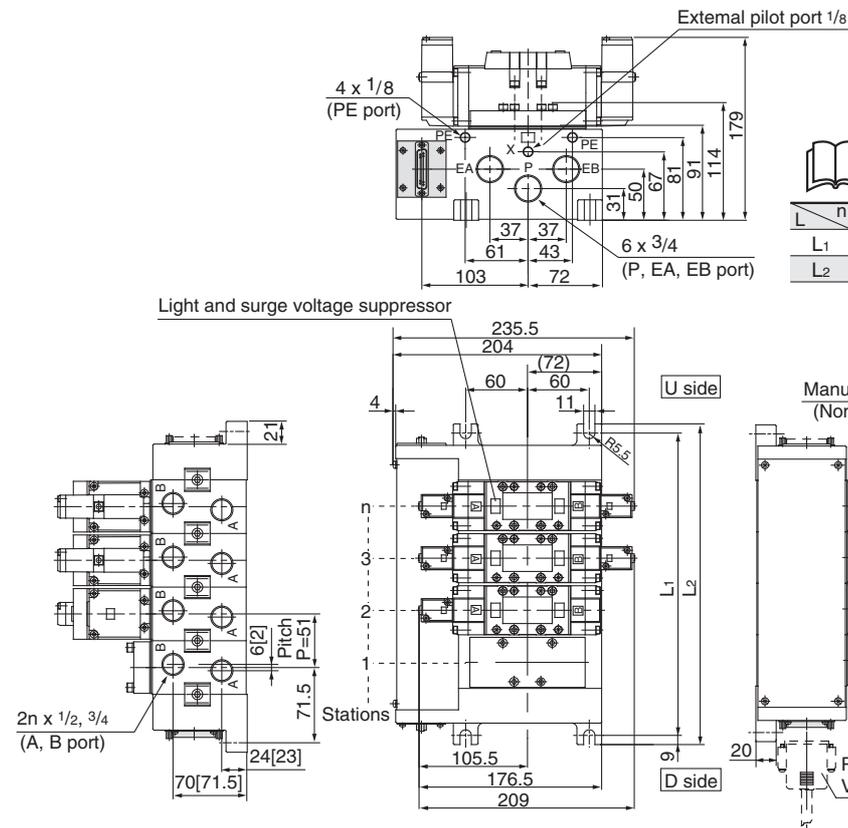
[] =A, B port 3/4



Bottom piping

VV5FR5-01^{CD}/_{CU}-Station 2- Bore size □-Q

Plug-in/With D-sub connector: VV5FR5-01FD-Station 1- Bore size □-Q, VV5FR5-01FU-Station 1- Bore size □-Q



Manifold weight general equation $M=0.916n+1.633$ (kg) n: Stations

n	2	3	4	5	6	7	8	Equation
L1	194	245	296	347	398	449	500	$L1=51 \times n+92$
L2	212	263	314	365	416	467	518	$L2=51 \times n+110$

Bottom piping:

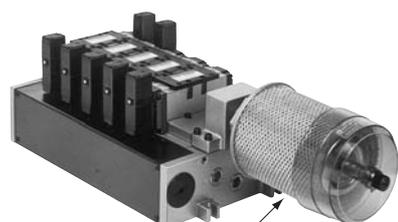
VV5FR5-01^{FD}/_{FU}-Station 2- Bore size □-Q



[] =A, B port 3/4

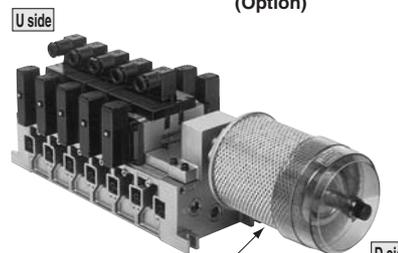
Manifold with Exhaust Cleaner

- Protection of work environment
- Reduction of valve exhaust noise of 35dB or more
- Drainage and mist are collected. (99.9% or more)
- Piping work is reduced.



Plug-in

Exhaust cleaner (Option)



Non plug-in

Exhaust cleaner (Option)

Manifold Specifications

Manifold	Plug-in type: VV5FR5-01□-Q	Non plug-in type: VV5FR5-10-Q
Wiring	With terminal block With multi-connector With D-sub connector	DIN terminal
Applicable valve model	VFR5□00-□F-Q	VFR5□10-□D-Q
Porting specifications	Common SUP/Common EXH	
	A, B port	Side: 1/2, 3/4, Bottom: 1/2 (Option)
	P port	Side: 3/4 EXH: 1 1/2
Stations	2 to 10 ⁽¹⁾	
Applicable exhaust cleaners	AMC810-14 (Connecting port R 1 1/2) ⁽²⁾	

Note 1) With multi connector, or with D-sub connector: 8 stations max.

Note 2) Exhaust cleaner: Not attached.

How to Order

VV5FR5 - 10 □ - 06 1 - 04 □ - CD - Q

Series VFR5000 Manifold

Base type/Electrical entry

01T	Plug-in type With Terminal block
01C	Plug-in type with multi-connector
01F	Plug-in type with D-sub connector
10	Non plug-in type

Connector mounting direction

Symbol	With connector	Applicable base
—	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	01C, 01F

Stations

02	2 stations
⋮	⋮
10	10 stations

- Base 01T, 10: 2 to 10 stations
- Base 01C/01F: 2 to 8 stations

Exhaust cleaner mounting direction

Symbol	Exhaust cleaner mounting direction
CD	D side | D side mounting
CU	U side | U side mounting

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Port size

Symbol	P, EA, EB	A, B *
04		1/2
06	3/4	3/4
M		Mixed

* For bottom ported: 1/2 only.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom *

* Semi-standard

Caution

When using exhaust cleaner, mount it downwards.

How to Order Manifold Assembly

Instruct by specifying the valves and blanking plate to be mounted on the manifold along with the manifold base model no.

<Example> Plug-in type with terminal block: 6 stations

VV5FR5-01T-061-04-CD-Q	1 set (Manifold part no.)
*VFR5100-5FZ-Q	3 sets (2 position single part no.)
*VFR5200-5FZ-Q	2 sets (2 position double part no.)
*VVFS5000-10A	1 set (Blanking plate assembly part no.)
*AMC810-14	1 set (Exhaust cleaner part no.)

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

Valve arrangement is counted from the D side.

When ordering, specify the part nos. in order from the 1st. station in the D side.

When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

<Example> Non plug-in type: 6 stations

VV5FR5-10-061-04-CU-Q	1 set (Manifold part no.)
*VFR5110-5E-Q	3 sets (2 position single part no.)
*VFR5210-5E-Q	2 sets (2 position double part no.)
*VVFS5000-10A	1 set (Blanking plate assembly part no.)
*AMC810-14	1 set (Exhaust cleaner part no.)

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

Valve arrangement is counted from the D side.

When ordering, specify the part nos. in order from the 1st. station in the D side.

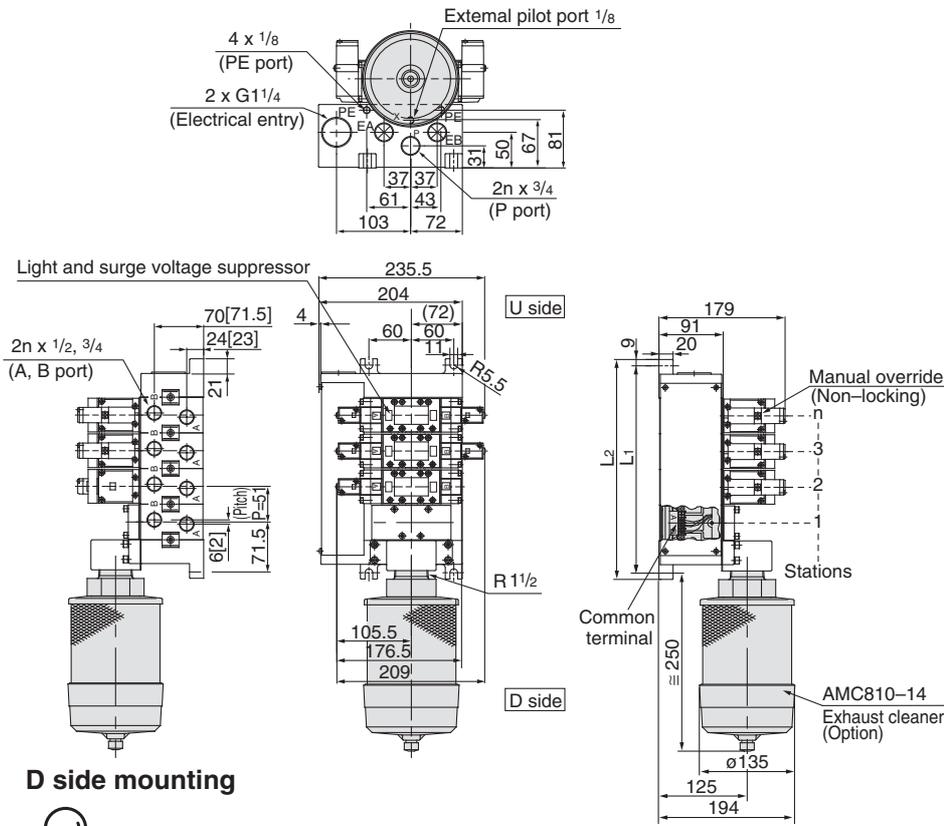
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VFR5000

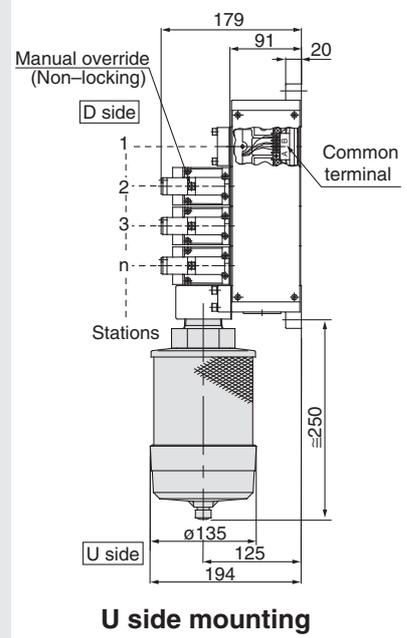
Manifold with Exhaust Cleaner Plug-in/Non Plug-in

Plug-in: VV5FR5-01T-Station 1-Bore size- $\frac{CD}{CU}$ -Q



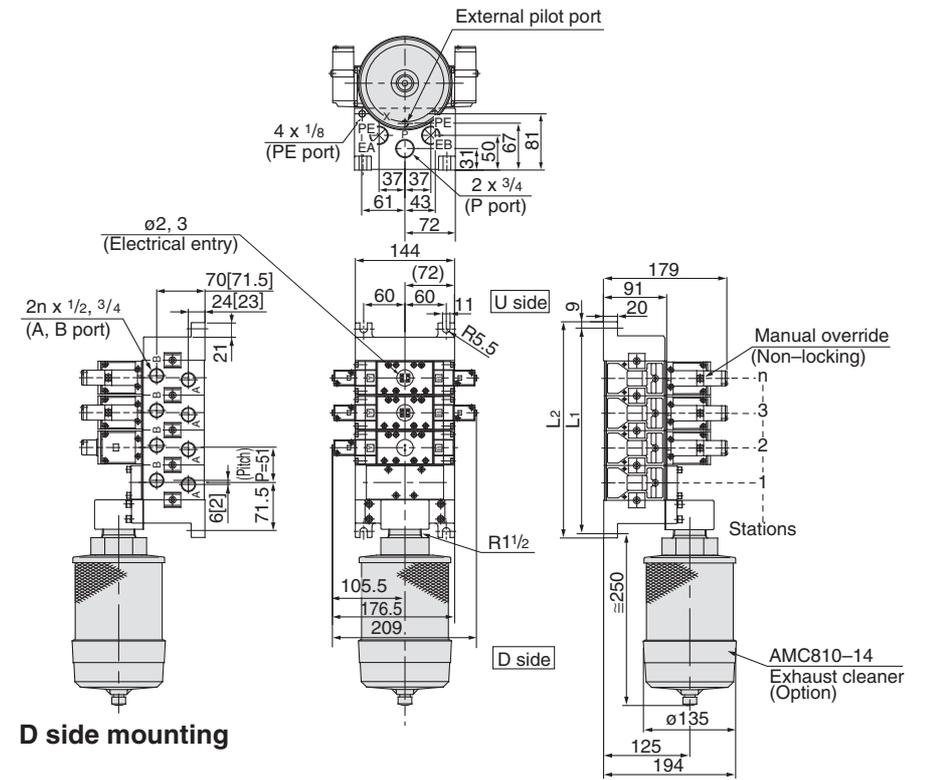
D side mounting

$\left[\right] = A, B \text{ port } \frac{3}{4}$



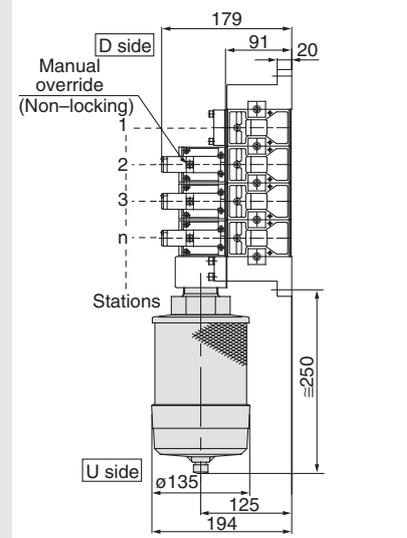
U side mounting

Non plug-in: VV5FR5-10-Station 1-Bore size- $\frac{CD}{CU}$ -Q



D side mounting

$\left[\right] = A, B \text{ port } \frac{3}{4}$



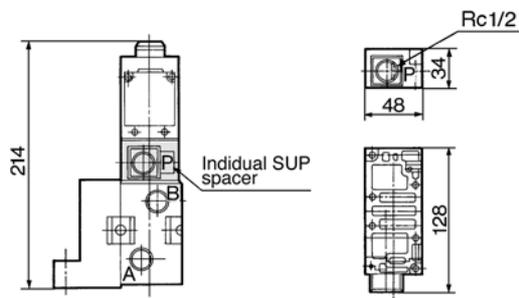
U side mounting

n: Station

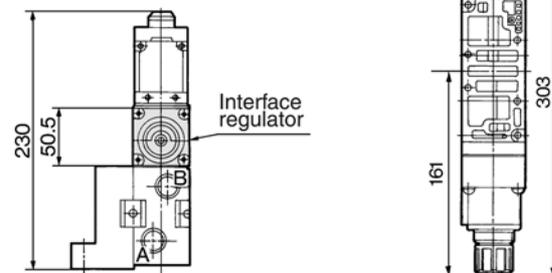
L	n	2	3	4	5	6	7	8	9	10	Equation
L ₁		194	245	296	347	398	449	500	551	602	L ₁ =51 X n+92
L ₂		212	263	314	365	416	467	518	569	620	L ₂ =51 X n+110

Manifold Option Parts Assembly Plug-in/Non Plug-in

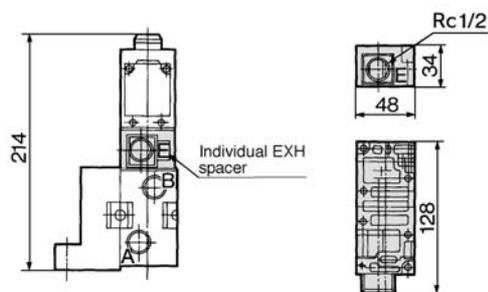
Individual SUP spacer:
 VVFS5000-P-04-1(Plug-in)
 VVFS5000-P-04-2(Non plug-in)



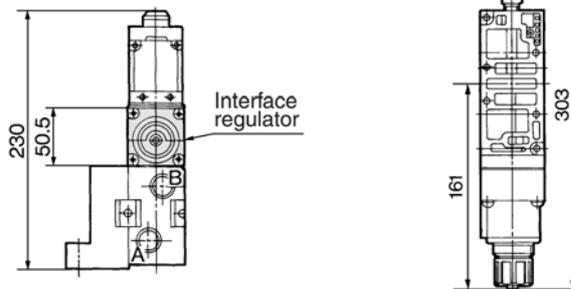
Interface regulator/P port regulation
 ARBF5050-00-P-1(Plug-in)
 ARBF5050-00-P-2(Non plug-in)



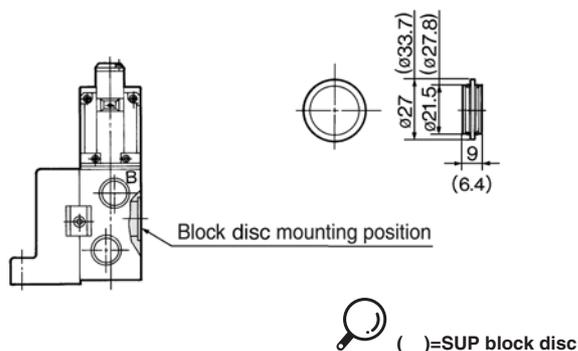
Individual EXH spacer:
 VVFS5000-R-04-1(Plug-in)
 VVFS5000-R-04-2(Non plug-in)



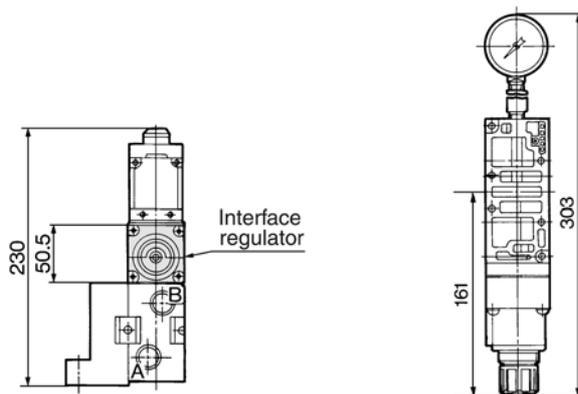
Interface regulator/A port regulation
 ARBF5050-00-A-1(Plug-in)
 ARBF5050-00-A-2(Non plug-in)



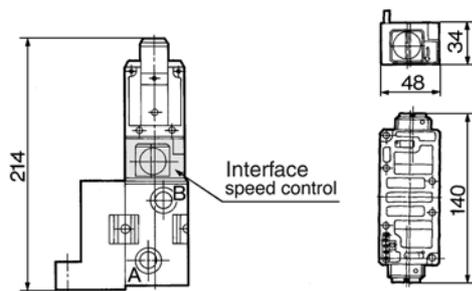
SUP block disc: AXT628-12A
EXH block disc: AXT512-14-1A



Interface regulator/B port regulation
 ARBF5050-00-B-1(Plug-in)
 ARBF5050-00-B-2(Non plug-in)



Interface speed control:
 VVFS5000-20A-1(Plug-in)
 VVFS5000-20A-2(Non plug-in)

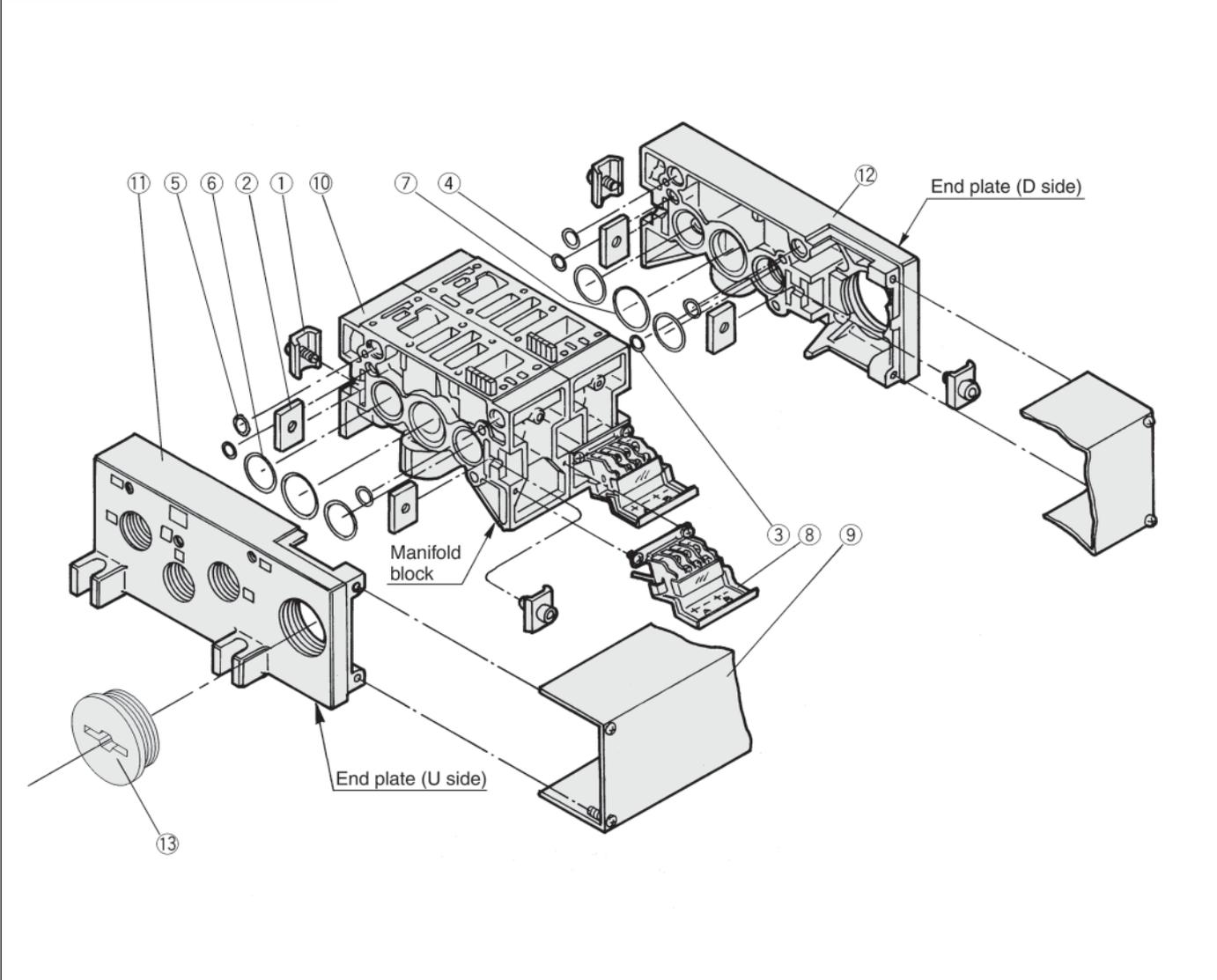


- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR**
- VP7

- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VFR5000

Manifold Exploded View Plug-in/Non Plug-in



Replacement Parts

No.	Name	Material	Part No.
①	Connection bracket A	Steel plate	AXT628-6-1A
②	Connection bracket B	Steel plate	AXT628-6-2
③	O ring	NBR	AS568-006
④	O ring	NBR	AS568-010
⑤	O ring	NBR	AS568-013
⑥	O ring	NBR	AS568-022
⑦	O ring	NBR	AS568-026
⑧	Terminal block assembly	-	VFR5000-21-1A
⑨	Junction cover assembly	For 01T For 01SU	VVFS5000-4A- <u>Station</u> AZ738-31A- <u>Station</u>
⑬	Rubber plug	NBR	AXT336-9

- When requiring replacement manifold stations, order replacement parts assembly no. ⑩: manifold block assembly part.
Plug-in: When ordering manifold with terminal block, ⑨ Junction cover assembly is required

Replacement Parts: Sub Assembly



Note) The above figure shows plug-in manifold with terminal block.

No.	Name	Part No.	Component parts	Applicable manifold base
⑩	Manifold block assembly	VFR5000-20-1A- ⁰⁴ / ₀₆	Manifold block ⑩, Connection bracket ①, ②, Terminal block ⑧, O ring ③, ④, ⑤, ⑥, ⑦, Receptacle assembly	Plug-in
		VVFS5000-1A-2- ⁰⁴ / ₀₆	Manifold block ⑩, Connection bracket ①, ②, O ring ③, ④, ⑤, ⑥, ⑦	Non plug-in
⑪	End plate (U side) assembly	VVFS5000-2A-1	End plate(U)⑪, Connection bracket ①, ②	Plug-in
		VVFS5000-2A-2	End plate(U)⑪, Connection bracket ①, ②	Non plug-in
⑫	End plate (D side) assembly	VVFS5000-3A-1	End plate(D)⑫, Connection bracket ①, ②, O ring ③, ④, ⑤, ⑥, ⑦	Plug-in
		VVFS5000-3A-2	End plate(D)⑫, Connection bracket ①, ②, O ring ③, ④, ⑤, ⑥, ⑦	Non plug-in

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



Plug-in type



Non plug-in type

Symbol

2 position	3 position
Single	Closed center
(A)4 2(B) (EA)5 1 3(EB) (P)	(A)4 2(B) (EA)5 1 3(EB) (P)
Double	Exhaust center
(A)4 2(B) (EA)5 1 3(EB) (P)	(A)4 2(B) (EA)5 1 3(EB) (P)
	Pressure center
	(A)4 2(B) (EA)5 1 3(EB) (P)

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.

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)
	Lubrication		Non-lube ⁽¹⁾
	Manual override		Non-locking push type
Impact/Vibration resistance		300/50m/s ² ⁽²⁾	
Enclosure		Dustproof	
Electricity specifications	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 (2.04 W: With light/surge voltage suppressor)
Electrical entry	Plug-in type	Conduit terminal	
	Non plug-in type	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

Model

Type of actuation	Model		Port size	Flow characteristics ⁽¹⁾								Max. operating cycle ⁽²⁾ (Hz)	Response time ⁽³⁾ (ms)	Weight ⁽⁴⁾ (kg)
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → EA/EB)			Cv	Q [L/min] [ANR] ^⑤			
				C [dm ³ /s-bar] ^⑥	b	Cv	C [dm ³ /s-bar] ^⑥	b	Cv						Q [L/min] [ANR]^{⑤}
2 position	Single	VFR610□ VFR611□	3/4	40	0.12	9.1	9176	41	0.15	9.6	9555	2	100 or less	4.73 (4.56)
	Double	VFR620□ VFR621□	3/4	40	0.14	9.2	9273	41	0.17	9.7	9659	2	100 or less	4.78 (4.61)
3 position	Closed center	VFR630□ VFR631□	3/4	39	0.17	9.3	9188	39	0.15	9.3	9089	1	150 or less	4.72 (4.55)
	Exhaust center	VFR640□ VFR641□	3/4	38	0.14	8.9	8809	42 [40]	0.12 [0.15]	9.6 [9.4]	9635 [9322]	1	150 or less	4.72 (4.55)
	Pressure center	VFR650□ VFR651□	3/4	38 [20]	0.10 [0.44]	8.7 [5.7]	8628 [5604]	40	0.16	9.3	9372	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

Note 5) These valves have been calculated according to the ISO6358 and indicate the follow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

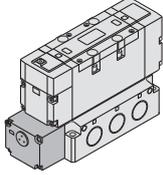
SY
SYJ
SX
VK
VZ
VF
VFR
VP7
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

VFR6000

How to Order

Electrical entry

F: Plug-in conduit style



Option

-	None
Z	With light surge voltage suppressor

Port size (P, A, B, EA, EB port)

-	Without sub-plate
06	3/4
10	1

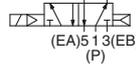
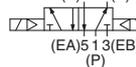
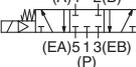
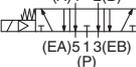
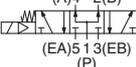
Plug-in

VFR6 0 0 5 **F** 10 **Q**

Non plug-in

VFR6 1 1 1 **D** 10 **Q**

Configuration

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

Body option

0	Standard
1*	Direct manual override

*Option

Thread

-	Rc (PT)
F	G (PF)
N	NPT
T	NPTF

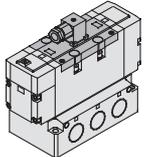
Voltage

1	100V AC, 50/60Hz
2	200V AC, 50/60Hz
3	110V to 120V AC, 50/60Hz
4	220V AC, 50/60Hz
5	24V DC
6	12V DC
7	240V AC 50/60Hz

 Contact SMC for other voltages

Electrical entry

D: DIN connector
DO: Without connector



 Protective class class III (Mark: )

How to Order Pilot Valve Assembly

SF4 - 1 F - 22 - Q

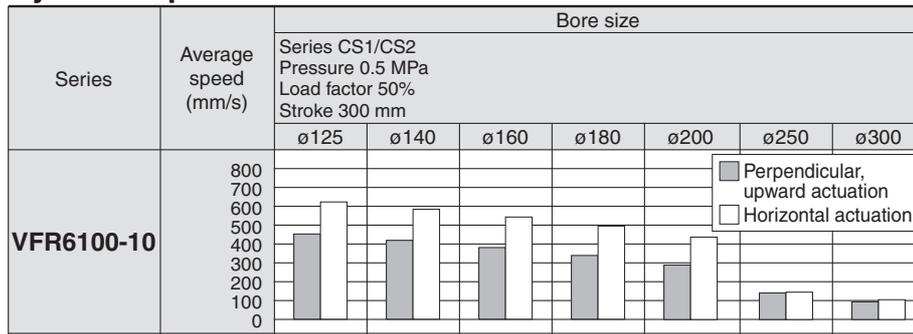
Voltage

No	Rated voltage
1	100V AC 50/60Hz
2	200V AC 50/60Hz
3	110 to 120V AC 50/60Hz
4	220V AC 50/60Hz
5	24V DC
6	12V DC
7	240V AC 50/60Hz

For other rated voltages, please consult with SMC

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

Cylinder Speed Chart

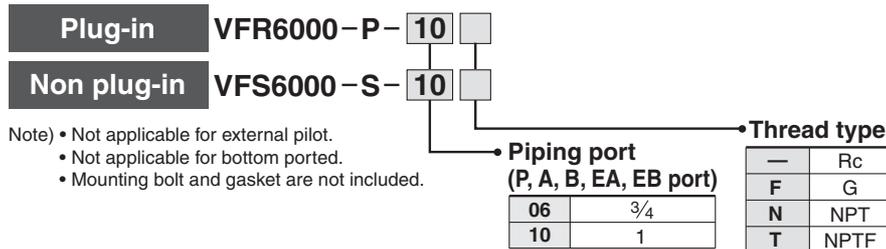


- * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- * The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- * Load factor: ((Load mass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



SY

SYJ

SX

VK

VZ

VF

VFR

VP7

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

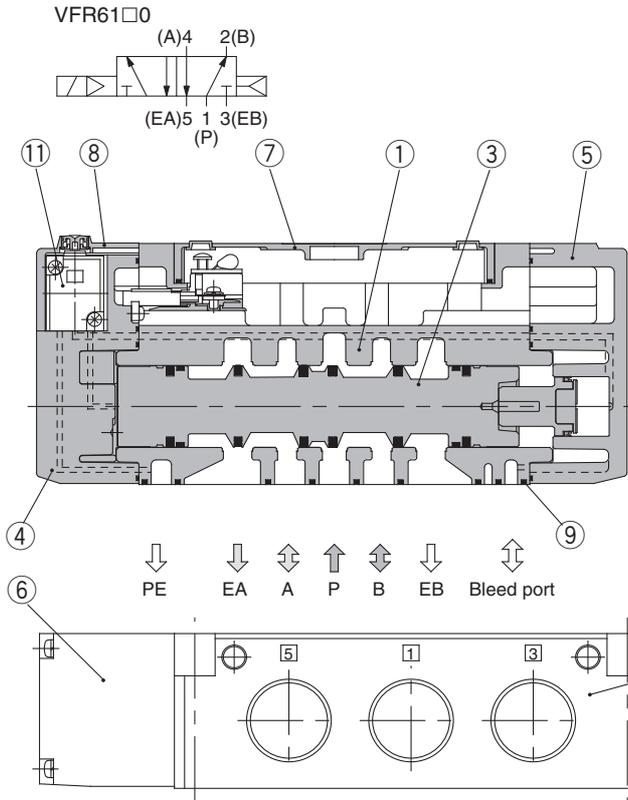
VS7

VQ7

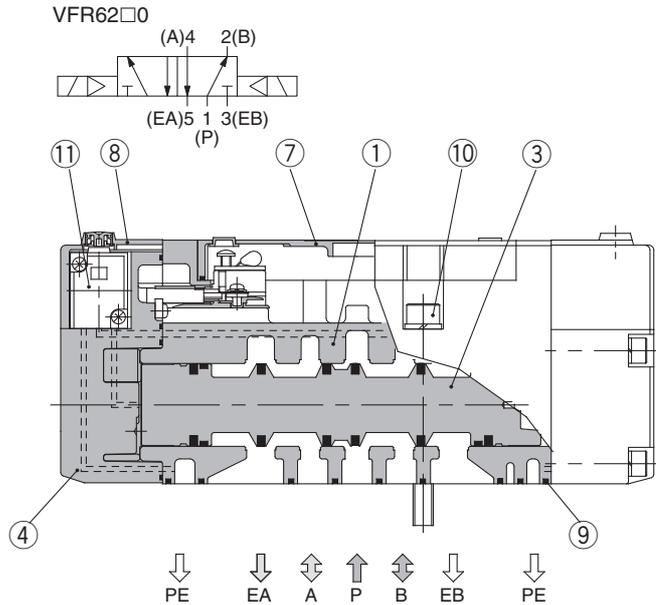
VFR6000

Construction

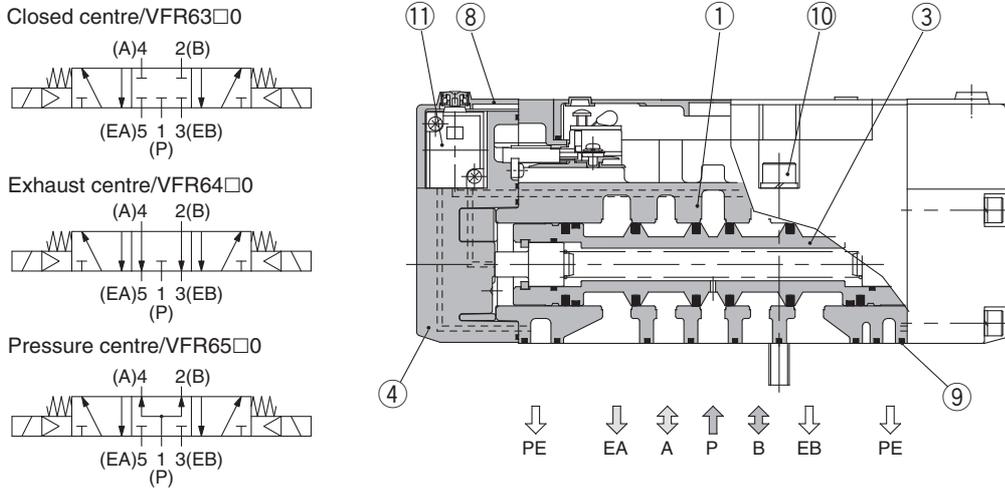
2 position single



2 position double



3 position closed centre/exhaust centre/pressure centre



This figure shows closed centre.

Component Parts

No.	Name	Material	Note
①	Body	Aluminium die cast	Platinum silver
②	Sub-plate	Aluminium die cast	Platinum silver
③	Spool valve	Aluminium, NBR	
④	Adapter plate	Aluminium die cast	Black

Component Parts

No.	Name	Material	Note
⑤	End plate	Aluminium die cast	Black
⑥	Junction cover	Resin	Black
⑦	Light cover	Resin	
⑧	Pilot valve cover	Resin	Black

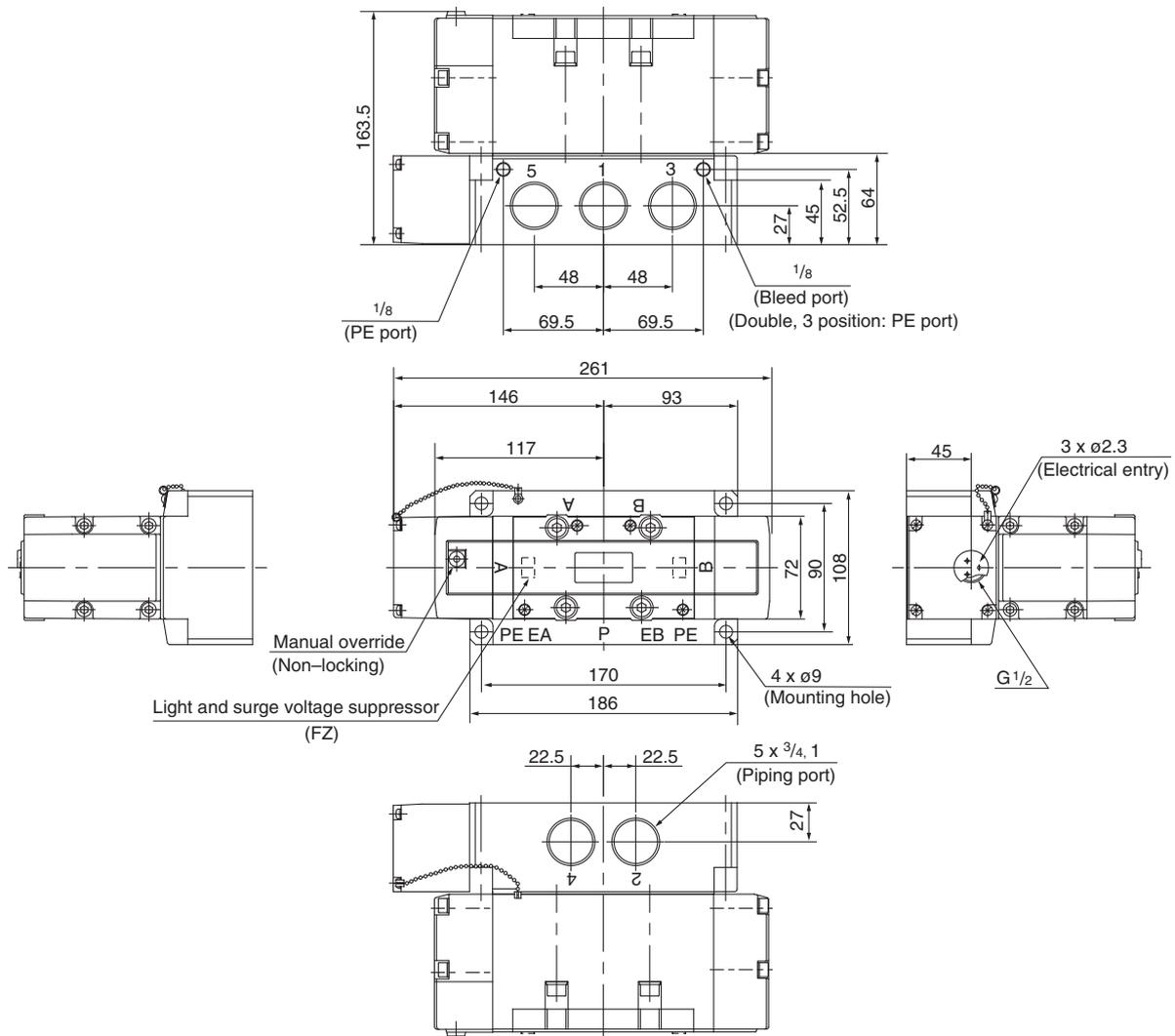
Replacement Parts

No.	Name	Material	Part No.		
			VFR61□□	VFR62□□	VFR63□□, 64□□, 65□□
⑨	Gasket	NBR	VFS6000-15	VFS6000-15	VFS6000-15
⑩	Hex. socket head cap screw	Brass	M8 X 80	M8 X 80	M8 X 80
⑪	Pilot valve assembly	-			

Refer to "How to Order Pilot Valve Assembly" on p.1.8-84

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

2 position single: VFR610⁰-□F(Z)



SY

SYJ

SX

VK

VZ

VF

VFR

VP7

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

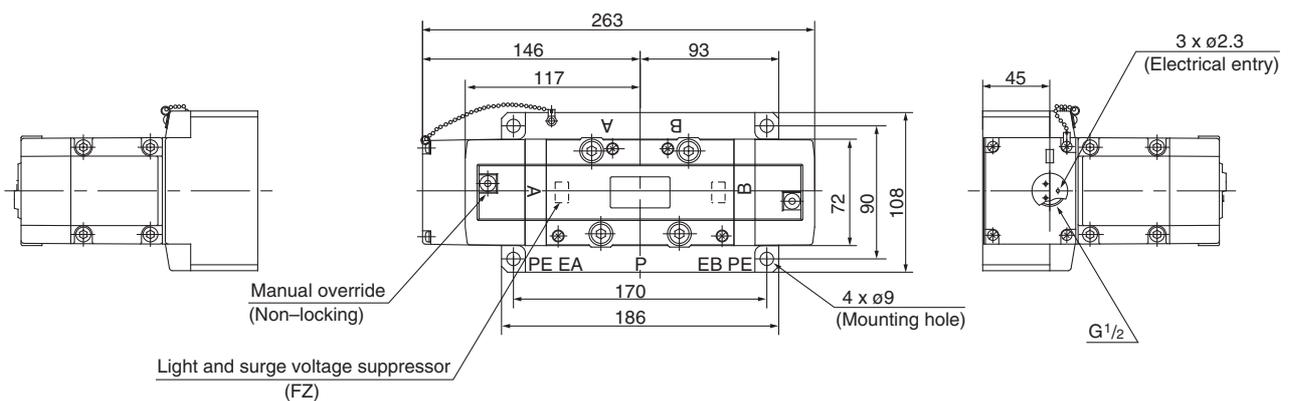
VQ7

2 position double: VFR620⁰-□F(Z)

3 position closed centre: VFR630⁰-□F(Z)

3 position exhaust centre: VFR640⁰-□F(Z)

3 position pressure centre: VFR650⁰-□F(Z)

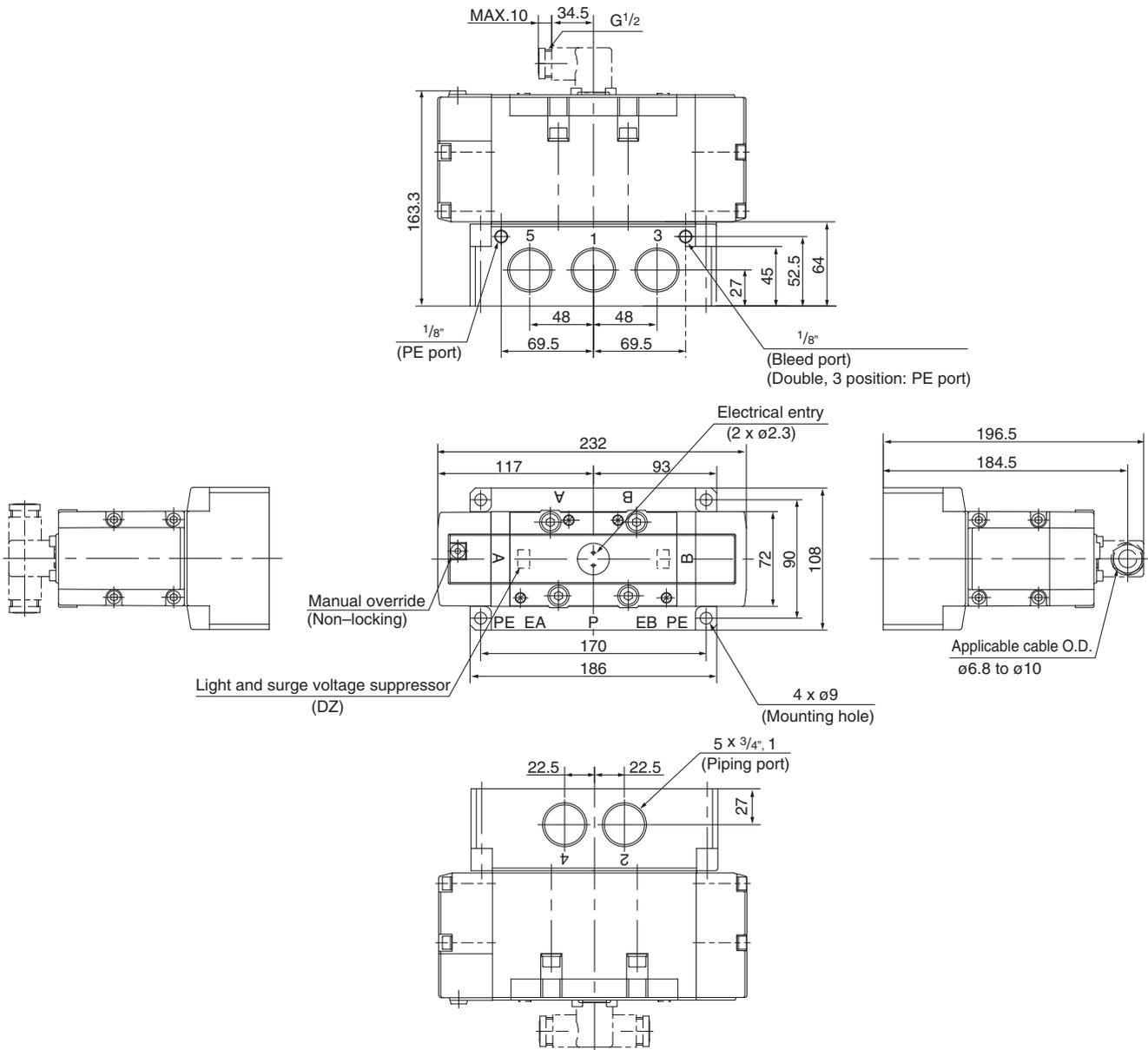


*Other dimensions are same as single style.

VFR6000

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

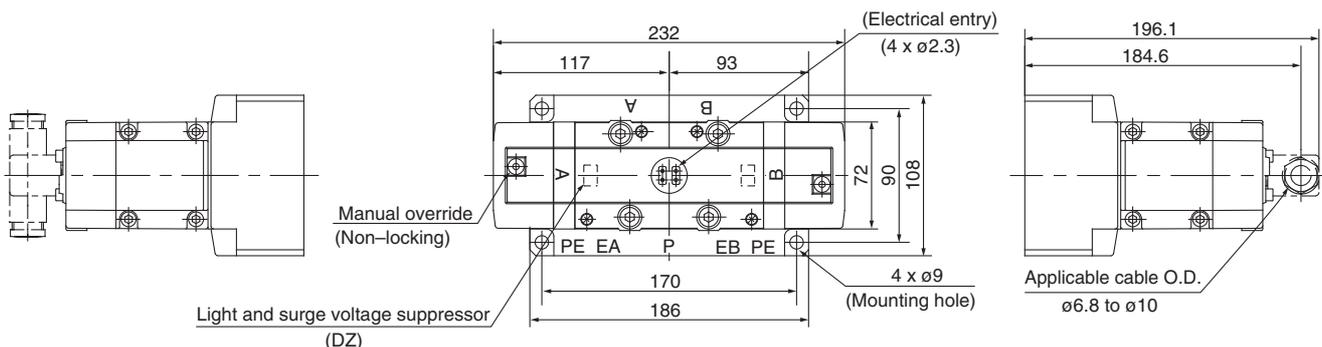
2 position single: VFR611⁰₁-□D(Z)



2 position double: VFR621⁰₁-□E/VFR621⁰₁-□D(Z) 3 position closed centre: VFR631⁰₁-□D(Z)

3 position exhaust centre: VFR641⁰₁-□D(Z)

3 position pressure centre: VFR651⁰₁-□D(Z)



*Other dimensions are same as single style.